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, and other Department personnel working at check stations. The authors wish to express their appreciation to all those who assisted in data collection.

2021 - JCR Evaluation Form

SPECIES: Pronghorn
PERIOD: 6/1/2021 - 5/31/2022

HERD: PR615 - RED DESERT

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

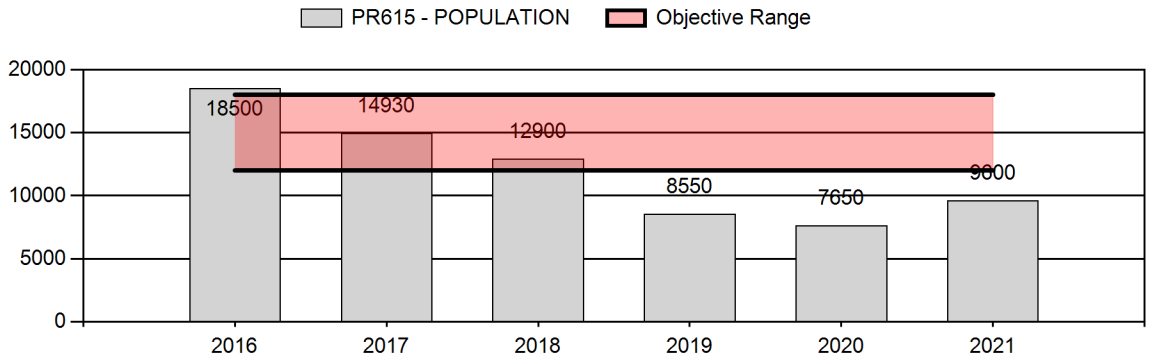
	2016 - 2020 Average	2021	2022 Proposed
Population:	12,506	9,600	9,030
Harvest:	280	275	375
Hunters:	304	351	450
Hunter Success:	92%	78%	83 %
Active Licenses:	325	351	450
Active License Success:	86%	78%	83 %
Recreation Days:	1,001	1,300	1,600
Days Per Animal:	3.6	4.7	4.3
Males per 100 Females	56	62	
Juveniles per 100 Females	51	56	

Population Objective (± 20%) :	15000 (12000 - 18000)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-36%
Number of years population has been + or - objective in recent trend:	4
Model Date:	2/24/2022

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:	11.2%	16.4%
Proposed change in post-season population:	-0.5%	-5.9%

Population Size - Postseason



2022 Hunting Seasons
Red Desert Pronghorn (PR615)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
60	1	Aug. 15	Sep. 16	Sep. 17	Oct. 31	100	Any antelope
61	1	Aug. 15	Sep. 9	Sep. 10	Oct. 31	175	Any antelope
64	1	Aug. 15	Sep. 16	Sep. 17	Oct. 31	225	Any antelope

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

2022 Management Summary

1.) **Hunting Season Evaluation:** This herd experienced a severe winter with exceptionally deep snow in 2018-19, causing significant mortality that was observed by both field personnel and hunters. Losses during the 2019-20 winter, which had less snowfall but severe cold that extended from late October through February, were also above average, at least in the eastern portion of the herd unit. These losses, compounded with near-record low fawn crops in 2018 (41:100), 2019 (49:100) and 2020 (45:100) have caused this population to decline.

The current spreadsheet population model for the Red Desert herd indicates this population was still nearly 35% below objective in 2021. This model is a truncated version of previous models, initiating in 2008 rather than 1993. While initial population estimates are high, removal of 15 years of historic herd data allows the current model to closely align with three recent line transect estimates of population size, falling within the 95% confidence intervals of each. Line transect population estimates are derived using a proven and robust scientific methodology and anchoring the spreadsheet model to these independent estimates of herd size increases confidence in the model's predictions. A line transect survey of this herd flown in spring 2021 provided a fourth independent estimate (see Appendix A.), and the spreadsheet model aligns almost perfectly with the most recent data. With the herd so far below objective, doe harvest was eliminated in 2019 and no doe/fawn licenses were offered in 2020, 2021 or 2022.

Classification sample size declined in 2021, to its smallest size since 2005. Most of the decline was in Area 61, with sample size from Area 64 actually increasing slightly. The buck:doe ratio for this herd improved to 62:100, reaching the range for special management for the first time in four years. Buck:doe ratios exceeded the minimum for special management in Area 60 and Area 61, but was only 55:100 in Area 64. Area 64 also had an extremely low yearling buck:doe ratio (3:100), while its supply of mature bucks was comparable to the other two areas at 52:100. Fawn production improved in 2021, again the highest in four years. Fawn:doe ratios were similar between Areas 61 and 64, but at a low 38:100 in the drier Area 60.

Hunter success declined in 2021 to its lowest level since 2006. Nearly all of the decline was in Area 64, with success increasing in Area 61 and remaining nearly stable in Area 60. The days of effort required to harvest an animal also jumped to an all-time high in Area 64. Despite the reduced hunter success, hunter satisfaction increased to 88% and dissatisfaction decreased to 4%, both within the normal range for this herd (Figure 1.). These shifts were seen in all three areas, despite the record poor harvest statistics reported for Area 64.

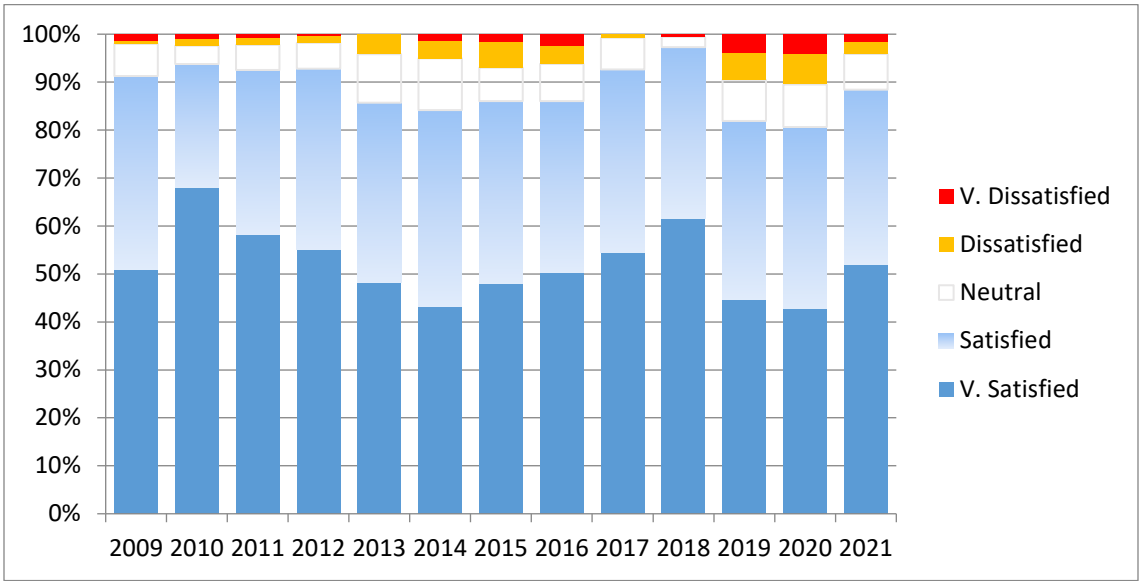


Figure 1. Hunter satisfaction and dissatisfaction for the Red Desert Pronghorn Herd.

Improved hunter satisfaction may have been related to improved quality of bucks available for harvest, rather than simple hunter success. Thirty-seven percent of the buck harvest was checked and measured in 2021, and average length of bucks increased from 13" in 2020 to 13.5" in 2021. The longest horn measured in 2021 was 16.2", from Area 64, compared to 15.8" the year before. More importantly, the proportion of bucks 14" or longer increased from 21 percent of the harvest in 2020 to 36% in 2021 (Figure 2.). This herd has a reputation for exceptional bucks, and it would appear hunter satisfaction is tied more to buck quality than simple hunter success.

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 declined as increased harvest affected buck quality and rebounded when buck quality recovered in 2021. Bucks longer than 14" made up only 24% of the buck harvest from Area 61 in 2020 when hunter satisfaction was low, but satisfaction was restored by 2021 when 46% of harvested bucks were at least 14" long.

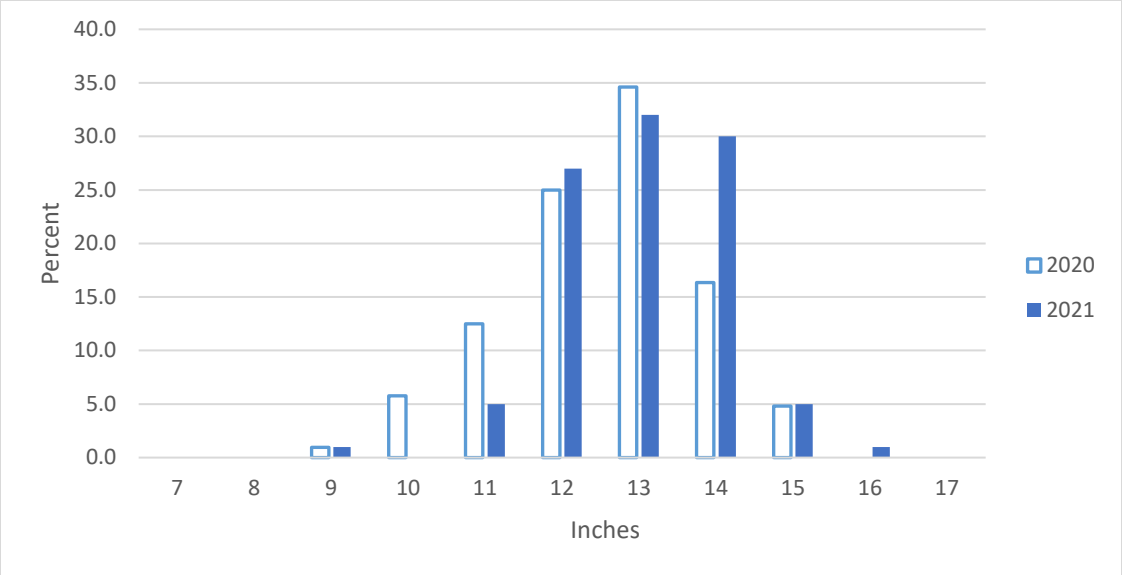


Figure 2. Comparison of horn length of pronghorn bucks checked from the Red Desert Pronghorn Herd in 2020 and 2021.

From 2019 through 2021, reported harvests represented 9.4 % of the bucks estimated to be in this herd. In an effort to meet the new statewide standard of a harvest rate of 15%, license quotas were increased by 100 (25%) in 2022, which should harvest 16.4%. All of the increase was split between Area 60 and Area 61 because of their higher buck:doe ratios and hunter success. Harvest statistics were drastically lower in Area 64 in 2021, as was the buck:doe ratio, and no further increase was issued for this area.

2.) **Population Modeling:** Bio-year 2021 postseason population estimate for this herd unit from the WGFD spreadsheet model was approximately 9,600 pronghorn. In 2021, WGFD managers also began using PopR integrated population models (IPMs) to estimate population indices for mule deer and pronghorn. The 2021 postseason population estimate for this herd unit from the IPM was approximately 9,545 (CL = 8,420 – 12,070) pronghorn. Postseason population estimates from both models for 2021 were reported here to allow for comparison during this transitional year. The Department intends to replace the WGFD spreadsheet model with the PopR IPM in bio-year 2022.

Efforts to model this herd with the new IPM failed to produce a model better than the current spreadsheet version, but the 2021 population estimate from a 'constant adult survival' IPM was quite similar. Estimates from the current spreadsheet model fall within the confidence intervals on all four recent LT estimates, and match two of the four, including the most recent in 2020. The selected IPM with 'constant' adult survival fell outside the confidence intervals of 3 of the past 6 line transect surveys, but fit well with the 2020 estimate. Tracking with buck:doe ratios was poor, falling outside confidence intervals on about half of the years' data, but the 2021 population estimate was within 2% of the spreadsheet model. However, a second run of the same 'constant' IPM with identical inputs at a later date produced a model with a population estimate almost 5% higher.

As was seen with other pronghorn herds, using IPMs with 'time varying' adult mortality produced lower estimates of herd size, falling below confidence intervals of 3 of the 6 line transect estimates and hitting only the lower limits of the remaining three, including the 2020 estimate. The 2021 population estimate from this IPM was about 12% below the spreadsheet model. This IPM also tracked outside the confidence intervals of at least half the observed buck:doe ratios. When replicated a few days later with identical inputs, this model's 2021 estimate rose by more than 18% and exceeded the spreadsheet estimate.

In an effort to compare with the spreadsheet model, the 'constant' IPM was also run in a truncated version like the spreadsheet model, beginning in 2010. Rather than improving fit with the spreadsheet model, or real world data, the truncated IPM provided an estimate more than 15% lower and only aligned with the most recent line transect estimate. Another truncated model was run, using the 'time varying" option. This model fell below the confidence intervals of 3 LTs yet above that of the latest LT, with a 2021 population estimate of 14,260, almost 50% higher than the spreadsheet estimate and at least 43% above any 20-year IPM. It would appear using the maximum number of years of data is more beneficial with IPMs, even if those data are inconsistent over time. It also appears the IPM may need a hybrid version to incorporate individual years of low adult survivability into a 'constant' adult survival model to generate reasonable estimates of pronghorn herd sizes in this part of Wyoming.

Appendix A
Line Transect Report

Bio Year: 2020
Species: Pronghorn
Aircraft: Cessna 182, Wyo. Aerophoto
Pilot: Jamie Burgess
Observers: Greg Hiatt, Stan Harter
Conditions: Fair green-up, mostly clear skies, moderate wind in north.

Herd Code: PR615
Herd Unit: Red Desert
Hunt Areas: 60, 61, 64
Dates: 25, 26, 27 May 2021
Flight Time: 14.1 hrs

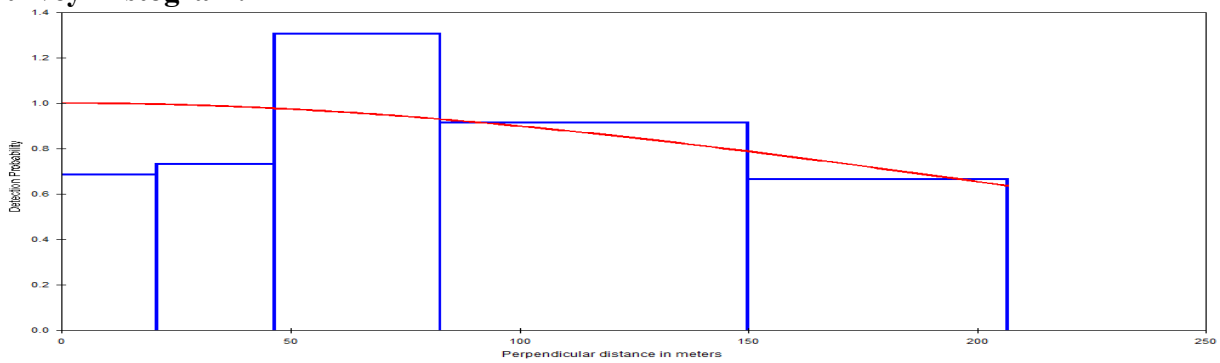
Survey Design:

Distance bands at 300':	20m, 45m, 80m, 145m, 200m
Average Above Ground Level (AGL):	309.8064 ft
Actual average distance bands:	20.65m, 46.47m, 82.62m, 149.74m, 206.54m
Number of transects:	42
Transect sampling scheme:	North-south transects at 4' intervals, starting at 107o 18' and ending at 108o 42'. Lines were split north/south at 42o latitude.
Length of transects:	1,538.162 km (960.15 miles)
Number of observers:	1

Notes:

Pilot's GPS was misaligned for the first 4 flight lines, flown by Hiatt on the 25th. Landed on Minex Road to re-orient GPS, then restarted survey south-bound on correct Transect 4 (County Line), renumbered as Line 10. Finished on Transect 22. Transects 1, 2, and 3 were reflown on the 26th by Hiatt. Harter took over as observer and flew Transects 42 through 26, landing in Lander. Harter finished flying Transects 23, 24 and 25 on the morning of 27th from Lander.

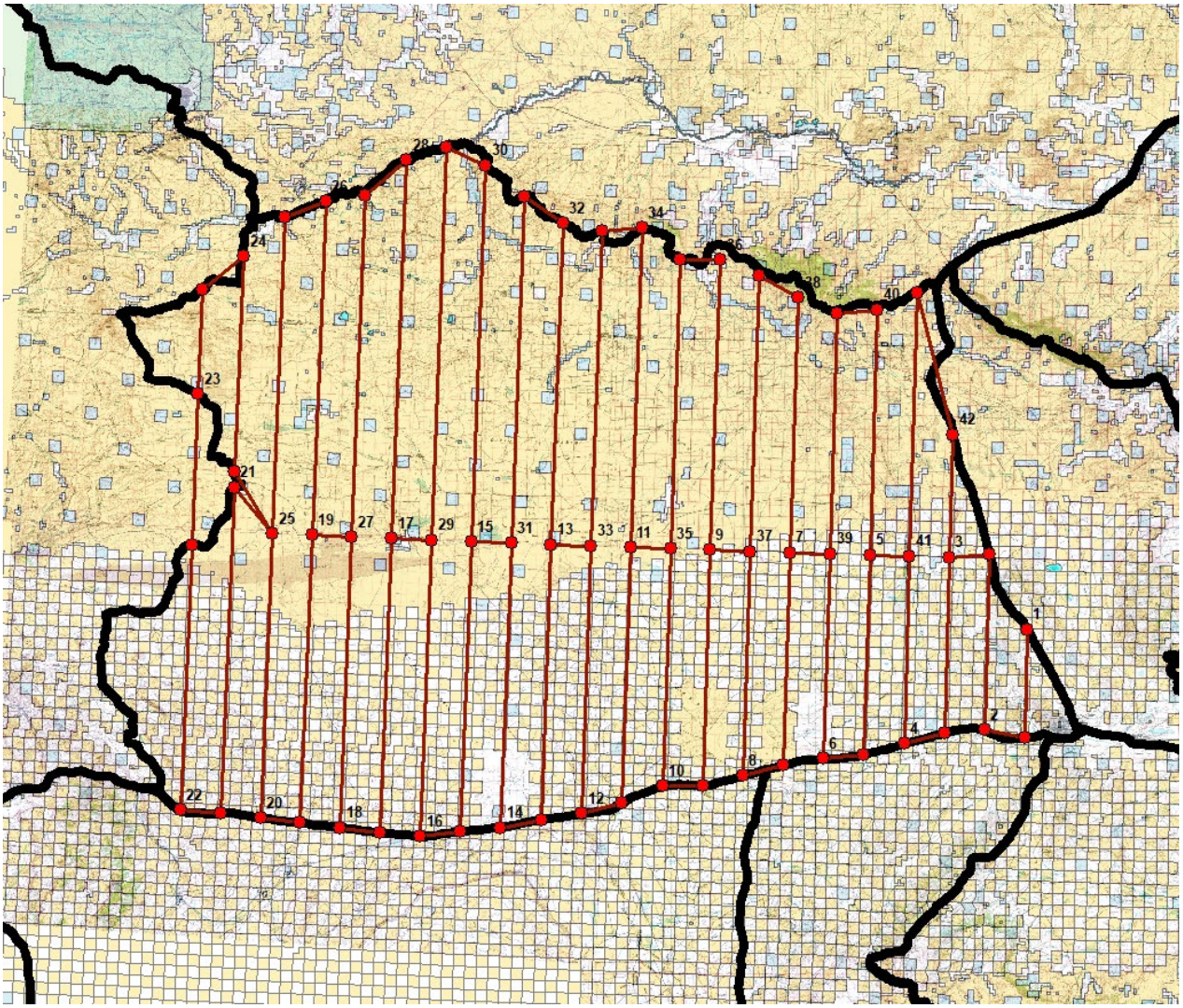
Survey Histogram:



Distance Estimate:

Model used:	Half-normal with Cosine adjustment
Density estimate (D):	2.2195 pronghorn/sq mi
% Coeff. Var. (CV)	18.66 %
Occupied habitat:	3,380.49 sq mi
Population estimate:	7,503 pronghorn (2.2195 Ph/sq mi * 3380.49 sq mi)
95% CI:	5,198 - 10,830

Flight Lines:



2021 - JCR Evaluation Form

SPECIES: Pronghorn
PERIOD: 6/1/2021 - 5/31/2022

HERD: PR630 - IRON SPRINGS

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

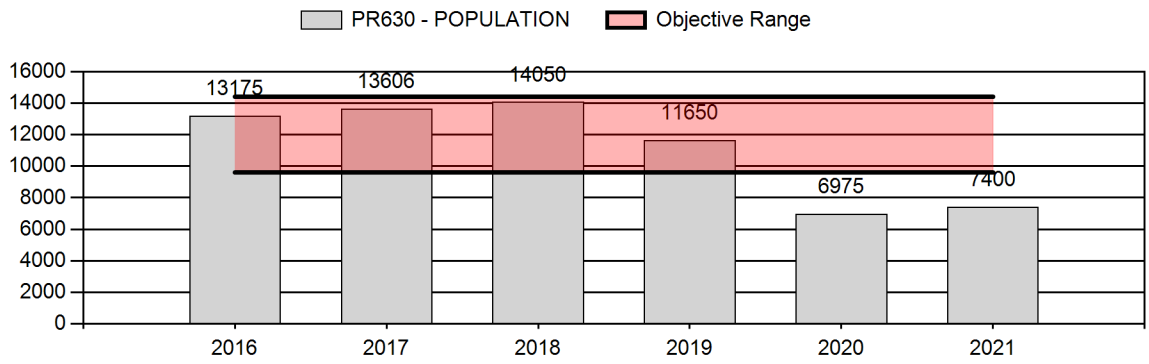
	2016 - 2020 Average	2021	2022 Proposed
Population:	11,891	7,400	7,500
Harvest:	804	456	465
Hunters:	803	506	550
Hunter Success:	100%	90%	85 %
Active Licenses:	945	572	550
Active License Success:	85%	80%	85 %
Recreation Days:	2,804	1,826	1,720
Days Per Animal:	3.5	4.0	3.7
Males per 100 Females	53	48	
Juveniles per 100 Females	45	52	

Population Objective (± 20%) :	12000 (9600 - 14400)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-38.3%
Number of years population has been + or - objective in recent trend:	2
Model Date:	2/24/2022

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

	JCR Year	Proposed
Females ≥ 1 year old:	4.9%	4.2%
Males ≥ 1 year old:	14.7%	14.5%
Proposed change in post-season population:	8.6%	1.3%

Population Size - Postseason



2022 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	150	Any antelope
52	2	Aug. 15	Sep. 15	Sep. 16	Nov. 14	150	Any antelope valid south of North Spring Creek
52	6	Aug. 15	Sep. 15	Sep. 16	Oct. 31	100	Doe or fawn
52	7	Aug. 15	Sep. 15	Sep. 16	Nov. 14	100	Doe or fawn valid south of North Spring Creek
56	1	Aug. 15	Sep. 19	Sep. 20	Oct. 31	50	Any antelope
108	1	Aug. 15	Sep. 19	Sep. 20	Oct. 31	50	Any antelope
108	7	Aug. 15	Sep. 19	Sep. 20	Nov. 30	25	Doe or fawn valid south of the Bridger Pass Road (B.L.M. Road 3301), east of the Continental Divide and north of the Miller Hill Road (Carbon County Road 505W)

2021 Hunter Satisfaction: 81% Satisfied, 12% Neutral, 7% Dissatisfied

2022 Management Summary

1.) **Hunting Season Evaluation:** Classification and harvest data in 2020 indicated this herd suffered heavy losses during the 2019-20 winter. Classification sample size declined again to another record low in 2021, and was less than half the sample classified in 2019 before the harsh winter. All of the decline in sample size came from Area 52, with samples in Area 56 and Area 108 showing slight improvement over the record lows recorded in 2020. For the herd as a whole, the buck:doe ratio changed little from 2020 to 2021. But within the three hunt areas, the ratio for Area 108 dropped to 30:100 while Area 52 rose to 56:100. As would be expected, the exceptionally poor fawn crops in Areas 56 and 108 in 2020 yielded exceptionally low yearling recruitment in 2021. Area 52, however, had 18 yearling bucks for every 100 does, a 10-year high. Fawn production improved slightly in Area 52 and Area 108, but dropped to a new record low of 11:100 in Area 56. 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 80% in 2021, the 2nd lowest in 37 years. Of the seven license types, hunter success was lowest for the Type 1 and Type 7 licenses in Area 108, at 73% and 71% respectively. Hunters with Area 52 Type 1 and Type 6 licenses fared the best, with 83% and 84% success. Hunter satisfaction improved slightly, but was still the 2nd worst out

of the 13 years of records (Figure 1.). Similarly, hunter dissatisfaction declined slightly, but was still the 3rd worst on record. This pattern was repeated in all three hunt areas, but dissatisfaction was greatest in Area 108, at 17%, and least in Area 56 at just 3%. This latter statistic is surprising, given the greatly restricted access in Area 56, but apparently most hunters who apply for licenses in this area have come to learn what difficulties they will encounter. Five of 10 hunter comments received after the 2021 hunts complained about low antelope numbers, and three of those were for Area 108.

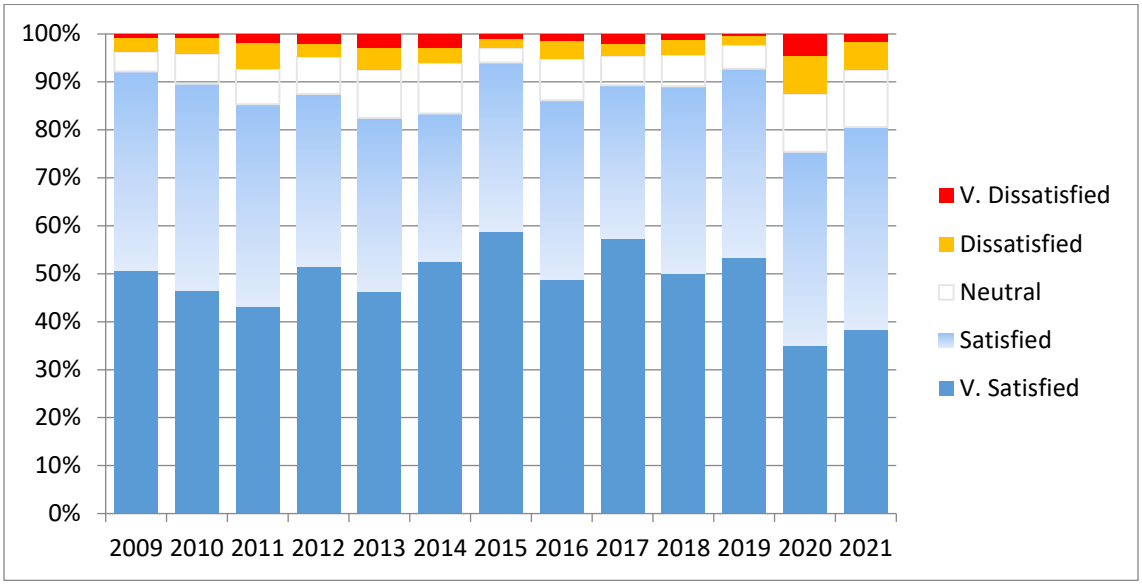


Figure 1. Hunter satisfaction and dissatisfaction in the Iron Springs Pronghorn Herd.

Unlike some neighboring herds, buck quality showed little improvement in this herd in 2021 (Figure 2.). Horn measurements were obtained from 11% of the reported harvest. While the proportion of bucks in the 13" range increased, average horn length declined from 12.1" in 2020 to 11.75" in 2021. The maximum horn length was 14.7" in 2020, but only 14.3" in 2021. In 2020, bucks longer than 14" made up 10% of the buck harvest, but in 2021 they were only 7%. Poor buck quality probably contributes to the continued poor hunter satisfaction in this herd.

Incorporating classification and harvest data, the spreadsheet model predicts roughly half the population was lost during the 2019-20 winter, and the herd was still almost 40% below objective in 2021. Harvest adjustments for winter losses were made in the northern portion of the herd in 2020, with further quota reductions in Area 52 in 2021. While doe harvest is not necessary with the herd so far below objective, some Type 6 and 7 licenses have been retained in Areas 52 and 108 to address damage issues. To address landowner and outfitter concerns, the quota for the Type 7 licenses in southern Area 52 is reduced by 50.

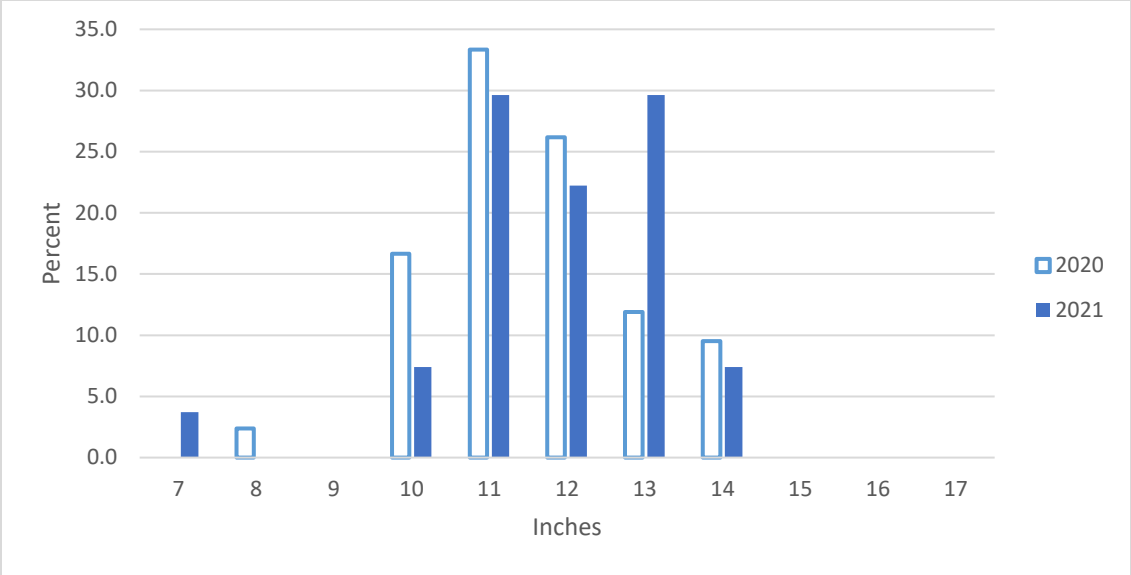


Figure 2. Comparison of horn length of pronghorn bucks checked from the Iron Springs Pronghorn Herd in 2020 and 2021.

From 2019 through 2021, reported harvests averaged 17.1% of the bucks estimated to be in this herd. Projected harvest from the 2022 license quotas would represent 14.6% of the bucks predicted to be in the herd this year, below the 25% target. But roughly 90% of the pronghorn in Area 56 and at least half those in Area 108 are unavailable for harvest due to a lack of access. Pronghorn in major blocks of Area 52, particularly in the southern half, are also unavailable for harvest. Given the exceptionally poor fawn production and recruitment seen in Areas 56 and 108, existing supply of bucks will need to be extended for several more years than typical until recruitment returns to normal.

2.) **Population Modeling:** Bio-year 2021 postseason population estimate for this herd unit from the WGFD spreadsheet model was approximately 7,400 pronghorn. In 2021, WGFD managers also began using PopR integrated population models (IPMs) to estimate population indices for mule deer and pronghorn. The 2021 postseason population estimate for this herd unit from the IPM was approximately 10,465 (CL = 9,185 – 11,765) pronghorn. Postseason population estimates from both models for 2021 were reported here to allow for comparison during this transitional year. The Department intends to replace the WGFD spreadsheet model with the PopR IPM in bio-year 2022.

Efforts to model this herd with the new IPM failed to produce a model better than the current spreadsheet version. Estimates from the current spreadsheet model only fall within the confidence interval of 1 of 5 line transect estimates, weaving between the other four. But it tracks well with observed buck:doe ratios and predicts the sharp decline in pronghorn numbers seen after the 2019-20 winter. An IPM with 'constant' adult survival fell within the confidence intervals of 2 of 4 line transect surveys, including the most recent 2017 estimate, but tracking with buck:doe ratios was poor, falling outside confidence intervals of at least a third of the years' ratios. Most importantly, this model failed to mimic the drastic decline in pronghorn numbers seen following the 2019-20 winter. This model was replicated

with identical inputs on a different date, and unlike with other neighboring herds, the two estimate were within 1% of each other. As with other herds, IPMs using ‘time varying’ adult mortality produced lower estimates of herd size, falling well below confidence intervals of 2 of the 4 line transect estimates, including the 2017 survey. Population estimates of the ’time-varying’ model were less than half the spreadsheet model estimates. This IPM also tracked outside confidence intervals of at least half the observed buck:doe ratios. This ‘time-varying’ model was also repeated with identical inputs on different dates, and population estimates were more than 6% apart. The IPM may need a hybrid version to incorporate individual years of low adult survivability into a ‘constant’ adult survival model to generate reasonable estimates of pronghorn herd sizes in this part of Wyoming, and managers may have to accept population estimates that vary by the date run.

2021 - JCR Evaluation Form

SPECIES: Pronghorn

HERD: PR631 - WIND RIVER

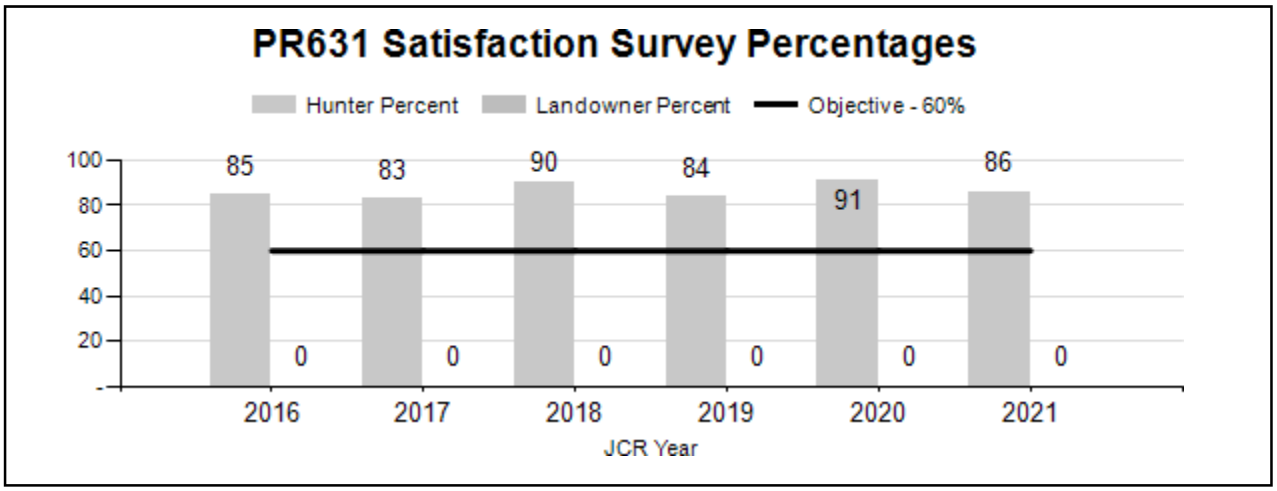
HUNT AREAS: 84

PERIOD: 6/1/2021 - 5/31/2022

PREPARED BY: ZACH GREGORY

	2016 - 2020 Average	2021	2022 Proposed
Hunter Satisfaction Percent	87%	86%	90%
Landowner Satisfaction Percent	0%	0%	0%
Harvest:	117	122	125
Hunters:	126	135	120
Hunter Success:	93%	90%	104 %
Active Licenses:	156	163	160
Active License Success:	75%	75%	78 %
Recreation Days:	648	634	700
Days Per Animal:	5.5	5.2	5.6
Males per 100 Females:	36	35	
Juveniles per 100 Females	48	53	

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



2022 Hunting Seasons
Wind River Antelope (PR631)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
84	1	Aug. 15	Sep. 16	Sep. 17	Oct. 31	100	Any antelope
84	6	Aug. 15	Sep. 16	Sep. 17	Oct. 31	75	Doe or fawn

2021 Hunter Satisfaction: 86% Satisfied, 11% Neutral, 3% Dissatisfied

2022 Management Summary

1.) Hunting Season Evaluation: The hunt season in area 84 has remained unchanged for the past five years. During that time period, 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 year period with satisfaction ranging from 83% to 86% in 2021. Given no obvious trends up or down in hunter success, relatively stable hunter satisfaction, and no damage complaints from landowners license quotas for 2022 will remain unchanged to provide the same amount of opportunity as the last five years.

2021 - JCR Evaluation Form

SPECIES: Pronghorn
PERIOD: 6/1/2021 - 5/31/2022

HERD: PR632 - BEAVER RIM

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

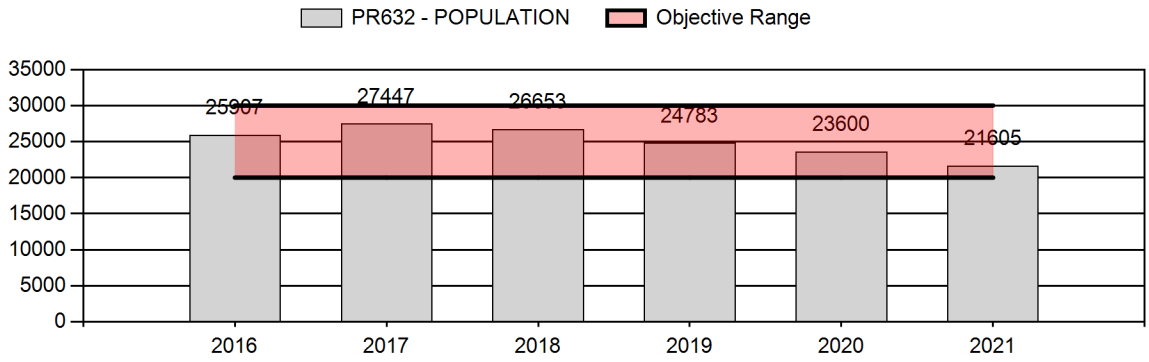
	2016 - 2020 Average	2021	2022 Proposed
Population:	25,678	21,605	22,400
Harvest:	1,758	1,336	1,250
Hunters:	1,822	1,539	1,450
Hunter Success:	96%	87%	86%
Active Licenses:	2,024	1,583	1,500
Active License Success:	87%	84%	83%
Recreation Days:	5,507	4,295	4,000
Days Per Animal:	3.1	3.2	3.2
Males per 100 Females	59	48	
Juveniles per 100 Females	55	46	

Population Objective (± 20%) :	25000 (20000 - 30000)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-13.6%
Number of years population has been + or - objective in recent trend:	1
Model Date:	2/25/2022

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

	JCR Year	Proposed
Females ≥ 1 year old:	4%	6%
Males ≥ 1 year old:	23%	28%
Proposed change in post-season population:	+1.2%	+3.7%

Population Size - Postseason



2022 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. 16	Sept. 17	Oct. 31	150	Any antelope
65	7	Aug. 15	Aug. 31	Sept. 1	Nov. 7	100	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. 16	Sept. 17	Oct. 31	125	Any antelope
67	1	Aug. 15	Sept. 16	Sept. 17	Oct. 31	200	Any antelope
68	1	Aug. 15	Sept. 16	Sept. 17	Oct. 31	400	Any antelope
69	1	Aug. 15	Sept. 14	Sept. 15	Oct. 31	100	Any antelope
69	6	Aug. 15	Sept. 14	Sept. 15	Oct. 31	50	Doe or fawn
74	1	Aug. 15	Sept. 16	Sept. 17	Oct. 31	175	Any antelope
106	1	Aug. 15	Sept. 16	Sept. 17	Oct. 31	175	Any antelope

2021 Hunter Satisfaction: 87.5% Satisfied, 8.0% Neutral, 4.5% Dissatisfied

2022 Management Summary

1.) Hunting Season Evaluation: A total of 1,336 pronghorn were harvested in 2021, with minimal doe/fawn harvest in response to low fawn recruitment since 2019. The total buck/doe ratio dropped to 48M/100F in 2021. The 2022 hunting seasons are designed to provide appropriate, but reduced opportunity for bucks, realizing with the yearling buck/doe ratio of 5YM/100F and low fawn/doe ratio, we are not likely fully replacing harvested bucks annually. Doe/fawn harvest will remain quite low, with most hunt areas having none, in response to declining population trends. The population is expected to increase by just under 4% to about 22,400 in 2022, increasing toward objective if fawn recruitment improves to the 5-year average and with anticipated harvest. However, buck/doe ratios are expected to remain below the special management criteria level as estimated using the previous 5-year average. The population model projected a reduced buck/doe ratio of 50M/100F. This is primarily due to low numbers of observed yearling bucks as expected given continued poor fawn numbers in 2021. Habitats received near average precipitation since January 2021. Winter 2021-22 was very mild, with warmer than average temperatures and very limited snow cover on winter ranges, lending hope for improved fawn recruitment and over- winter survival across all ages.

In 2022, doe/fawn license quotas exist only in 2 hunt areas. Hunt Area 65 Type 7 licenses will remain to address damage situations in restricted parts of Hunt Areas 65 and 66, and Hunt Area 69 will have a 50% reduction of Type 6 licenses from 2021. Reductions have also been made to Type 1 license quotas in all but hunt area 65 in response to declines in buck/doe ratios. Even with

reductions in Type 1 license quotas, buck harvest in the Beaver Rim herd unit is predicted to be about 28% of the pre-season buck population as estimated in POP R. The 3-year average from 2019-21 was 25% as estimated in POP R, with lower values for all 4 years in Spreadsheet model.

2.) Population Modeling: Bio-year 2021 postseason population estimate for this herd unit from the WGFD spreadsheet model was approximately 23,289 pronghorn. In 2021, WGFD managers also began using Pop R integrated population models (IPM) to estimate population indices for mule deer and pronghorn. The 2021 postseason population estimate for this herd unit from the IPM was approximately 21,605 (CL = 19,800 – 23,795) pronghorn. Postseason population estimates from both models for 2021 were reported here to allow for comparison during this transitional year. The Department intends to replace the WGFD spreadsheet model with the Pop R IPM in bio-year 2022.

Both models track well with all line-transect (LT) estimates (Spreadsheet model since 1994 and POP R since 2000). The population estimates also reflect observed trends over the years, but the severity of change in trends and extremities of high and low population levels seems more drastic with the Spreadsheet model; whereas the POP R model trends and severity of fluctuations appear more plausible based on trends in classification and harvest data. Spreadsheet models have several data ranges requiring manual edits on an annual basis, leading to potential for greater user error in creating each year's model and resultant estimates. Although the mechanics of the new POP R model are not yet fully understood, the potential for errors in the user setup process seems lower. The POP R model produces a postseason abundance estimate of 21,605 animals in 2021, which is 1.2% greater than the estimate from 2020 in POP R. Both of these estimates are around 2,000 pronghorn fewer than the Spreadsheet model produced, but the lower POP R estimates are likely more accurate based on recent significant declines in fawn recruitment; the 2021 preseason fawn/doe ratio of 46J/100F is the 3rd lowest in the herd unit since 1994. A line-transect (LT) survey was flown at the end of biological year 2020l with an end-of-bio year estimate of 16,761 pronghorn. Both Spreadsheet and POP R models simulate end-of-bio year abundance estimates slightly above the upper confidence interval for the LT estimate. The 2021 abundance estimate in POP R is 13.6% below objective (25,000).

2021 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2021 - 5/31/2022

HERD: PR634 - BADWATER

HUNT AREAS: 75

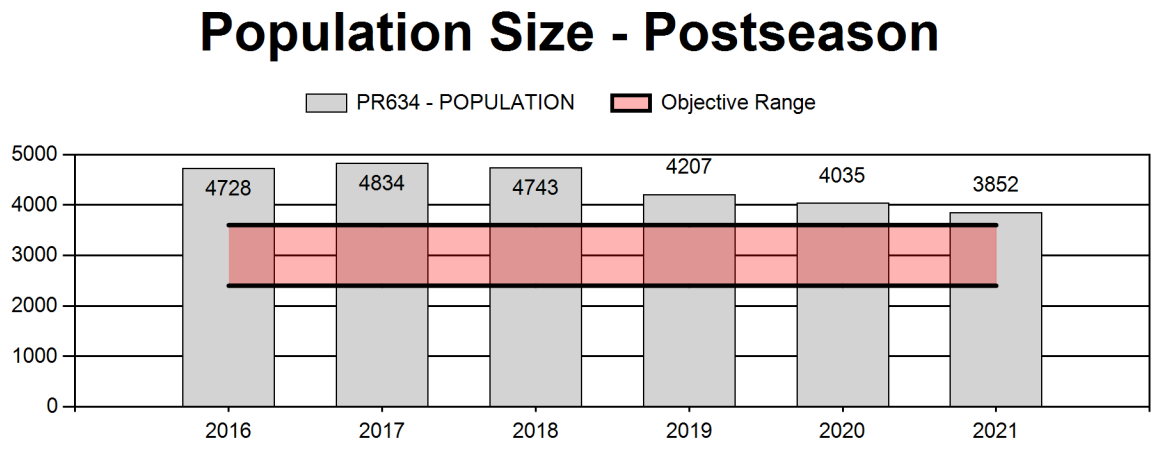
PREPARED BY: ZACH GREGORY

	2016 - 2020 Average	2021	2022 Proposed
Population:	4,509	3,852	3,678
Harvest:	738	348	383
Hunters:	755	397	375
Hunter Success:	98%	88%	102 %
Active Licenses:	814	421	357
Active License Success:	91%	83%	107 %
Recreation Days:	2,041	917	863
Days Per Animal:	2.8	2.6	2.3
Males per 100 Females	65	65	
Juveniles per 100 Females	63	40	

Population Objective (± 20%) :	3000 (2400 - 3600)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	28%
Number of years population has been + or - objective in recent trend:	11
Model Date:	02/20/2022

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

	JCR Year	Proposed
Females ≥ 1 year old:	8%	13%
Males ≥ 1 year old:	40%	43%
Proposed change in post-season population:	-8%	-9%



2022 Hunting Seasons
Badwater Antelope (PR634)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
75	1	Aug. 15	Sep. 16	Sep. 17	Oct. 31	325	Any antelope
75	6	Aug. 15	Sep. 16	Sep. 17	Oct. 31	100	Doe or fawn

2021 Hunter Satisfaction: 90% Satisfied, 5% Neutral, 5% Dissatisfied

2022 Management Summary

1.) Hunting Season Evaluation: The Badwater Antelope herd has been above objective for over five years. In addition, the buck/doe ratio has been above the prescribed recreational threshold of 60:100. To manage the population toward the objective of 3,000 antelope, license numbers in area 75 increased each of the last 6 years prior to 2019. To accommodate a pronghorn horn growth study being conducted by the University of Wyoming, it was decided to maintain the population at a level above objective to provide year-to-year consistency during the study. In response, license numbers were reduced from 2018 to 2019 in an attempt to maintain the population at approximately 4,000 pronghorn or 33% above objective. 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. The poor survival combined with low recruitment again in 2021 evidenced by a fawn:doe ratio of 40:100 resulted in another year of population decline. Given the previous three years of low fawn recruitment and previous two years of low survival, the population is expected to continue to decline in 2022, albeit at a lower rate than the previous two years due to the reduction in licenses. To slow the downward population trend, doe/fawn licenses will be reduced.

Buck:doe ratios have fluctuated over the last several years (59:100 in 2019, 47:100 in 2020, 65:100 in 2021). Two of the previous three years the buck:doe ratio was below the 60:100 recreational management strategy. Hunter success for Type 1 licenses declined from 96% in 2020 to 86% in 2021, and overall success declined from 101% to 88%, respectively, and below the 5 year average of 98%. Given the variability in buck:doe ratios over that past several years (ranging 47:100 to 65:100), decreased hunter success, and continued population decline, Type 1 license allocation will remain the same as in 2021. This should result in the potential harvest of 40% of the preseason bucks in 2022 and a three year average harvest of 39% of the preseason bucks.

2.) Population Modeling: The bio-year 2021 postseason population estimate for this herd unit from the WGFD spreadsheet model was approximately 4,015 pronghorn. In 2021, WGFD managers also began using PopR integrated population models (IPMs) to estimate population indices for mule deer and pronghorn. The 2021 postseason population estimate for this herd unit from the PopR IPM was 3,852 (CL = 3,382 – 4,209) pronghorn. Postseason population estimates from both models for 2021 were reported here to allow for comparison during this transitional year. The Department intends to replace the WGFD spreadsheet model

with the PopR IPM in bio-year 2022. The new PopR modeling program indicates a similar downward trend in the population as the previously used spreadsheet model, however, the post season population numbers vary slightly from each other. Nevertheless both models are predicting the population to be nearing the upper limits of the objective for this herd in 2022.

2021 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2021 - 5/31/2022

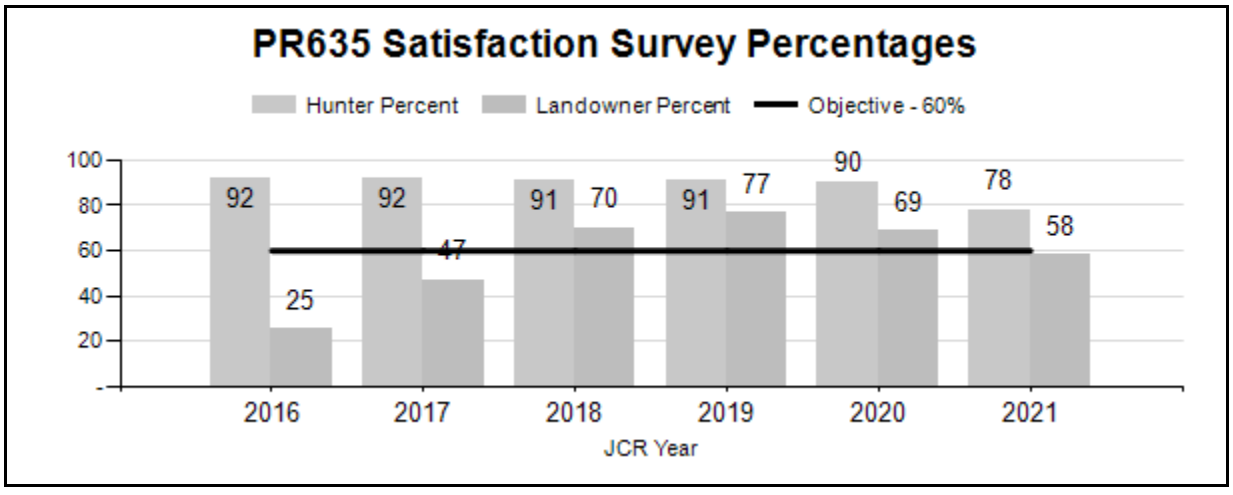
HERD: PR635 - PROJECT

HUNT AREAS: 97, 117

PREPARED BY: ZACH GREGORY

	2016 - 2020 Average	2021	2022 Proposed
Hunter Satisfaction Percent	91%	78%	90%
Landowner Satisfaction Percent	57%	58%	65%
Harvest:	477	336	275
Hunters:	458	341	275
Hunter Success:	104%	99%	100%
Active Licenses:	543	416	300
Active License Success:	88%	81%	92%
Recreation Days:	1,766	1,458	1,200
Days Per Animal:	3.7	4.3	4.4
Males per 100 Females:	40	49	
Juveniles per 100 Females	45	29	

Satisfaction Based Objective	60%
Management Strategy:	Recreational
Percent population is above (+) or (-) objective:	8%
Number of years population has been + or - objective in recent trend:	4



2022 Hunting Seasons
Project Antelope (PR635)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
97, 117	1	Aug. 15	Sep. 16	Sep. 17	Oct. 31	200	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. 16	Sep. 17	Oct. 31	200	Doe or fawn
97, 117	7			Aug. 15	Oct. 31	50	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

2021 Hunter Satisfaction: 78% Satisfied, 12% Neutral, 10% Dissatisfied
2021 Landowner Satisfaction: 58% Good # of Ant, 17% Too many Ant, 25% Too few Ant

2022 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 the satisfaction objective was set in 2013, hunter satisfaction has remained around 90% annually, however in 2021 it declined to 78%. 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. Landowner satisfaction remained above 60% in both 2019 and 2020, subsequently in 2021 the decrease in population has corresponded to the drop in satisfaction to 58%, slightly below our objective. Based on hunter comments and the landowner survey, the decrease in satisfaction is due to lower

antelope numbers. Fawn recruitment has progressively declined the last three years with a fawn:doe ratio of 29:100 in 2021. In addition, buck/doe ratios have been quite low since 2018 and a low yearling buck:doe ratio of 6:100 in 2021, indicating another year of low survival. However, buck ratios did increase from 34:100 in 2020 to 49:100 in 2021. In response to another year of low fawn recruitment combined with under objective landowner satisfaction and hunter comments, license numbers will decrease again in 2022. Given extremely low recruitment in the area for three years it is unlikely the population will grow over the next year but lower harvest should mitigate the decline. Type 2 and 7 license numbers will also be decreased due to successfully mitigating damage concerns.

2021 - JCR Evaluation Form

SPECIES: Pronghorn
PERIOD: 6/1/2021 - 5/31/2022

HERD: PR636 - NORTH FERRIS

HUNT AREAS: 63
PREPARED BY: GREG HIATT

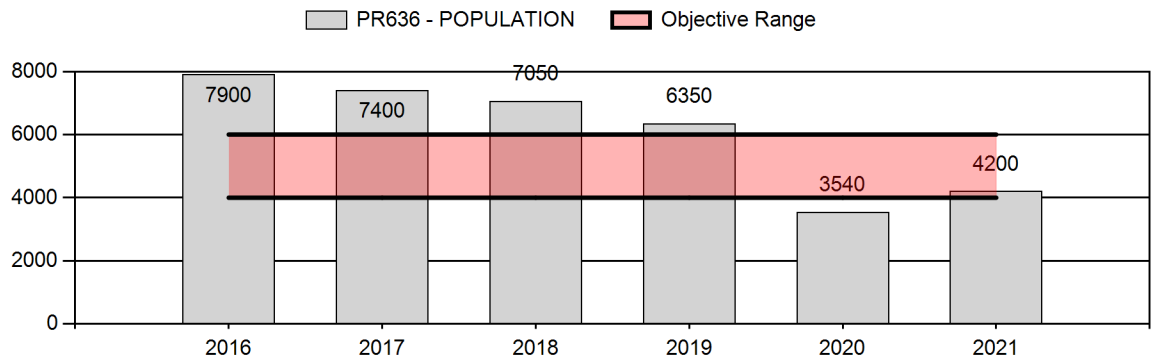
	2016 - 2020 Average	2021	2022 Proposed
Population:	6,448	4,200	4,200
Harvest:	574	247	230
Hunters:	631	322	290
Hunter Success:	91%	77%	79 %
Active Licenses:	700	322	290
Active License Success:	82%	77%	79 %
Recreation Days:	1,709	798	735
Days Per Animal:	3.0	3.2	3.2
Males per 100 Females	69	62	
Juveniles per 100 Females	66	74	

Population Objective (± 20%) :	5000 (4000 - 6000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-16%
Number of years population has been + or - objective in recent trend:	2
Model Date:	2/24/2022

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

	JCR Year	Proposed
Females ≥ 1 year old:	1%	0.3%
Males ≥ 1 year old:	23.2%	22.8%
Proposed change in post-season population:	23%	5%

Population Size - Postseason



2022 Hunting Seasons
North Ferris Pronghorn (PR636)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
63	1	Aug. 15	Sep. 16	Sep. 17	Oct. 31	125	Any antelope
63	2	Aug. 15	Sep. 16	Sep. 17	Oct. 31	250	Any antelope valid east of the Buzzard Road (Natrona County Road 410-Carbon County Road 497)

2021 Hunter Satisfaction: 72% Satisfied, 20% Neutral, 8% Dissatisfied

2022 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 again in 2021, the smallest in 7 years, and was less than half the sample collected in 2019. As intended, the buck:doe ratio declined to its lowest level in six years, but at 62:100 was still slightly above desired level for a recreational herd. The yearling buck:doe ratio remained low, a result of the drastically low fawn crop of only 33:100 in 2020. Fawn production returned to normal levels in 2021, at 74:100.

Hunter success improved in 2021, but was still below the 5-year average. Hunter effort declined to 3.2 days per animal, falling within the normal range for this herd after highs in 2020. Seventeen percent of the buck harvest was checked in the field, and average horn length increased to 12.4 inches. Only 8% of the bucks exceeded 14", compared to 2% in 2020 and 12% prior to the hard winter. Despite the partial recovery of horn sizes, hunter satisfaction dropped to a new record low in 2021, below 72% (Figure 1.). Hunter dissatisfaction declined slightly, but was still the 3rd highest in 13 years. Three of 7 hunter comments complained about low numbers and poor quality of bucks.

Incorporating 2021 classification and harvest data and reduced survival during the 2019-20 winter, the herd spreadsheet model predicts more than 45% of the population was lost during that winter and the herd was still about 15% below objective at posthunt 2021. With the herd still below objective, no doe harvest is warranted and Type 6 and 7 licenses are not offered. If fawn production remains near normal in 2022, addition of doe/fawn harvest should be considered in the near future. From 2019 through 2021, reported harvests averaged 22.8% of the males estimated to be in this herd each year, despite the large proportion of the population unavailable to hunters on private ground with limited or no access. Quotas for buck harvest in 2022 are predicted to achieve a 23% harvest rate. Opening dates are shifted to retain a Saturday opener and align with neighboring areas in the Lander Region.

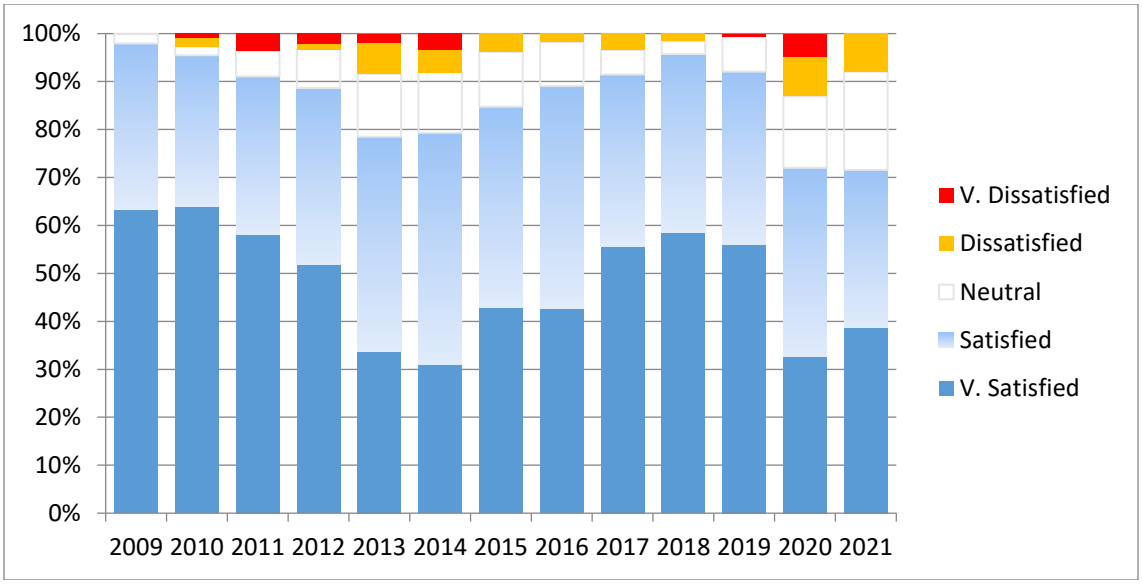


Figure 1. Hunter satisfaction and dissatisfaction in the North Ferris Pronghorn Herd.

2.) **Population Modeling:** Bio-year 2021 postseason population estimate for this herd unit from the WGFD spreadsheet model was approximately 4,205 pronghorn. In 2021, WGFD managers also began using PopR integrated population models (IPMs) to estimate population indices for mule deer and pronghorn. The 2021 postseason population estimate for this herd unit from the IPM was approximately 5,810 (CL = 4,980 – 6,660) pronghorn. Postseason population estimates from both models for 2021 were reported here to allow for comparison during this transitional year. The Department intends to replace the WGFD spreadsheet model with the PopR IPM in bio-year 2022.

Efforts to model this herd with the new IPM failed to produce a model better than the current spreadsheet version. The critical factor in modeling pronghorn populations in this part of the state appears to be a need to incorporate greatly reduced adult survival during periodic severe winters. The current IPM does not appear to be able to incorporate isolated years of low survival. Models run with 'constant' adult mortality were able to match the most recent LT estimate, prior to the hard winter, but could not accommodate the severe decline seen since that time. Three 'constant' models were run with identical inputs yielding three separate estimates of herd size, but these varied from each other by less than 4%. Models using the 'time varying' option on adult survival generated winter losses in the expected years, but ran well below confidence intervals on most LT estimates, including the most recent. Two identical runs of this model yielded estimates ~5% apart. Both had herd estimates almost a quarter the size of the spreadsheet model. It appears the IPM needs a methodology to incorporate individual years of low adult survivability into the 'constant' adult survival model to generate reasonable estimates of pronghorn herd sizes in this part of the state.

2021 - JCR Evaluation Form

SPECIES: Pronghorn
PERIOD: 6/1/2021 - 5/31/2022

HERD: PR637 - SOUTH FERRIS

HUNT AREAS: 62
PREPARED BY: GREG HIATT

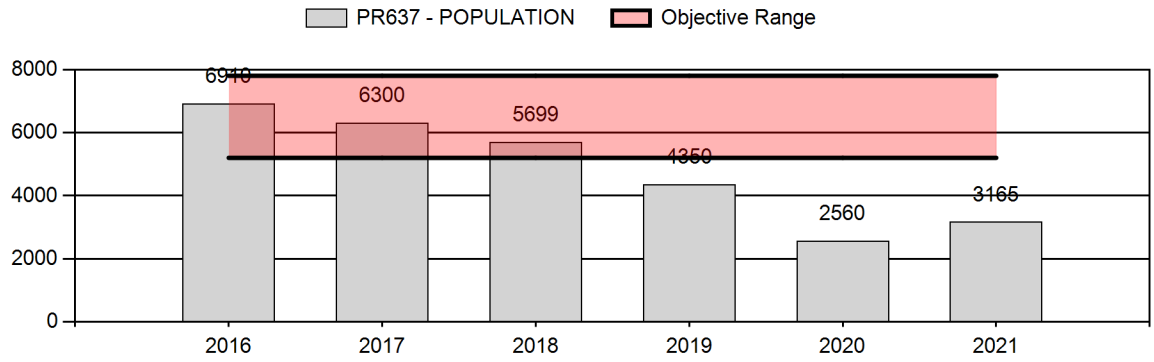
	2016 - 2020 Average	2021	2022 Proposed
Population:	5,164	3,165	3,220
Harvest:	158	68	70
Hunters:	171	86	90
Hunter Success:	92%	79%	78 %
Active Licenses:	189	86	90
Active License Success:	84%	79%	78 %
Recreation Days:	512	322	290
Days Per Animal:	3.2	4.7	4.1
Males per 100 Females	63	64	
Juveniles per 100 Females	37	27	

Population Objective (± 20%) :	6500 (5200 - 7800)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-51.3%
Number of years population has been + or - objective in recent trend:	3
Model Date:	2/25/2022

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:	7.4%	7.5%
Proposed change in post-season population:	3.4%	1.7%

Population Size - Postseason



2022 Hunting Seasons
South Ferris Pronghorn (PR637)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
62	1	Aug. 15	Sep. 9	Sep. 10	Oct. 31	50	Any antelope
62	2	Aug. 15	Sep. 9	Sep. 10	Oct. 31	50	Any antelope valid east of the Continental Divide and north of Wise Dugout Draw

2021 Hunter Satisfaction: 77% Satisfied, 17% Neutral, 6% Dissatisfied

2022 Management Summary

1.) **Hunting Season Evaluation:** The population model and a line transect survey flown in June 2019 indicate this herd is still almost 50 percent below objective size, a result of heavy losses during the 2018-19 and 2019-20 winters and several years of poor fawn production (28:100 in 2019, 20:100 in 2020 and 27:100 in 2021). With the herd so far below objective, no doe harvest is warranted and no Type 6 licenses are issued. The buck:doe ratio increased in 2021, slightly above the recreational range at 64:100. Because of checker-boarded landownership, more than half of the hunt area is unavailable to almost all hunters, and herd ratios do not represent what is available for harvest. In 2021, the buck:doe ratio on the limited access portion of the herd was 87:100, while the ratio for the publicly accessible portion was only 36:100. The yearling buck:doe ratio in 2021 was only 7:100, not surprising given the near record low fawn production in 2020.

Hunter success and effort were largely unchanged from 2020. Hunter success remained low at 79 percent, and the days of effort per animal harvested increased slightly to 4.7 days, a near record high. Despite unchanged hunter success, hunter satisfaction improved to 77%, but was still the 2nd lowest in 13 years (Figure 1.). Hunter dissatisfaction declined, but was still the 3rd highest ever reported for this herd. Three of four hunter comments received after the 2021 hunt complained of low numbers of antelope.

Thirteen percent of the 2021 buck harvest was checked and measured in the field. Average horn length was 12.2”, a slight improvement over the 11.4” average in 2020. None of the buck horns exceeded 14”, whereas 21% did so in 2019 before the hard winter. The longest horn checked was just 13.9”.

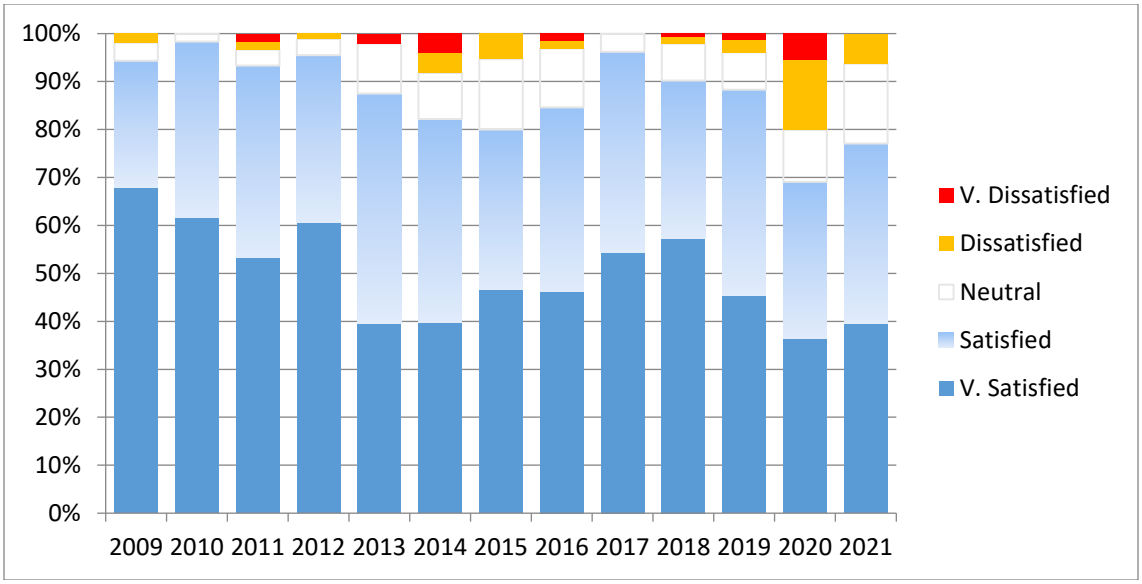


Figure 1. Hunter satisfaction and dissatisfaction in the South Ferris Pronghorn Herd.

From 2019 through 2021, reported harvests represented 8.8 % of the males estimated to be in this herd. License quotas for 2022 represent only 7.6% of the bucks predicted to be in the herd this year, but at least half the pronghorn in the area are unavailable for harvest due to checker-boarded land ownership and a lack of access, and this half includes the majority of bucks in the population. Within the portion of the area that has been available to hunters in past years, the large Stone Ranch was sold this past winter and it is not known if the new owners will be as generous to hunters seeking access as in the past. The extremely low yearling buck:doe and fawn:doe ratios observed in the past 3 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 will receive supplemental predator control through Animal Damage Management Board funding beginning in 2022 in an effort to improve fawn survival.

2.) **Population Modeling:** Bio-year 2021 postseason population estimate for this herd unit from the WGFD spreadsheet model was approximately 3,165 pronghorn. In 2021, WGFD managers also began using PopR integrated population models (IPMs) to estimate population indices for mule deer and pronghorn. The 2021 postseason population estimate for this herd unit from the IPM was approximately 2,870 (CL = 2,375 – 3,485) pronghorn. Postseason population estimates from both models for 2021 were reported here to allow for comparison during this transitional year. The Department intends to replace the WGFD spreadsheet model with the PopR IPM in bio-year 2022.

Efforts were made to model this herd with the new IPM, but failed to produce a model better than the current spreadsheet version. Estimates from the current spreadsheet model fall within the confidence intervals on all four recent LT estimates, and nearly match three of the four, including the most recent in 2018. IPMs with 'constant' adult survival did nearly as well, but did not center on any of the LT estimates and were near the top end of the

confidence interval for the most recent in 2018. A second run of the 'constant' IPM a few days later with identical inputs yielded a new population estimate that was slightly (~5%) higher than the earlier run. Population estimates from the two IPM with 'constant" survival were slightly lower than the spreadsheet model. As was seen with other herds, using IPMs with 'time varying' adult mortality produced even lower estimates of herd size, falling below confidence intervals of 3 of the 4 LTs. Population estimate for 2021 from this IPM was less than 10% larger than the classification sample, an unlikely possibility. Neither version of IPM tracked well with buck:doe ratios for the four most recent years. It appears the IPM might benefit from a hybrid version to incorporate individual years of low adult survivability into a 'constant' adult survival model to generate reasonable estimates of pronghorn herd sizes in this part of the state.

2021 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2021 - 5/31/2022

HERD: MD642 - DUBOIS

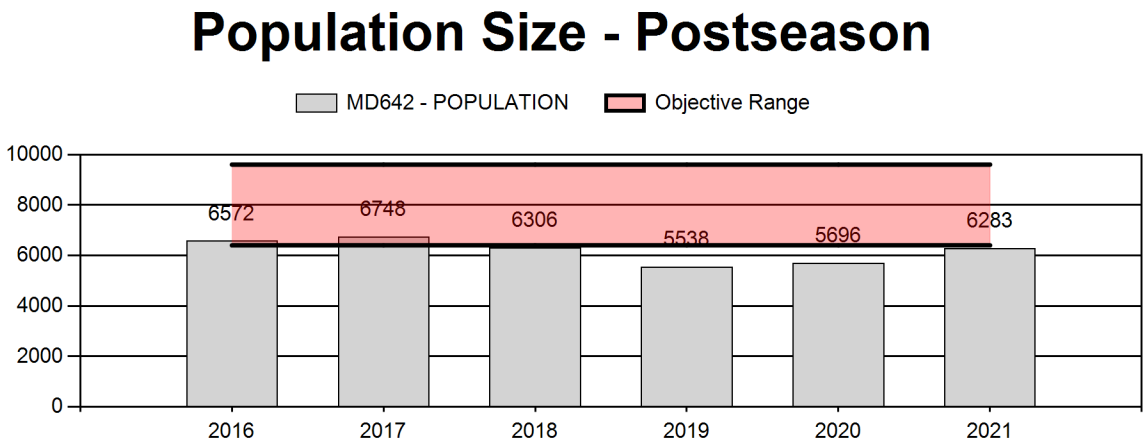
HUNT AREAS: 128, 148
PREPARED BY: ZACH GREGORY

	2016 - 2020 Average	2021	2022 Proposed
Population:	6,172	6,283	6,348
Harvest:	391	452	450
Hunters:	1,111	1,074	1,200
Hunter Success:	35%	42%	38%
Active Licenses:	1,122	1,092	1,250
Active License Success:	35%	41%	36 %
Recreation Days:	5,963	5,579	6,100
Days Per Animal:	15.3	12.3	13.6
Males per 100 Females	25	31	
Juveniles per 100 Females	51	70	

Population Objective (± 20%) :	8000 (6400 - 9600)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-21.5%
Number of years population has been + or - objective in recent trend:	11
Model Date:	2/20/2022

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:	40%	32%
Proposed change in post-season population:	12%	3%



2022 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	75	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. 30		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

2022 Region L nonresident quota: 250

2021 Hunter Satisfaction: 60% Satisfied, 20% Neutral, 21% Dissatisfied

2022 Management Summary

1.) Hunting Season Evaluation: The 2022 mule deer hunting seasons in both areas 128 and 148 will remain unchanged from the 2021 seasons. Herd demographics indicate the population was relatively stable over the past 4 years with a slight increase from 2020 to 2021. Fawn production was 70:100 in 2021 which was significantly higher than the previous five years and resulted in a population increase. The buck:doe ratio in the herd unit has been remarkably stable over decades and is typically in the mid-20's:100. In 2021 the buck:doe ratio was 31:100 which is slightly higher than the last five years and well within the historical range of variation for this herd. The yearling buck:doe ratio was 9:100, marginally higher than the five-year average, indicating average to above average fawn survival over the year. Harvest increased significantly in 2021 compared to 2020 and correspondingly the days/harvest reduced by exactly half from 24.6 in 2020 to 12.3 in 2021, the lowest since 2016. This increase in success could partially be contributed to a moderate amount of snowfall and cooler temperatures midway through the general season resembling a more typical migration of deer into the herd unit in mid-October.

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. These licenses had a success rate of 43% in 2021, down from 56% in 2020 and 79% in 2019, indicating no need to increase opportunity as less than half of the active hunters successfully harvested a white-tailed doe or fawn even with the extended seasons on private land. In addition, the Type 3 licenses saw

the lowest hunter success rate in 11 years at 58% and has gradually decreased over time since 2013.

2.) Chronic Wasting Disease Monitoring and Management: This is a Tier 2 surveillance herd that is currently scheduled for priority sampling in 2023. Past opportunistic sampling indicates CWD prevalence in the herd is 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 wildlife/vehicle collisions. Mule deer mortality along the highway has been a persistent problem for decades. Much of the problem stems from the fact the highway parallels the herd's spring/fall migration route and is exacerbated by the fact the highway bisects densely populated winter range. The highway assessment being conducted by Eco Resolutions from Golden, Colorado began in spring, 2020 and was completed in 2021 with the publication of a mitigation strategy document.

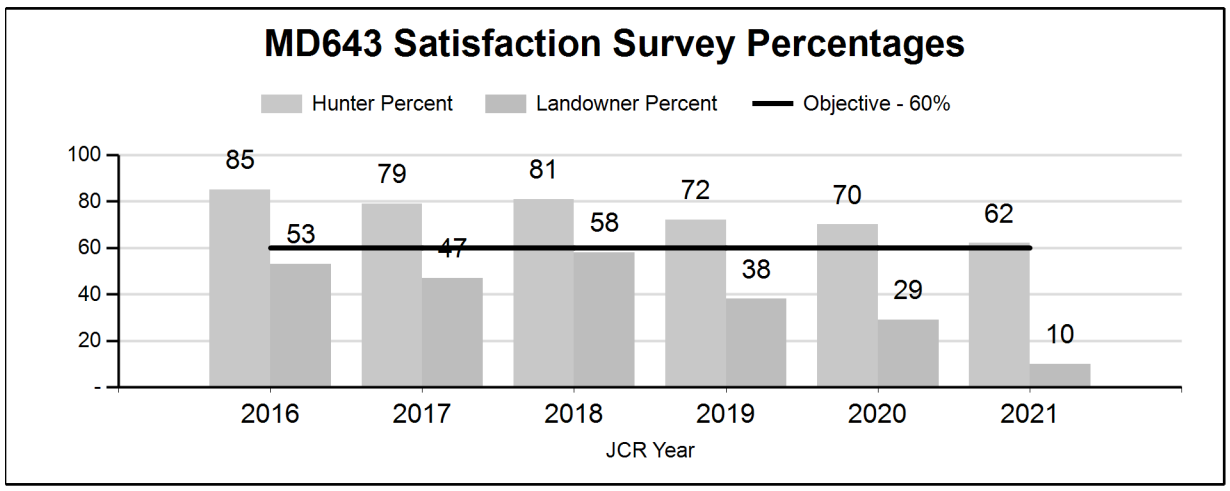
5.) Population Modeling: The bio-year 2021 postseason population estimate for this herd unit from the WGFD spreadsheet model was approximately 6,128 mule deer. In 2021, WGFD managers also began using PopR integrated population models (IPMs) to estimate population indices for mule deer and pronghorn. The 2021 postseason population estimate for this herd unit from the PopR IPM was approximately 6,283 (CL = 5,397 – 7,370) mule deer. Postseason population estimates from both models for 2021 were reported here to allow for comparison during this transitional year. The Department intends to replace the WGFD spreadsheet model with the PopR IPM in bio-year 2022.

2021 - JCR Evaluation Form

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

PERIOD: 6/1/2021 - 5/31/2022
PREPARED BY: ZACH GREGORY

	2016 - 2020 Average	2021	2022 Proposed
Hunter Satisfaction Percent	78%	62%	65%
Landowner Satisfaction Percent	44%	10%	10%
Harvest:	410	220	200
Hunters:	597	443	400
Hunter Success:	69%	50%	50 %
Active Licenses:	680	469	400
Active License Success:	60%	47%	50 %
Recreation Days:	2,336	1,838	1,900
Days Per Animal:	5.7	8.4	9.5
Males per 100 Females:	29	17	
Juveniles per 100 Females	51	54	
Satisfaction Based Objective			60%
Management Strategy:			Recreational
Percent population is above (+) or (-) objective:			-24%
Number of years population has been + or - objective in recent trend:			3



2022 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	300	Any deer
157	3	Sep. 1	Sep. 30	Nov. 1	Nov. 30	200	Any white-tailed deer
157	6	Sep. 1	Sep. 30	Oct. 1	Nov. 10	200	Doe or fawn
157	8	Sep. 1	Sep. 30	Oct. 1	Oct. 31	350	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

2021 Hunter Satisfaction: 62% Satisfied, 17% Neutral, 21% Dissatisfied
2021 Landowner Satisfaction: 10% Good # of MD, 10% Too many MD, 80% Too few MD

2022 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 62% in 2021. The declinein hunter satisfaction has coincided with a decline in deer numbers based on observations by personnel and hunter and landowner comments. In 2020, 47% of landowners thought mule deer numbers were too low. This increased to 80% of landowners in 2021. This dramatic shift in landowner sentiment supports hunter and department personnel observations indicating a substantial population decline in the herd. To reduce harvest pressure in the herd, Type 6 licenses were cut by 50% from 400 in 2019 to 200 in 2020.

In 2019 the Department initiated focused CWD sampling in this herd unit and that continued in 2021. While prevalence data is still preliminary for the herd unit, sampling from 2019-2021 indicate CWD prevalence in hunt area 157 is 66% in adult male mule deer. The impact of this high prevalence on the population is unknown but it is certainly possible CWD could have been a contributing factor in the population decline over the past 3 years.

Despite indications that hunter satisfaction is continuing to decline and landowners are increasingly

concerned about low numbers of mule deer, the 2022 season will remain unchanged. This level of harvest pressure will likely curtail growth in the population. The Department believes prudent disease mitigation, that is lowering population density in this herd unit, is warranted to attempt to decrease the impact of the disease and increase herd viability. Discussions are ongoing concerning the collection of better demographic data in the herd which will be helpful in determining the effect of both the disease and management actions to mitigate high prevalence of CWD in the future.

While most landowners now believe mule deer numbers are too low, the vast majority of landowners still feel white-tailed deer numbers are either at a desirable level or too high. As such, white-tailed deer harvest will also remain unchanged from 2021. White-tailed deer license numbers were increased substantially from 2019 to 2020 and maintaining the higher harvest in 2022 is desirable from a landowner and hunter opportunity standpoint.

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 2021. To date, 297 samples were collected including 166 adult male mule deer (Figure 1), 10 yearling male mule deer, and 121adult female mule deer with a prevalence rate of 66%, 30%, and 24% respectively (Figure 1). White-tailed deer were also sampled (Figure 2), indicating a lower prevalence rate than mule deer inside the same herd unit.

	2019				**2020**		
Species	Tested	# Pos	Prevalence	Species	Tested	# Pos	Prevalence
Ad M MD	76	44	57.9%	Ad M MD	46	32	69.6%
Yrlg M MD	1	0	0.0%	Yrlg M MD	4	2	50.0%
Ad F MD	43	9	20.9%	Ad F MD	39	10	25.6%

	2021				**2019-2021 Total**		
Species	Tested	# Pos	Prevalence	Species	Tested	# Pos	Prevalence
Ad M MD	44	33	75.0%	Ad M MD	166	109	65.7%
Yrlg M MD	5	1	20.0%	Yrlg M MD	10	3	30.0%
Ad F MD	39	10	25.6%	Ad F MD	121	29	24.0%

Figure. 1 Results from CWD Tier 2 surveillance effort in the Project Mule Deer Herd 2019-2021

	2019				2020		
Species	Tested	# Pos	Prevalence	Species	Tested	# Pos	Prevalence
Ad M WTD	68	15	22.1%	Ad M WTD	56	14	25.0%
Ad F WTD	31	5	16.1%	Ad F WTD	36	8	22.2%
Yrlg M WTD	0	0	0.0%	Yrlg M WTD	6	0	0.0%

	2021				2019-2021 Total		
Species	Tested	# Pos	Prevalence	Species	Tested	# Pos	Prevalence
Ad M WTD	46	12	26.1%	Ad M WTD	170	41	24.1%
Ad F WTD	40	7	17.5%	Ad F WTD	107	20	18.7%
Yrlg M WTD	8	0	0.0%	Yrlg M WTD	14	0	0.0%

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

In 2022 the WGFD, in collaboration with the University of Wyoming, U.S. Geological Survey, and the Eastern Shoshone & Northern Arapaho Tribal Fish and Game Department will be implementing 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. We will be collaring mule deer in 2022/23 to gather data on movement, survival, and habitat selection. We will also begin more intensive abundance and distribution estimates to have a better understanding of the population and its change. Pooling all of this data will help identify the effects of harvest strategies and CWD hot spots that may be artificially concentrating deer thus increasing transmission and prevalence rates. Identifying these hotspots will allow WGFD and Tribal managers to target harvest pressure, mitigate transmission, and potentially lower CWD prevalence rates.

2021 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2021 - 5/31/2022

HERD: MD644 - SOUTH WIND RIVER

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

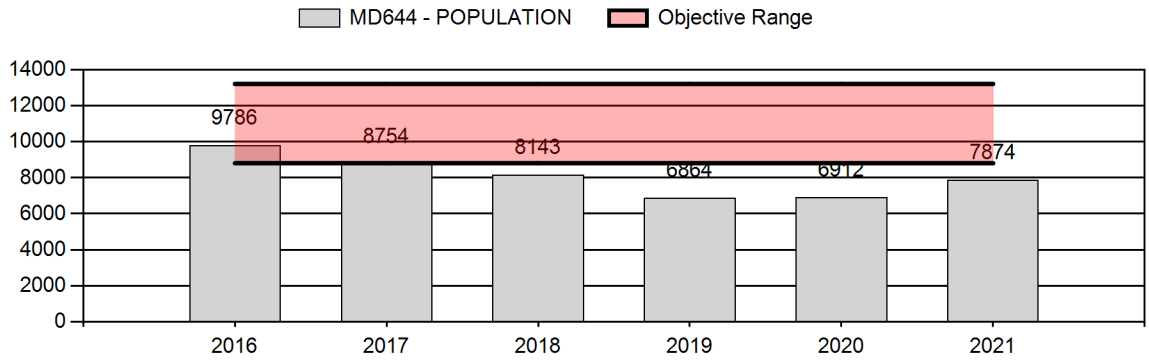
	2016 - 2020 Average	2021	2022 Proposed
Population:	8,092	7,874	7,913
Harvest:	506	232	250
Hunters:	1,324	882	900
Hunter Success:	38%	26%	28 %
Active Licenses:	1,327	891	900
Active License Success:	38%	26%	28 %
Recreation Days:	5,239	3,237	3,500
Days Per Animal:	10.4	14.0	14
Males per 100 Females	28	32	
Juveniles per 100 Females	71	81	

Population Objective (± 20%) :	11000 (8800 - 13200)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-28.4%
Number of years population has been + or - objective in recent trend:	2
Model Date:	02/23/2022

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

	JCR Year	Proposed
Females ≥ 1 year old:	0.5%	0%
Males ≥ 1 year old:	24%	39%
Proposed change in post-season population:	+10.8%	+0.5%

Population Size - Postseason



2022 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 three (3) 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 three (3) points or more on either antler or any white-tailed deer
160	Gen	Sept. 1	Sept. 30	Oct. 15	Oct. 20		Antlered mule deer three (3) points or more on either antler or any white-tailed deer

2022 Region L Non-Resident Quota: 250

2021 Hunter Satisfaction: 35.6% Satisfied, 24.6% Neutral, 39.8% Dissatisfied

2022 Management Summary

1.) Hunting Season Evaluation: The classification survey flown in November 2021 showed modest improvement in the number of mule deer observed in this herd unit compared to that observed in 2020, giving some hope that prior observation declines were at least partially related to distribution shifts. Due to this mule deer population remaining well below objective and concerns about the overall number of hunters in the herd unit with respect to the number of available buck mule deer, the 2021 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. The Region L non-resident quota was 250 for the 2021 season, with non-resident hunter numbers evenly split between the South Wind River and Dubois herd units.

The 2021 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 2 years, the desired increase in the total buck/doe ratio finally materialized in 2021 with an increase to 32 total bucks/100 does, as the yearling buck/doe ratio doubled to 16YM/100F in 2021 and the adult buck/doe ratio remained at 15AM/100F. The total of 384 bucks observed in classification surveys was the best in 4 years, but was about 8% below the average since 2004. Most groups of does had adult bucks present, indicating the rut was still occurring. The total number of deer observed increased 48% over the 2020 sample, with both surveys conducted with

a 20% reduction of deer flight budgets compared with most surveys since 2004. The fawn/doe ratio increased to 81J/100F in 2021, the 4th highest since 1994.

Since the 2020 and 2021 seasons did reduce hunter numbers and mule deer buck harvest as desired, no changes are being made for the 2022 general seasons in hunt areas 92, 94, and 160. With minimal use of the area 92 Type 6 licenses where mule deer damage concerns had been voiced, that license type is eliminated in 2022. Increases in white-tailed deer have been observed, especially in area 92, yet with access limited mostly to private land, no changes are being made to the Type 3 season, and 25 licenses are being added to the Type 8 season. Although the buck/doe ratio in 2021 was above the "recreational" level for mule deer, the 2022 season maintains the APR season structure to continue to reduce hunter participation and therefore, buck harvest, in a population 28% below objective. This also serves as a stop gap measure to more restrictive season structures such as limited quota that has become a more desirable (both internally and among the public) management tool for this herd unit. In addition, the buck/doe ratio observed in Sweetwater mule deer was only 17M/100F, 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 remains well below objective, more restrictive hunting season options such as limited quota seasons may be considered. The Region L non-resident quota will stay at 250 for the 2021 season.

2.) Mule Deer Initiative Habitat Information

Weather

Precipitation

Precipitation from October 2020 through September 2021 was below the 30-year average. Winter snows contributed the majority of the annual precipitation. Precipitation during the growing season (April-June 2021) was also slightly below the 30-year average (Figure 1). Most of the growing season precipitation fell during April which was followed by a dry, hot summer and a mild fall. 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.

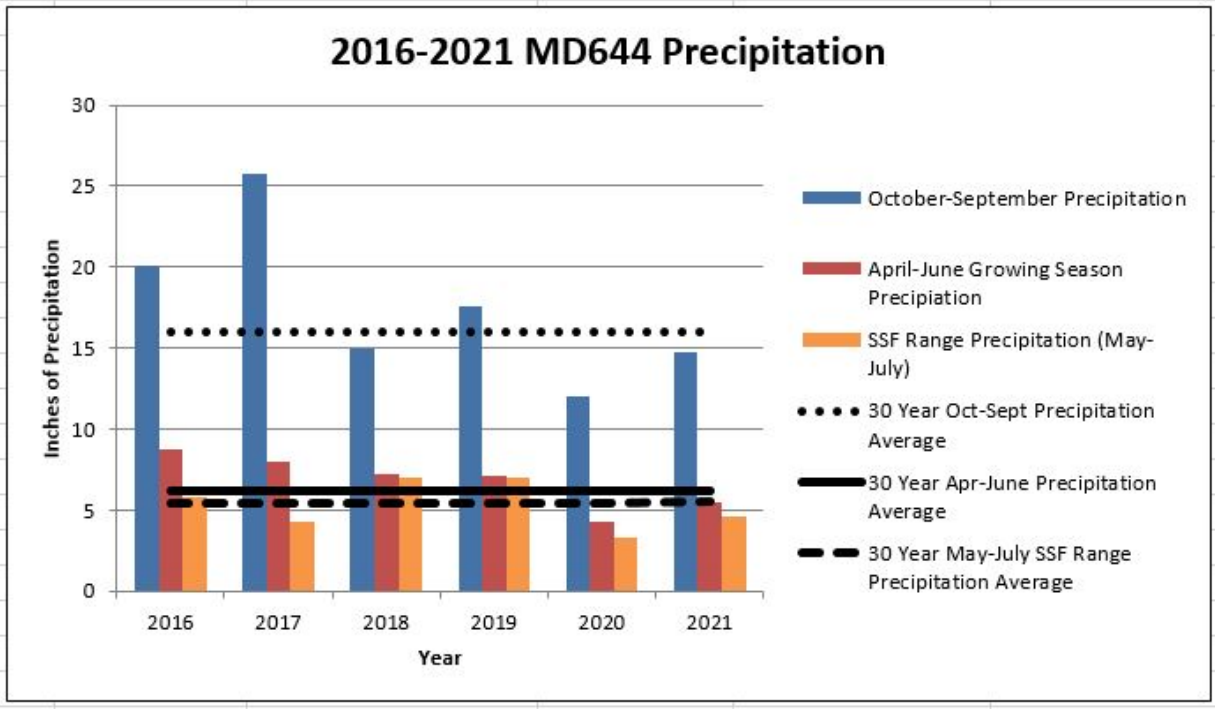


Figure 1. Annual precipitation levels compared to 30-year averages.

Winter Conditions

During winter 2021-2022, temperatures were mostly mild and there was very little snowfall. Fall 2021 was extraordinarily mild with warm temperatures. Temperature from November-February averaged 30.5 degrees Fahrenheit which was six degrees above normal for this time period in the Lander Area. A total of 57.4"of snowfall was recorded in Lander from September 1, 2021 through May 19, 2022, significantly lower than the 30-year average of 86.7". Above average temperatures combined with below average snowfall in the Lander area, resulted in mild winter conditions. As such, over winter mule deer survival should have been above average.

Habitat

Precipitation was slightly below average during spring, 2021. Above normal temperatures and very low precipitation amounts in late summer likely reduced annual growth on shrubs important for mule deer, yet fawn ratios increased to 81J/100F in 2021. 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 2021. It was the seventh year of aspen enhancement treatments (cut/ pile and lop/scatter) within the South Pass area. Sites treated were in Mill Creek, Gold Creek, Twin Creek, and the Loop Road. A total of 361 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. Since 2015, a total of 2,858 acres have been treated on South Pass in cooperation with USFS- Shoshone National Forest, BLM, and Wyoming State Forestry.

Beaver Dam Analogs (BDAs), and beaver relocation are becoming increasingly popular tools for use in habitat enhancement and restoration across Wyoming. Ten additional BDA's (upstream from the 10 that were installed in 2020), were constructed within the Mill Creek Watershed, in concert with conifer removal to improve riparian condition and aspen vigor. Historic beaver activity is present along Mill Creek, and hopefully beaver will re-inhabit this watershed as conditions improve.

Nearly 800 acres of cheatgrass were treated within the Red Canyon WHMA. This was a follow-up treatment over the same area that was treated in 2018. In 2021, with recommendations from Fremont County Weed and Pest, the herbicide Indaziflam (Rejuvra®) was used at a 5 oz/acre rate. Previous treatment consisted of Imazapic herbicide, which generally provides 1-2 years of control. Indaziflam should provide 3-4 years of control. Annual post-treatment monitoring will determine when additional treatment may be necessary.

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 17 acres in cooperation with 11 landowners along the length of Squaw Creek. 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.

In 2021, 39 RHA's were conducted in the South Wind River Herd Unit totaling 1,733 assessed acres. Of those acres, 648 acres were in aspen communities, 912 acres were in rangeland, 153 acres were in riparian corridors, and 20 acres were in wet meadows. While there were some areas of severe browse within both aspen and rangeland habitats, 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 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.

Shrub and Rangeland communities assessed showed many areas of 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. Herbaceous understory species diversity is generally good, especially when assessments are conducted earlier in the season. In dry years, like both 2020 and 2021, 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 2021 were generally in good condition. Assessments occurred in the vicinity of Red Canyon 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 heavy use livestock and wildlife crossings occur. 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 beavers. Some of the streams assessed in 2021 may be good candidates for future releases.

The results of these RHAs and other habitat monitoring completed in recent years indicate long-term shrub conditions are diminished, particularly on winter ranges. Spring and summer habitats seem capable of supporting mule deer above current levels, as shown by fawn/doe ratios averaging above 70J/100F over the last 2 decades (occasionally into the mid/upper 80s). Yet winter survival has been lower than anticipated in most years, mostly due to poor habitat conditions on winter ranges because of low production and elevated utilization. Long-term climate and weather patterns are likely factors limiting shrub communities, as evidenced by high levels of decadent or dead shrubs across most of the herd unit, leading to the belief that mule deer populations here might not reach the current objective (which was lowered in 2015), without substantial improvements in precipitation and lower utilization.

3.) **Chronic Wasting Disease Monitoring and Management.** This is a Tier 1 surveillance herd and has been prioritized for CWD surveillance beginning in 2023. To date, no meaningful CWD prevalence data is available within this herd unit and no CWD management actions have occurred. Over 100 mule deer and white-tailed deer have been sampled in 2019-2021, with a no CWD positive mule deer and a few CWD positive white-tailed deer.

4.) **Population Modeling:** Bio-year 2021 postseason population estimate for this herd unit from the WGFD spreadsheet model was approximately 6,944 mule deer. In 2021, WGFD managers also began using POP R integrated population models (IPM) to estimate population indices for mule deer and pronghorn. The 2021 postseason population estimate for this herd unit from the IPM was approximately 7,874 (CL = 6,993 – 8,900) mule deer. Postseason population estimates from both models for 2021 were reported here to allow for comparison during this transitional year. The Department intends to replace the WGFD spreadsheet model with the POP R IPM in bio-year 2022.

Both models fit well with the estimate produced by the sightability survey conducted in 2014 (Spreadsheet model since 1994 and POP R since 2000). The population estimates also reflect observed trends over the years, but the severity of change in trends and extremities of high and low

population levels seems more extreme with the Spreadsheet model, whereas the POP R model trends and severity of fluctuations appear more plausible based on field observations and classification and harvest data. Spreadsheet models have several data ranges requiring manual edits on an annual basis, leading to potential for greater user error in creating each year's model and resulting estimates. Although the mechanics of the new POP R model are not yet fully understood, the potential for errors in the user setup process seems lower. The POP R model for South Wind River mule deer produces a 2021 postseason abundance estimate of 7,874 animals, a 10.8% increase over the POP R estimate for 2020. These estimates are above those produced by the Spreadsheet model, but the POP R estimates are likely more accurate based on increases in fawn recruitment. The 2021 post-season fawn/doe ratio of 81J/100F being 50% higher than in 2019. The 2021 abundance estimate in POP R is 28.4% below objective (11,000).

2021 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2021 - 5/31/2022

HERD: MD646 - SWEETWATER

HUNT AREAS: 96-97
PREPARED BY: STAN HARTER

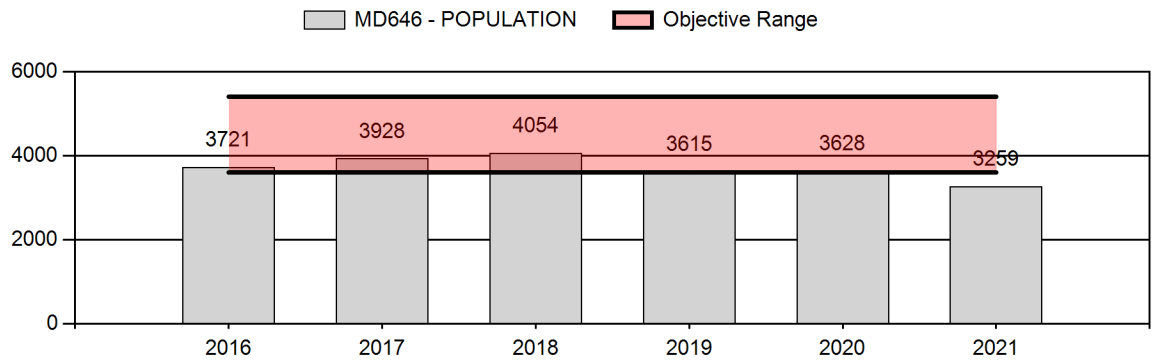
	2016 - 2020 Average	2021	2022 Proposed
Population:	3,789	3,259	3,430
Harvest:	345	176	200
Hunters:	803	529	550
Hunter Success:	43%	33%	36 %
Active Licenses:	803	529	550
Active License Success:	43%	33%	36 %
Recreation Days:	2,747	2,160	2,000
Days Per Animal:	8.0	12.3	10
Males per 100 Females	19	17	
Juveniles per 100 Females	74	78	

Population Objective (± 20%) :	4500 (3600 - 5400)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-27.6%
Number of years population has been + or - objective in recent trend:	3
Model Date:	2/25/2022

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

	JCR Year	Proposed
Females ≥ 1 year old:	0.5%	0%
Males ≥ 1 year old:	35.5%	32.1%
Proposed change in post-season population:	-5.5%	+5.2%

Population Size - Postseason



2022 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 three (3) points or more on either antler or any white-tailed deer
97	Gen	Sept. 1	Sept. 30	Oct. 15	Oct. 20		Antlered mule deer three (3) 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

2022 Region Q Non-Resident Quota: 125

2021 Hunter Satisfaction: 44.5% Satisfied, 22.2% Neutral, 33.3% Dissatisfied

2022 Management Summary

1.) Hunting Season Evaluation. Due to persistent and dangerously high winds throughout December 2021, classification surveys were not flown and the ground surveys done resulted in a sample of 765 mule deer, much lower than the average sample observed from a helicopter. The 2021 post-season fawn/doe ratio of 78J/100F was just below the ratio of 80J/100F observed in 2020. However, the adult buck/doe ratio declined to 7AM/100F and the total buck/doe ratio of 17M/100F was the lowest since 2003. A distribution survey was flown in January 2022 in conjunction with Green Mountain elk surveys, with a total of 1,359 mule deer observed, near the average of classification sample sizes since 2004, which mimic population trends. We attempted to classify mule deer during this flight, but too many large groups were found to do so accurately. Based on the number of adult bucks observed in January, it appears the ground classification in December 2021 largely missed adult bucks.

The 2021 hunting season resulted in a 10% reduction of harvest to 169 bucks, the 2nd lowest level since 2004. The Sweetwater mule deer herd unit remains below objective, with low buck/doe ratios. The 2020 and 2021 seasons did reduce mule deer buck harvest as desired, but buck/doe ratios remain lower than the minimum for "recreational" management. As a result, no changes are being made for the 2022 general license seasons in hunt areas 96 and 97. White-tailed deer numbers seem lower than in previous years with access almost entirely on private lands. For 2022, there will be 25 Type 3 licenses and a 50% reduction to 25 Type 8 licenses in area 97. The reduction of Type 8 licenses is due to low harvest and low active license numbers in 2021, combined with reduced access following recent land ownership changes. The 2022 season maintains the APR season structure to continue to reduce hunter participation and therefore, buck harvest, in a population 28% below objective. This also serves as a stop gap measure to more restrictive season structures such as limited quota that has become a more desirable (both

internally and among the public) management tool for this herd unit. The Region Q non-resident quota remains at 125 for the 2022 season. Resident hunter numbers dropped 32% and non-resident numbers declined 18% in 2021, the lowest levels since 2004. Lower hunter numbers combined with APRs resulted in lower mule deer buck harvest. Precipitation has been near average since January 2021 and winter 2021-22 has been very mild, with warmer than average temperatures and very limited snow cover on winter ranges. As such, winter survival has likely been quite good. Through reduced buck harvest, minimal winter mortality, and fawn recruitment near the 5-year average, this population should grow slightly to a post-season 2022 population of over 3,400 mule deer.

2.) Mule Deer Initiative Habitat Information

Weather

Precipitation

Precipitation from October 2020 through September 2021 was lower than the 30-year average. Winter snows contributed the majority of the annual precipitation. The growing season precipitation (April-June 2021) was also below the thirty year average, as was the high elevation SSF seasonal range average precipitation (May- July 2021) (Figure 1). Temperatures through the summer were 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.

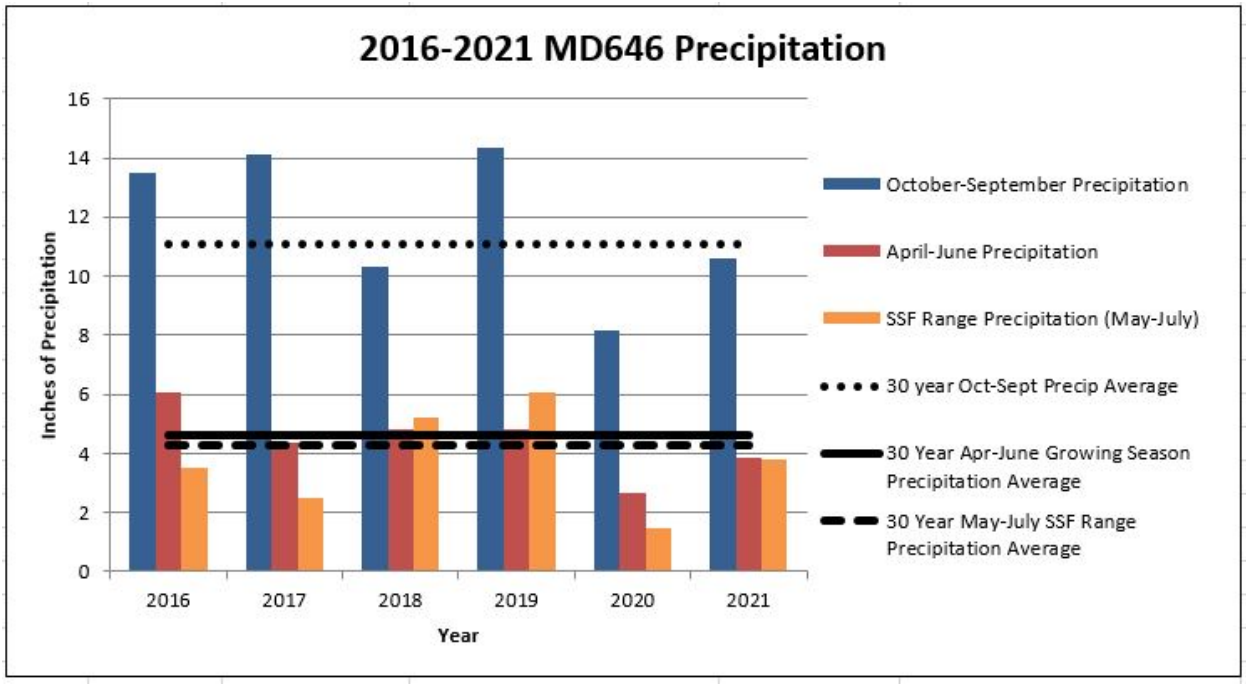


Figure 1. Annual precipitation levels compared to 30-year averages.

Winter Conditions

The 2021-2022 winter was characterized by markedly below normal snowfall with temperatures averaging 28.6° F. A total of 32.1”of snowfall was recorded in Jeffrey City from September1, 2021 through May 19, 2022, which was 20” below the 30-year average. Temperatures were six degrees above 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 below average during the spring/ summer of 2021, which likely provided reduced forage quality across the herd unit for mule deer does in early parturition. 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.

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 308 acres of limber pine, lodgepole pine, and juniper were mechanically removed from aspen and riparian habitats on BLM land and private lands. An additional 15 acres of limber pine and juniper were removed on Long Creek Mountain, to target mule deer winter range, and sage grouse nesting habitat.

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 2015-2021, 124 RHA’s were conducted across the herd unit, mostly in the vicinity of Green Mountain, which is an important area for wildlife. In 2021, 13 RHA’s were conducted, in aspen, riparian, rangeland and wet meadow 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 and various levels of age class 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.

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 2021, 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 on the south side of Green Mountain. This burn produced a major 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 2022 and 2023. Encouraging this type of habitat action will be encouraged given the vegetation response.

Riparian areas and wet meadows assessed in 2021 were a mixed bag of situations found across the herd unit. 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 was removed from private lands along Willow Creek, combined with the presence of beaver should drastically improve the habitat conditions for mule deer.

Other springs, wet meadows, and more ephemeral seeps and streams are exhibiting a significant amount of hummocking from livestock and feral horse activity. Tin Cup Spring, and several springs on the north side of Green Mountain that were assessed are showing signs of drying out, such as sagebrush and juniper encroachment, and other upland species colonizing the tops of hummocks and fringes of the riparian areas.

The results of these RHAs and other habitat monitoring completed in recent years indicate long-term shrub conditions are diminished, particularly on winter ranges. Spring and summer habitats seem capable of supporting mule deer above current levels, as shown by fawn/doe ratios averaging 77J/100F over the last 2 decades (occasionally into the 90s). Yet winter survival has been lower than anticipated in most years, mostly due to poor habitat conditions on winter ranges because of low production and elevated utilization. Long-term climate and weather patterns are likely factors limiting shrub communities, as evidenced by high levels of decadent or dead shrubs across most of the herd unit, leading to the belief that mule deer populations here might not reach the current objective (which was lowered in 2015), without substantial improvements in precipitation and lower utilization.

3.) Chronic Wasting Disease Monitoring & Management: This is a Tier 1 surveillance herd that was prioritized with mandatory CWD sampling in 2021. From 2019-2021, CWD samples have been collected from 203 male mule deer (195 adults, 8 yearlings) using extra field personnel, as well as increased use of check stations. Nine adult male mule deer tested positivesince 2019. We set up a new check station at the Sweetwater Station WYDOT rest area specifically to collect CWD samples with someone attending that check station for the entire 6-day season. Sample distribution of mature males was similar to the distribution of harvest with more harvest and CWD samples from hunt area 96 than area 97, which is similar to long-term harvest trends. To date, no CWD management actions have occurred in this herd unit. Relatively high buck harvest has occurred in Sweetwater Mule Deer over the past several years or decades, and thus essentially

constitutes a "treatment" and MAY be a reason this herd unit exhibits low prevalence. Perhaps this has been an unintended management experiment that has occurred concurrent with the advent and spread of CWD.

4.) Population Modeling: Bio-year 2021 postseason population estimate for this herd unit from the WGFD spreadsheet model was approximately 3,259 mule deer. In 2021, WGFD managers also began using Pop R integrated population models (IPM) to estimate population indices for mule deer and pronghorn. The 2021 postseason population estimate for this herd unit from the IPM was approximately 3,793 (CL = 3,233 – 4,507) mule deer. Postseason population estimates from both models for 2021 were reported here to allow for comparison during this transitional year. The Department intends to replace the WGFD spreadsheet model with the Pop R IPM in bio-year 2022.

Both models follow observed trends similarly. The POP R model trends and severity of trend fluctuations appeared more accurate, based on field observations and classification and harvest data. Although it is known annual buck harvest has been high relative to the pre-season number of bucks, the POP R model shows the percentage of pre-season bucks harvested in many years to be well above 70% and often as high as 100%, which is impossible to achieve and still have a viable population. Spreadsheet models have several data ranges requiring manual edits on an annual basis, leading to potential for greater user error in creating each year's model and resultant estimates. Although the mechanics of the new POP R model are not yet fully understood, the potential for errors in the user setup process seems lower. For 2022, the Spreadsheet model was chosen, due to the above stated issue with buck harvest rate. The Spreadsheet model for Sweetwater mule deer produced a 2021 postseason abundance estimate of 3,259 animals, a 5.5% decrease from the estimate in 2020. The Spreadsheet model produced abundance estimates similar to the estimates produced by the POP R model in most years, but the 2021 estimate is 534 lower than in POP R. The 2021 abundance estimate in the Spreadsheet model is 27.6% below objective (4,500).

2021 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2021 - 5/31/2022

HERD: MD647 - FERRIS

HUNT AREAS: 87
PREPARED BY: GREG HIATT

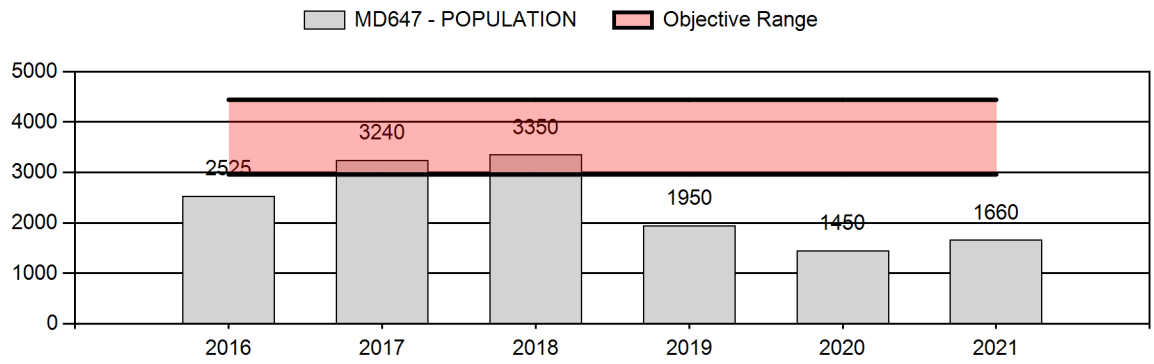
	2016 - 2020 Average	2021	2022 Proposed
Population:	2,503	1,660	1,800
Harvest:	95	62	60
Hunters:	118	71	70
Hunter Success:	81%	87%	86 %
Active Licenses:	118	71	70
Active License Success:	81%	87%	86 %
Recreation Days:	633	343	380
Days Per Animal:	6.7	5.5	6.3
Males per 100 Females	54	48	
Juveniles per 100 Females	83	75	

Population Objective (± 20%) :	3700 (2960 - 4440)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-55.1%
Number of years population has been + or - objective in recent trend:	13
Model Date:	2/1/2022

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:	15.1%	13.8%
Proposed change in post-season population:	9%	15%

Population Size - Postseason



2022 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	75	Antlered mule deer or any white-tailed deer

2021 Hunter Satisfaction: 72% Satisfied, 13% Neutral, 15% Dissatisfied

2022 Management Summary

1.) **Hunting Season Evaluation:** This herd reached objective range in 2017 and 2018, the first time in over a decade, 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 the herd spreadsheet model predicts the population was still more than 50 percent below objective size by posthunt 2021.

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. Buck:doe ratios reported for this herd are inflated by major portions of the herd unit being unavailable to most hunters and essentially unhunted.

Harvest statistics show slight improvement over record lows seen in 2020. Hunter success rose to 87% and the average days hunted per deer harvested dropped to a more typical 5.5 days. With improved success, hunter satisfaction improved slightly to 72%, but was still the 4th lowest in 13 years of records (Figure 1.). Hunter dissatisfaction increased, to its 3rd highest level, while the proportion of hunters 'very dissatisfied' with their hunts increasing to a record high of 7.5%. Hunter comments suggest this dissatisfaction was mainly due to the low quality of bucks available, as expressed in three of the six hunter comments received.

Antler measurements were collected on 13% of the reported harvest in 2021. Average spread of field checked adult mule deer bucks from this herd increased from 19.85 inches in 2020 to 22.8 inches in 2021. The maximum spread rose from 25 inches in 2020 to 28 inches in 2021. None of the harvest checked in 2019 or 2020 were Class 3 bucks, but in 2021, 33% of the adult bucks checked were Class 3. These data suggest the herd is beginning to recover from the 2018-19 and 2019-20 winters.

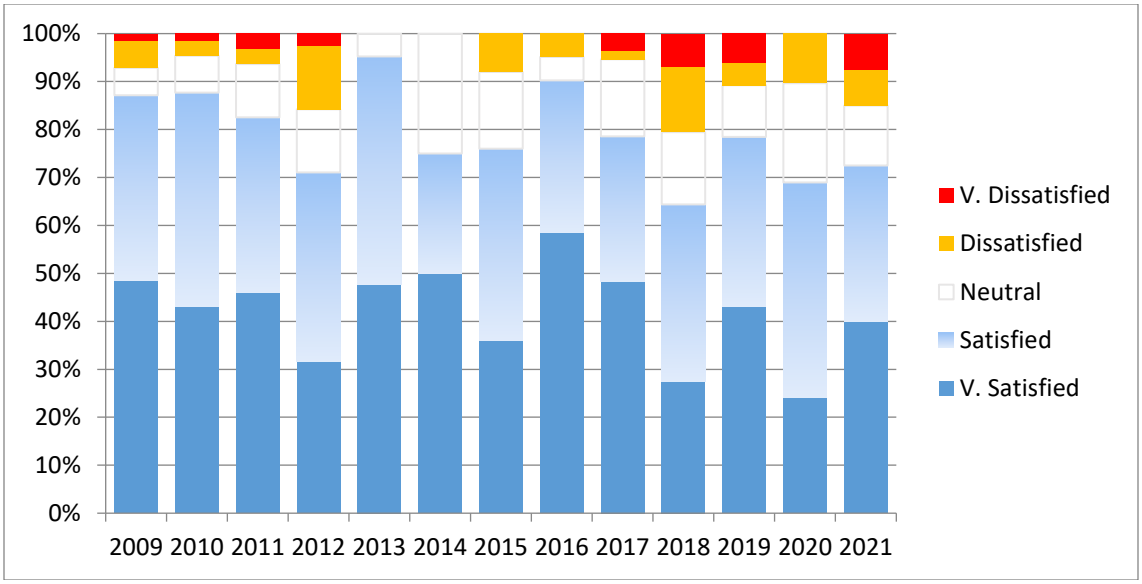


Figure 1. Hunter satisfaction and dissatisfaction for the Ferris Mule Deer Herd.

Classification ratios were collected from the ground this past year because unrelenting winds would not allow for safe helicopter surveys. As a result, sample size was much smaller, but classification into buck classes was presumably more accurate due to increased observer time and the ability to use optics. The buck:doe ratio increased to 48:100 in 2021, but solely from an increased recruitment of yearling bucks. The ratio of adult bucks:does declined for the 4th consecutive year to 25:100, its lowest level since 2013, despite the reduction in license quota. The proportion of Class 3 bucks has been steadily declining since these data were first collected in 2015, and no Class 3 bucks were seen in the 2021 classifications. Winds abated in January and helicopter surveys were conducted in the same manner and wintering areas as past classification surveys. A total of 830 deer were counted, roughly 10% less than counted and classified in a helicopter survey in 2020. Because of larger group sizes, the increased size of fawns and some bucks having already dropped antlers, only 529 of the 830 deer were classified. Out of 76 adult bucks classified in the aerial survey, only 2 (<3%) were Class 3. Of the 50 Class 2 bucks found during the helicopter survey, 32% were in the checker-board and unavailable to almost all hunters.

Classification, harvest, antler measurement and satisfaction data all indicate this herd is recovering from losses in the 2018-19 and 2019-20 winters but has not yet approached objective size nor the desired supply of mature bucks. The spreadsheet model predicts both the population and buck:doe ratio should increase slightly with the harvest from 75 Type 1 licenses.

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:** Bio-year 2021 postseason population estimate for this herd unit from the WGFD spreadsheet model was approximately 1,660 mule deer. In 2021, WGFD managers also began using PopR integrated population models (IPMs) to estimate population indices for mule deer and pronghorn. The 2021 postseason population estimate for this herd unit from the IPM was approximately 800 (CL = 565 - 1,040) mule deer. Postseason population estimates from both models for 2021 were reported here to allow for comparison during this transitional year. The Department intends to replace the WGFD spreadsheet model with the PopR IPM in bio-year 2022.

Population estimates and predicted increases in buck:doe ratio in this season proposal are based upon the spreadsheet model of this herd that has performed well for many years. Attempts at modeling this herd using the new IPM were made, but with poor success. IPM models using both the 'constant' adult mortality option and the 'time varying' adult mortality identified the need for low survivability in severe winters, but produced population estimates that were less than classification sample sizes. Five simulation runs with identical settings using the same database produced five separate population estimates, none of which agreed with another. It would appear the current IPM options cannot adequately mimic a population that is typically constant, but interrupted by years with vast changes in adult survivability. The IPM results were most similar to the CJ,CA option on the spreadsheet model, which is really nothing more than a calculator designed to identify a population size that is adequate to support reported harvests, with no effort to replicate the annual changes seen in the real world.

2021 - JCR Evaluation Form

SPECIES: Mule Deer

PERIOD: 6/1/2021 - 5/31/2022

HERD: MD648 - BEAVER RIM

HUNT AREAS: 90

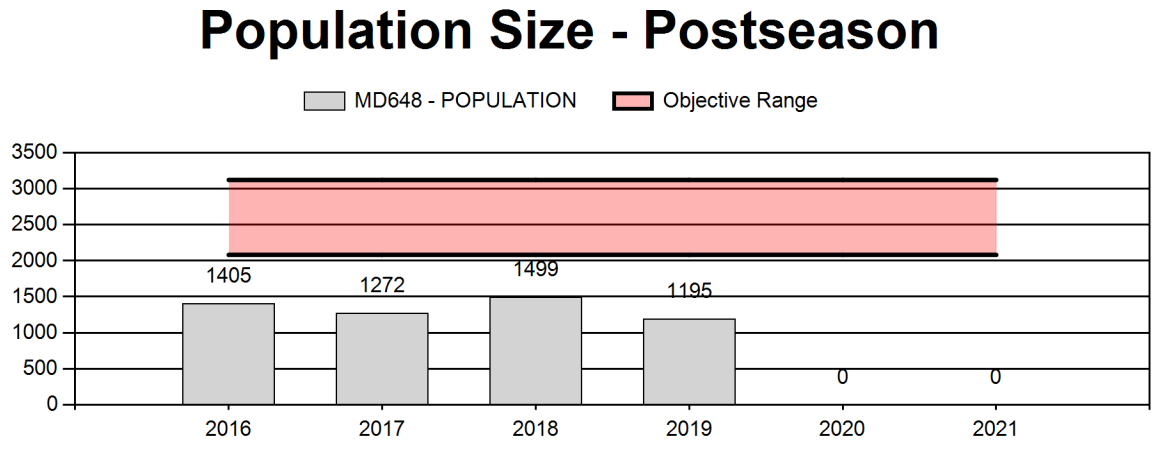
PREPARED BY: ZACH GREGORY

	2016 - 2020 Average	2021	2022 Proposed
Population:	1,074	N/A	1,000
Harvest:	51	43	30
Hunters:	65	74	50
Hunter Success:	78%	58%	60 %
Active Licenses:	65	74	50
Active License Success:	78%	58%	60 %
Recreation Days:	410	621	450
Days Per Animal:	8.0	14.4	15
Males per 100 Females	37	30	
Juveniles per 100 Females	43	59	

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:	11
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%



2022 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

2021 Hunter Satisfaction: 47% Satisfied, 21% Neutral, 32% Dissatisfied

2022 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. Given the small number of licenses issued annually, 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 indications of population growth, the hunt season in area 90 has been structured to provide a high quality recreational experience for a limited number of hunters annually. Despite only 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 summers of 2020 and 2021 were very dry throughout this herd unit and resulted in very poor vegetation production. Although the 2021-22 winter was quite mild, fawn mortality was still likely high due to the lack of feed available throughout the area. A classification survey was conducted in the area in 2021, albeit at lower intensity due to budget restrictions. Nevertheless, classification data shows a fawn:doe ratio of 59:100 indicating another year of low recruitment but improved from 2018 and 2019 data of 33:100 and 43:100 respectively. The lack of classification data for several years precluded calculating a population estimate for the year but indications are the population declined over the past year.

Hunter success declined to a notable low of 58% while days/harvest increased, understandably, to a historic high of 14.4. Some of the lower success can be attributed to the hot, dry weather throughout the hunting season that made deer more difficult to find. However, historically low satisfaction and success combined with hunter comments and poor demographics necessitates the need to reduce licenses in area 90.

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.

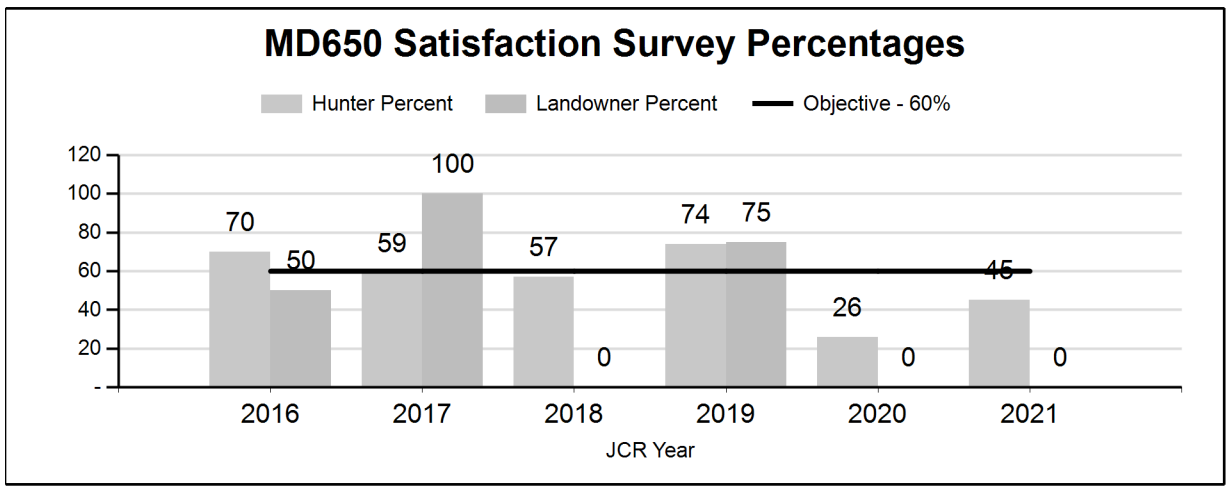
2021 - JCR Evaluation Form

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

PERIOD: 6/1/2021 - 5/31/2022
PREPARED BY: GREG HIATT

	2016 - 2020 Average	2021	2022 Proposed
Hunter Satisfaction Percent	59%	45%	50%
Landowner Satisfaction Percent	60%	0%	0%
Harvest:	42	14	20
Hunters:	108	74	90
Hunter Success:	39%	19%	22 %
Active Licenses:	108	74	90
Active License Success:	39%	19%	22 %
Recreation Days:	363	265	315
Days Per Animal:	8.6	18.9	15.8
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:	3



2022 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 three (3) points or more on either antler or any white-tailed deer, archery and muzzle-loading firearms only

2022 Region Q nonresident quota: 125 licenses

2021 Landowner Satisfaction: 0% Satisfied, 0% Neutral, 100% Dissatisfied
2021 Hunter Satisfaction: 45% Satisfied, 20% Neutral, 35% Dissatisfied

2022 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. Only one landowner responded this year, and they were dissatisfied with deer numbers and buck quality. Hunter satisfaction improved to 45% in 2021, but was still the 3rd lowest satisfaction rate in this herd since these data were first collected in 2009 (Figure 1.). None of the hunters surveyed were 'very satisfied' with their hunting experience. Hunter dissatisfaction declined from 48% to 35%, but was still the 4th highest in 13 years. The proportion of hunters 'very dissatisfied' with their hunting experience was the 2nd highest on record. Only two hunters provided written comment on this area, and both were strongly negative. Hunting conditions apparently improved in 2021, but were still well below hunter and landowner expectations for this herd.

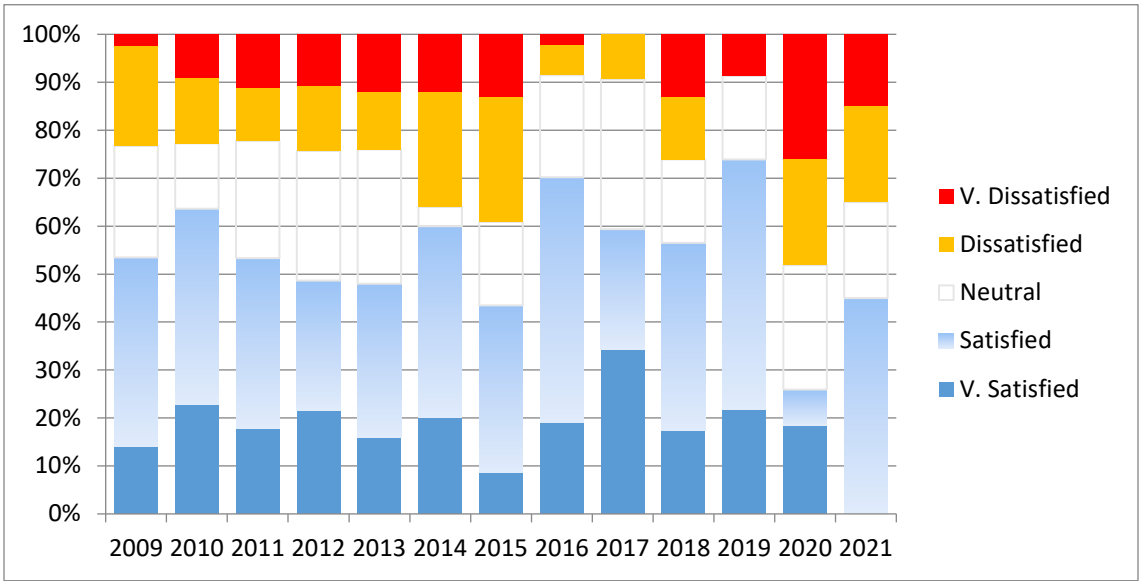


Figure 1. Hunter satisfaction and dissatisfaction for the Chain Lakes Mule Deer Herd.

Hunter success dropped to 19%, the poorest since 2013, a result of both low deer numbers and the 3-point antler restriction. While the 3-point antler point restriction may not significantly affect harvest in this primitive weapon hunt area, it is necessary to prevent a sharp increase in hunter numbers in this area if the rest of Region Q has the antler point restriction. Only 3 harvested bucks were checked from this area in 2021, but still represented 21% of the reported harvest. Average spread of the three was 19", with the largest being 25" wide.

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.

2021 - JCR Evaluation Form

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

PERIOD: 6/1/2021 - 5/31/2022

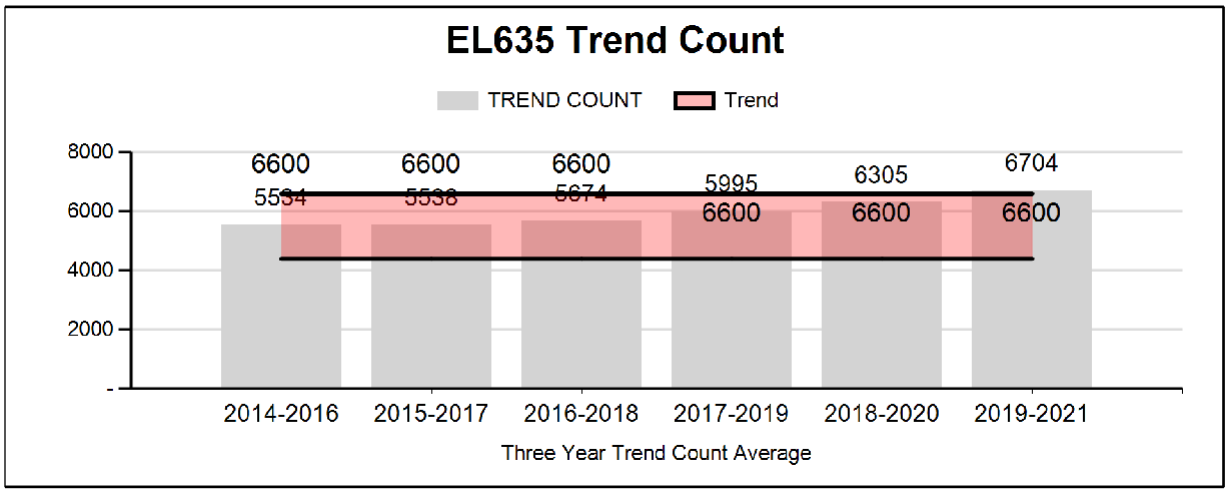
PREPARED BY: ZACH GREGORY

	2016 - 2020 Average	2021	2022 Proposed
Trend Count:	5,973	7,266	6,700
Harvest:	932	928	1,300
Hunters:	2,430	2,710	2,700
Hunter Success:	38%	34%	48%
Active Licenses:	2,535	2,852	2,800
Active License Success	37%	33%	46%
Recreation Days:	16,262	19,089	19,000
Days Per Animal:	17.4	20.6	14.6
Males per 100 Females:	20	20	
Juveniles per 100 Females	24	20	

Trend Based Objective (± 20%)	5,500 (4400 - 6600)
Management Strategy:	Recreational
Percent population is above (+) or (-) objective:	32%
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 2: 1 year old:	0%	0%
Males 2: 1 year old:	0%	0%
Juveniles (< 1 year old):	0%	0%



2022 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	Nov. 15	Dec. 15	700	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

2021 Hunter Satisfaction: 65% Satisfied, 19% Neutral, 16% Dissatisfied

2022 Management Summary

1.) Hunting Season Evaluation: Personnel counted a total of 7,266 elk during the February, 2022 trend count. This was 796 more elk than counted in 2021 and is largely due to an increase in

the number of elk seen in hunt area 67 while elk numbers in areas 68 and 69 were essentially unchanged. The trend count three year average increased to 6,703. This is slightly above the 20% range of the established objective of 5,500 elk, putting this herd over objective. That being said, a large reason for increased elk numbers may be attributed to an influx of elk that normally winter in the Cody region. Collar data and trend counts from Cody region personnel indicate a large number of elk that typically winter in the Meeteetse Rim area wintered in the Spring Mountain/Table Mountain area. 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 1,709 counted this year, slightly under objective. The South Dubois segment is at objective (1,100) with a 2021 winter count of 1,162. The Dunoir/Spring Mountain segment continues to be above the set objective of 2,200 elk with a 2021 winter count of 4,395, over 1,000 more than in 2020. But again, based on collar data, a portion of the elk observed are the additional Cody region elk. Both Type 4 and 6 licenses in area 67 are structured to allow antlerless harvest on the Dunoir/Spring Mountain segment with Type 6 license pressure focused exclusively on this segment.

Overall hunter success in this herd declined from 45% in 2020 to 34% in 2021. Area 67 had the second lowest success rate (31%) in over a decade, and specifically both the Type 4 and 6 license hunter success was 50% lower (31% & 28%, respectively) in 2021 compared to 2020 (64% & 59%, respectively). License allocation was significantly increased for the 2021 hunting seasons, however anabnormally hot and dry late fall/early winter contributed to the low harvest in 2021. It is expected the license increase implemented 2021 is appropriate, assuming normal harvest success, to reverse the growing trend in the population. Therefore license quotas, with the exception of the Type 9 license, will remain the same in 2022. Further, there is concern that raising the number of Type 6 licenses will likely decrease harvest success, because access to elk on private lands is becoming an ever increasing concern as elk are finding refuge on these large tracts of currently inaccessible properties. We will continue to work with landowners in an attempt to increase access to private lands that will help disperse elk onto adjacent public lands and facilitate an increase in harvest. Due to an increase in demand by both resident and nonresident hunters, the Type 9 licenses will increase from 125 to 150. In addition, all archery hunters will be allowed to take any elk.

2.) Chronic Wasting Disease Monitoring and Management. This is a Tier 2 surveillance herd. To date, there have been 125 samples collected with 2 of those testing positive. No CWD management actions have occurred. This herd was prioritized for CWD surveillance in 2021 and will continue through fall 2023.

2021 - JCR Evaluation Form

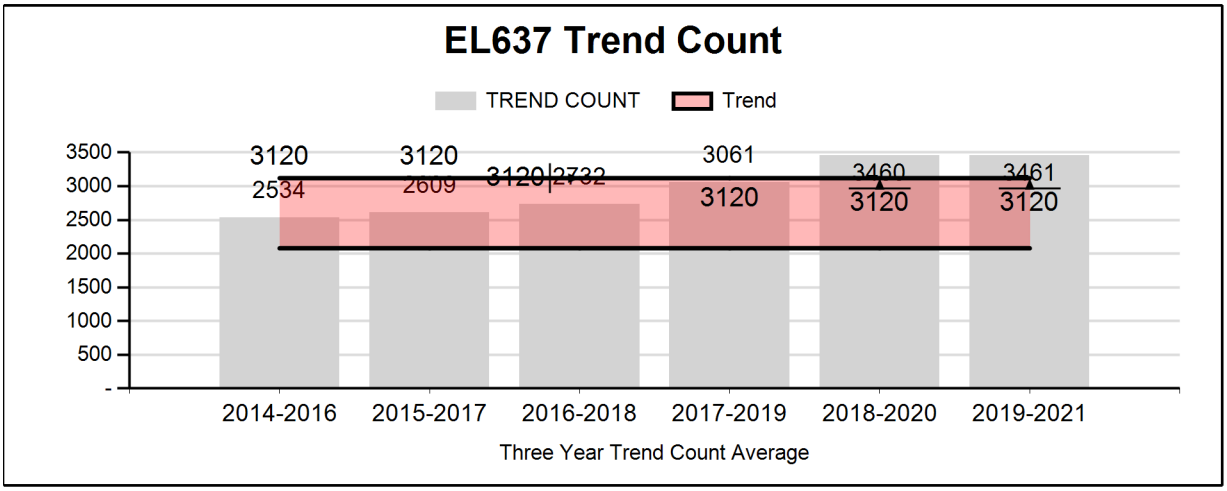
SPECIES: Elk
PERIOD: 6/1/2021 - 5/31/2022
HERD: EL637 - SOUTH WIND RIVER
HUNT AREAS: 25, 27-28, 99
PREPARED BY: STAN HARTER

	2016 - 2020 Average	2021	2022 Proposed
Trend Count:	3,117	2,994	2,800
Harvest:	621	695	725
Hunters:	1,836	1,755	1,800
Hunter Success:	34%	40%	40%
Active Licenses:	1,889	1,831	1,900
Active License Success	33%	38%	38 %
Recreation Days:	13,457	12,252	12,000
Days Per Animal:	21.7	17.6	16.6
Males per 100 Females:	24	40	
Juveniles per 100 Females	31	35	

Trend Based Objective (± 20%)	2,600 (2080 - 3120)
Management Strategy:	Recreational
Percent population is above (+) or (-) objective:	15%
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%



2022 Hunting Seasons
South Wind River Elk (EL637)

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	150	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

2021 Hunter Satisfaction: 63.3% Satisfied, 19.9% Neutral, 13.8% Dissatisfied

2022 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 2021 trend count/classification survey flown in January and February 2022, when pooled with a ground count of elk in the North Fork Road area, produced a count of 2,994 elk, 940 fewer than in 2020 and placing the 2021 annual trend count within the objective range (± 20%). The 2021 trend count was nearly identical to the 2018 count, thus the latest 3-year average of 3,461 elk was identical to the same average as last year. Therefore, this level is outside the upper +20% margin of the objective. Distribution shifts between hunt areas 25 and 28 resulted in a near average count in both areas. The calf/cow ratio of 35J/100F for the herd unit equals the long-term average and the total bull/cow ratio of 40M/100F was the highest for the herd unit since 1994. The 2022 season structure is very similar to the largely successful 2021 season, which resulted in 695 total elk harvested and overall 40% hunter success. Hunter satisfaction also improved in 2021. We are dropping the Type 6 license in hunt area 28, which has targeted elk in the vicinity of Lander's City Limits and the North Fork Road, with plans to utilize a newly revised Commission Regulation - Chapter 34 to provide "on-demand" harvest of elk should damage problems arise. This season was much less needed in 2020 and 2021 due to mild, open conditions allowing elk to use areas away from cattle feedlines and hay storage (which have largely been fenced to reduce damage problems). With that license reduction, along with

increasing opportunity for hunting good numbers of elk in hunt area 27, we are adding 25 licenses to the area 27 Type 4 season. We also return to the long-term "standard" closing date of November 20 for those seasons where an extra day was added in 2021 to allow a final "full" weekend of hunting.

Changes made to increase antlerless elk harvest in 2021 worked well despite a very mild, open hunting season, with a 2% increase over 2020 and the harvest of 695 elk being near the long-term average. However, with continued average trend counts above objective and increased calf recruitment, continued female harvest is needed to limit growth and move toward objective. The seasons above should maintain or increase antlerless elk harvest in 2022, and help curtail population growth and move this herd toward objective.

2.) Chronic Wasting Disease Monitoring and Management. This is a Tier 1 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 been prioritized for CWD surveillance in 2024.

2021 - JCR Evaluation Form

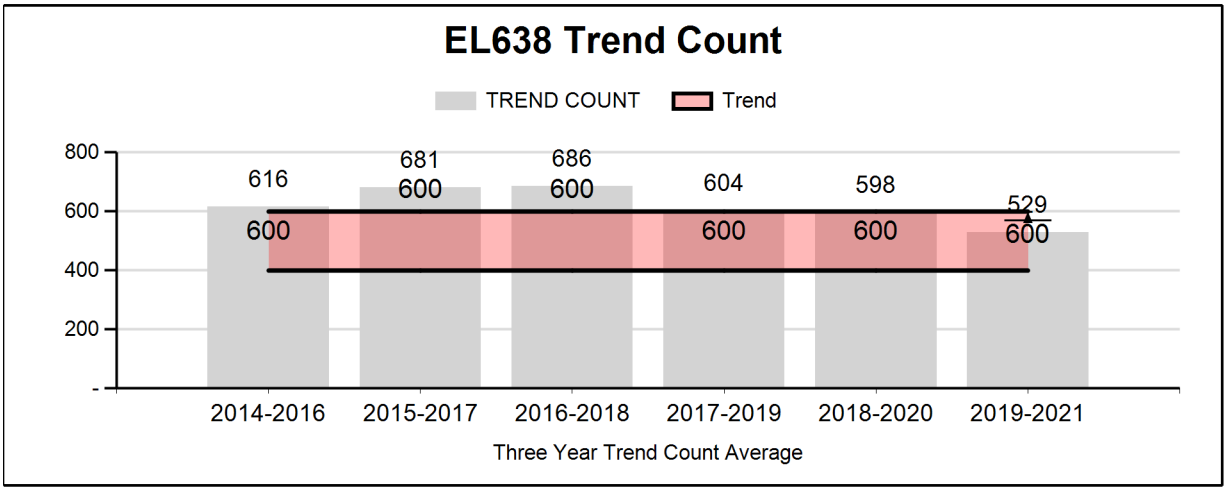
SPECIES: Elk
PERIOD: 6/1/2021 - 5/31/2022
HERD: EL638 - GREEN MOUNTAIN
HUNT AREAS: 24, 128
PREPARED BY: STAN HARTER

	2016 - 2020 Average	2021	2022 Proposed
Trend Count:	622	535	500
Harvest:	229	262	275
Hunters:	578	657	650
Hunter Success:	40%	40%	42%
Active Licenses:	583	670	670
Active License Success	39%	39%	41 %
Recreation Days:	3,586	4,078	4,100
Days Per Animal:	15.7	15.6	14.9
Males per 100 Females:	37	34	
Juveniles per 100 Females	32	32	

Trend Based Objective (± 20%)	500 (400 - 600)
Management Strategy:	Recreational
Percent population is above (+) or (-) objective:	7%
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%



2022 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	175	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

2021 Hunter Satisfaction: 70.8% Satisfied, 20.3% Neutral, 8.9% Dissatisfied

2022 Management Summary

1.) Hunting Season Evaluation: The Green Mountain elk herd unit has a mid-winter trend count objective of 500 elk. The 2021 trend count/classification survey was flown in January 2022, and resulted in a count of 535 elk. Conditions were relative snow free, and we found tracks in several places indicating we missed elk (likely some bull groups, but also possibly another cow/calf group). Only 2 bull elk were found in area 128, but a group of over 100 has been frequently visiting a haystack and causing damage at the Split Rock Ranch, along with known elk in the west end of area 128 that range widely from the Sweetwater River to Beaver Rim. The latest 3-year trend count average is 529, placing the population within the objective's range. Hunting seasons have been constructed over the last 15-20 years to successfully reduce the population. As hunting seasons have been manipulated over the past several years, it is clear hunter over-crowding is a concern. License numbers were increased substantially in area 24 until 2013, which resulted in minimal increases in harvest and significant increases in complaints about hunter crowding and perceived fewer elk.

The 2021 calf/cow ratio was 32J/100F (22% below the average of 41J/100F since 1994). Traditionally high calf recruitment in this herd unit has made reducing this population difficult with hunting seasons, especially given increased license allocation resulting in hunter crowding and no increase in hunter harvest. The bull/cow ratio of 34M/100F is 17% below the long-term average, with the fewest adult bulls observed in the last 5 years and 33% below the average since 2011, with an increase in spikes observed. Some hunters have stated disappointment they are seeing a decline in bull quality in recent years.

The total harvest for the herd unit in 2021 was only 3 fewer total than in 2020. Area 24 Type 1 hunters had the lowest success in 4 years, and overall hunter success was 10% below the long-

term average. With declining bull harvest and hunter success, along with diminishing size and number of observed adult bulls, we are recommending a reduction of 25 Type 1 licenses in Area 24 in 2022. This is also consistent with recent comments from hunters that mimic previously documented hunter crowding issues related to high license numbers. There are no changes to Type 4 and Type 5 seasons in Area 24, however the Casper Region requested their Area 23 Type 4 licenses be valid in Area 128 from November 15 – December 15 to allow hunters to pursue elk that move from Area 23 to Area 128 during that time period. This may also help address some landowner concerns about elk numbers throughout the hunt area. If antlerless harvest stays above average levels in both hunt areas in 2022 and calf recruitment stays below average, this population should decrease and remain at objective.

2021 - JCR Evaluation Form

SPECIES: Elk
PERIOD: 6/1/2021 - 5/31/2022

HERD: EL639 - FERRIS

HUNT AREAS: 22, 111
PREPARED BY: GREG HIATT

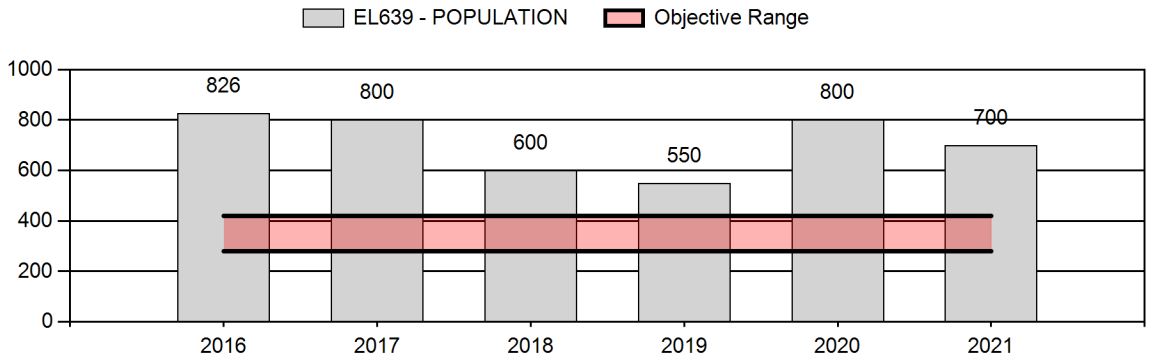
	2016 - 2020 Average	2021	2022 Proposed
Population:	715	700	675
Harvest:	149	150	180
Hunters:	291	276	360
Hunter Success:	51%	54%	50%
Active Licenses:	301	299	360
Active License Success:	50%	50%	50%
Recreation Days:	1,820	1,960	2,780
Days Per Animal:	12.2	13.1	15.4
Males per 100 Females	86	0	
Juveniles per 100 Females	41	0	

Population Objective (± 20%) :	350 (280 - 420)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	100%
Number of years population has been + or - objective in recent trend:	9
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:	--12%	-4%

Population Size - Postseason



2022 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	75	Antlerless elk
111	6	Sep. 1	Sep. 30	Nov. 1	Dec. 31	200	Cow or calf

2021 Hunter Satisfaction: 73% Satisfied, 19% Neutral, 8% Dissatisfied

2022 Management Summary

1.) **Hunting Season Evaluation:** Conditions for this year's trend count were again near ideal, with fresh snow cover, good light and light winds for all days of flying. A total of 665 elk were counted, still well above the objective of 350 but almost 15% less than counted in 2020 (see Appendix A.). The trend count found 478 elk in the largely publicly available portion of this herd, but 287 of these (43% of the total) were in one herd below Pathfinder Ranch lands where they were largely unavailable during hunting season. Another 187 elk (28%) were in checker-boarded lands where hunter access is severely limited. Roughly 70% of the elk in this herd were unavailable for public harvest due to access limitations on private lands.

Hunter success declined for four of the five license types in 2021, with success for the Type 4 license hunters in Area 111 remaining essentially unchanged. The average number of days hunted per elk harvested rose by 30% in Area 22, but was unchanged in Area 111. Given that mild weather allowed access to most public lands during the 2021 hunt, these data suggest increased harvests have successfully reduced elk numbers, at least on public

lands. Hunter satisfaction remained constant in Area 22, despite the poorer success (Figure 1.), but declined by 11% in Area 111 (Figure 2.). Hunter dissatisfaction also declined in both areas, with a larger proportion of hunters neutral about their hunting experience.

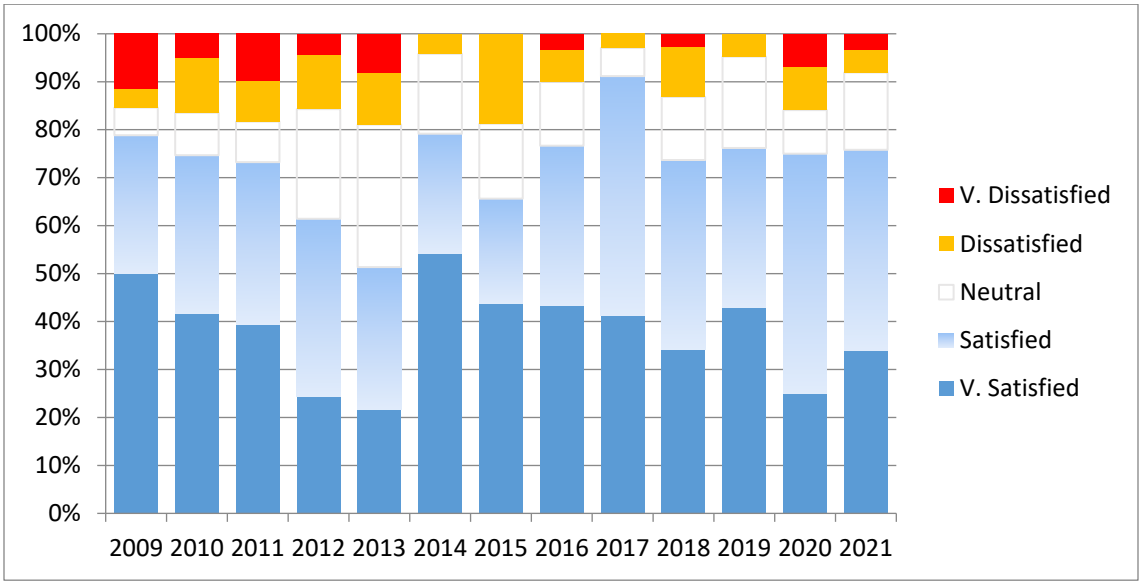


Figure 1. Hunter satisfaction and dissatisfaction for Area 22 in the Ferris Elk Herd.

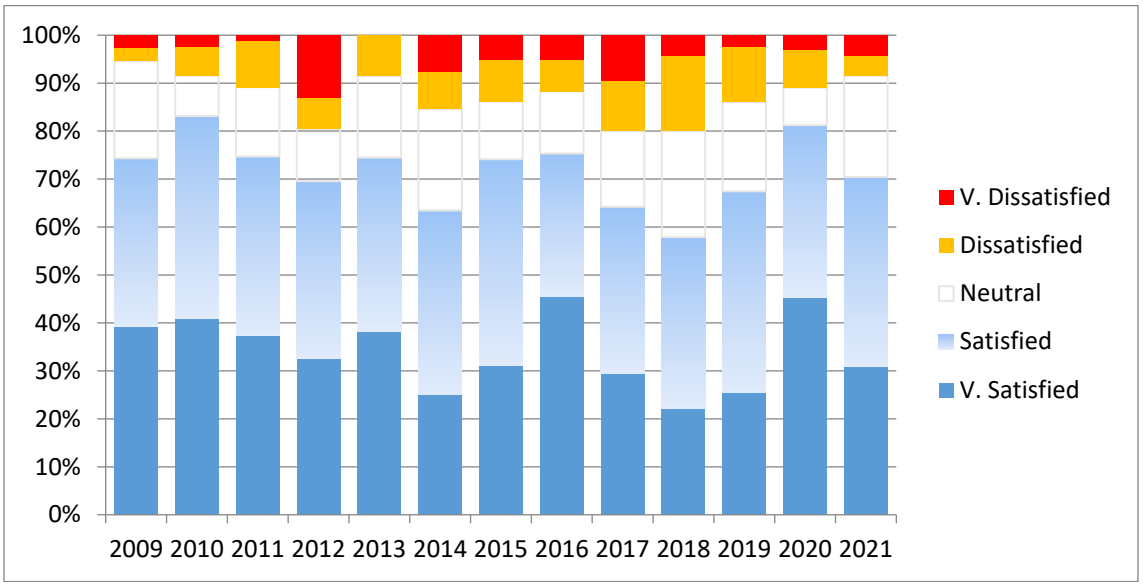


Figure 2. Hunter satisfaction and dissatisfaction for Area 111 in the Ferris Elk Herd.

Calf production was low this year, at 32:100 versus 56:100 in 2020. The antlered:cow ratio also declined, from 63:100 to 55:100. Antlerless harvests need to continue, and should be increased, but more than half the reproductive portion of this herd is unavailable for harvest on private lands or public lands with no access. The Stone Ranch, straddling both hunt areas

and providing much of the public access in the past, was sold this past winter. The new landowners are reviewing the Hunter Management Program and it is hoped enough public access can be retained to maintain elk harvests. Regardless of this change, 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 2021 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 the winter ranges occupied by these 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 due to weather conditions. In 2021, date of harvest data suggest at least 22 percent of the Type 1 harvest occurred in the late hunt. 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:	2021	**Herd Code:**	EL639
Species:	Elk	**Herd Unit:**	Ferris
Aircraft:	R66 helicopter	**Hunt Areas:**	22, 111
Pilot:	Dave Stinson, 307 Aviation	**Dates:**	13-15 Jan 2022
Observers:	Linnea Sailor	**Flight Time:**	**??** hrs
Conditions:	good snow cover, good light, light winds		

Survey Design:

An aerial trend count of this herd was flown on 13-15 January 2022. Due to favorable conditions and helicopter schedule, the bighorn sheep trend count/classification was flown at the same time. Deer classifications of this area were completed from the ground this year due to unrelenting high winds in November and December, so those flight hours were used to count winter distribution of mule deer. Those tasks were added to the elk and bighorn sheep survey. As a result, coverage of this year's elk trend count was expanded to include habitats likely to be occupied by bighorn sheep and mule deer 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 counted elk were 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	60	19	4	85	168	31.7	148.3	6.7	141.7
111	North	196	57	33	24	310	29.1	29.1	16.8	12.2
111	South	98	39	11	39	187	39.8	51.0	11.2	39.8
Total		354	115	48	148	665	32.5	55.4	13.6	41.8

Conditions for this year's trend count were again near ideal, with fresh snow cover, good light and light winds for all days of flying. A total of 665 elk were counted, still well above the objective of 350 but almost 15% less than counted in 2020. The trend count found 478 elk in the largely publicly available portion of this herd, but 287 of these (43% of the total) were in one herd below Pathfinder Ranch lands where they were largely unavailable during hunting season. Another 187 elk (28%) were in checker-boarded lands where hunter access is severely limited. Roughly 70% of the elk in this herd were unavailable for public harvest due to access limitations on private lands.

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 along the Taper Ranch Road, with the southern portion consisting almost entirely of checker-boarded, publicly inaccessible lands.

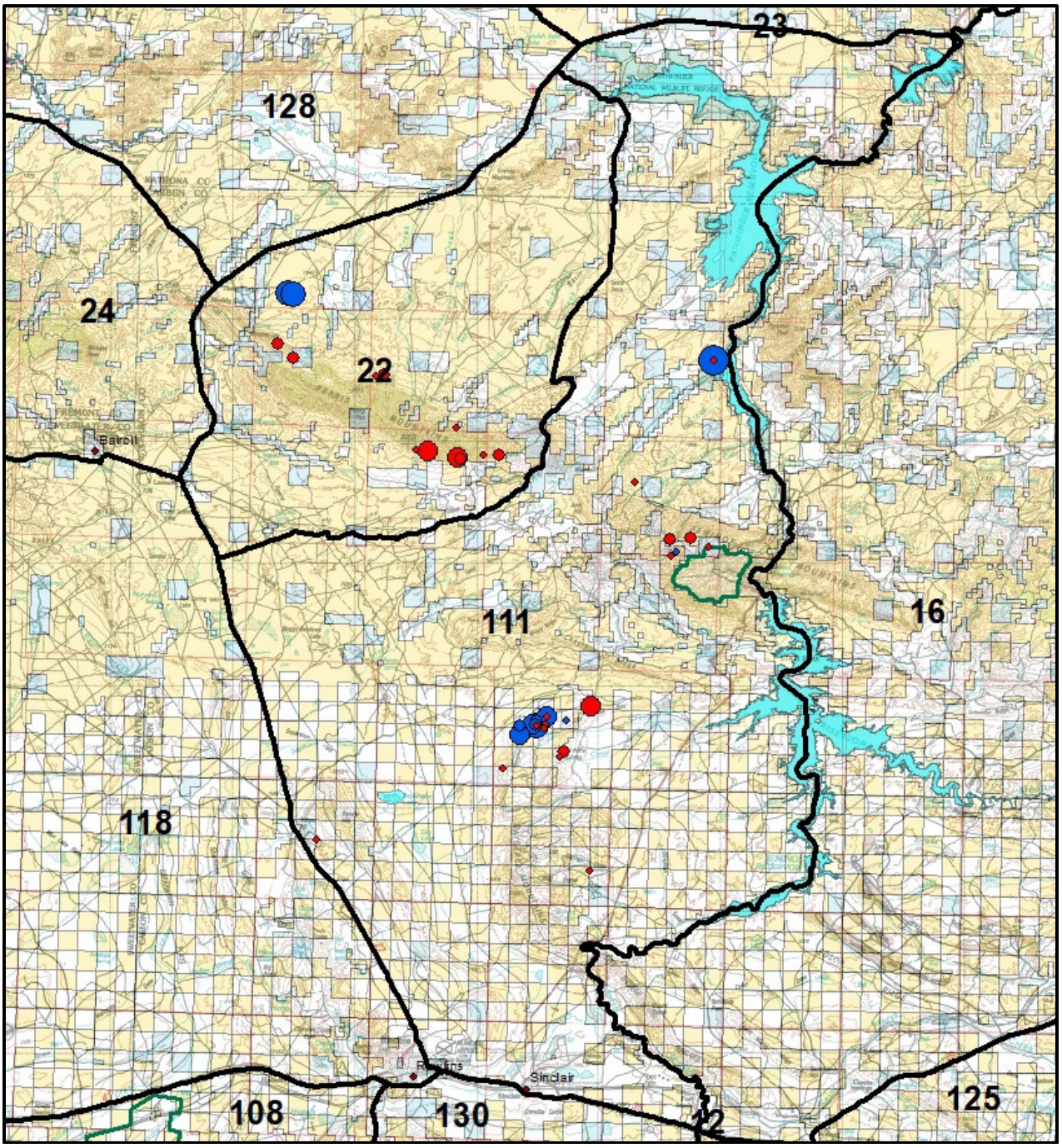


Figure 1. Locations and comparative group sizes of elk found in the Ferris Herd during the 2021 winter trend count on 13-15 January 2022. Branch-antlered bulls are shown in red, all other classes of elk are shown in blue.

2021 - JCR Evaluation Form

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

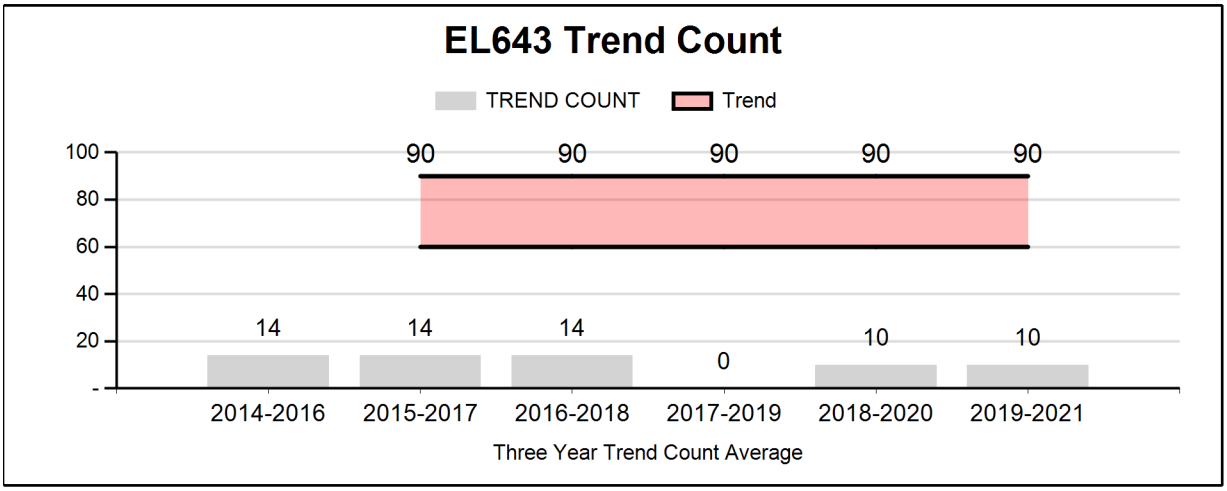
PERIOD: 6/1/2021 - 5/31/2022
PREPARED BY: GREG HIATT

	2016 - 2020 Average	2021	2022 Proposed
Trend Count:	36	0	0
Harvest:	58	57	65
Hunters:	92	84	120
Hunter Success:	63%	68%	54%
Active Licenses:	102	89	20
Active License Success	57%	64%	325%
Recreation Days:	473	518	670
Days Per Animal:	8.2	9.1	10.3
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:	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%



2022 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	Any 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)

2021 Hunter Satisfaction: 78% Satisfied, 10% Neutral, 12% Dissatisfied

2022 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 and adding some elk seen during a pronghorn line transect survey in the days before (see Appendix A). Only 31 elk were found, 11 less than in 2017 and more than 50 percent below objective. License quotas have remained constant over the past four years, with 100 licenses available each year. Hunter success jumped to 95% for Type 1 hunters in 2021, but remained relatively constant for hunters with Type 4 and Type 6 licenses. Overall, hunter success was 64%, above the 5-year average of 56%. As would be expected with higher hunter success, hunter satisfaction rose to 78%, the 4th highest recorded in this herd in the past 13 years (Figure 1.). While the experimental end-of-year trend count indicates this herd is below objective, the improved hunter success suggests elk numbers have increased and license quotas were increased in 2022.

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 of 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 and the same opening date is used in 2022.

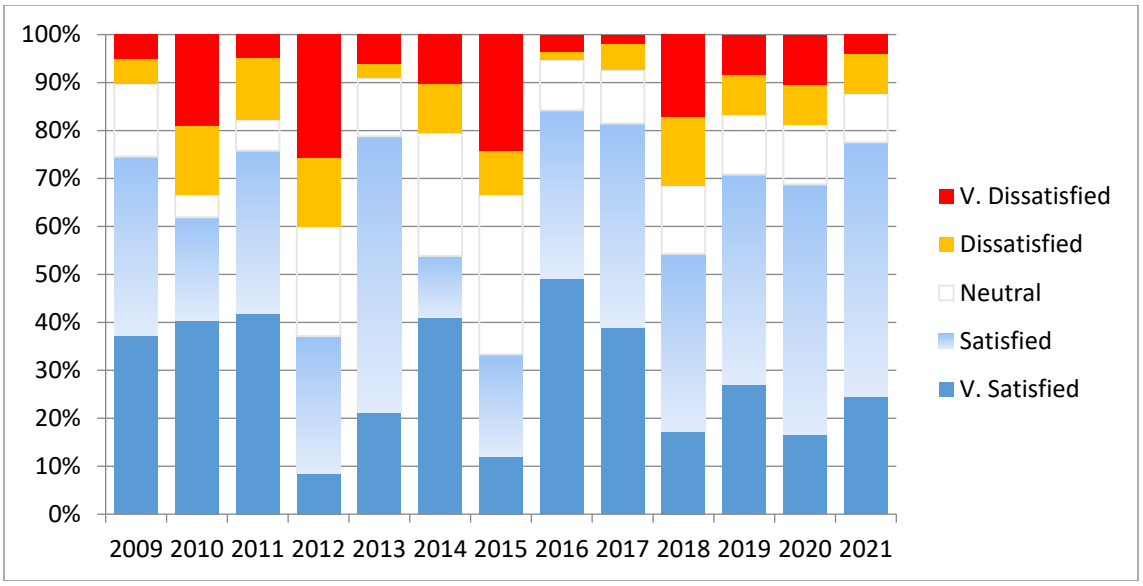


Figure 1. Hunter satisfaction and dissatisfaction in the Shamrock Elk Herd.

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.

Appendix A
Spring Trend Count Report

Bio Year:	2020	**Herd Code:**	EL643
Species:	Elk	**Herd Unit:**	Shamrock
Aircraft:	Cessna 182, Wyo. Aerophoto	**Hunt Areas:**	118
Pilot:	Jamie Burgess	**Dates:**	29 May 2021
Observers:	Greg Hiatt, Sarah Dugan	**Flight Time:**	5.5 hrs
Conditions:	Fair green-up, mostly clear skies but with smoky haze, calm		

Survey Design:

Flight lines were flown north-south. Lines south of 42o latitude were spaced at 2' intervals, starting at 107o 18' and ending at 108o 0'. Lines in the northern portion were spaced 4' apart, starting at 107o 54' and ending on 107o 30'. Observers looked out both sides of the aircraft, scanning as far as possible for elk. If a group of elk was spotted, observers were free to leave the line to obtain an accurate count before returning to the flight line.

Count Results:

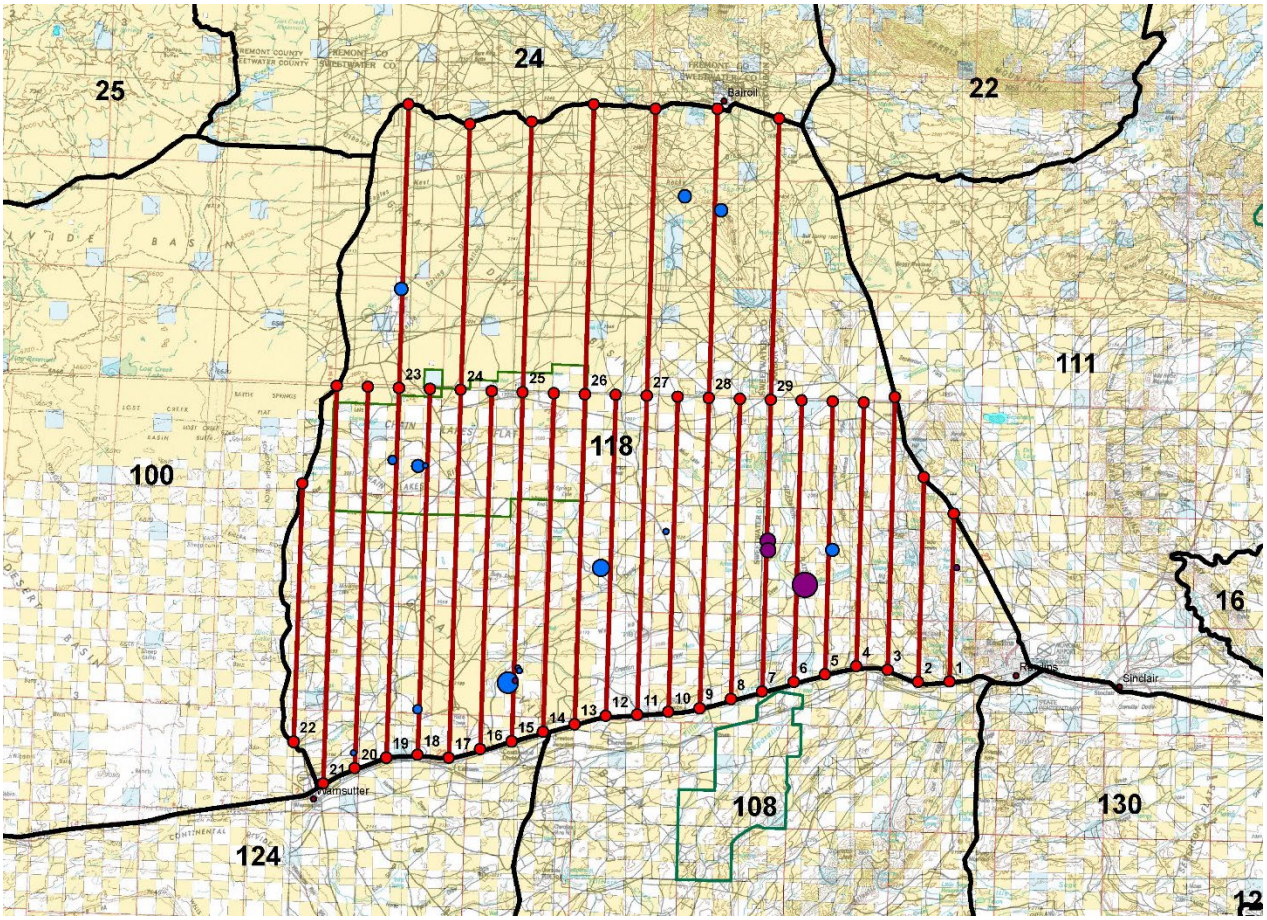
Hunt Area	Count Block	Flight time	Number Counted	Photos Taken?	Comments
118	South		14	n	Transects at 2' intervals
118	North		0	n	Transects at 4' intervals
118	South		17	n	Seen on pronghorn transect on 25th
		5.5 hrs	31		

Notes:

Only 14 elk were seen during the trend count, despite covering ~450 miles of occupied desert habitat. While vegetation green-up was less than ideal, hazy light conditions from western forest fires reduced contrast and shadows, probably affecting visibility of elk more than vegetative conditions. Seventeen elk seen during a pronghorn line transect using an identical flight line were not relocated during the elk survey and were added into the total. Based on locations and group sizes, 12 of the 14 elk seen during the elk survey on the 29th had also been spotted during the pronghorn survey on the 25th.

Flight Lines:

Flight lines used in both the 2017 and 2021 spring trend counts are shown in the map below, although the 2017 survey skipped line 22 at the western end of the southern part of the survey. Locations and comparative size of elk groups found in the 2021 survey are shown in purple, while the 2017 observations are shown in blue.



2021 - JCR Evaluation Form

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

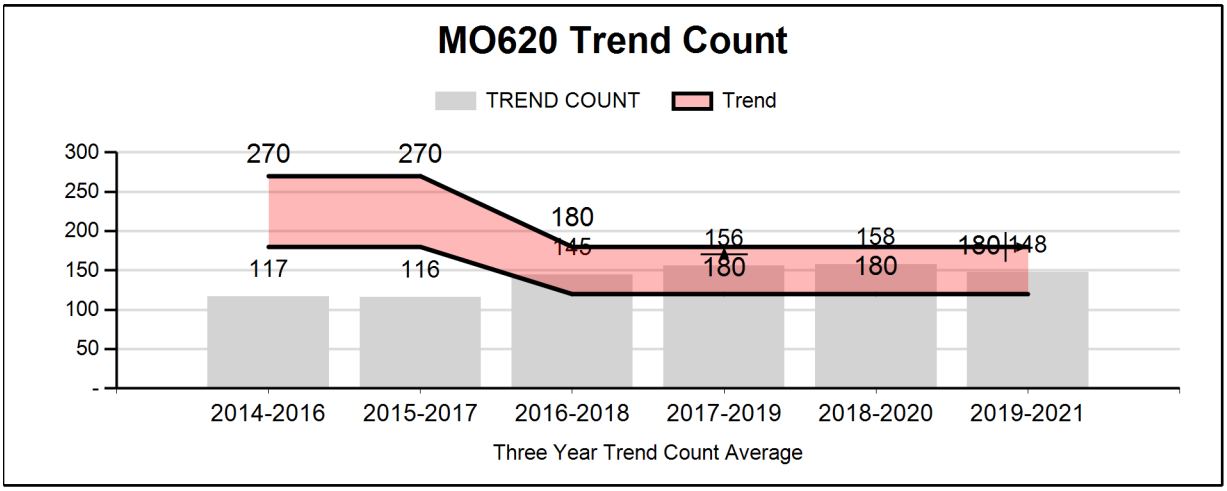
PERIOD: 6/1/2021 - 5/31/2022
PREPARED BY: STAN HARTER

	2016 - 2020 Average	2021	2022 Proposed
Trend Count:	147	143	150
Harvest:	6	4	5
Hunters:	6	5	5
Hunter Success:	100%	80%	100 %
Active Licenses:	6	5	5
Active License Success	100%	80%	100 %
Recreation Days:	54	74	75
Days Per Animal:	9	18.5	15
Males per 100 Females:	64	73	
Juveniles per 100 Females	49	36	

Trend Based Objective (± 20%)	150 (120 - 180)
Management Strategy:	Special
Percent population is above (+) or (-) objective:	-4.7%
Number of years population has been + or - objective in recent trend:	0

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%



2022 Hunting Seasons

Lander Moose (MO320)

Hunt Area	Hunt Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
2, 30	1	Sept. 1	Sept. 30	Oct. 1	Nov. 20	5	Antlered moose
39				CLOSED			

2022 Management Summary

1.) Hunting Season Evaluation: With a general lack of snow cover in many places, moose were often greatly scattered in habitats away from willow riparian habitats during classification/trend count flights conducted in January and February 2022. As such, the 2021 mid-winter trend count of 143 moose was 21% above what was seen in 2020, but 22% below the recent high count in 2019, when 183 moose were observed with deeper snow conditions forcing moose into more open winter range habitats. The current 3-year trend count average is 148 moose, placing this population at objective of 150 moose. Harvest survey results from the 2021 season show only 80% bull harvest with 5 licenses valid in both hunt areas 2 and 30. Only 3 of 5 hunters submitted teeth for aging via cementum annuli, which indicated the average age of harvested bulls was 6 years (range 2-12) with an average antler spread of 34 inches (range 26-42) from 3 measurements. The average age of harvested moose has been above 5 in 5 of the last 7 seasons, and antler size has also increased. Hunting season structure has been conservative due to concerns about population status. Accordingly, hunter success has been 100% in 4 of the last 5 seasons. Classification data showed a low calf/cow ratio of 36J/100F (with one set of twin calves), and the bull/cow ratio declined to 73M/100F. 49 bulls were observed during classifications, which is a little above average. However, with lower hunter success and increased effort (days/harvest) in 2021 combined with the lower observed calves, the 2022 hunting season remains conservative with no changes.

2021 - JCR Evaluation Form

SPECIES: Moose

PERIOD: 6/1/2021 - 5/31/2022

HERD: MO621 - DUBOIS

HUNT AREAS: 6

PREPARED BY: ZACH GREGORY

	2016 - 2020 Average	2021	2022 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:	67	45	60
Days Per Animal:	13.4	9	12

Limited Opportunity Objective:

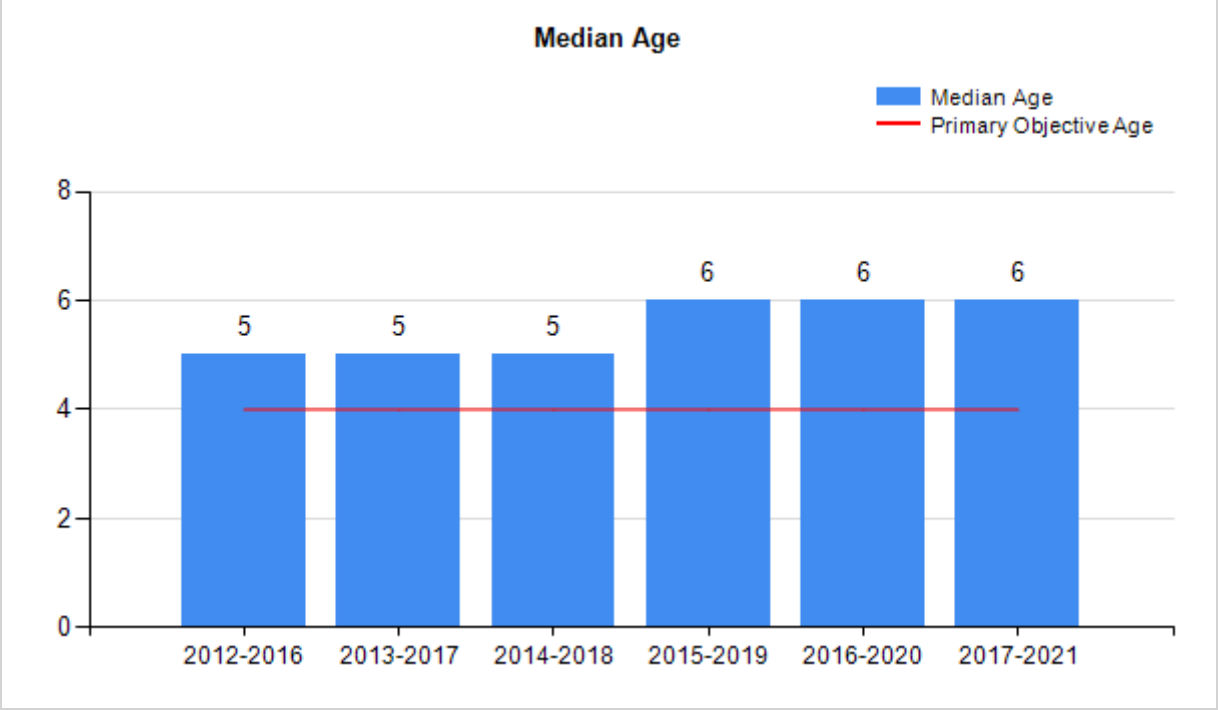
5-year running median age of harvested bulls is > 4 years

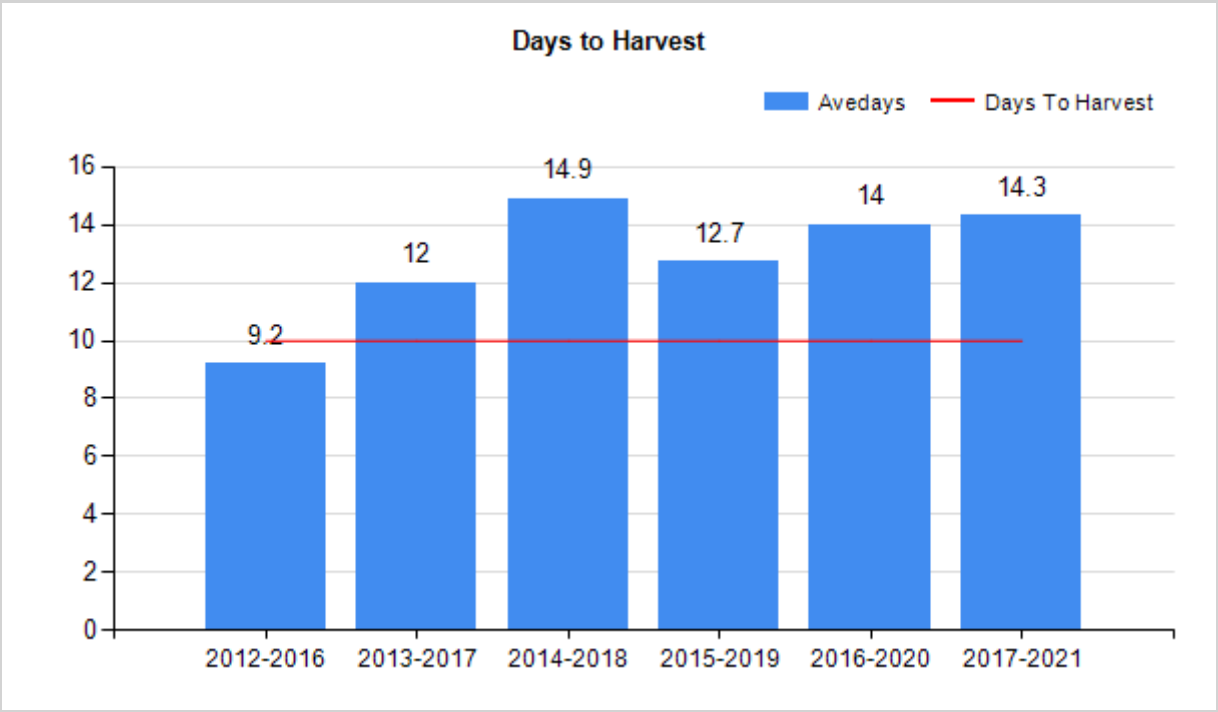
5-year running average of <= 10 days/animal to harvest

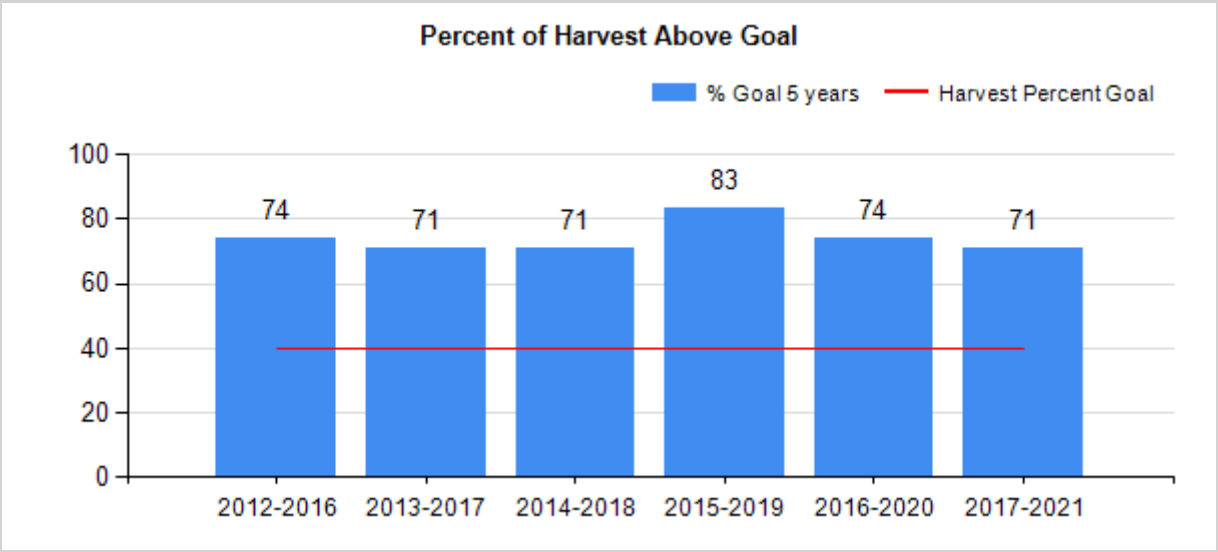
Secondary Objective:

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
9.2
12
14.9
12.7
14
14.3
2012-2016
2013-2017
2014-2018
2015-2019
2016-2020
2017-2021


Percent of Harvest Above Goal
% Goal 5 years
Harvest Percent Goal
100
80
60
40
20
0
74
71
71
83
74
71
2012-2016
2013-2017
2014-2018
2015-2019
2016-2020
2017-2021

2022 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

2022 Management Summary

1.) Hunting Season Evaluation: The 2022 hunting season remains 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 2021. This indicates hunters are able to find adult bull moose in the area. Furthermore, tooth age data indicate criteria for the limited opportunity objective in the herd continue to be met. Lab ages for 3 bulls harvested in 2021 yielded a median age of 6. This is the same as the 5-year running median age of harvest of 6. Indications are the population continues to languish well below historical levels in the area with low numbers of moose occupying traditional winter ranges throughout the area. Winter surveys do not reveal any increasing trend in moose numbers so additional hunting opportunity is not warranted in 2022.

2021 - JCR Evaluation Form

SPECIES: Bighorn Sheep
PERIOD: 6/1/2021 - 5/31/2022

HERD: BS609 - WHISKEY MOUNTAIN

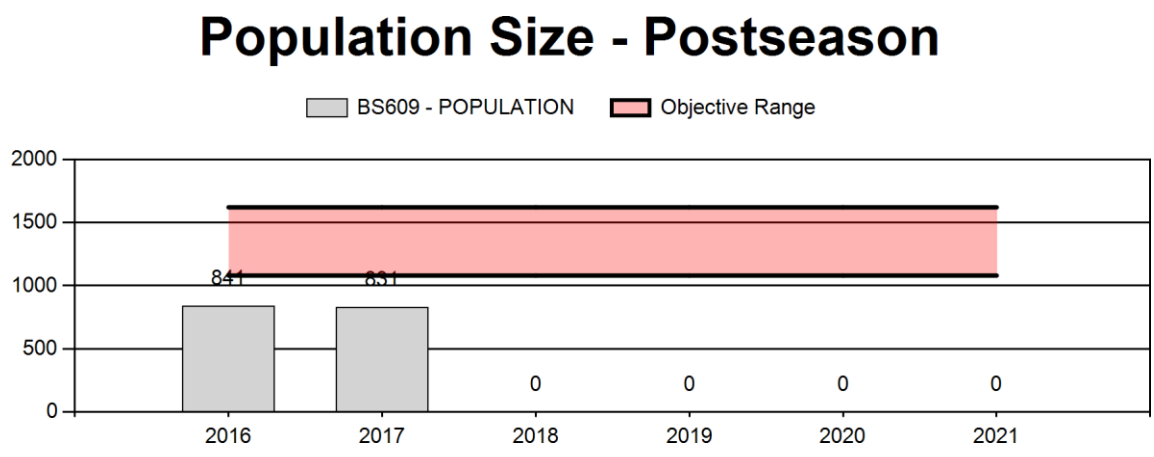
HUNT AREAS: 8-10
PREPARED BY: ZACH GREGORY

	2016 - 2020 Average	2021	2022 Proposed
Population:	334	N/A	N/A
Harvest:	11	9	8
Hunters:	19	16	12
Hunter Success:	58%	56%	67 %
Active Licenses:	19	16	12
Active License Success:	58%	56%	67 %
Recreation Days:	211	154	125
Days Per Animal:	19.2	17.1	15.6
Males per 100 Females	49	44	
Juveniles per 100 Females	18	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:	11
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%



2022 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
9	1	Aug. 1	Aug. 14	Aug. 15	Oct. 15	4	Any ram
10	1	Aug. 1	Aug. 14	Aug. 15	Oct. 15	4	Any ram

2021 Management Summary

1.) Hunting Season Evaluation: The only change between the 2021 and 2022 hunting season is the reduction of 3 Type 1 licenses in hunt area 8. The reduction will result in the issuance of 3 resident licenses and 1 non-resident license in area 8. 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 2021. Personnel classified a historically low number of sheep within the herd unit in 2021 with a sample of 226. This, in part, can be attributed to no count conducted in Area 8 at the time of this writing and poor weather conditions. Due to the low classification sample, age/sex ratios should be viewed with caution. That said, the lamb/ewe ratio was the highest it has been in the last 5 years at 36:100. Area 9 had a lamb:ewe ratio of 35:100 and area 10 had a ratio of 36:100, a significant increase from previous years. Hunter success in 2021 was 75% for area 10 and 60% for area 9, well within the historic range for these areas. The average age of rams harvested in 2021 for 9 and 10 (8 and 10, respectively) indicate the availability of older rams in these hunt areas. Although the population has not improved there still is recreational opportunity for 4 hunters each in areas 9 and 10. The low harvest success of 43% in area 8 during 2021 remained the same as in 2020 while the previous 5-year average success was 55%. That said, only 4 licenses will be issued in area 8 in 2022 in an effort to maintain some opportunity for older ram harvest while allowing for increase growth and age of younger rams.

2.) 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 attributable to pneumonia. During March of 2021, 14 ewes were captured, collared, and VITs implanted in 11pregnant ewes in Area 8. This capture effort was the first time sheep had ever been captured and handled in the area. 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). Ten lambs were successfully captured and collared during the spring of 2021 with two lambs that remain alive as of May, 2022. Similar as stated above, the six lamb moralities were primarily attributed to pneumonia. Captures continued in December of 2021 to re-capture ewes and lambs for body

condition evaluations and deployment of new collars. 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.

2021 - JCR Evaluation Form

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

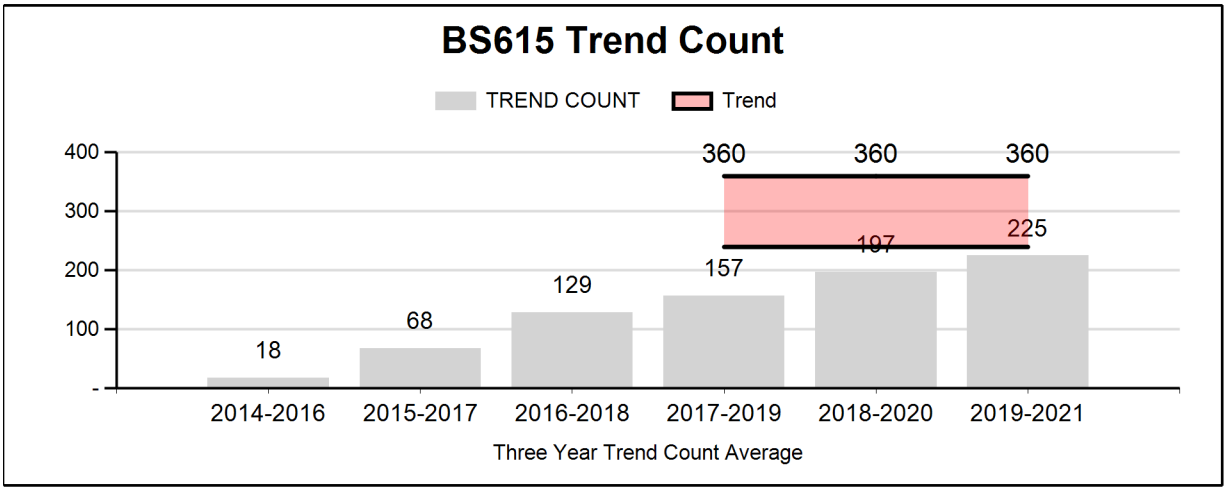
PERIOD: 6/1/2021 - 5/31/2022
PREPARED BY: GREG HIATT

	2016 - 2020 Average	2021	2022 Proposed
Trend Count:	159	266	270
Harvest:	4	7	11
Hunters:	4	7	11
Hunter Success:	100%	100%	100 %
Active Licenses:	4	7	11
Active License Success	100%	100%	100 %
Recreation Days:	29	67	132
Days Per Animal:	7.2	9.6	12
Males per 100 Females:	57	0	
Juveniles per 100 Females	48	0	

Trend Based Objective (± 20%)	300 (240 - 360)
Management Strategy:	Special
Percent population is above (+) or (-) objective:	-11.3%
Number of years population has been + or - objective in recent trend:	13

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:	6%	12%
Juveniles (< 1 year old):	0%	0%



2022 Hunting Seasons
Ferris-Seminoe Bighorn Sheep (BS615)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
17	1	Aug. 15	Aug. 31	Sep. 1	Oct. 31	8	Any ram
26	1	Aug. 15	Aug. 31	Sep. 1	Oct. 31	2	Any ram (2 resident)

2022 Management Summary

1.) **Hunting Season Evaluation:** A winter trend count flown in January 2022 found 266 bighorn sheep, providing a 3-year average of 225 sheep, still well below the objective of 300. As is typical, the majority (88%) of these animals were in Area 17, and were evenly split between the Seminoe and Ferris Mountains (see Appendix A.). At 47 lambs:100 ewes, lamb production was lower than in 2020 (71:100), but comparable to ratios seen in 2018 (46:100) and 2019 (43:100). Lamb production was higher in Area 26 (58:100) than in Area 17 (46:100).

Ram:ewe ratios ranged from a low 32:100 in the Ferris Mountains to 183:100 in the Seminoe Mountains, with the combined herd ratio at a more typical 87:100. A total of 96 rams were found during the trend count, with 67 percent of these in the Seminoe portion of Area 17.

Despite the abundance of rams in the herd, average age of harvested rams declined again slightly to 6.7 years, compared to 7.0 years in 2020 and 7.4 years in 2019 (Figure 1.). While there is a good supply of rams, the majority appear to be younger, products of the exceptional lamb production seen in 2015, 2016 and now 2020. There are enough mature rams for an increase in the license quota.

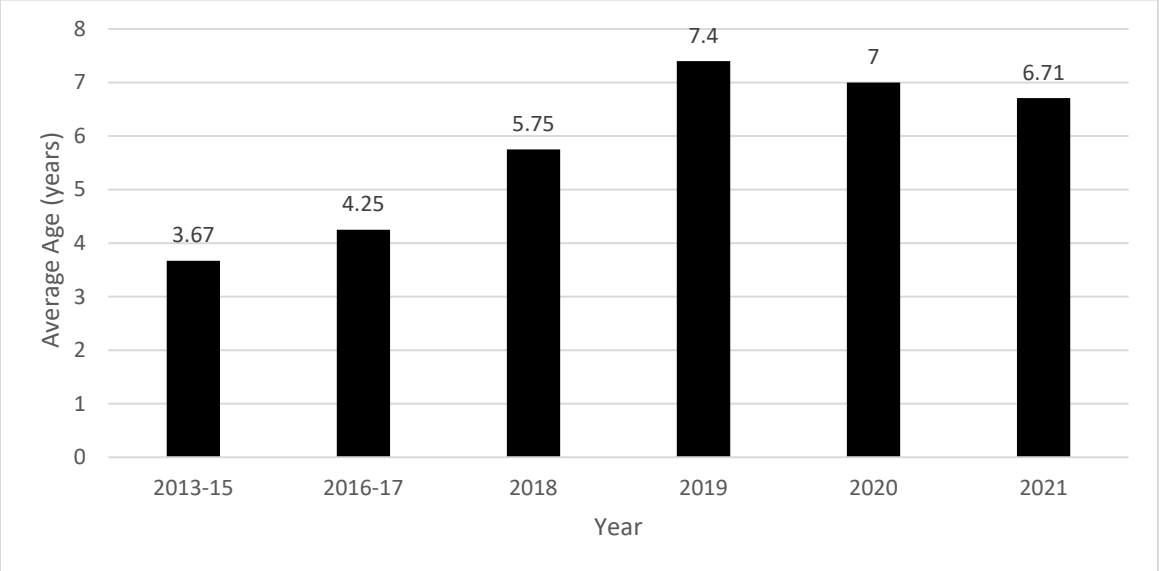


Figure 1. Average age of rams harvested from the Ferris-Seminoe Bighorn Sheep Herd.

Three of the seven rams harvested in 2021 came from Area 26, despite the significantly smaller number of sheep present on the east side of the North Platte River. To prevent over harvest of this segment of the population, license quotas are separated between the two hunt areas this year. The combined total would be 10 licenses, an increase of two over the 2021 quota. In addition, one of the licenses in 2021 was a medical carryover and this individual is expected to be an 11th hunter in 2022.

Appendix A
Winter Trend Count Report

Bio Year:	2021	**Herd Code:**	BS615
Species:	Bighorn sheep	**Herd Unit:**	Ferris-Seminoe
Aircraft:	R66 helicopter	**Hunt Areas:**	17, 26
Pilot:	Dave Stinson, 307 Aviation	**Dates:**	13-15 Jan 2022
Observers:	Linnea Sailor	**Flight Time:**	**??** hrs
Conditions:	good snow cover, good light, light winds		

Survey Design:

An aerial trend count of this herd was flown on 13-15 January 2022. Due to favorable conditions and helicopter schedule, the bighorn sheep trend count/classification was flown simultaneous with the Ferris elk trend count. Deer classifications of this area were completed from the ground this year due to unrelenting high winds in November and December, and those flight hours were used to document winter distribution of mule deer. Those tasks were added to the bighorn sheep and elk survey. As a result, coverage of this year's bighorn sheep trend count was expanded to include habitats likely to be occupied by elk and mule deer 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 herds, but 8 sheep remained unclassified from the count.

Count Results:

Hunt Area	Count Block	Classification				Total	Herd Ratios (/100 ewes)	
		Ewes	Lambs	Rams	Uncl		Lamb	Ram
17	Ferris	63	28	20	8	119	44.4	31.7
17	Seminoe	35	17	64	0	116	48.6	182.9
26	All	12	7	12	0	31	58.3	100.0
Total		110	52	96	8	266	47.3	87.3

Conditions for this year's trend count were again near ideal, with fresh snow cover, good light and light winds for all days of flying. A total of 266 bighorn sheep were counted, little changed from the 274 found in 2020. The majority (88%) of the animals were in Area 17 and were evenly split between the Ferris and Seminoe Mountains. Locations and relative group size of bighorn sheep found during this survey are shown in Figure 1.

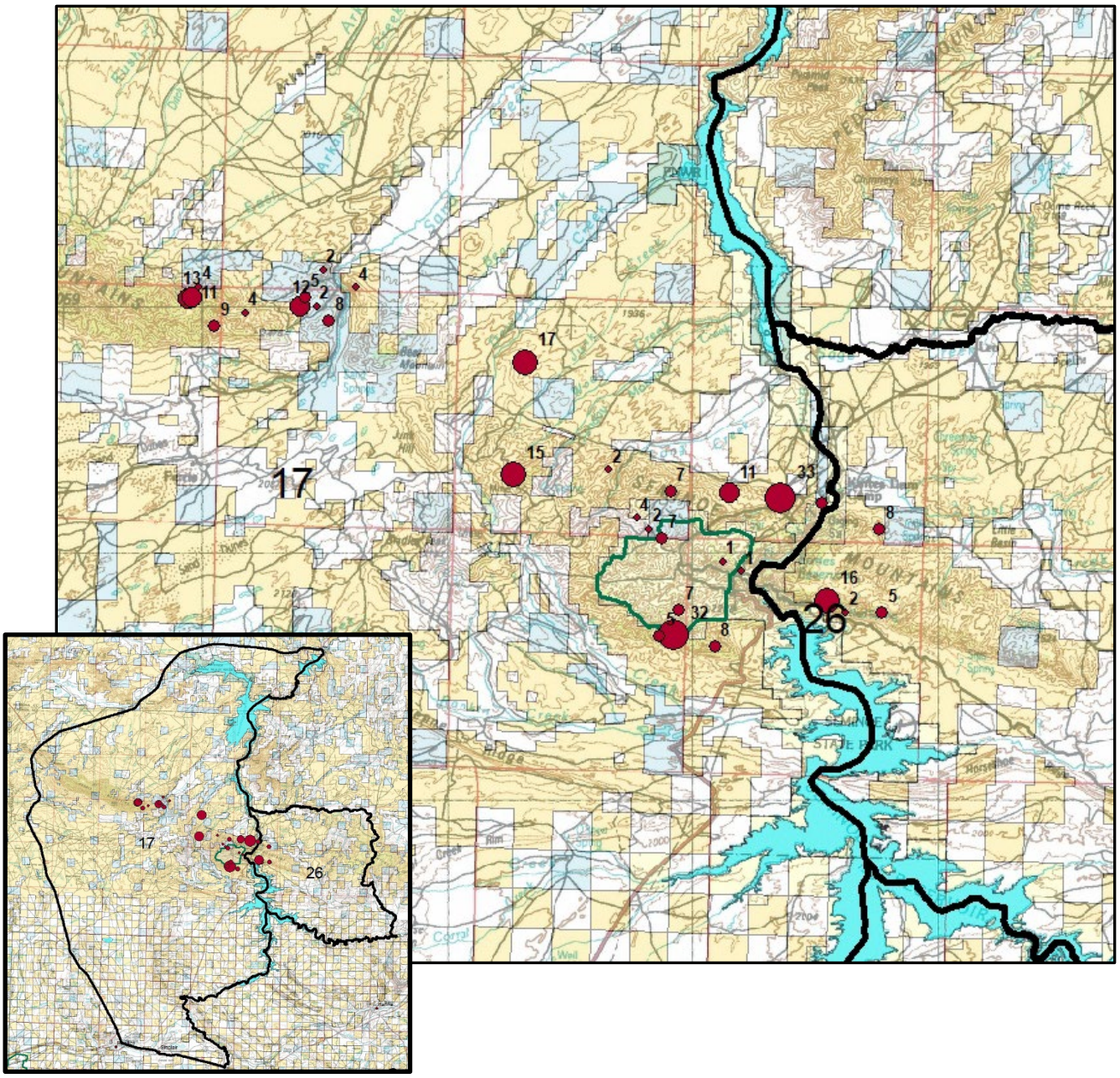


Figure 1. Locations and groups sizes of bighorn sheep found in the Ferris-Seminoe Herd during the 2021 winter trend count on 13-15 January 2022.