TABLE OF CONTENTS…… i

ACKNOWLEDGEMENTS…… ii

PRONGHORN
Red Desert (PR615) - Areas 60, 61, & 64……. 1
Iron Springs (PR630) - Areas 52, 56, & 108…… 7
Wind River (PR631) - Area 84…….. 11
Beaver Rim (PR632) - Areas 65, 66, 67, 68, 69, 74, & 106…….. 13
Badwater (PR634) - Area 75…….. 16
Project (PR635) - Areas 97 & 117……. 18
North Ferris (PR636) - Area 63……. 20
South Ferris (PR637) - Area 62……. 24

MULE DEER
Dubois (MD642) - Areas 128 & 148……... 29
Project (MD643) - Areas 157, 170, & 171…… 32
South Wind River (MD644) - Areas 92, 94, & 160…….. 35
Sweetwater (MD646) - Areas 96 & 97……. 41
Ferris (MD647) - Area 87……. 86
Beaver Rim (MD648) - Area 90……... 89
Chain Lakes (MD650) - Area 98…….. 91

ELK
Wiggins Fork (EL635) - Areas 67, 68, & 69…… 94
South Wind River (EL637) - Areas 25, 27, 28, & 99…..... 97
Green Mountain (EL638) - Areas 24 & 128……. 99
Ferris (EL639) - Areas 22 & 111…….. 101
Shamrock (EL643) - Area 118…….. 104

MOOSE
Lander (MO620) - Areas 2, 30, & 39…… 107
Dubois (MO621) - Area 6……. 109

BIGHORN SHEEP
Whiskey Mountain (BS609) - Areas 8, 9, 10, & 23…….. 112
Ferris/Seminoe (BS615) – Area 17…… 115

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.

2019 - JCR Evaluation Form

SPECIES: Pronghorn | PERIOD: 6/1/2019 - 5/31/2020

HERD: PR615 - RED DESERT

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

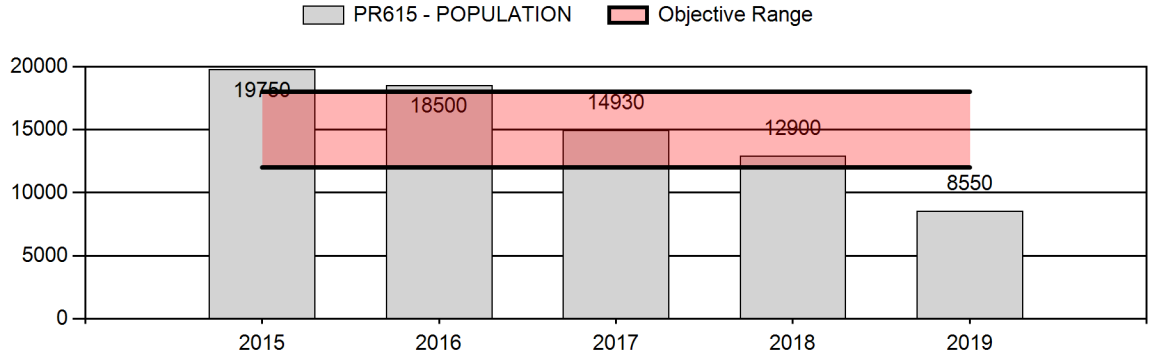
	2014 - 2018 Average	2019	2020 Proposed
Population:	15,432	8,550	7,925
Harvest:	289	202	270
Hunters:	306	257	315
Hunter Success:	94%	79%	86 %
Active Licenses:	333	257	315
Active License Success:	87%	79%	86 %
Recreation Days:	1,005	908	1,050
Days Per Animal:	3.5	4.5	3.9
Males per 100 Females	56	53	
Juveniles per 100 Females	56	49	

Population Objective (± 20%) :	15000 (12000 - 18000)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-43%
Number of years population has been + or - objective in recent trend:	2
Model Date:	03/25/2020

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:	8.5%	12.5%
Total:	2.3%	3.3%
Proposed change in post-season population:	-34%	-7%

Population Size - Postseason



2020 Hunting Seasons
Red Desert Pronghorn (PR615)

Hunt Area	Type	Archery Dates Opens	Archery Dates Closes	Season Dates Opens	Season Dates Closes	Quota	Limitations
60	1	Aug. 15	Sep. 18	Sep. 19	Oct. 31	50	Any antelope
61	1	Aug. 15	Sep. 11	Sep. 12	Oct. 31	150	Any antelope
64	1	Aug. 15	Sep. 18	Sep. 19	Oct. 31	150	Any antelope

2019 Hunter Satisfaction: 82% Satisfied, 9% Neutral, 9% Dissatisfied

2020 Management Summary

1.) Hunting Season Evaluation: The current population model for the Red Desert herd indicates this population has dropped roughly 40% below objective range over the past two years. This model is a truncated version of previous models, initiating in 2008 rather than 1993. Removal of 15 years of historic herd data allows the current model to closely align with the three most 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, particularly the most recent in 2017, increases confidence in the model's predictions. This herd experienced above normal severity in two of the three most recent winters, causing significant mortality that was noted by both field personnel and hunters. These losses, compounded with near-record low fawn crops in 2018 (41:100) and 2019 (49:100) have caused this population to sharply decline. A line transect survey of this herd scheduled for spring of 2020 should help quantify losses during the past two winters and further align the model with independent estimates of herd size.

Concurrent with the decline in herd size and fawn production, the buck:doe ratio dropped from 64:100 in 2017 to 53:100 in 2019, well below the special management minimum. "Special management" criteria are standardized across the state and require a minimum buck:doe ratio of 60:100 for pronghorn herds. This criterion is intended to provide an increased proportion of bucks in the herd and improved buck quality. In response to these changes, doe harvest was eliminated in 2019 and buck harvest greatly reduced in the eastern portion of the herd. The quota for Type 1 licenses in hunt area 60 was not reduced in 2019, but the preseason buck:doe ratio in that area dropped from 79:100 in 2018 to only 45:100 in 2019. Not surprisingly, hunter success in hunt area 60 dropped to a dismal 77% in 2019, and hunter satisfaction dropped to 68%, with 21% dissatisfied. Quota for that area was reduced from 75 to 50 licenses in response.

In area 61, the preseason buck:doe ratio was 55:100 in 2019 and below the special management minimum for the sixth consecutive year. Hunter success for this area was only 82%, a further drop from the 86% seen in 2018. Despite the poor hunter success, hunter satisfaction remained high at 96%. 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, however the license quota for this area was raised from 50 to 150 during review by the Commission.

Hunter satisfaction in this herd decreased in 2019 to its lowest level since these data were first collected in 2009 (Figure 1). Both general dissatisfaction and strong dissatisfaction were record highs. Only 82 percent of hunters were satisfied with the quality of their hunt experiences in this special management herd, with a near-record low of 45 percent strongly satisfied. Nearly all dissatisfaction came from area 60 hunters.

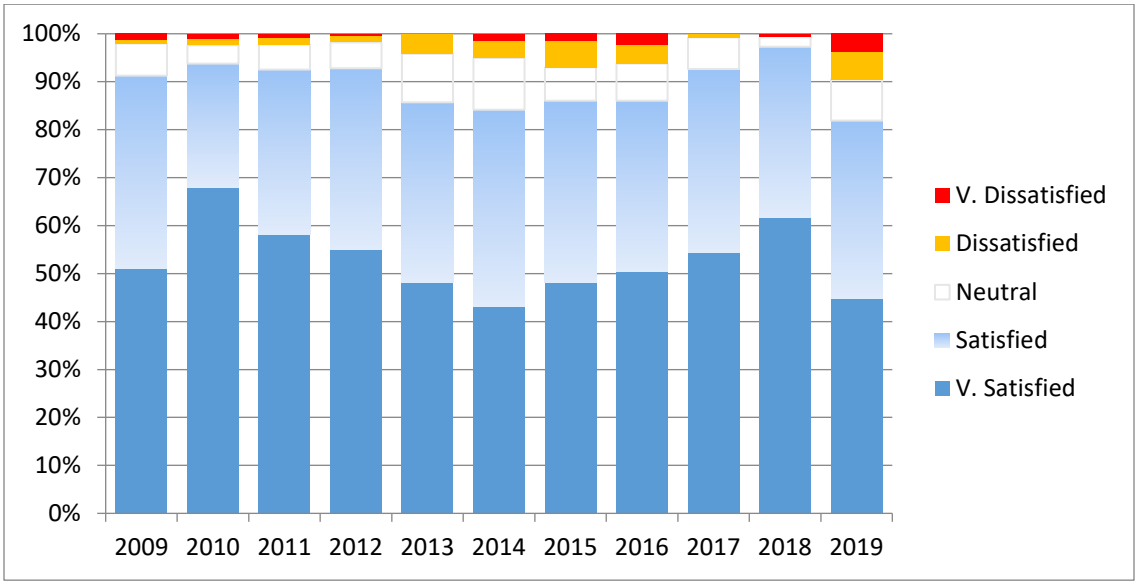


Figure 1. Hunter satisfaction and dissatisfaction for the Red Desert Pronghorn Herd.

Department and University personnel checked and measured horn length of 14 percent of the bucks harvested from this herd in 2019, above the statewide average of 8 percent. The largest buck in the sample was 15.55 inches long, the 17th longest buck in the state and it was aged at 13 years by tooth annuli, the oldest buck in the 2019 statewide harvest checks. Average horn length from this herd was 13.5 inches, more than an inch greater than the statewide average of 12.3 inches. Overall, hunters in the Red Desert herd in 2019 enjoyed a supply of bucks with greater horn length than the rest of the state (Figure 2). Most of these longer horns were in the 12-14" range, with few above 15". The herd had 34 percent of the bucks at 14 inches or longer, compared to a statewide average of 12 percent in this size.

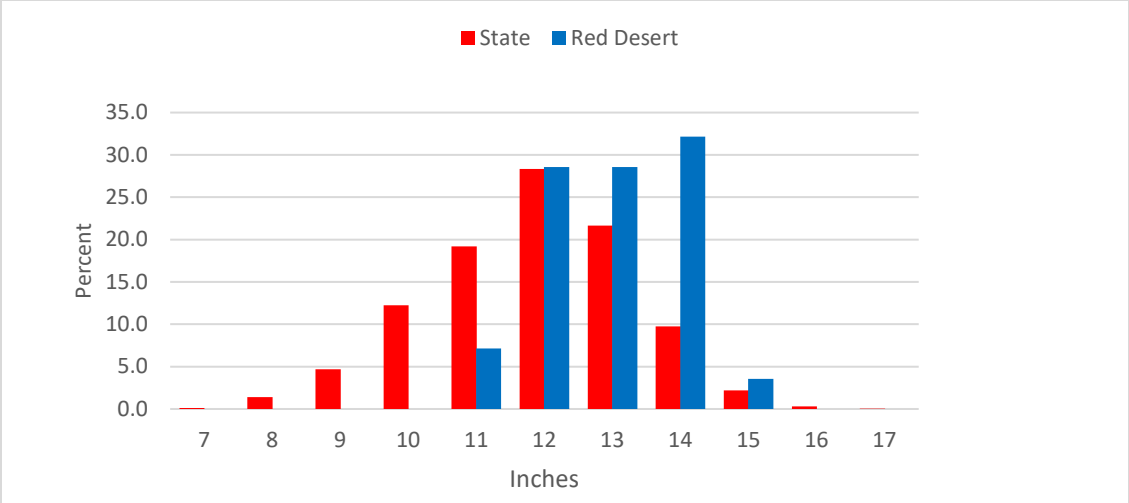


Figure 2. Percentages by horn length of pronghorn bucks checked from the Red Desert herd unit compared to statewide, 2019.

The proportion of bucks >15" declined in 2019 compared to 2018, replaced with an increase in horns in the 12" range (Figure 3). Field check data show a slight increase in 3+-aged bucks in the harvest from 89 percent in 2018 to 92 percent in 2019, so the decline in horn length is attributed to reduced horn growth due to physiological stress during the tough 2018-19 winter, rather than a decline in the proportion of mature bucks.

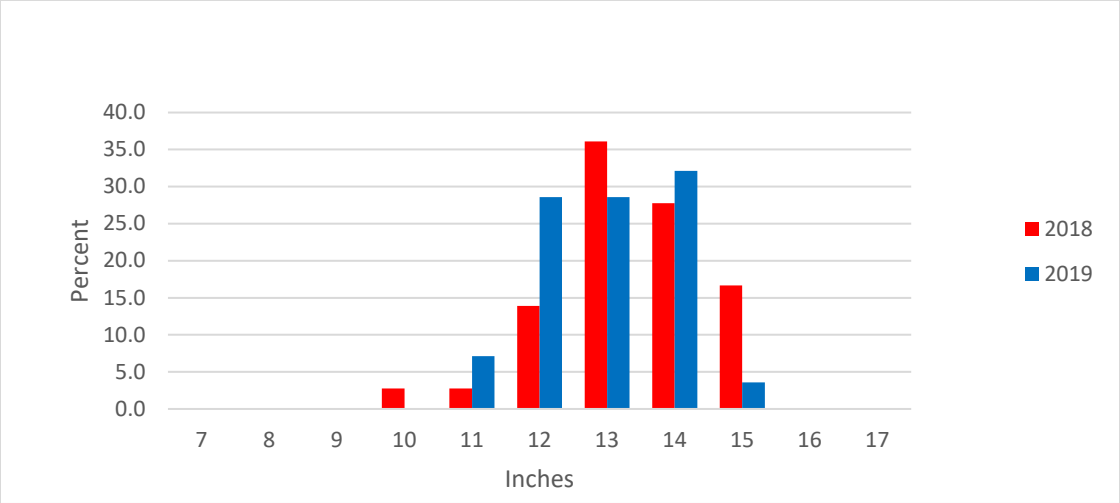


Figure 3. Percentages by horn length of pronghorn bucks checked from the Red Desert herd unit in 2018 and 2019.

Losses during the 2019-20 winter, which had less snowfall but severe cold that extended from late October through February, are again expected to be above average. Twenty-seven pronghorn mortalities related to winter stress were examined and documented in this herd, excluding road kills and fence kills (Table 1).

Sex	No.	f	1	2	3	4+
m	13	1		1		11
f	14	3	2		3	6
?	0					
Total	27	4	2	1	3	17
% Adults	100		9	4	13	74
Percent	100	15	7	4	11	63

Table 1. Age and sex of winter mortalities documented in the Red Desert Pronghorn herd during the 2019-20 winter.

Age and sex composition of mortalities can give an indication of winter severity. Typically the first animals to be lost in winter are those with the least fat reserves; the young of the year and older age classes. As winter severity increases, increasing numbers of the more vigorous 1-, 2- and 3-year olds will be lost. The number of fawns found in post-winter mortality surveys will depend on the number of fawns in the population prior to winter, but looking at the distribution of adult age classes allows for comparison of winter severity (Figure 4).

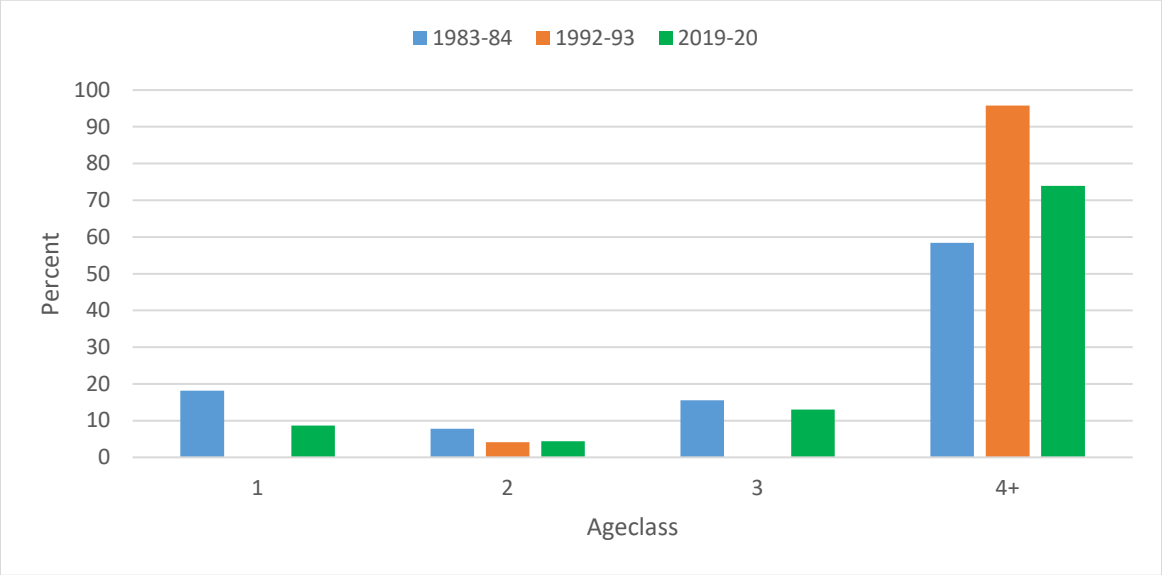


Figure 4. Age structure of adult pronghorn winter mortalities in the Red Desert herd in the 1983-84, 1992-93 and 2019-20 winters.

The winter of 1983-84 was the harshest in recent memory, and estimates of losses to pronghorn herds in the south-central portion of the state ranged from 50-80 percent. Mortality surveys found significant numbers in the 1-, 2- and 3-year age classes. The 1992-93 winter was less significant, but again had a late October snowfall that crusted over and lasted well into March. Fewer mortalities were found, and most were fawns or old, mature animals. Herd losses were probably less than half those of the 1983-84 winter. Age class distribution of winter losses during the 2019-20 winter fall between the 1983-84 and 1992-93 winters, and severity would be expected to also be mid-range.

2.) Management Objective Review: The postseason population objective for this herd was reviewed and left unchanged in 2015 following a public meeting in Rawlins and adoption by the Wyoming Game and Fish Commission. Population, weather, and habitat conditions were reviewed again for this herd in February 2020. After internal review, managers determined the current objective of 15,000 pronghorn is still reasonable for this herd, given access and habitat conditions. Herd size initially remained within objective range, but dropped below beginning in 2017. Fluctuations in survival and fawn production have been in response to changes in weather extremes rather than habitat limitations. The Department has not had any damage complaints over the past five years and comments from the public indicate many would like to see more pronghorn in the herd. This herd is currently included in a long-term research project evaluating harvest rates and horn growth, and changing management objective at this time could negatively affect that project. As a result of this assessment, managers recommend the herd be retained in special management with a population objective of 15,000.

2019 - JCR Evaluation Form

SPECIES: Pronghorn | PERIOD: 6/1/2019 - 5/31/2020

HERD: PR630 - IRON SPRINGS

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

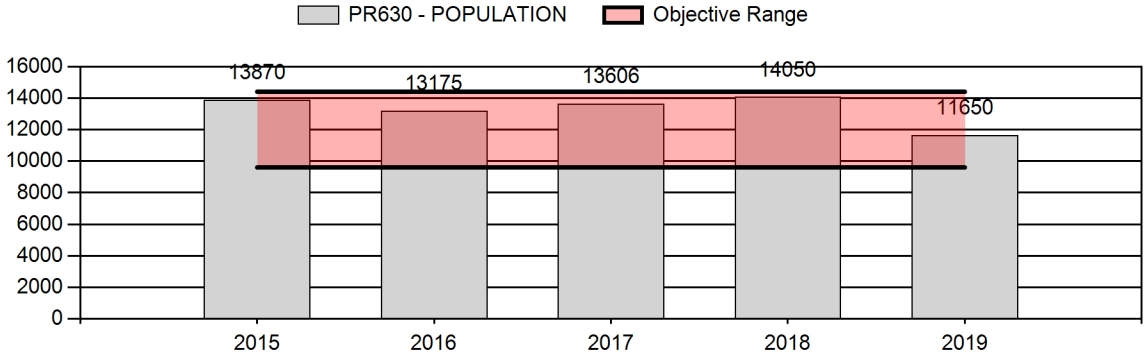
	2014 - 2018 Average	2019	2020 Proposed
Population:	13,280	11,650	11,200
Harvest:	658	926	800
Hunters:	631	936	920
Hunter Success:	104%	99%	87%
Active Licenses:	760	1,066	920
Active License Success:	87%	87%	87%
Recreation Days:	2,199	3,099	2,775
Days Per Animal:	3.3	3.3	3.5
Males per 100 Females	53	48	
Juveniles per 100 Females	53	35	

Population Objective (± 20%) :	12000 (9600 - 14400)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-2.9%
Number of years population has been + or - objective in recent trend:	0
Model Date:	03/11/2020

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

	JCR Year	Proposed
Females ≥ 1 year old:	6.7%	5.8%
Males ≥ 1 year old:	14.1%	13.5%
Total:	7.3%	6.6%
Proposed change in post-season population:	-10.5%	-3.6%

Population Size - Postseason



2020 Hunting Seasons
Iron Springs Pronghorn (PR630)

Hunt Area	Type	Archery Dates Opens	Archery Dates Closes	Season Dates Opens	Season Dates Closes	Quota	Limitations
52	1	Aug. 15	Sep. 15	Sep. 16	Oct. 31	250	Any antelope
52	2	Aug. 15	Sep. 15	Sep. 16	Nov. 14	200	Any antelope valid south of North Spring Creek
52	6	Aug. 15	Sep. 15	Sep. 16	Oct. 31	200	Doe or fawn
52	7	Aug. 15	Sep. 15	Sep. 16	Nov. 14	200	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	6	Aug. 15	Sep. 19	Sep. 20	Oct. 31	50	Doe or fawn
108	7	Aug. 15	Sep. 19	Sep. 20	Nov. 30	50	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)

2019 Hunter Satisfaction: 93% Satisfied, 5% Neutral, 2% Dissatisfied

2020 Management Summary

1.) Hunting Season Evaluation: Both the herd model and a line transect survey flown in June 2018 indicate the harvest strategy employed over recent years has successfully maintained this herd within objective range. However, the current model does not include increased losses during the 2018-19 winter and may be overestimating current herd size. Winter conditions for Area 52 in the Platte Valley do not appear to have been severe that winter, but were clearly severe in the northern portion of the herd in Areas 56 and 108. Fawn production dropped to a record low of 35:100 in 2019, presumably a response to winter stresses on does and cold precipitation during the fawning period. The 2019-20 winter has again been severe in the northern portion of the herd but less harsh in Area 52. As a result, license quotas are unchanged for Area 52, but reduced for Area 108 where fawn production was only 21:100 in 2019 and the buck:doe ratio was only 34:100. Because of limited access, Area 56 offers minimal opportunity for hunters and the quota for that area is unchanged.

Hunter satisfaction in this herd increased in 2019 (Figure 1), to the second highest level since these data were first collected in 2009. More than 92 percent of hunters were satisfied with the quality of

their hunt experiences, with less than three percent dissatisfied.

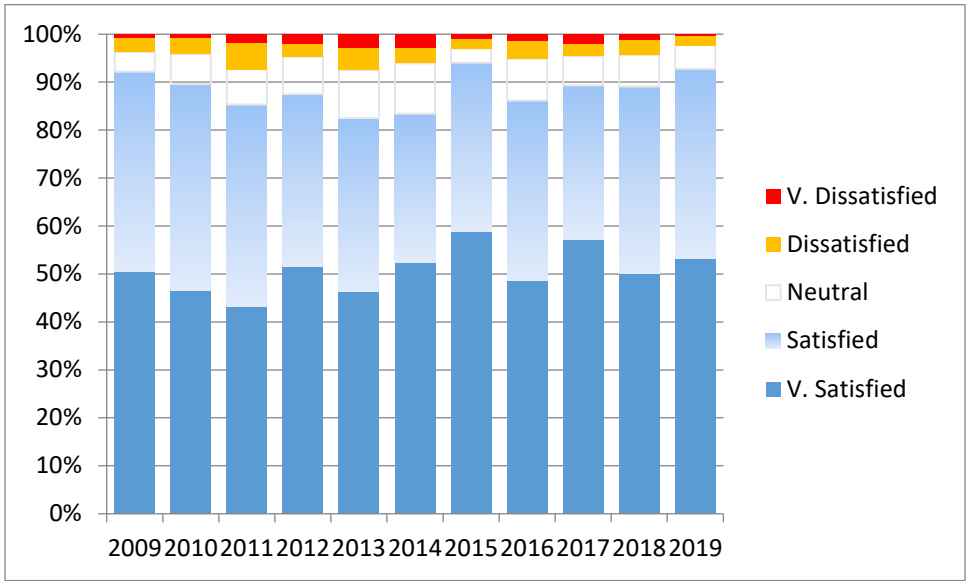


Figure 1. Hunter satisfaction and dissatisfaction for the Iron Springs Pronghorn Herd.

Department and University personnel checked and measured horn length of 10 percent of the bucks harvested from this herd in 2019. Area 52 produced the largest buck in the sample at 15.86 inches, compared to 14.4 inches from Area 108 and 12.5 inches from Area 56. The 15.86 inch buck from Area 52 was the ninth longest buck checked in the entire state. Average length of horns of bucks checked from Areas 52 and 108 were slightly above the statewide average, while the average for Area 56 was a half-inch shorter than the statewide average. Overall, hunters in the Iron Springs Herd in 2019 enjoyed a supply of bucks with horns slightly longer than the rest of the state (Figure 2), but most of these longer horns were in the 12-13" range, with the herd having the same proportion of ≥14" horns as the statewide sample.

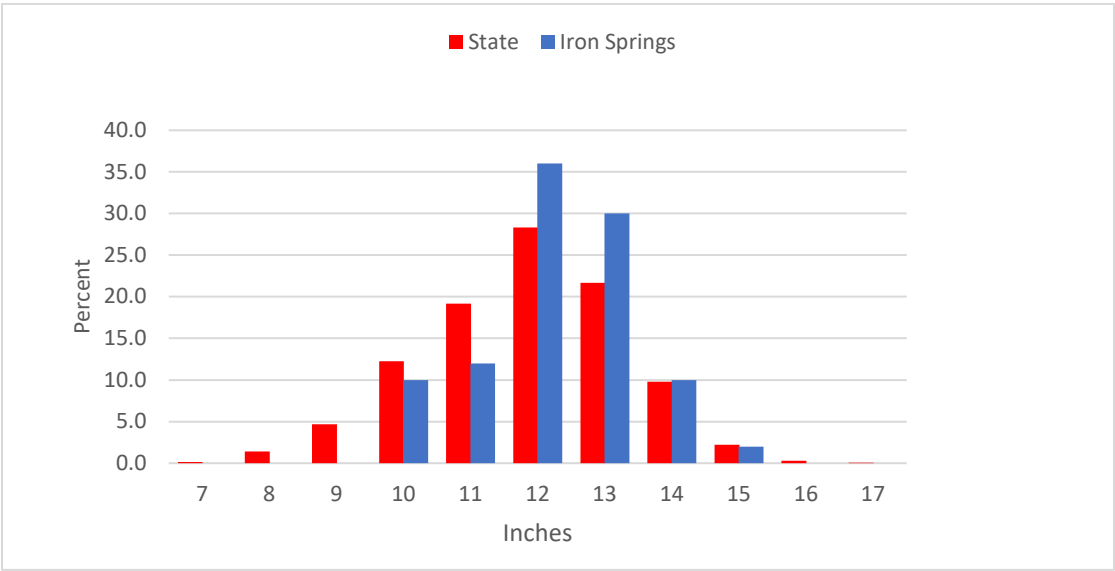


Figure 2. Percentages by horn length of pronghorn bucks checked from the Iron Springs herd unit compared to statewide, 2019.

The proportion of bucks >14" declined in 2019 compared to 2018, replaced with increases in horns in the 12-13" range (Figure 3). Field check data show a slight increase in 3+-aged bucks in the harvest in 2019, so the decline in horn length is attributed to reduced horn growth due to physiological stress in the tough 2018-19 winter, rather than a decline in the proportion of mature bucks.

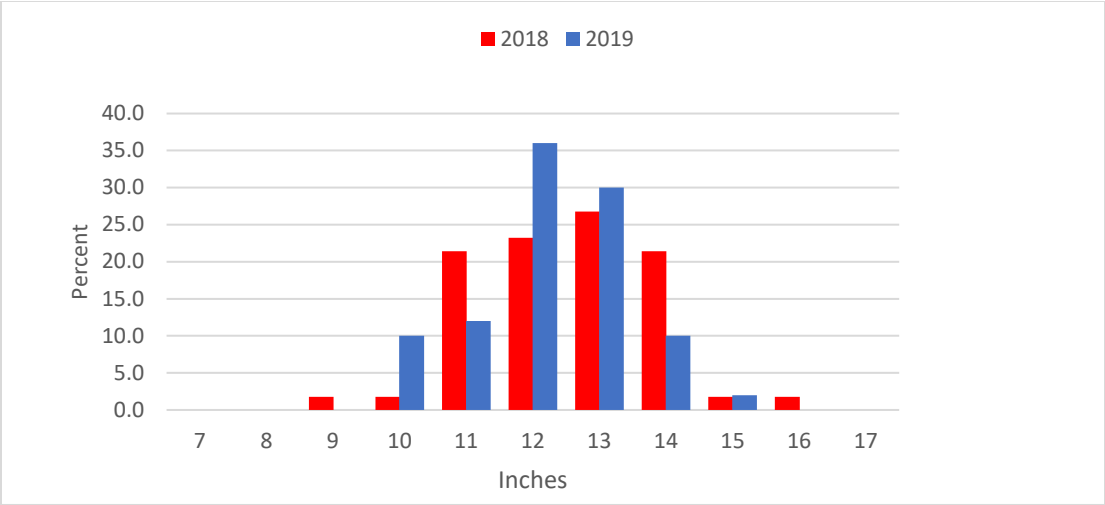


Figure 3. Percentages by horn length of pronghorn bucks checked from the Iron Springs herd unit in 2018 and 2019.

2.) Management Objective Review: The postseason population objective for this herd was reviewed and left unchanged in 2015 following a public meeting in Rawlins and adoption by the Wyoming Game and Fish Commission. Herd size has largely remained within the objective range for the following five years. Population, weather, and habitat conditions were reviewed for this herd in February, 2020. After internal review, managers determined the current objective of 12,000 pronghorn is still reasonable for this herd, given access and habitat conditions. Fluctuations in fawn production and survival have been attributed to changes in weather extremes rather than habitat limitations. In most years, use of restricted area doe/fawn harvest has been effective in addressing landowner concerns on private lands and croplands. As a result of this assessment and the effectiveness of additional license types at addressing private land damage issues, managers did not propose any changes to the existing objective in 2020.

2019 - JCR Evaluation Form

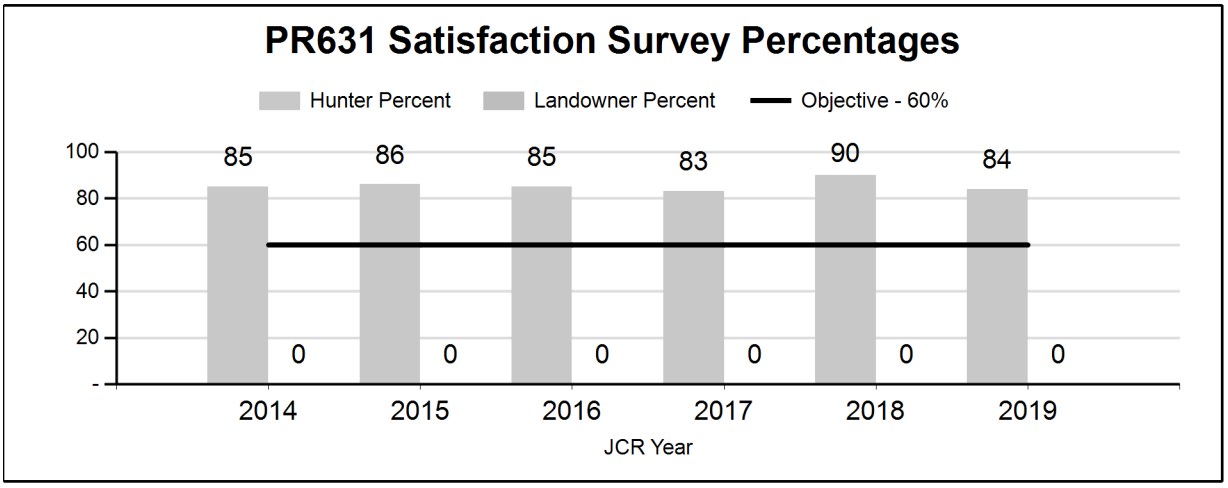
SPECIES: Pronghorn
HERD: PR631 - WIND RIVER
HUNT AREAS: 84

PERIOD: 6/1/2019 - 5/31/2020

PREPARED BY: GREG ANDERSON

	2014 - 2018 Average	2019	2020 Proposed
Hunter Satisfaction Percent	86%	84%	85%
Landowner Satisfaction Percent	0%	0%	0%
Harvest:	116	111	110
Hunters:	122	136	135
Hunter Success:	95%	82%	81%
Active Licenses:	151	162	165
Active License Success:	77%	69%	67%
Recreation Days:	635	773	775
Days Per Animal:	5.5	7.0	7.0
Males per 100 Females:	30	26	
Juveniles per 100 Females	38	46	

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:	10



2020 Hunting Seasons
Wind River Antelope (PR631)

Hunt Area	Type	Archery Dates Opens	Archery Dates Closes	Season Dates Opens	Season Dates Closes	Quota	Limitations
84	1	Aug. 15	Sep. 18	Sep. 19	Oct. 31	100	Any antelope
84	6	Aug. 15	Sep. 18	Sep. 19	Oct. 31	75	Doe or fawn

2019 Hunter Satisfaction: 84% Satisfied, 12% Neutral, 4% Dissatisfied

2020 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 90% and most recently 84% in 2019. Given no obvious trends up or down in hunter success, relatively stable hunter satisfaction, and no damage complaints from landowners license quotas for 2020 will remain unchanged to provide the same amount of opportunity as the last five years. The season closing date will be extended from October 22 to October 31 to provide more hunting opportunity, align with surrounding hunt areas, and to address requests from the public and an outfitter over the past few years.

2019 - JCR Evaluation Form

SPECIES: Pronghorn | PERIOD: 6/1/2019 - 5/31/2020

HERD: PR632 - BEAVER RIM

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

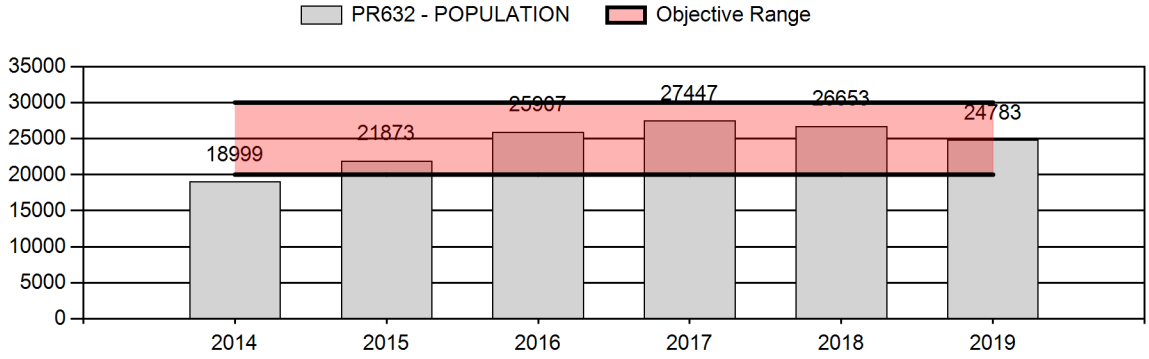
	2014 - 2018 Average	2019	2020 Proposed
Population:	24,176	24,783	25,631
Harvest:	1,349	2,214	2,070
Hunters:	1,404	2,283	2,300
Hunter Success:	96%	97%	90 %
Active Licenses:	1,557	2,581	2,575
Active License Success:	87%	86%	80 %
Recreation Days:	4,461	6,980	7,000
Days Per Animal:	3.3	3.2	3.4
Males per 100 Females	60	50	
Juveniles per 100 Females	64	47	

Population Objective (± 20%) :	25000 (20000 - 30000)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-0.9%
Number of years population has been + or - objective in recent trend:	0
Model Date:	3/10/2020

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

	JCR Year	Proposed
Females ≥ 1 year old:	6.5%	6.1%
Males ≥ 1 year old:	20.7%	21.1%
Total:	8.1%	7.4%
Proposed change in post-season population:	-7.9%	+3.4%

Population Size - Postseason



2020 Hunting Seasons

Beaver Rim Pronghorn (PR632)

Hunt Area	Hunt Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
65	1	Aug. 15	Sept. 18	Sept. 19	Oct. 31	150	Any antelope
65	6	Aug. 15	Sept. 18	Sept. 19	Oct. 31	150	Doe or fawn
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. 18	Sept. 19	Oct. 31	150	Any antelope
66	6	Aug. 15	Sept. 18	Sept. 19	Oct. 31	100	Doe or fawn
67	1	Aug. 15	Sept. 18	Sept. 19	Oct. 31	275	Any antelope
68	1	Aug. 15	Sept. 18	Sept. 19	Oct. 31	500	Any antelope
68	6	Aug. 15	Sept. 18	Sept. 19	Oct. 31	150	Doe or fawn
69	1	Aug. 15	Sept. 14	Sept. 15	Oct. 31	200	Any antelope
69	6	Aug. 15	Sept. 14	Sept. 15	Oct. 31	200	Doe or fawn
74	1	Aug. 15	Sept. 18	Sept. 19	Oct. 31	250	Any antelope
106	1	Aug. 15	Sept. 18	Sept. 19	Oct. 31	200	Any antelope
106	6	Aug. 15	Sept. 18	Sept. 19	Oct. 31	150	Doe or fawn

2019 Hunter Satisfaction: 89.8% Satisfied, 6.9% Neutral, 3.3% Dissatisfied

2020 Management Summary

1.) Hunting Season Evaluation: As a result of increased female harvest in 2019, as well as reduced fawn survival and yearling recruitment, this population declined about 8% from 2018 to 2019. The current population estimate of just under 25,000 pronghorn is at objective. Total harvest in 2019 was 2,214 pronghorn. Pre-season classification data indicates the fawn/doe ratio decreased to 47J/100F and the total buck/doe ratio dropped to 50M/100F in 2019. The 2020 hunting seasons are designed to maximize opportunity for both male and female pronghorn, while maintaining the population at objective and to move buck/doe ratios as close to the special management criteria as possible. Some hunt areas have experienced more severe winter conditions than others, with observed fawn abandonment and significant mortality in areas 67 and 74. Therefore for 2020, doe/fawn license numbers have been reduced or eliminated in several hunt areas to address these losses and concerns. Reductions have also been made to the number of Type 1 licenses in several areas in response to declines in buck/doe ratios, especially where yearling buck/doe ratios dipped into single digits. Hunt Area 68 is part of a University of Wyoming research project comparing how buck pronghorn ages and horn sizes are correlated. Buck/doe ratios remained good in Area 68, allowing a 25% increase in Type 1 licenses as a "treatment" for this study to determine if increasing buck harvest has any impact on age and horn size. Area 106 will have no changes in license numbers as a "control" for this study. The season closing date will be extended from October 22 to October 31 to provide more hunting opportunity, to align with surrounding hunt areas, and to address requests from the public and an outfitter over the past few years. All 2020 hunting season changes and expected productivity should allow this population to grow slightly in the next year to about 25,600 pronghorn.

2.) Management Objective Review: Managers reviewed the management objective for Beaver Rim pronghorn (PR632) in 2020, and considered population trend, model alignment with past line-transect (LT) surveys, weather data, and habitat data. The management objective has been 25,000 pronghorn since the formation of the current herd unit in the early 1990s. The population has fluctuated around the objective and remained within the 20% "buffer" since 2002. Population models have aligned well with end-of-year population estimates derived from 7 of the last 8 LT surveys. Another LT is planned for the end of the current biological year to be conducted in May or June 2020. With a well-functioning model and our ability to manage within the parameters of the current management objective, we are not recommending a change in 2020.

2019 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2019 - 5/31/2020

HERD: PR634 - BADWATER

HUNT AREAS: 75

PREPARED BY: GREG ANDERSON

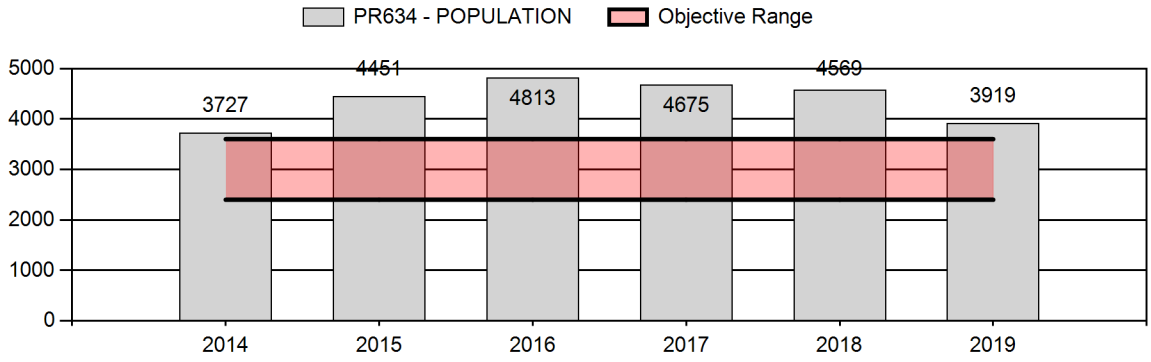
	2014 - 2018 Average	2019	2020 Proposed
Population:	4,447	3,919	4,014
Harvest:	534	914	905
Hunters:	551	966	970
Hunter Success:	97%	95%	93%
Active Licenses:	595	1,035	1,050
Active License Success:	90%	88%	86%
Recreation Days:	1,506	2,887	2,890
Days Per Animal:	2.8	3.2	3.2
Males per 100 Females	69	59	
Juveniles per 100 Females	74	51	

Population Objective (± 20%) :	3000 (2400 - 3600)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	31%
Number of years population has been + or - objective in recent trend:	6
Model Date:	2/7/2020

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

	JCR Year	Proposed
Females ≥ 1 year old:	17%	15%
Males ≥ 1 year old:	46%	48%
Total:	18%	18%
Proposed change in post-season population:	-16%	+2%

Population Size - Postseason



2020 Hunting Seasons
Badwater Antelope (PR634)

Hunt Area	Type	Archery Dates Opens	Archery Dates Closes	Season Dates Opens	Season Dates Closes	Quota	Limitations
75	1	Aug. 15	Sep. 18	Sep. 19	Oct. 31	525	Any antelope
75	6	Aug. 15	Sep. 18	Sep. 19	Oct. 31	350	Doe or fawn

2019 Hunter Satisfaction: 90% Satisfied, 6% Neutral, 4% Dissatisfied

2020 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 prior to 2019. To manage the population toward the objective of 3,000 antelope, license numbers in area 75 increased each of the last 6 years. The population model for the herd indicates the 2019 harvest combined with below average recruitment decreased the population 16% to approximately 3,900 antelope. In addition, the buck/doe ratio declined 65/100 in 2018 to 59/100 in 2019. Although the population remains above objective at close to 4,000 antelope, the 2020 season is designed to keep antelope numbers unchanged in 2020. Beginning in 2019, area 75 was included in a Department sponsored study to examine the effects on harvest on buck quality in antelope populations. Area 75 was designated a 'control' area for the study with the intent of trying to maintain a stable population and buck/doe ratio for the duration of the study through 2022. The intent is to compare buck quality and age structure to area 73 where harvest pressure on bucks will be increased. In response, license numbers will be decreased for the 2020 season in area 75. Given average recruitment, 2020 harvest should maintain the antelope population at 4,000. The season closing date will be extended from October 22 to October 31 to provide more hunting opportunity, align with surrounding hunt areas, and to address requests from the public and an outfitter over the past few years.

2019 - JCR Evaluation Form

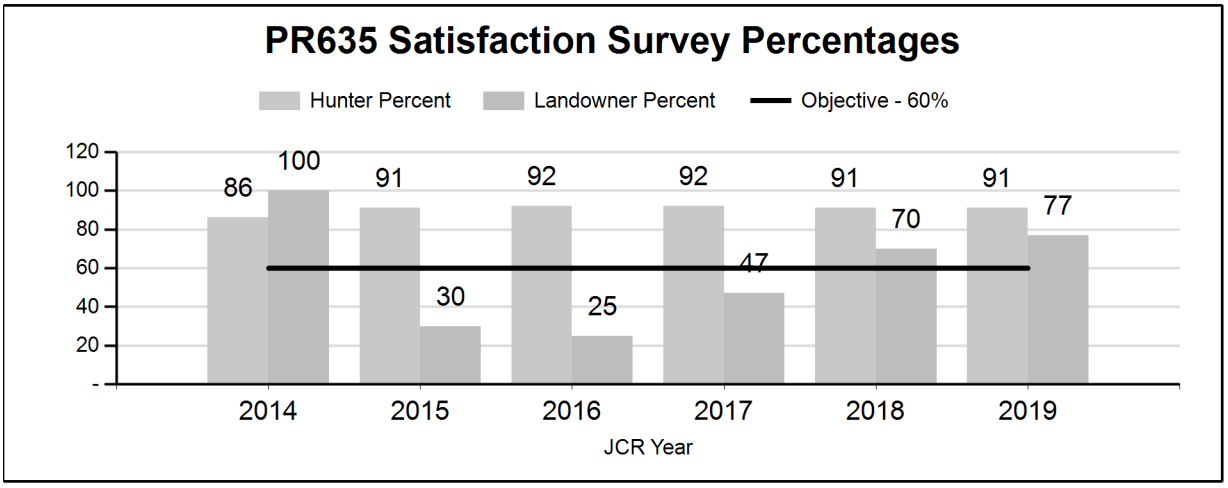
SPECIES: Pronghorn
HERD: PR635 - PROJECT
HUNT AREAS: 97, 117

PERIOD: 6/1/2019 - 5/31/2020

PREPARED BY: GREG ANDERSON

	2014 - 2018 Average	2019	2020 Proposed
Hunter Satisfaction Percent	90%	91%	90%
Landowner Satisfaction Percent	47%	77%	60%
Harvest:	458	548	450
Hunters:	424	558	400
Hunter Success:	108%	98%	112 %
Active Licenses:	507	664	575
Active License Success:	90%	83%	78 %
Recreation Days:	1,597	2,022	1,800
Days Per Animal:	3.5	3.7	4
Males per 100 Females:	46	33	
Juveniles per 100 Females	58	38	

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:	1



2020 Hunting Seasons
Project Antelope (PR635)

Hunt Area	Type	Archery Dates Opens	Archery Dates Closes	Season Dates Opens	Season Dates Closes	Quota	Limitations
97, 117	1	Aug. 15	Sep. 18	Sep. 19	Oct. 31	275	Any antelope
97, 117	2			Aug. 15	Oct. 31	50	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. 18	Sep. 19	Oct. 31	150	Doe or fawn
97, 117	7			Aug. 15	Oct. 31	150	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

2019 Hunter Satisfaction: 91% Satisfied, 7% Neutral, 2% Dissatisfied
2019 Landowner Satisfaction: 77% Good # of Ant, 23% Too many Ant, 0% Too few Ant

2020 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. In 2014 only four landowners responded to the Department survey. Personnel began making individual contacts in 2015. At that time, only 30% of landowners were satisfied with antelope numbers. Most felt there were too many antelope. Landowner satisfaction declined further in 2016 when 75% of landowners contacted felt there were too many antelope. In response, license numbers were increased in both 2017 and 2018. With increased harvest antelope numbers declined and landowner satisfaction increased steadily from 2016 through 2019 when 77% of landowners indicated they were satisfied with antelope numbers. In 2019 personnel also counted significantly fewer antelope along designated classification routes. During the same time period hunter satisfaction remained unchanged at approximately 90%. Given the high level of hunter and landowner satisfaction and an apparent recent decline in antelope numbers, Type 1 and Type 6 licenses will be decreased in 2020 to scale back harvest and help prevent further population decline. The Type 2 and Type 7 license quotas will remain unchanged to deal with localized damage problems. The season closing date will be extended from October 22 to October 31 to provide more hunting opportunity, align with surrounding hunt areas, and to address requests from the public and an outfitter over the past few years.

2019 - JCR Evaluation Form

SPECIES: Pronghorn | PERIOD: 6/1/2019 - 5/31/2020

HERD: PR636 - NORTH FERRIS

HUNT AREAS: 63 | PREPARED BY: GREG HIATT

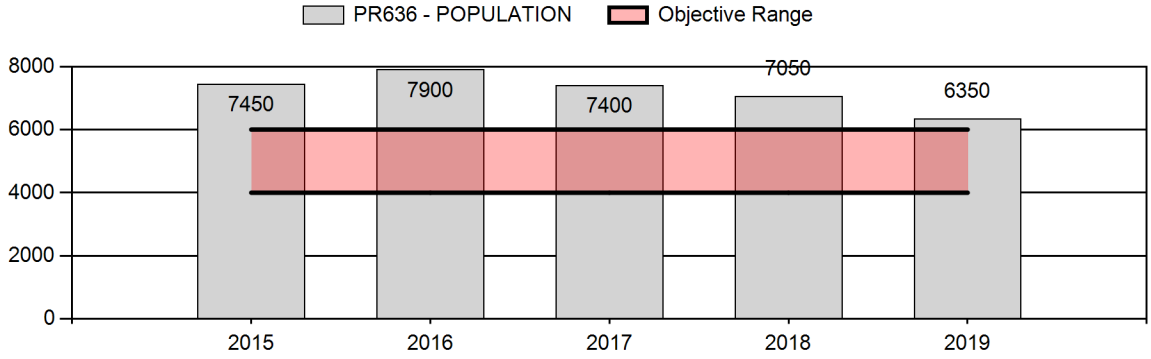
	2014 - 2018 Average	2019	2020 Proposed
Population:	5,770	6,350	5,600
Harvest:	416	657	710
Hunters:	448	741	845
Hunter Success:	93%	89%	84 %
Active Licenses:	493	792	845
Active License Success:	84%	83%	84 %
Recreation Days:	1,255	1,792	2,200
Days Per Animal:	3.0	2.7	3.1
Males per 100 Females	65	63	
Juveniles per 100 Females	75	59	

Population Objective (± 20%) :	5000 (4000 - 6000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	27%
Number of years population has been + or - objective in recent trend:	6
Model Date:	03/09/2020

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

	JCR Year	Proposed
Females ≥ 1 year old:	9.1%	10.3%
Males ≥ 1 year old:	20.1%	24.6%
Total:	9.3%	11.1%
Proposed change in post-season population:	-10.2%	-11.6%

Population Size - Postseason



2020 Hunting Seasons
North Ferris Pronghorn (PR636)

Hunt Area	Type	Archery Dates Opens	Archery Dates Closes	Season Dates Opens	Season Dates Closes	Quota	Limitations
63	1	Aug. 15	Sep. 18	Sep. 19	Oct. 31	200	Any antelope
63	2	Aug. 15	Sep. 18	Sep. 19	Oct. 31	350	Any antelope valid east of the Buzzard Road (Natrona County Road 410-Carbon County Road 497)
63	6	Aug. 15	Sep. 18	Sep. 19	Oct. 31	150	Doe or fawn
63	7	Aug. 15	Sep. 18	Sep. 19	Oct. 31	250	Doe or fawn valid east of the Buzzard Road (Natrona County Road 410-Carbon County Road 497)

2019 Hunter Satisfaction: 92% Satisfied, 7% Neutral, 1% Dissatisfied

2020 Management Summary

1.) Hunting Season Evaluation: Both the herd model and a line transect survey flown in June 2019 indicate the harvest strategy employed over recent years has successfully reduced this herd from more than 50 percent above objective in 2016 to roughly 27 percent above objective in 2019. Fawn production has remained near normal levels, and winter severity has been much less than seen in herds to the south. Recent harvest quotas have reduced the buck:doe ratio from 72:100 in 2017 to 63:100 in 2019. Continuation of this harvest strategy in 2020 should bring herd size within objective range and return buck:doe ratios within recreational range. The only changes in hunting seasons are shifts in the opening dates to retain a Saturday opener and align with neighboring areas in the Lander Region.

Hunter satisfaction in this herd decreased slightly in 2019 (Figure 1), but still exceeded 90 percent. Less than 1 percent of the responding hunters were dissatisfied.

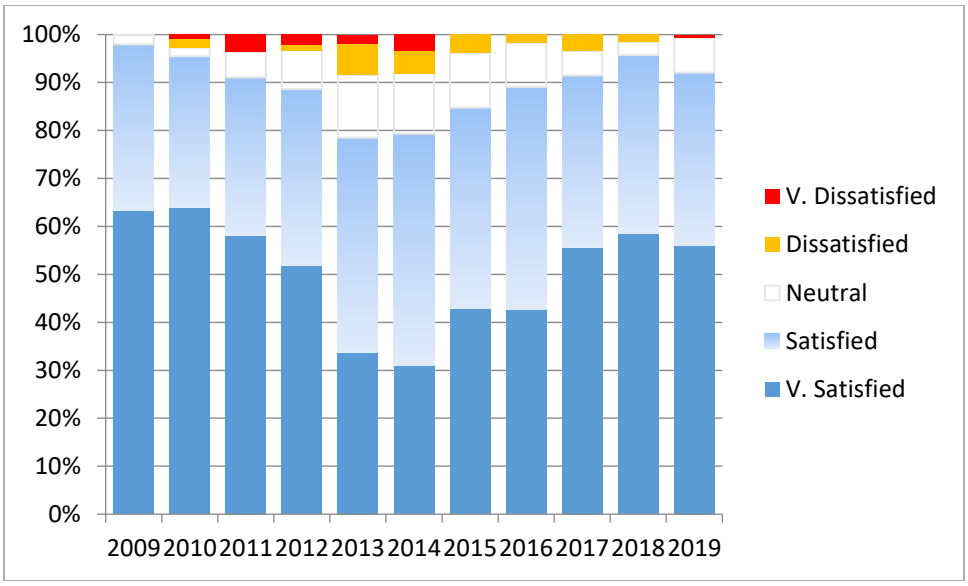


Figure 1. Hunter satisfaction and dissatisfaction for the North Ferris Pronghorn Herd.

Department and University personnel checked and measured horn length of more than 23 percent of the bucks harvested from this herd in 2019, nearly three times the statewide average of 8 percent. The largest buck in the sample was 16.8 inches long, the second largest in the state. Average horn length from this herd, however, was only 12.5 inches, only slightly better than the statewide average of 12.3 inches. Overall, hunters in the South Ferris Herd in 2019 enjoyed a supply of bucks with horn that were slightly longer than the rest of the state (Figure 2), but most of these longer horns were in the 12" range. Only 12 percent of the bucks were ≥14", matching the statewide average.

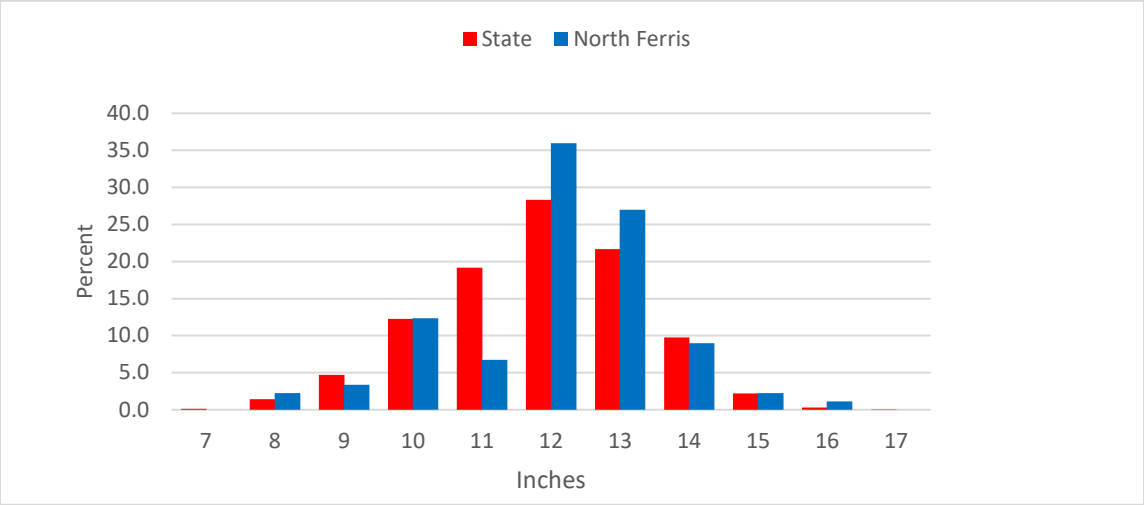


Figure 2. Percentages by horn length of pronghorn bucks checked from the North Ferris herd unit compared to statewide, 2019.

The proportion of bucks in the 3+ ageclass improved to 84 percent in 2019 compared to 77 percent in 2018 and the proportion of longer bucks also increased (Figure 3). This herd did not experience

the severe conditions and deep snowfall during the 2018-19 winter that was seen in the herds to the south, and presumably did not also see the stunting of horn growth due to physiological stresses.

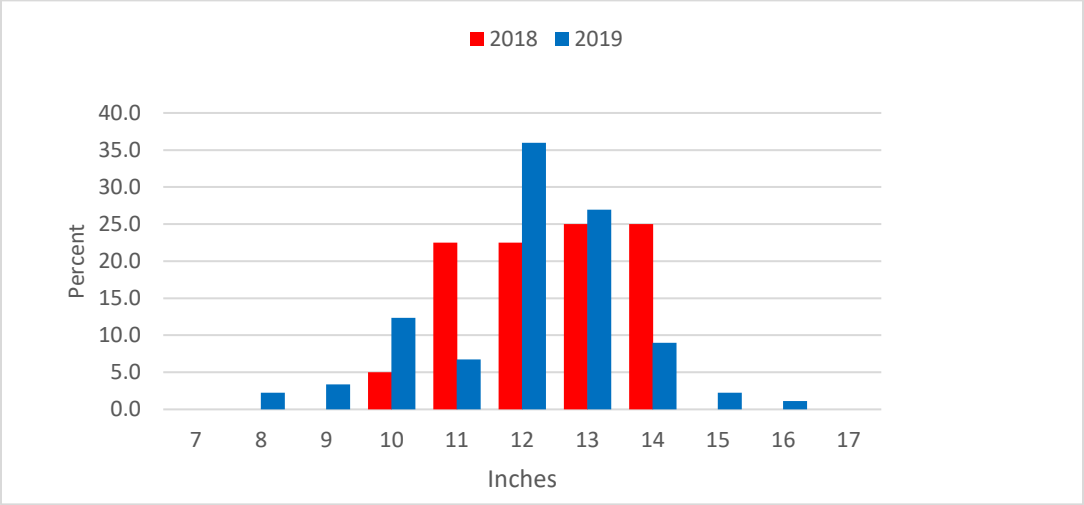


Figure 3. Percentages by horn length of pronghorn bucks checked from the North Ferris herd unit in 2018 and 2019.

2019 - JCR Evaluation Form

SPECIES: Pronghorn | PERIOD: 6/1/2019 - 5/31/2020

HERD: PR637 - SOUTH FERRIS

HUNT AREAS: 62 | PREPARED BY: GREG HIATT

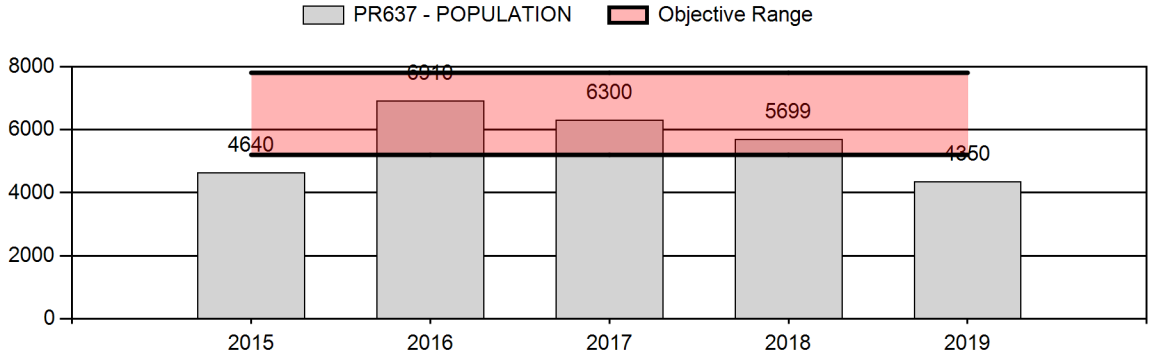
	2014 - 2018 Average	2019	2020 Proposed
Population:	5,604	4,350	4,500
Harvest:	166	132	80
Hunters:	172	170	95
Hunter Success:	97%	78%	84 %
Active Licenses:	192	180	95
Active License Success:	86%	73%	84 %
Recreation Days:	565	446	310
Days Per Animal:	3.4	3.4	3.9
Males per 100 Females	62	65	
Juveniles per 100 Females	48	28	

Population Objective (± 20%) :	6500 (5200 - 7800)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-33.1%
Number of years population has been + or - objective in recent trend:	1
Model Date:	03/09/2020

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

	JCR Year	Proposed
Females ≥ 1 year old:	0.3%	0%
Males ≥ 1 year old:	9.3%	5.9%
Total:	2.9%	1.7%
Proposed change in post-season population:	-38%	3.4%

Population Size - Postseason



2020 Hunting Seasons
South Ferris Pronghorn (PR637)

Hunt Area	Type	Archery Dates Opens	Archery Dates Closes	Season Dates Opens	Season Dates Closes	Quota	Limitations
62	1	Aug. 15	Sep. 11	Sep. 12	Oct. 31	50	Any antelope
62	2	Aug. 15	Sep. 11	Sep. 12	Oct. 31	50	Any antelope valid east of the Continental Divide and north of Wise Dugout Draw

2019 Hunter Satisfaction: 88% Satisfied, 8% Neutral, 4% Dissatisfied

2020 Management Summary

1.) **Hunting Season Evaluation:** This herd's population model and a line transect survey flown in June 2019 indicate this herd is more than 30 percent below objective size, a result of several years of poor fawn production (28:100 in 2019) and heavy losses during the 2018-19 winter. With the herd so far below objective, no doe harvest is warranted and the minimal Type 6 licenses are removed. While the buck:doe ratio for the entire herd was high in 2019 at 65:100, most of these surplus bucks are on checkerboarded lands where the majority of hunters do not have access, an issue the Type 2 licenses partially address. The buck:doe ratio for the Type 2 area in 2019 was 88:100, while the largely publicly available portion of the herd had only 45:100. Because of this low buck:doe ratio, the herd being well below objective, and anticipating additional losses during the severe 2019-20 winter, quotas for the Type 1 and Type 2 licenses are reduced.

Hunter satisfaction in this herd decreased slightly in 2019 (Figure 1), but remained high. More than 88 percent of hunters were satisfied with the quality of their hunt experiences, with less than four percent dissatisfied.

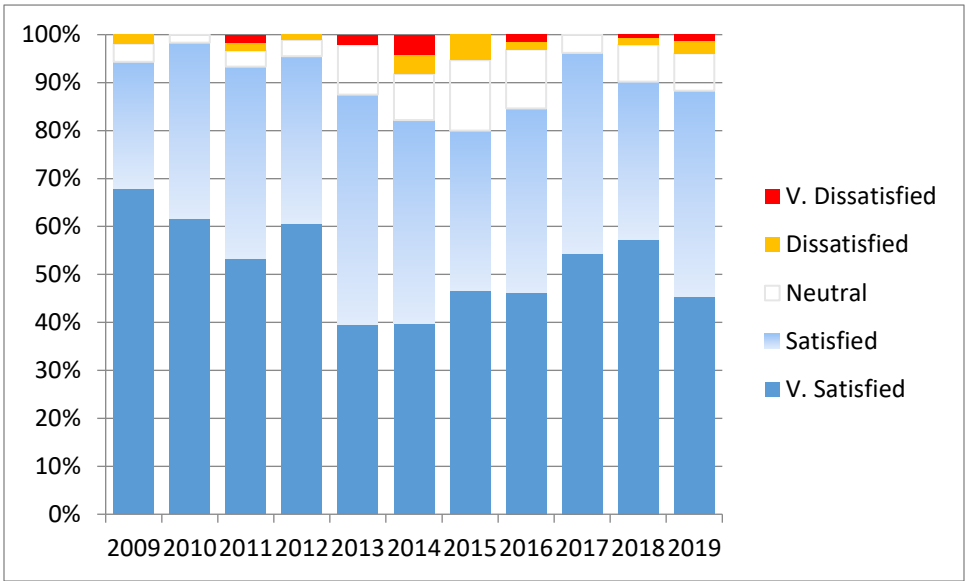


Figure 1. Hunter satisfaction and dissatisfaction for the South Ferris Pronghorn Herd.

Department and University personnel checked and measured horn length of 11 percent of the bucks harvested from this herd in 2019, slightly above the statewide average of 8 percent. The largest buck in the sample was 15 inches long. Average horn length from this herd was 12.7 inches, compared to a statewide average of 12.3 inches. Overall, hunters in the South Ferris herd in 2019 enjoyed a supply of bucks with horns that were longer than the rest of the state (Figure 2). Most of these longer horns were in the 12" range, but the herd had 21 percent of the bucks at 14 inches or longer, compared to a statewide average of 12 percent in this size.

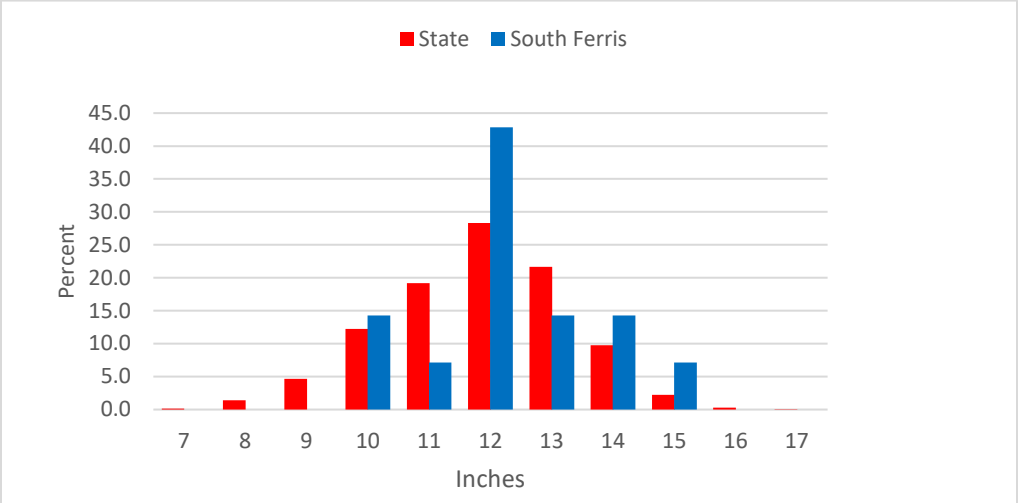


Figure 2. Percentages by horn length of pronghorn bucks checked from the South Ferris herd unit compared to statewide, 2019.

The proportion of bucks >14" declined in 2019 compared to 2018, replaced with increases in horns in the 12" range (Figure 3). Field check data show an increase in 3+-aged bucks in the harvest in 2019, so the decline in horn length is attributed to reduced horn growth due to physiological stress during the tough 2018-19 winter, rather than a decline in the proportion of mature bucks.

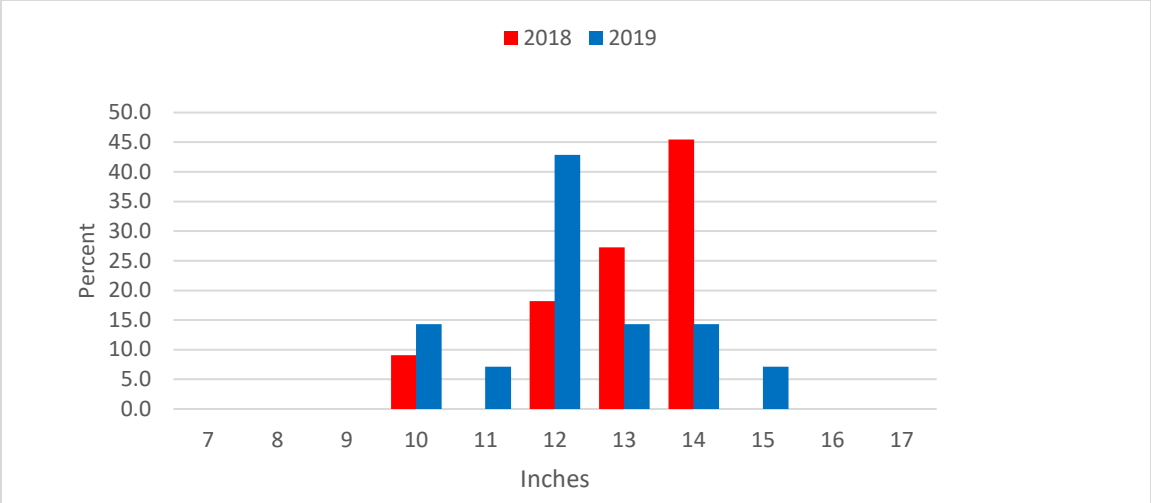


Figure 3. Percentages by horn length of pronghorn bucks checked from the South Ferris herd unit in 2018 and 2019.

2.) **Winter severity:** The 2019-20 winter was again harsh in this herd unit. The first heavy blizzard hit in late October, and temperatures rarely got above freezing for the next four months. Much of the October snow still covered the ground at the end of February. Hundreds of pronghorn, including a dozen with satellite telemetry collars, came west across the North Platte River from the Medicine Bow herd unit to winter in Area 62. Most ended up in the Haystack Mountains, Brown's Canyon Rims, or along the Interstate between Sinclair and Rawlins. More than a dozen drowned crossing the North Platte, as it had not yet frozen completely over. At least two hundred also entered the herd unit from the Red Desert to the west, crossing US 287 just north of Rawlins.

Mortality during the 2019-20 winter was high, presumably for both resident and migrant pronghorn. At least six of the telemetered pronghorn that entered Area 62 died in this herd unit during the winter. Pronghorn carcasses were found or reported in the Brown's Canyon Rim, Haystack Mountains, Stone Fence winter ranges, and north of the Interstate from Fort Steele to Rawlins. In addition to the telemetry losses, 61 pronghorn mortalities related to winter stress were examined and documented in this herd, excluding drownings, increased road kills and fence kills (Table 1).

Sex	No.	f	1	2	3	4+
m	29	4	3	1		18
f	29	4	4		5	16
?	3					
Total	61	8	7	1	5	34
% Adults	100		15	2	11	72
Percent	100	15	13	2	9	62

Table 1. Age and sex of winter mortalities documented in the South Ferris Pronghorn herd during the 2019-20 winter.

Age and sex composition of mortalities can give an indication of winter severity. Typically the first animals to be lost are those with the least fat reserves; the young of the year and older age classes. As winter severity and duration continues, increasing numbers of the more vigorous 1-, 2- and 3-year olds will be lost. The number of fawns found in post-winter mortality surveys will depend on the number of fawns in the population prior to winter, but looking at the distribution of adult age classes allows for comparison of winter severity (Figure 4).

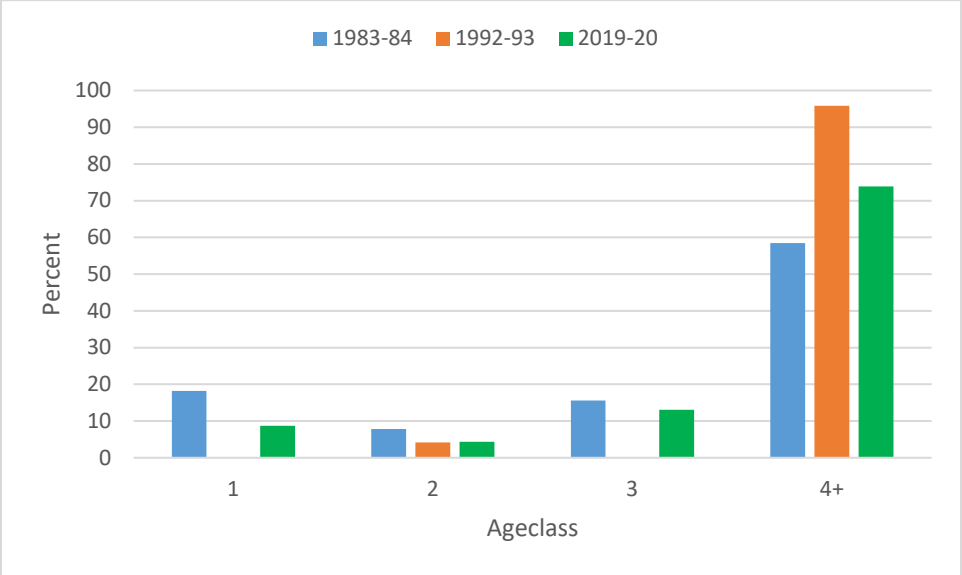


Figure 4. Age structure of adult pronghorn winter mortalities in the South Ferris herd in the 1983-84, 1992-93 and 2019-20 winters.

The winter of 1983-84 was the harshest in recent memory, and estimates of losses to pronghorn herds in the south-central portion of the state ranged from 50-80 percent. Mortality surveys found significant numbers in the 1-, 2- and 3-year age classes. The 1992-93 winter was less significant, but again had a late October snowfall that crusted over and lasted well into March. Fewer mortalities were found, and most were fawns or old, mature animals. Herd losses were probably less than half those of the 1983-84 winter. Age class distribution of winter losses in the South Ferris herd during the 2019-20 winter fall between the 1983-84 and 1992-93 winters, and losses would be expected to also be mid-range. These documented mortalities certainly include pronghorn that migrated dozens of miles from the Medicine Bow herd unit and losses of resident animals that did not have the stress of these long migrations may have been less significant. Current model population estimates do not project high losses during this past winter, and may be overestimating herd size.

2019 - JCR Evaluation Form

SPECIES: Mule Deer

PERIOD: 6/1/2019 - 5/31/2020

HERD: MD642 - DUBOIS

HUNT AREAS: 128, 148

PREPARED BY: GREG ANDERSON

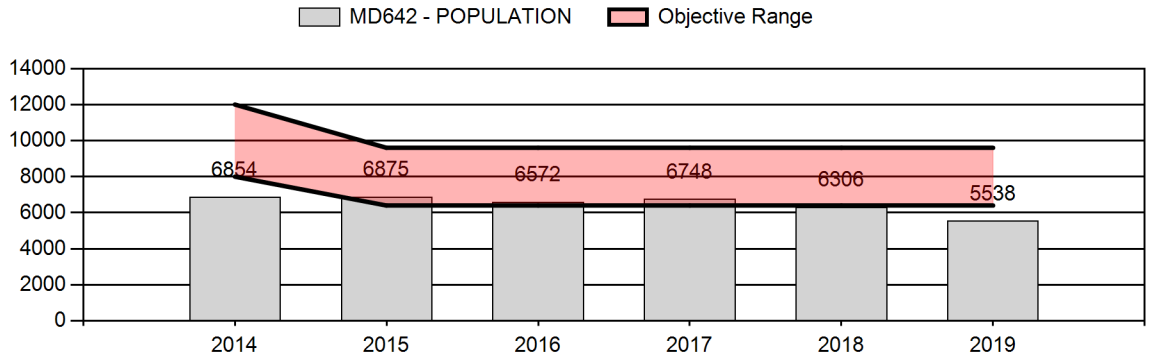
	2014 - 2018 Average	2019	2020 Proposed
Population:	6,671	5,538	6,184
Harvest:	411	374	445
Hunters:	1,161	1,012	1,100
Hunter Success:	35%	37%	40 %
Active Licenses:	1,170	1,025	1,125
Active License Success:	35%	36%	40 %
Recreation Days:	6,334	5,245	5,400
Days Per Animal:	15.4	14.0	12.1
Males per 100 Females	27	20	
Juveniles per 100 Females	56	48	

Population Objective (± 20%) :	8000 (6400 - 9600)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-30.8%
Number of years population has been + or - objective in recent trend:	4
Model Date:	2/24/2020

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

	JCR Year	Proposed
Females ≥ 1 year old:	1%	1%
Males ≥ 1 year old:	35%	36%
Total:	6%	7%
Proposed change in post-season population:	-9%	+11%

Population Size - Postseason



2020 Hunting Seasons
Dubois Mule Deer (MD642)

Hunt Area	Type	Archery Dates Opens	Archery Dates Closes	Season Dates Opens	Season Dates Closes	Quota	Limitations
128	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 15		Antlered mule deer or any white-tailed deer
128	1	Sep. 1	Sep. 30	Nov. 1	Nov. 20	50	Any deer
128	3	Sep. 1	Sep. 30	Nov. 1	Nov. 20	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
148	Gen	Sep. 1	Sep. 14	Sep. 15	Oct. 25		Antlered mule deer or any white-tailed deer
148, 149, 150, 151, 152	3	Sep. 1	Sep. 14	Sep. 15	Nov. 30	25	Any white-tailed deer

2020 Region L nonresident quota: 250

2019 Hunter Satisfaction: 61% Satisfied, 22% Neutral, 17% Dissatisfied

2020 Management Summary

1.) Hunting Season Evaluation: The 2020 hunting seasons in both areas 128 and 148 will remain unchanged from the 2019 seasons. Indications are the population in the herd unit declined slightly from 2018 to 2019. The likely cause of the decline was environmental factors that resulted in poor fawn recruitment and low yearly survival. Low yearling survival was evident in a lower than average buck/doe ratio for the herd unit. The buck/doe ratio in the herd unit has been remarkably stable over decades and is typically in the mid-20's/100. In 2019 the buck/doe ratio dipped to 20/100. The fawn/doe ratio was also lower than any of the previous 5 years. That said, environmental factors have historically been the major influence on this population. Total mule deer harvest in the herd unit was 374 in 2019. It is unlikely this level of harvest was responsible for the population decline and it was below the average harvest of 411 mule deer over the previous 5 years. Given the significant drop in the buck/doe ratio from 26/100 in 2018 to 20/100 in 2019 and both this herd and the South Wind River population are below objective the Region L quota will be decreased by 50 for the 2020 season. Season structure in the herd unit has provided for increased white-tailed deer harvest over the past several years as personnel and the public have noted more white-tailed deer throughout hunt area 128. With the addition of a Type 8

license in 2019, white-tailed deer harvest accounted for approximately 25% of total deer harvest in the herd unit.

2.) Management Objective Review: The population objective for this herd was reviewed and modified in 2015. At that time, the numerical population objective was set at 8,000. The objective was decreased from a previous number of 10,000 following a public meeting in Dubois and adoption by the Wyoming Game & Fish Commission. Since that time the population model for the herd indicates the population has fluctuated between close to 7,000 deer to a current low of 5,500. Hunt seasons have been fairly consistent over this time period and it is thought most of the population fluctuation is due to environmental conditions. Although no browse surveys are conducted in the herd unit, herbaceous vegetation surveys indicate there are plenty of resources to support more than the current number of 5,500 deer on winter range in the herd unit. The Department has not had any damage complaints over the past 5 years and comments from the public indicate they would like to see more mule deer in the herd. Following an internal review in February, 2020 it is recommended the objective remain unchanged at 8,000 deer.

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. Many of the deer migrated into the Blackrock Creek/Spread Creek area down to Jackson Hole. Although this study was completed in 2019, a similar study began in 2019 on the Wind River Reservation (WRR). In this study, adult, doe mule deer have been collared throughout the WRR in 2019 and 2020. Most of the deer collared on the WRR along the Wind River have followed the same migration paths as deer collared in the Dubois Mule Deer Herd.

4.) In 2019, funding was acquired to conduct an assessment of U.S. Highway 26 where it runs through the upper Wind River Valley to determine if modifications can be made to decrease the number of deer/vehicle collisions. Mule deer mortality along the highway has been a persistent problem for decades. 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 started in April, 2020 and will is being conducted by Eco Resolutions from Golden, Colorado.

2019 - JCR Evaluation Form

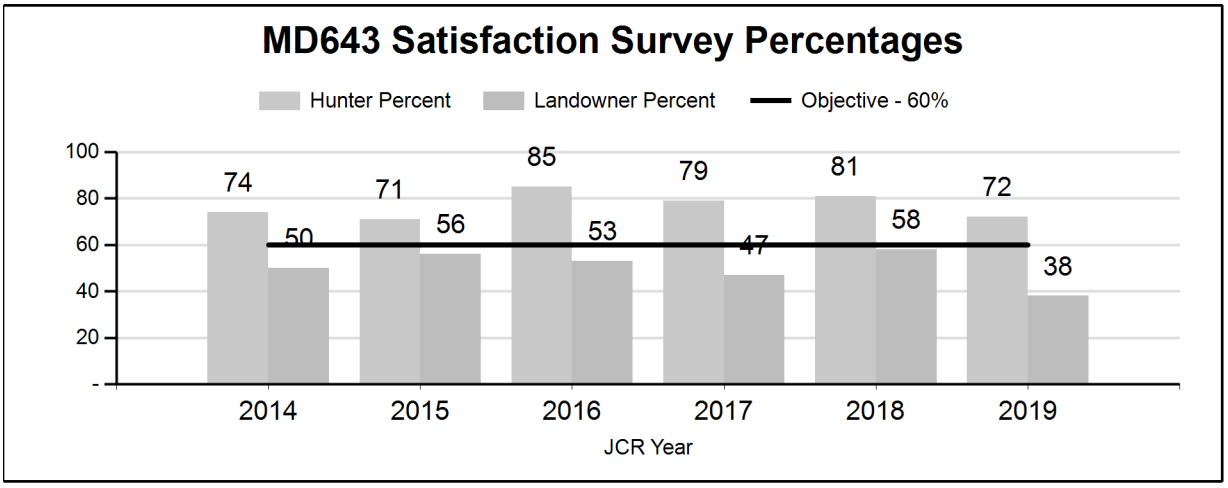
SPECIES: Mule Deer
HERD: MD643 - PROJECT
HUNT AREAS: 157, 170-171

PERIOD: 6/1/2019 - 5/31/2020

PREPARED BY: GREG ANDERSON

	2014 - 2018 Average	2019	2020 Proposed
Hunter Satisfaction Percent	78%	72%	75%
Landowner Satisfaction Percent	53%	38%	60%
Harvest:	462	409	275
Hunters:	605	694	450
Hunter Success:	76%	59%	61 %
Active Licenses:	711	749	475
Active License Success:	65%	55%	58 %
Recreation Days:	2,450	2,676	1,800
Days Per Animal:	5.3	6.5	6.5
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:	-5%
Number of years population has been + or - objective in recent trend:	1



2020 Hunting Seasons
Project Mule Deer (MD643)

Hunt Area	Type	Archery Dates Opens	Archery Dates Closes	Season Dates Opens	Season Dates Closes	Quota	Limitations
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

2019 Hunter Satisfaction: 72% Satisfied, 17% Neutral, 11% Dissatisfied
2019 Landowner Satisfaction: 38% Good # of MD, 14% Too many MD, 48% Too few MD

2020 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. In 2014 only four landowners responded to a Department survey. Personnel subsequently began making individual contacts in 2015. At that time 53% of landowners felt mule deer numbers were acceptable and 32% of landowners thought there were too many mule deer. While the number of landowners satisfied with mule deer numbers did not vary dramatically between 2015 and 2018 there were a steadily increasing number of landowners who felt there were too many deer during this time period. In response, license numbers were increased in 2017, 2018, and 2019 to increase harvest and reduce mule deer numbers. Hunter satisfaction varied over the same time period but remained well above the 60% objective threshold. In 2019 personnel noted seeing significantly fewer deer throughout much of the herd unit. Also, in 2019, hunter satisfaction decreased from 81% in 2018 to 72%. Landowner satisfaction also declined significantly to 38% in 2019. Unlike previous years where nearly all landowner dissatisfaction was the result of too many deer, 48% of landowners surveyed in 2019 felt there were too few mule deer. Whereas in past years, landowner satisfaction did not meet the 60% threshold due to

too many deer, the threshold was not met in 2019 due to the belief there were not enough mule deer. Personnel, hunter, and landowner observations all indicate mule deer numbers declined in 2019. In response, both Type 1 and Type 6 licenses will be decreased in 2020 to reduce harvest. While landowners and hunters saw a marked decline in mule deer numbers, 73% of landowners felt white-tailed deer numbers had increased and there were too many. In response, white-tailed deer hunting opportunity will be expanded by increasing Type 3 and Type 8 licenses.

2019 - JCR Evaluation Form

SPECIES: Mule Deer | PERIOD: 6/1/2019 - 5/31/2020

HERD: MD644 - SOUTH WIND RIVER

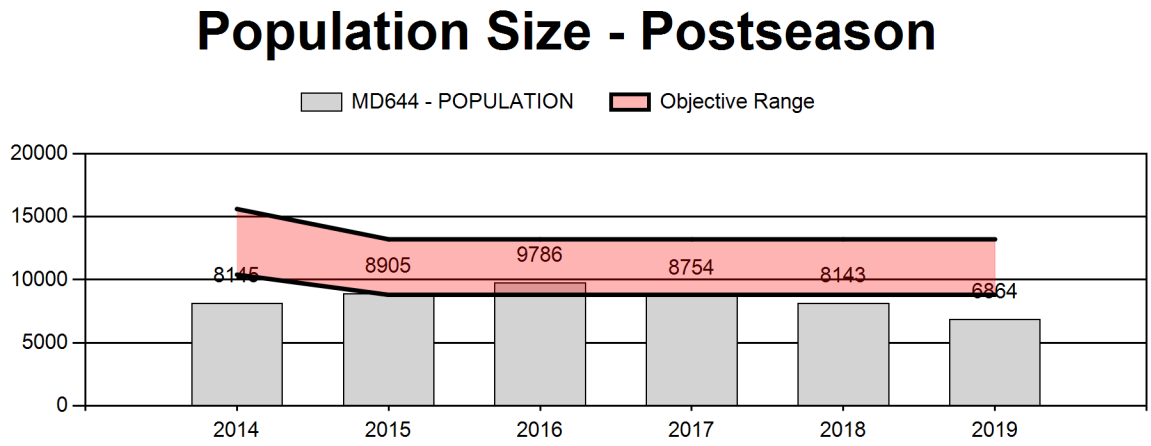
HUNT AREAS: 92, 94, 160 | PREPARED BY: STAN HARTER

	2014 - 2018 Average	2019	2020 Proposed
Population:	8,747	6,864	7,034
Harvest:	625	436	322
Hunters:	1,428	1,233	1,000
Hunter Success:	44%	35%	32%
Active Licenses:	1,433	1,235	1,025
Active License Success:	44%	35%	31 %
Recreation Days:	5,921	4,598	4,000
Days Per Animal:	9.5	10.5	12.4
Males per 100 Females	30	24	
Juveniles per 100 Females	78	54	

Population Objective (± 20%) :	11000 (8800 - 13200)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-37.6%
Number of years population has been + or - objective in recent trend:	5
Model Date:	3/2/2020

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

	JCR Year	Proposed
Females ≥ 1 year old:	1.2%	0.6%
Males ≥ 1 year old:	30.4%	23.0%
Total:	5.9%	4.4%
Proposed change in post-season population:	-13.7%	+2.5%



2020 Hunting Seasons

South Wind River Mule Deer (MD644)

Hunt Area	Hunt Type	Archery Dates		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	6	Sept. 1	Sept. 30	Oct. 1	Oct. 20	25	Doe or fawn valid on private land north of the Little Popo Agie River
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	150	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

2020 Region L Non-Resident Quota: 250

2019 Hunter Satisfaction: 47.1% Satisfied, 20.4% Neutral, 32.5% Dissatisfied

2020 Management Summary

1.) Hunting Season Evaluation: The South Wind River mule deer population has declined each of the last 5 years, with the 2019 population estimate being 13.7% below the 2018 estimate. This was unexpected following wet springs each year since 2015. However, it seems the timing and duration of wet, cold rain or snow events apparently impacted mule deer fawn survival. Yearling buck/doe ratios have declined similarly over the last 4 years, despite good fawn/doe ratios the previous years. While declines have been noticed in each of the 3 hunt areas in the herd unit, the decrease has been the most dramatic in area 94. The classification survey flown in November 2019 resulted in a 55% decline in the number of mule deer observed in area 94 compared to that observed in 2018. The 2019 hunting season featured a season length reduction for general youth license hunters from an extra 14 days to 3 days (in addition to the standard 8-day general license season). The youth-only hunting seasons have been very popular with local families. However, the South Wind River herd unit was one of the last places where these seasons were available. Therefore, youth hunters from all parts of Wyoming were converging on these 3 hunt areas, leading to increased complaints from local hunters and landowners. Due to an overall declining mule deer population and concerns about the overall number of hunters in the herd unit with respect to the number of available buck mule deer, the 2020 deer season will not include a youth-only segment, and the "standard" general license season will be reduced from 8 to 6 days. These season length changes will accompany implementation of antler point restrictions (APR) for mule deer for the 3rd time since 2004. This measure is being implemented to reduce hunter numbers and total harvest. The APR season structure will be evaluated for 2 years, after which managers will consider whether the population has rebounded enough to allow a return to a more typical general season or if the population continues to decline, more restrictive hunting season options such as limited quota seasons may be considered. Following a significant drop in the buck/doe ratio in the Dubois herd unit and with both Dubois and South Wind River herd units being below objective, the Region L quota will be decreased by 50 for the 2020 season. With modest winter mortality and reduced harvest in 2020, we expect the South Wind River mule deer population may still grow slightly if fawn/doe and buck/doe ratios show minor improvement, resulting in a 2020 post-season population of just over 7,000 mule deer.

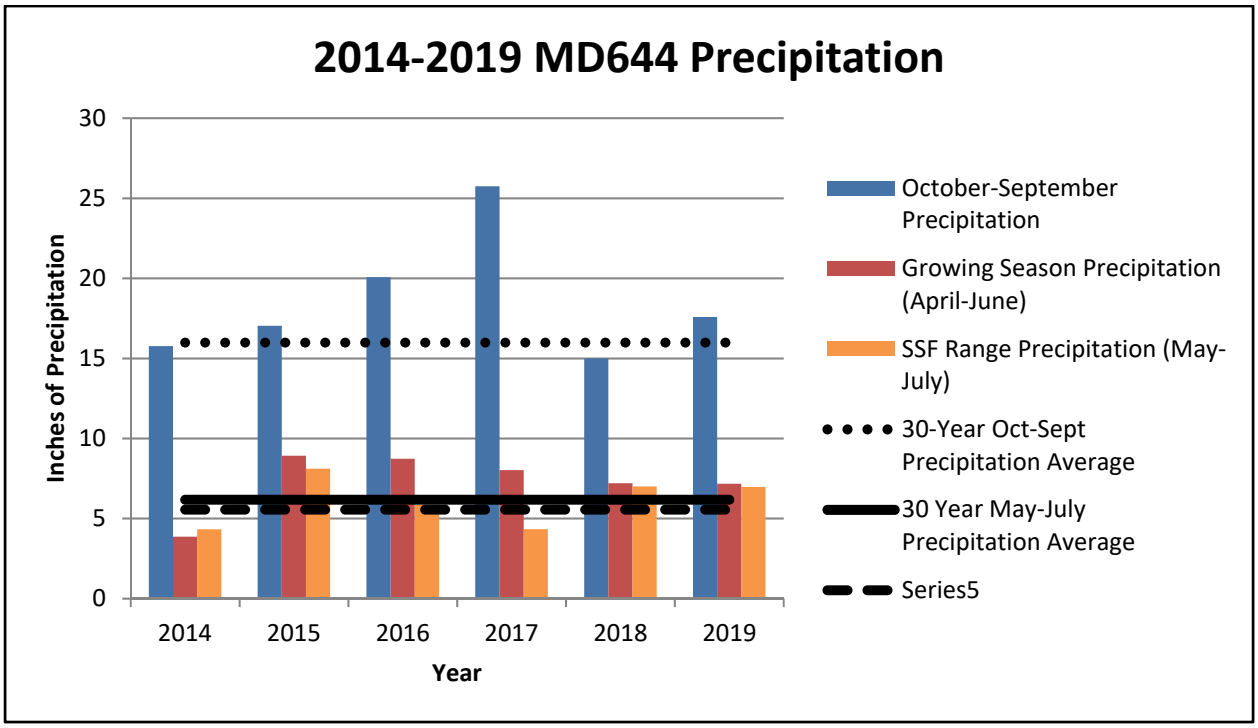
2.) Management Objective Review: The management objective for the South Wind River mule deer herd unit (MD644) was reviewed in 2020. Managers considered population trend, weather data, and habitat data from assessments (RHAs - see Appendix A) conducted in the last 5 years. The management objective was reduced to 11,000 mule deer during the last objective review in 2015. The population has declined nearly 30% since 2015, following 44% growth over the previous 2 years, indicating this population is resilient and has the potential to reach the current objective over the next 5 years with favorable conditions. Therefore, we are not recommending a change to the management objective in 2020.

Appendix A. Weather and habitat summary for South Wind River Mule Deer

Weather

Precipitation

Precipitation from October 2018 through September 2019 was slightly above the 30-year average. Heavy winter snows contributed the majority of the annual precipitation. Precipitation during the growing season (April-June 2018 and 2019) was slightly higher than the 30-year average. Most of the growing season (April-June) precipitation fell during April and May 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.



Winter Conditions

The 2019-2020 winter was characterized by colder than average temperatures. Temperature from November-February averaged 22°F and was below-normal for this time period in the Lander area. A mild fall gave way to an early, difficult winter. A total of 57.7”of snowfall was recorded in Lander from October 2019-February 2020. This is above the 30-year average. Above-average snowfall totals combined with below-average temperatures for Lander and the surrounding foothills created nearly continuous snow conditions for most of the winter. This likely meant wildlife had to work harder to access forage to maintain body condition. Snowpack may benefit vegetation production during the coming growing season, depending on spring precipitation.

Habitat

Precipitation was average during the spring of 2019 which provided good early forage production across the herd unit providing quality forage for mule deer does in early parturition. Above-normal temperatures, and very low precipitation amounts from June-August likely caused lower vegetation production and may have caused increased nutritional stress on lactating does, contributing to decreased fawn/doe ratios (54/100) in 2019, the 3rd lowest level in 40 years.

Significant Events

Habitat enhancements continued across the Herd Unit in 2019. It was the fifth year of treatments (cut/ pile and lop/scatter) within the South Pass area. Sites treated were in Twin Creek, Rock Creek, Mill Creek, Gold Creek, on Iron Mountain, and the south end of the Loop Road. A total of 709 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 2,235 acres have been treated on South Pass in cooperation with USFS- Shoshone National Forest, BLM, and Wyoming State Forestry.

The Table Mountain Juniper Project was implemented in 2019. Encroaching juniper from an important mixed mountain shrub community on Table Mountain near Lander was removed. This project was done in cooperation with private landowners and the U.S. Fish and Wildlife Service Partners Program. This project encompassed 340 acres of crucial mule deer winter range and important sage-grouse habitat.

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 still in its initial planning stages, although treatment occurred on approximately 200 acres at the very head of the infestation, and will continue for the next 3-5 years.

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 2015-2019, a total of 32 RHA's were conducted in Aspen, Rangeland, and Riparian Habitats: Ten in aspen communities and encompassed 1,325 acres, twelve in rangeland communities and encompassed 4,065 acres, and ten in riparian habitats that encompassed 210 acres. Assessment locations were selected using collared mule deer locations, and within areas of known mule deer use.

In general, habitats are in good condition with moderate to high species diversity, moderate browse/hedging of important woody vegetation, and predominantly mid-seral state of shrubs and aspen.

Aspen habitats are generally showing good regeneration, although average browse on aspen exceeds 45% which is higher than the 30-35% browse threshold to establish healthy aspen communities. Most communities appear to be in mid-seral stage, with conifer encroachment becoming a concern, but regeneration still occurring at healthy levels.

Rangelands exhibited higher than desirable browse levels on preferred shrub species, and in many cases shrub age-class diversity was limited to mature and decadent shrubs with few young and seedling aged shrubs. However, leader growth on shrubs has been good the last several years due to higher than average precipitation. Observed herbaceous species diversity was high. In 2018, severe tent caterpillar activity affected antelope bitterbrush (*Purshia tridentata*) vigor in the Red Canyon and South Pass areas, but the shrubs appeared to overcome the effects and recovered later in the season.

Riparian areas were in fair to good condition. Some areas received heavier than desired livestock use, and are becoming incised and showing reduced riparian vegetation vigor. Other sites were in better condition with low levels of erosion along the stream and beaver activity maintaining floodplain connectivity.

2019 - JCR Evaluation Form

SPECIES: Mule Deer | PERIOD: 6/1/2019 - 5/31/2020

HERD: MD646 - SWEETWATER

HUNT AREAS: 96-97 | PREPARED BY: STAN HARTER

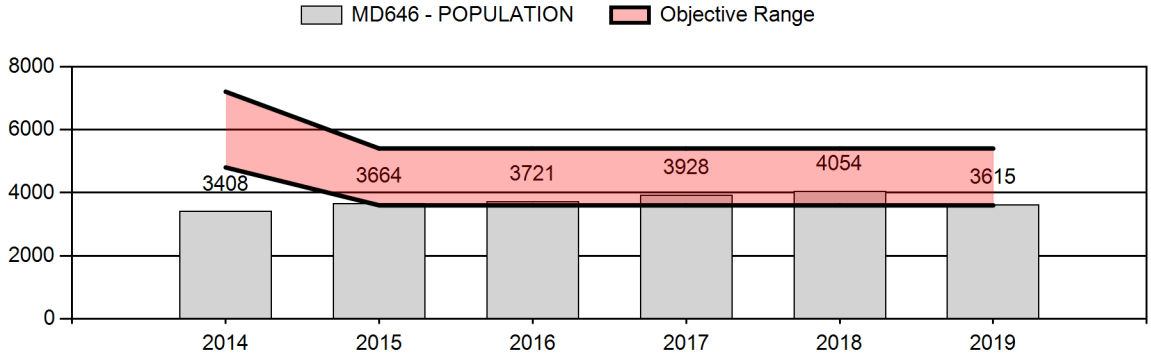
	2014 - 2018 Average	2019	2020 Proposed
Population:	3,755	3,615	3,765
Harvest:	406	281	220
Hunters:	862	724	650
Hunter Success:	47%	39%	34 %
Active Licenses:	862	724	650
Active License Success:	47%	39%	34 %
Recreation Days:	3,101	2,344	2,000
Days Per Animal:	7.6	8.3	9.1
Males per 100 Females	19	19	
Juveniles per 100 Females	82	66	

Population Objective (± 20%) :	4500 (3600 - 5400)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-19.7%
Number of years population has been + or - objective in recent trend:	1
Model Date:	3/2/2020

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

	JCR Year	Proposed
Females ≥ 1 year old:	0.2%	0.0%
Males ≥ 1 year old:	45.5%	34.5%
Total:	7.2%	5.5%
Proposed change in post-season population:	-10.7%	+4.2%

Population Size - Postseason



2020 Hunting Seasons

Sweetwater Mule Deer (MD646)

Hunt Area	Hunt Type	Archery Dates		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	50	Doe or fawn white-tailed deer

2020 Region Q Non-Resident Quota: 125

2019 Hunter Satisfaction: 51.9% Satisfied, 23.4% Neutral, 24.7% Dissatisfied

2020 Management Summary

1.) Hunting Season Evaluation: The Sweetwater mule deer population has remained fairly stable for the last 5 years, with the 2019 population estimate of just over 3,600 mule deer being about 11% lower than 2018. The 2019 classification survey completed in December resulted in the 2nd highest number of mule deer observed in 25 years. This was mainly due to most deer moving to winter ranges in area 97 before the flight, which improves our efficiency in finding deer in more confined habitats. The fawn/doe ratio dropped to its lowest level in 5 years to 66J/100F, and the yearling buck/doe ratio was the lowest since 1994 at 5YM/100F. However, the adult buck/doe ratio was improved to 13AM/100F, the best since 2012. The total buck/doe ratio, 19M/100F, has been below the recreational management range in 5 of the last 7 years, mostly due to high harvest of bucks relative to the population size and number of bucks available prior to each hunting season. The 2020 hunting season length will remain at 6 days, and will feature implementation of antler point restrictions (APR) for mule deer for the 3rd time since 2004. This measure is being implemented to reduce hunter numbers and total buck harvest, thereby increasing the potential for buck/doe ratios to move back into the recreational management range. With the Sweetwater mule deer herd unit remaining below objective and with low buck/doe ratios, combined with a desire to reduce hunter numbers, the Region Q non-resident quota will be decreased by 25 for the 2020 season. Through reduced buck harvest, minimal winter mortality, and minor increases in fawn/doe ratios, this population should grow slightly to a post-season 2020 population of nearly 3,800 mule deer, with the total buck/doe ratio improving to at least 22M/100F.

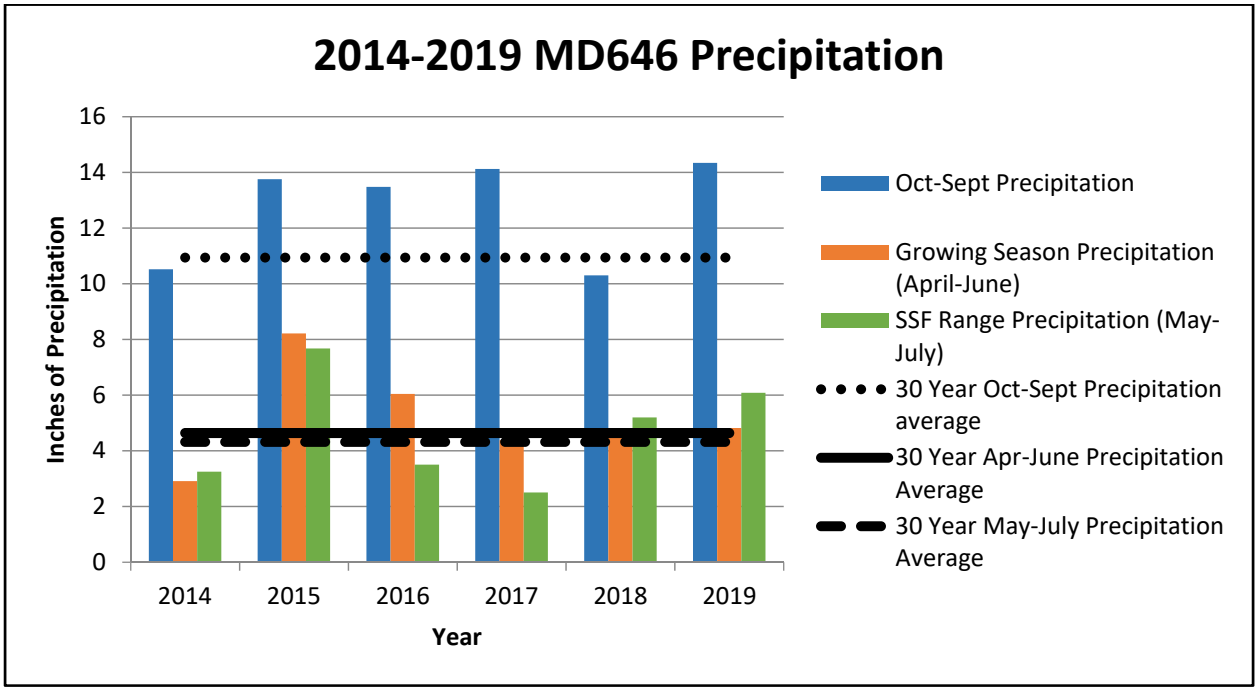
2.) Management Objective Review: The management objective for the Sweetwater mule deer herd unit (MD646) was reviewed in 2020. Managers considered population trend, weather data, and habitat data from assessments (RHAs - see Appendix A) conducted in the last 5 years. The management objective was reduced to 4,500 mule deer during the last objective review in 2015. Following a 2-year growth period of nearly 38% from 2013 to 2015, the population has been quite stable, with the 5-year average being 16% below objective. With favorable conditions, this population has the potential to reach the current objective over the next 5 years. Therefore, we are not recommending a change to the management objective in 2020.

Appendix A. Weather and habitat summary for Sweetwater Mule Deer

Weather

Precipitation

Precipitation from October 2018 through September 2019 was significantly higher than the 30-year average. Heavy winter snows contributed the majority of the annual precipitation. The growing season precipitation (April-June 2019) was at the 30-year average, while the high elevation SSF seasonal range average precipitation (May- July 2019) was slightly above the 30-year average. Temperatures through the summer were slightly 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.



Winter Conditions

The 2019-2020 winter was characterized by below normal snowfall amounts with temperatures averaging 20.4°F, which is considered below-normal for the November-February time period in the Jeffrey City area. The winter was characterized by high winds across the herd unit. A total of 32.5”of snowfall was recorded in Jeffrey City from November 2019-February 2020. This is 6” above the 30-year average.

Habitat

Growing season precipitation was above average during the spring/early summer of 2019 which provided good forage across the herd unit for mule deer does in early parturition. Above-normal temperatures and low precipitation amounts from June-August likely caused lower vegetation production. Hailstorms in late-May and early-June caused extreme defoliation of sagebrush, and flattened herbaceous forage extending from the top of Beaver Rim near Sweetwater Station, south

and east to Crook's Mountain and Green Mountain. Habitat conditions were still good overall, yet the fawn/doe ratio observed in the Sweetwater Herd Unit (66 fawns/100 does) was the lowest in a 6-year decline.

Significant Events

The BLM and WGFD partnered to hire a technician to conduct a habitat inventory on Green Mountain and prepare a Habitat Management Plan to help inform the BLM Integrated Vegetation Management Plan for Green Mountain. The Green Mountain Habitat Plan is attached in Appendix B. Habitat treatments on Green Mountain have mostly been deferred until the completion of these planning documents and NEPA, however 100 acres of aspen treatment were conducted on Cooper Creek and upper West Cottonwood Creek in 2019. Green Mountain Aspen and Riparian Enhancement is a project funded through the Mule Deer Initiative and other partners. Past treatments are showing good progress including Beaver Dam Analogues (BDA), fenced riparian areas, and aspen treatments. Moving forward into 2020-2021 additional aspen treatments are planned.

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 2015-2019, 101 RHA's were conducted across the herd unit, but predominantly centered on Green Mountain proper where our technician spent the majority of her time. Of these, 61 aspen RHA's were conducted encompassing 3,143 acres, 26 were conducted in rangeland encompassing 3,910 acres, and 14 were conducted in riparian habitat encompassing 294 acres.

Habitats within the Sweetwater Herd Unit are generally in fair condition, and appear to be trending downward. Green Mountain is an oasis on the northern border of the Red Desert and attracts wildlife from long distances with its perennial water sources, forest cover, and diversity of vegetation. Due to the number of wildlife and livestock species congregating across the mountain, habitats are heavily utilized in all categories.

Aspen habitats are almost exclusively in late seral condition with extensive conifer encroachment, heavy browse on all younger age classes, and obvious drying. Nearly 85% of stands assessed were in late seral stage, and every single aspen stand assessed exhibited severe browse levels greater than 50%, and most above 75% browse. While herbaceous diversity is moderate to high, there are many examples of more xeric species becoming ubiquitous throughout the aspen stands, especially juniper, sagebrush, and cheatgrass. Without immediate treatment actions being instituted across the mountain, as suggested in the Green Mountain Habitat Plan, aspen will likely continue to trend downward and will eventually be extirpated.

Rangeland habitats on and surrounding Green Mountain are in slightly better condition. Most mixed mountain shrub and sagebrush communities exhibit severe hedging, and have low age class diversity with mature and decadent shrubs making up the majority of every stand. However, herbaceous vegetation diversity is moderate to high, leader growth is good when spring precipitation is above normal, and conifer encroachment is low. Nearly 75% of rangelands assessed exhibited some level of cheatgrass presence, which is of increasing concern within the Sweetwater Herd Unit.

Riparian areas showed higher than desirable levels of livestock and feral horse impacts in almost every assessment conducted. Incision of streams is occurring in many areas, and xeric species are encroaching into riparian habitats. There is evidence of beaver recolonizing several streams across Green Mountain, which is encouraging after they appeared to have been removed for several years. The Green Mountain Habitat Plan identifies several streams where BDAs and riparian fencing could potentially improve aspen, willow and cottonwood habitats, as well as reduce down cutting of streams.

Appendix B

Green Mountain Habitat Management Plan - 2020

Wyoming Game & Fish Department
Lander Region
260 Buena Vista Drive
Lander, WY 82520 USA

PURPOSE

The purpose of this document is to assess current habitat condition and recommend habitat treatment on and around Green Mountain, Wyoming. This effort is the result of a well-focused collaboration between Wyoming Game and Fish Department and Bureau of Land Management to maintain, enhance, and restore habitat on Green Mountain. Habitat assessments were completed to address the growing concern over habitat decline, both in quantity and quality, and the objectives outlined in the Habitat Management Plan for South Wind River and Sweetwater Mule Deer Herd Units (WGFD 2017a). Management recommendations stemming from this assessment, focus primarily on aspen communities but also include riparian and mixed mountain shrub sites. Broad guidelines on recommended treatment technique are provided, in addition to prioritized site-specific treatment for aspen stands. Implementation of these recommended treatments across the landscape in the phases proposed will enhance the long-term quality of wildlife habitat in the targeted vegetation communities. Future habitat management on Green Mountain should consider the current assessed condition, site prioritization and recommendations in this document. Every management situation, project and geographic site is unique and will require adaptive and creative solutions and actions to be successful. The intent of this plan is to provide guidance to Bureau of Land Management's Integrated Vegetation Management Plan for habitat improvement project implementation.

TABLE OF CONTENTS

Introduction **4**

Rapid Habitat Assessment **6**

Aspen 6

Mixed Mountain Shrub 6

Riparian 6

Current Conditions **7**

Aspen 7

Mixed Mountain Shrub 8

Riparian 9

Habitat Quality Prioritization **10**

Methods 10

Results 13

Prioritized Treatment Phases **14**

Recommendations **15**

Aspen 15

Mixed Mountain Shrub 18

Riparian 20

Literature Cited **22**

Appendix A. Rapid Habitat Assessment Surveys **25**

Appendix B. Aspen Habitat Attributes And Qualifiers **28**

Aspen Habitat Attributes 28

Aspen Qualifiers 29

Appendix C. Site Prioritization And Treatment Recommendations **30**

Appendix D. Recommended Aspen Treatment Phases **36**

Appendix E. Beaver Dam Analog Site Prioritization **40**

INTRODUCTION

Green Mountain is located 15 miles southeast of Jeffrey City, Wyoming (Figure 1). Hosting a diversity of plant and animal communities like an oasis on the northern border of the Red Desert, this mountain once overflowed with natural springs and seeps creating the relic finger drainages we see today. Remnant beaver dams litter these drainages reflecting the capacity of water once found here. Present signs of more xeric plant communities infiltrating this mountain system are apparent. Though turning back time is neither practical nor representative of inevitable ecological succession, understanding the history of this area and the mountain itself can help guide management.

With the Oregon Trail at a short reach, Green Mountain experienced many anthropogenic modifications throughout its recent history. As European Americans settled West, increased grazing pressure, invasive species, stream alteration, timber removal, and fire suppression were and still are drivers of ecological change. The replacement of natural disturbance regimes, such as fire that once provided a mosaic of successional stages, plant communities, and habitat types converted the landscape to what we see today (Shepperd et al. 2006).

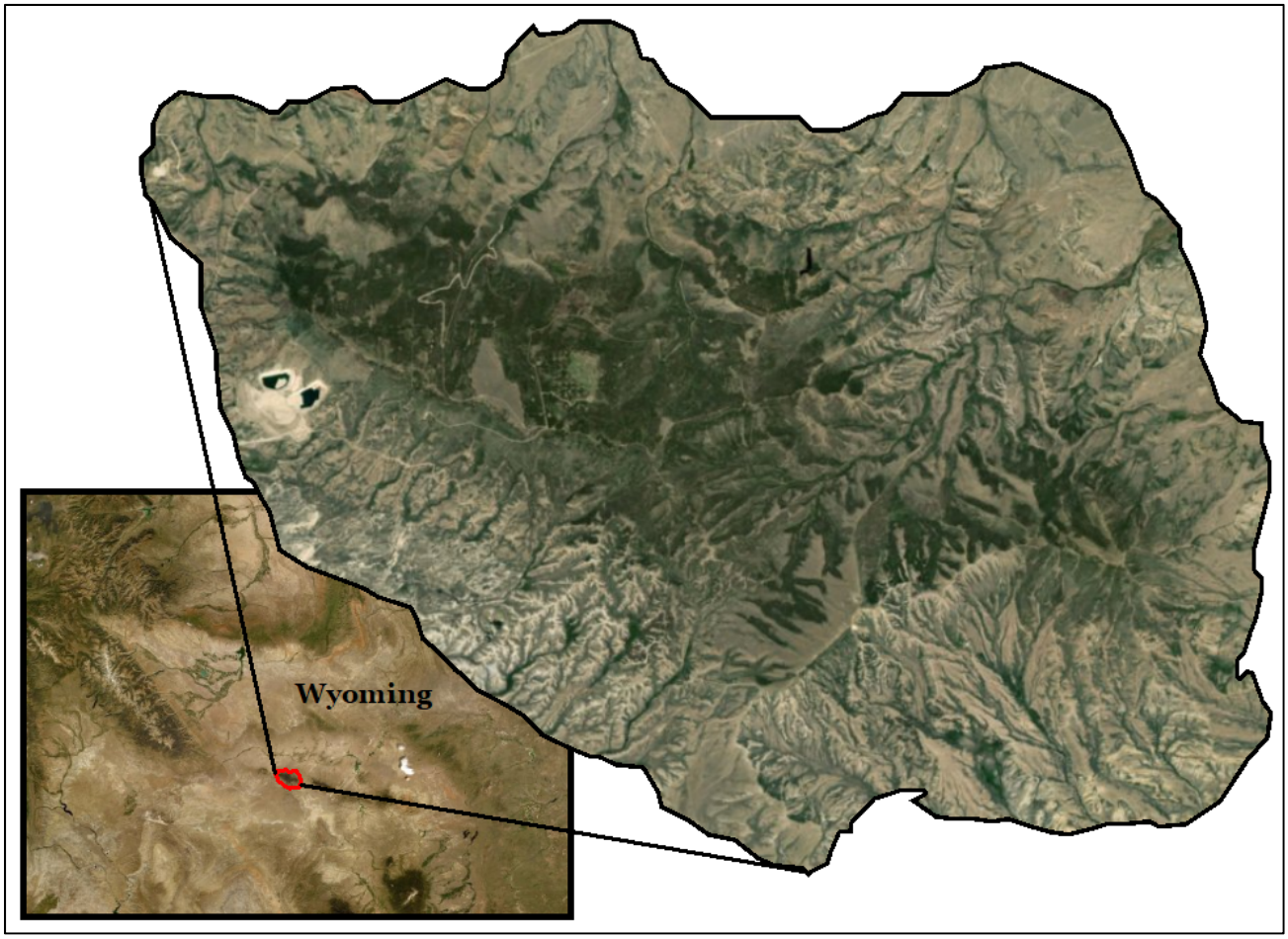


Figure 1. Green Mountain, Wyoming.

Dense conifer stands now tower over pockets of aspen, shading out rich understory forage and drawing moisture from the once saturated soil. Cheatgrass dominates southern aspects in patchy monocultures while thistle intrudes into heavily grazed, eroded, and channeled riparian corridors. Beaver rich and functional streams have been silted in and lost as a result of a variety of reasons such as: excessive herbivory, motorized recreation, climate change, and explorative mining (Figure 2). Declining aspen recruitment due to heavy browse and conifer encroachment, is shrinking aspen stands. Aspen that remain are hedged and lack age-class diversity. Though these signs of late seral succession are alarming, with proper and thoughtful management there is capacity for this landscape to once again support healthy stands of aspen and other desired vegetative communities.

Figure 2. Relic beaver dam on south face of Green Mountain. Riparian area silted in and dominated by xeric species.

Green Mountain is predominantly public land. Resource managers have an obligation and responsibility to manage this mountain in the public trust to ensure its persistence for future generations. Though treatment has been ongoing for countless years, it has been sparse and localized. A comprehensive landscape approach is preferred to keep the mountain from continuing this downward trend. In response to growing concern over habitat decline (both quantity and quality), Wyoming Game and Fish Department (WGFD) in cooperation with Bureau of Land Management (BLM) implemented a Rapid Habitat Assessment (RHA) analysis on Green Mountain (summer of 2019). These assessments provide the basis for the following recommendations and site prioritization for this habitat management plan.

Rapid Habitat Assessment data collection was conducted between July and October of 2019 by WGFD. The RHA data collected clearly demonstrate the need for focused management action to improve vegetation community vigor and habitat quality on Green Mountain. To guide management decisions for site-specific treatment, a prioritization tool was used to rank individual sites based on habitat assessment attributes, such as: seral state, hedging, species diversity, etc. Recommendations will reflect this site prioritization. A description of the RHA process, current habitat condition, prioritization methods and results, and management recommendations are further discussed below.

RAPID HABITAT ASSESSMENT

The RHA method is designed to be a systematic inventory of plant community function and vigor to make informed decisions on a landscape scale. Rapid Habitat Assessments are a tool to aid in understanding how plant communities are functioning and where management opportunities exist to improve current conditions. Wyoming Game and Fish Department utilizes RHAs in aspen clone/stands, riparian corridors, and mixed mountain shrub communities. Each RHA is intended to represent and characterize a broad area of the landscape. Copies of RHA data forms for each plant community type are attached in Appendix A.

The RHA technique and data form for each survey type was reviewed by WGFD and BLM personnel prior to the Green Mountain analysis. The perimeters of each site surveyed were documented using the Collector app (ESRI 2018) and RHA metrics/observations were recorded using the Survey123 (ESRI 2019) application. A brief description of data collection methods is outlined below.

Aspen

Aspen stands previously mapped by BLM (2007-2008) on Green Mountain were referenced to determine survey locations. A pace transect within each stand was conducted to evaluate understory species diversity, aspen age-class diversity, seral state, browse, invasive species, and disturbance (Appendix A). Additionally, representative photos were taken at either existing or newly established points.

Mixed Mountain Shrub

Assessments of mixed mountain shrub communities across the Green Mountain study area were conducted when the site was located within one or more of the following:

- Migration routes or stopover sites;
- Designated mule deer seasonal range (transition and summer ranges);
- Habitats not designated as crucial, but showed extensive use by mule deer based on radio/GPS-telemetry data;
- Sites representing a larger drainage or specific area such as a pasture, allotment, or private land parcel.

A pace transect was conducted to estimate percent browse on primary shrub, disturbance, current use, seral state, primary shrub age class diversity, conifer encroachment, sagebrush cover class, percent bare ground, understory species diversity, primary shrub hedging class, and invasive species (Appendix A).

Riparian

Streams with adjacent aspen communities or documented mule deer use based on telemetry data were assessed. In each of the sites, greater than or equal to ¼ mile of the stream/riparian corridor was evaluated. Metrics recorded include disturbance, current use, average riparian width, bank erosion, presence/absence of beaver activity, riparian area function, vertical structure category, key deciduous woody species, herbivory, primary and secondary woody species, riparian herbaceous community and diversity, and invasive species (Appendix A). Additionally, photos were taken at either existing or newly established sites.

CURRENT CONDITIONS

Analysis of RHA data reflect late succession and high browse in all vegetation types. A total of 5,609 acres were assessed from July to October of 2019. The RHA methodology outlined above and provided in Appendix A was utilized to assess habitat condition. The following provides a brief description of the 2019 RHA data reflective of current habitat condition.

Aspen

A total of 2,829 acres of aspen were assessed at 59 sites on Green Mountain (Table 1). Based on these assessments, 2,394 acres (84.6 %) were in late seral, 426 acres (15.1%) were mid seral, and 9 acres (0.3%) were early seral. Browse on young suckers was greater than 50% on nearly every acre assessed (2,826 acres) (Figure 3). Measures of species diversity showed 995 acres (35.2%) with greater than 60 species, 1,831 acres (64.7%) between 30 to 60 species, and the remaining 3 acres had less than 30 species present. No stands had greater than 50% recruitment (percent of aspen pace transect with a height class greater than 6 feet). Aspen stands with recruitment age classes below 50% are not sustainable for the stand to persist (Rogers 2017). Invasive species were present in half the stands assessed.

Figure 3. Excessive seasonal browse results in young hedged aspen to stay below browse line.

Aspen			
			Percent Acres
Seral State	Early		0.3%
	Middle		15.1%
	Late		84.6%
Browse on Regeneration	Light	< 26%	0.1%
	Moderate	26-50%	0%
	Severe	> 50%	99.9%
Species Diversity	High	> 60	35.2%
	Medium	30-60	64.7%
	Low	< 30	0.1%
Recruitment	Sustainable	≥ 50%	0%
	Unsustainable	< 50%	100%
Invasive Species	Present		55.4%
	Absent		44.6%
Total Acres			2,829

Table 1. Results (percentage of acres) of 2019 aspen Rapid Habitat Assessments on Green Mountain.

Mixed Mountain Shrub

A total 2,727 acres of mixed mountain shrub were assessed at 21 sites (Table 2). Conifer encroachment on Green Mountain was classified into "phases":

Phase 1 – trees present but shrubs and herbs are the dominant vegetation that influence ecological processes (hydrologic, nutrient, and energy cycles) (Figure 4).

Phase 2 – trees are co-dominant with shrubs and herbs, and all three vegetation layers influence ecological processes on the site.

Phase 3 – trees are the dominant vegetation and primary plant layer influencing ecological processes on the site.

Figure 4. Phase 1 transitioning into Phase 2 conifer encroachment at Cottonwood Crest assessment site.

Of the acres assessed, 1,116 (40.9%) were in Phase 1, 165 acres (6.1%) were in Phase 2, and the remaining 1,446 acres (53%) had no documented encroachment. Though the majority of assessed mixed mountain shrub communities appeared to have little conifer encroachment, it is important to note the boundaries of these assessed sites were defined by the presence of continuous conifer and therefore, Phase 3 conifer encroachment was not documented. It is unknown how far the conifer stands at the edge of the assessed sites had encroached into the mountain shrub community over time. Use of historical photos may provide some comparison and measure of encroachment.

Species diversity was low (less than 25 species observed) on 192 acres (7%), moderate (between 25 and 50 species observed) on 1,566 acres (57%), and high (greater than 50 species observed) on 969 acres (36%). Further, 828 acres (30.4%) had moderate hedging and 1,899 acres (69.6%) had severe hedging. There were no sites that exhibited light hedging. Invasive species were present in 65.3% or 1,780 acres. Disturbance such as excess grazing/browsing, off-road travel, and recreation were commonly observed.

Mixed Mountain Shrub			
			Percent Acres
Conifer Encroachment	Phase 1		40.9%
	Phase 2		6.1%
	None		53%
Species Diversity	High	> 50	36%
	Medium	25-50	57%
	Low	< 25	7%
Hedging	Light		0%
	Moderate		30.4%
	Severe		69.6%
Invasive Species	Present		65.3%
	Absent		34.7%
Total Acres			2,727

Table 2. Results (percentage of acres) of 2019 mixed mountain shrub Rapid Habitat Assessments on Green Mountain.

Riparian

Ten riparian assessments were completed, encompassing a total of 53 acres (Table 3). Within these assessed sites, 29 acres of primary woody species (54.7%) were moderately browsed and 24 acres (45.3%) were severely browsed. Primary woody species for these sites were quaking aspen (*Populus tremuloides*), narrowleaf cottonwood (*Populus angustifolia*), or willow (*Salix spp.*). Disturbance such as high or excessive grazing/browsing, recreational use, and roads were common throughout the riparian sites assessed. Medium riparian species diversity (between 15 and 30 species) was documented on 35 acres (66%) and high riparian species diversity (greater than 30 species) was seen on 18 acres (34%). In addition, light erosion (less than 25%) was observed on 25 acres (47.2%), moderate erosion (between 25 and 50%) on 26 acres (49.1%), and the remaining 2 acres (3.7%) exhibited severe erosion (greater than 50%) (Figure 5).

All sites had characteristics trending towards a more xeric community. These sites are defined by the presence of xeric species encroaching into the riparian area. Xeric species include big sagebrush (*Artemisia tridentata*), silver sagebrush (*Artemisia cana*), antelope bitterbrush (*Purshia tridentata*), rubber rabbitbrush (*Ericameria nauseosa*), green rabbitbrush (*Chrysothamnus spp.*), common juniper (*Juniperus communis*), Rocky Mountain juniper (*Juniperus scopulorum*), lodgepole pine (*Pinus contorta*), and/or limber pine (*Pinus flexilis*). All riparian sites assessed had one or more invasive species present. These species included cheatgrass (*Bromus tectorum*), musk thistle (*Carduus nutans*), and/or Canada thistle (*Cirsium arvense*).

Figure 5. High riparian erosion on east side of Green Mountain.

Riparian			
			Percent Acres
Browse on Primary Woody Species	Light		0%
	Moderate		54.7%
	Severe		45.3%
Riparian Species Diversity	High	< 30	34%
	Medium	15-30	66%
	Low	> 30	0%
Erosion	Light	< 25%	47.2%
	Moderate	25-50%	49.1%
	Severe	> 50%	3.7%
Total Acres			53

Table 3. Results (percentage of acres) of 2019 riparian Rapid Habitat Assessments on Green Mountain.

HABITAT QUALITY PRIORITIZATION

The aspen assessment sites have been prioritized to guide management prescriptions and improve vegetation condition and habitat value. Hierarchical weighted values placed on the habitat data was used in a "prioritization tool" or calculation (Table 4) to rank sites from highest to lowest need for treatment. Habitat quality assessed using the RHA methodology ultimately guide recommendations based on this prioritization tool and the qualifying factors outlined in Appendix B. Prioritization is focused on those sites with the highest likelihood of success while highlighting sites with severe degradation where treatments may fail due to the loss of resiliency. This tool was adapted from Prioritization of Conservation Resources (Lotze et al. 2017), Ecoregional Assessment and Biodiversity Vision Toolbox (The Nature Conservancy 2006), and Ecoregional Planning in the Northern Great Plains Steppe (The Nature Conservancy 1999).

Methods

Four quantifiable habitat condition attributes (seral state, browse of regeneration, species diversity, and recruitment) from the aspen RHA data were given hierarchical values reflective of habitat quality. Respectively, these habitat conditions were comparatively weighted: 40, 30, 20, and 10 (sum of 100). A higher total weight indicates a site that provides low habitat quality and in need of treatment. A description of how each weight was assigned to the respective habitat attribute is provided in Appendix B.

Survey Type	Habitat Attribute	Weight
Aspen	Seral State	40
	Browse of Regeneration	30
	Species Diversity	20
	Recruitment	10
	Total	100

***Qualifiers:** Wet meadows and springs, stands beyond recovery, invasive species, slope, herbivory, access, and/or lodgepole or limber pine (See Appendix B)

Table 4. Weights assigned to aspen habitat condition attributes for prioritizing treatment. Qualifiers will be considered after weighting to better categorize priority stands.

Within the defined habitat attributes, each site was assigned a site-specific value based on the RHA habitat condition data collected (i.e. early, middle or late seral) (Table 5). This site value was then multiplied by the habitat attribute weight to provide a site-specific prioritization score (Appendix C). A description and example of how these values were assigned and used is outlined in Tables 5 and 6.

Attribute	Condition	Value	Definition	Reference
Seral State	Early	1	**Early**- Aspen regeneration less than 10' is dominant due to recent disturbance	Campbell et al. 2001 (p. 303, Table 1)
	Middle	2	**Middle**- Conifer cover (including understory and overstory) exceeds 25%, OR aspen regeneration (5-15 feet) is less than 500 stems/acre, OR aspen canopy cover is less than 40% and sagebrush cover exceeds 10%.	
	Late	3	**Late**- Conifer species comprise at least half of the canopy cover, OR aspen canopy cover is less than 40% and sagebrush cover exceeds 15%, OR dominant aspen trees are greater than 100 years old.	
Browse of Regeneration	Light	1	**Light** - Browsing impacts on regeneration (stems <6 ft. tall) uncommon (< 26%).	Rogers 2017 (Appendix 2) Kitchen et al. 2019 (p. 35) Rogers et al. 2013 (p. 23)
	Moderate	2	**Moderate**- Browsing has moderate impact on regeneration (26-50%).	
	Severe	3	**Severe** - Browsing impacts clearly evident (> 50%) on regeneration. If stand has no regeneration, then it is categorized as sever.	
Species Diversity	High	1	The total number of species observed within one half hour for each site. Broken down into three categories based on the highest value plus one standard deviation equally divided by 3. **High**: >60 species **Medium**: 30-60 species **Low**: <30 species	Zhang et al. 2014
	Medium	2		
	Low	3		
Recruitment		0.0 - 1.0	The percent composition of the ≥6 foot height classes (out of browse zone) within the 50 stem transect inverted. If there are no stems within ≥6 foot height classes, then the complexity rating is 1. If 40% of the stems are within ≥6 foot height classes, then the complexity rating is 0.60. This provides a proportional rating relative to recruited height class.	Rogers 2017 (p. 61 and 75) Otting et al. 2003 (p. 2) Kitchen et al. 2019 (p. 35)

Table 5. Explanation/definition of how site-specific values were assigned based on quantitative data from aspen Rapid Habitat Assessments.

Site 1: Along Loop Rd					
Habitat Condition	**Weight**	**x**	**Site Value**	**=**	**Score**
Seral State	40		3		120
Browse of Regeneration	30		3		90
Species Diversity	20		2		40
Recruitment	10		1		10
TOTAL	100		-		**260**

Table 6. A sample calculation of the aspen prioritization tool using the weights (Table 4) and site-specific values (Table 5). This site is in late seral (3), with severe browse (3), medium species diversity (2) and no recruitment (1). The site value assigned to each site-specific habitat condition is multiplied by the weighted habitat attribute values to produce a total weighted value of 260. In comparison to all other sites this value ranks as one of the first aspen stands in need of treatment. Managers can then use qualifiers such as access to decide the best treatment type and priority for each stand.

Results

Results of the site-specific prioritization is provided in Figure 6 and Appendix C. Areas ranked as the highest priority (Figure 6, red to orange) are characterized as late seral with high browse on regeneration, low understory species diversity, and little recruitment. As the sites become lower priority (Figure 6, yellow to green), these characteristics trend toward less severe conditions. These results are intended for managers to make guided decisions on the order, timing, and type of treatment for aspen stands on and around Green Mountain, Wyoming.

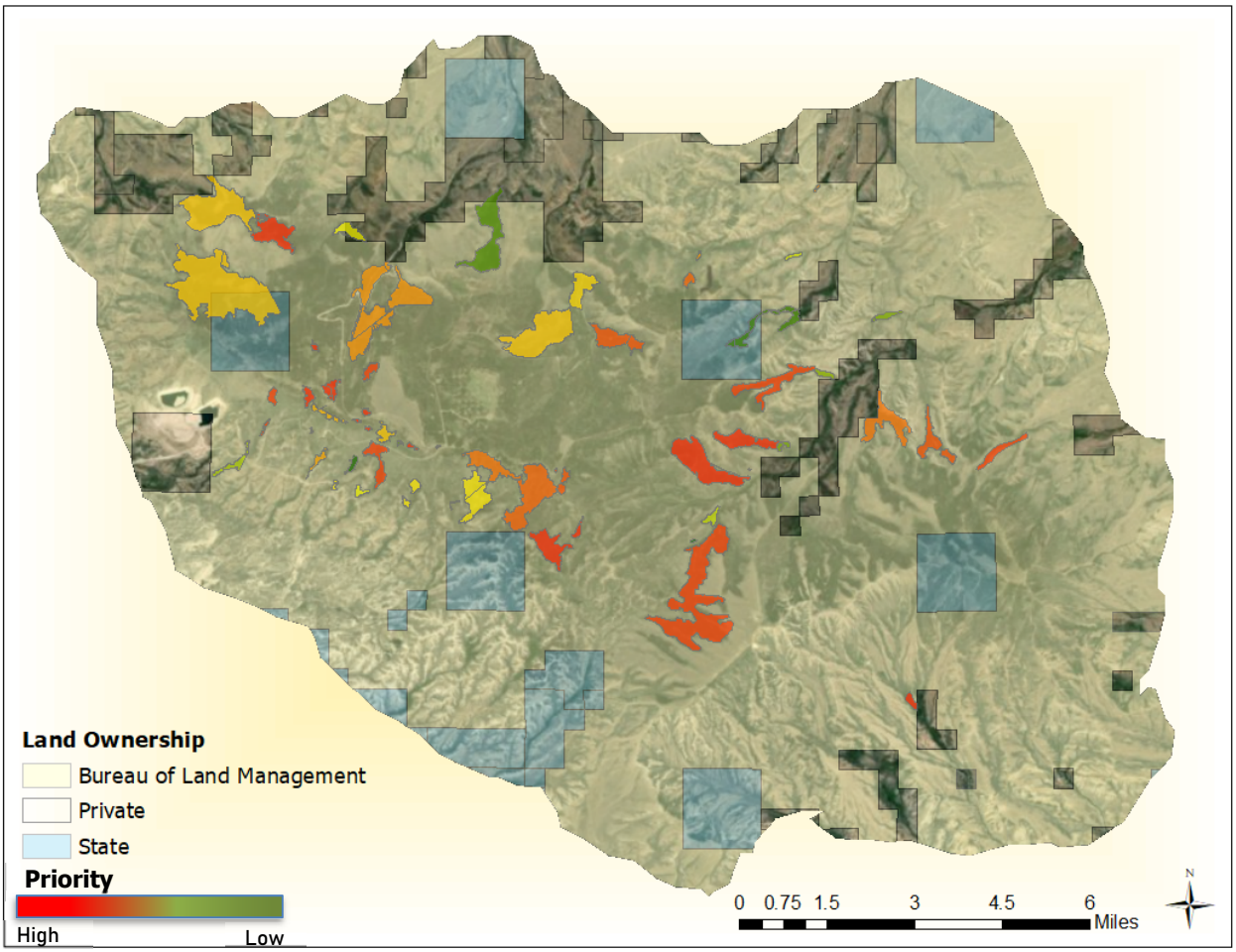


Figure 6. Results of prioritization tool. Aspen stands in red to orange are ranked as the highest priority while stands in yellow to green are of lower priority for treatment.

PRIORITIZED TREATMENT PHASES

The order in which treatment may occur is broken down into phases (Figure 7, Appendix D). Sites were grouped into phases based on site priority, whether the site was previously treated, the site's geographic location, and recommended treatment. Each phase is not indicative of an exact time, but rather a proposed order and grouping of site treatment to disperse treatment across the mountain over time to spread browse more evenly and ultimately increase the likelihood of treatment success. Treatment timing should be closely coordinated between WGFD and BLM.

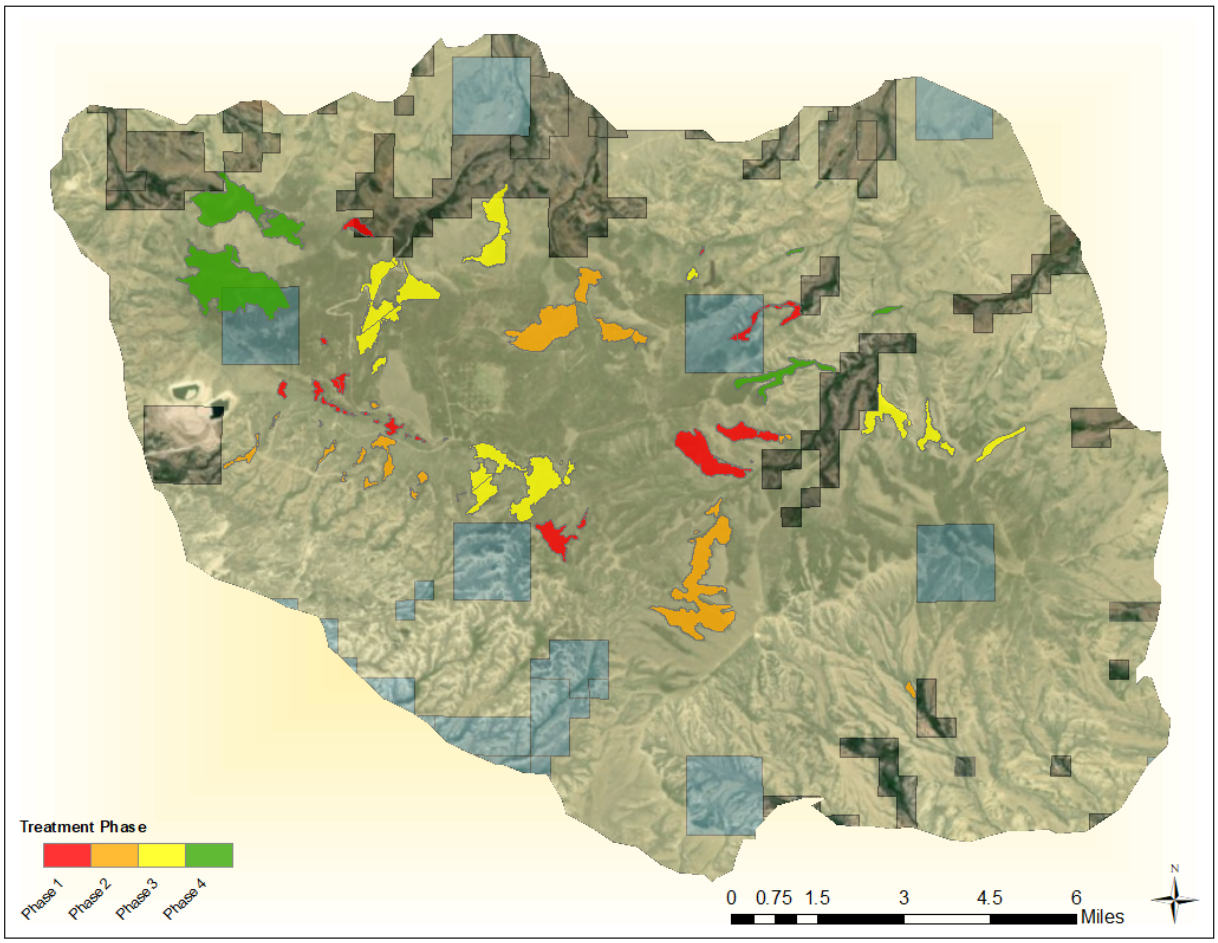


Figure 7. Dispersed aspen treatment broken down into phases to better alleviate browse and guide management based on high priority stands.

RECOMMENDATIONS

The following management recommendations and techniques are intended to be used in concert with the prioritized and phased approach outlined above and in Appendices C and D. These recommendations are broad and are guidelines for developing and implementing treatment prescriptions and other management considerations on the Green Mountain greater area. Where possible, treatments will reasonably consider seasonal use by hunters in order to reduce disturbance of harvest opportunity.

Progressive and adaptive land management and stewardship by private landowners, agricultural producers, state, and federal land management agencies is required to attain a landscape scale approach and sustain a healthy and balanced ecosystem. Though funding and planning resources to implement treatment and monitoring may be limited, effort should be invested in locations where the greatest benefit is realized. Kitchen et al. (2019) sums up the intent of these management recommendations well and can be applied broadly:

> *"…no guidelines for aspen management can anticipate all situations. The intent here is to promote holistic thinking in management decisions. When action precedes understanding—of either the larger ecological context or the agents operating on aspen in specific sites—the probability of irrevocable loss of aspen increases. Conversely, failure to act can also yield negative consequences. Predecision and postdecision monitoring is critical when management outcomes are uncertain. Documentation of restoration failures, as well as successes, is an important component of management..."*

Aspen

Aspen stands are often rich in diversity of forbs, grasses, and shrubs providing high nutritional value and unique habitat for many species. Elk (*Cervus canadensis*), mule deer (*Odocoileus hemionus*), and moose (*Alces alces*) require the succulent forage, cover, and parturition habitat provided by aspen during the spring and summer months (Peterson & Peterson 1992, Mackie et al. 1998). With this rich vegetative community, water retention is often higher than many other forest types, providing an oasis for all life.

At the individual level, aspen trees host a diverse suite of insects and have a higher density of cavities than conifers. Large stands of aspen trees are strongly preferred by bats and primary cavity excavators (Vonhof 1996) such as house wren (*Troglodytes aedon*), norther flicker (*Colaptes auratus)*, downy woodpecker (*Picoides pubescens*), and hairy woodpecker (*Leuconotopicus villosus*) as well as red squirrels (Tamiasciurus hudsonicus). These centers of biodiversity in turn provide a source of prey for many predatory bird species (Reynolds et al. 1992). For example, the American kestrel (*Falco sparverius)*, northern goshawk (*Accipiter gentilis*), golden eagle (*Aquila chrysaetos*), and red-tailed hawk (*Buteo jamaicensis*) are all resident to Green Mountain. Conifer and sagebrush encroachment threaten aspen persistence on Green Mountain and throughout the intermountain West. Environmental factors contributing to aspen decline include fire suppression, excessive browse by wild and domestic ungulates, and loss of water retention on the landscape. Failure to manage for these factors will result in the loss of aspen and associated plant communities (Kitchen et al. 2019).

Recommendation 1: Create a mosaic of late, early, mid seral stands.

Figure 8. Hadsell Burn on Green Mountain. March 30, 2015.

- Implement disturbance interval reflective of natural fire regimes within the area (Figure 8). Continuous disturbance intervals are required to restore the natural age/height class distribution essential for proper functioning aspen communities (Campbell et al. 2001, Shepperd et al. 2006, Shepperd et al. 2004).
- Buffer treatment 50-100ft. outside aspen stand to allow for stand expansion.
- Consider site specific habitat conditions when assessing treatment options. A combination of multiple treatment types is necessary and dependent on site-specific conditions such as invasive species, terrain, access, etc. (Shepperd et al. 2006, Rogers 2017). If invasive species are present, plan a treatment that will not encourage further distribution.
- Allow naturally ignited fires to burn through late seral aspen communities (opposed to full suppression) to encourage suckering after the disturbance.

Recommendation 2: Maintain and enhance understory species diversity (>30 species) and increase water availability by reducing competition from encroaching xeric species.

- Remove and/or thin conifers through mechanical means (e.g. mulching, cutting) to reduce competition (Shepperd et al. 2006, Shepperd et al. 2004).
- Prescribe fire using spring or fall prescriptions to optimize aspen and herbaceous species regeneration (Shepperd 2004, Kitchen et al. 2019).
- Protect springs and seeps supporting aspen communities to ensure health and vigor of understory herbaceous species (Shepperd 2006). Consider BDA's or Zeedyk Structures to enhance springs and seeps, as appropriate.
- Monitor, map and treat invasive species to preserve native diversity (Shepperd et al. 2001).

Recommendation 3: Reduce browse on regeneration and recruitment.

- Conduct treatments on a larger scale to disperse browsing pressure. In areas where wildlife or livestock congregate use management strategies (i.e. riders, temporary fencing, etc.) to ensure suckers can grow above the browse zone (Campbell et al. 2001, WGFD 2015).
- Spread treatment evenly across the mountain (see suggested treatment phases in Appendix D).
- Defer grazing post-fire for at least two full growing seasons. This time is critical for aspen recruitment and without it, the stand may not reestablish (Kilpatrick and Abendroth 2001).

- Treatments to induce suckering (regeneration) should be carefully evaluated in areas where moderate to severe browse is documented (Bartos et al. 1998).
- Restore recruitment age classes (>6ft tall trees). Twenty five out of the 50 stem pace transect (50%) should fall within the 6-10+ age class category (Rogers 2017, WGFD 2015).
- Monitor browse after treatment. A successful treatment should indicate an overall upward trend of age class distribution (Figure 9) and a decrease of browse level from the baseline data referenced in this document. Any browse over 30% is categorized as severe (Rogers et al. 2013).

Figure 9. Aspen regeneration after lop and scatter conifer treatment on south face of Green Mountain.

Recommendation 4: Continue stand monitoring post treatment

- Conduct a 50-stem pace transect to document age class diversity and browse (WGFD 2019a).
- Recapture designated photo points in the four cardinal directions within the stand and one photo outside (WGFD 2019a).
- Post treatment monitoring is recommended in years 1, 3, 5, and 10 (Figure 10).
- Reduce impacts of recreation such as new two-tracks after conifer removal.

Figure 10. Conifer encroachment post treatment on south face of Green Mountain. Further monitoring required for follow-up treatment.

Mixed Mountain Shrub

Mountain shrubs grow on the foothills and parks of Green Mountain. After forbs and grasses have cured, mountain shrub zones become an important source of nutrients for many species (WGFD 2015). Pronghorn (*Antilocapra americana*) are the predominant species using these habitats (Figure 11), but mule deer, elk, feral horses (*Equus caballus*), and cattle also utilize these habitats/vegetation communities.

The primary woody species within these zones are big sagebrush (*Artemisia tridentata*), antelope bitterbrush (*Purshia tridentata*), and rubber rabbitbrush (*Ericameria nauseosa*). These species are often a minor component of the landscape but are highly selected for their forage and nutritional value (WGFD 2015). The greatest threat to these communities on Green Mountain is excessive browse, lack of age class diversity, and invasive species.

Figure 11. Pronghorn north of Green Mountain.

Recommendation 1: Enhance or maintain age class diversity by implementing management and monitoring techniques to establish early seral plant communities on the landscape.

- Prescribe burn or mow parks and meadows with moderate to low age class diversity (WGFD 2017b). Annual stem growth (biomass) is greater on recently burned plants in the absence of heavy browse pressure (Cook et al. 1994).
- Prescribe burn or mechanically treat mixed mountain shrub stands with phase 2 or greater conifer encroachment (WGFD 2017b).
- Conduct pace transects pre and post treatment on primary woody species (25 plants) to determine age classes present (Figure 12) on the landscape (Seedling: 1-3 years old; Young: stem < 4¼" diameter and/or not producing seeds; Mature: vigorous growth with branching structure; Decadent: 50% of plant branches are dead; and Dead) (WGFD 2019b).

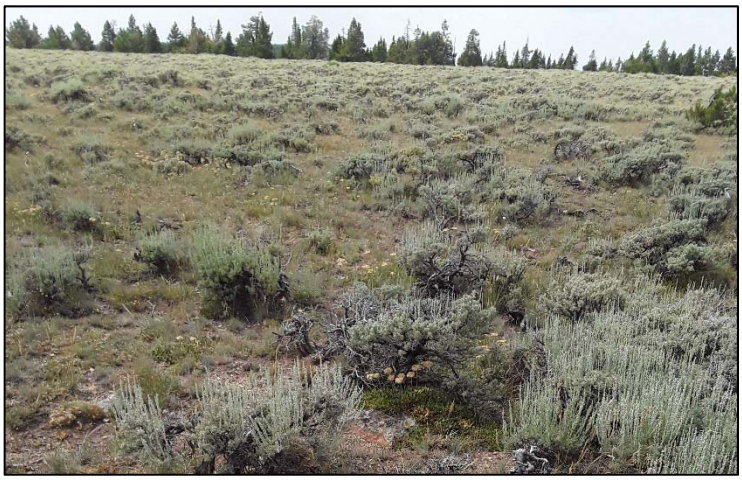


Figure 12. Mountain big sagebrush community with three distinct age classes.

Recommendation 2: Manage herbivory to not exceed 40% of annual leader growth; use above these levels can be detrimental to the vigor and survival of mountain shrub.

- Conduct a 25-stem pace transect to record percent hedging on leader growth if treatment is planned to document pre and post condition of shrub community (years 1, 3, 5, and 10 post treatment) (WGFD 2019b).
- Continue feral horse management.
- Work cooperatively with permittees to manage livestock grazing and improve trends within mountain shrub communities (WGFD 2017b).

Recommendation 3: Manage invasive species.

- Inventory and map invasive species (WGFD 2017b, WGFD 2015).
- Develop invasive species management plan with a focus on cheatgrass to prioritize treatment areas and evaluate preferential grazing strategies post treatment.
- Work with Fremont County Weed and Pest to consider best available science to implement treatment protocols for all noxious weed species (WGFD 2017b).

Riparian

Riparian corridors are dispersed across Green Mountain. Wet meadows, springs, seeps, and streams all provide lush, highly nutritious vegetation for forage and cover yearlong. Balancing use in these rich communities is challenging and overutilization is common (WGFD 2015). Though resilient, these riparian areas are quickly fading (Leonard et al. 1997). Disturbance such as overgrazing, beaver removal and explorative mining has caused excessive erosion, head-cutting, and loss of many of the riparian areas on Green Mountain. These habitats, given proper protection, can be lush and provide important habitat for wildlife (Figure 13).

Figure 13. Fenced riparian area in excellent condition with diverse understory and forage. South slope of Whiskey Peak.

Recommendation 1: Plan livestock management based on site specific conditions.

- Prescribed rotational grazing with differing intensity and season of use requirements may benefit riparian habitats (Leonard et al. 1997).
- Evaluate potential for off-site water developments to reduce livestock impacts on riparian areas.
- Protect important springs, seeps, and stream habitat with temporary or permanent fencing to improve water retention in riparian habitats (WGFD 2015).
- Monitor livestock use through a pace transect to document woody species use (preferred less than 30% browse).

Recommendation 2: Increase water availability by reducing conifer encroachment.

- Remove conifer from riparian habitats using site-specific treatment prescriptions (i.e. mechanical, fire, etc.).

Recommendation 3: Implement Beaver Dam Analogs (BDA) (Figure 15) and/or beaver reintroduction.

- Implement recommended BDA or Zeedyk structures to stabilize erosion or headcutting (Appendix E).
- Implement targeted stream restoration through beaver reintroduction in areas with adequate cover and forage.
- Reestablish forage and cover through willow and cottonwood pole planting.

Figure 8. Beaver Dam Analogs (BDAs) used on the Maiers property on northwest end of Green Mountain.

Recommendation 4: Manage invasive species.

- Treat Canada thistle and musk thistle and other invasive species as observed. These species are not yet abundant and successful treatment is feasible.

Recommendation 5: Reduce recreational impact on stream crossings and riparian corridors.

- Install signs prohibiting off road travel or the creation of new roads.
- Actively enforce violations that negatively impact riparian areas.

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APPENDIX A. RAPID HABITAT ASSESSMENT SURVEYS

2019 Aspen Rapid Habitat Assessment

Mgmt. Objective: Productive, diverse and sustainable aspen communities that are capable of supporting seasonal habitat needs for mule deer.

Site Name:		Database Name:	
Date:	Observers:		
Herd Unit:		UTM: T	E N
Site Description			
Current year growing conditions (circle): Below Normal Normal Above Normal			
Habitat Function (circle all that apply): Forage Cover Water			
Disturbance History (optional):			
Wildlife Species: Season: Sum Win All Mig	Wildlife Species: Season: Sum Win All Mig	Wildlife Species: Season: Sum Win All Mig	Livestock Species: Season: Sum Win All Mig
Category A: Seral State			
Conifer species comprise at least half of the canopy cover OR Aspen canopy cover is less than 40% and sagebrush cover exceeds 15% OR Dominant aspen trees are greater than 100 years old		Late Seral	
Conifer cover (including understory and overstory) exceeds 25% OR Aspen regeneration (5-15 ft) is less than 500 stems/acre OR Aspen canopy cover is less than 40% and sagebrush cover exceeds 10%		Mid Seral	
Aspen regeneration less than 10ft is dominant due to recent disturbance		Early Seral	
Aspen stand has 3+ age classes and appears to be functioning at a high level		Proper Function	
Category B: Herbivory			
Annual Herbivory Grass/Forb (optional): NA Light Moderate Severe			
Height Class Browse Level (50 trees <6in DBH)	Browsed	Not Browsed	
0-3 ft			
3-6 ft			
6-10 ft			
>10 ft			
Percent Browsed= /50	Herbivory Category: (THAB): Light (0-10%) Moderate (11-30%) Severe (>30%)		
Browsing Species: Season: Sum Win All Mig	Browsing Species: Season: Sum Win All Mig	Browsing Species: Season: Sum Win All Mig	Browsing Species: Season: Sum Win All Mig
Category C: Species Diversity			
# Forb Species:	Most Abundant 3 Forbs (optional):		
# Grass Species:	Most Abundant 3 Grasses (optional):		
# Shrub Species:	Most Abundant 3 Shrubs (optional):		
# Tree Species:	Most Abundant 3 Trees (optional):		
List Species Present in Survey Area (optional):			
Invasive Spp: None Present Management Limiting	Species Diversity Category (THAB): Low Medium High	Community Type (Mueggler 1988) (optional):	
Current Habitat Conditions			
Reasons for Not Meeting Management Objective:			
Meets Primary Objective (THAB): Yes Partial, trending up Partial Partial, trending down No			
Notes:			

Photos	N	S	E	W	Outside

Figure 9. Aspen rapid habitat assessment form (WGFD 2019a).

2019 Rangeland Rapid Habitat Assessment

Mgmt. Objective: Resilient, productive, diverse rangelands dominated by native species which support seasonal habitat needs of mule deer.

Site Name:			Database Name:		
Date:	Observers:				
Herd Unit:			UTM: T	E	N
Site Description					
Current year growing conditions (circle): Below Normal Normal Above Normal					
Habitat Function (circle all that apply): Forage Cover Water					
Disturbance History (optional):					
Wildlife Species: Season: Sum Win All Mig	Wildlife Species: Season: Sum Win All Mig	Wildlife Species: Season: Sum Win All Mig	Livestock Species: Season: Sum Win All Mig		
Primary Woody Species					
Primary Woody Species (min 5% composition):					
Age class structure: >= 3 classes with young/seedlings only young due to disturbance	2 age classes no seedlings only young and mature/decadent	only mature/decadent			
% Seedling:	% Young:	% Mature:	% Decadent:	% Dead	Relative % of Shrub Composition:
Primary Woody Species Hedging Class: Light Moderate Severe					
Secondary Woody Species (Optional)					
Secondary Woody Species:					
Age class structure: >= 3 classes with young/seedlings only young due to disturbance	2 age classes no seedlings only young and mature/decadent	only mature/decadent			
% Seedling:	% Young:	% Mature:	% Decadent:	% Dead	Relative % of Shrub Composition:
Secondary Woody Species Hedging Class: Light Moderate Severe					
Category A: Seral State and Site Function					
Conifer Encroachment: NA Phase 1 Phase 2 Phase 3			Sagebrush Cover Class: NA <5% 5-15% 16-25% > 25%		
Percent Bare Ground (optional): <20% 21-40% >40%			Relative Comp. Shrub/Grass/Forb (optional): Good Fair Poor		
Seral State of the Site (THAB): Early Middle Late					
Category B: Herbivory					
Annual Herbivory Grass/Forb: NA Light Moderate Severe			Herbivory Category (THAB): Light (0-10%) Moderate (11-30%) Severe (>30%)		
Category C: Species Diversity					
ESD (optional):					
# Forb Species:	Most Abundant 3 Forbs (optional):				
# Grass Species:	Most Abundant 3 Grasses (optional):				
# Shrub Species:	Most Abundant 3 Shrubs (optional):				
# Tree Species:	Most Abundant 3 Trees (optional):				
List Species Present in Survey Area (optional):					
Invasive Spp: None Present Management Limiting			Site Characteristics (THAB): Xeric Mesic	Species Diversity (THAB): Low Medium High	
Current Habitat Conditions					
Reasons for Not Meeting Management Objective:					
Meets Primary Objective (THAB): Yes Partial, trending up Partial Partial, trending down No					
Notes:					
Photos	N	S	E	W	G

Figure 10. Rangeland (mixed mountain shrub) rapid habitat assessment form (WGFD 2019b).

2019 Riparian Rapid Habitat Assessment

Mgmt. Objective: Resilient, productive, diverse riparian areas dominated by native species which support seasonal habitat needs of mule deer.

Site Name:		Database Name:	
Date:	Observers:		
Herd Unit:		UTM: T E N	
Site Description			
Current year growing conditions (circle): Below Normal Normal Above Normal			
Habitat Function (circle all that apply): Forage Cover Water			
Disturbance History (optional):			
Wildlife Species: Season: Sum Win All Mig	Wildlife Species: Season: Sum Win All Mig	Wildlife Species: Season: Sum Win All Mig	Livestock Species: Season: Sum Win All Mig
Key Forage Woody Species			
Key Forage Woody Species:		Average Height (ft):	
Relative % of Woody Species Composition:		Recruitment Occurring: Y N	
Browse Use of Key Forage Woody Species: NA Light Moderate Severe			
Key Cover Woody Species			
Key Cover Woody Species:		Average Height (ft):	
Relative % of Woody Species Composition:		Recruitment occurring: Y N	
Browse Use of Key Cover Woody Species: NA Light Moderate Severe			
Category A: Site Function			
Average Riparian Width: < 20ft 21-50ft 51-100ft 101-200ft >200ft		Stream Type: Perennial Ephemeral	
Bank Erosion: <25% 26-50% 51-75% >=76%		Bank Incision: Y N	
Beaver Activity: Relict Inactive w/ Ponds Active w/o Ponds Active w/ Ponds Unsuitable Suitable but no evidence of any activity			
Evidence of heavy livestock use: Y N	Vertical Structure Categories Present: Short (<3') Mid (3-15') Tall (>15')		
Xeric Species Encroaching: Y N	Is Spruce/Fir 50% of Relative Woody Species Composition in Site: Y N NA		
Category B: Herbivory			
Annual Herbivory Grass/Forb: NA Light Moderate Severe	Herbivory Category (THAB): Light (0-10%) Moderate (11-30%) Severe (>30%)		
Category C: Species Diversity			
Riparian Zone Herbaceous Plant Community: Native Introduced Mix			
# Forb Species:	Most Abundant 3 Forbs (optional):		
# Grass Species:	Most Abundant 3 Grasses (optional):		
# Shrub Species:	Most Abundant 3 Shrubs (optional):		
# Tree Species:	Most Abundant 3 Trees (optional):		
List Species Present in Survey Area (optional):			
Invasive Spp: None Present Management Limiting	Species Diversity (THAB): Low Medium High		
Current Habitat Conditions			
Reasons for Not Meeting Management Objective:			
Meets Primary Objective (THAB): Yes Partial, trending up Partial Partial, trending down No			
Notes:			

Photos	View Upstream	View Downstream	From Left Bank	From Right Bank	Ground

Figure 11. Riparian rapid habitat assessment form (WGFD 2019c).

APPENDIX B. ASPEN HABITAT ATTRIBUTES AND QUALIFIERS

Aspen Habitat Attributes

Seral state was ranked as the most important attribute. The assessment of seral state within each stand was evaluated by the following criteria from Campbell et al. 2001:

Early- Aspen regeneration less than 10' is dominant due to recent disturbance.

Middle - Conifer cover (including understory and overstory) exceeds 25%, OR aspen regeneration (5-15 feet) is less than 500 stems/acre, OR aspen canopy cover is less than 40% and sagebrush cover exceeds 10%.

Late- Conifer species comprise at least half of the canopy cover, OR aspen canopy cover is less than 40% and sagebrush cover exceeds 15%, OR dominant aspen trees are greater than 100 years old.

In late seral succession, conifer chokes out aspen and dries the soil creating high risk for stand loss (Shepperd 2006). Due to the complexity of seral state determination and significance to a healthy aspen stand, this attribute was assigned a weight of 40 (Table 5).

Browse of Regeneration was ranked the second most important attribute. Heavy browse will stunt regeneration or stop it all together (Kitchen et al. 2019). An aspen stand will not persist if browse exceeds regeneration. Browse was recorded within a 50-stem pace transect, stems less than 6 feet tall were recorded as the regeneration age class (Rogers 2017 & Kitchen et al. 2019). Those stems within the regeneration age were used to calculate percent browse of regeneration (Table 6). This attribute was assigned a weight of 30 (Table 5).

Species Diversity was ranked as the third most important attribute. Low species diversity is not a direct indicator of aspen stand health; however, it can reflect habitat quality and ultimately provide insight on long-term health of a stand (Rogers 2017, Shepperd e. al. 2006). The number of species within each site was used to classify stand diversity (Table 6). Because species diversity provides a broad perspective of overall habitat condition it was assigned a weight of 20 (Table 5).

Recruitment was ranked lowest. Though recruitment has high importance for stand persistence, it was ranked lower due to its dependence on multiple inhibiting factors such as browse and encroachment (Kitchen et al. 2019). Recruitment should still be considered when determining treatment options in order to infer limiting conditions of a stand. The percent composition of stems greater than or equal to 6 feet tall within the 50-stem transect was quantified to classify recruitment (Rogers 2017, Otting et al. 2003, & Kitchen et al. 2019). Recruitment was assigned a weight of 10 (Table 5).

Aspen Qualifiers

Qualifiers listed in Table 1 were considered after the stand prioritization tool analysis. Though necessary for considering management decisions, qualifiers were attributes with minimal quantifiable data associated with them and therefore could not be added to the prioritization tool. Qualitative review of each individual aspen stand using these qualifiers ensure representative site-specific prioritization. A description of how each qualifier was used in the prioritization process is outlined below:

Wet meadows and springs were recorded if present. If this qualifier occurs within an aspen stand, then it may have a higher likelihood of regenerating after treatment (Shepperd 2006 & Doucet 1989).

Stands beyond recovery may have disease, little to no regeneration, and/or have such high browse pressure that even with any form of treatment, they will not regenerate. Due to the nature of the prioritization tool, these stands may be ranked highest since they are typically in late seral and have high browse. Ultimately, these stands will be removed from prioritization but still acknowledged to reflect overall habitat condition on Green Mountain.

Invasive species and *cattle use* will be considered when identifying types of management. Though it may not change the way each site is prioritized, it will help guide managers. A site with cheatgrass may require post-fire herbicide application and grazing rest.

Slope effects how heavily livestock may use the area and what type of treatment is practical. Typically, sites with >40% slope have minimal cattle use and therefore would have a greater likelihood of treatment success with less browse pressure (Ditsch et al. 2006). Sites with too steep of slopes may be difficult to access which may change the type of treatment.

Access will help guide management type and prioritization. A site with low access is not feasible for a burn if a fire engine cannot access it but may be high priority since it is out of the public eye.

Lodgepole and limber pine presence will guide management type. Lodgepole responds positively to fire while limber pine can be more sensitive to disturbance. Understanding how these species respond to different treatment types will identify site specific management.

APPENDIX C. SITE PRIORITIZATION AND TREATMENT RECOMMENDATIONS

Location Name	Weight	Rank	Qualifiers	Treatment
Along Loop Road	260	1	spring, steep slope, less than 1/2 mile from road, out of public eye, limber pine	Lop and scatter treatment with good burn potential due to existing road fire breaks and abundance of springs and seeps. Monitor for cheatgrass. Treat in conjunction with Along Loop Rd 4, West Sagebrush Park 2, Upper South Face, Upper South Face 2, Upper South Face 3, and Upper South Face 5.
Anaconda Rd 2	260	1	seasonally wet, moderate slope, access on Anaconda Rd, cheatgrass, limber pine.	May be too far gone. Field visit required to verify treatment needs.
East Sagebrush Park 3	260	1	too far gone for treatment, potential disease in clone	May be too far gone. Potential for fuels crew thinning. Lop and scatter to block user created road.
East Wild Horse 1	260	1	spring, cheatgrass, Canada thistle, musk thistle, cattle, limber and lodgepole, good access, moderate slope	Lop and scatter to inhibit cattle use or Rx burn with at least 2 years deferment. Treat in conjunction with East Wild Horse 2. Cheatgrass and thistle treatment. Thistle eradication is possible due to low level infestation.
East Wild Horse 2	260	1	spring, musk thistle, cheatgrass, Canada thistle, moderate slope, cattle use, good access, lodgepole and limber	Lop and scatter to inhibit cattle use or Rx burn with at least 2 years deferment. Treat in conjunction with East Wild Horse 1. Cheatgrass and thistle treatment. Thistle eradication is possible due to low level infestation.
Elk	260	1	spring, flat, lodgepole and limber	Small isolated stand. Potential lop and scatter in conjunction with Snow stand.
Jost Creek 2	260	1	may be too far gone, dry drainage, Canada thistle, less than 1 mile from road.	Field visit required. May be too far gone. Difficult access. Canada thistle treatment.
North Sheep Creek Park	260	1	moderate slope, lodgepole	Treat and buffer pockets of vigorous aspen and evaluate the rest of the stand for additional treatment. PCT or thin lodgepole.
Snow	260	1	spring, moderate slope, good access, lodgepole dominant	Lop and scatter. Evaluate Rx burn - bounded by roads on three sides.

Stratton Exclosure on Abel Creek – Aspen	260	1	stream, cheatgrass, flat, good access, cattle use, limber	Maintain exclosure. Fuels crew remove conifers.
Upper Crooks 1	260	1	access by ATV or foot, moderate slope, lodgepole and limber	Combination Lop and scatter/cut pile pending field investigation.
Upper Crooks 3	260	1	cheatgrass, access, moderate slope, lodgepole and limber	Treat in conjunction with Upper Crooks 1. Cheatgrass treatment.
Upper South Face	260	1	access by foot less than 1 mile, steep slope, limber dominant	Lop and scatter treatment with good burn potential due to existing road fire breaks and abundance of springs and seeps. Monitor for cheatgrass. Treat in conjunction with Along Loop Rd 4, West Sagebrush Park 2, Upper South Face, Upper South Face 2, Upper South Face 3, and Upper South Face 5.
Upper Southface 5	260	1	wet meadows, moderate slope, access by foot less than 1 mile, limber dominant	Lop and scatter treatment with good burn potential due to existing road fire breaks and abundance of springs and seeps. Monitor for cheatgrass. Treat in conjunction with Along Loop Rd 4, West Sagebrush Park 2, Upper South Face, Upper South Face 2, Upper South Face 3, and Upper South Face 5.
West Sagebrush Park	260	1	spring, wet meadow, flat, good access on loop road, lodgepole dominant	Combination lop scatter/cut pile pending field investigation.
West Sagebrush Park 2	260	1	moderate slope, good access on loop road, lodgepole dominant	Lop and scatter treatment with good burn potential due to existing road fire breaks and abundance of springs and seeps. Lack of cheatgrass. Treat in conjunction with Along Loop Rd 4, West Sagebrush Park 2, Upper South Face, Upper South Face 2, Upper South Face 3, and Upper South Face 5.
Lower Steep	259.8	2	cheatgrass, moderate slope, good access, limber and lodgepole	Lop/scatter with hinge cutting to protect from livestock. Heavy conifer encroachment. Documented mule deer use.
Middle South Face 2	259.8	2	seasonal wetland, cheatgrass, access, limber and lodgepole	Lop/scatter with Rx burn - road for fire break. Follow-up with cheatgrass treatment.
Rabbit Creek	259.8	2	stream, cheatgrass, Canada thistle, musk thistle, cattle use, moderate	Lope and scatter and hinge cut. Weed treatment.

			slope, good access, lodgepole and limber	
Sagebrush Park 3	259.8	2	spring, wet meadow, moderate slope, good access, lodgepole and limber	Combination Lop and scatter/cut pile pending recreation VRM evaluation.
Steep	259.8	2	cheatgrass, steep slope, access by foot, dominant limber	Lop and scatter. Evaluate cheatgrass treatment.
Stratton Ridge 2	259.8	2	spring, good access, moderate slope, lodgepole and limber	Lop and scatter or thinning in preparation for potential Rx burn. Roads on two sides for fire breaks.
Whiskey Peak 5	259.8	2	stream, cheatgrass, good access from two track, cattle use, limber dominant	Lop and scatter prep for Rx burn in conjunction with Whiskey Peak 2 and Whiskey Ridge 6. Cheatgrass treatment.
Wild Horse Rd	259.8	2	access from Wild Horse Rd, limber and lodgepole	Lope and scatter and treat with Jost Creek stands.
East Cottonwood Campground	259.6	3	spring, steep to moderate slope, cattle, good access, heavy recreation, lodgepole and limber	Cut and pile due to recreational use. More conservative prescription.
East Jost Creek 2	259.6	3	moderate slope, good access, lodgepole	Lop and scatter. Buffer at 100ft to promote expansion. Treat with Jost Creek.
Whiskey Peak 2	259.6	3	stream, cheatgrass, good access from two track, cattle use, lodgepole dominant	Lop and scatter prep for Rx burn in conjunction with Whiskey Peak 5 and Whiskey Ridge 6. Cheatgrass treatment.
East Jost Creek	259.4	4	moderate to steep slope, good access, lodgepole and limber	Lop and scatter. Buffer at 100ft to promote expansion. Treat with Jost Creek 2.
Spring Creek 2	259.4	4	stream, moderate slope, cheatgrass, access by ATV or foot, cattle use, lodgepole and limber	Potential lop and scatter however, access is difficult.
Jost Creek Untreated	259.2	5	moderate slope, good access, lodgepole and limber	Treat in conjunction with Jost Creek Treated, Jost Creek 2, East Jost Creek, East Jost Creek 2, Wild Horse Rd. Combination of treatments: Cut and Pile near road, lop/scatter with Rx burn if possible.
Whiskey Ridge6	259.2	5	stream, spring, Canada thistle, cheatgrass, access from two track, cattle use, limber and lodgepole	Lop and scatter prep for Rx burn in conjunction with Whiskey Peak 5 and Whiskey Peak 2. Cheatgrass and Canada thistle treatment.
Owl Hills	259	6	spring, cheatgrass, flat, good access, limber	Lop and scatter and treat weeds.

Spring Creek 3	258.8	7	stream, moderate slope, cheatgrass, access by ATV or foot, cattle use, lodgepole and limber	Evaluate potential for BDAs to improve hydrology. Potential lop and scatter however, access is difficult.
West Cottonwood Creek North	258.8	7	stream, cheatgrass, moderate slope, cattle use, good access on loop road, lodgepole dominant	Combination Lop and scatter/cut pile pending recreation VRM evaluation.
Anaconda Rd 4	258.6	8	cheatgrass, access on Anaconda Rd, limber pine	Lop and scatter, cheatgrass treatment recommended.
Along Loop Road 4	258.4	9	wet meadow, spring, steep slope, less than 1/2 mile from road, out of public eye, limber pine	Lop and scatter treatment with good burn potential due to existing road fire breaks and abundance of springs and seeps. Monitor for cheatgrass. Treat in conjunction with Along Loop Rd 4, West Sagebrush Park 2, Upper South Face, Upper South Face 2, Upper South Face 3, and Upper South Face 5.
Sheep Creek Park	240	10	springs, stream, wet meadow, cheatgrass, Canada thistle, good access, lodgepole dominant	Treat and buffer pockets of vigorous aspen and evaluate the rest of the stand for additional treatment. PCT or thin lodgepole.
Sheep Creek Park 2	240	10	wet meadow, spring, steep to moderate slope, cattle use, lodgepole dominant, moderate access	Lop and scatter/hinge cut.
Upper South Face 2	240	10	stream, wet meadow, spring, good access, steep slope, limber and lodgepole	Lop and scatter treatment with good burn potential due to existing road fire breaks and abundance of springs and seeps. Monitor for cheatgrass. Treat in conjunction with Along Loop Rd 4, West Sagebrush Park 2, Upper South Face, Upper South Face 2, Upper South Face 3, and Upper South Face 5.
West Cottonwood Campground	240	10	spring, Canada thistle, steep slope, good access, lodgepole dominant	Treatment should be conducted in the stand to protect campground from wildfire. Combination of lop/scatter and cut and pile where necessary for entire stand around campground.
North Cottonwood Campground	238.2	11	stream, cheatgrass, Canada thistle, moderate slope, good access, lodgepole and limber	Treatment should be conducted in the stand to protect campground from wildfire. Combination of lop/scatter

				and cut and pile where necessary for entire stand around campground.
Jost Creek Treated	220	12	moderate slope, good access, lodgepole and limber	Treat in conjunction with Jost Creek Untreated, Jost Creek 2, East Jost Creek, East Jost Creek 2, Wild Horse Rd. Combination of treatments: Cut and Pile near road, lop/scatter with Rx burn if possible.
Lower South Face	220	12	moderate slope, cheatgrass, limber, good access	Previous treatment with little regeneration. Cheatgrass treatment.
Lower South Face 3	220	12	spring, cheatgrass, moderate slope, good access, limber	Easily treatable by cutting sparse conifer. Treat cheatgrass.
Middle South Face 3	220	12	cheatgrass, foot access, limber	Conduct maintenance on previous conifer removal. Cheatgrass treatment.
South Maiers	219.6	13	stream, cheatgrass, moderate slope, good access, cattle use, lodgepole and limber	Treated 2017. Monitor results. Evaluate potential for cheatgrass treatment.
Lower South Face 2	219.4	14	spring, cheatgrass, Canada thistle, moderate slope, good access, limber	Protect spring from livestock. Treat cheatgrass and Canada thistle. Remove limber pine from aspen and surrounding shrub.
Spring Creek 1	219.2	15	stream, flat, cheatgrass, cattle use	Evaluate potential for BDAs to improve hydrology.
On Willow Creek Rd	219	16	cheatgrass, Canada thistle, good access, limber	Lop and scatter and treat weeds.
Big Eagle Mine 2	218.8	17	seasonal wetland, cheatgrass, Canada thistle, flat, cattle	Potential fuels crew project removing sparse conifer encroachment. Cheatgrass/Canada thistle treatment.
Lower Rabbit Creek	218	18	stream, flat, cheatgrass, musk thistle, cattle use, limber	Lop/Scatter. Potential for exclosure to allow aspen and willow to regenerate. Musk thistle/cheatgrass treatment.
Willow Creek 1	217.8	19	stream, cheatgrass, cattle use, good access, lodgepole dominant	Evaluate for BDAs and potential exclosure. Reuse Wild Horse Exclosure materials. Cheatgrass treatment.
West Wild Horse 2 Exclosure	217.4	20	stream, Canada thistle, cheatgrass, musk thistle, good access, lodgepole	Lop and scatter. Clean up exclosure materials.
Upper South Face 3	200	21	too far gone for treatment, potential disease in clone	Lop and scatter treatment with good burn potential due to existing road fire breaks and abundance of springs and seeps. Monitor for cheatgrass. Treat in conjunction with Along Loop Rd 4, West Sagebrush Park 2, Upper

				South Face, Upper South Face 2, Upper South Face 3, and Upper South Face 5.
Lower Cottonwood Creek	199.4	22	stream, moderate slope, Canada thistle, cheatgrass, cattle use, lodgepole and limber	Lop/scatter to inhibit livestock use. Cheatgrass/Canada thistle treatment.
Cooper Creek	198	23	spring, cheatgrass, cattle, good access	Partially treated in 2019, extend into state in 2020 (lop/scatter). Monitor for cattle pressure and cheatgrass.
Exclosure Stand	197	24	cheatgrass, flat, good access, could use repair	Cheatgrass treatment. Fuels crew remove conifer and repair fence.
Middle South Face	179	25	spring, cheatgrass, moderate slope, good access, limber and lodgepole	Easily treatable by cutting sparse conifer. Treat cheatgrass. Very little regeneration reaching above browse zone.
West Stratton Exclosure	175.8	26	flat, good access	Fuels crew remove conifer.

APPENDIX D. RECOMMENDED ASPEN TREATMENT PHASES

Phase 1 - Lop and scatter treatments on south east, and north side of mountain. Complete Hadsell Burn on south face of Green Mountain. Continue monitoring stands with previous treatment. Evaluate potential for BDAs in riparian areas.

Phase 1		
Total Acres		**492.16**
Location Name	Treatment	Acres
Upper South Face 5	Lop and scatter treatment with good burn potential due to existing road fire breaks and abundance of springs and seeps. Monitor for cheatgrass.	3.54
West Sagebrush Park 2	Lop and scatter treatment with good burn potential due to existing road fire breaks and abundance of springs and seeps. Lack of cheatgrass.	1.99
Along Loop Road 4	Lop and scatter treatment with good burn potential due to existing road fire breaks and abundance of springs and seeps. Monitor for cheatgrass.	14.07
Snow	Lop and scatter. Evaluate Rx burn.	21.33
Along Loop Road	Lop and scatter treatment with good burn potential due to existing road fire breaks and abundance of springs and seeps. Monitor for cheatgrass.	14.74
Upper South Face 3	Lop and scatter treatment with good burn potential due to existing road fire breaks and abundance of springs and seeps. Monitor for cheatgrass.	1.56
Steep	Lop and scatter. Evaluate cheatgrass treatment.	11.32
Upper South Face	Lop and scatter treatment with good burn potential due to existing road fire breaks and abundance of springs and seeps. Monitor for cheatgrass.	2.09
Upper South Face 2	Lop and scatter treatment with good burn potential due to existing road fire breaks and abundance of springs and seeps. Monitor for cheatgrass.	18.80
South Maiers	Treated 2017. Monitor results. Evaluate potential for cheatgrass treatment.	29.34
Spring Creek 3	Evaluate potential for BDAs to improve hydrology. Lop and scatter.	2.35
Cooper Creek	Partially treated in 2019, extend into state in 2020 (lop/scatter).	58.69
Elk	Potential lop and scatter in conjunction with Snow stand.	4.25
East Wild Horse 2	Lop and scatter to inhibit cattle use or Rx burn with at least 2 years deferment. Cheatgrass and thistle treatment. Thistle eradication is possible due to low level infestation.	71.87
East Wild Horse 1	Lop and scatter to inhibit cattle use or Rx burn with at least 2 years deferment. Cheatgrass and thistle treatment. Thistle eradication is possible due to low level infestation.	154.83
Upper Crooks 3	Treat in conjunction with Upper Crooks 1. Cheatgrass treatment.	8.20
Upper Crooks 1	Combination Lop and scatter/cut pile pending field investigation.	73.19

Phase 2 - Complete remaining treatments on south face if not done in Phase 1 and continue monitoring previously treated sites. Reduce fire risk and improve riparian habitat surrounding Cottonwood Campground. Burn Stratton Ridge if not completed in Hadsell Burn.

Phase 2		
Total Acres		**858.04**
Location Name	Treatment	Acres
East Sagebrush Park 3	May be too far gone. Potential for fuels crew thinning. Lop and scatter to block user created road.	0.54
West Sagebrush Park	Combination lop scatter/cut pile pending field investigation.	4.66
Middle South Face 2	Lop/scatter with Rx burn - road for fire break. Follow-up with cheatgrass treatment.	42.12
Lower Steep	Lop/scatter with hinge cutting to protect from livestock. Heavy conifer encroachment. Documented mule deer use.	3.71
Anaconda Rd 4	Lop and scatter, cheatgrass treatment recommended.	11.70
Lower South Face	Previous treatment with little regeneration. Cheatgrass treatment.	3.64
Anaconda Rd 2	May be too far gone. Field visit required to verify treatment needs.	0.703
Middle South Face	Easily treatable by cutting sparse conifer. Treat cheatgrass. Very little regeneration reaching above browse zone.	9.25
Lower South Face 2	Protect spring from livestock. Treat cheatgrass and Canada thistle. Remove limber pine from aspen and shrub.	9.08
Big Eagle Mine 2	Potential fuels crew project removing sparse conifer encroachment. Cheatgrass/Canada thistle treatment.	21.63
Lower South Face 3	Easily treatable by cutting sparse conifer. Treat cheatgrass.	2.20
Middle South Face 3	Conduct maintenance on previous conifer removal. Cheatgrass treatment.	10.08
North Cottonwood Campground	Combination of lop/scatter and cut and pile where necessary for entire stand around campground.	58.21
West Cottonwood Campground	Combination of lop/scatter and cut and pile where necessary for entire stand around campground.	204.08
West Wild Horse 2 Exclosure	Lop and scatter. Clean up exclosure materials.	6.93
Exclosure Stand	Cheatgrass treatment. Fuels crew remove conifer and repair fence.	0.45
Stratton Ridge 2	Lop and scatter or thinning in preparation for potential Rx burn. Roads on two sides for fire breaks.	371.02
On Willow Creek Rd	Lop and scatter and treat weeds.	14.89
West Stratton Exclosure	Fuels crew remove conifer.	1.49
East Cottonwood Campground	Cut and pile due to recreational use. More conservative prescription.	70.97
Stratton Exclosure on Abel Creek – Aspen	Maintain exclosure. Fuels crew remove conifers.	10.69

Phase 3 - Prescribe burn whenever possible, otherwise, lop/scatter and cut/pile on Jost Creek and Whiskey peak sites. Continue monitoring previously treated stands and sites with potential invasive species infestation due to treatment. Follow up with herbicide where needed and defer grazing on high browse sites.

Phase 3		
Total Acres		**759.87**
Location Name	Treatment	Acres
Sagebrush Park 3	Combination Lop and scatter/cut pile pending recreation VRM evaluation.	15.94
Jost Creek Untreated	Cut and Pile near road, lop/scatter with Rx burn if possible.	68.76
Jost Creek Treated	Cut and Pile near road, lop/scatter with Rx burn if possible.	86.27
Jost Creek 2	Field visit required. May be too far gone. Difficult access. Canada thistle treatment.	1.37
Wild Horse Rd	Lope and scatter and treat with Jost Creek stands.	0.99
East Jost Creek	Lop and scatter. Buffer at 100ft to promote expansion. Treat with Jost Creek 2.	163.71
East Jost Creek 2	Field visit required. May be too far gone. Difficult access. Canada thistle treatment.	15.84
Spring Creek 2	Potential lop and scatter however, access is difficult.	11.09
Lower Cottonwood Creek	Lop/scatter to inhibit livestock use. Cheatgrass/Canada thistle treatment.	148.99
West Cottonwood Creek North	Combination Lop and scatter/cut pile pending recreation VRM evaluation.	62.92
Whiskey Ridge6	Lop and scatter prep for Rx burn in conjunction with Whiskey Peak 5 and Whiskey Peak 2. Cheatgrass and Canada thistle treatment.	92.07
Whiskey Peak 2	Lop and scatter prep for Rx burn in conjunction with Whiskey Peak 5 and Whiskey Ridge 6. Cheatgrass treatment.	56.93
Whiskey Peak 5	Lop and scatter prep for Rx burn in conjunction with Whiskey Peak 2 and Whiskey Ridge 6. Cheatgrass treatment.	34.50

Phase 4 - Monitor previously treated sites and follow up herbicide treatments on sites with invasive species infestation. Focus treatment on Sheep Creek Park and Rabbit Creek. Evaluate potential for BDAs on riparian sites.

Phase 4		
Total Acres		**715.83**
Location Name	Treatment	Acres
Sheep Creek Park	Treat and buffer pockets of vigorous aspen and evaluate the rest of the stand for additional treatment. PCT or thin lodgepole.	295.15
North Sheep Creek Park	Treat and buffer pockets of vigorous aspen and evaluate the rest of the stand for additional treatment. PCT or thin lodgepole.	88.23
Sheep Creek Park 2	Lop and scatter/hinge cut.	211.39
Owl Hills	Lop and scatter and treat weeds.	1.84
Spring Creek 1	Evaluate potential for BDAs to improve hydrology.	6.18
Lower Rabbit Creek	Lop/Scatter. Potential for exclosure to allow aspen and willow to regenerate. Musk thistle/cheatgrass treatment.	10.17
Rabbit Creek	Lope and scatter and hinge cut. Weed treatment.	89.95
Willow Creek	Evaluate for BDAs and potential exclosure. Reuse Wild Horse Exclosure materials. Cheatgrass treatment.	12.92

APPENDIX E. BEAVER DAM ANALOG SITE PRIORITIZATION

Riparian areas on Green Mountain with potential for restoration with the use of Beaver Dam Analogs (BDAs). Ordered 1 (highest priority for BDAs) through 7 (lowest priority for BDAs) under the Priority column in the table below. This prioritization is intended to give managers an order in which to implement treatment.

Site	Comments	Priority
Whiskey Creek	Very high cattle use in past and present. Relic beaver and may be good area for BDA. Some willow still present.	2
Big Camp Creek	High cattle use with relic beaver activity abundant. Important water source for cattle and wildlife. Stream restoration necessary to reduce impact and lower risk of complete loss. Many sites nearby have dried.	3
Willow Creek	Channel is still winding, and riparian area is fairly wide in comparison to most in the area. Channel beginning to straighten and riparian area shrinking with more xeric plant communities. Road has had an impact on these changes. Many springs and streams feed into creek in this area. High recreational use. High deer and elk use. Some horse sign.	5
Elk Creek	Relic beaver activity with headcutting. Heavy use area by livestock and wildlife, many trails through and around creek. Road cutting through creek.	6
Rabbit Creek	High cattle and horse use on lower gradient and high elk present on steeper slopes. Potential for BDA though small stream. Very few willows present.	7
West Cottonwood	Riparian area dry by eastern edge of assessment. Perennial moving towards ephemeral. Current horse and pronghorn use. No grazing this year, but likely heavy grazing most years.	4
Cooper Creek	Very high use area. Riparian plant species grazed to the ground. Current deer, elk, horse, and cattle use. Drying. Lots of dead and dying conifer. Some willow still present.	1

2019 - JCR Evaluation Form

SPECIES: Mule Deer | PERIOD: 6/1/2019 - 5/31/2020

HERD: MD647 - FERRIS

HUNT AREAS: 87 | PREPARED BY: GREG HIATT

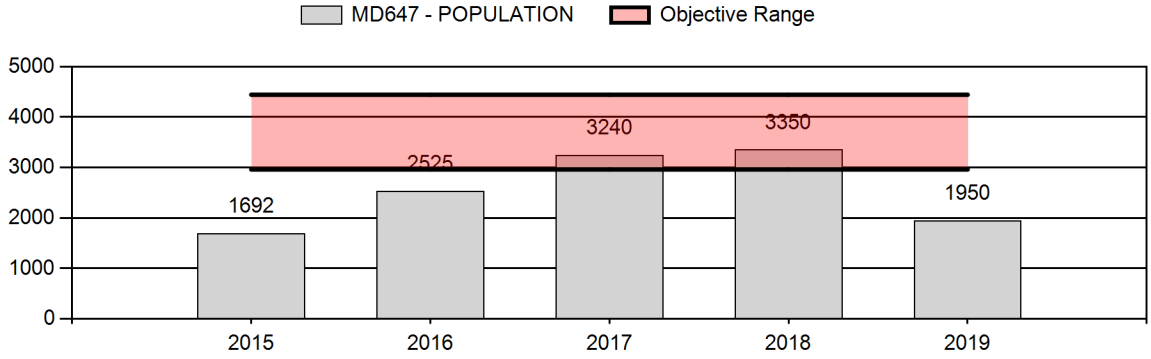
	2014 - 2018 Average	2019	2020 Proposed
Population:	2,475	1,950	2,175
Harvest:	70	111	75
Hunters:	85	138	95
Hunter Success:	82%	80%	79 %
Active Licenses:	85	138	95
Active License Success:	82%	80%	79 %
Recreation Days:	422	694	460
Days Per Animal:	6.0	6.3	6.1
Males per 100 Females	53	50	
Juveniles per 100 Females	81	72	

Population Objective (± 20%) :	3700 (2960 - 4440)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-47.3%
Number of years population has been + or - objective in recent trend:	2
Model Date:	03/09/2020

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:	21.3%	13.9%
Total:	5.4%	3.3%
Proposed change in post-season population:	-51%	1.1%

Population Size - Postseason



2020 Hunting Seasons
Ferris Mule Deer (MD647)

Hunt Area	Type	Archery Dates Opens	Archery Dates Closes	Season Dates Opens	Season Dates Closes	Quota	Limitations
87	1	Sep. 1	Sep. 30	Oct. 15	Oct. 31	100	Antlered mule deer or any white-tailed deer

2019 Hunter Satisfaction: 78% Satisfied, 11% Neutral, 11% Dissatisfied

2020 Management Summary

1.) Hunting Season Evaluation: The population model for this herd indicates improved fawn production that began in 2015 allowed this herd to reach objective range in 2017 and 2018, the first time in a decade. Thanks to improved precipitation, extensive habitat treatments and increased predator control, fawn:doe ratios the past four years have been the highest recorded in 16 years. In order to align with 2019 classification and harvest data, however, the model indicates losses during the severe 2018-19 winter were significant and predicts the herd is again well below objective.

With the herd being in special management, hunters have come to expect better opportunities to see and harvest larger bucks than available in neighboring general license, more productive herds. Conservative harvests when the herd was well below objective increased buck:doe ratios above 55:100 beginning in 2016, but major portions of the herd unit are unavailable to hunters, generating buck:doe ratios that do not represent what is available to the hunting public. License quotas were increased in the past three years, successfully reducing the buck:doe ratio, but also increasing dissatisfaction and complaints about low buck quality. The 2019 classification survey found 69 bucks per 100 does in the checkerboarded, largely unavailable portion of the herd unit, and 44:100 in the northern portion, which is largely available to public hunting.

Antler measurements were collected on 19 percent of the reported harvest in 2018, and 7 percent of the 2019 harvest. Average spread of field checked adult mule deer bucks from this herd dropped from 21.5 inches in 2018 to 20.25 in 2019, and the maximum fell from 27 inches to 24.5 inches. Despite this herd being in special management, only 12 percent of the bucks checked in 2018 were Class 3 bucks, and no harvested Class 3 bucks were checked in 2019. Classification data show a similar decline in mature bucks from this herd as license quotas were increased. Class 3 bucks represented 12 percent of classified adult bucks in 2015, but only 3 percent of adult bucks in the 2019 sample. Half of the Class 3 bucks in the 2019 survey were in the checkerboard where there is little or no access.

With the reduced license quota in 2019, hunter satisfaction for this herd improved but still had the third-highest dissatisfaction level since these data were first compiled in 2009 (Figure 1). Six percent of the hunters were strongly dissatisfied with their hunting experience in this special management herd, near last year's record high. The most common complaint in hunter comments was a lack of mature, trophy bucks.

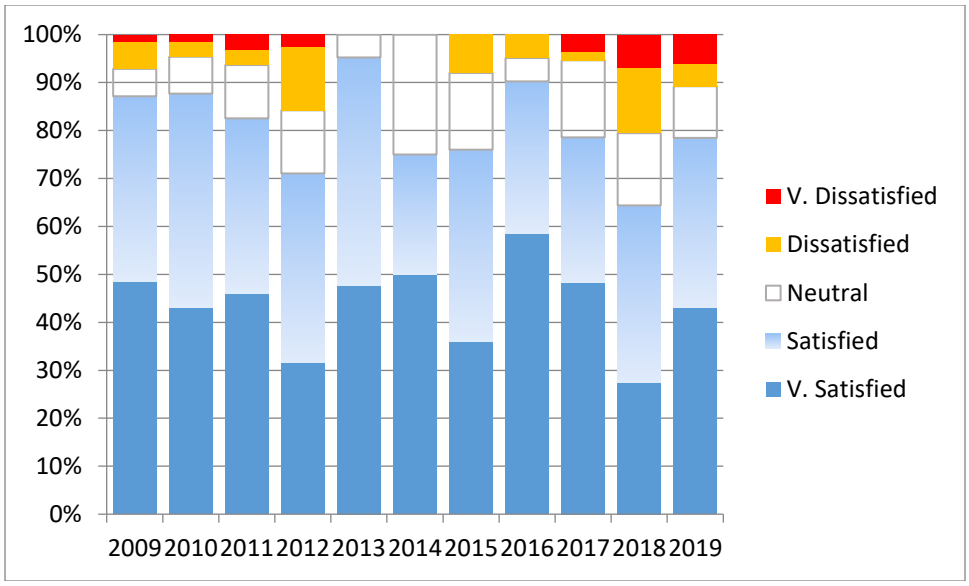


Figure 1. Hunter satisfaction and dissatisfaction for the Ferris Mule Deer Herd.

New Type 2, "two points or less" licenses were proposed in 2020 to simultaneously address the issues of high buck:doe ratios and poor buck quality while providing a similar level of hunting opportunity, but were rejected under statewide review. As with "spikes only" elk seasons, the "two points or less" restriction of these Type 2 licenses was intended to harvest surplus, younger males out of this herd without over-harvesting the mature age class bucks. It would afford hunters who desire a less crowded hunting experience but are not concerned about antler quality an opportunity to harvest a young buck, presumably without having to wait ten years to draw a license. Once the novelty of this license restriction becomes more familiar, similar license types should be considered for this herd in the future. Reducing the number of Type 1 licenses will reduce harvest pressure on bucks, allowing this segment of the population to increase, but will do little to alleviate pressure on older age classes. Many of the animals gained by this decrease in harvest will continue to be found where most hunters do not have access. The model estimates the population should slightly increase with the harvest from 100 Type 1 licenses.

2019 - JCR Evaluation Form

SPECIES: Mule Deer

PERIOD: 6/1/2019 - 5/31/2020

HERD: MD648 - BEAVER RIM

HUNT AREAS: 90

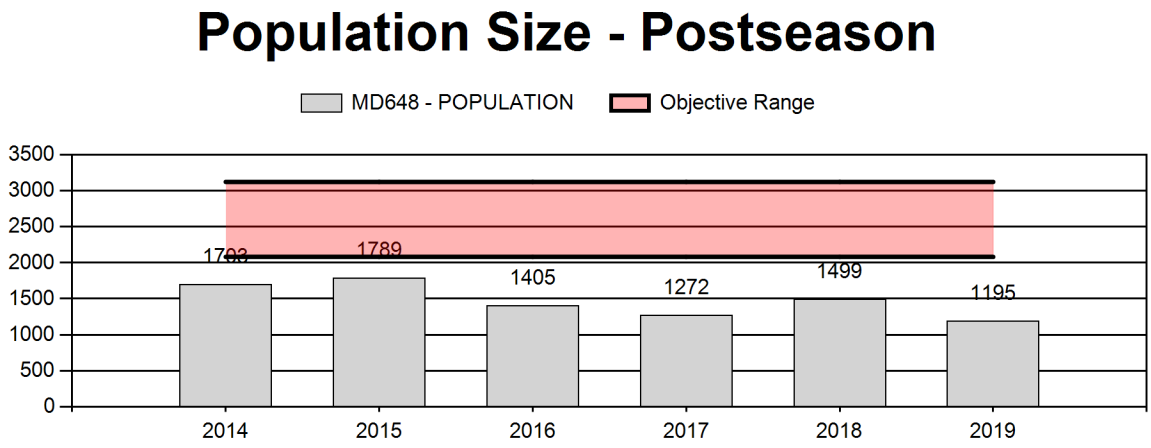
PREPARED BY: GREG ANDERSON

	2014 - 2018 Average	2019	2020 Proposed
Population:	1,534	1,195	1,218
Harvest:	46	47	60
Hunters:	54	70	73
Hunter Success:	85%	67%	82 %
Active Licenses:	54	70	73
Active License Success:	85%	67%	82 %
Recreation Days:	354	393	425
Days Per Animal:	7.7	8.4	7.1
Males per 100 Females	40	32	
Juveniles per 100 Females	52	43	

Population Objective (± 20%) :	2600 (2080 - 3120)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-54.0%
Number of years population has been + or - objective in recent trend:	10
Model Date:	2/24/2020

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:	17%	22%
Total:	4%	4%
Proposed change in post-season population:	-4%	+2%



2020 Hunting Seasons
Beaver Rim Mule Deer (MD648)

Hunt		Archery Dates		Season Dates			
Area	Type	Opens	Closes	Opens	Closes	Quota	Limitations
90	1	Sep. 1	Sep. 30	Oct. 1	Oct. 31	75	Any deer

2019 Hunter Satisfaction: 75% Satisfied, 9% Neutral, 16% Dissatisfied

2020 Management Summary

1.) Hunting Season Evaluation: The 2020 hunt season in area 90 will be the same as the 2019 season. For the past two decades area 90 has been managed for trophy mule deer with fairly limited license numbers 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 experience for a limited number of hunters annually. Despite limited buck harvest, indications are the population only remained stable from 2018 to 2019 at approximately 1,200 deer. The lack of growth can be attributed to fairly low fawn recruitment in 2019 at 43/100. All demographic data for this herd including the population model should be viewed cautiously as classification and harvest data sample sizes tend to be very small. Given average recruitment in 2020 the population size is predicted to remain stable at 1,200 deer in 2020.

2.) Management Objective Review: The current population objective of 2,600 deer with a 'special management' emphasis was set in 2015 following a public meeting in Riverton and approval by the Wyoming Game & Fish Commission. The population objective remained unchanged from when it was set in 1985. At that time deer densities were significantly higher than they have been for the past several decades. Despite limited buck harvest for a number of years, this population has not exhibited consistent growth and remains approximately half of the current objective. Despite not being near objective the objective will remain unchanged at 2,600 with a special management designation following an internal review in February, 2019. There is clear demand from the public for a greater number of deer in the area and many hunters familiar with the area remember the early 1990's when deer densities were higher. If environmental conditions change in the near future and conditions are conducive to population growth the Department does not want to curtail growth due to a lower population objective. It should be noted the population model for this herd is suspected to be poor quality due to extremely low classification sample sizes input to the model.

2019 - JCR Evaluation Form

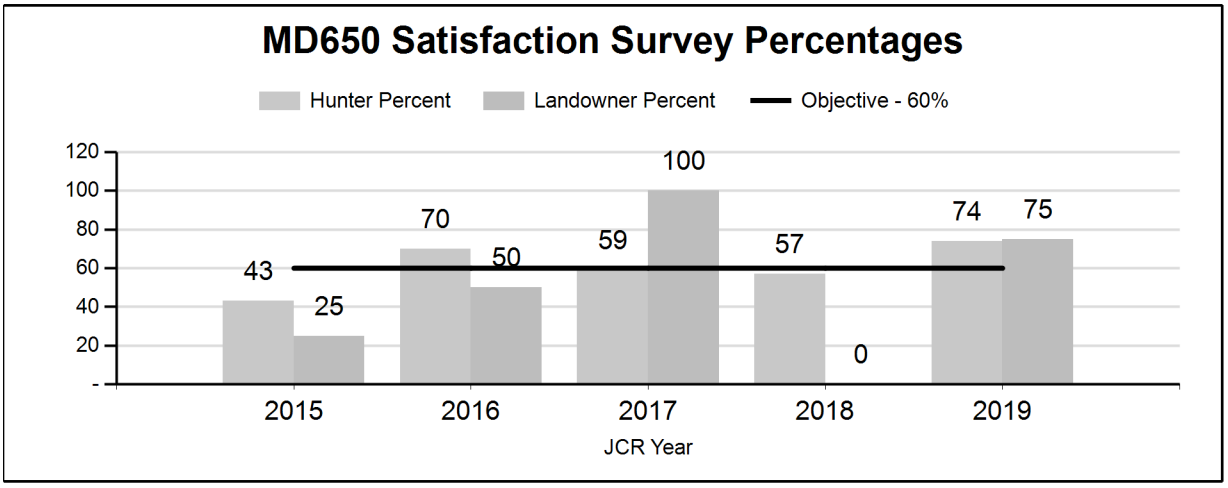
SPECIES: Mule Deer
HERD: MD650 - CHAIN LAKES
HUNT AREAS: 98

PERIOD: 6/1/2019 - 5/31/2020

PREPARED BY: GREG HIATT

	2014 - 2018 Average	2019	2020 Proposed
Hunter Satisfaction Percent	60%	74%	75%
Landowner Satisfaction Percent	54%	75%	75%
Harvest:	46	32	30
Hunters:	105	80	100
Hunter Success:	44%	40%	30 %
Active Licenses:	105	80	100
Active License Success:	44%	40%	30 %
Recreation Days:	359	236	280
Days Per Animal:	7.8	7.4	9.3
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:	14%
Number of years population has been + or - objective in recent trend:	1



2020 Hunting Seasons
Chain Lakes Mule Deer (MD650)

Hunt Area	Type	Archery Dates Opens	Archery Dates Closes	Season Dates Opens	Season Dates Closes	Quota	Limitations
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

2020 Region Q nonresident quota: 125 licenses

2019 Landowner Satisfaction: 75% Satisfied, 0% Neutral, 25% Dissatisfied
2019 Hunter Satisfaction: 74% Satisfied, 17% Neutral, 9% Dissatisfied

2020 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. In 2019, a single landowner was "somewhat" dissatisfied with deer numbers, while the rest were satisfied. Most landowners were dissatisfied with buck quality and supported use of the three-point restriction. Hunter satisfaction exceeded the objective of 60 percent in 2019 for the first time since 2016, and was the highest satisfaction rate in this herd since these data were first collected in 2009 (Figure 1). Improved hunter satisfaction is most likely due to decreased numbers of hunters in the field, since hunter success and days of effort have remained relatively constant. While the three-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 small area if the rest of Region Q has the antler point restriction. The slight decrease in the Nonresident quota for Region Q from 150 to 125 addresses hunting pressure concerns in the other two hunt areas in the region.

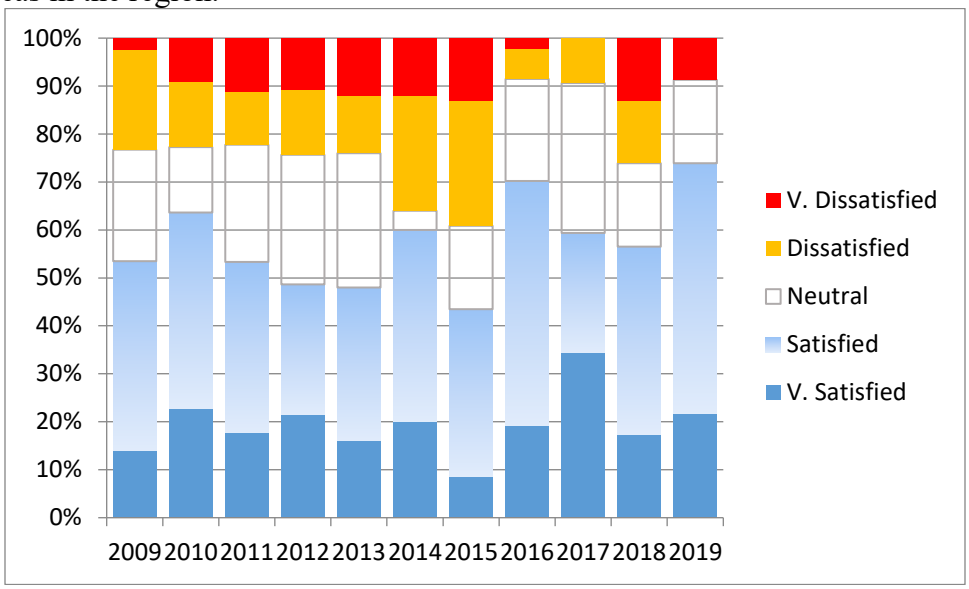


Figure 1. Hunter satisfaction and dissatisfaction for the Chain Lakes Mule Deer Herd.

2.) Management Objective Review: This herd consists of small bands of deer residing yearlong in pockets of suitable habitat in the eastern Red Desert. No reliable population estimate is available for this herd, nor is one likely under current work force and budget constraints. Following contacts with landowners and a public meeting in Rawlins, a Landowner/Hunter Satisfaction objective was adopted for this herd by the Wyoming Game and Fish Commission in 2015. Population, weather, and habitat conditions were reviewed for this herd in February, 2020 along with trends in hunter and landowner satisfaction. Both hunters and landowners have been satisfied with this method of evaluating and managing deer numbers in this herd. After internal review, managers determined the use of Landowner/Hunter Satisfaction objectives is still reasonable for this herd and recommended no changes.

2019 - JCR Evaluation Form

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

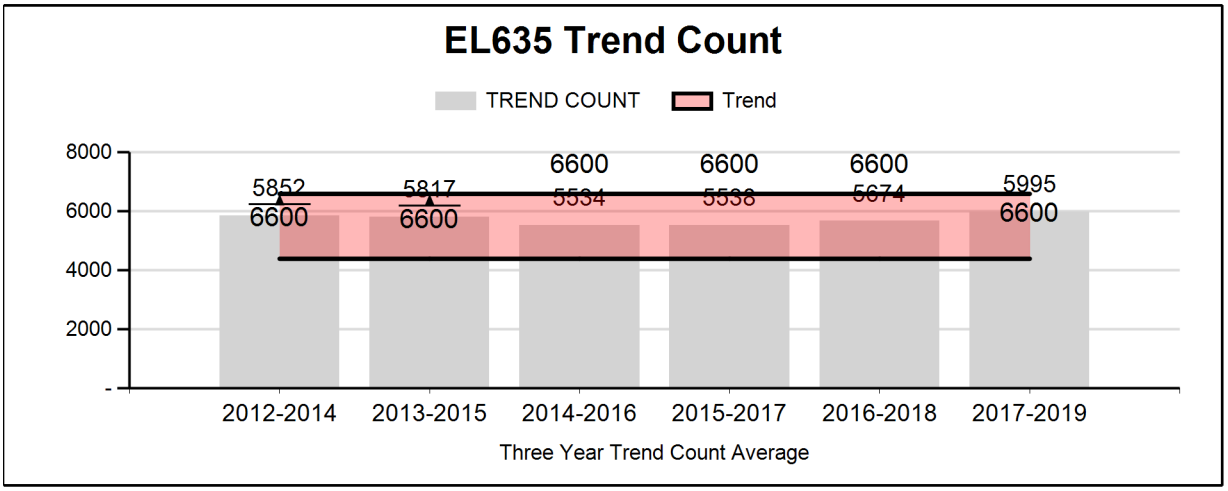
PERIOD: 6/1/2019 - 5/31/2020
PREPARED BY: GREG ANDERSON

	2014 - 2018 Average	2019	2020 Proposed
Trend Count:	5,642	6,375	6,000
Harvest:	925	852	1,000
Hunters:	2,561	2,235	2,500
Hunter Success:	36%	38%	40%
Active Licenses:	2,668	2,319	2,600
Active License Success	35%	37%	38%
Recreation Days:	17,680	13,780	15,500
Days Per Animal:	19.1	16.2	15.5
Males per 100 Females:	18	18	
Juveniles per 100 Females	26	22	

Trend Based Objective (± 20%)	5,500 (4400 - 6600)
Management Strategy:	Recreational
Percent population is above (+) or (-) objective:	16%
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%



2020 Hunting Seasons
Wiggins Fork Elk (EL635)

Hunt Area	Type	Archery Dates Opens	Archery Dates Closes	Season Dates Opens	Season Dates Closes	Quota	Limitations
67	Gen	Sep. 15	Sep. 30	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	250	Antlerless elk
67	6	Sep. 15	Sep. 30	Nov. 15	Dec. 15	600	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	125	Any elk, archery only
68	Gen	Sep. 15	Sep. 30	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

2019 Hunter Satisfaction: 66% Satisfied, 19% Neutral, 15% Dissatisfied

2020 Management Summary

1.) Hunting Season Evaluation: Based on an annual, winter trend count conducted in January, 2020, the 2020 hunting season will include increased antlerless elk harvest in area 67 and decreased antlerless elk harvest in areas 68 and 69. Personnel counted a total of 6,375 elk during the January, 2020 trend count. Elk numbers increased from the 6,069 counted in 2019. The three year average of elk count numbers was 5,995. This is well within the 20% range of the

established objective of 5,500 elk. That said, the number of elk counted has increased each year since 2016. This herd has 3 established sub-populations designated based on migratory movements and winter range use. Of these 3 sub-populations, all of the growth seen over the past 4 years has occurred in the Dunoir/Spring Mountain and East Fork groups. Both Type 4 and 6 licenses in area 67 are structured to focus antlerless harvest on these elk groups. These license types will be increased by a total of 350 in 2020 to begin decreasing elk numbers in the Dunoir/Spring Mountain and East Fork sub-herds. In contrast, elk numbers in areas 68 and 69 have decreased over the past several years so antlerless harvest focusing on elk in these areas will be decreased in 2020. With a total of 850 antlerless elk licenses valid in area 67 it is expected wintering elk numbers will decline in 2021 but remain within the designated objective range.

2019 - JCR Evaluation Form

SPECIES: Elk
HERD: EL637 - SOUTH WIND RIVER
HUNT AREAS: 25, 27-28, 99

PERIOD: 6/1/2019 - 5/31/2020

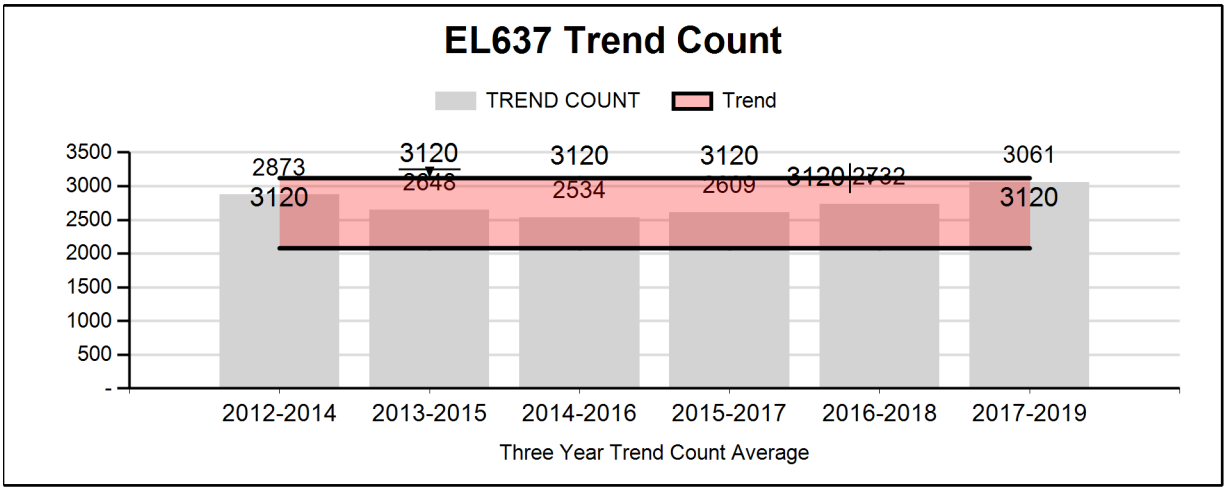
PREPARED BY: STAN HARTER

	2014 - 2018 Average	2019	2020 Proposed
Trend Count:	2,666	3,455	3,200
Harvest:	645	557	650
Hunters:	2,024	1,724	1,800
Hunter Success:	32%	32%	36%
Active Licenses:	2,065	1,790	1,800
Active License Success	31%	31%	36%
Recreation Days:	15,296	11,531	13,000
Days Per Animal:	23.7	20.7	20
Males per 100 Females:	28	22	
Juveniles per 100 Females	32	29	

Trend Based Objective (± 20%)	2,600 (2080 - 3120)
Management Strategy:	Recreational
Percent population is above (+) or (-) objective:	33%
Number of years population has been + or - objective in recent trend:	2

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

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



2020 Hunting Seasons
South Wind River Elk (EL637)

Hunt Area	Hunt Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
25, 27	1	Sept. 1	Sept. 30	Oct. 1	Oct. 31	150	Any elk
25, 27	1			Nov. 1	Nov. 20		Antlerless elk
25	4	Sept. 1	Sept. 30	Oct. 15	Nov. 20	150	Antlerless elk
25	6	Sept. 1	Sept. 30	Nov. 1	Nov. 20	100	Cow or calf
27	4	Sept. 1	Sept. 30	Oct. 1	Nov. 20	50	Antlerless elk
28	Gen	Sept. 1	Sept. 30	Oct. 1	Oct. 14		Any elk
28	Gen			Oct. 15	Oct. 22		Antlered elk valid in the entire area; any elk valid on private land north of the Little Popo Agie River
28	4	Sept. 1	Sept. 30	Nov. 1	Nov. 20	125	Antlerless elk
28	6	Closed	Closed	Dec. 1	Jan. 31	25	Cow or calf, valid off national forest north of the Little Popo Agie River and east of R 101 W; also valid in Area 127 south of the Boulder Flats Road and west of U.S. Highway 287
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

2019 Hunter Satisfaction: 59.3% Satisfied, 21.5% Neutral, 19.2% Dissatisfied

2020 Management Summary

1.) Hunting Season Evaluation: The South Wind River elk herd unit has a mid-winter trend count objective of 2,600 elk. Weather and observation conditions were nearly optimal for the 2019 trend count/classification survey flown in January 2020, and when pooled with a ground classification count of elk on the outskirts of Lander, produced a count of 3,455 elk. The latest 3-year average is 3,061 elk, placing the 2019 count just within the +20% margin of the objective. The calf/cow ratio of 29J/100F for the herd unit was the lowest in 5 years and the total bull/cow ratio of 22M/100F was the lowest since 2008. With increasing numbers of elk observed during the mid- winter trend counts, the 2020 season structure includes an additional 50 antlerless licenses in area 25, converting the area 28 general license season to any elk for the first two weeks, and expanding the boundary for the area 28 Type 6 license to include lands around Table Mountain where elk damage problems arose in winter 2019-20. In addition, to address concerns from hunters and landowners about few bulls in area 25, the number of area 25/27 Type 1 licenses are being reduced by 50. The expected increase in antlerless elk harvest in 2020 should curb population growth and move this herd toward objective.

2019 - JCR Evaluation Form

SPECIES: Elk
HERD: EL638 - GREEN MOUNTAIN
HUNT AREAS: 24, 128

PERIOD: 6/1/2019 - 5/31/2020

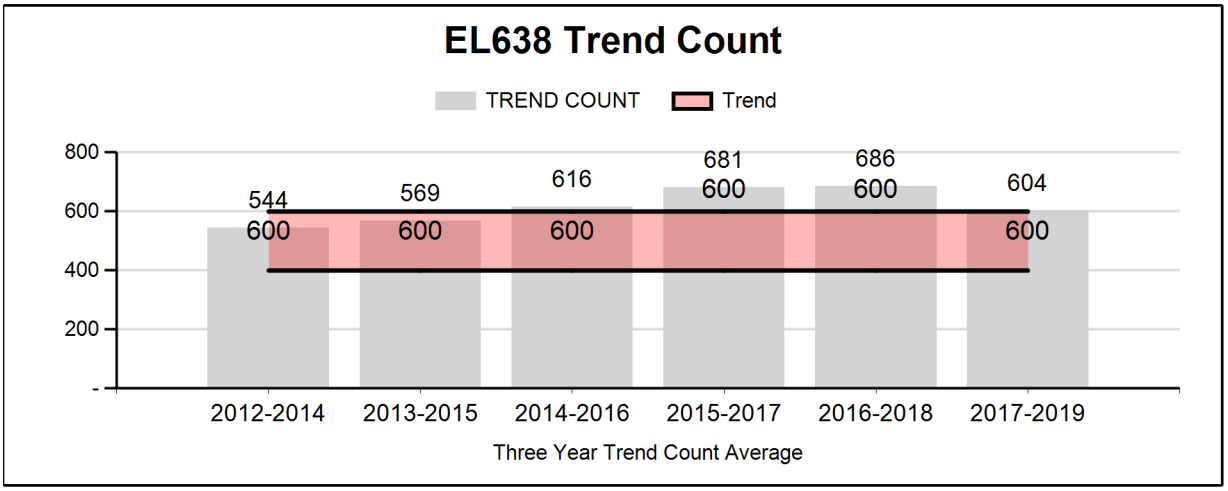
PREPARED BY: STAN HARTER

	2014 - 2018 Average	2019	2020 Proposed
Trend Count:	634	488	500
Harvest:	211	252	240
Hunters:	560	617	600
Hunter Success:	38%	41%	40%
Active Licenses:	566	617	600
Active License Success	37%	41%	40%
Recreation Days:	3,464	3,626	3,500
Days Per Animal:	16.4	14.4	14.6
Males per 100 Females:	32	50	
Juveniles per 100 Females	35	38	

Trend Based Objective (± 20%)	500 (400 - 600)
Management Strategy:	Recreational
Percent population is above (+) or (-) objective:	-2.4%
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%



2020 Hunting Seasons

Green Mountain Elk (EL638)

Hunt Area	Hunt Type	Archery Dates		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		Antlered elk

2019 Hunter Satisfaction: 60.4% Satisfied, 23.9% Neutral, 15.8% Dissatisfied

2020 Management Summary

1.) Hunting Season Evaluation: The Green Mountain elk herd unit has a mid-winter trend count objective of 500 elk. The 2019 trend count flown in February 2020 resulted in a count of 488 elk, but there were at least 2 known groups of elk that were missed. The latest 3-year average is 604, placing the population just above the objective's range. Hunting seasons have been manipulated over the last 15-20 years to reduce the population, yet it seems to remain relatively stable. 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 2019 calf/cow ratio was 38J/100F, and have averaged over 40J/100F since 1994, which adds difficulty in reducing populations with hunting seasons, especially in areas where hunter crowding can be an issue. The bull/cow ratio is skewed high, given the two missed groups consisted largely of cows and calves. The number of observed bulls declined in 2019 and most of the mature bulls were smaller than normal. While hunter success for bulls has been good, some hunters and landowners have remarked they also are seeing smaller bulls on average. With a population historically over objective, an increase of 25 Type 5 licenses was made for the 2020 season. No changes were made to the area 24 Type 1 or Type 4 quotas or area 128 general license seasons. If antlerless harvest increases to average levels in both hunt areas in 2020, this population should decrease toward objective.

2019 - JCR Evaluation Form

SPECIES: Elk | PERIOD: 6/1/2019 - 5/31/2020

HERD: EL639 - FERRIS

HUNT AREAS: 22, 111 | PREPARED BY: GREG HIATT

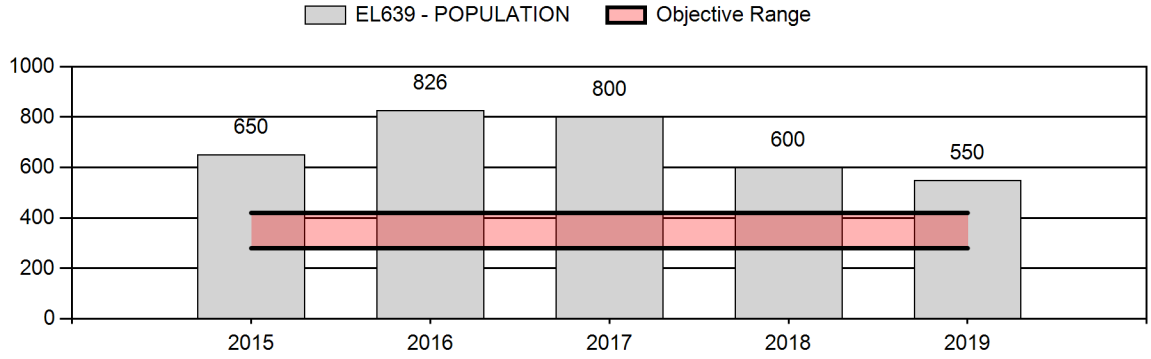
	2014 - 2018 Average	2019	2020 Proposed
Population:	670	550	500
Harvest:	137	104	125
Hunters:	270	250	235
Hunter Success:	51%	42%	53%
Active Licenses:	277	270	235
Active License Success:	49%	39%	53%
Recreation Days:	1,602	1,936	1,800
Days Per Animal:	11.7	18.6	14.4
Males per 100 Females	87	0	
Juveniles per 100 Females	43	0	

Population Objective (± 20%) :	350 (280 - 420)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	57%
Number of years population has been + or - objective in recent trend:	7
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%
Total:	0%	0%
Proposed change in post-season population:	-15%	-9%

Population Size - Postseason



2020 Hunting Seasons
Ferris Elk (EL639)

Hunt Area	Type	Archery Dates Opens	Archery Dates Closes	Season Dates Opens	Season Dates Closes	Quota	Limitations
22	1	Sep. 1	Sep. 30	Oct. 8	Oct. 31	40	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	50	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	50	Antlerless elk
111	6	Sep. 1	Sep. 30	Nov. 1	Dec. 31	100	Cow or calf

2019 Hunter Satisfaction: 69% Satisfied, 19% Neutral, 12% Dissatisfied

2020 Management Summary

1.) Hunting Season Evaluation: While this herd is still above objective, trend counts indicate recent cow harvests have successfully reduced herd size and, more importantly, reduced the reproductive segment of the herd. The population estimate of ~550 elk this past winter, based upon a trend count of 481 elk, is still above objective but classifications confirm at least 180 of these elk are antlered. Poor hunter success for Type 4 license holders (5%) and Type 6 & 7 cow/calf licenses (28%), along with a high number of days of effort also indicate antlerless harvests have been effective. Despite the poor hunting statistics, hunter satisfaction improved slightly in 2019 (Figure 1). Hunter satisfaction was nearly 10% lower in area 111 where access is less available.

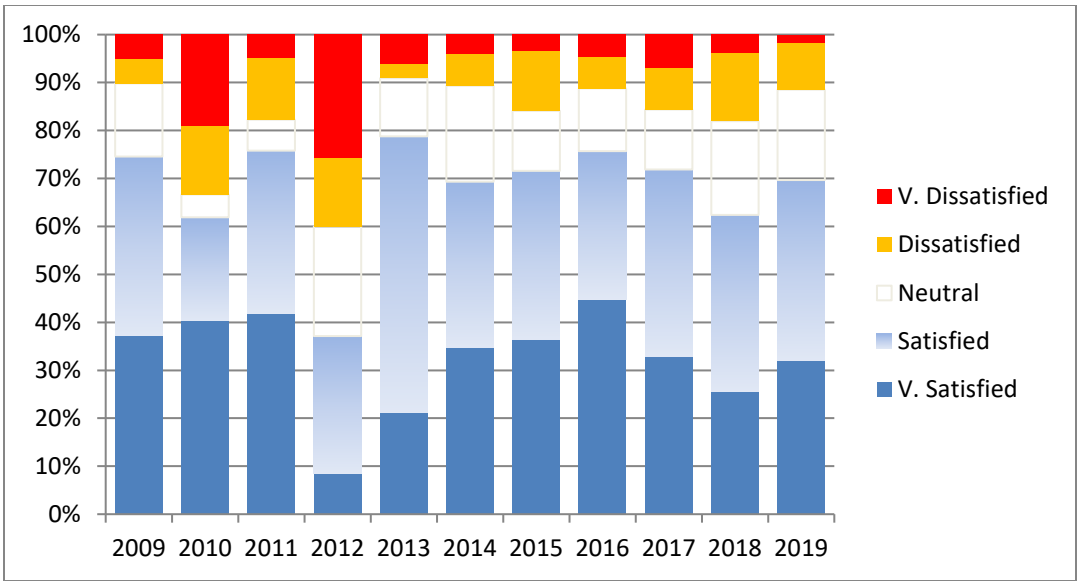


Figure 1. Hunter satisfaction and dissatisfaction in the Ferris Elk Herd.

Antlerless harvests need to continue, but can be slowed now that the herd is no longer in excess of 800 animals and is trending towards objective. As a result, Type 7 licenses in Area 111 are discontinued, as is the January extension for all types. Early winter hunts have successfully allowed for harvest of antlerless elk that are on private land and unavailable during October, and a similar strategy was successfully employed in 2019 for "any elk" seasons for the Type 1 licenses. To maintain harvest of surplus antlered elk, the same season is employed again 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 hunts accordingly. Barring changes in access across private lands, elk occupying the Haystack Mountains in checker-boarded lands in Area 111 will continue to be unavailable to most hunters. This year's trend count found 92 elk (19 percent) in the largely unhunted checkerboard, compared to 83 elk the previous year.

2019 - JCR Evaluation Form

SPECIES: Elk | PERIOD: 6/1/2019 - 5/31/2020

HERD: EL643 - SHAMROCK

HUNT AREAS: 118 | PREPARED BY: GREG HIATT

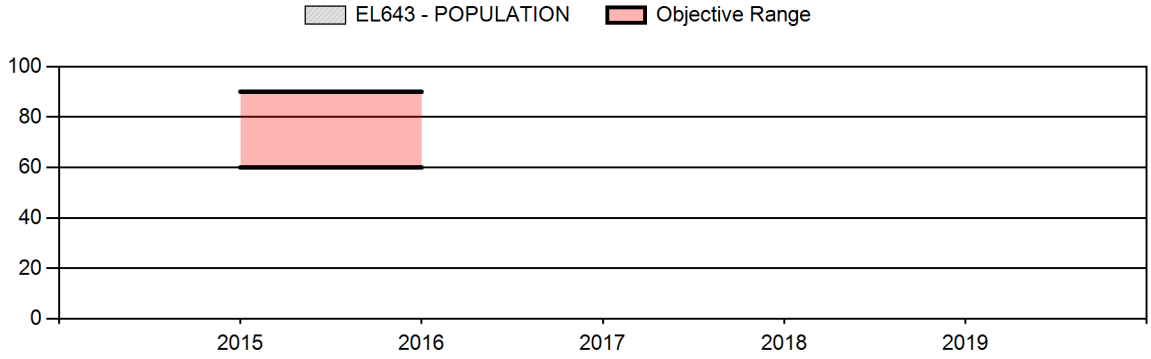
	2014 - 2018 Average	2019	2020 Proposed
Population:		N/A	N/A
Harvest:	51	58	50
Hunters:	82	93	90
Hunter Success:	62%	62%	56 %
Active Licenses:	90	103	90
Active License Success:	57%	56%	56 %
Recreation Days:	414	633	1,000
Days Per Animal:	8.1	10.9	20
Males per 100 Females	0	0	
Juveniles per 100 Females	0	0	

Population Objective (± 20%) :	75 (60 - 90)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	N/A%
Number of years population has been + or - objective in recent trend:	0
Model Date:	None

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

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

Population Size - Postseason



2020 Hunting Seasons
Shamrock Elk (EL643)

Hunt Area	Type	Archery Dates Opens	Archery Dates Closes	Season Dates Opens	Season Dates Closes	Quota	Limitations
118	1	Sep. 1	Sep. 30	Oct. 22	Nov. 12	25	Any elk
118	4	Sep. 1	Sep. 30	Oct. 22	Nov. 30	25	Antlerless elk
118	6	Sep. 1	Sep. 30	Oct. 22	Nov. 30	50	Cow or calf valid south of the Mineral X Road (Sweetwater County Road 63 and B.L.M. Road 3206)

2019 Hunter Satisfaction: 71% Satisfied, 12% Neutral, 17% Dissatisfied

2020 Management Summary

1.) Hunting Season Evaluation: The most recent end-of-year trend count for this herd was in June 2017, with only 42 elk found, more than 40 percent below objective. Despite the low count, license quotas have remained relatively constant, with 100 licenses available in 2019. Hunter success rose in 2019, for all three license types, and averaged 56 percent, near the 5-year average. As would be expected with higher hunter success, hunter satisfaction climbed to 71 percent, above the 5-year average of 61 percent (Figure 1).

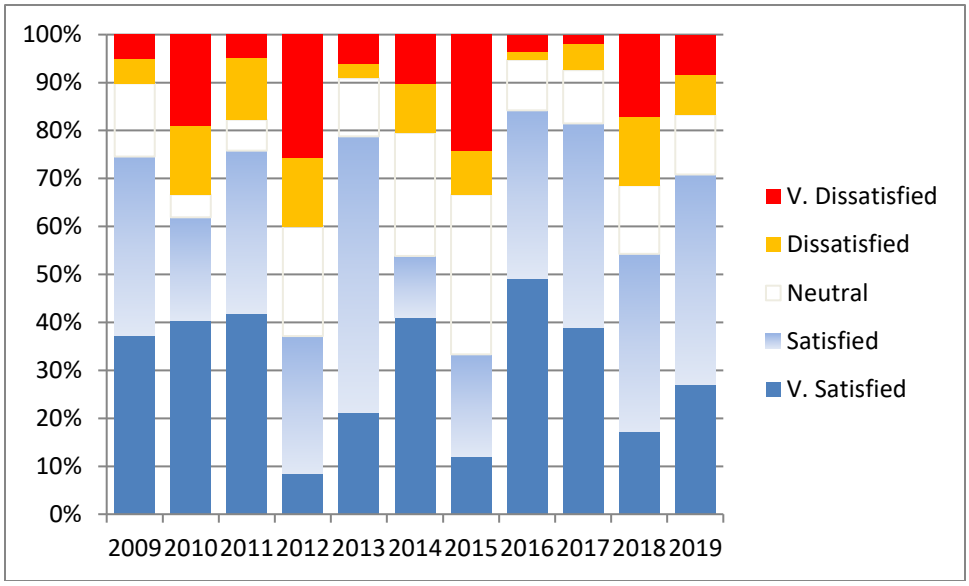


Figure 1. Hunter satisfaction and dissatisfaction for the Shamrock Elk Herd.

When first issued, the Type 6 licenses in this herd were limited to a small portion of the area to address damage concerns in the southeast corner. The early Oct. 1 starting date was effective in increasing harvest and dispersing elk off private pastures. But when the area restriction on these

licenses was expanded to encompass the entire southern half of the hunt area, Type 1 and 4 hunters began to complain that the early cow hunt was making elk more wary and hazing large groups of elk out of the herd unit into Area 100. To address these annual concerns, the season opening date for Type 6 licenses is moved back to coincide with the regular season. No other changes were made.

2.) Management Objective Review: Because this herd consists of small bands of elk residing yearlong in pockets of suitable habitat in the eastern Red Desert, no reliable population estimate is available for this herd, nor is one likely under current work force and budget constraints. Following contacts with landowners and a public meeting in Rawlins, a unique Spring Trend Count objective was adopted by the Wyoming Game and Fish Commission in 2016. To re-synchronize reviews of this herd with the overlapping Chain Lakes mule deer and Red Desert pronghorn herds, population, weather, and habitat conditions were reviewed for this elk herd in February, 2020. Although no habitat assessment surveys have been conducted in this herd unit, the good physical condition of harvested animals, apparent high calf production, and the presence of hundreds of feral horses indicate there are more than enough resources to support the current number of elk in the herd unit. The Department has not received any damage complaints over the four years the new management objective has been in place. In addition, because of budgeting limitations, the trend count scheduled for 2020 will be only the second spring trend count of this herd. After internal review, managers determined it is premature to judge the effectiveness of the current objective for this herd and recommended no changes.

2019 - JCR Evaluation Form

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

PERIOD: 6/1/2019 - 5/31/2020

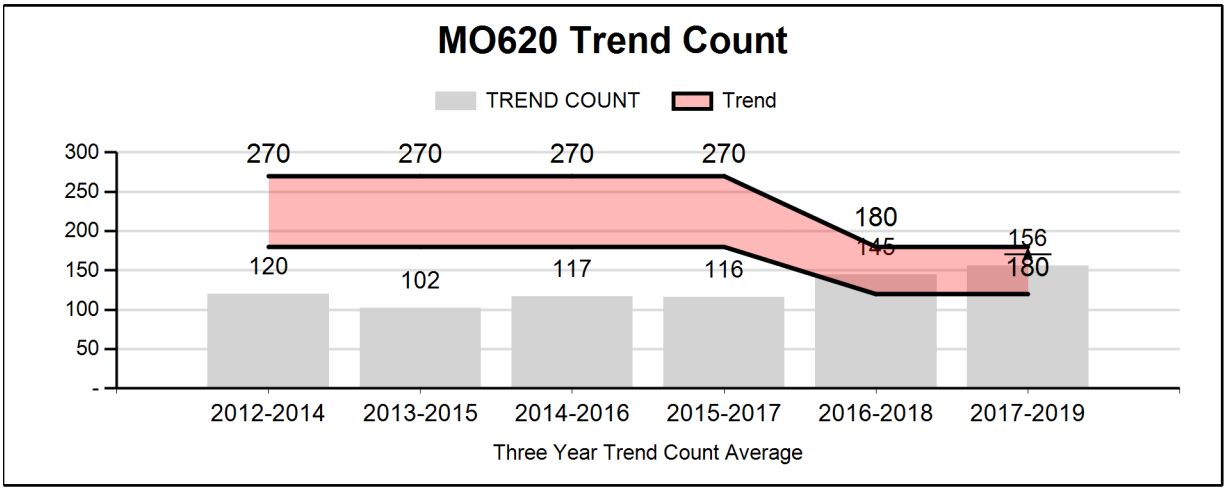
PREPARED BY: STAN HARTER

	2014 - 2018 Average	2019	2020 Proposed
Trend Count:	127	183	190
Harvest:	7	5	5
Hunters:	8	5	5
Hunter Success:	88%	100%	100%
Active Licenses:	8	5	5
Active License Success	88%	100%	100%
Recreation Days:	95	36	40
Days Per Animal:	13.6	7.2	8
Males per 100 Females:	57	56	
Juveniles per 100 Females	44	49	

Trend Based Objective (± 20%)	150 (120 - 180)
Management Strategy:	Special
Percent population is above (+) or (-) objective:	22%
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%



2020 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			

2020 Management Summary

1.) Hunting Season Evaluation: The mid-winter trend count of 183 moose was the 3rd highest since 1994. The current 3-year average is 156 moose, placing this population just above the objective of 150 moose, but well within the ± 20% range. Harvest survey results from the 2019 season show 100% bull harvest with 5 licenses valid in both hunt areas 2 and 30. However, only 3 hunters submitted teeth for aging via cementum annuli, which indicated the average age of harvested bulls was 5.3 years (range 3-10) with an average antler spread of 39.25 inches (range 38.5-40) from 2 measurements. The average age of harvested moose has been above 5 in 3 of the last 5 seasons, and antler size has generally increased as well. Hunting season structure has been conservative for the past several years due to concerns about population declines. As such, hunter success has been 100% in each of the last 3 seasons. Classification data showed a calf/cow ratio of 49J/100F (with one set of twin calves), and the bull/cow ratio dropped to 56M/100F. The 2020 season features no changes, given continued concerns about this population and fewer bulls were observed during the mid-winter flight.

2019 - JCR Evaluation Form

SPECIES: Moose

PERIOD: 6/1/2019 - 5/31/2020

HERD: MO621 - DUBOIS

HUNT AREAS: 6

PREPARED BY: GREG ANDERSON

	2014 - 2018 Average	2019	2020 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:	68	28	35
Days Per Animal:	13.6	5.6	7

Limited Opportunity Objective:

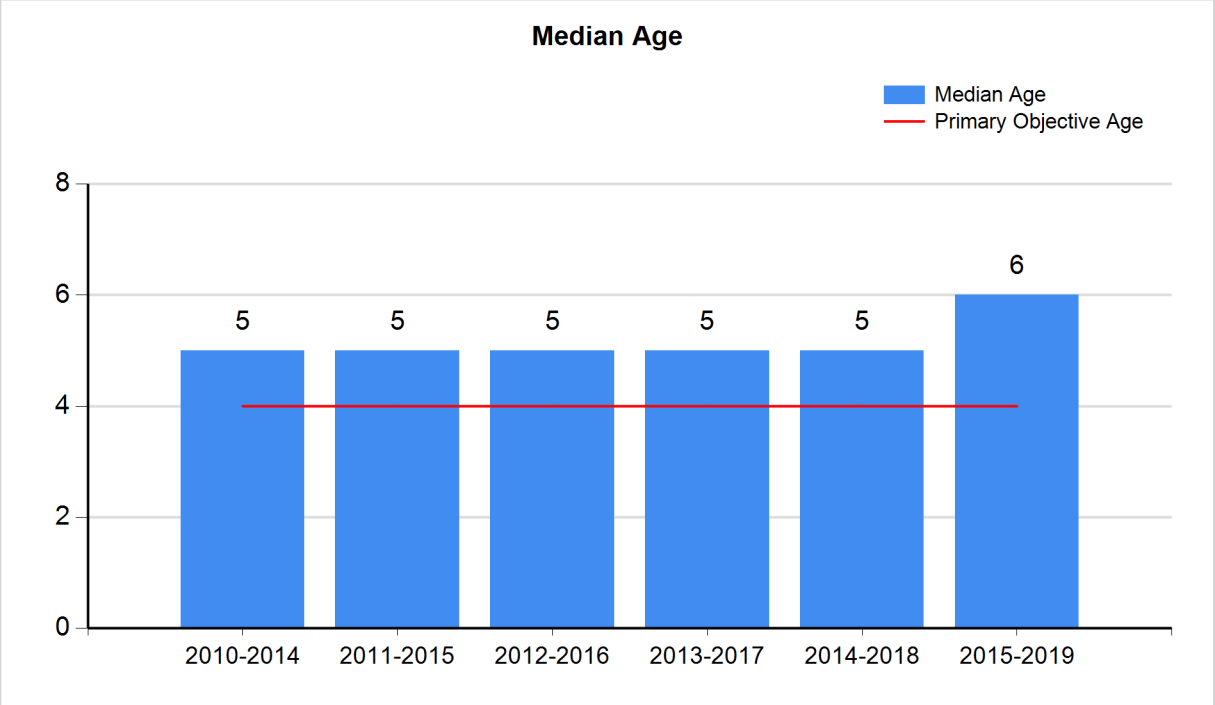
5-year running median age of harvested bulls is > 4 years

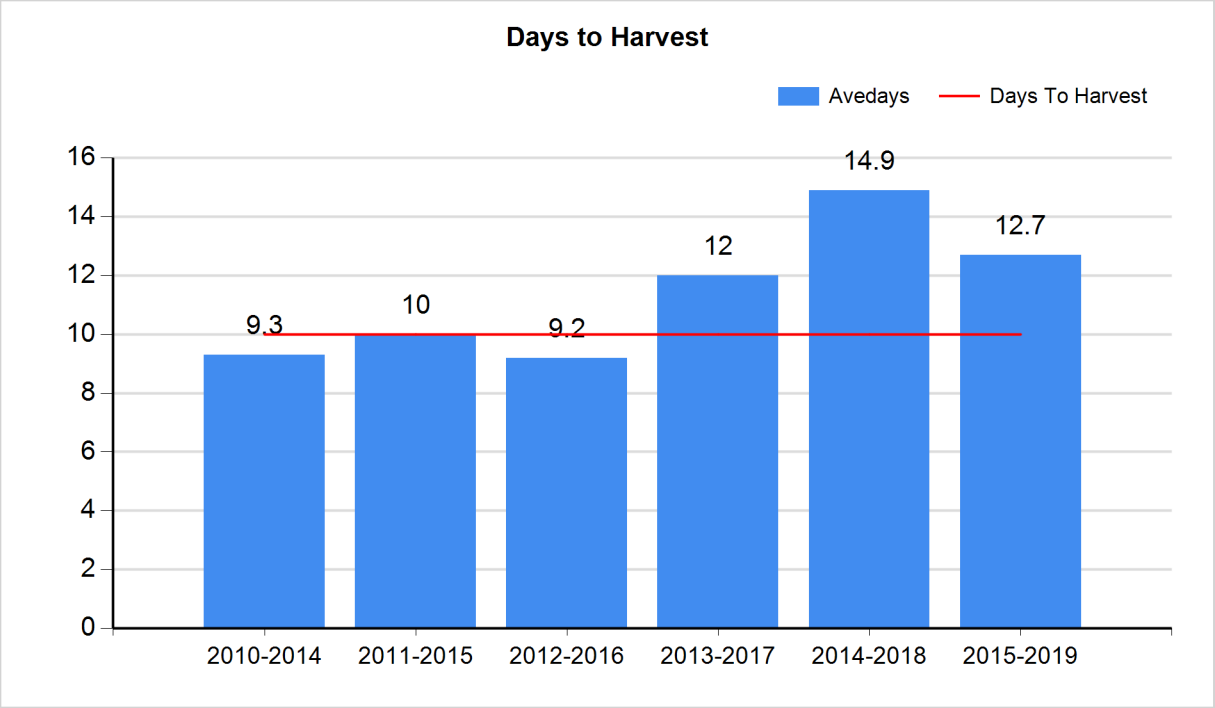
5-year running average of <= 10 days/animal to harvest

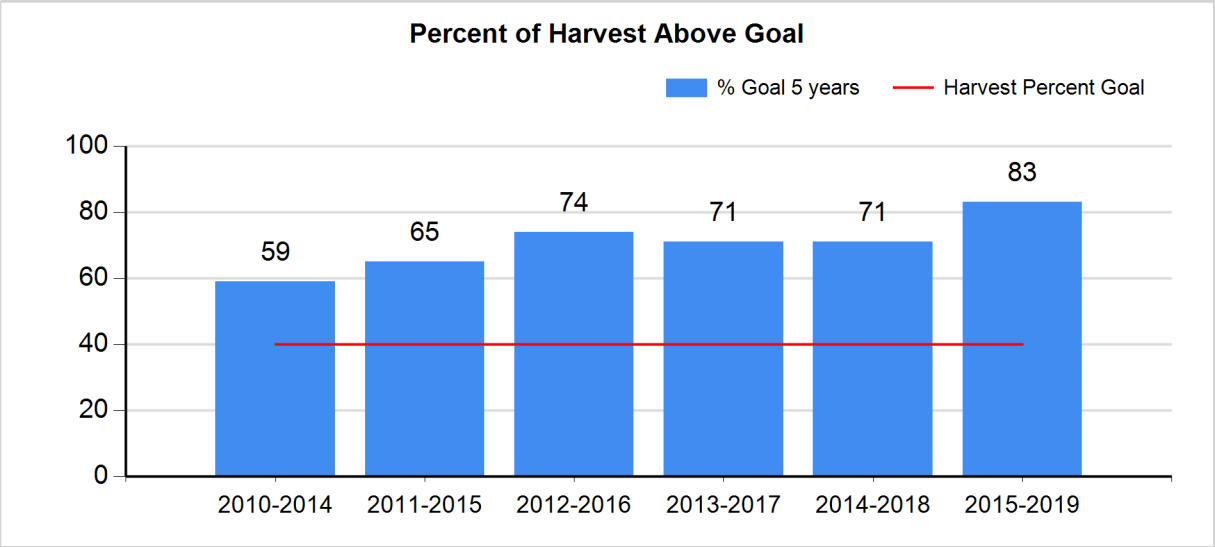
Secondary Objective:

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
9.3
10
9.2
12
14.9
12.7
2010-2014
2011-2015
2012-2016
2013-2017
2014-2018
2015-2019


Percent of Harvest Above Goal
% Goal 5 years
Harvest Percent Goal
100
80
60
40
20
0
59
65
74
71
71
83
2010-2014
2011-2015
2012-2016
2013-2017
2014-2018
2015-2019

2020 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

2020 Management Summary

1.) Hunting Season Evaluation: The 2020 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 2019. 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 5 bull harvested in 2019 yielded a median age of 6. This is also the 5-year running median age of harvest. 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 2020.

2.) Management Objective Review: The current limited opportunity objective for this moose population was adopted in 2015 following a public meeting in Dubois and approval by the Wyoming Game & Fish Commission. The limited opportunity objective was selected for this population because moose numbers had declined to the point personnel were not able to collect adequate demographic data to model the population and get a population estimate. Over the past 5 years moose numbers have not changed dramatically and personnel are still unable to collect enough demographic data to model the population. As such, the limited opportunity objective remains appropriate for this herd. Personnel have continued to census 5 designated winter ranges throughout the herd unit to document the presence of bulls in the population as well as document broad trends in the population. Over the past 5 years, moose numbers counted on the designated winter ranges have ranged from 29 to 48 with no indication of an increasing or decreasing trend.

2019 - JCR Evaluation Form

SPECIES: Bighorn Sheep

PERIOD: 6/1/2019 - 5/31/2020

HERD: BS609 - WHISKEY MOUNTAIN

HUNT AREAS: 8-10

PREPARED BY: GREG ANDERSON

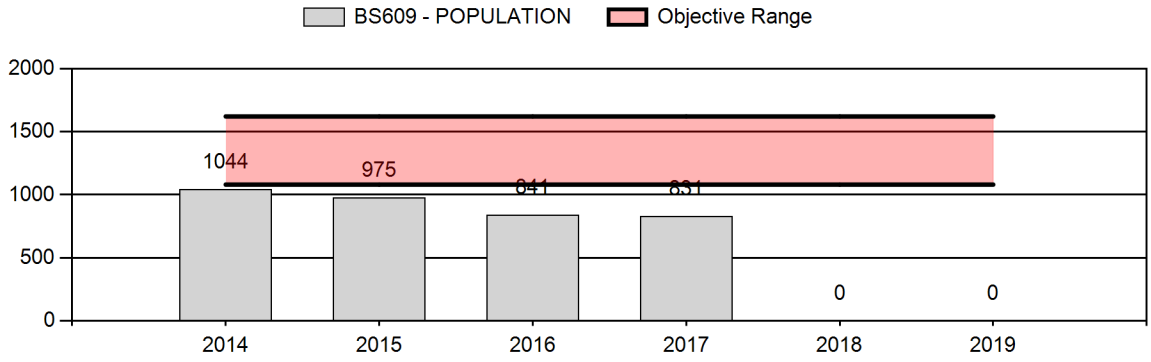
	2014 - 2018 Average	2019	2020 Proposed
Population:	738	N/A	N/A
Harvest:	15	11	12
Hunters:	22	17	16
Hunter Success:	68%	65%	75%
Active Licenses:	22	17	16
Active License Success:	68%	65%	75%
Recreation Days:	248	83	100
Days Per Animal:	16.5	7.5	8.3
Males per 100 Females	53	51	
Juveniles per 100 Females	22	22	

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:	10
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%
Total:	0%	0%
Proposed change in post-season population:	0%	0%

Population Size - Postseason



2020 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	8	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

2020 Management Summary

1.) Hunting Season Evaluation: The 2020 hunting seasons in areas 8, 9, and 10 will remain unchanged from the 2019 seasons. Although this population is well below objective, hunt season harvest has been having minimal impact on the population for over a decade. The main influence on this population is thought to be persistent pneumonia present since 1991. Due to persistent pneumonia, lamb recruitment in the population has been well below replacement levels for nearly two decades and the population has thus declined significantly. The 2020 hunt seasons in each of the three hunt areas will continue to provide a reasonable amount of recreational opportunity given the fact the population is well below objective. Although harvest is significantly lower throughout the herd unit than it was a decade ago, the average age of harvested rams in each of the 3 hunt areas continues to be relatively high indicating hunters have access to rams in the herd unit despite a lower overall population. In 2019, the average age of harvested rams was 8, 10, and 8 in hunt areas 8, 9, and 10 respectively. The average age of harvested rams was higher than the previous 5 year average for each area. While hunters have access to mature, trophy quality rams it is not deemed necessary to further limit harvest in the herd unit despite lower overall numbers of sheep.

2.) Management Objective Review: The population objective for this herd was last reviewed in 2018 through an internal review process and left unchanged with a population objective of 1,350 sheep. Indications are there is plenty of habitat including preferred winter range to support this number of sheep in the herd. However, the population has not been close to 1,350 for over two decades. It appears persistent pneumonia in the population is resulting in continued declines. In 2018 it was determined there was insufficient demographic data to continue modeling this herd and produce a population estimate. If this continues, it will be necessary to establish an alternate objective for this herd instead of a population estimate. Beginning in 2019 the Department in cooperation with the University of Wyoming began a lamb survival study in the herd to determine cause specific mortality and other demographic parameters for sheep in the population. Until this study is completed it is not recommended the management objective be reviewed again despite the current inability to produce a viable model.

3.) In 2019, a lamb survival study was initiated in 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 primary cause of mortality for lambs was pneumonia. Three of the adult ewes also died during the same time period.

4.) Given the long-term population decline in the herd and corresponding public concern, the Department initiated a public collaboration process in December, 2018 to inform the public on ongoing issues with the sheep herd and collect input on what actions the public would like the Department to pursue to potentially mitigate the population decline. The process was completed in June, 2019 and culminated with a report detailing a number of action items the public would like to see implemented. Many of the desired actions were information sharing in nature and will be implemented by Department personnel over the next several years. Other items involved habitat improvements and more data collection such as continuing the lamb survival study and will necessitate dissemination of information in the future.

2019 - JCR Evaluation Form

SPECIES: Bighorn Sheep | PERIOD: 6/1/2019 - 5/31/2020

HERD: BS615 - FERRIS-SEMINOE

HUNT AREAS: 17, 26 | PREPARED BY: GREG HIATT

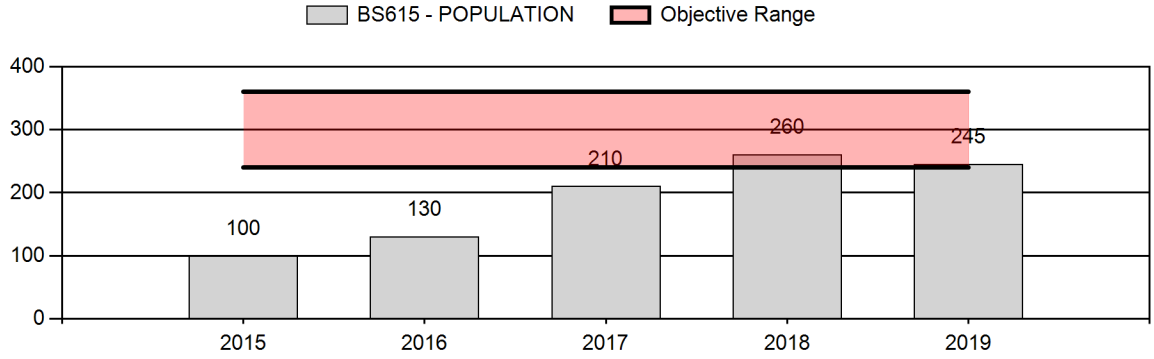
	2014 - 2018 Average	2019	2020 Proposed
Population:	153	245	265
Harvest:	2	5	5
Hunters:	2	5	5
Hunter Success:	100%	100%	100 %
Active Licenses:	2	5	5
Active License Success:	100%	100%	100 %
Recreation Days:	21	22	45
Days Per Animal:	10.5	4.4	9
Males per 100 Females	56	0	
Juveniles per 100 Females	48	0	

Population Objective (± 20%) :	300 (240 - 360)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-18.3%
Number of years population has been + or - objective in recent trend:	10
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:	6%	8%
Total:	2%	2%
Proposed change in post-season population:	+8%	+8%

Population Size - Postseason



2020 Hunting Seasons
Ferris-Seminoe Bighorn Sheep (BS615)

Hunt Area	Type	Archery Dates Opens	Archery Dates Closes	Season Dates Opens	Season Dates Closes	Quota	Limitations
17,26	1	Aug. 15	Aug. 31	Sep. 1	Oct. 31	5	Any ram

2020 Management Summary

1.) Hunting Season Evaluation: Attempts at spreadsheet modeling to estimate size of this herd have been unsuccessful because of the limited years of classification and harvest data, four infusions of transplanted bighorns during the past five years, and difficulty collecting accurate herd ratios from such a small herd. Recent population estimates are based on numbers of bighorn sheep seen during winter helicopter surveys combined with ground estimates of sheep bands that were missed from the air. The presence of significant numbers of sheep marked with satellite uplinked telemetry collars facilitate identification of sheep bands missed during the helicopter surveys. A winter trend count flown in February 2020 found 135 bighorn sheep, and the most current population estimate is ~245 bighorn sheep, down from 270 in 2018. The slight decline in numbers is attributed to increased mortality, primarily of lambs, due to the severe 2018-19 winter. Similar losses are expected after the 2019-20 winter. As is typical, the majority of these animals area in Area 17. Lamb production remained good at 43:100 in 2019, similar to the 46:100 seen in 2018. Ram:ewe ratios have been fairly constant over the past three years, ranging from 47:100 in 2017 to 44:100 in 2019, with at least 32 adult rams seen during the trend count. Harvest from this herd was increased to five rams in 2019, and average age of harvested rams increased from 5.75 years in 2018 to 7.4 years in 2019.

2.) Management Objective Review: In 2020, managers reviewed the past five years' population, weather and habitat data and determined the current management objective for the Ferris-Seminoe Bighorn Sheep herd was no longer appropriate. Given the inability to model this herd, a change from the postseason population objective of 300 bighorn sheep to a Mid-Winter Trend Count objective of 300 bighorn sheep was reviewed internally and is currently being taken to the public for comment before being presented to the Commission this summer. Detailed analysis of telemetry data from 111 bighorn sheep in this herd unit by Dwinnell et. al. (2019) found a high degree of overlap in home ranges of telemetered sheep, suggesting standardized winter surveys could be effective in finding a consistent majority of the population. Adopting a mid-winter trend count objective of 300 bighorn sheep, based upon a running 3-year average, would allow the herd to continue to increase above current levels. This increase is desired and sustainable given field personnel evaluations coupled with the Dwinnell et. al. (2019) assessment. Detailed analysis/assessment and response from the public and landowners is provided in Appendix A.

Literature Cited

Dwinnell, S, V. Donovan, and K. Monteith. 2019. Trends in Dispersal and Resource Use of Ferris-Seminoe Bighorn Sheep 2019 Research Brief. Haub School of Environment and Natural Resources, University of Wyoming. 39 pp.