TABLE OF CONTENTS

Acknowledgements

The data contained in these reports was collected by the combined efforts of Laramie Region and Cheyenne-based Wildlife Division personnel, including District Wildlife Biologists, District Game Wardens, Habitat Biologists, the Wildlife Management Coordinator, Regional Supervisor and other Department staff and volunteers working at check stations. The authors express their sincere appreciation to all those who assisted with data collection.

Post-Season Classification Data Statement

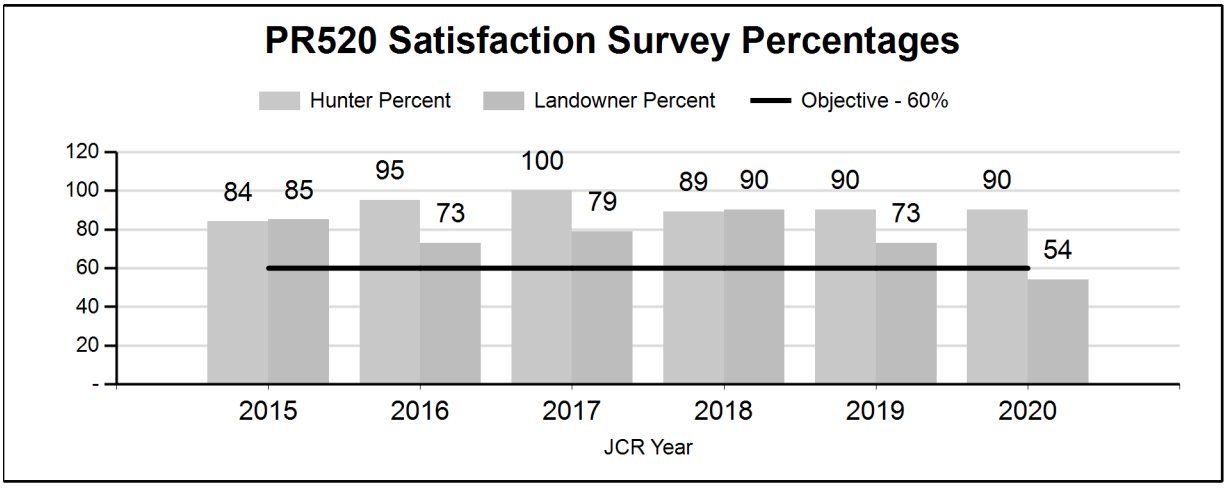
The Laramie Region worked closely with Biological Services and Speedgoat to revise the survey design for mule deer and elk post-season classification counts during the 2020/2021 field season. The new design allows for random sampling, thereby providing more rigorous, less biased estimates of herd composition. In addition, the design requires fewer hours to collect an appropriate sample. This helps to improve staff safety and fiscal efficiency. Readers will notice that, in many herds, fewer animals were counted during the 2020 biological year, compared to past years. This is expected and appropriate given the updated survey design.

2020 - JCR Evaluation Form

SPECIES: Pronghorn
HERD: PR520 - CHALK BLUFFS
HUNT AREAS: 111

PERIOD: 6/1/2020 - 5/31/2021
PREPARED BY: MARTIN HICKS

	2015 - 2019 Average	2020	2021 Proposed
Hunter Satisfaction Percent	91%	90%	60%
Landowner Satisfaction Percent	79%	54%	60%
Harvest:	135	166	135
Hunters:	134	187	150
Hunter Success:	101%	89%	90 %
Active Licenses:	166	212	170
Active License Success:	81%	78%	79 %
Recreation Days:	477	975	750
Days Per Animal:	3.5	5.9	5.6
Males per 100 Females:	37	62	
Juveniles per 100 Females	66	47	
Satisfaction Based Objective			60%
Management Strategy:			Private Land
Percent population is above (+) or (-) objective:			12%
Number of years population has been + or - objective in recent trend:			3



2021 Hunting Seasons
Chalk Bluffs Pronghorn Herd Unit (PR520)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
111	1	Aug. 15	Sept. 19	Sept. 20	Oct. 14	150	Any antelope
111	1			Oct. 15	Dec. 31		Doe or fawn
111	6	Aug. 15	Sept. 19	Sept. 20	Dec. 31	50	Doe or fawn

2020 Hunter Satisfaction: 89% Satisfied, 6% Neutral, 5% Dissatisfied
2020 Landowner Satisfaction: 36% Above Desired Levels, 50% At Desired Levels, 14% Below Desired Levels

2021 Management Summary

1.) Hunting Season Evaluation: The 2021 season is designed to provide opportunity while maintaining a hunter and landowner satisfaction of 60%. The season will continue to run through December 31 for doe and fawn pronghorn to reduce damage situations from pronghorn that migrate from Colorado as the season progresses. Access continues to be an issue with this herd unit so managers are cognizant of monitoring the satisfaction level of hunters (which is well above desired objective levels) along with success and effort trends to determine license structure. Based on those factors is does not appear a change in season structure is warranted at this time. All licenses sold in 2020 and of those, 72% were active, which was a slight decrease compared to 2019. The majority of those hunters were overwhelmingly satisfied with their hunt. For the past several years hunters satisfaction has remained high. It appears that the majority of hunters who are applying for this license have access secured prior to their hunt. A severe blizzard hit the I-25 corridor from the Colorado state line to Casper and left anywhere from 30-40" in the lower elevations resulting in excessive winter mortality due to snow depth as well as pronghorn getting hit by vehicles on plowed roads and highways. Because of the increased mortality doe/fawn licenses have been reduced to 50.

2.) Management Objective Review: The last time this herd unit's objective was reviewed was in 2018, so the next objective review will take place in 2023.

3.) Weather and Habitat: Precipitation in Hunt Area 111 was below normal for the biological year. Early spring precipitation occurred during April and early May, but rain events decreased in frequency and moisture amounts thereafter. Precipitation events throughout the remainder of the summer were sporadic and covered very small geographic areas. NOAA weather station data from Cheyenne, Wyoming, reported a 38% decline from average in annual precipitation in 2020. Lack of summer precipitation led to early senescence of grasses and forbs, likely leading to a higher reliance on cropland (irrigated and dryland) to meet nutritional requirements.

2020 - JCR Evaluation Form

SPECIES: Pronghorn
PERIOD: 6/1/2020 - 5/31/2021

HERD: PR521 - HAWK SPRINGS

HUNT AREAS: 34
PREPARED BY: MARTIN HICKS

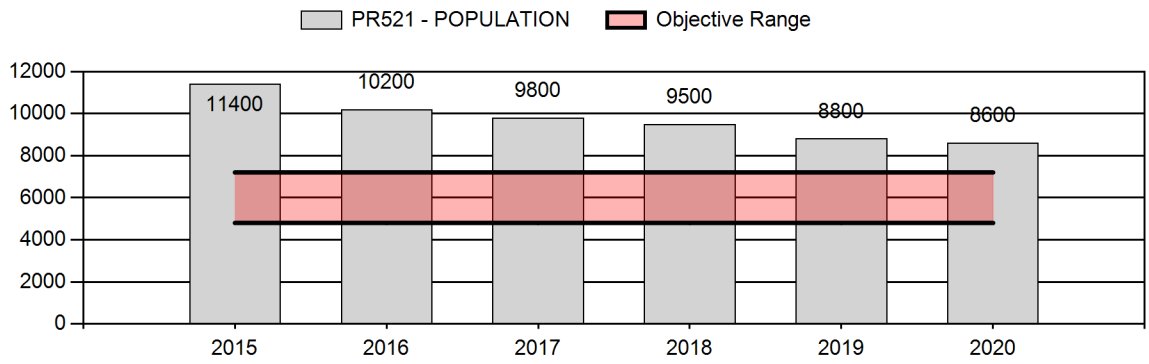
	2015 - 2019 Average	2020	2021 Proposed
Population:	9,940	8,600	9,100
Harvest:	1,145	787	525
Hunters:	1,439	970	630
Hunter Success:	80%	81%	83%
Active Licenses:	1,474	1,045	680
Active License Success:	78%	75%	77%
Recreation Days:	4,888	3,477	2,500
Days Per Animal:	4.3	4.4	4.8
Males per 100 Females	41	43	
Juveniles per 100 Females	46	33	

Population Objective (± 20%) :	6000 (4800 - 7200)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	43%
Number of years population has been + or - objective in recent trend:	5
Model Date:	01/21/2021

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

	JCR Year	Proposed
Females ≥ 1 year old:	4.9%	1.0%
Males ≥ 1 year old:	26%	23%
Total:	8.2%	5.2%
Proposed change in post-season population:	-2%	+5%

Population Size - Postseason



2021 Hunting Seasons
Hawk Springs Pronghorn Herd Unit (PR521)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
34	1	Aug. 15	Sept. 19	Sept. 20	Oct. 14	700	Any antelope
34	6	Aug. 15	Sept. 19	Sept. 20	Dec. 31	100	Doe or fawn

2020 Hunter Satisfaction: 78% Satisfied, 12% Neutral, 10% Dissatisfied

2021 Management Summary

1.)Hunting Season Evaluation: The 2021 season structure was a reduction in both Type 1 and Type 6 licenses to address a population that has experience poor fawn recruitment for five consecutive years (5-year average = 38 fawns:100 does). The proportion of males in the population rebounded in 2020 which was not expected given five years of poor fawn recruitment (Appendix A pending). However, even with a declining population there are still damage situations that need a lengthy doe/fawn season structure to address. The reduction of the number of male and female pronghorn licenses should offset poor juvenile recruitment thus slowing down the decreasing population trend. In addition an early spring blizzard hit the area on March 14-15 leaving anywhere from 30-40" of heavy, wet snow along the I-25 corridor from the Colorado state line to Casper. Excessive mortalities in pronghorn were observed post-storm due to snow depths as well as getting hit by vehicles on plowed roads and highways. An additional reduction in Type 6 licenses is warranted as a direct and indirect result of the storm.

2.) Management Objective Review: The last time this herd unit's objective was reviewed was in 2018, the next objective review will take place in 2023.

3.) Research: Managers of the Hawk Springs Herd Unit have expressed concern for this herd's recent poor performance. There is speculation that habitat quality has degraded significantly enough to a point that it is lacking the proper nutrient requirements for lactating does to sustain a fawn to weaning age. In particular the condition of lands enrolled into USDA's Conservation Reserve Program (CRP) are of concern as far as forage productivity and diversity. A grant was submitted to the USDA in 2020 for a 3-year survival study and is in review. An application likely will be submitted again in 2021 to further investigate the relationship between habitat use, parturition areas, survival and condition of CRP in southeast Wyoming.

4.) Weather and Habitat Data: Precipitation in Hunt Area 34 was well below normal for the biological year. Early spring precipitation occurred during April and May, but rain events decreased in frequency and amounts in early June. Precipitation events throughout the remainder of the summer were sporadic and covered very small geographic areas. NOAA weather station data from sites in Cheyenne and Torrington documented a decrease in annual precipitation 38% and 50% from average. Lack of summer precipitation led to early senescence of grasses and forbs, likely leading to a higher reliance on cropland (irrigated and dryland) to meet nutritional

requirements. Poor fawn survival in this herd unit may be partially attributed to poor mid to late summer forage quality, particularly in areas lacking vegetative diversity, including dryland cropland and introduced cool season grass pastures.

2020 - JCR Evaluation Form

SPECIES: Pronghorn
PERIOD: 6/1/2020 - 5/31/2021

HERD: PR522 - MEADOWDALE

HUNT AREAS: 11
PREPARED BY: MARTIN HICKS

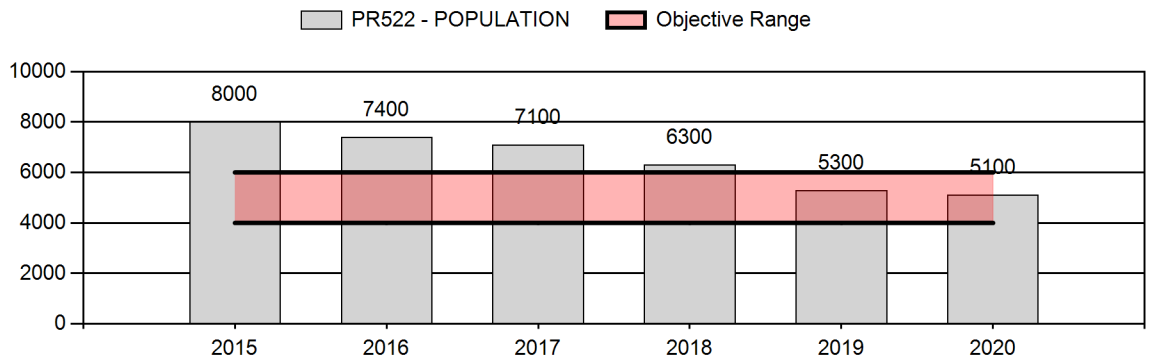
	2015 - 2019 Average	2020	2021 Proposed
Population:	6,820	5,100	4,900
Harvest:	616	503	390
Hunters:	680	612	485
Hunter Success:	91%	82%	80 %
Active Licenses:	734	651	520
Active License Success:	84%	77%	75 %
Recreation Days:	2,188	2,477	2,000
Days Per Animal:	3.6	4.9	5.1
Males per 100 Females	41	34	
Juveniles per 100 Females	46	37	

Population Objective (± 20%) :	5000 (4000 - 6000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	2%
Number of years population has been + or - objective in recent trend:	5
Model Date:	01/21/2021

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

	JCR Year	Proposed
Females ≥ 1 year old:	5.9%	4%
Males ≥ 1 year old:	30%	30%
Total:	8.8%	7.3%
Proposed change in post-season population:	-10%	-8%

Population Size - Postseason



2021 Hunting Seasons
Meadowdale Pronghorn Herd Unit (PR522)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
11	1	Aug. 15	Sept. 30	Oct. 1	Oct. 31	400	Any antelope
11	6	Aug. 15	Sept. 30	Oct. 1	Oct. 31	200	Doe or fawn

2020 Hunter Satisfaction: 75% Satisfied, 13% Neutral, 12% Dissatisfied

2021 Management Summary

1.) Hunting Season Evaluation: The 2021 season structure included a reduction in both Type 1 and Type 6 licenses to address a population that has experience poor fawn recruitment for five consecutive years (5-year average: 40 fawns: 100 does). The proportion of males in the population has steadily declined in recent years, as was expected given five years of poor fawn recruitment (Appendix A pending). The reduction of the number of male and female pronghorn licenses should offset poor juvenile recruitment, resulting in a post-season population estimate of 4,900 pronghorn. Given poor fawn recruitment this population was expected to decrease compared to previous years, however average adult survival prevented a sharper decline.

2.) Management Objective Review: The last time this herd unit's objective was reviewed was in 2018, so the next objective review will take place in 2023.

3.) Weather and Habitat Data: Precipitation in Hunt Area 11 was well below normal for the biological year. Early spring precipitation occurred during April and May, but rain events decreased in frequency and amounts in early June. Precipitation events throughout the remainder of the summer were sporadic and covered very small geographic areas. Annual precipitation data collected in Cheyenne documented a 38% decline from averages in 2020. Lack of summer precipitation led to early senescence of grasses and forbs, likely leading to a higher reliance on limited cropland (irrigated and dryland) and sagebrush habitats to meet nutritional requirements.

2020 - JCR Evaluation Form

SPECIES: Pronghorn
PERIOD: 6/1/2020 - 5/31/2021

HERD: PR523 - IRON MOUNTAIN

HUNT AREAS: 38
PREPARED BY: LEE KNOX

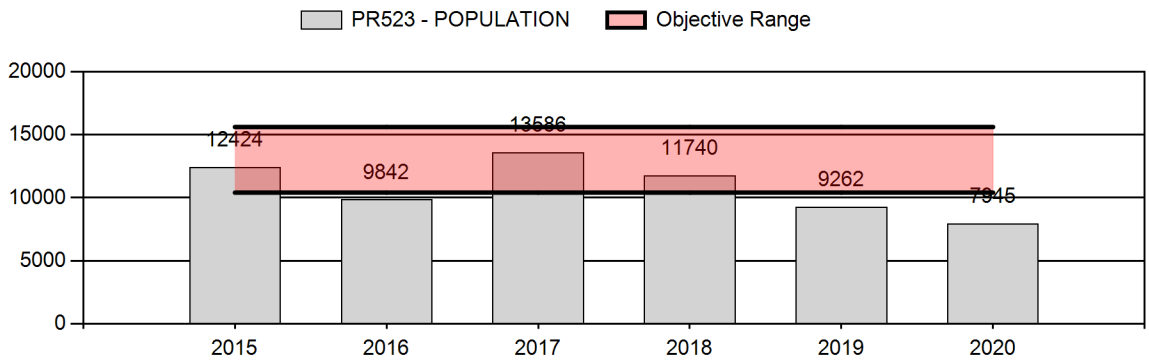
	2015 - 2019 Average	2020	2021 Proposed
Population:	11,371	7,945	7,800
Harvest:	1,432	725	710
Hunters:	1,720	986	850
Hunter Success:	83%	74%	84%
Active Licenses:	1,769	1,006	1,000
Active License Success:	81%	72%	71%
Recreation Days:	6,344	3,472	3,500
Days Per Animal:	4.4	4.8	4.9
Males per 100 Females	51	43	
Juveniles per 100 Females	60	40	

Population Objective (± 20%) :	13000 (10400 - 15600)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-38.9%
Number of years population has been + or - objective in recent trend:	2
Model Date:	2/11/2021

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

	JCR Year	Proposed
Females ≥ 1 year old:	4%	4%
Males ≥ 1 year old:	29%	28%
Total:	7%	8%
Proposed change in post-season population:	7%	8%

Population Size - Postseason



2021 Hunting Seasons
Iron Mountain Pronghorn (PR523)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
38	1	Aug. 15	Oct. 4	Oct. 5	Oct. 31	400	Any antelope
38	2	Aug. 15	Oct. 4	Oct. 5	Dec. 31	400	Any antelope south of hwy 34
38	6	Aug. 15	Oct. 4	Nov. 1	Dec. 31	100	Doe or fawn

2020 Hunter Satisfaction: 92% Satisfied, 3% Neutral, 5% Dissatisfied

2021 Management Summary

1.) Hunting Season Evaluation: The Iron Mountain pronghorn herd is declining due to poor fawn recruitment. Fawn ratios overall have been in the high 50s and low 60s since 2016. While this is not especially low, we are seeing a large variation in fawn ratios from east to west, with fawn ratios from the eastern portion of the herd unit often in the high 30s to low 40s. Compounding the issue, in November most of the pronghorn from the western portion of the herd unit migrate east and winter on agriculture fields, causing crop damage. An additional full price license was added to address this issue. The full price quota was reduced by 200 licenses, and split between the type 1 and type 2. A March snow storm produced 30-50 inches of snow along the eastern front of the Laramie Mountains, causing an increase in winter kill due to the severe conditions. The type 6 licenses were reduced by 100 to mitigate those mortalities.

2.) Management Objective Review: The current objective was set at 13,000 in 1997. The management objective was last reviewed in 2019.

3.) Habitat: Precipitation in Hunt Area 38 was well below normal for the biological year. Early spring precipitation occurred during April and May, but rain events decreased in frequency and amounts in early June. Precipitation events throughout the remainder of the summer were sporadic and covered very small geographic areas. NOAA weather station data from Laramie documented a 45% decrease in precipitation from average annual precipitation. Lack of summer precipitation led to early senescence of grasses and forbs, likely leading to a higher reliance on sagebrush habitats to meet nutritional requirements.

In fall 2020, the WGFD entered into an agreement to manage a portion (3,110 acres) of the Pilot Hill area as a WHMA on the western slope of the Laramie Range, just outside of Laramie. Lower elevations of this property include pronghorn crucial winter range.

In fall and early winter 2020, pronghorn were able to stay at higher elevations in the western half of the hunt area. Conditions remained mild through December 2020.

Appendix A

Classification

2015 - 2020 Preseason Classification Summary

for Pronghorn Herd PR523 - IRON MOUNTAIN

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2015	14,011	212	217	429	26%	676	41%	536	33%	1,641	3,021	31	32	63	± 6	79	± 7	49
2016	11,909	162	259	421	24%	862	49%	463	27%	1,746	1,586	19	30	49	± 4	54	± 5	36
2017	15,282	157	387	544	25%	1,019	46%	630	29%	2,193	2,080	15	38	53	± 4	62	± 5	40
2018	13,097	142	296	438	25%	859	49%	451	26%	1,748	1,526	17	34	51	± 5	53	± 5	35
2019	10,431	142	158	300	21%	726	50%	417	29%	1,443	1,609	20	22	41	± 4	57	± 5	41
2020	8,743	90	211	301	24%	696	55%	276	22%	1,273	0	13	30	43	± 5	40	± 4	28

2020 - JCR Evaluation Form

SPECIES: Pronghorn
PERIOD: 6/1/2020 - 5/31/2021

HERD: PR524 - DWYER

HUNT AREAS: 103
PREPARED BY: MARTIN HICKS

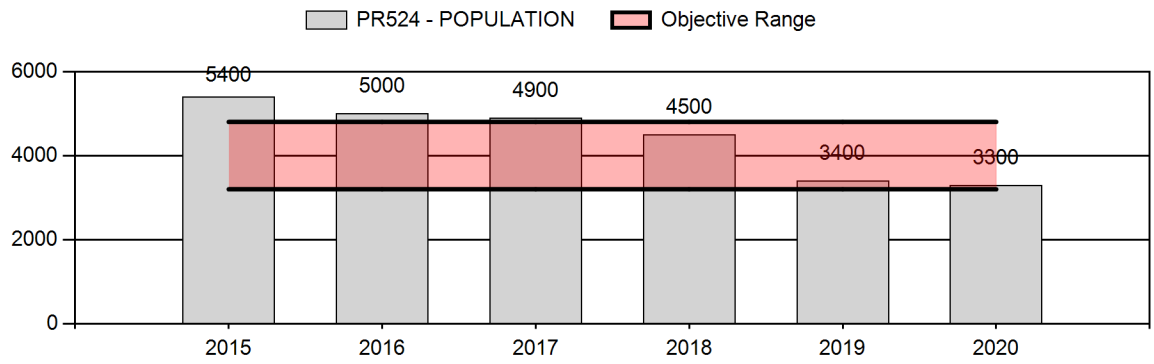
	2015 - 2019 Average	2020	2021 Proposed
Population:	4,640	3,300	3,450
Harvest:	688	407	230
Hunters:	776	601	325
Hunter Success:	89%	68%	71 %
Active Licenses:	829	622	345
Active License Success:	83%	65%	67 %
Recreation Days:	2,431	1,898	1,100
Days Per Animal:	3.5	4.7	4.8
Males per 100 Females	46	31	
Juveniles per 100 Females	41	26	

Population Objective (± 20%) :	4000 (3200 - 4800)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-17.5%
Number of years population has been + or - objective in recent trend:	3
Model Date:	01/21/2021

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

	JCR Year	Proposed
Females ≥ 1 year old:	7.7%	2.2%
Males ≥ 1 year old:	32%	30%
Total:	11%	6.1%
Proposed change in post-season population:	-10%	+5%

Population Size - Postseason



2021 Hunting Seasons
Dwyer Pronghorn Herd Unit (PR524)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
103	1	Aug. 15	Oct. 4	Oct. 5	Oct. 31	350	Any antelope
103	6	Aug. 15	Oct. 4	Oct. 5	Dec. 31	100	Doe or fawn

2020 Hunter Satisfaction: 76% Satisfied, 11% Neutral, 13% Dissatisfied

2021 Management Summary

1.) Hunting Season Evaluation: The 2021 season structure included a reduction in both Type 1 and Type 6 licenses to address a population that has experienced poor fawn recruitment for five consecutive years (five-year average: 34 fawns:100 does). The proportion of males in the population has not declined compared to adjacent herds but classification samples sizes typically are well below the adequate number needed to make accurate inferences (Appendix A pending). Even with a declining population there continues to be isolated areas of damage concerns, consequently a lengthy doe/fawn season will continue. The reduction of the number of male and female pronghorn licenses should offset poor juvenile recruitment, resulting in a post-season population estimate of 3,300 pronghorn. In addition an early spring blizzard hit the area on March 14-15 leaving anywhere from 30-40" of heavy, wet snow along the I-25 corridor from the Colorado state line to Casper. Excessive mortalities in pronghorn were observed post-storm due to snow depths as well as getting hit by vehicles on plowed roads and highways. An additional reduction in Type 6 licenses is warranted as a direct and indirect result of the storm.

2.) Management Objective Review: The last time this herd unit's objective was reviewed was in 2019. The next objective review will take place in 2024.

3.)Weather and Habitat Data: Precipitation in this herd unit was well below normal in 2020. Early spring precipitation occurred during April and May, but decreased significantly by early June. Precipitation events throughout the remainder of the summer were sporadic and covered very small geographic areas. NOAA weather station data collected in Torrington and Douglas showed a 50% and 57% departure from average annual precipitation. Lack of precipitation led to early senescence of grasses and forbs, likely leading to dietary shifts to shrub communities earlier in the year than normal.

Cheatgrass control efforts post-Britannia wildfire continued in the western foothills portion of hunt area 103, with 5,399 acres treated. Herbicide applications completed in 2019 showed 100% control of cheatgrass one year later. Transects will continue to be read in 2021 to determine herbicide efficacy and gauge native vegetation recovery following treatment. Portions of the burned areas are used by pronghorn.

2020 - JCR Evaluation Form

SPECIES: Pronghorn
PERIOD: 6/1/2020 - 5/31/2021

HERD: PR525 - MEDICINE BOW

HUNT AREAS: 30-32, 42, 46-48
PREPARED BY: LEE KNOX

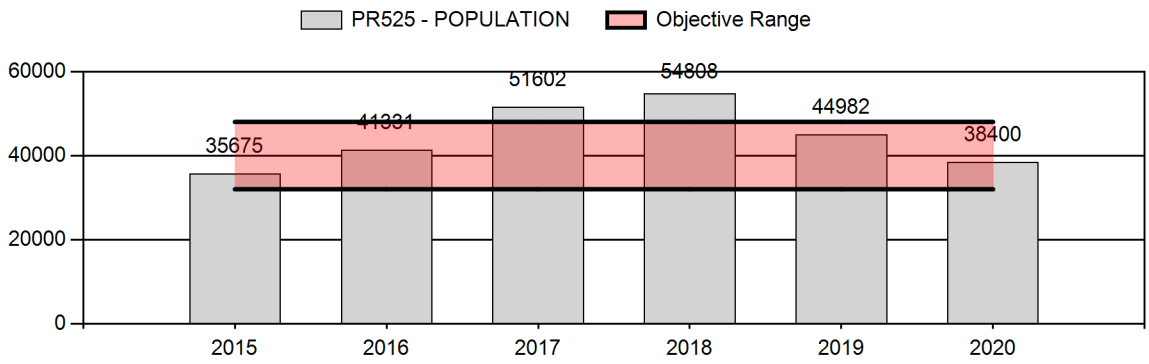
	2015 - 2019 Average	2020	2021 Proposed
Population:	45,680	38,400	44,900
Harvest:	2,951	3,502	3,000
Hunters:	3,164	4,120	3,450
Hunter Success:	93%	85%	87 %
Active Licenses:	3,493	4,485	3,300
Active License Success:	84%	78%	91 %
Recreation Days:	8,611	13,107	9,000
Days Per Animal:	2.9	3.7	3
Males per 100 Females	49	38	
Juveniles per 100 Females	70	60	

Population Objective (± 20%) :	40000 (32000 - 48000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-4%
Number of years population has been + or - objective in recent trend:	1
Model Date:	2/12/2021

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

	JCR Year	Proposed
Females ≥ 1 year old:	6%	4%
Males ≥ 1 year old:	29%	22%
Total:	9%	8%
Proposed change in post-season population:	7%	7%

Population Size - Postseason



2021 Hunting Seasons
Medicine Bow Pronghorn Herd Unit (PR525)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
42	1	Aug. 15	Sep. 24	Sep. 25	Oct. 31	200	Any antelope
42	6	Aug. 15	Sep. 24	Sep. 25	Oct. 31	50	Doe or fawn
46	1	Aug. 15	Sep. 24	Sep. 25	Oct. 31	100	Any antelope
46	2	Aug. 15	Sep. 24	Oct. 5	Oct. 31	100	Any antelope
46	6	Aug. 15	Sep. 24	Sep. 25	Oct. 31	100	Doe or fawn
47	1	Aug. 15	Sep. 24	Sep. 25	Oct. 31	500	Any antelope
47	2	Aug. 15	Sep. 24	Oct. 5	Oct. 31	300	Any antelope
47	6	Aug. 15	Sep. 24	Sep. 25	Oct. 31	350	Doe or fawn
48	1	Aug. 15	Sep. 24	Sep. 25	Oct. 31	150	Any antelope
48	2	Aug. 15	Sep. 24	Oct. 5	Oct. 31	100	Any antelope
48	6	Aug. 15	Sep. 24	Sep. 25	Oct. 31	50	Doe or fawn
30	1	Aug. 15	Oct. 4	Oct. 5	Oct. 31	400	Any antelope
30	6	Aug. 15	Oct. 4	Oct. 5	Oct. 31	50	Doe or fawn
31	1	Aug. 15	Sep. 24	Sep. 25	Oct. 31	75	Any antelope
32	1	Aug. 15	Sep. 24	Sep. 25	Oct. 31	600	Any antelope
32	6	Aug. 15	Sep. 24	Sep. 25	Oct. 31	400	Doe or fawn
32	7	Aug. 15	Sep. 24	Sep. 25	Oct. 31	150	Doe or fawn valid on or within one (1) mile of irrigated land

2020 Hunter Satisfaction: 81% Satisfied, 10% Neutral, 9% Dissatisfied

2021 Management Summary:

1.) Hunting Season Evaluation: The effects of two hard winters and a persisting drought have reduced pronghorn numbers in the Medicine Bow herd unit, with hunt areas 31,42,46, and 48 being the hardest hit. The current population estimate is within 20% of the population objective, which aligns with the end of bio year 2019 LT estimate of 52,000 SE 5700. We reduced both type 1 and type 6 licenses in hunt areas 31,42, 46 and 48 due to poor hunter success, and below average fawn and buck ratios(Appendix A). Hunt areas 30 and 31 were reduced to address high number of mortalities from a severe March snow storm. We remained status quo in hunt areas 32, 47 to maintain the population within objective.

2.) Management Objective review: The current objective was set at 40,000 in 2014. The management objective was last reviewed in 2019.

3.) Population Abundance Estimate: We conducted a line transect survey in June of 2020. The survey was conducted using Flight line Services in a Husky fixed wing. Total survey cost was $10,400 for 35 hours of flying. We flew 2,433 miles on 99 transects with a mean flight height of 308 ft and detected 680 clusters with 1,255 pronghorn. Total occupied habitat used in the analysis was 3,000 square miles. Pronghorn density was estimated at 17 mi2 (95% CI 14-21/mi2). The population estimate was 52,000 pronghorn with a 95% confidence interval of 42,000 – 64,500 pronghorn (Appendix B).

4.) Research: Wind energy development in Shirley Basin covers about 60,966 acres of crucial winter range habitat. The Department is currently working with the Wyoming Cooperative Fish and Wildlife Research Unit to better understand the effects of wind energy on pronghorn. Collars were deployed on March 20, 2018 on 80 doe pronghorn. Captures will take place twice a year to maintain the sample size of 80 collared does. At the time of writing adult doe survival was 77% (95% CI 67%- 86%) in biological year 2020. Overall survival of the original 80 does is 26% with 15 remaining in the study (Appendix C).

5.) Habitat: Precipitation levels were below normal for the 2020 biological year. Early spring precipitation occurred during April and May, but quickly diminished in early June. Precipitation events throughout the remainder of the summer were sporadic and covered very small geographic areas. NOAA weather stations in Laramie and Rawlins recorded departures from average annual precipitation of 45% and 28% respectively. Remote precipitation gauge sites established by the BLM in the upper Shirley Basin documented 50% of normal annual precipitation. Seasonal water sources dried up earlier than normal causing major shifts in pronghorn habitat use. Shrub conditions continue to be poor with the landscape being dominated by late seral shrub plant communities and continued overutilization by big game.

In Hunt Area 48, the RR316 wildfire burned 14,200 acres in spring, summer and fall pronghorn ranges. High burn severity will likely result in delayed plant recovery and soil stabilization, and will result in the loss of sagebrush habitats for decades. Conversion of 10 miles of woven wire / barbed combination fence to 4 wire fence is planned to occur south of HWY 30 within the wildfire area, which should lead to improved pronghorn movements. Additional fence on the highway ROW on HWY 30 and HWY 72 is also being converted to 5 wire fence. This conversion should allow for some improvement in pronghorn movement in Area 48. Wind energy development continues to expand throughout Hunt Area 47 with major road and wind turbine construction completed during summer and fall of 2020.

Appendix A

Classification

2015 - 2020 Preseason Classification Summary

for Pronghorn Herd PR525 - MEDICINE BOW

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2015	38,028	424	529	953	19%	2,249	45%	1,747	35%	4,949	2,810	19	24	42	± 3	78	± 4	55
2016	43,874	614	806	1,420	22%	3,007	46%	2,046	32%	6,473	2,492	20	27	47	± 2	68	± 3	46
2017	54,726	516	996	1,512	24%	2,764	44%	1,962	31%	6,238	2,807	19	36	55	± 3	71	± 3	46
2018	58,808	537	1,186	1,723	25%	3,071	45%	2,073	30%	6,867	2,392	17	39	56	± 3	68	± 3	43
2019	49,195	335	791	1,126	21%	2,612	48%	1,730	32%	5,468	2,349	13	30	43	± 2	66	± 3	46
2020	42,300	260	724	984	19%	2,599	51%	1,560	30%	5,143	0	10	28	38	± 2	60	± 3	44

Appendix B

Line Transect

2020 PR525 - MEDICINE BOW Pronghorn Line-Transect Summary

Survey Dates:	6/15/2021 - 5/24/2021
Survey Cost:	$ 10,400.00
Flight Service:	LAIRD FLYING SERVICE
Aircraft:	HUSKY
Observers:	

Weather Conditions:

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

Transect Limits:	0 to 0
Transect Direction:	North/South
Transect Interval (Minutes of Longitude):	0
Transect Length: (Mi.):	2,433
Transect Altitude (AGL):	310 ft.

Occupied Habitat (mi^2):	3,000
Density Estimate (Animals/mi^2 with Confidence Intervals):	17.3 (13.97 - 21.48)
Population Estimate (with Confidence Intervals):	51,992 (41,938 - 64,456)

Appendix C

Research

Evaluating the Influences of Wind Energy on the Movement, Distribution, and Habitat Quality of Pronghorn

Captures, March 2021

PROJECT BACKGROUND

The Shirley Basin in south-central Wyoming provides crucial winter range for the Medicine Bow pronghorn herd. Numerous factors influence survival of pronghorn including predation, disease, harsh environmental conditions, and human development. One of the main objectives of this 6-year project is to understand the demographic consequences of wind development on pronghorn and to evaluate the effects of wind energy development on the movement of pronghorn that winter in the Shirley Basin. There is a substantial footprint of proposed wind energy development in the Shirley Basin, and it is not currently known in any detail how such development in crucial pronghorn habitat will influence this pronghorn herd. Since there are many proposed wind development projects throughout pronghorn winter range in Wyoming, this study will help evaluate effects and explore potential solutions to minimize habitat loss for wintering pronghorn. TB Flats and Ekola Flats are areas where wind energy development and crucial winter range for pronghorn overlap, and thus present an opportunity to learn about how pronghorn respond to wind development.

In March 2018, the University of Wyoming and the Wyoming Game and Fish Department initiated a collaborative study to evaluate pronghorn response to wind energy in the Shirley Basin. We captured and collared 80 adult female pronghorn in the Shirley Basin and have

redeployed collars from mortalities twice a year, in November/December and March, to maintain our sample size of 80. Over the first two years of the project we noticed that a significant portion of our collard pronghorn migrate north to winter in Bates Hole and then migrate back to the Shirley Basin in the summer where they intermingle with the majority of our collared pronghorn. To further our understanding of this northerly migration, in March 2020 we spatially targeted those animals that winter in Bates Hole and collared 40 of these adult female pronghorn. Bates Hole is located on the north edge of the Shirley Basin and south of the Casper Mountains. We continue to redeploy collars from mortalities twice a year, in November/December and March, to maintain our sample size of 120 adult female pronghorn, 80 in the Shirley Basin proper and 40 in Bates Hole. This sample will allow us to evaluate the effects of wind energy development on the seasonal movement of pronghorn in the Shirley Basin area.

As of March 2021, the original 80 collars deployed in the Shirley Basin have been out for 3 years putting them at the end of their battery life. The study plan was to recapture and replace all of the original collars in March 2021. However, because many of the collars have been redeployed several times and some had been on mortality several times (collars on mortality use more battery) we felt it was necessary to start this process in November 2020. Thus, at the beginning of March 2021 there were only 44 pronghorn still wearing collars from 2018. We were able to recapture 36 of the 44 pronghorn. We were unable to recapture 8 of the animals because of private land access, the inability to hear VHF, and 1 that was unsafe to capture.

FAWN PROJECT BACKGROUND

The Shirley Basin in southcentral Wyoming provides significant crucial winter range for the Medicine Bow pronghorn herd. Numerous factors influence survival of pronghorn including predation, disease, harsh environmental conditions, and human development (Gaillard et al. 2000, Raithel et al. 2007). One of the main objectives of this 6-year project is to understand the demographic consequences of wind development on pronghorn populations in addition to evaluating any changes in habitat use due to avoidance of wind turbines.

Due to the sensitivity of young animals to disturbance and the strong influence of juvenile survival on demographic performance of ungulate populations (Michel et al. 2018), we have initiated a neonate component to evaluate fawn survival. In addition, we would like to further our understanding of how juvenile pronghorn learn their seasonal movements and habitat use. Often, juvenile ungulates will establish similar migratory movements to their mothers as has been shown in white-tailed deer (Nelson 1998), but little is known about how pronghorn neonates learn their seasonal movement patterns. In order to get at this objective, we need to collar mother-offspring pairs. In June 2020, we collared 36 neonate pronghorn in the Shirley Basin. At the beginning of March 2021, we had 11 surviving fawns and we recaptured and replaced the collars on all but one of them.

DATA COLLECTION

This March marked the 8th adult capture event for this study. We captured 65 adult female pronghorn. In addition, this was the first capture event for replacing collars on 9-month old pronghorn, where we recaptured 11 9-month-olds. Captures took place on March 2nd, 3rd, and 4th of 2021. All captures were conducted via helicopter net-gunning and animals were field processed by Native Range Capture Services. During captures we had 3 capture mortalities and 8 animals have died within the two-week period following captures and we will consider these to be capture-related mortalities (see Figure 1 for a detailed summary of all capture mortalities). 10 9-month-old and 10 adult doe pronghorn were fitted with VECTRONIC SURVEY-1D IRIDIUM collars. 12 adult doe pronghorn were fitted with ATS G5-D Iridium GPS collars. 2 adult doe pronghorn were fitted with LOTEK PinnaclePro Iridium solar GPS collars. 38 adult doe pronghorn were fitted with Telonices RECON-4560-4 Globalstar Sattelite GPS collars. The Telonics collars are programmed to collect a GPS location every 2 hours and transmit 2 locations via satellite every other day. The battery capacity of these collars is approximately 3 years. The collars emit a very high frequency (VHF) signal, which will allow ground technicians to locate collars to retrieve the stored data in the case of a mortality. All other collars are set to the similar specs but they transmit all GPS locations remotely.

The capture crew collected biological samples during field processing. We collected blood samples (~20 ml) and hair (20+ hairs) for DNA testing and to provide the Wyoming Game and Fish Veterinary Lab with samples to screen for disease. We also collected fecal samples (~15 to 20 pellets) for nutrition analysis.

During this capture event, one of the Bates Hole doe pronghorn was accidently recaptured and the collar was replaced with a new Shirley Basin collar. The collar that was removed then was redeployed on a new doe pronghorn because this collar had only be out for one year. Also, one adult doe pronghorn was captured and the collar was replaced and then the same animal was accidently recaptured again and the collar was swapped again.

Figure 1.

AID	Serial_number	Mort date	Status	Mort_type	Observations	Carcass	Notes
SB-089	701912	3/2/2021	Recapture	Captur mort	Broken neck	Taken to lab	
SB-033	701919	3/2/2021	Recapture	Capture mort	Broken neck	Walker decided to field dress and donate this carcass because it was early in the morning	This was one of the origanal 80
SB-052	702713	3/3/2021	Recapture	Capture mort	Broken leg and was euthanized	Taken to lab	This was one of the origanal 80 and was the mom of a fawns
SB-056	702718	3/5/2021	Recapture	Post-capture mort	Nothing left	Carcass was completely scavenged	This was one of the origanal 80
SB-110	723228	3/12/2021	Recapture	Post-capture mort	Nothing left	Carcass was completely scavenged	
SBF-028	48558	3/10/2021	Fawn Recapture	Post-capture mort	Found dead in a snare	Taken to lab	Based on the time line, the lab believes that the cause of death was from the capture not the snare.
SBF-047	48551	3/4/2021	Fawn Recapture	Post-capture mort	Nothing left	Carcass was completely scavenged	
SBF-020	48563	3/4/2021	Fawn Recapture	Post-capture mort	Nothing left	Carcass was completely scavenged	
SBF-017	48555	3/8/2021	Fawn Recapture	Post-capture mort	Highway mortality	Carcass mostly consumed	GPS data showed pronghorn going right up to the highway then went on mort not far from highway. Rob checked the mort and found shatterd femur and identified cause of death to be vehicle collision
SBF-036	48565	3/3/2021	Fawn Recapture	Post-capture mort	Nothing left	Carcass was completely scavenged	Coyote feeding on carcass when it was picked up
SBF-034	47972	3/10/2021	Fawn Recapture	Post-capture mort	Just the head was found	Just the head was found	Coyote tracks were all around the area the head was burried

CAPTURE LOCATIONS

Of the 72 pronghorn captured and successfully collared in March 2021, 24 of the collars were new captures in the Shirley Basin, 5 were redeployed collars in Bates Hole (one of these was the redeployed collar from the mistake capture), 10 were replacing collars on 9-month-olds, and 33 were replacing collars from the original 80.

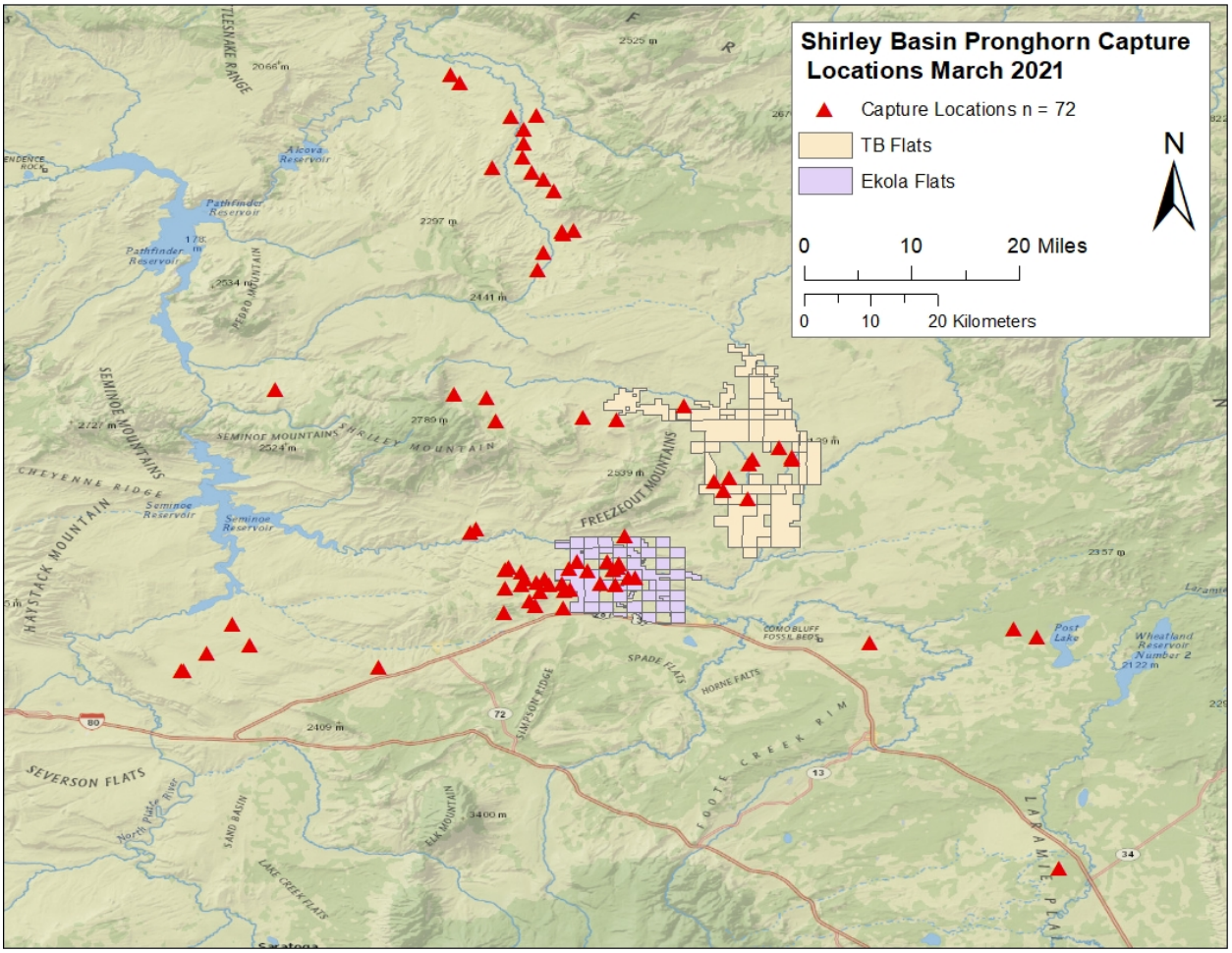


Figure 2. Capture locations of all (n = 72) pronghorn does in the larger Shirley Basin study area.

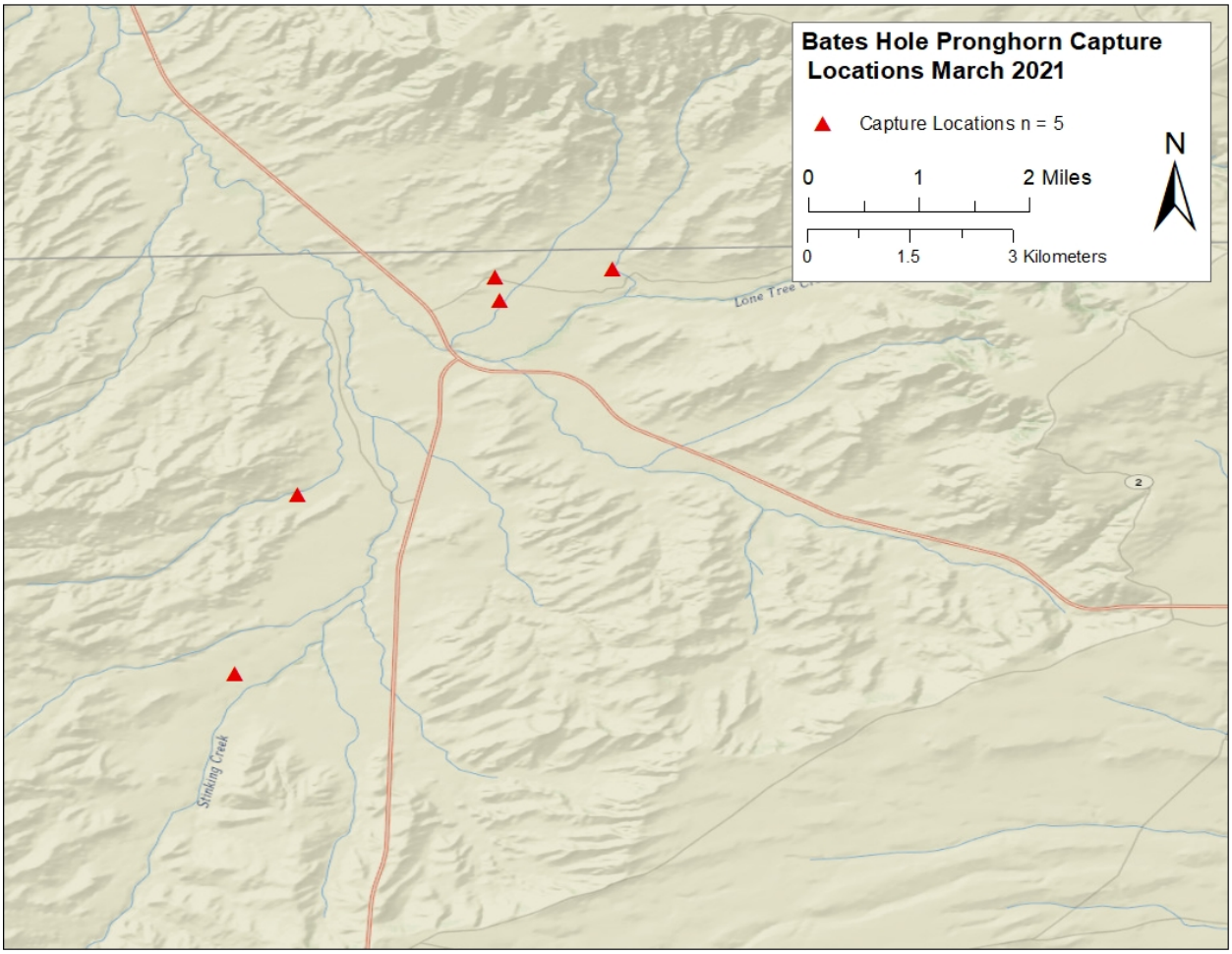


Figure 3. Capture locations of 5 redeployed collars in Bates Hole.

COLLABORATORS

Research partners for this project include Lee Knox, Embere Hall, Teal Cufaude, Heather O'Brian, Rob Shipe, and Justin Binfet of the Wyoming Game and Fish Department. We want to sincerely thank all collaborators for their help and funding to make this project possible: Wyoming Game and Fish Department, Pacificorp, Invenergy, BluEarth Renewables, and The Nature Conservancy in Wyoming. In addition, we would like to thank the numerous landowners that allowed us access to capture on their property; this project would not be possible without their collaboration.

FOR MORE INFORMATION, CONTACT:

University of Wyoming
Cody Wallace – cwalla21@uwyo.edu

Matthew Kauffman – mkauffml@uwyo.edu

Wyoming Game and Fish Department

Embere Hall - embere.hall@wyo.gov

Lee Knox - lee.knox@wyo.gov

Teal Cufaude - teal.cufaude@wyo.gov

Justin Bainfet - justin.binfet@wyo.gov

Heather O'Brian - heather.obrien@wyo.gov

2020 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2020 - 5/31/2021

HERD: PR526 - COOPER LAKE

HUNT AREAS: 43

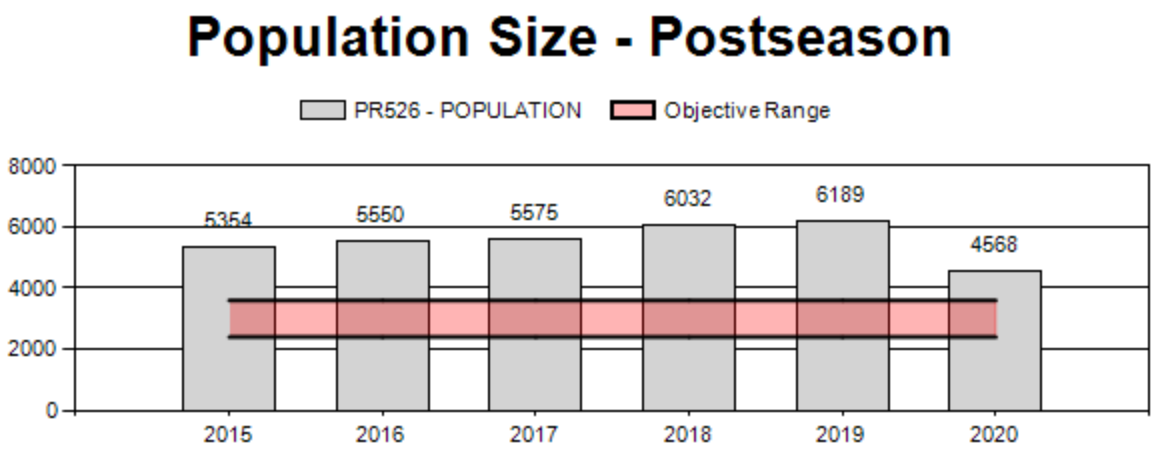
PREPARED BY: KEATON WEBER

	2015 - 2019 Average	2020	2021 Proposed
Population:	5,740	4,568	4,154
Harvest:	805	799	846
Hunters:	932	1,105	1,016
Hunter Success:	86%	72%	83%
Active Licenses:	1,005	1,170	1,088
Active License Success:	80%	68%	78%
Recreation Days:	2,883	3,878	3,380
Days Per Animal:	3.6	4.9	4.0
Males per 100 Females	58	37	
Juveniles per 100 Females	83	68	

Population Objective (± 20%):	3000 (2400 - 3600)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	52%
Number of years population has been + or - objective in recent trend:	22
Model Date:	2/08/2021

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

	JCR Year	Proposed
Females ≥ 1 year old:	20%	20%
Males ≥ 1 year old:	20%	20%
Total:	18%	22%
Proposed change in post-season population:	4%	10%



2021 Hunting Seasons
Cooper Lake (PR526)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
43	1	Aug. 15	Sep. 14	Sep. 15	Oct. 31	500	Any antelope
43	6	Aug. 15	Sep. 14	Sep. 15	Oct. 31	600	Doe or fawn

2020 Hunter Satisfaction: 67% Satisfied, 14% Neutral, 19% Dissatisfied

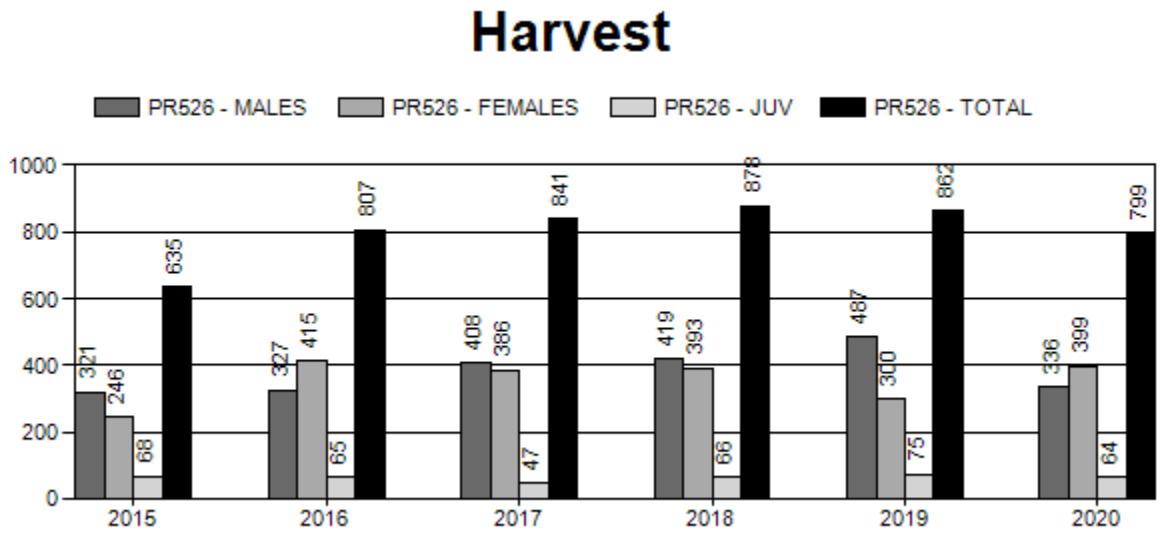
2021 Management Summary

1.) Hunting Season Evaluation: Cooper Lake is predominantly a private land herd. This herd is above objective and season length is as liberal as access will allow. The majority of harvest comes from the Laramie River and Diamond Lake Hunter Management Areas. A decrease in 100 Type 1 and Type 2 licenses has been implemented to reduce the overcrowding and to compensate for reduced access. Hunter success rates have steadily declined from 87% (2016) to 68% (2020) and number of days hunted per harvest has steadily increased from 2.7 (2016) to 4.9 (2020). The management strategy is recreational management which prescribes for a buck ratio of 30 to 59:100 does. Buck ratios have slightly declined with buck ratios in 2020 at 37:100, and the 3 year average at 44:100 does. Additionally, this herd still has good fawn recruitment at 68 fawns:100 does in 2020. A wet, cold snow storm during the first week of June and a hot, dry summer that extended into the fall of 2020 likely explains the large decline in population estimate from 6,189 individuals in 2019 to 4,568 in 2020. The reduced license quotas, weather events and conditions are not of great concern, as the population estimate is still above objective.

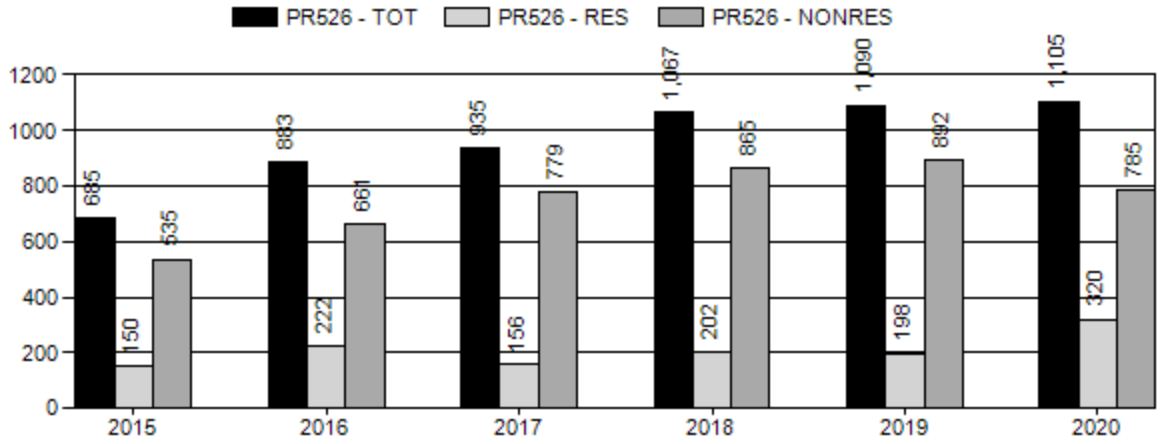
2.) Management Objective Review: The current objective was set at 3,000 in 1986. The management objective was last reviewed in 2018.

3.) Population Abundance Estimate: We conducted a line transect survey in May of 2019. The survey was conducted using Laird Flying Services in a Husky fixed wing. Total survey cost was $1,750.00 for 6 hours of flying. We flew 492 miles on 32 transects with a mean flight height of 321 ft. and detected 405 clusters with 725 pronghorn. Total occupied habitat used in the analysis was 445 square miles. Pronghorn density was estimated at 14.31 per square mile (95% CI 11.4 – 17.95/sq. mi.). The population estimate was 6,369 pronghorn with a 95% confidence interval of 5,077-7,989 pronghorn (Appendix B).

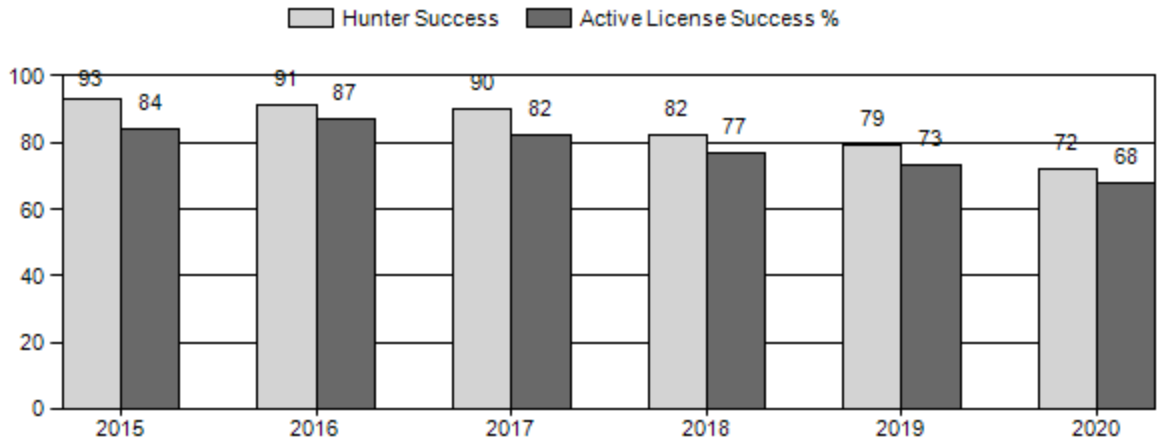
4.) Habitat: A wet, cold snow storm during the first week of June likely had negative impacts on fawn survival. An extremely hot, dry summer that extended into the fall of 2020 likely explains the large decline in population estimate from 6,189 individuals in 2019 to 4,568 in 2020 due to very low forage production causing poor body conditions for pronghorn entering the fall and winter months. However, these weather events and conditions are not of great concern, as the population estimate is still above objective (3,000).



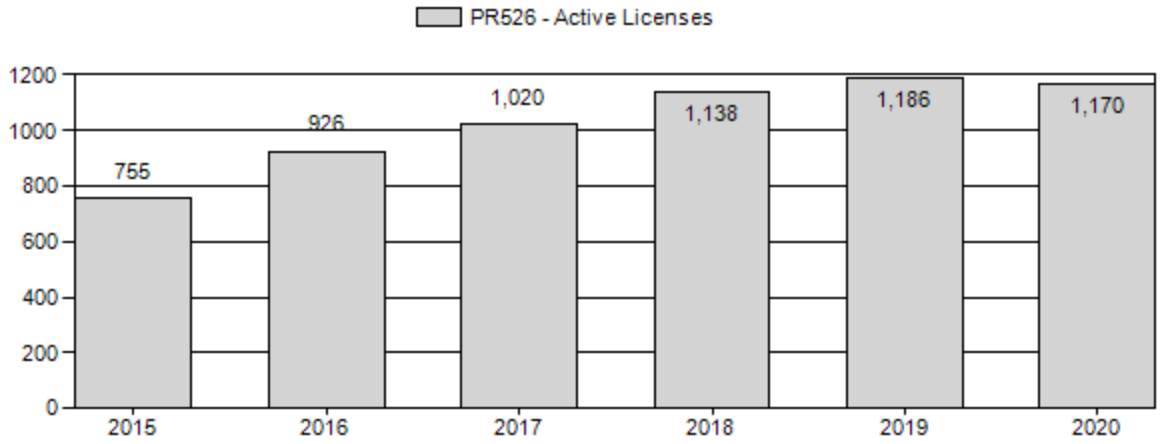
Number of Hunters



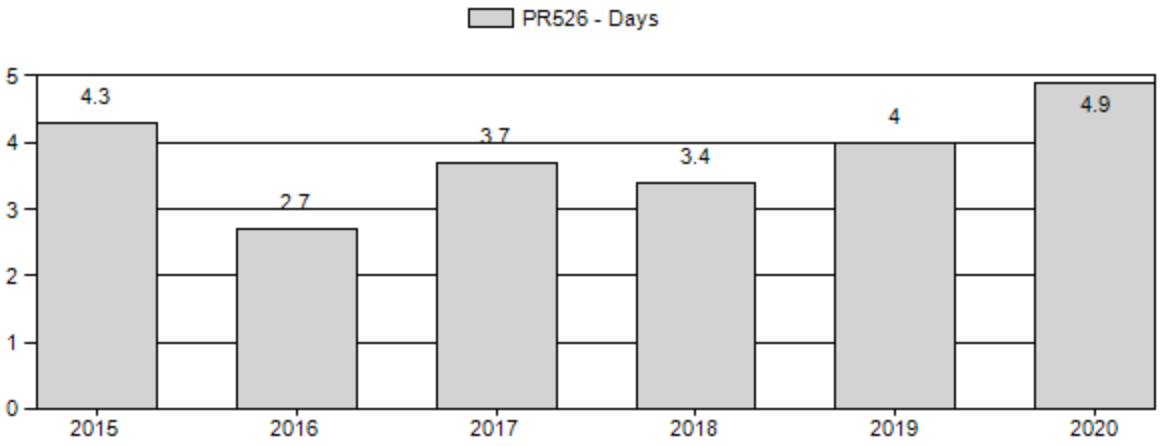
Harvest Success



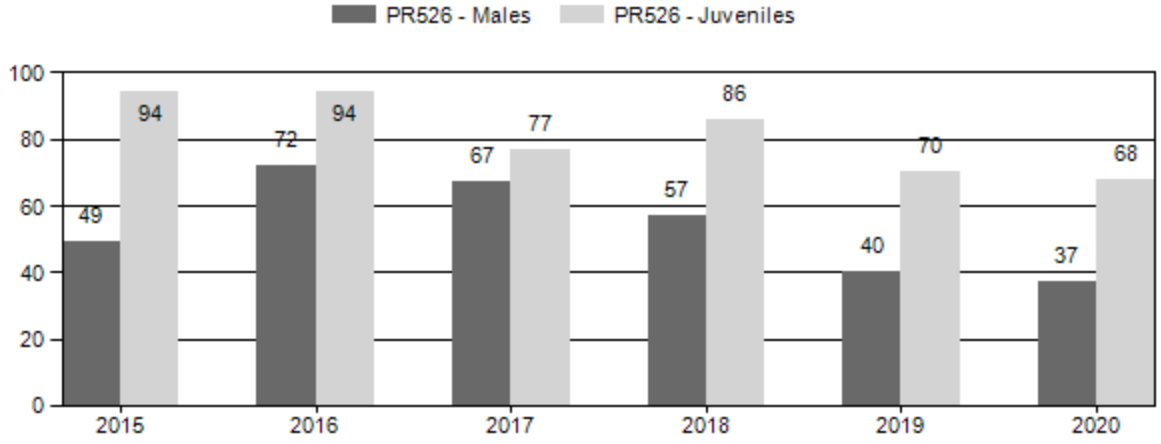
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



Appendix A

Classification

2015 - 2020 Preseason Classification Summary

for Pronghorn Herd PR526 - COOPER LAKE

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2015	6,052	68	92	160	20%	325	41%	307	39%	792	2,352	21	28	49	± 7	94	± 12	63
2016	6,367	109	139	248	27%	345	38%	324	35%	917	2,878	32	40	72	± 9	94	± 11	55
2017	6,500	135	243	378	27%	564	41%	437	32%	1,379	2,904	24	43	67	± 7	77	± 7	46
2018	6,998	52	88	140	23%	246	41%	211	35%	597	1,984	21	36	57	± 9	86	± 13	55
2019	7,137	34	100	134	19%	336	48%	236	33%	706	1,959	10	30	40	± 6	70	± 9	50
2020	5,447	48	52	100	18%	268	49%	182	33%	550	0	18	19	37	± 7	68	± 10	49

Appendix B

Line Transect

2018 PR526 - COOPER LAKE Pronghorn Line-Transect Summary

Survey Dates:	5/31/2019 – 5/31/2019
Survey Cost:	$ 1,750.00
Flight Service:	LAIRD FLYING SERVICE
Aircraft:	HUSKY
Observers:	Kelly Todd and Becca Lutz
Weather Conditions:	
Temperature (Degrees Fahrenheit):	70
Cloud Cover (%):	50
Wind Speed (MPH):	0 – 20
Transect Limits:	-106.194932 to -10F.588132
Transect Direction:	North/South
Transect Interval (Minutes of Longitude):	3
Transect Length: (Mi.):	492
Transect Altitude (AGL):	321 ft.
Occupied Habitat (mi^2):	445
Density Estimate (Animals/mi^2 with Confidence Intervals):	14.31 (11.4 - 17.95)
Population Estimate (with Confidence Intervals):	6,369 (5,077 – 7,989)

2020 - JCR Evaluation Form

SPECIES: Pronghorn
PERIOD: 6/1/2020 - 5/31/2021

HERD: PR527 - CENTENNIAL

HUNT AREAS: 37, 44-45
PREPARED BY: LEE KNOX

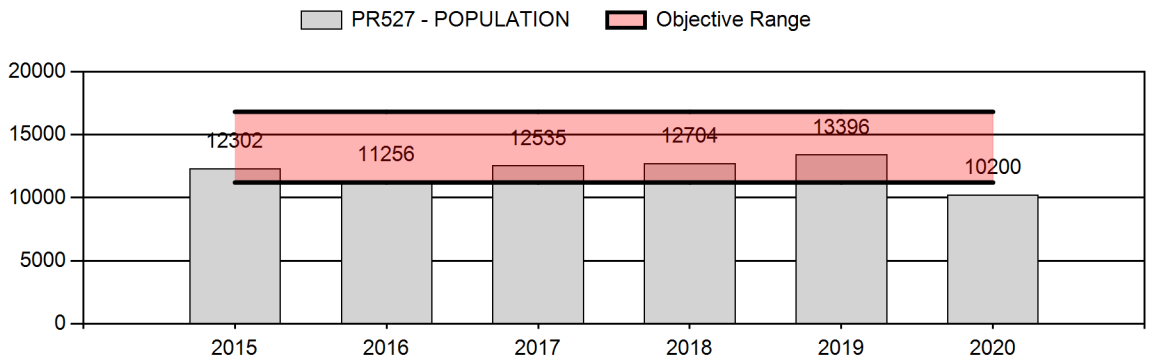
	2015 - 2019 Average	2020	2021 Proposed
Population:	12,439	10,200	10,000
Harvest:	1,019	879	1,000
Hunters:	1,089	1,075	1,250
Hunter Success:	94%	82%	80 %
Active Licenses:	1,215	1,157	1,200
Active License Success:	84%	76%	83 %
Recreation Days:	3,653	4,603	3,700
Days Per Animal:	3.6	5.2	3.7
Males per 100 Females	45	38	
Juveniles per 100 Females	58	52	

Population Objective (± 20%) :	14000 (11200 - 16800)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-27.1%
Number of years population has been + or - objective in recent trend:	1
Model Date:	2/11/2021

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

	JCR Year	Proposed
Females ≥ 1 year old:	5.5%	5%
Males ≥ 1 year old:	23%	46%
Total:	8%	8%
Proposed change in post-season population:	9%	10%

Population Size - Postseason



2021 HUNTING SEASONS
Centennial Pronghorn Herd (PR527)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
37	1	Aug. 15	Sep. 19	Sep. 20	Oct. 14	300	Any antelope
37	6	Aug. 15	Sep. 19	Sep. 20	Oct. 14	100	Doe or fawn
44	1	Aug. 15	Sep. 14	Sep. 15	Oct. 31	450	Any antelope
44	6	Aug. 15	Sep. 14	Sep. 15	Oct. 31	100	Doe or fawn
45	1	Aug. 15	Sep. 14	Sep. 15	Oct. 31	500	Any antelope
45	6	Aug. 15	Sep. 14	Sep. 15	Oct. 31	200	Doe or fawn

2020 Hunter Satisfaction: 89.5% Satisfied, 8% Neutral, 2.5% Dissatisfied

2021 Management Summary

1.) Hunting Season Evaluation: The management strategy is recreational management which prescribes for a buck ratio of 30 to 59:100 does. Buck ratios remain within management guidelines at 38:100 does, with a 3 year average of 44:100 does. 2021 was the first year the population dipped below 20% of the management goal of 14,000. Fawn ratios have been low, with the three year average of 54:100 does. In hunt areas 44 and 45, adjusting the segment of the population being harvested by reducing the types 6s, and increasing type 1s, will maintain hunter opportunity while increasing the population within 20% of the objective. Hunt area 37 type 1 and 6s were increased to take advantage of good population numbers west of Harriman road.

2.) Management Objective review: The current objective was set at 14,000 in 1997. The management objective was last reviewed in 2018.

4.) Habitat: Snow accumulations, especially at the higher elevations within this hunt area were below normal. Precipitation levels were below normal for the 2020 biological year. Early spring precipitation occurred during April and May. A spring snowstorm on June 8, 2020, resulted in 8" of snow in Laramie and the foothills and plains to the west of Laramie. While spring precipitation events are critical to the growth of vegetation, poorly timed events such as this one during peak fawning periods, could have had some impact on fawn survival. Precipitation events throughout the remainder of the summer were sporadic and covered very small geographic areas. NOAA weather stations in Laramie and Rawlins recorded departures from average annual precipitation of 45% and 28% respectively. Lack of summer precipitation led to earlier senescence of grasses and forbs, likely leading to pronghorn dietary shifts to shrub communities much earlier in the year than normal. Through fall and early winter 2020, conditions remained mild, with no persistent snow accumulations.

Appendix A

Classification

2015 - 2020 Preseason Classification Summary

for Pronghorn Herd PR527 - CENTENNIAL

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2015	13,414	199	277	476	19%	1,181	48%	802	33%	2,459	2,207	17	23	40	± 3	68	± 5	48
2016	12,388	182	353	535	25%	1,000	48%	565	27%	2,100	1,724	18	35	54	± 4	56	± 4	37
2017	13,681	107	284	391	21%	972	52%	508	27%	1,871	2,039	11	29	40	± 4	52	± 4	37
2018	13,800	124	260	384	23%	823	50%	439	27%	1,646	1,532	15	32	47	± 4	53	± 5	36
2019	14,782	132	328	460	23%	1,006	50%	562	28%	2,028	1,609	13	33	46	± 4	56	± 4	38
2020	11,100	79	207	286	20%	743	53%	383	27%	1,412	0	11	28	38	± 4	52	± 5	37

2020 - JCR Evaluation Form

SPECIES: Pronghorn
PERIOD: 6/1/2020 - 5/31/2021

HERD: PR528 - ELK MOUNTAIN

HUNT AREAS: 50
PREPARED BY: TEAL CUFAUDE

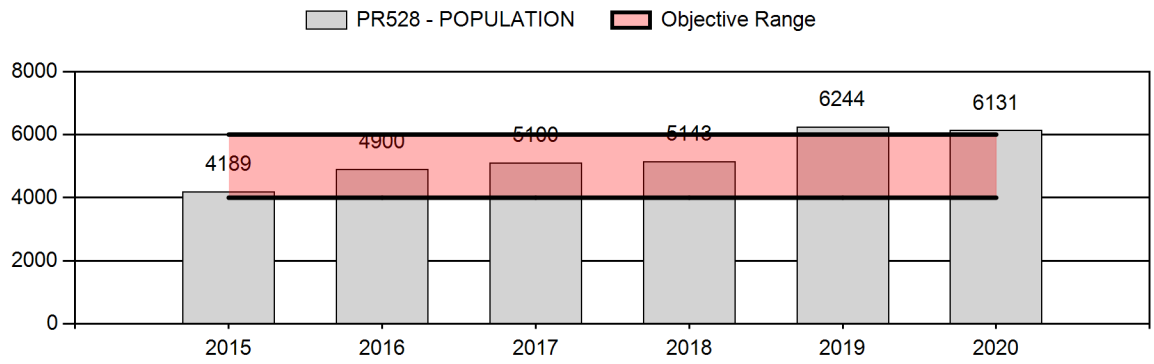
	2015 - 2019 Average	2020	2021 Proposed
Population:	5,115	6,131	6,050
Harvest:	347	400	425
Hunters:	366	437	450
Hunter Success:	95%	92%	94 %
Active Licenses:	402	487	495
Active License Success:	86%	82%	86 %
Recreation Days:	1,153	1,319	1,400
Days Per Animal:	3.3	3.3	3.3
Males per 100 Females	45	40	
Juveniles per 100 Females	55	50	

Population Objective (± 20%) :	5000 (4000 - 6000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	23%
Number of years population has been + or - objective in recent trend:	6
Model Date:	02/12/2021

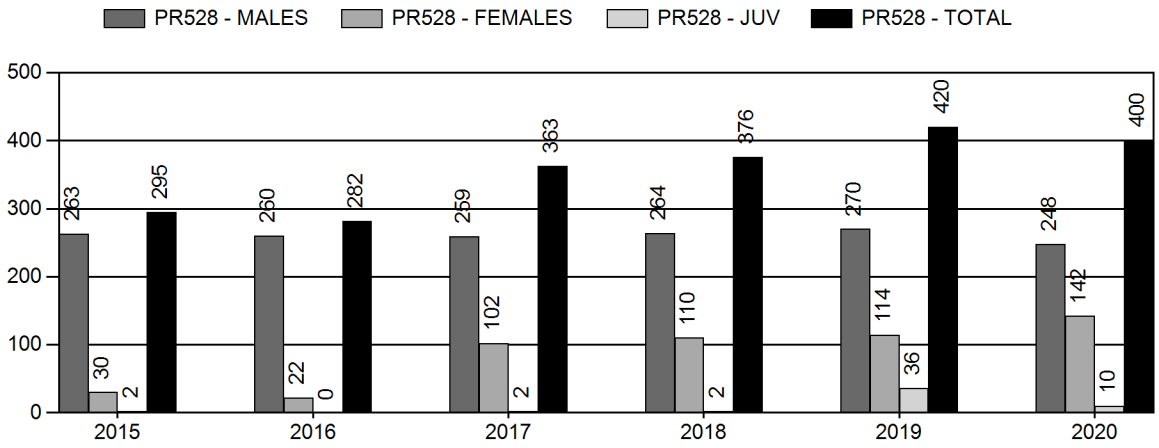
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	JCR Year	Proposed
Females ≥ 1 year old:	4.5%	4.9%
Males ≥ 1 year old:	19.4%	20.3%
Total:	7%	8%
Proposed change in post-season population:	0.4%	1.3%

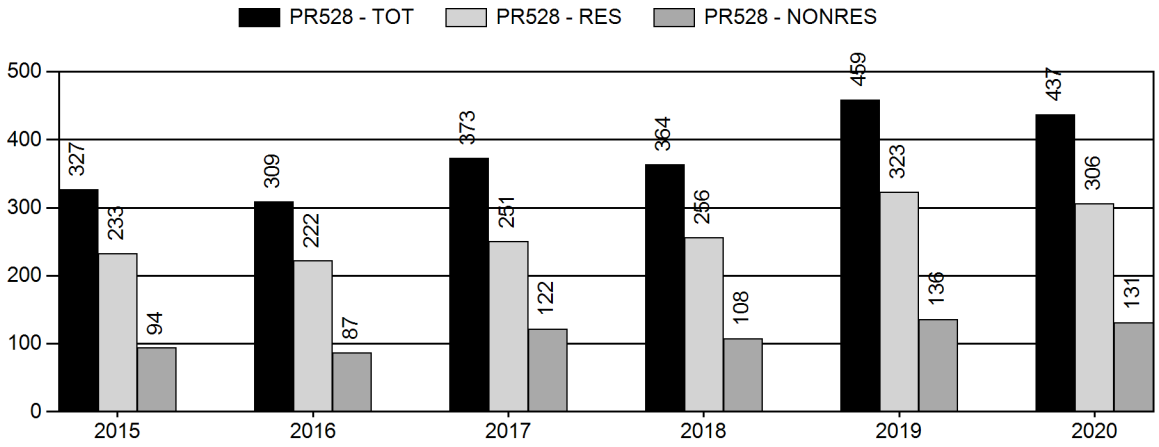
Population Size - Postseason



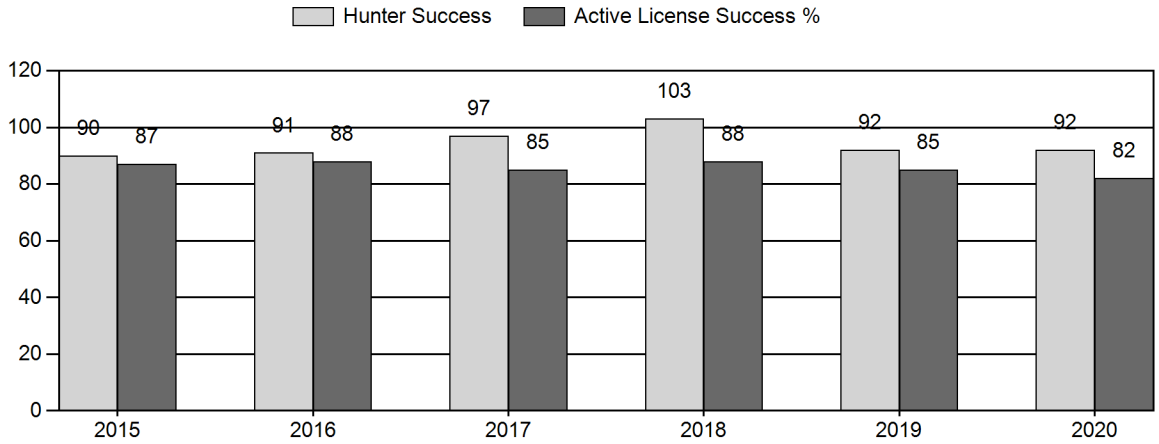
Harvest



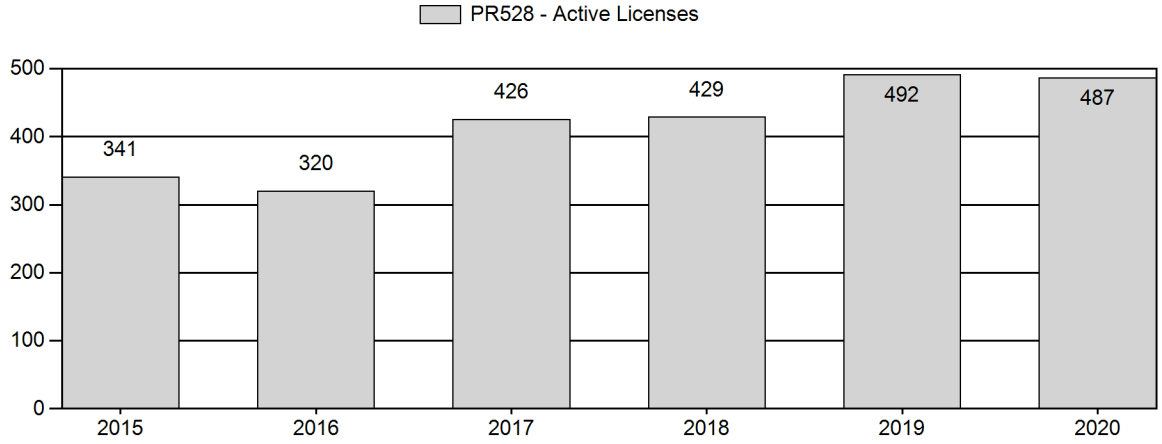
Number of Hunters



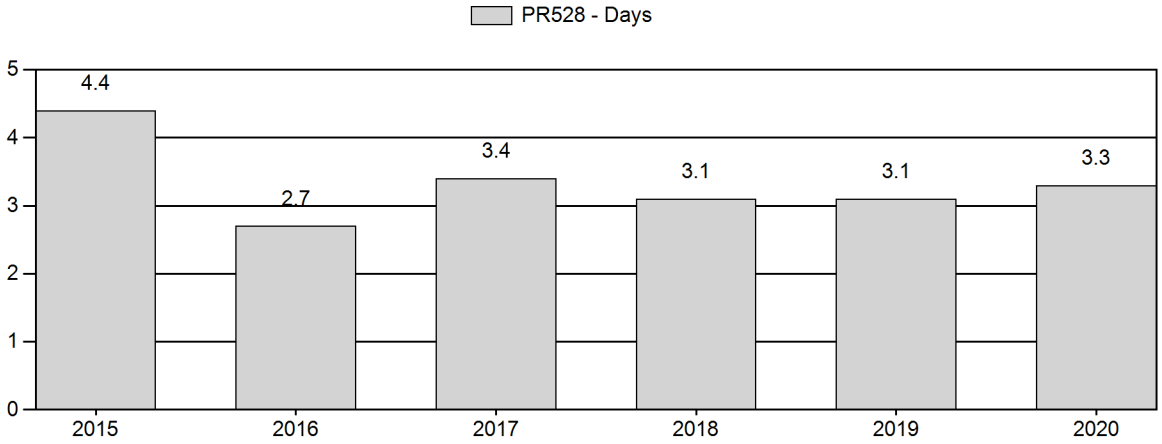
Harvest Success



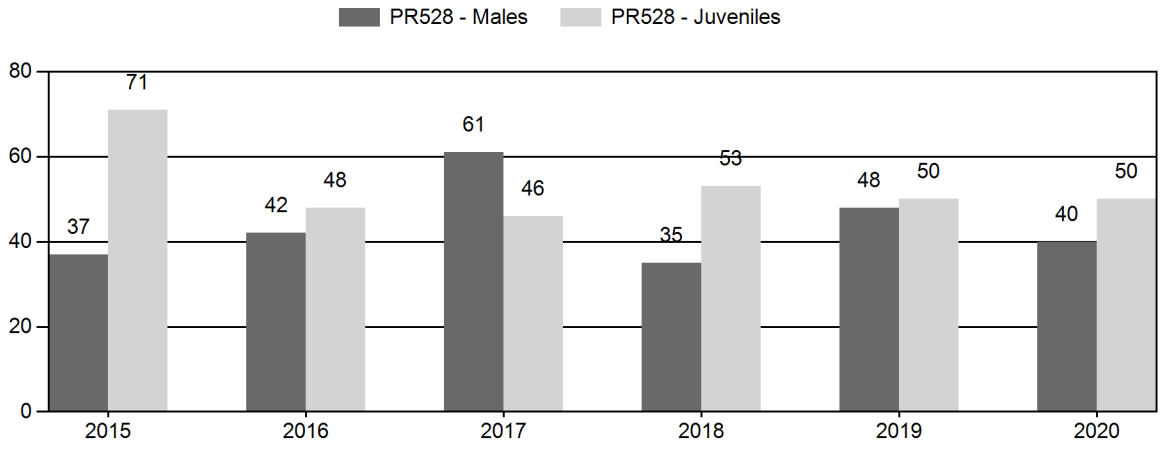
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2021 Hunting Seasons
Elk Mountain Pronghorn (PR528)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
50	1	Aug. 15	Aug. 31	Sep. 16	Oct. 31	300	Any antelope
50	6	Aug. 15	Aug. 31	Sep. 16	Oct. 31	200	Doe or fawn
50	0			Sep. 1	Sep. 15	50	Any antelope, muzzle-loading firearms only

2020 Hunter Satisfaction: 85.8% Satisfied, 8.8% Neutral, 5.3% Dissatisfied

2021 Management Summary

1.) Hunting Season Evaluation: The pre-season fawn/doe ratio (50/100) exceeded the five-year average and the buck/doe ratio remained within the recreational management objective limits (Appendix A). In 2020, hunter satisfaction increased slightly, days to harvest (3.3) was reasonable, and hunter success (91%) was good. The post-season population estimate of 6,130 pronghorn was above the 5,000 (±20%) population objective.

In 2020, reported buck harvest represented 19.3% of the males estimated in this herd. License quotas for 2021 represent approximately 20% of the bucks predicted to be in the herd. Managers will consider increasing the Type 1 quota for the 2022 hunting season if harvest of estimated preseason bucks remains below 25%. The current season structure was implemented in 2019 and managers intended to maintain quotas over a three year period. It is anticipated that hunters will have a high likelihood of success and days to harvest will remain low in 2021. The license allocation should allow for stabilizing pronghorn numbers near the upper end of the population objective range.

2.) Management Objective Review: The objective was last reviewed in 2018 and will be reviewed again in 2023.

3.) Weather/Habitat: Snow accumulations, especially at higher elevations within this hunt area were below normal. Precipitation levels also were below normal for the 2020 biological year. Early spring precipitation occurred during April and May. Precipitation events throughout the remainder of the summer were sporadic and covered very small geographic areas. Lack of summer precipitation led to earlier senescence of grasses and forbs, likely resulting in pronghorn dietary shifts to shrub communities earlier in the year than normal. Through fall and early winter 2020, conditions remained mild, with no persistent snow accumulations. Cheatgrass control efforts continued near Corral Creek between Bennet Peak and Barrett Ridge in the southwestern portion of hunt area 50. In 2020, 1,039.4 acres were treated via aerial application of the herbicide, Plateau.

4.) Line Transect Survey: A LT survey was conducted to estimate pronghorn abundance at the end of biological year 2018. The end of biological year population estimate was 13,107 pronghorn (95% confidence interval= 9,847-17,445 pronghorn).

2015 - 2020 Preseason Classification Summary

for Pronghorn Herd PR528 - ELK MOUNTAIN

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2015	4,502	118	108	226	18%	612	48%	437	34%	1,275	1,153	19	18	37	± 4	71	± 6	52
2016	5,200	80	83	163	22%	391	53%	189	25%	743	1,459	20	21	42	± 6	48	± 7	34
2017	5,500	157	152	309	30%	503	48%	230	22%	1,042	1,426	31	30	61	± 7	46	± 5	28
2018	5,557	74	111	185	19%	523	53%	276	28%	984	1,209	14	21	35	± 5	53	± 6	39
2019	6,706	95	197	292	24%	610	50%	308	25%	1,210	1,214	16	32	48	± 5	50	± 5	34
2020	6,571	85	187	272	21%	677	53%	340	26%	1,289	1,606	13	28	40	± 4	50	± 5	36

2020 - JCR Evaluation Form

SPECIES: Pronghorn
PERIOD: 6/1/2020 - 5/31/2021

HERD: PR529 - BIG CREEK

HUNT AREAS: 51
PREPARED BY: TEAL CUFAUDE

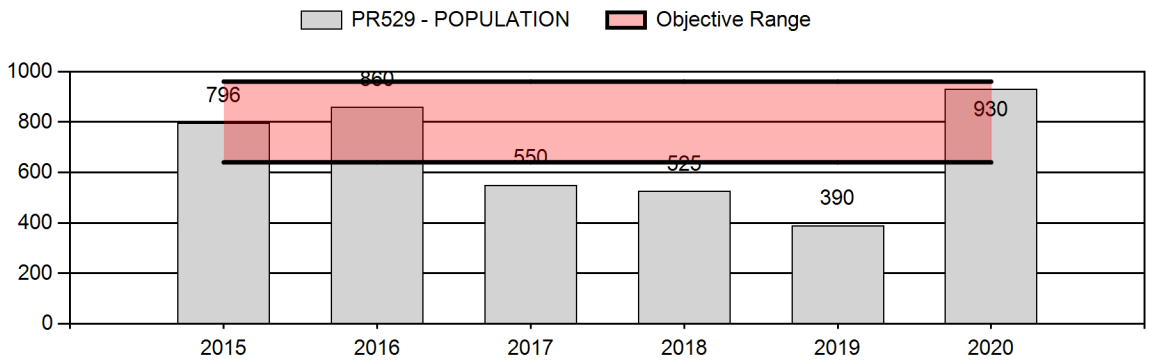
	2015 - 2019 Average	2020	2021 Proposed
Population:	624	930	815
Harvest:	134	158	164
Hunters:	135	180	180
Hunter Success:	99%	88%	91 %
Active Licenses:	157	214	200
Active License Success:	85%	74%	82 %
Recreation Days:	469	601	600
Days Per Animal:	3.5	3.8	3.7
Males per 100 Females	63	0	
Juveniles per 100 Females	53	0	

Population Objective (± 20%) :	800 (640 - 960)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	16%
Number of years population has been + or - objective in recent trend:	1
Model Date:	02/12/2021

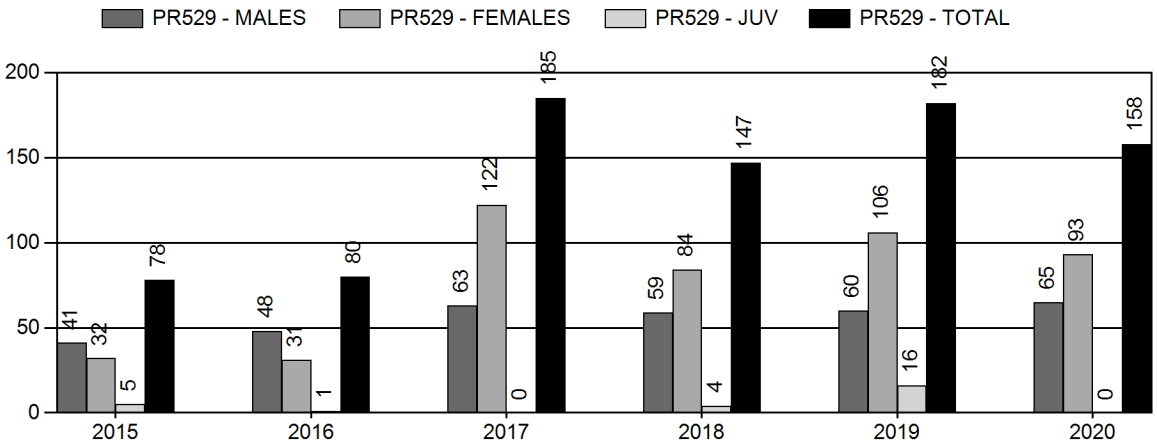
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	JCR Year	Proposed
Females ≥ 1 year old:	22.1%	25.1%
Males ≥ 1 year old:	20.3%	19.8%
Total:	18.6%	22%
Proposed change in post-season population:	3%	14%

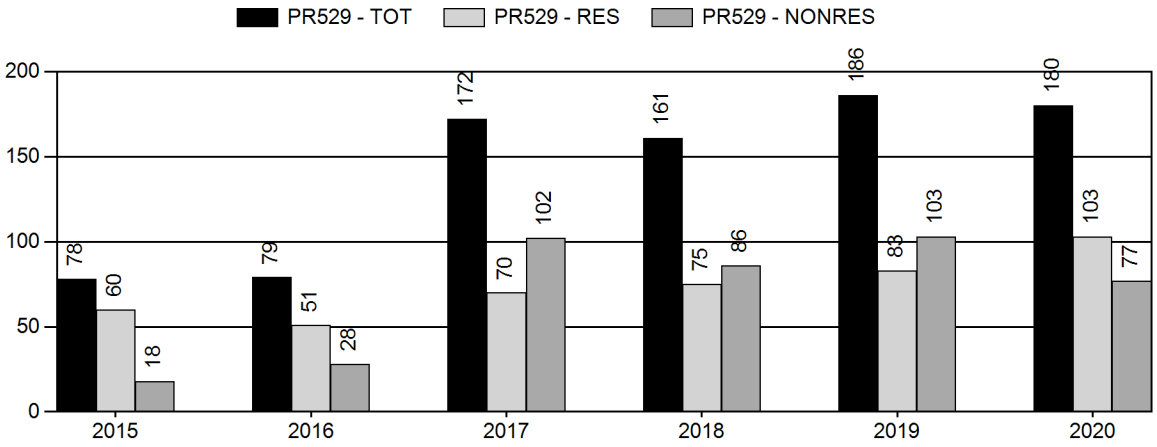
Population Size - Postseason



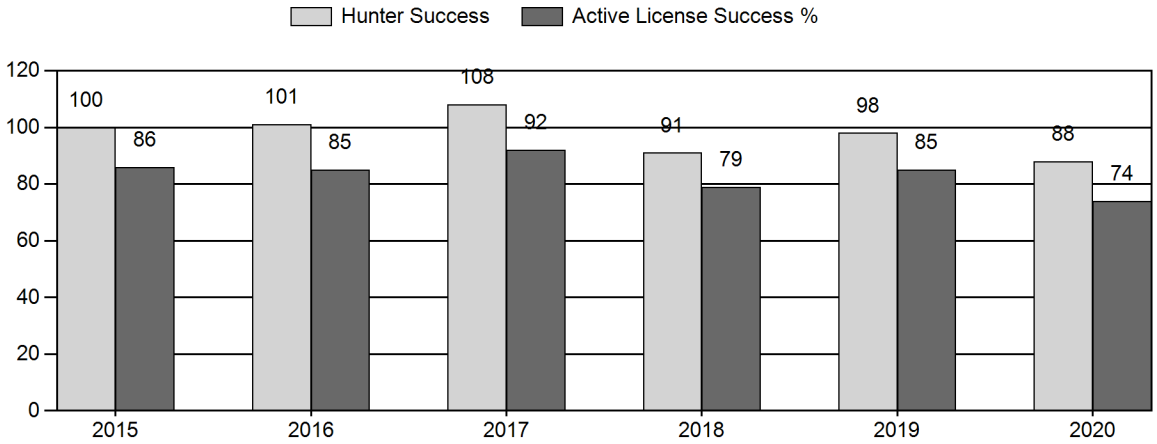
Harvest



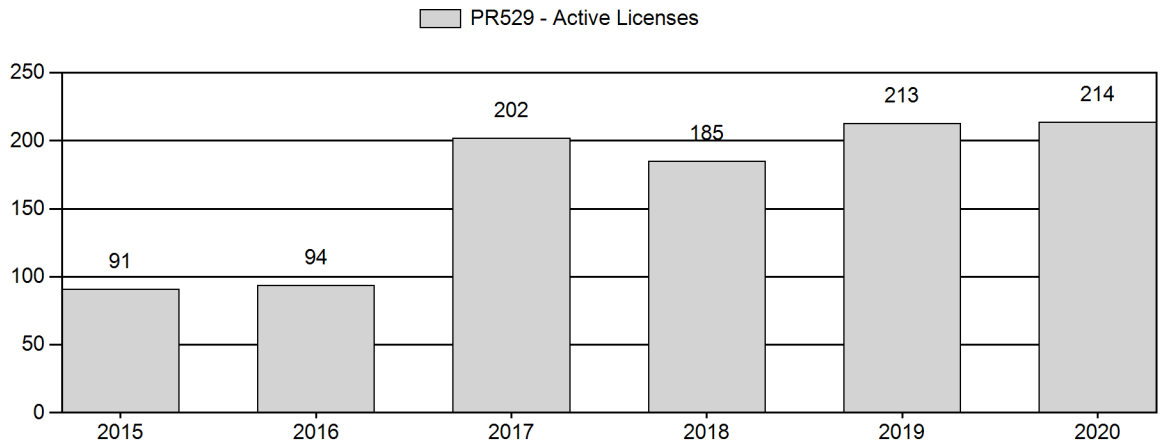
Number of Hunters



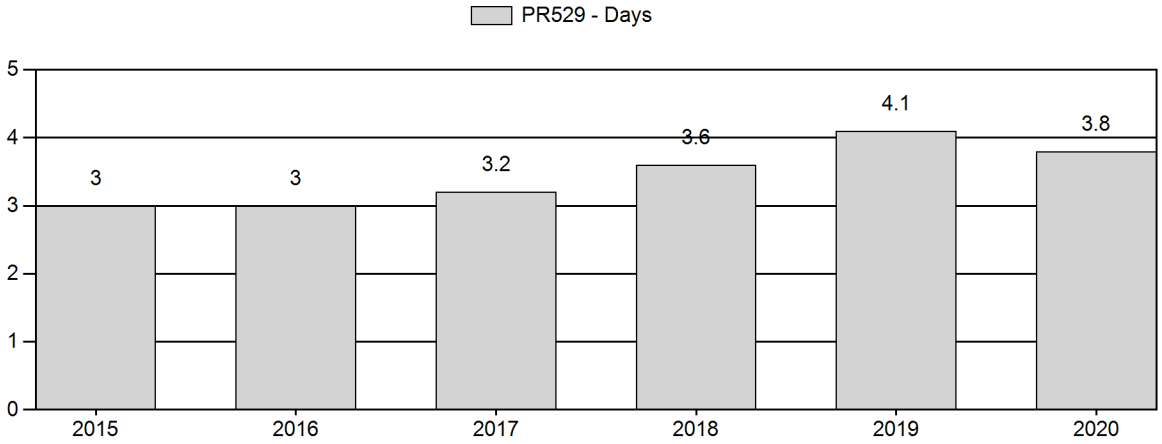
Harvest Success



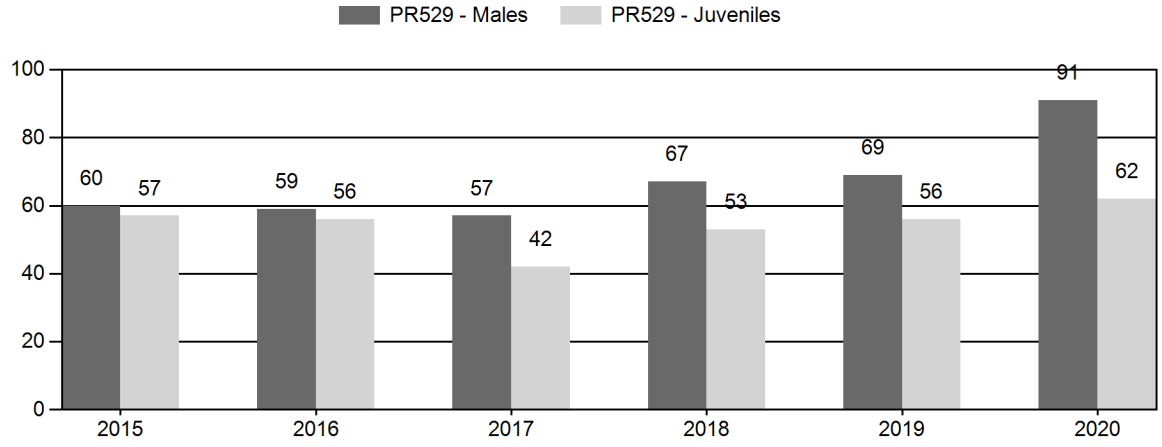
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2021 Hunting Seasons
Big Creek Pronghorn (PR529)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
51	1	Aug. 15	Sep. 15	Sep. 16	Nov. 14	100	Any antelope
	6			Aug. 15	Sep. 15	150	Doe or fawn valid on private land
		Aug. 15	Sep. 15	Sep. 16	Nov. 14		Doe or fawn valid in the entire area

2020 Hunter Satisfaction: 78.9% Satisfied, 11.8% Neutral, 9.2% Dissatisfied

2021 Management Summary

1.) Hunting Season Evaluation: The pre-season fawn/doe ratio (62/100) exceeded the five-year average and buck/doe ratio remained above recreational management objective limits (Appendix A). Hunter satisfaction and success (87%) decreased, while days to harvest increased (3.8) indicating a challenging 2020 hunting season. The 2020 population estimate of 930 pronghorn was within the objective range, however the spreadsheet model for this herd affords managers little opportunity to obtain an accurate post hunt population estimate. One challenge when modeling this herd is that it is an interstate population. Based on classification sample sizes and past Line Transect Surveys, managers estimate the herd to be performing better than the model estimates.

In 2020, reported harvests represented 20.3% of the males estimated to be in this herd. Managers will consider increasing the Type 1 quota for the 2023 hunting season if harvest of estimated preseason bucks remains below 25%.The current season structure was implemented in 2020 and managers intended to maintain quotas over a three year period. The 2021 season structure is expected to maintain pronghorn numbers at objective.

2.) Management Objective Review: The objective was last reviewed in 2018 and will be reviewed again in 2023.

3.) Weather/Habitat: Snow accumulations, especially at higher elevations within this herd unit were normal. Precipitation levels were below normal for the 2020 biological year. Early spring precipitation occurred during April and May. Precipitation events throughout the remainder of the summer were sporadic and covered very small geographic areas. Lack of summer precipitation led to earlier senescence of grasses and forbs, likely resulting in pronghorn dietary shifts to shrub communities earlier in the year than normal. Through fall and early winter 2020, conditions remained mild, with no persistent snow accumulations.

4.) Line Transect Survey: A Line Transect (LT) survey was conducted to estimate pronghorn abundance at the end of biological year 2018. The end of biological year population estimate was 2,704 pronghorn (95% confidence interval=1,946-3,757 pronghorn).

2015 - 2020 Preseason Classification Summary

for Pronghorn Herd PR529 - BIG CREEK

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2015	882	58	91	149	28%	248	46%	141	26%	538	561	23	37	60	± 6	57	± 6	36
2016	950	61	123	184	27%	311	46%	175	26%	670	657	20	40	59	± 5	56	± 5	35
2017	750	48	114	162	29%	285	50%	120	21%	567	435	17	40	57	± 5	42	± 4	27
2018	687	45	186	231	31%	344	45%	182	24%	757	546	13	54	67	± 3	53	± 3	32
2019	590	52	144	196	31%	283	44%	159	25%	638	448	18	51	69	± 3	56	± 3	33
2020	1,103	38	185	223	36%	245	39%	153	25%	621	587	16	76	91	± 9	62	± 7	33

2020 - JCR Evaluation Form

SPECIES: Bighorn Sheep PERIOD: 6/1/2020 - 5/31/2021

HERD: BS516 – DOUGLAS CREEK

HUNT AREAS: 18 PREPARED BY LEE KNOX

	2015 - 2019 Average	2020	2021 Proposed
Population:		N/A	N/A
Harvest:	0	2	1
Hunters:	0	2	1
Hunter Success:	100%	100%	100%
Active Licenses:	2	2	1
Active License Success:	100%	100%	100 %
Recreation Days:	0	7	7
Days Per Animal:	0	7	7

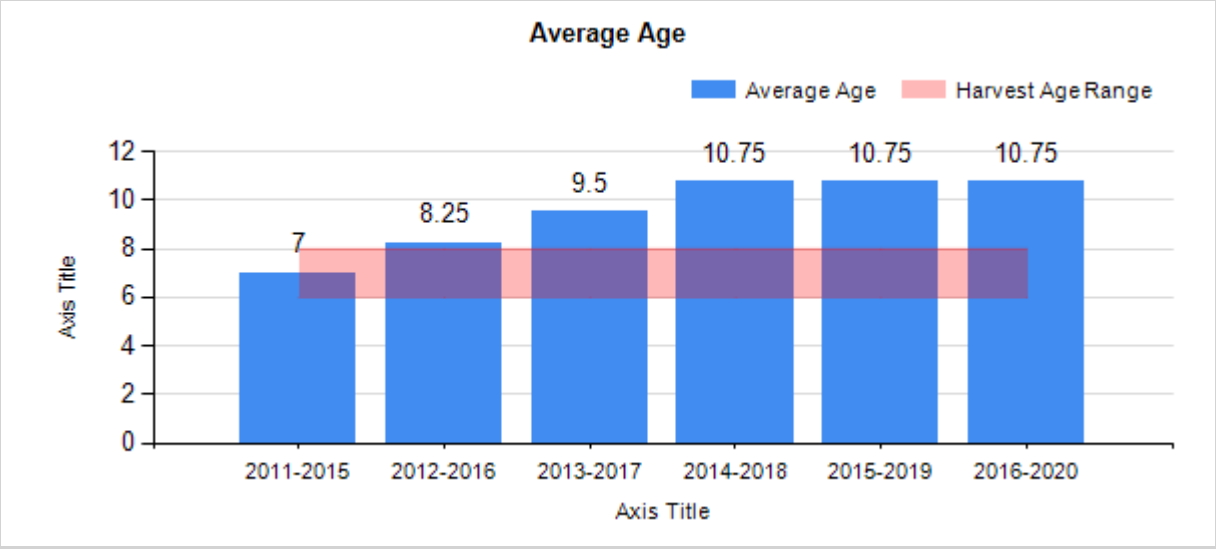
Limited Opportunity Objective:

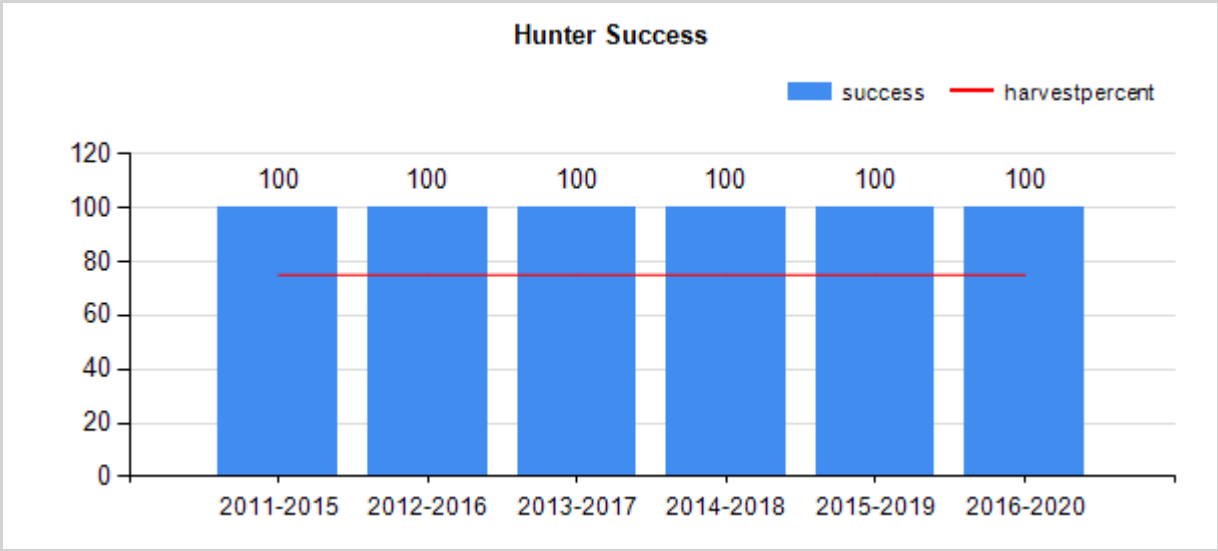
5-year average of > 75% hunter success

5-year average harvest age of 6-8 years

Secondary Objective:

Management Strategy: Special




Hunter Success
success
harvestpercent
120
100
80
60
40
20
0
100
100
100
100
100
100
2011-2015
2012-2016
2013-2017
2014-2018
2015-2019
2016-2020

2021 Hunting Seasons
Douglas Creek Bighorn Sheep Herd Unit (BS 516)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
18, 21	1	Aug. 15	Aug. 31	Sep. 1	Oct. 31	2	Any ram (2 residents)
18,21	1			Nov.1	Nov. 30		Any ram, valid only in Hunt Area 18

Current Management Objective:

1) **5-year running average of ≥ 75% hunter success**- 100%
2) **5-year running average age of harvested rams between 6 and 8 years of age**- 2015- 2020 Average Age: 7 years old
3) **Documented occurrence of adult rams in the population**~ > 25 rams observed

2021 Management Summary

1.) Hunting Season Evaluation: The 2021 season will be open for two resident licenses, valid in hunt areas 18 and 21. Harvest has been minimal in hunt area 18 with only three rams harvested in six years. Traditionally both hunt areas 18 and 21 would be closed every other year to insure hunter opportunity at a mature ram, however with a longer season, and observations of mature rams post 2020 season, there is additional opportunity and the season will remain open.

2.) Management Objective Review: The objective was last reviewed in 2016 and was changed from a population objective of 350 sheep to a limited opportunity objective.

4.) Habitat Annual precipitation in the hunt area was below normal in 2020. Winter severity was low, likely resulting in little to no significant mortality. In September 2020, the Mullen Fire burned approximately 176,800 acres in the Snowy Range, with the bulk of acres burned on national forest lands, including two wilderness areas. The western third of the wildfire encompasses occupied sheep habitat. Burning of beetle killed lodgepole pine stands is likely to open line of sight visibility, and create more open travel corridors for bighorns, aiding their movements to escape terrain and lambing habitats. High fire severity in places is cause for concern for cheatgrass invasion in Savage Run and Platte River wilderness areas, as well as other areas adjacent to North Platte River. The USFS has identified at least 17,000 acres that are at risk of cheatgrass invasion due to fire severity, slopes and aspects, and known areas of cheatgrass infestations prior to the wildfire. Funding applications have been submitted to treat up to 15,000 acres in 2021 and 2022 on US Forest Service lands. An additional 2,800 acres of BLM lands on the west side of the North Platte River are also targeted for treatment in the Prospect Mountain area. Due to the high fire severity, we anticipate some mortality of mixed mountain shrubs, the extent yet unknown.

2020 - JCR Evaluation Form

SPECIES: Bighorn Sheep

PERIOD: 6/1/2020 - 5/31/2021

HERD: BS517 - LARAMIE PEAK

HUNT AREAS: 19

PREPARED BY: MARTIN HICKS

	2015 - 2019 Average	2020	2021 Proposed
Population:		N/A	N/A
Harvest:	7	8	8
Hunters:	8	8	8
Hunter Success:	88%	100%	100 %
Active Licenses:	8	8	8
Active License Success:	88%	100%	100 %
Recreation Days:	80	93	85
Days Per Animal:	11.4	11.6	10.6

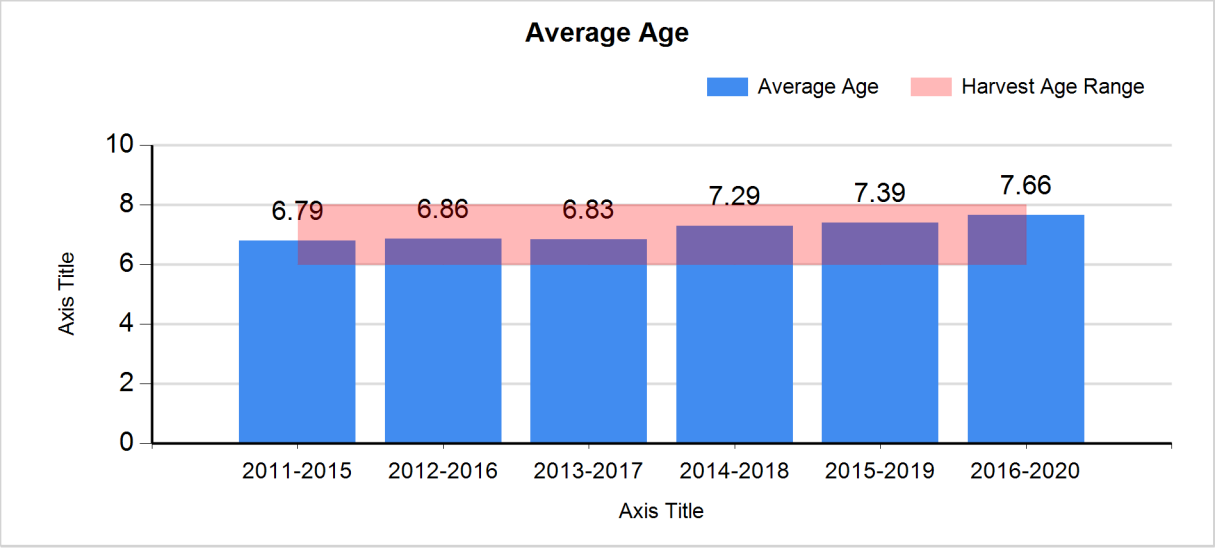
Limited Opportunity Objective:

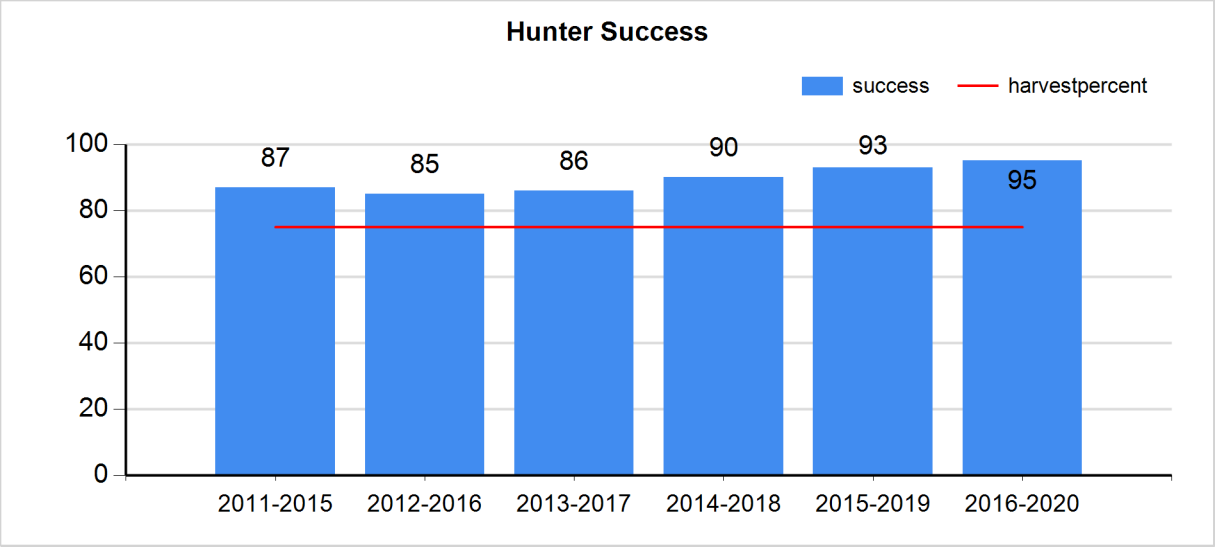
5-year average of > 75% hunter success

5-year average harvest age of 6-8 years

Secondary Objective:

Management Strategy: Special




Hunter Success
success
harvestpercent
100
80
60
40
20
0
87
85
86
90
93
95
2011-2015
2012-2016
2013-2017
2014-2018
2015-2019
2016-2020

2021 Hunting Seasons
Laramie Peak Bighorn Sheep Herd Unit (BS517)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
19	1	Aug. 15	Aug. 30	Sept. 1	Oct. 31	8	Any ram

Current Management Objective:

1) **5-year running average of >75% hunter success**-94%
2) **5-year running average age of harvested rams between 6 and 8 years of age**-7.5
3) **Documented occurrence of adult rams in the population**-30

2021 Management Summary

1) Hunting Season Evaluation: The 2021 season will provide 8 hunters the opportunity to harvest a mature ram, with a high likelihood of success. There are a number of older age rams in the population to maintain the management objective. However, access to the wild sheep remains difficult due to large tracts of private land within occupied sheep habitat that is not open for hunting opportunities. Hunter crowding is an issue if more than 8 licenses are prescribed and harvest statistics have suffered when there were more than 8 bighorn sheep hunters in the field.

2.) Management Objective Review: The herd objective was reviewed in 2019 and will be reviewed again in 2024.

3.) Ongoing Research: During the winter of 2019 sixteen bighorn sheep ewes were captured as part of the state-wide disease surveillance efforts focusing on bacterial pathogens that may lead to all age die offs. Results indicated that 4 pathogens were detected either through nasal or tonsil swabs that are associated with pneumonia: *Mycoplasma ovipneumonia, Mannheimia haemolytica, Pasteurella multocida* and *Bibersteina trehalosi*. GPS collar surveillance reveled a small die-off during the winter of 2019/20. Carcass searches resulted in 9 bighorn sheep, of which 4 were testable and *Mannheimia haemolytica* was discovered in all four sheep. An adult ram was euthanized in January 2021 just off Palmer Canyon road approximately 18 miles west of Wheatland and was determined to have severe bronchial pneumonia due to *Mannheimia haemolytica*. In January of 2021, seven additional female wild sheep were captured (3 Sybille Canyon, 4 Duck Creek) and fitted with GPS collars for additional disease surveillance. Two dynamic message signs were erected within Sybille Canyon along Wyoming Highway 34 ROW due to two rams hit and killed by vehicles during the 2020/21 winter.

4) Weather and Habitat: Precipitation in this herd unit was below normal in 2020. Early spring precipitation events occurred during April and May and quickly declined in number of events and precipitation received per event by early June. Precipitation events throughout the remainder of the summer were sporadic and covered very small geographic areas. Lack of precipitation led to early senescence of grasses and forbs in summer months. While no NOAA weather stations are close to occupied habitats in Area 19, weather stations in Laramie, Cheyenne, Torrington, and Douglas all reported significant declines in annual precipitation, from 38% - 57% below normal.

Cheatgrass control efforts via herbicide application post-wildfire continued in the eastern foothills

of the Laramie Range on 5,399 acres of the 2019 Brittania Wildfire. The Cabin Fire (215 acres) in the Laramie River, Clemons Fire (295 acres) and School Creek Fire (227 acres) in Sybille Canyon, were also treated. Herbicide applications completed within the Brittania and School Creek wildfires in fall 2019 showed 100% control of cheatgrass one year later. Transects will continue to be read in 2021 to determine herbicide efficacy and gauge native vegetation recovery following treatment. Duck Creek and Sybille Canyon areas were treated with a combination of Rejuvra and Plateau herbicides. Recently approved for rangeland use, the Department is optimistic Rejuvra herbicide will provide longer term control of cheatgrass compared to other herbicides traditionally used. Bighorn sheep use of recovering native vegetation from the 2019 School Creek wildfire was high in fall 2020 in areas treated with herbicide. As seen in previous herbicide applications, increased moisture is available to native vegetation due to the lack of cheatgrass competition, resulting in higher production as well as extended green periods in summer and fall months.

2020 - JCR Evaluation Form

SPECIES: Bighorn Sheep
PERIOD: 6/1/2020 - 5/31/2021

HERD: BS519 - ENCAMPMENT RIVER

HUNT AREAS: 21
PREPARED BY: TEAL CUFAUDE

	2015 - 2019 Average	2020	2021 Proposed
Population:		N/A	N/A
Harvest:	1	0	1
Hunters:	1	0	1
Hunter Success:	100%	0%	100%
Active Licenses:	1	0	1
Active License Success:	100%	0%	100 %
Recreation Days:	7	0	7
Days Per Animal:	7	0	7

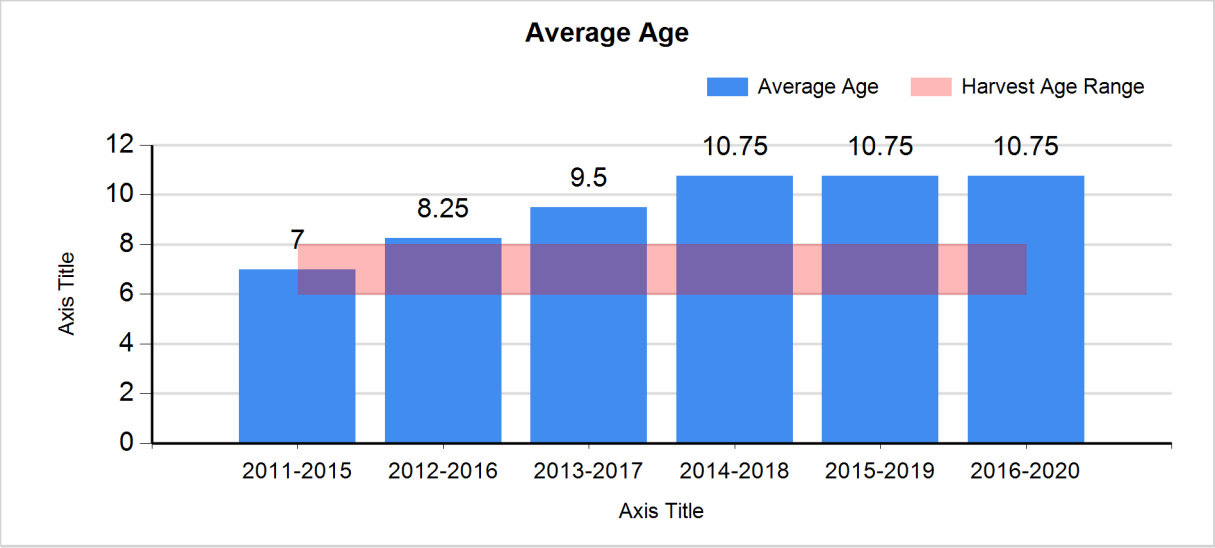
Limited Opportunity Objective:

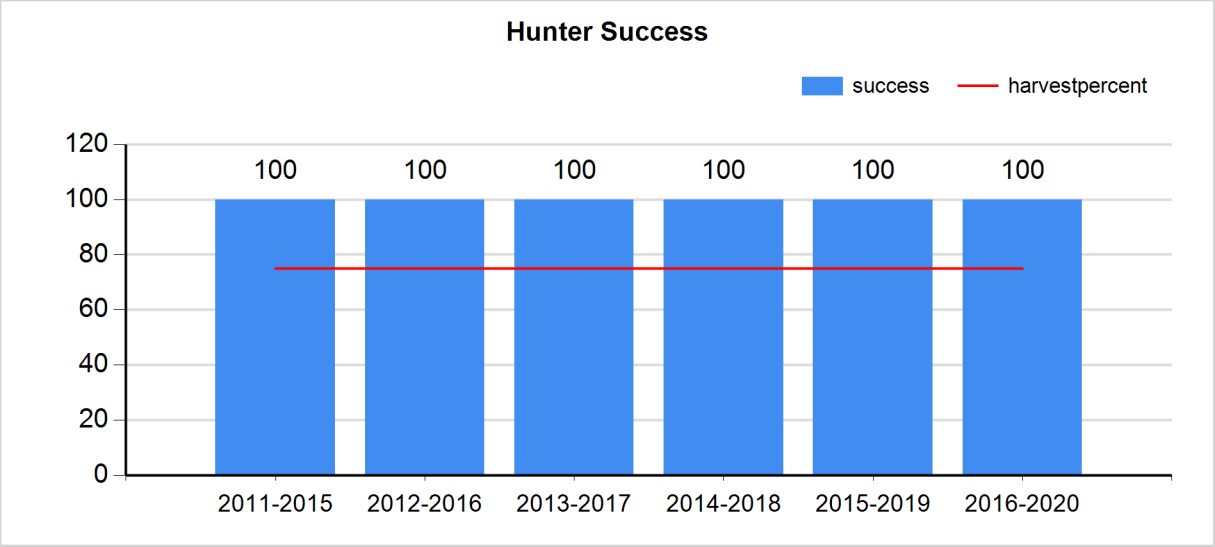
5-year average of > 75% hunter success

5-year average harvest age of 6-8 years

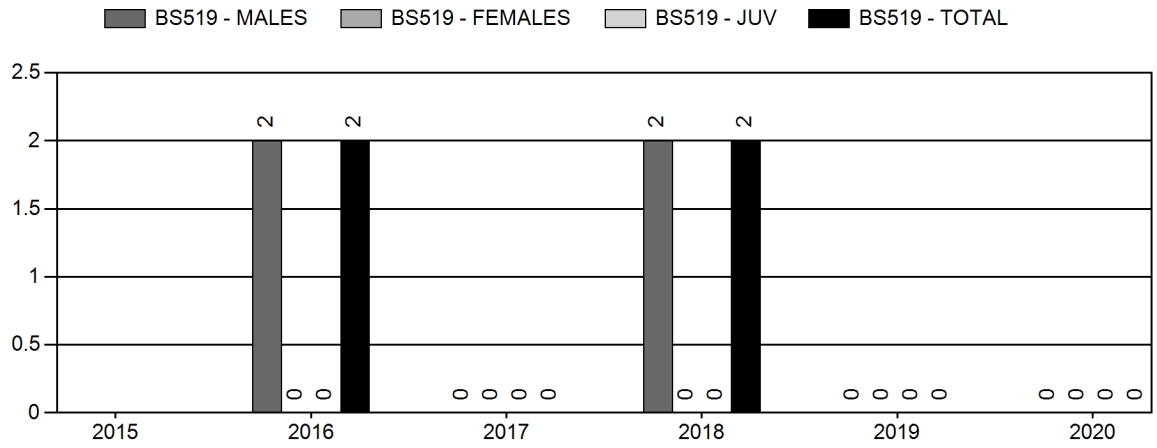
Secondary Objective:

Management Strategy: Special

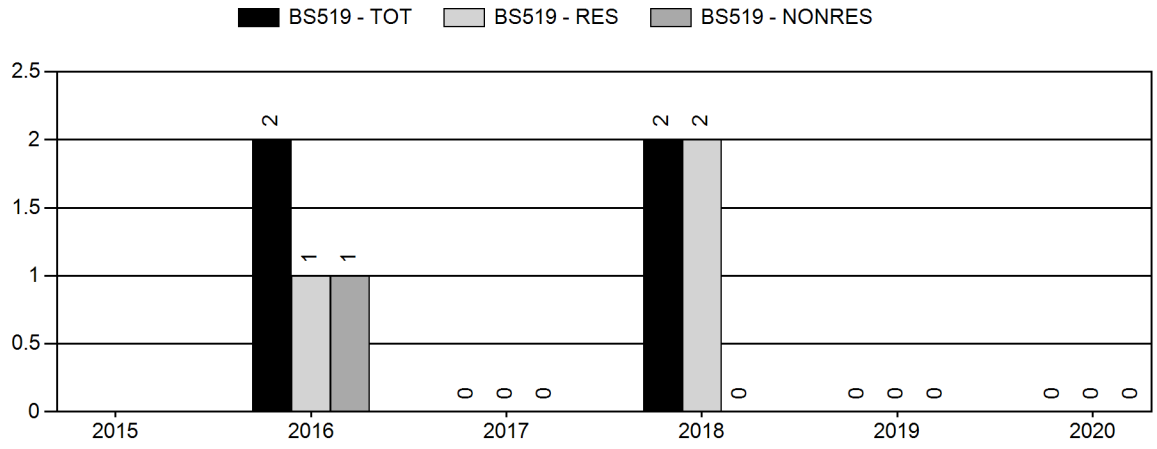



Hunter Success
success
harvestpercent
120
100
80
60
40
20
0
100
100
100
100
100
100
2011-2015
2012-2016
2013-2017
2014-2018
2015-2019
2016-2020

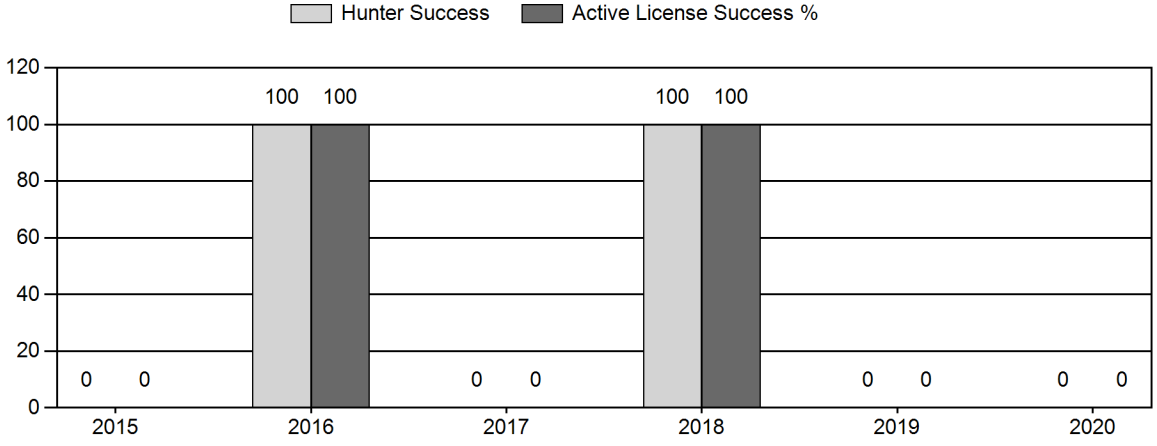
Harvest



Number of Hunters



Harvest Success



2021 Hunting Seasons
Encampment River Bighorn Sheep (BS519)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
18, 21	1	Aug. 15	Aug. 31	Sep. 1	Oct. 31	2	Any ram (2 residents)
18, 21	1			Nov. 1	Nov. 30		Any ram, valid only in Hunt Area 18

Current Management Objective: Bighorn Sheep Limited Opportunity

1) 5-year running average of >75% hunter success
   - Currently Met: 2016-2020 Hunter Success- 100%
2) 5-year running average age of harvested rams between 6 and 8 years of age
   - Currently Met: 2016-2020 Harvest Mean Age- 10.75 years of age
3) Documented occurrence of adult rams in the population
   - Currently Met: >10 adult rams observed in 2020

2021 Management Summary

1.) Hunting Season Evaluation: From 2008-20, the hunting season in this herd unit in conjunction with the Douglas Creek herd unit was open every other year. The 2021 hunting season will provide two resident hunters the opportunity to harvest mature rams in hunt areas 18 or 21. Based on frequent observations of mature rams in both herds managers elected to forgo the traditional season closure to provide more opportunity. We expect hunters will have a high likelihood of success and this herd will continue to meet the bighorn sheep limited opportunity management objectives.

2.) Management Objective: We are maintaining this herd at the current objective based on internal discussions and conversations with our constituents. We evaluated and considered population status and habitat data included in this document and a change is not warranted at this time. We will review this herd objective again in 2026; however, if the situation arises that a change is needed, we will review and submit a proposal as needed.

3.) Weather/Habitat: Annual precipitation in the hunt area was below normal in 2020. Winter severity was low, likely resulting in little to no significant bighorn sheep mortality. No major disturbances were documented in the areas associated with the herd. Cheatgrass continues to be an issue on the southeast facing slopes at lower elevations. The WGFD, in conjunction with the USFS, BLM, and Carbon County Weed and Pest, continue to conduct large-scale aerial cheatgrass treatments.

4.) Research: In winter 2020-21, WGFD conducted a capture and collar event in this herd unit as part of a statewide disease assessment effort. Data gathered from the 21 collared bighorn ewes will also be used for habitat selection analyses.

5.) Disease: In October 2020, an emaciated and apparently sick ram was euthanized along Highway 70, west of the Continental Divide. Laboratory and culture results indicated the ram had a large sinus tumor and was infected with *Bersteinia trehalosi* and *Mannheimia haemolytica*, two serious

pathogens of respiratory disease. WGFD managers received reports of other rams in the area throughout October and November, but were unable to locate any other sheep that appeared sick. Managers will continue to monitor these areas throughout 2021.

2020 - JCR Evaluation Form

SPECIES: Elk
PERIOD: 6/1/2020 - 5/31/2021

HERD: EL531 - IRON MOUNTAIN

HUNT AREAS: 6
PREPARED BY: LEE KNOX

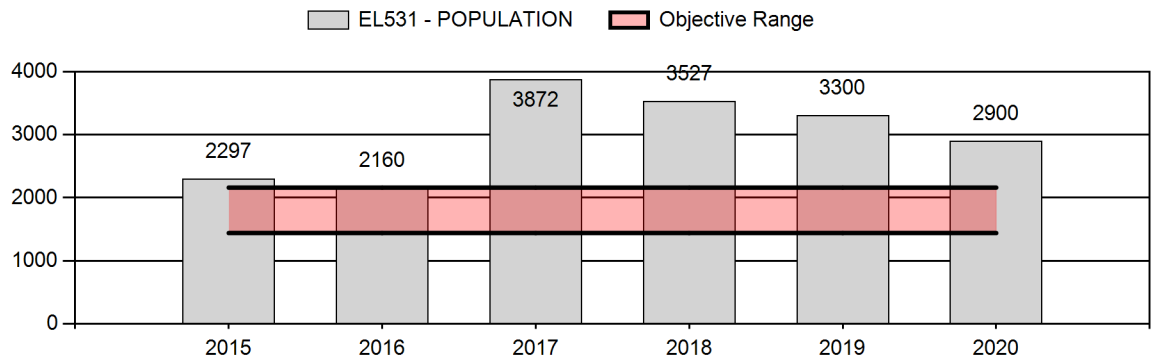
	2015 - 2019 Average	2020	2021 Proposed
Population:	3,031	2,900	3,000
Harvest:	585	628	600
Hunters:	1,382	1,529	1,400
Hunter Success:	42%	41%	43 %
Active Licenses:	1,423	1,560	1,550
Active License Success:	41%	40%	39 %
Recreation Days:	8,877	8,576	8,600
Days Per Animal:	15.2	13.7	14.3
Males per 100 Females	31	0	
Juveniles per 100 Females	50	0	

Population Objective (± 20%) :	1800 (1440 - 2160)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	61%
Number of years population has been + or - objective in recent trend:	20
Model Date:	2/20/2021

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

	JCR Year	Proposed
Females ≥ 1 year old:	19%	17%
Males ≥ 1 year old:	44%	52%
Total:	18%	18%
Proposed change in post-season population:	20%	21%

Population Size - Postseason



2021 Hunting Seasons
Iron Mountain Elk (EL531)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
6	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 31		Any elk valid off national forest
6	Gen			Nov. 1	Nov. 30		Antlerless elk valid off national forest
6	1	Sep. 1	Sep. 30	Oct. 15	Oct. 31	75	Any elk
6	1			Nov. 1	Jan. 31		Antlerless elk
6	4	Sep. 1	Sep. 30	Oct. 15th	Jan. 31	50	Antlerless elk
6	6	Sep. 1	Sep. 30	Aug. 15	Jan. 31	1100	Cow or calf valid off national forest

2021 Hunter Satisfaction: 59% Satisfied, 20% Neutral, 21% Dissatisfied

2020 Management Summary

1.) Hunting Season Evaluation: The Iron Mountain Elk Herd remains well above the population objective of 1,800 elk. The current season structure is designed to maximize cow elk harvest. In 2020 area managers meet with 18 key landowners one on one to discuss elk harvest and hunter access in hunt area 6. Harvest did increase from 489 in 2019, to 828 in 2020. The type 4 opening date will be moved two weeks earlier to address poor harvest from 2018-2020, and will provide more time before access is impacted by weather. We maintain 1,100 type 6 licenses, even though they do not sell out, to ensure there are always licenses available.

2.) Management Objective review: The management objective for Iron Mountain is a post season population objective of 1800 elk. This objective was set in 1997 and last reviewed in 2017.

3.) **CWD management:** The 3-year (2018-2020) CWD prevalence in the Iron Mountain Elk Herd is 14% with a sample size of 249.

5.) Habitat and Weather: Precipitation in the herd unit was below normal for 2020. NOAA weather station data gathered from Laramie and Cheyenne documented annual precipitation declines of 45% and 38% from average, respectively. Lack of spring moisture resulted in decreased production of herbaceous forages.

The WGFD entered into an agreement to manage 3,110 acres of the Pilot Hill area as a WHMA. Suitable elk habitat is found midslope in mixed mountain shrub communities and at higher elevations in aspen / mixed conifer habitats on the WHMA. Future management of recreational

access in the foothills east of Laramie will largely determine the habitat effectiveness of the area for elk and other wildlife. The USFS and Wyoming State Forestry Division have been working cooperatively to complete conifer and aspen mastication and prescribed fire treatments on USFS, OSLI, and intermixed private lands on Pole Mountain. Aspen regeneration in treatment areas has been mixed. Some browsing of young aspen regeneration has been high, likely by elk, mule deer, and livestock. Western Spruce Budworm infestations are having some effect on conifers in upper elevations at Pole Mountain. Aggressive timber harvest practices are likely the only means to reduce potential impacts to coniferous forest communities. Wyoming State Forestry has completed some harvest of infected trees in the Pole Mountain area.

In the southernmost portions of Area 6 south of Interstate 80, and in the northern half of the herd unit, habitat conditions continue to be impacted by increasing elk numbers, lack of managed disturbances in shrub dominated rangelands, and increases in cheatgrass composition in preferred habitats. Elk use of irrigated hay meadows continues to create damage problems throughout the herd unit. In periods of drought, private landowners see higher competition for forage resources between cattle and elk. With increased competition we expect to see decreased landowner tolerance for elk.

2020 - JCR Evaluation Form

SPECIES: Elk | PERIOD: 6/1/2020 - 5/31/2021

HERD: EL533 - SNOWY RANGE

HUNT AREAS: 8-12, 110, 114, 125 | PREPARED BY: TEAL CUFAUDE

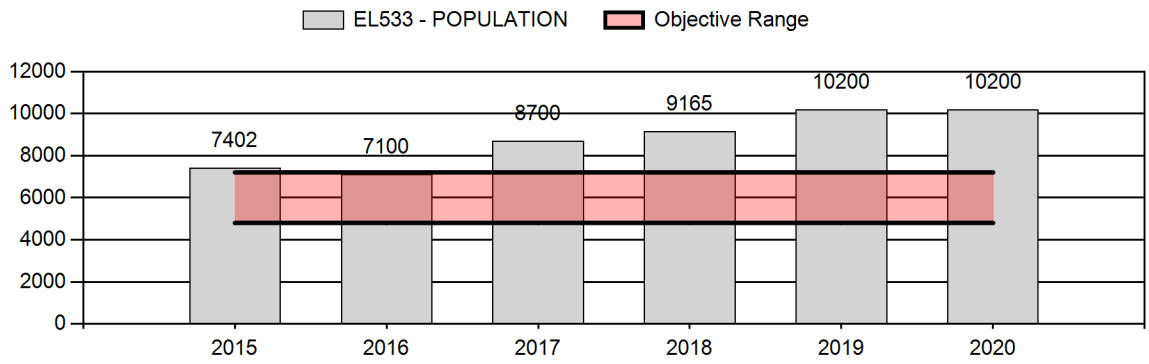
	2015 - 2019 Average	2020	2021 Proposed
Population:	8,513	10,200	9,600
Harvest:	1,976	1,888	2,000
Hunters:	5,780	5,034	5,800
Hunter Success:	34%	38%	34 %
Active Licenses:	6,107	5,410	6,100
Active License Success:	32%	35%	33 %
Recreation Days:	45,750	40,671	44,000
Days Per Animal:	23.2	21.5	22
Males per 100 Females	28	23	
Juveniles per 100 Females	42	45	

Population Objective (± 20%) :	6000 (4800 - 7200)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	70%
Number of years population has been + or - objective in recent trend:	6
Model Date:	03/08/2021

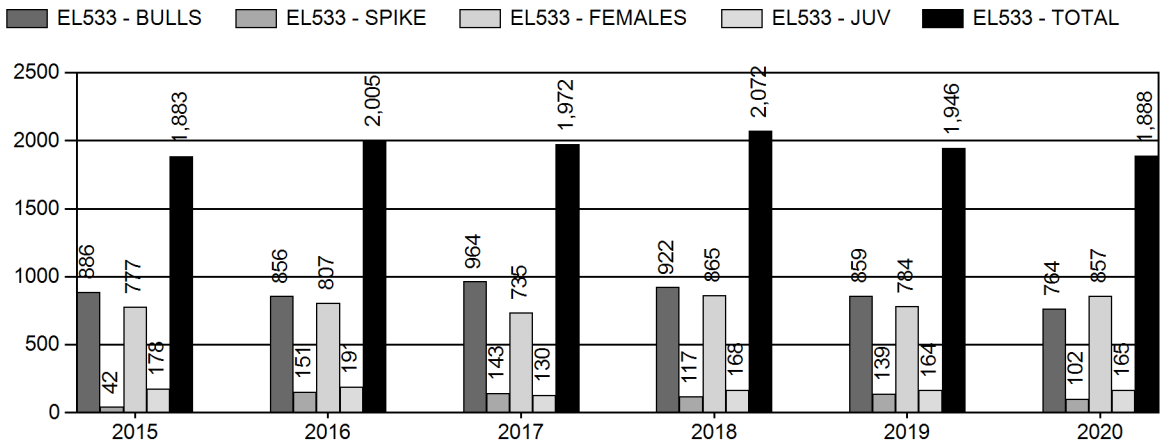
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	JCR Year	Proposed
Females ≥ 1 year old:	13.7%	13.5%
Males ≥ 1 year old:	37.3%	40.6%
Total:	16.8%	18.4%
Proposed change in post-season population:	1%	5.6%

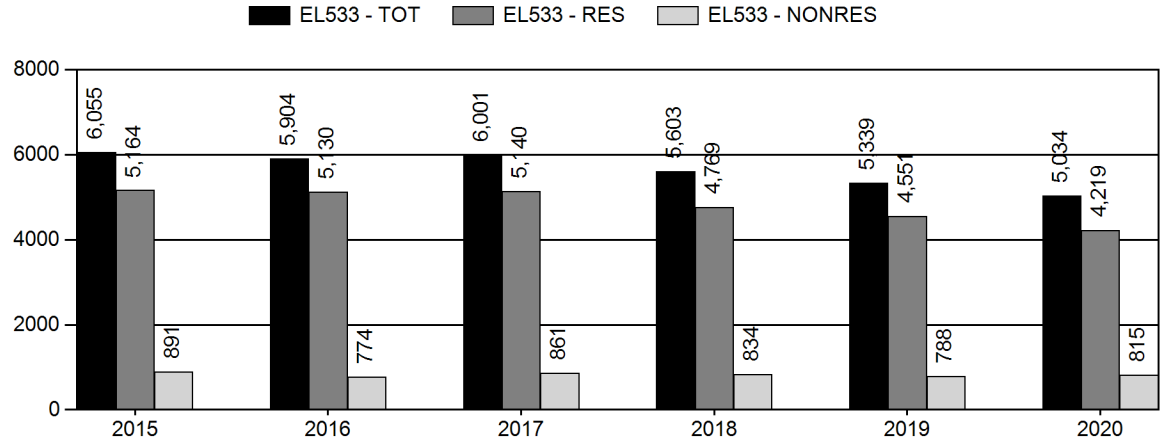
Population Size - Postseason



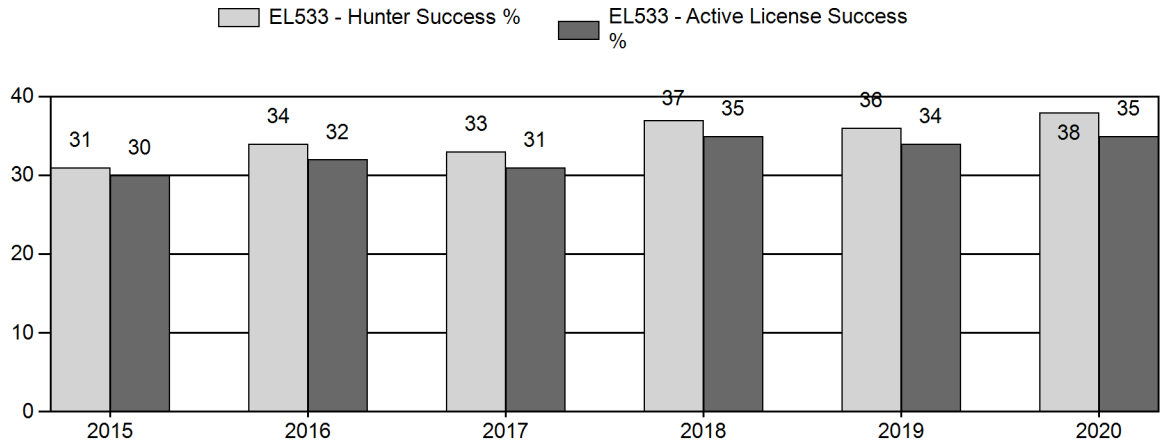
Harvest



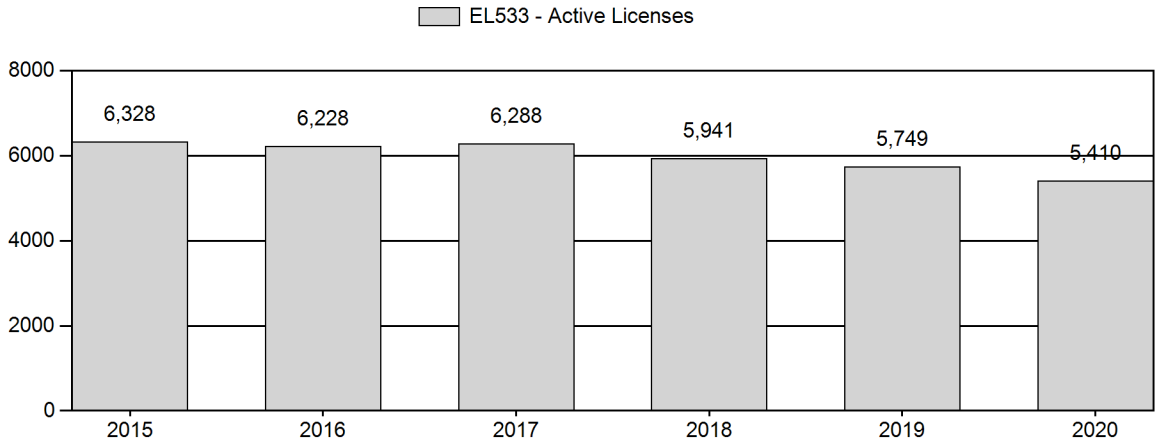
Number of Hunters



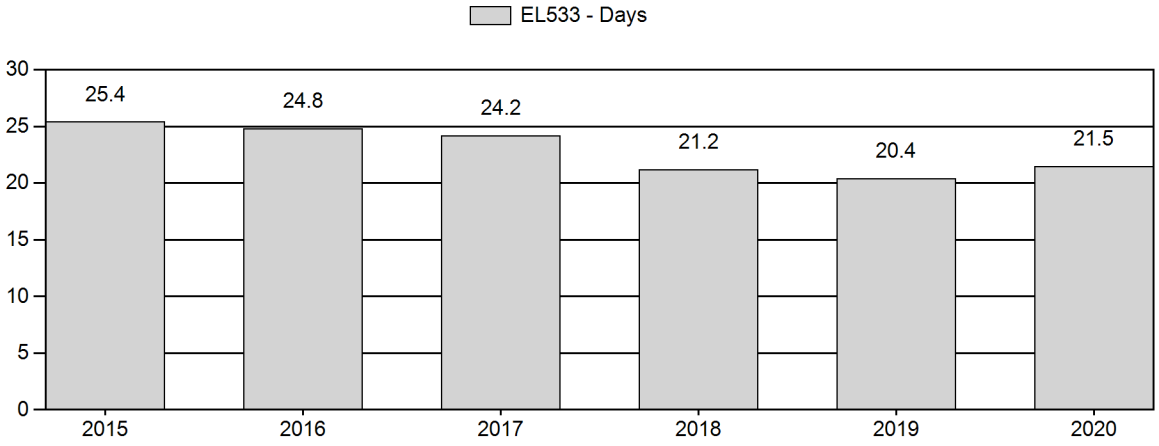
Harvest Success



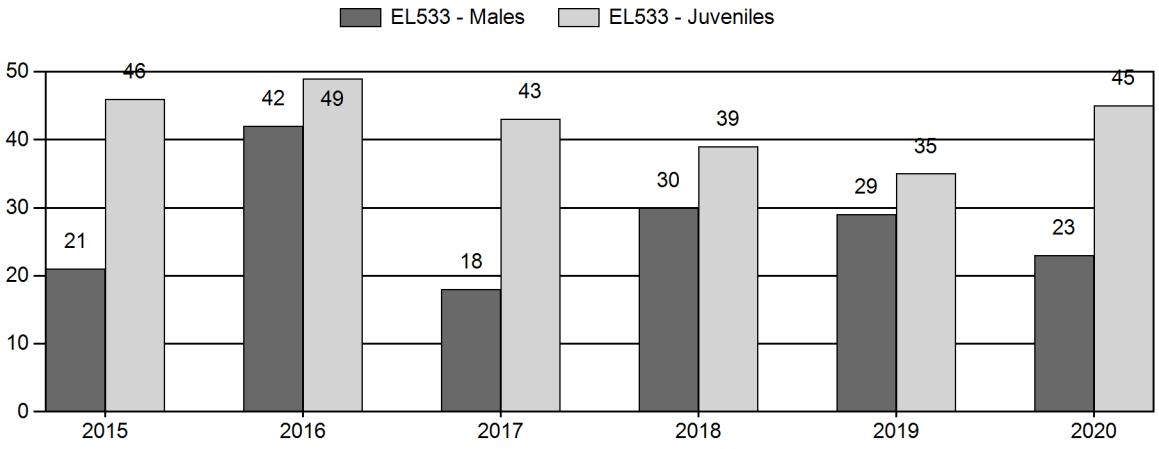
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2021 Hunting Seasons
Snowy Range Elk Herd Unit (EL533)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
8	1	Sep. 1	Sep. 30	Oct. 1	Jan. 31	150	Any elk
8	6			Aug. 15	Jan. 31	200	Cow or calf
9	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 31		Any elk
9	6	Sep. 1	Sep. 30	Oct. 1	Dec. 31	250	Cow or calf
9, 10	7			Aug. 15	Jan. 31	250	Cow or calf valid off national forest
10	Gen	Sep.1	Sep. 30	Oct. 15	Oct. 31		Any elk
10	6	Sep.1	Sep. 30	Oct. 1	Dec. 31	100	Cow or calf
11	1	Sep. 15	Sep. 30	Oct. 1	Nov. 30	200	Any elk
11	1			Dec. 1	Dec. 31		Any elk valid off national forest; the Wyoming Game and Fish Commission's Wick Wildlife Habitat Management Area shall be closed south of Interstate 80
11	4	Sep. 15	Sep. 30	Oct. 1	Nov. 30	300	Antlerless elk
11	6	Sep. 15	Sep. 30				Cow or calf valid in the entire area
11	6			Aug. 15	Jan. 31	250	Cow or calf valid off national forest; the Wyoming Game and Fish Commission's Wick Wildlife Habitat Management Area shall be closed south of Interstate 80
11	9			Sep. 1	Sep. 30	50	Any elk, archery only
12	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 31		Any elk
12	6	Sep. 1	Sep. 30	Oct. 1	Nov. 14	200	Cow or calf
12	6			Nov. 15	Dec. 31		Cow or calf valid off national forest and off Pennock Mountain Wildlife Habitat Management Area
12, 13, 15, 110	7			Aug. 15	Jan. 31	225	Cow or calf valid on private land
110	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 31		Any elk
110	6	Sep. 1	Sep. 30	Oct. 1	Nov. 14	200	Cow or calf
110	6			Nov. 15	Dec. 31		Cow or calf valid off national forest
125	1	Sep. 1	Sep. 30	Oct. 1	Dec. 31	250	Any elk
125	1			Jan. 1	Jan. 31		Antlerless elk
125	6	Sep. 1	Sep. 30	Oct. 1	Jan. 31	300	Cow or calf

2020 Hunter Satisfaction: 58.8% Satisfied, 21.5% Neutral, 19.7% Dissatisfied

2021 Management Summary

1.) Hunting Season Evaluation: The 2020 harvest survey indicated 5,034 hunters harvested 1,888 elk. Elk hunter numbers were impacted by the Mullen Fire. Eighty-one hunt area 110 Type 6 hunters and 35 hunt area 9 Type 6 hunters received license refunds. Hunter success (37.5%) was slightly better than 2020 and days to harvest was comparable to the last five years. Appendix A describes the postseason classification summary from 2015-2020. The 2020 postseason population estimate of 10,200 elk remained above the objective. The 2021 hunting seasons in the Snowy Range herd unit will continue to provide recreational elk hunting opportunities while reducing the overall elk population towards the objective of 6,000 ±20%.

Hunt areas 9, 10, 12, and 110 will remain general license hunting seasons in 2021. Hunt area 110 Type 6 licenses were increased in 2019 and the quota will remain unchanged in 2021. Hunt area 9 Type 6 licenses were increased in 2021 to focus harvest on elk within the Mullen Fire perimeter.

The season dates for Type 6 licenses in hunt areas 12 and 110 were changed for the 2021 hunting season. In hunt area 12, the Type 6 has been valid west of WY130 from November 15-January 31. There is very little public hunting access west of WY 130, making hunters relatively unsuccessful after November 14. For the 2021 season, hunt area 12 Type 6 licenses will be valid off national forest and off Pennock Mountain Wildlife Habitat Management Area from November 15–December 31. This will be a reduction of 31 days (month of January) for these licenses, however January harvests have historically been very limited because of limited public hunting access. We anticipate even with a shortened season, Type 6 licensed hunters will be more successful given the proposed change will expand the areas that are legally accessible to harvest antlerless elk. Pennock Mountain Wildlife Habitat Management Area, is closed to motorized vehicles after November 14, so this area will be closed to Type 6 hunters after November 14. Hunt area 110 Type 6 licenses will be valid off national forest from November 15-December 31. These changes should increase Type 6 harvest success, while acknowledging the crucial range road closures that begin November 14 on much of the national forest. A similar change was implemented for Type 6 seasons in the adjacent Sierra Madre hunt areas 13 and 15.

The August-January Type 7 seasons were maintained to mitigate damage on private land. Type 7 quotas have been increased over the last three years, and were unchanged for 2021. The Type 7 special archery season in hunt areas 9, 10 and 12, 110 was eliminated in 2021. The intent of the Type 7 license was to focus harvest on and near private lands. The special archery season permitted archers to hunt the entire hunt area which reduced the effectiveness of these licenses in the areas they were intended to be used. Type 7 hunters will still be able to archery hunt however the respective hunt area limitations will apply. This should also mitigate some concerns about hunter crowding on the national forest during the popular special archery season. The hunt area 11 Type 6 special archery season was removed in 2021 for the same reason.

Hunt area 11 Type 6 licenses were increased to account for the hunting licenses that were historically prescribed in hunt area 114. In 2021, Hunt area 11 Type 1 licensed hunters will be permitted to hunt any elk from December 1-31 off national forest and the Wick Wildlife Habitat Management Area to address continued bull elk damage on stored crop. Language was added to the

hunt area 11 Type 1 and Type 6 season limitations to clarify that the portion of the Wildlife Habitat Management Area north of Interstate 80 would be open for hunting.

2.) Management Objective Review: The postseason population objective was last reviewed in 2018 and will be reviewed again in 2023.

3.) Weather/Habitat: Annual precipitation in the herd unit was below normal in 2020. Decreases in snowpack, as well as precipitation received in the growing season at high and low elevations resulted in decreased forage production for grasses, forbs, and shrubs across all seasonal ranges. Winter conditions in the herd unit were moderate in 2020. In fall 2020, the Mullen Fire burned approximately 176,800 acres in the Snowy Range, with the bulk of acres burned on national forest lands, including two wilderness areas. Appendix B describes habitat disturbances and habitat work completed in 2020.

4.) Chronic Wasting Disease Management: This is a Tier 2 surveillance herd, and was last prioritized for Chronic Wasting Disease (CWD) sampling in 2019. The most current prevalence data is reported in the 2019 Job Completion Report.

5.) Hunt Area Boundary Change: The hunt area 11 and 10 boundaries were changed in 2021. The boundary change eliminated hunt area 114. The expansion of hunt area 10 across Interstate 80(into what was hunt area 114) will allow landowners more flexibility to increase elk harvest in an expanding population of elk on the Laramie River (Appendix C). The expansion of hunt area 11 north across Interstate 80 will also allow hunters and landowners more flexibility to harvest elk. Elk in this area can be very nomadic and often move between hunt areas. This change will allow hunters to go where the elk go. This should help landowners address crop damage, but also provide hunters public land to hunt when there is a lack of access or elk north of Interstate 80.

2015 - 2020 Postseason Classification Summary

for Elk Herd EL533 - SNOWY RANGE

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2015	7,402	206	190	396	13%	1,885	60%	876	28%	3,157	693	11	10	21	± 1	46	± 2	38
2016	7,100	242	470	712	22%	1,697	52%	837	26%	3,246	657	14	28	42	± 2	49	± 2	35
2017	8,700	182	146	328	11%	1,778	62%	768	27%	2,874	707	10	8	18	± 1	43	± 2	36
2018	9,165	187	278	465	18%	1,574	59%	608	23%	2,647	585	12	18	30	± 2	39	± 2	30
2019	10,200	434	326	760	18%	2,618	61%	919	21%	4,297	547	17	12	29	± 1	35	± 1	27
2020	10,200	41	46	87	13%	384	60%	174	27%	645	573	11	12	23	± 3	45	± 5	37

High fire severity in places is cause for concern for cheatgrass invasion in the Savage Run and Platte River wilderness areas, as well as other areas adjacent to the North Platte River. In mid elevation foothills along the eastern flanks of the Snowies, between Woods Landing and Albany, are additional areas for concern. The USFS has identified at least 17,000 acres that are at risk of cheatgrass invasion due to fire severity, slopes and aspects, and known areas of cheatgrass infestations prior to the wildfire. The USFS, WGFD, and numerous other partners are working together to plan for cheatgrass herbicide treatments. Funding applications have been submitted to treat up to 15,000 acres in 2021 and 2022 on US Forest Service lands. An additional 2,800 acres of BLM lands on the west side of the North Platte River are also targeted for treatment in the Prospect Mountain area. Due to high fire severity on some southerly aspects, we anticipate some mortality of mixed mountain shrubs, the extent yet unknown. Field reconnaissance in 2021 will aid in determining mortality rates. Future seeding efforts may be necessary depending on mortality observed. We anticipate aspen regeneration will be excellent, if herbivory by wild ungulates and livestock is not excessive. Returning much of the acreage on the southern half of the Snowies to more early seral stages, will result in improved forage conditions for elk, if cheatgrass can be controlled. Causing some concern post-fire, is the loss of security cover. Due to the high density of roads within the Medicine Bow National Forest, elk may find it increasingly more difficult to find places of refuge away from roads. Until we can complete field reconnaissance in summer 2021, we do not know to what extent this issue may be. Fire severity throughout the burn area varied greatly, so we are optimistic that some security cover still exists in places.

Disturbances to habitat on the northern half of the Snowies, by wild or prescribed means, remains minimal. Approximately 150 acres of mixed mountain shrub habitats were mowed on the Wick WHMA in fall 2020. Some elk use of these shrubs is anticipated upon regeneration in 2021 and for several years thereafter. Two planned prescribed fires are scheduled for completion on the Wick WHMA (400 acres, 800 acres) over the next two years. These treatments should further enhance herbaceous and woody vegetation, improving overall production and nutritive content for use by elk on winter ranges.

Other areas recently burned by the Badger Creek (2018) and Squirrel Creek wildfires (2012) are still recovering. The USFS, WGFD, and other partners have intervened in these areas as well and completed aerial herbicide treatments to control competitive annuals. Aspen regeneration has been very good within the Squirrel Creek wildfire areas, so we anticipate similar results following recent wildfire activity. Some overutilization of woody riparian species has been observed, particularly in portions of the Badger Creek wildfire south of Hwy 230. Browse use can be attributed to domestic livestock, moose, and elk.

With recent approval of the USFS LaVA analysis, plans for treatments in forested habitats totaling over 300,000 acres over the next 15 years were starting to take shape. Logging of live and dead timber, prescribed burning, and other planned and unplanned treatments were anticipated to have positive impacts on plant communities that elk rely upon. With the 176,800 acre Mullen wildfire, LaVA treatments that were in early planning phases, have been temporarily put on hold. After further assessment of resources in summer 2021 within the fire perimeter, and practices

successfully implemented to control erosion and promote native plant species recovery, the WGFD hopes to work with the USFS on addressing habitat issues in the northern half of the Snowy Range through the LaVA process.

Appendix C Hunt Area 10, 11, and 114 Boundary Change

Hunt area 114 extends from the town of Laramie north and west between Interstate Highway 80 and Wyoming Highway 30, to its western boundary at Wyoming Highway 115. Hunt area 114 is predominately private lands with limited public access. Elk management has varied from providing opportunity to address late season damage to stored hay from bull elk, to managing for bull quality. Cow elk license issuances have also fluctuated due to large numbers of elk crossing Interstate Highway 80 from hunt areas 10 or 11 into 114. Other years when the elk do not cross, there isn't enough elk or access to accommodate the number of licenses. Additional concerns are that landowners along the Little Laramie and Big Laramie rivers that traditionally do not have elk started seeing elk passing through 5-6 years ago. Now they are seeing herds of cows remaining year round and calving on their property.

Following discussions with area managers, we propose splitting hunt area 114 into hunt areas 11 and 10. Both hunt areas currently border hunt area 114 to the south and west along Interstate Highway 80. Extending both hunt areas across the interstate, dividing along Dutton Creek to the Lower Dutton Creek- Laramie River Canal, will allow us to better manage elk. Dissolving hunt Area 114 will allow those landowners in the new part of hunt area 10 to address increasing elk populations through a general licenses. Extending Hunt Area 11 across the interstate will allow us to maintain enough licenses to address damage concerns while always having a place for hunters to go.

It's worth noting, we first proposed boundary changes to Landowners in hunt area 114 in 2018 at a landowner meeting in Arlington. We followed up the next year in February of 2019 in Elk Mountain with Landowners from Elk Hunt area 11 and 114. We then held a final meeting in September of 2020 before proceeding with the proposed change.

The proposed boundary change will affect the written boundary description for elk hunt areas 10 and 11. Elk hunt area 114 will be removed.

Current elk hunt area 10 boundary description:
Area 10. Rock Creek. Beginning at the city of Laramie and Wyoming Highway 130; westerly along said highway to the divide between the Laramie River and the North Platte River; northerly along said divide to the divide between the Medicine Bow River and the Laramie River at Medicine Bow Peak; northeasterly along said divide to Sheep Lake Trail 389; northwesterly along said trail to Deep Creek; northeasterly down said creek to Rock Creek; northeasterly down said creek to Interstate Highway 80 at Arlington; southeasterly along said highway to Wyoming Highway 130.

Proposed Elk Hunt Area 10 boundary description (fig.1):
Area 10. Rock Creek. Beginning at the city of Laramie and Wyoming Highway 130; westerly along said highway to the divide between the Laramie River and the North Platte River; northerly along said divide to the divide between the Medicine Bow River and the Laramie River at Medicine Bow Peak; northeasterly along said divide to Sheep Lake Trail 389; northwesterly along said trail to Deep Creek; northeasterly down said creek to Rock Creek; northeasterly down said creek to Interstate Highway 80 at Arlington; southeasterly along said highway to ~~Wyoming Highway 130.~~

Dutton Creek; northeasterly down said creek to Lower Dutton Creek – Laramie River Canal; northeasterly along said canal to U.S. Highway 30-287; southeasterly along said highway to Interstate Highway 80;northwesterly along said highway to Wyoming Highway 130.

Current Elk Hunt Area 11 boundary description:
Area 11. Medicine Bow River. Beginning where Interstate Highway 80 crosses Rock Creek at Arlington; southwesterly up said creek to Deep Creek; southwesterly up said creek to Sheep Lake Trail 389; southeasterly along said trail to the divide between the Laramie River and the Medicine Bow River; southwesterly along said divide to Medicine Bow Peak and the divide between the Medicine Bow River and Brush Creek; northwesterly along said divide to U.S.F.S. Road 103; northwesterly along said road to the North Brush Creek Road (U.S.F.S. Road 100); northerly along said road to the Sand Lake Road (U.S.F.S. Road 101); northwesterly along said road to the Cedar Pass Road (U.S.F.S. Road 261); southwesterly along said road to U.S.F.S. Road 115; northerly along said road to the Pass Creek Basin Road; northerly along said road to the Pass Creek Road (Carbon County Road 404); northerly along said road to Wyoming Highway 72; northwesterly along said highway to Interstate Highway 80 at the west Elk Mountain interchange; southeasterly along said highway to Rock Creek.

Proposed Elk Hunt Area 11 boundary description (fig. 1):
Area 11. Medicine Bow River. Beginning where Interstate Highway 80 crosses Rock Creek at Arlington; southwesterly up said creek to Deep Creek; southwesterly up said creek to Sheep Lake Trail 389; southeasterly along said trail to the divide between the Laramie River and the Medicine Bow River; southwesterly along said divide to Medicine Bow Peak and the divide between the Medicine Bow River and Brush Creek; northwesterly along said divide to U.S.F.S. Road 103; northwesterly along said road to the North Brush Creek Road (U.S.F.S. Road 100); northerly along said road to the Sand Lake Road (U.S.F.S. Road 101); northwesterly along said road to the Cedar Pass Road (U.S.F.S. Road 261); southwesterly along said road to U.S.F.S. Road 115; northerly along said road to the Pass Creek Basin Road; northerly along said road to the Pass Creek Road (Carbon County Road 404); northerly along said road to Wyoming Highway 72; northwesterly along said highway ~~to Interstate Highway 80 at the west Elk Mountain interchange; southeasterly along said highway to Rock Creek~~ to U.S. Highway 30-287; southeasterly along said highway to Lower Dutton Creek – Laramie River Canal; Southwesterly along said canal to Dutton Creek; southwesterly along said creek to Interstate Highway 80; northwesterly along said highway to Rock Creek.

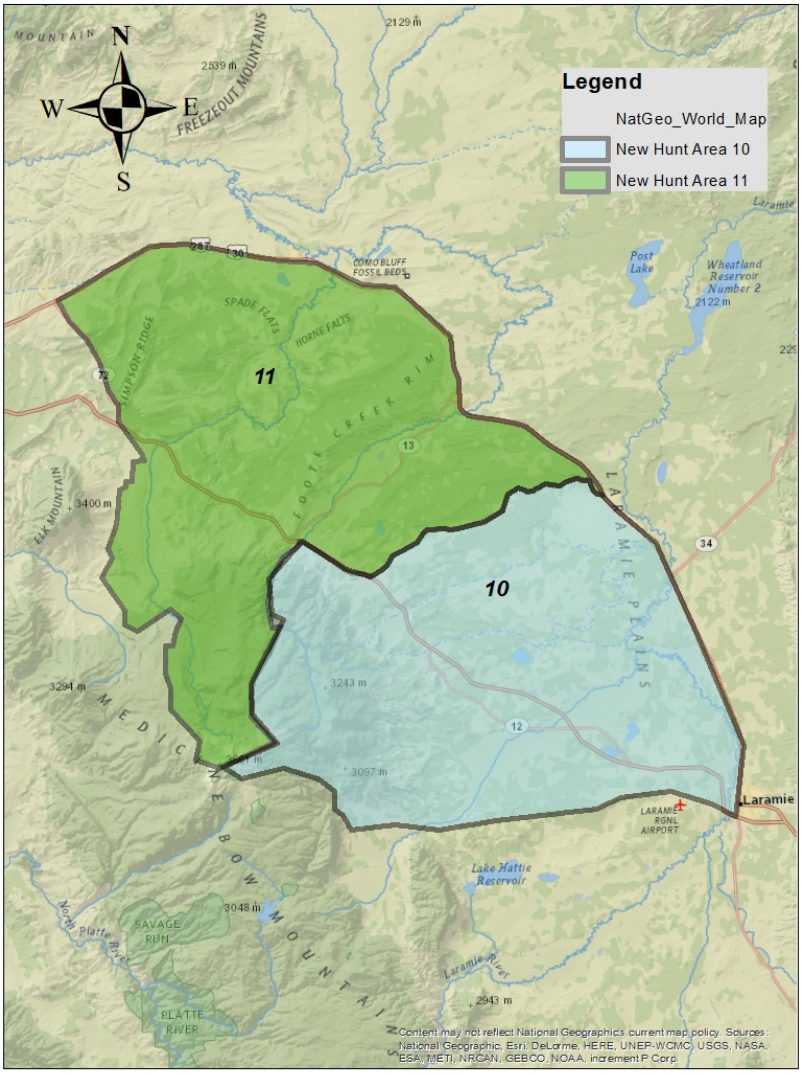


Figure 1. Elk Hunt Areas 10 and 11 proposed boundary change.

2020 - JCR Evaluation Form

SPECIES: Elk
HERD: EL534 - SHIRLEY MOUNTAIN
HUNT AREAS: 16

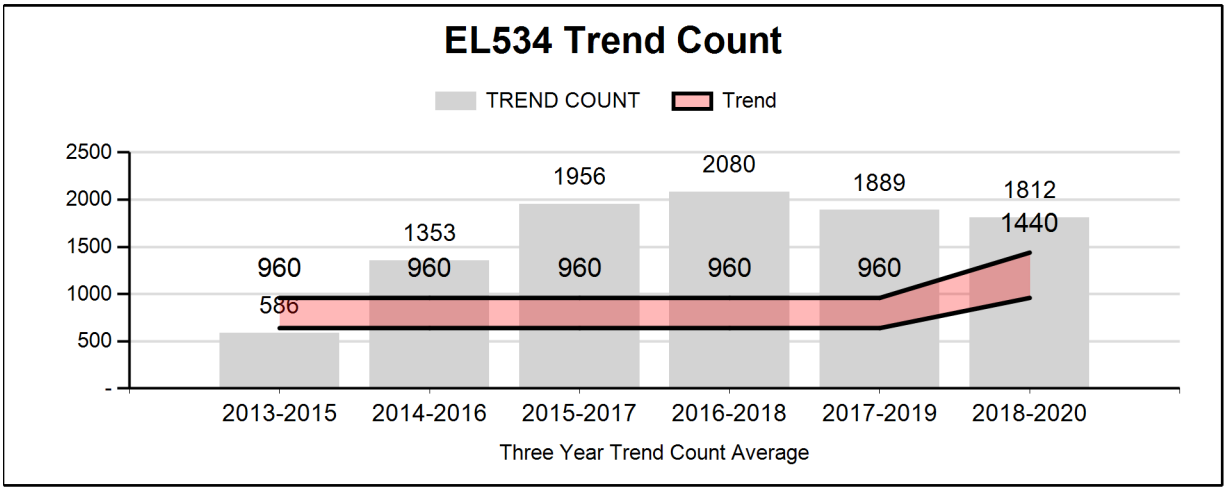
PERIOD: 6/1/2020 - 5/31/2021
PREPARED BY: TEAL CUFAUDE

	2015 - 2019 Average	2020	2021 Proposed
Trend Count:	1,945	1,577	1,400
Harvest:	359	457	475
Hunters:	669	681	800
Hunter Success:	54%	67%	59%
Active Licenses:	692	700	850
Active License Success	52%	65%	56%
Recreation Days:	5,220	6,582	6,500
Days Per Animal:	14.5	14.4	13.7
Males per 100 Females:	38	26	
Juveniles per 100 Females	41	32	

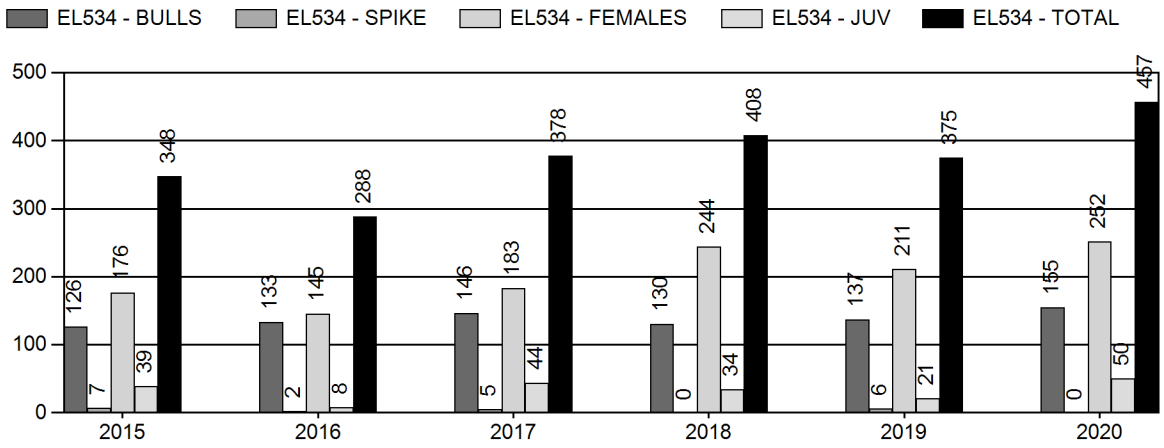
Trend Based Objective (± 20%)	1,200 (960 - 1440)
Management Strategy:	Special
Percent population is above (+) or (-) objective:	31%
Number of years population has been + or - objective in recent trend:	1

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

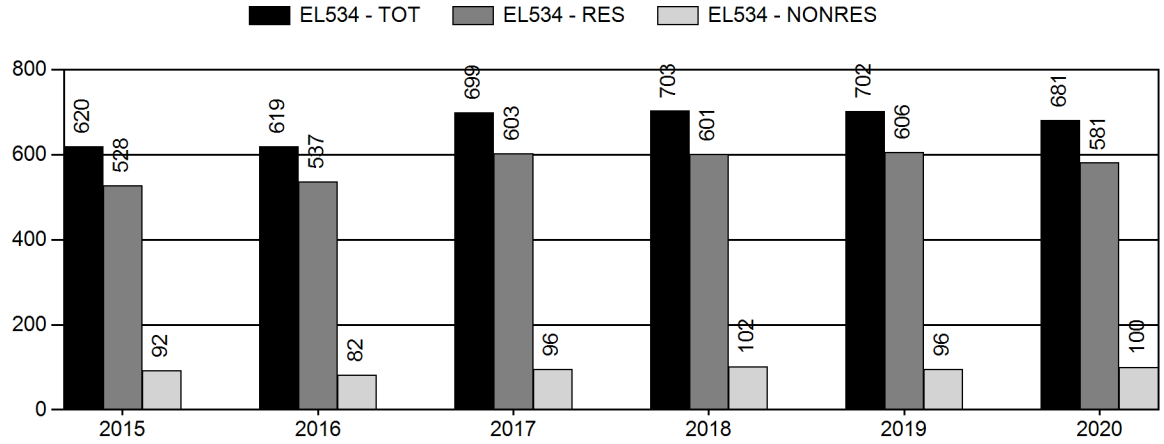
	JCR Year	Proposed
Females ≥ 1 year old:	N/A%	N/A%
Males ≥ 1 year old:	N/A%	N/A%
Juveniles (< 1 year old):	N/A%	N/A%



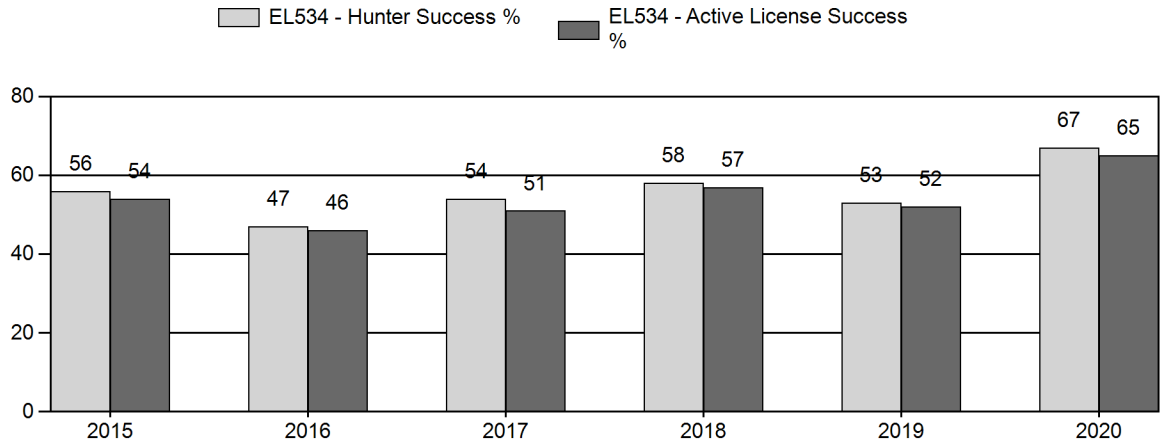
Harvest



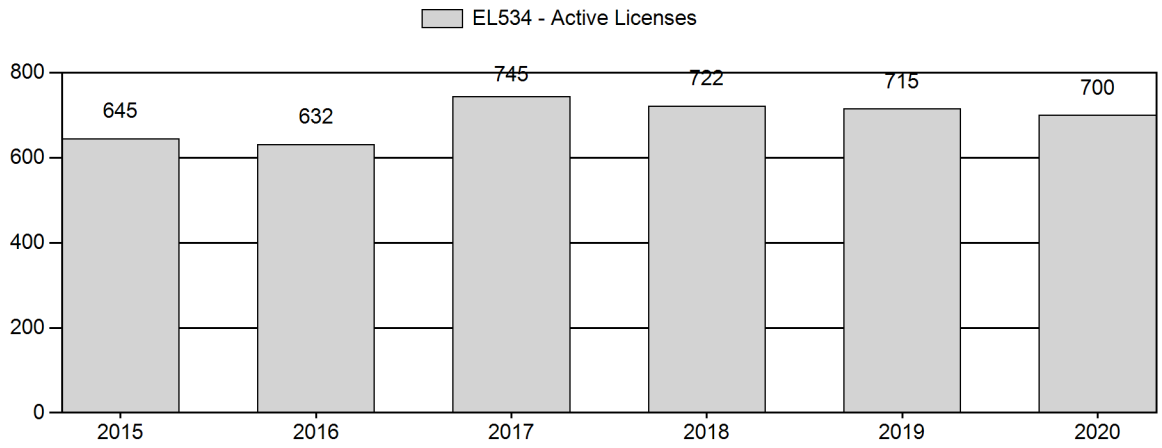
Number of Hunters



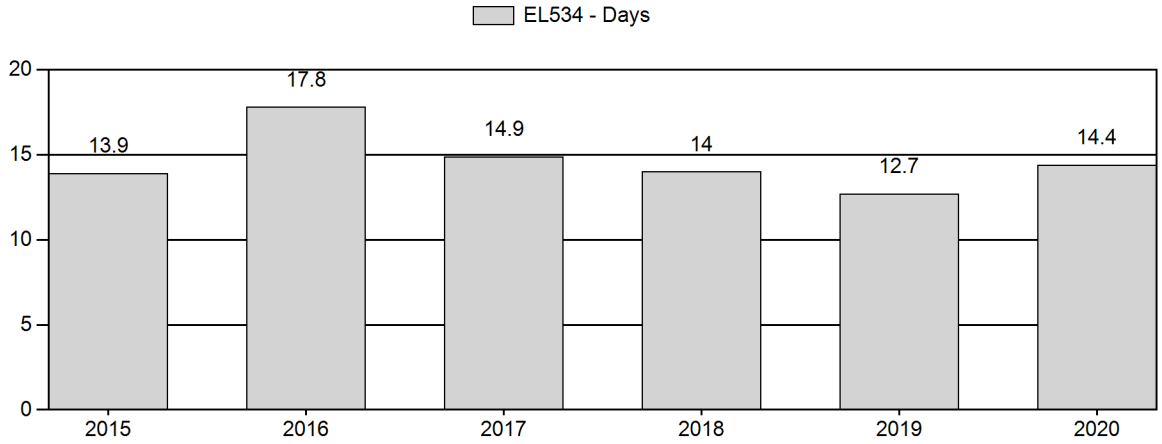
Harvest Success



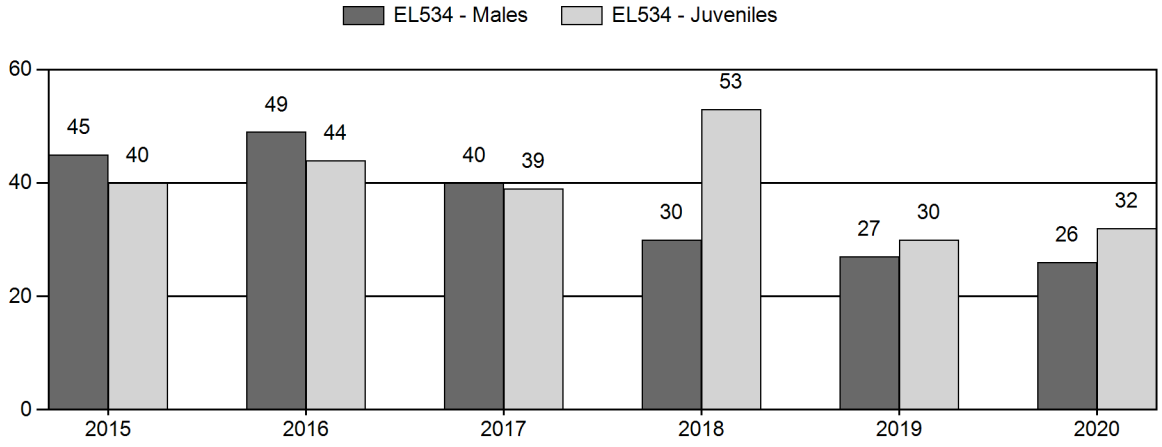
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2021 Hunting Seasons
Shirley Mountain Elk Herd Unit (EL534)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
16	1	Sep. 1	Sep. 30	Oct. 1	Oct. 31	175	Any elk
16	1			Dec. 1	Jan. 31		Antlerless elk
16	2	Sep. 1	Sep. 30	Nov. 1	Nov. 30	75	Any elk
16	2			Dec. 1	Jan. 31		Antlerless elk
16	4			Sep. 1	Sep. 30	300	Antlerless elk valid on private land; also valid on or within one-half (½) mile of irrigated land, and on the Hanna Draw Hunter Management Area (HMA permission slip required)
16	4	Sep. 1	Sep. 30	Oct. 1	Jan. 31		Antlerless elk valid in the entire area
16	6			Aug. 15	Sep. 30	300	Cow or calf valid on private land; also valid on or within one-half (½) mile of irrigated land, and on the Hanna Draw Hunter Management Area (HMA permission slip required)
16	6	Sep. 1	Sep. 30	Oct. 1	Nov. 30		Cow or calf valid in the entire area
16	7			Dec.1	Jan. 31	200	Cow or calf

2020 Hunter Satisfaction: 84% Satisfied, 9.7% Neutral, 6.3% Dissatisfied

2021 Management Summary

1.) Hunting Season Evaluation: The harvest survey indicated 681 hunters harvested 457 elk in 2020, with an overall success of 67%. The percentage of branch-antlered bulls (100%) in the antlered elk harvest and bull ratios (26 bulls/100 cows) observed during the postseason classification survey (Appendix A) met the special management parameters. The mid-winter trend count to estimate the wintering population of elk in the herd unit was conducted in January 2021 (Appendix B). The 2021 hunting seasons were prescribed with the objective of maintaining bull

ratios within the special management parameters and reducing elk numbers.

The Type 6, August 15-September 30, "within one-half (½) mile of irrigated land" limitation was retained to address elk damage. The Type 4, September 1-30, limitation was relaxed to allow hunters to hunt on private land and within one-half (½) mile of irrigated land. This change should maintain or improve hunter success. There are approximately four areas where this Type 4 limitation change could improve hunter success. In these areas elk often move off of private lands onto adjacent public land before legal shooting hours. This change will reduce the reliance on Hanna Draw Hunter Management Area access and provide an additional license type that can be used to address early-season damage.

Type 1 and Type 2 license success has exceeded 60% over the last three years. Managers proposed a conservative increases in the license quotas for both license types. Both the Type 1 and Type 2 are highly coveted licenses and license holders expect a high quality hunt experience. A large portion of this herd unit is unavailable to many hunters due to the checkerboard land ownership pattern and limited private land access. The Type 2 season runs through November and the number of publically accessible areas is further reduced because of weather and elk movement to winter ranges.

The Type 4 license success was 60% in 2020, however from 2018-2020 success averaged 35%. No changes were made to the Type 4 license quota. If success continues to exceed 60%, managers will consider an increase in Type 4 licenses.

A Type 7 license valid from December- January was added to increase cow harvest, while minimizing hunter crowding concerns during the popular Type 1 and Type 2 hunting seasons. Given the location of winter ranges elk occupy in December, hunters will likely need private land access in order to be successful on this new license type. The Type 6 season will end on November 30 to avoid overwhelming landowners with hunter requests for permission during the December-January period. Managers will monitor whether the reduction in Type 6 season length impacts hunter success.

2.) Management Objective Review: The management objective was reviewed in 2020 and changed from a mid-winter trend count of 800 elk to a mid-winter trend count of 1,200 (±20%) elk. The objective will be reviewed again in 2025.

3.) Weather/Habitat: Precipitation levels were below normal for the 2020 biological year. Early spring precipitation occurred during April and May, but quickly diminished in early June. Precipitation events throughout the remainder of the summer were sporadic and covered very small geographic areas. NOAA weather stations in Laramie and Rawlins recorded departures from average annual precipitation of 45% and 28% respectively. Remote precipitation gauge sites established by the BLM in the upper Shirley Basin documented 50% of normal annual precipitation. Shrub conditions continue to be poor with the landscape dominated by late seral shrub plant communities.

4.) Chronic Wasting Disease Management: Chronic Wasting Disease (CWD) was first detected in this herd unit in 2006. To date, no meaningful CWD prevalence data has been collected within

this herd unit and no CWD management actions have occurred. This is not a targeted surveillance herd because of the challenges associated with collecting a statistically valid sample of hunter-harvested elk.

2015 - 2020 Postseason Classification Summary

for Elk Herd EL534 - SHIRLEY MOUNTAIN

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2015	0	86	342	428	24%	948	54%	383	22%	1,759	596	9	36	45	± 0	40	± 0	28
2016	0	160	422	582	25%	1,196	52%	523	23%	2,301	634	13	35	49	± 0	44	± 0	29
2017	0	99	301	400	22%	1,012	56%	396	22%	1,808	581	10	30	40	± 0	39	± 0	28
2018	0	127	228	355	17%	1,164	55%	612	29%	2,131	463	11	20	30	± 0	53	± 0	40
2019	0	168	126	294	17%	1,106	64%	327	19%	1,727	0	15	11	27	± 0	30	± 0	23
2020	0	40	223	263	17%	997	63%	317	20%	1,577	390	4	22	26	± 0	32	± 0	25

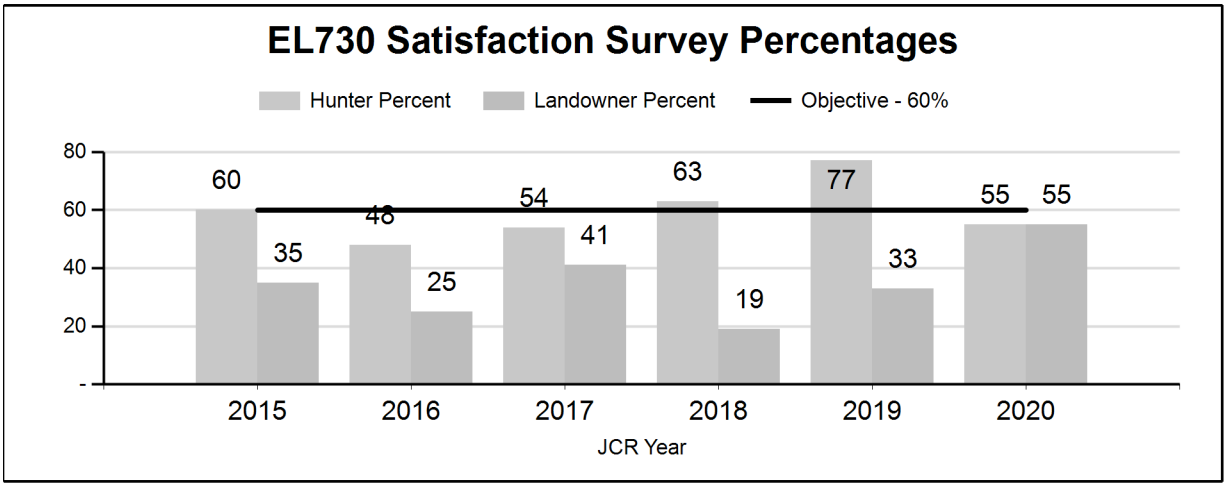
2020 - JCR Evaluation Form

SPECIES: Elk
HERD: EL730 - RAWHIDE
HUNT AREAS: 3

PERIOD: 6/1/2020 - 5/31/2021
PREPARED BY: MARTIN HICKS

	2015 - 2019 Average	2020	2021 Proposed
Hunter Satisfaction Percent	61%	55%	60%
Landowner Satisfaction Percent	31%	55%	60%
Harvest:	112	139	140
Hunters:	327	455	450
Hunter Success:	34%	31%	31%
Active Licenses:	342	472	470
Active License Success:	33%	29%	30%
Recreation Days:	2,246	3,284	3,280
Days Per Animal:	20.1	23.6	23.4
Males per 100 Females:	0	0	
Juveniles per 100 Females	0	0	

Satisfaction Based Objective	60%
Management Strategy:	Special
Percent population is above (+) or (-) objective:	-5%
Number of years population has been + or - objective in recent trend:	0



2021 Hunting Seasons
Rawhide Elk Herd Unit (EL730)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
3	Gen	Sept. 1	Sept. 14	Sept. 15	Oct. 14		Any elk
3	Gen			Oct. 15	Jan. 31		Any elk valid south of U.S. Hwy 26
3	6	Sept. 1	Sept. 30	Aug. 15	Nov. 30	200	Cow or calf
3	6			Dec. 1	Jan. 31		Cow or calf valid south of U.S. Hwy 26

2020 Hunter Satisfaction: 55% Satisfied, 23% Neutral, 22% Dissatisfied
2020 Landowner Satisfaction: 9% Above Desired Levels, 55% At Desired Levels, 36% Below Desired Levels

2021 Management Summary

1.) Hunting Season Evaluation: The 2021 season is designed to maximize harvest on a landscape that is dominated by private land to try and keep a growing elk herd at check. However, there are landowner concerns with not enough elk north of U.S. Highway 26 so that will remain a conservative season to try and improve satisfaction levels for that segment of landowners.

2.) Management Objective Review: The Rawhide Elk Herd Unit's landowner and sportsmen satisfaction objective was last reviewed in 2017 and will go up for review again in 2022.

3.) Ongoing Research: During the 2017/18 winter, 29 female elk were captured and fitted with radio collars as part of a study conducted with the Wyoming State Military Department (Camp Guernsey) to look at habitat selection, identify seasonal ranges, document calving area and map movement patterns. Collar data will be analyzed this year by a consulting firm through a competitive bid process and will be completed in 2022.

4.) Weather and Habitat: Annual precipitation was below normal in the Rawhide herd unit in 2020. NOAA weather stations in Torrington and Douglas showed decreases of 50% and 57% from average, respectively. Native rangeland habitats largely remain in late seral stages due to a lack of natural or managed disturbances on the landscape. Due to the proximity of perennial and annual agricultural crops to security cover provided by steep canyons and timber stands, elk are likely to shift their diets and utilize these forage resources when native rangeland forage resources are lacking in productivity or quality. Lack of spring precipitation resulted in early senescence of rangeland forages in 2020. Cheatgrass remains a large threat in native rangeland plant communities, and also in cropland environments. Ponderosa pine stands throughout the herd unit, particularly in areas around Guernsey and Hartville, including Camp Guernsey's military training grounds, experienced some mortality in 2020. Wyoming State Forestry is currently researching the issue, and believe a combination of drought stress and insect infestations may be the cause. Conservation Reserve Program (CRP) enrolled lands continue to provide very little hiding,

calving, and thermal cover and equally as poor forage production and forage quality for much of the year. This is primarily due to the dominance of low quality vegetative cover (e.g. smooth brome). Reduced CRP rental rates in 2020 resulted in numerous producers leaving the CRP program in Platte, Goshen and Laramie Counties. We anticipate the tracts will return to annual crop production or livestock grazing once water developments and fencing have been installed.

2020 - JCR Evaluation Form

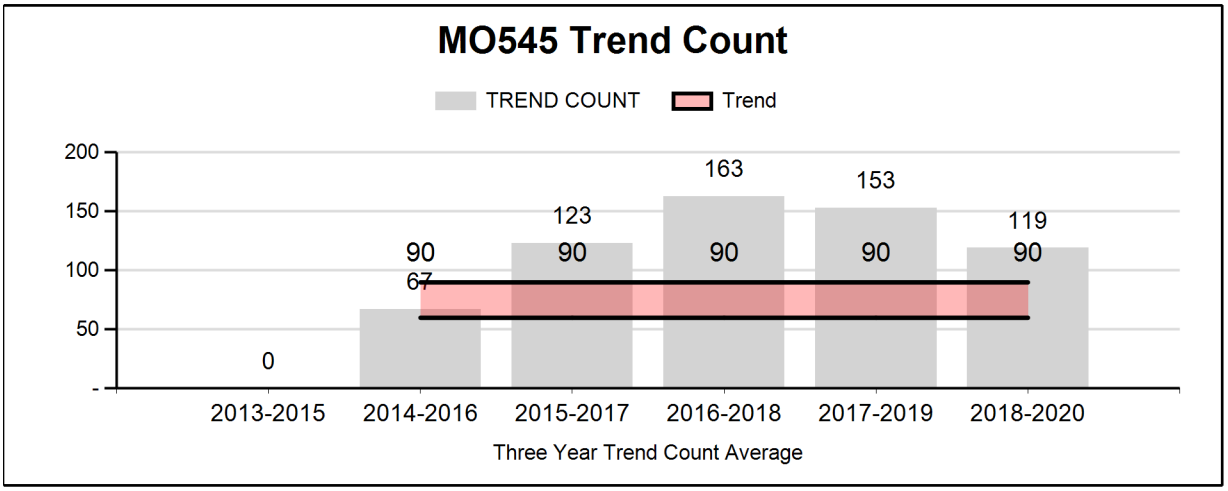
SPECIES: Moose
PERIOD: 6/1/2020 - 5/31/2021
HERD: MO545 - SNOWY RANGE
HUNT AREAS: 38, 41
PREPARED BY: TEAL CUFAUDE

	2015 - 2019 Average	2020	2021 Proposed
Trend Count:	165	67	125
Harvest:	40	25	45
Hunters:	44	30	50
Hunter Success:	91%	83%	90%
Active Licenses:	44	30	50
Active License Success	91%	83%	90 %
Recreation Days:	364	252	450
Days Per Animal:	9.1	10.1	10
Males per 100 Females:	100	89	
Juveniles per 100 Females	46	50	

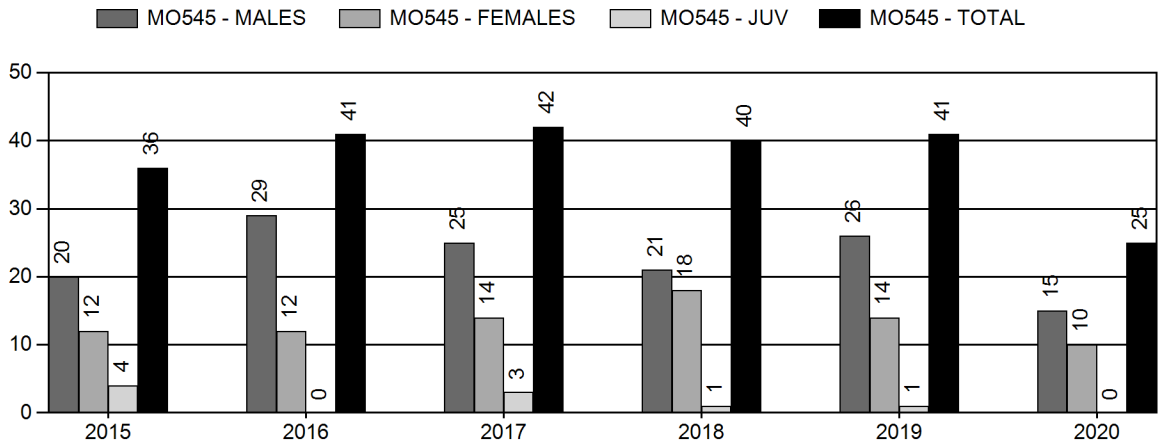
Trend Based Objective (± 20%)	75 (60 - 90)
Management Strategy:	Special
Percent population is above (+) or (-) objective:	-10.7%
Number of years population has been + or - objective in recent trend:	4

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

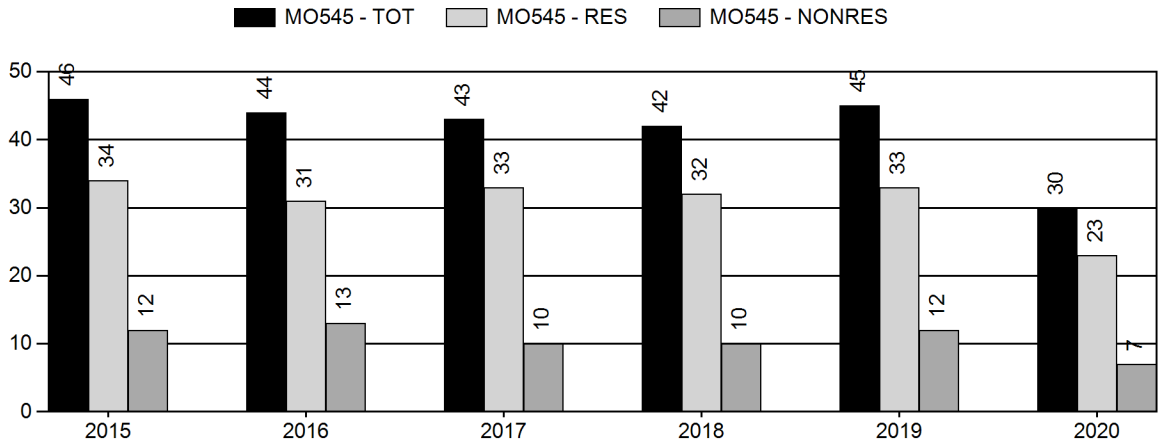
	JCR Year	Proposed
Females ≥ 1 year old:	N/A%	N/A%
Males ≥ 1 year old:	N/A%	N/A%
Juveniles (< 1 year old):	N/A%	N/A%



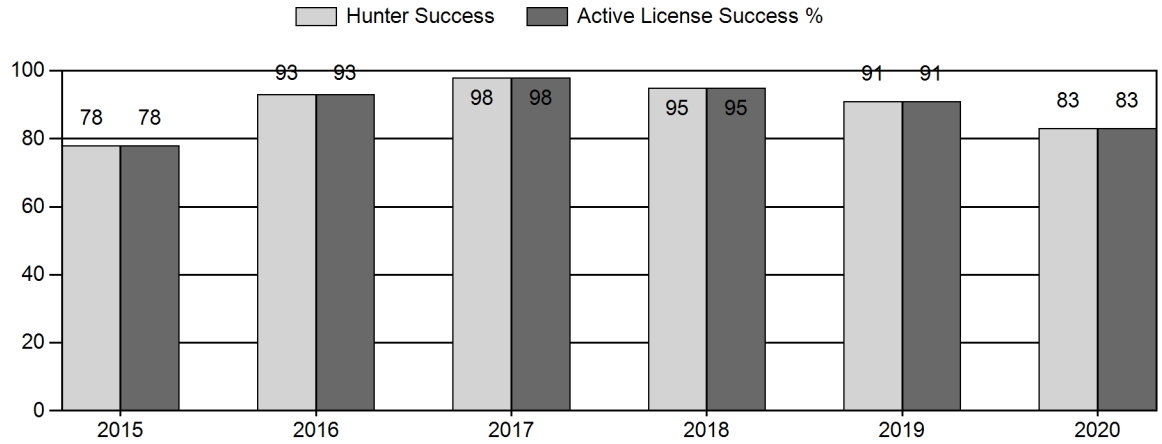
Harvest



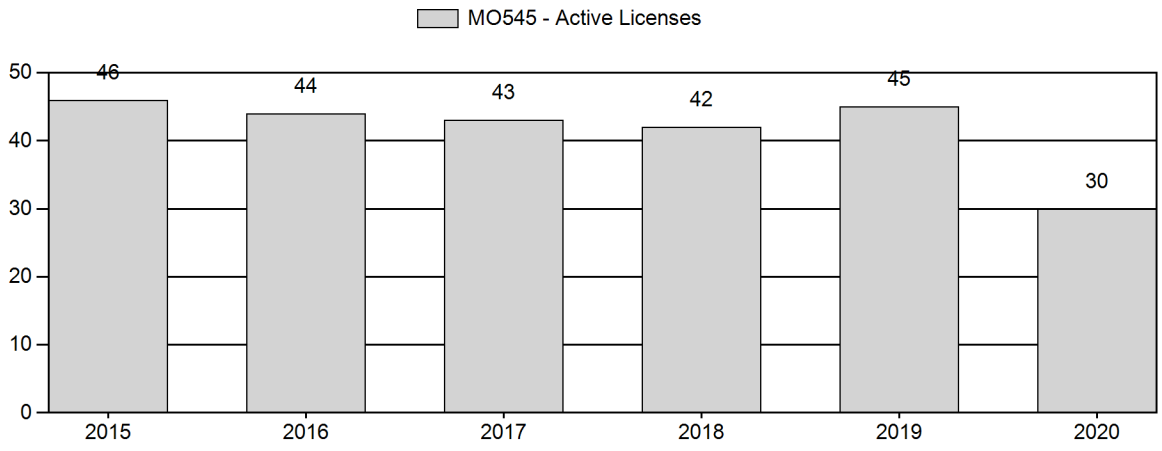
Number of Hunters



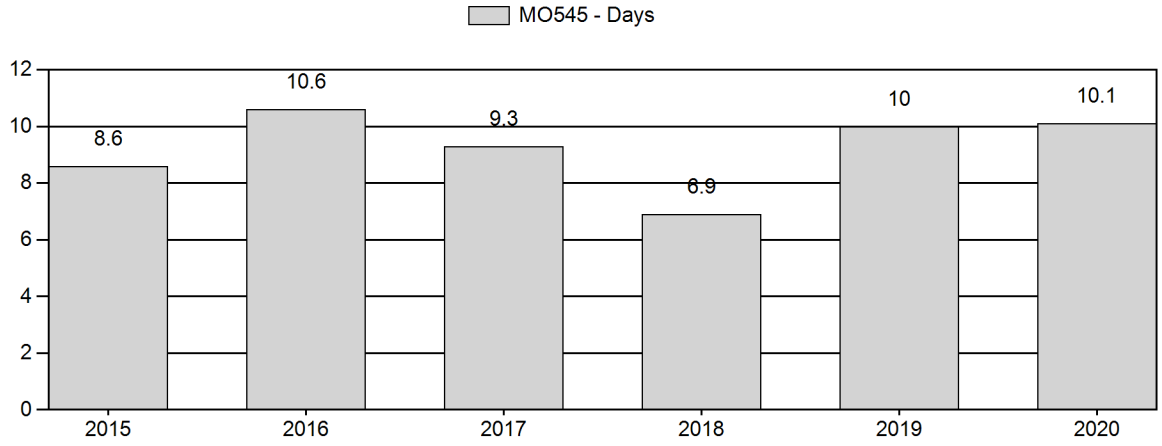
Harvest Success



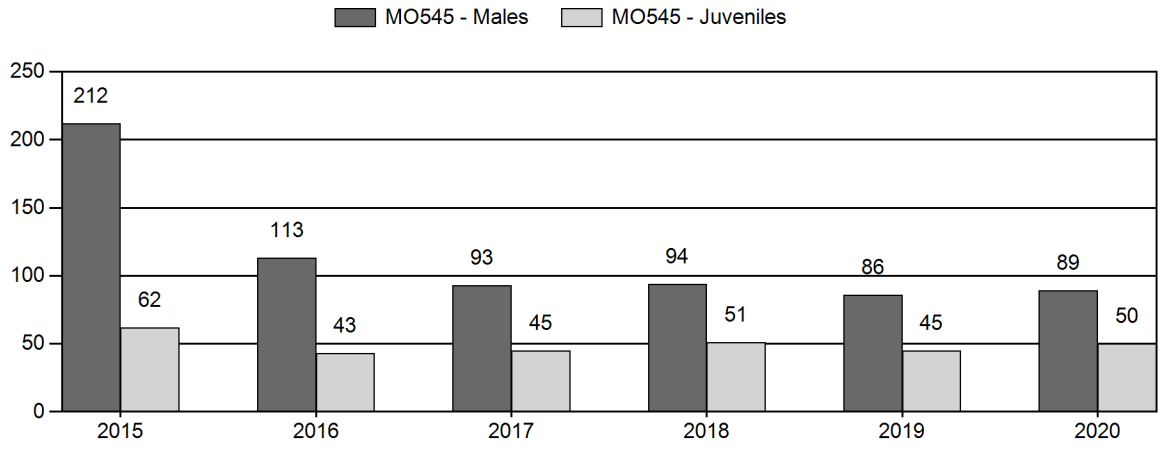
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2021 Hunting Seasons
Snowy Range Moose (MO545)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
38, 41	1	Sep. 1	Sep. 30	Oct. 1	Nov. 14	20	Any moose, except cow moose with calf at side
	4	Sep. 1	Sep. 30	Oct. 1	Nov. 14	20	Antlerless moose, except cow moose with calf at side

Secondary Management Objectives:

1) 3-yr. average of ≥ 4 years of age median for harvested bulls
   - Currently Met: 2018-2020 Median Age for Harvested Bulls- 5.2 years of age
2) 3-yr. average of ≥ 40% of bulls in harvest = ≥ 5 years of age
   - Currently Met: 2018-2020 Percentage of Bulls ≥ 5 years of age- 56%
3) Maintain sustainable communities of willow species preferred by moose
   - Currently Met: Reference Habitat Bullet

2021 Management Summary

1.) Hunting Season Evaluation: Since biological year 2016, mid-winter trend counts have been conducted to monitor moose in this herd unit. Appendix A illustrates the age and sex ratios observed during these trend counts. The three-year trend count average from 2018-20 was 118 moose, which was above the trend count objective. The 2020 trend survey, resulted in the lowest moose count (67 moose; Appendix B) since the trend objective was adopted in 2016. This low count was attributed to a change in number of observers and timing of flight. The Snowy Range herd unit has a reputation for producing trophy quality bulls. The 2020 bull harvest continued to be within WGFD's parameters for "prime-age bulls" (Appendix C). From 2010-20, 519 total hunters (399 resident, 120 nonresident) have harvested 469 moose in this herd unit. During this time, 218 antlerless moose (196 cows, 22 juveniles) have been harvested. Only one antlerless moose has been harvested on Type 1 licenses since 2010. Moose hunters affected by the 2020 Mullen Fire were given the opportunity to carryover or refund their moose license. Four Type 1 and six Type 4 licensed hunters opted to carryover. In 2021, Type 1 and Type 4 license quotas remained at 20 licenses each. This license allocation is expected to maintain the population at objective and age of harvested bulls within the secondary management objective ranges.

2.) Management Objective Review: The management objective review was deferred to 2022. This will allow managers the opportunity to assess the effects of the Mullen Fire in moose habitats and will allow for an additional mid-winter trend count.

3.) Habitat: Snowpack and total annual precipitation was below the 30-year average for this herd unit during biological year 2020. Lack of precipitation led to early senescence of grasses and forbs, likely leading to dietary shifts to riparian and upland shrub communities earlier in the year than normal for wild ungulates (Appendix D). In September 2020, the Mullen Fire burned approximately 176,800 acres in the Snowy Range on the Medicine Bow National Forest. The burned acreage included a substantial portion of the Snowy Range moose herd unit. Managers plan to establish

long-term willow monitoring transects in 2021 to continue monitoring willow production and utilization within the herd unit.

4.) Research: A moose research project was initiated by the Wyoming Cooperative Fish and Wildlife Research Unit and the WGFD in the Snowy Range herd unit during the spring of 2017. The objectives for this research were to assess survival and evaluate patterns of habitat use of female moose as a function of habitat conditions. This work has pointed to the importance of small wet meadow complexes for not only forage but also behavioral thermoregulation in moose. It highlights the importance of conserving these riparian corridors and wet meadow complexes. Collars from this study will transmit data until spring 2021. WGFD managers plan to pursue funding to continue monitoring these collared individuals to assess pre-/post-Mullen Fire habitat selection and distribution.

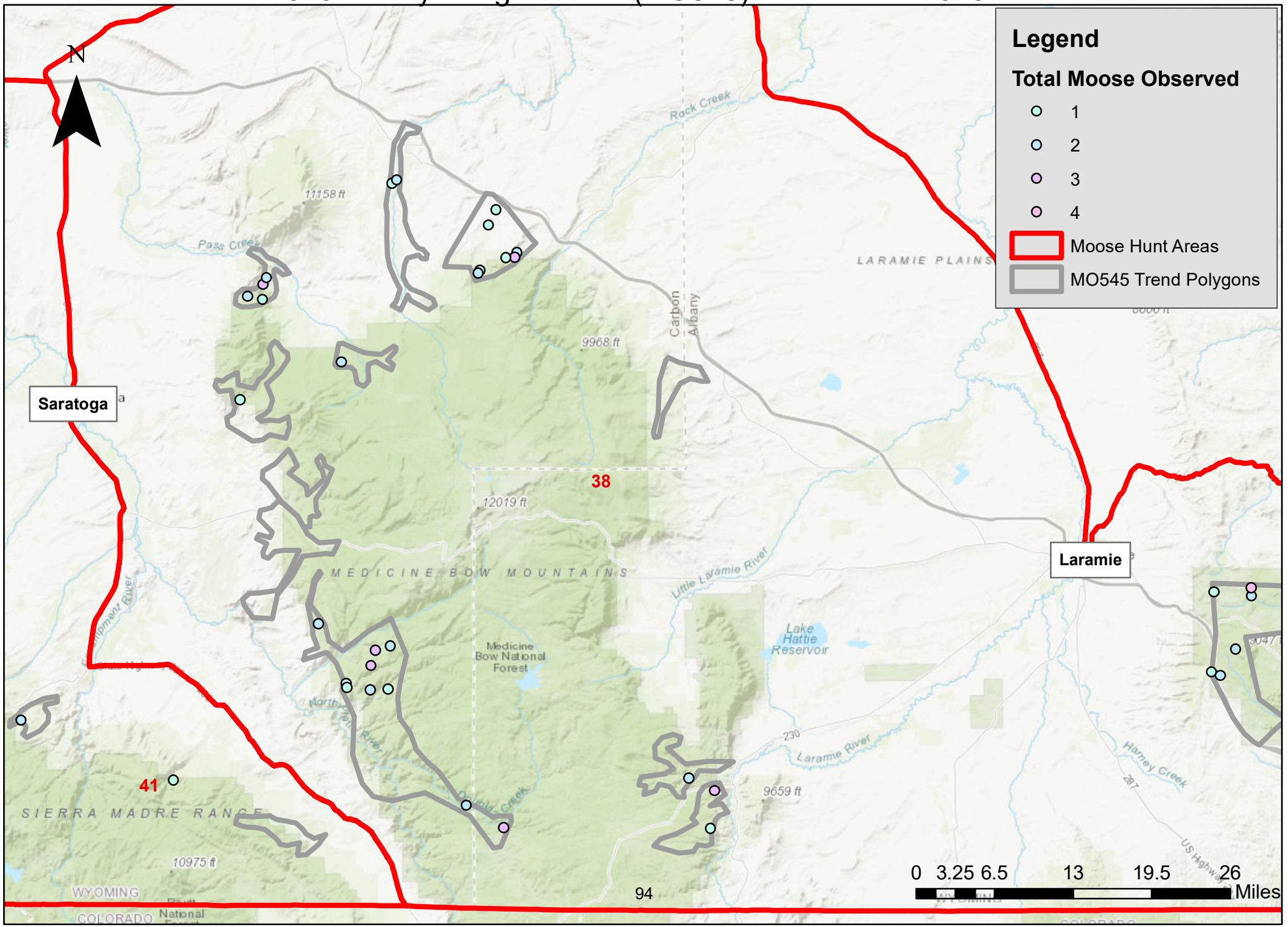
5.) Disease: In 2020, nine moose were tested for Chronic Wasting Disease (CWD). No sampled moose from this herd unit tested positive for CWD. In 2020, carotid artery worms were detected in one road-killed cow moose in the Snowy Range herd unit.

2015 - 2020 Postseason Classification Summary

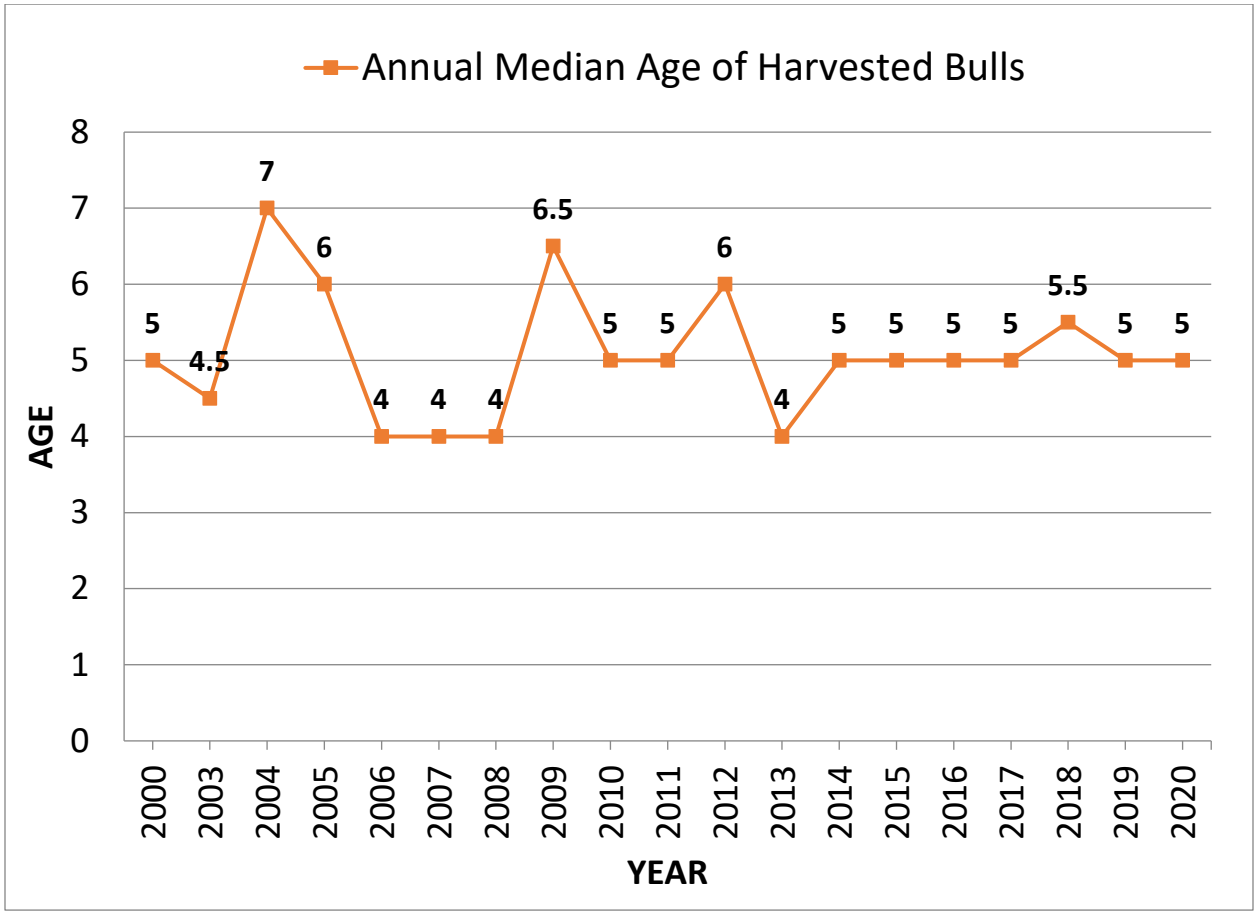
for Moose Herd MO545 - SNOWY RANGE

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2015	0	0	17	17	57%	8	27%	5	17%	30	246	0	212	212	± 0	62	± 0	20
2016	0	9	77	86	44%	76	39%	33	17%	195	0	12	101	113	± 0	43	± 0	20
2017	0	17	49	66	39%	71	42%	32	19%	169	0	24	69	93	± 0	45	± 0	23
2018	0	13	33	46	38%	49	41%	25	21%	120	0	27	67	94	± 0	51	± 0	26
2019	0	8	55	63	37%	73	43%	33	20%	169	0	11	75	86	± 0	45	± 0	24
2020	0	7	8	25	37%	28	42%	14	21%	67	0	25	29	89	± 0	50	± 0	26

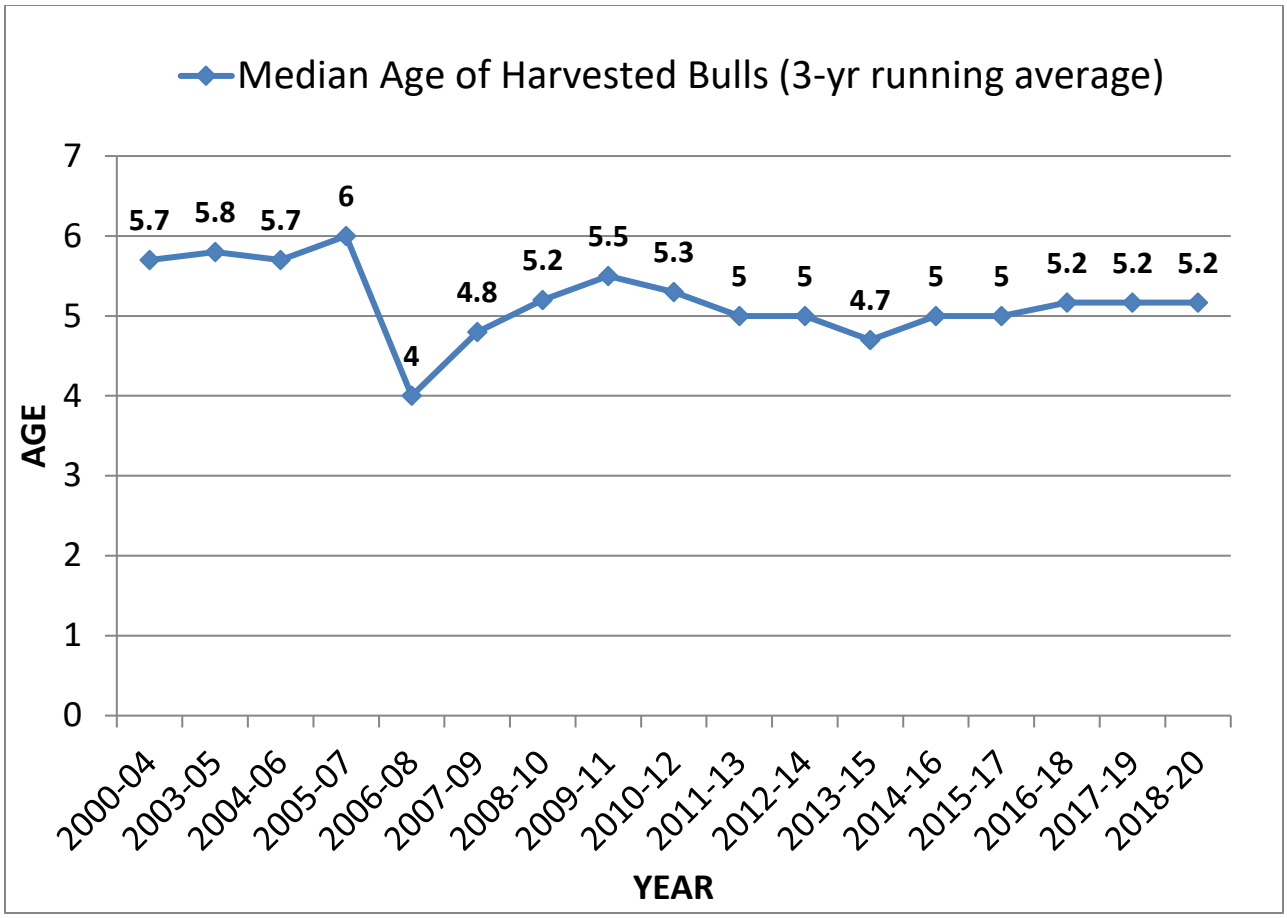
2020 Snowy Range Moose (MO545) Trend- Dec. 2020



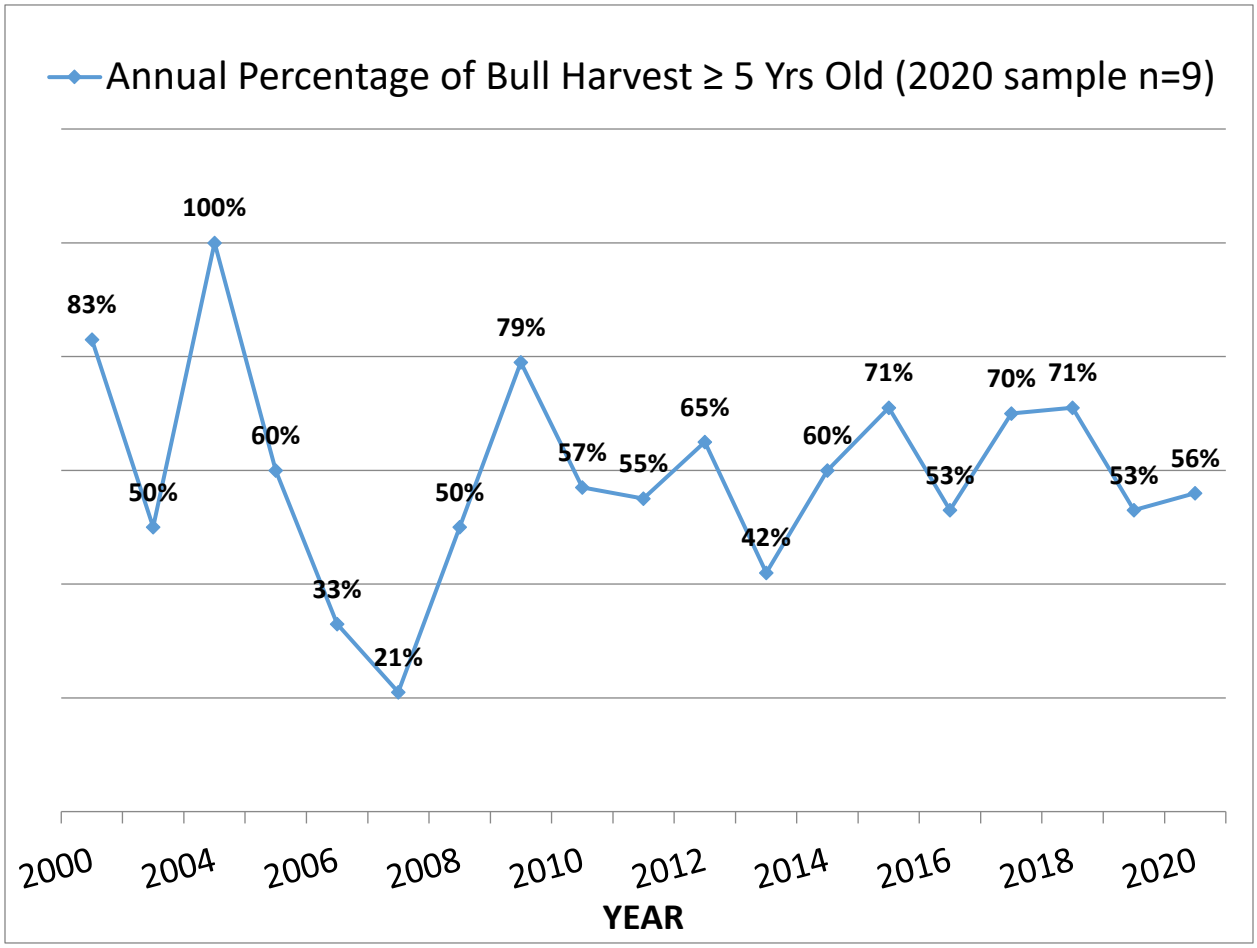
Appendix C Snowy Range Moose Secondary Objective Graphs



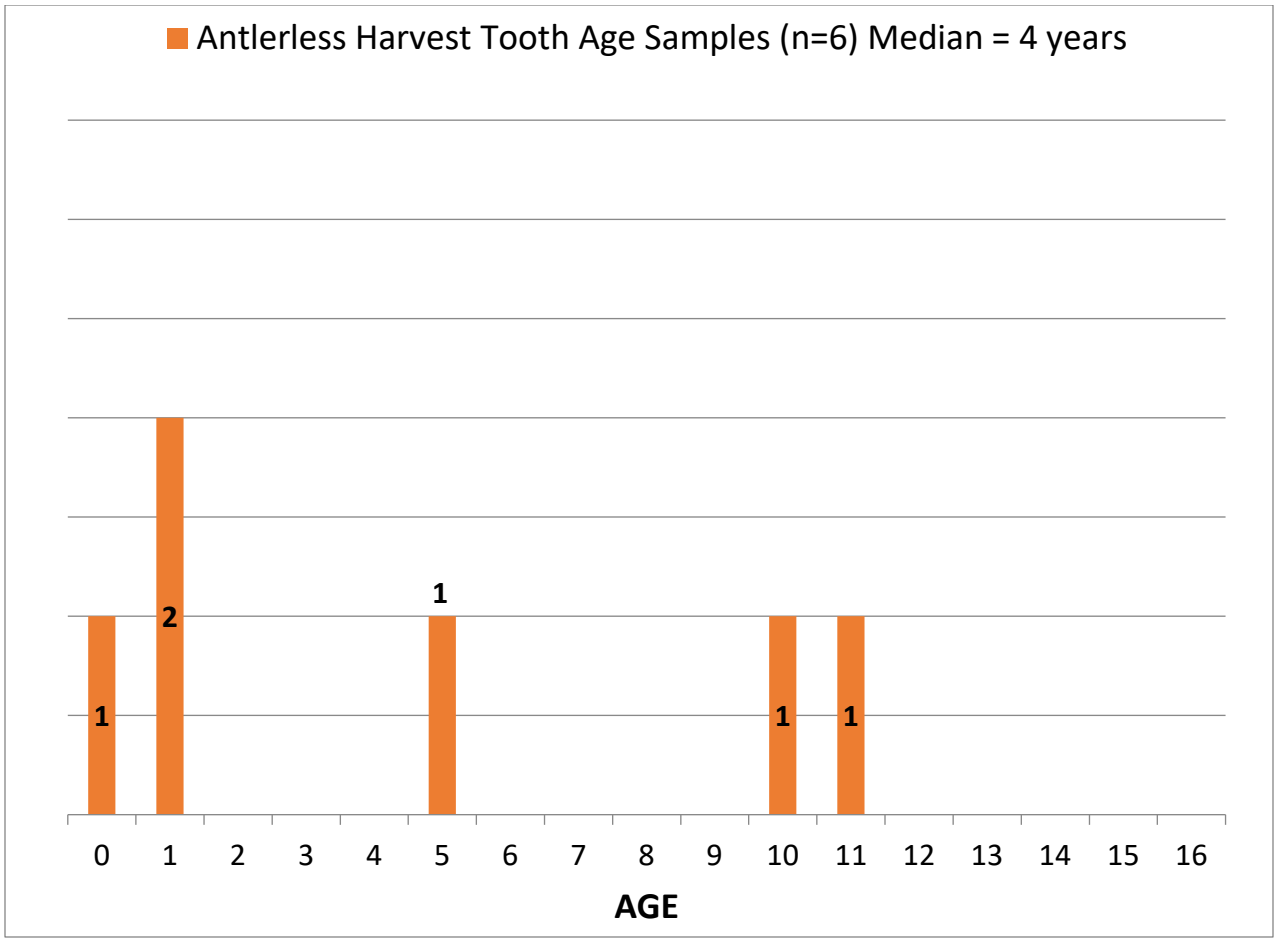
Median age of bulls harvested from the Snowy Range Moose herd unit, from lab aged teeth (n=9) in 2020.



Average (3-year running) median age of bulls harvested from the Snowy Range Moose herd unit, from lab aged teeth.



Annual percentages of the bull harvest ≥ 5-years in age from Snowy Range Moose herd unit, from lab aged teeth.



Age class distribution for antlerless moose harvested from Snowy Range Moose herd unit in 2020.

Snowy Appendix D Snowy Range Moose Habitat

In September 2020, the Mullen Fire burned approximately 176,800 acres in the Snowy Range on the Medicine Bow National Forest. Burn severity across this landscape varied greatly. Some riparian areas were too wet to burn, while significant portions of beetle killed lodgepole pine forest stands were totally consumed. Loss of security cover and thermal cover associated with coniferous forests has occurred in places. We anticipate positive vegetative responses by aspen and riparian habitats to occur. High shrub mortality within mixed mountain shrub stands may be expected with wildfires occurring prior to shrubs going into winter dormancy. The Laramie biologist team intends to establish long-term willow monitoring transects in 2021 to continue monitoring willow production and utilization within the Snowy Range. Plots within and outside of burned habitats will be established. Post-wildfire, spikes in nutritional levels of herbaceous and woody species is anticipated, which can correlate to improvements in individual animal and moose herd health.

During biological year 2020, cheatgrass control efforts continued near Corral Creek between Bennet Peak and Barrett Ridge in hunt area 38. In 2020, 1,039.4 acres were treated via aerial application of the herbicide, Plateau. Post-treatment monitoring to assess efficacy will be conducted in 2021. Mechanical treatments to remove heavy juniper encroachment were also conducted in this area in 2020.

Other areas recently burned by the Badger Creek (2018) and Squirrel Creek wildfires (2012) are still recovering. The USFS, WGFD, and other partners have intervened in these areas as well and completed aerial herbicide treatments to control competitive annuals. Aspen regeneration has been very good within the Squirrel Creek wildfire areas, so we anticipate similar results following recent wildfire activity. Some overutilization of woody riparian species has been observed, particularly in portions of the Badger Creek wildfire south of Hwy 230. High browse use can be attributed to domestic livestock, moose, and elk. Portions of these wildfire areas will be slated for re-treatment of cheatgrass in 2021-2022.

Disturbances to moose favored habitats in the northern half of the Snowy Range continue to be limited. Shrub mowing treatments were conducted on 150 acres on the Wick WHMA in fall 2020, including True mountain mahogany and Serviceberry shrub stands. All of these shrub species are utilized by moose in fall and winter months. Prescribed fires are planned for 1,200 acres of mixed mountain shrub habitats on the Wick WHMA in 2021-2022.

In the eastern portion of moose hunt area 38, Pole Mountain, habitat enhancement work continues on USFS, and State of Wyoming lands within mixed conifer, aspen, and shrub stands. Enhancement work has included mastication and some prescribed fire, resulting in return of plant communities to earlier seral states. These treatments are designed to encourage aspen and mixed mountain shrub regeneration and reduce conifer encroachment, which can result in more mesic conditions and improved herbaceous and woody plant species productivity and diversity.

In fall 2020, the WGFD entered into an agreement to manage a portion (3,110 acres) of the Pilot Hill area as a WHMA on the western slope of the Laramie Range, just outside of Laramie. The upper elevations of the WHMA include mixed conifer and aspen habitats. These areas will seasonally provide habitat for moose. Future management of coniferous forests, aspens, and mixed

mountain shrubs on this property through mechanical or prescribed fire means could be beneficial for wild ungulate populations, including moose.

The WGFD began shrub and aspen treatments on the Grizzly WHMA in 2018 and continued implementation in 2019 and 2020. Sagebrush mowing and aspen ripping activities are aimed at aspen enhancement, increasing shrub age class diversity and forage production on the unit. In 2020, 375 acres were mowed using batwing mowers.

Past large-scale wildfires within the Sierra Madre Range (Snake fire – 2016, Beaver Creek fire – 2016, and Ryan fire – 2018) are recovering at varying rates. These fires have increased age class diversity of mixed mountain shrubs and aspens.

2020 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2020 - 5/31/2021

HERD: MD534 - GOSHEN RIM

HUNT AREAS: 15
PREPARED BY: MARTIN HICKS

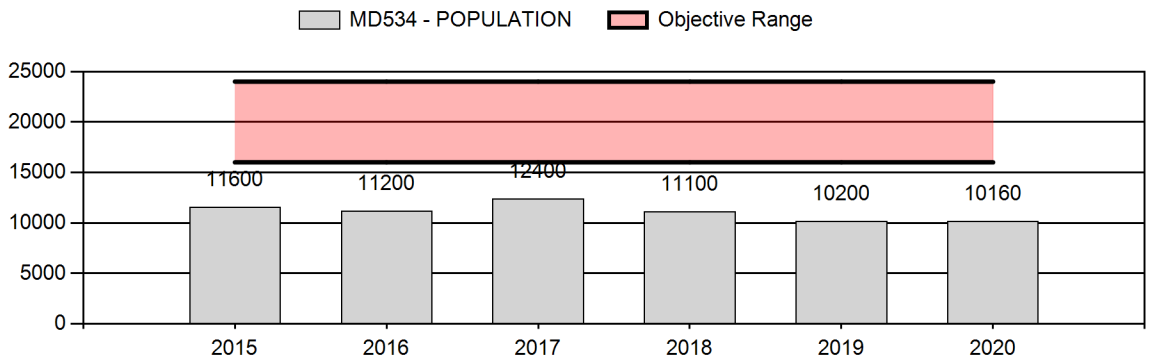
	2015 - 2019 Average	2020	2021 Proposed
Population:	11,300	10,160	10,300
Harvest:	973	793	805
Hunters:	1,777	1,727	1,725
Hunter Success:	55%	46%	47 %
Active Licenses:	1,866	1,774	1,775
Active License Success:	52%	45%	45 %
Recreation Days:	7,336	7,789	7,790
Days Per Animal:	7.5	9.8	9.7
Males per 100 Females	37	26	
Juveniles per 100 Females	54	43	

Population Objective (± 20%) :	20000 (16000 - 24000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-49.2%
Number of years population has been + or - objective in recent trend:	10
Model Date:	02/23/2021

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

	JCR Year	Proposed
Females ≥ 1 year old:	1.8%	1.9%
Males ≥ 1 year old:	29%	30%
Total:	7.2%	7.1%
Proposed change in post-season population:	-3%	+2%

Population Size - Postseason



2021 Hunting Seasons
Goshen Rim Mule Deer Herd Unit (MD534)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
15	Gen	Sept. 1	Sept. 30	Oct. 1	Oct. 14		Antlered mule deer or any white-tailed deer
15	6	Sept. 1	Sept. 30	Oct. 1	Dec. 31	300	Doe or fawn

2021Region T nonresident quota: 400 licenses

2020 Hunter Satisfaction: 60% Satisfied, 20% Neutral, 20% Dissatisfied

2021 Management Summary

1.)Hunting Season Evaluation: Goshen Rim Mule Deer Herd Unit is 49% below the objective of 20,000 mule deer so the season is structured to be as conservative as possible while still addressing minimal damage concerns throughout the herd unit. Allocation of 300 Type 6 licenses appears to be at a level that addresses damage while not compromising the population. Buck ratios are still within the recreational management range of 20-30 bucks:100 does but starting to decrease to the lower limit. However since they are within guideline limits there does not appear to be a need to reduce public opportunity by decreasing hunting days or Region T licenses.
CWD is and will continue to be an issue within this herd unit and will be one of the focus herds for surveillance efforts in 2020.

2.) Management Objective Review: The herd unit's objective was last reviewed in 2018 and is slated to be reviewed again in 2023.

3.) Weather and Habitat: Annual precipitation was below normal in the Goshen Rim herd unit in 2020. NOAA weather station data from Torrington and Cheyenne showed a 50% and 38% decrease from average for the year respectively. Due to the juxtaposition of annual and perennial agricultural croplands intermixed with rangeland habitats, mule deer likely shift diets to crops when native rangeland forage production is compromised by declines in precipitation or poorly timed events. Mixed mountain shrub habitats found on the Goshen Rim remain in late seral stages due to a lack of managed disturbance on the landscape. Annual shrub production and shrub nutritive content are both compromised as plants mature. Due to the close proximity of perennial and annual crops, mule deer are likely to shift their diets and utilize these forage resources in this intensive agricultural environment versus depending on shrubs. Due to the close proximity of perennial and annual crops, mule deer are likely to shift their diets and utilize these forage resources in this intensive agricultural environment versus depending on shrubs. Cheatgrass remains a large threat in the understory of shrub communities and also in cropland environments. Conservation Reserve Program (CRP) enrolled lands continue to provide minimal hiding, fawning, and thermal cover and equally poor forage production and nutritive quality for much of the year. This is primarily due to low quality vegetative cover. Significant acreage of CRP in southeast Wyoming expired in 2020, with numerous producers opting to not re-enroll in the program due to decreased soil rental rates. Most of the tracts will be returning to annual crop

production or livestock grazing. Over the last 35 years of the CRP programs' existence, we've seen multi-species stands convert to single specie grass stands (e.g. smooth brome) in the majority of CRP tracts, resulting in poor habitat for wild ungulates.

4.) Chronic Wasting Disease Management: This is a Tier 1 surveillance herd that was prioritized for CWD sampling in 2020. Prevalence estimates and sample sizes are below (Table 1). For this surveillance period we were able to obtain samples from 105 adult male mule deer. However, by combining the last three years we sampled 205 adult male deer for a prevalence of 38%. Managers are concerned with this high level of prevalence and plan to take this herd out for public input in 2022 to determine the future management through the guidelines of the Department's CWD Management Plan.

Table 1. CWD prevalence for hunter-harvested mule deer in the Goshen Rim Mule Deer Herd, 2018 - 2020.

Year(s)	Percent CWD-Positive and (*n*) – *Hunter Harvest Only*		
	Adult Males (CI = 95%)	Yearling Males	Adult Females
2018	**43% (n=80)**	0%	36%
2019	**52% (n=21)**	0%	0%
2020	**31%(n=105)**	6.7%	6.7%
2018-2020	**38.3% (22-45%, n=203)**	1% (22)	16.7% (30)

2020 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2020 - 5/31/2021

HERD: MD537 - LARAMIE MOUNTAINS

HUNT AREAS: 59-60, 64
PREPARED BY: MARTIN HICKS

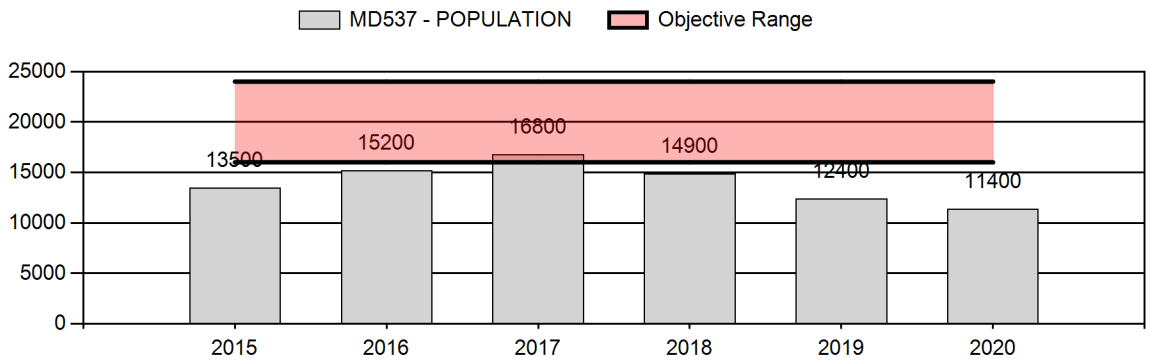
	2015 - 2019 Average	2020	2021 Proposed
Population:	14,560	11,400	9,250
Harvest:	1,107	925	925
Hunters:	1,996	1,936	1,930
Hunter Success:	55%	48%	48%
Active Licenses:	2,042	1,979	1,780
Active License Success:	54%	47%	52%
Recreation Days:	8,713	9,028	9,025
Days Per Animal:	7.9	9.8	9.8
Males per 100 Females	48	36	
Juveniles per 100 Females	61	61	

Population Objective (± 20%) :	20000 (16000 - 24000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-43%
Number of years population has been + or - objective in recent trend:	3
Model Date:	02/23/2021

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

	JCR Year	Proposed
Females ≥ 1 year old:	1.8%	2.2%
Males ≥ 1 year old:	28.9%	39.4%
Total:	7.4%	9.3%
Proposed change in post-season population:	+1%	-22%

Population Size - Postseason



2021 Hunting Seasons
Laramie Mountains Mule Deer Herd Unit (MD537)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
59	Gen	Sept. 1	Sept. 30	Oct. 15	Oct. 31		Antlered mule deer any white-tailed deer
59,64	6	Sept. 1	Sept. 30	Oct. 15	Oct. 31	150	Doe or fawn, valid on private land
59,64	6			Nov. 1	Dec. 31		Doe or fawn white-tailed deer
60	1	Sept. 1	Sept. 30				Curt Gowdy State Park closed
60	1			Oct. 20	Nov. 5	100	Antlered deer on national forest, any deer off national forest; all lands within Curt Gowdy State Park, archery only
60	1			Nov. 6	Nov. 30		Doe or fawn white-tailed deer valid off national forest; all lands within Curt Gowdy State Park, archery only
60	2	Sept. 1	Sept. 30				Curt Gowdy State Park closed
60	2			Oct. 20	Nov. 5	200	Any deer off national forest; all lands within Curt Gowdy State Park, archery only
60	2			Nov. 6	Nov. 30		Doe or fawn white-tailed deer valid off national forest; all lands within Curt Gowdy State Park, archery only
60	6	Sept. 1	Sept. 30				Curt Gowdy State Park closed
60	6			Oct. 20	Nov. 30	50	Doe or fawn; all lands within Curt Gowdy State Park, archery only
64	Gen	Sept. 1	Sept. 30				Valid in all of Area 64
64	Gen			Oct. 15	Oct. 31		Antlered mule deer or any white-tailed deer except the Wyoming Game and Fish Commission's Tom Thorne/Beth Williams Wildlife Habitat Management Area and the Laramie Peak

							Wildlife Habitat Management Area north of the Tunnel Road (Albany County Road 727) shall be closed
64	2	Sept. 1	Sept. 30	Oct. 15	Oct. 31	100	Antlered mule deer or any white-tailed deer

2021 Region J nonresident quota: 900 licenses

2020 Hunter Satisfaction: 58% Satisfied, 21% Neutral, 21% Dissatisfied

2021 Management Summary

1.) Hunting Season Evaluation: The Laramie Mountains Mule Deer Herd Unit is 43% below the population objective of 20,000 mule deer and as a result the 2021 season is conservative in structure. There are a small amount of Type 6 licenses available throughout the herd unit to address damage concerns. The general season will remain at 16 days to take advantage of buck ratios (36 bucks:100 does) that are well past the upper end of the recreational management threshold (20-30 buck:100 does). Hunters will need to keep in mind that the majority of the male deer fall within the Class I and II categories. There are very few Class III males on the landscape, most likely due to high prevalence of CWD (long-term average of 23%) within this herd unit.

2.) Management Objective Review: The population objective for the Laramie Mountains Herd Unit was last reviewed in 2019 and will be reviewed again in 2024.

3.) Weather and Habitat: Annual precipitation in the hunt area was well below normal for 2020 based on weather data analyzed from Cheyenne and Laramie weather stations. NOAA weather station data from Laramie and Cheyenne showed a 45% and 38% decrease from average for the year, respectively. Generally, shrub communities throughout the Laramie Range remain mostly in late seral successional stages, with decreased shrub productivity and nutritive content compared to more early seral shrub communities associated with recent disturbances (e.g. prescribed fire). The USFS and WY State Forestry continue to complete aspen, conifer, and shrub mastication and prescribed fire projects on the Pole Mountain unit of the Medicine Bow National Forest. Results of habitat treatments are varied, based largely on levels of herbivory post-treatment by wild ungulates and domestic livestock.

Ponderosa pine stands throughout the northern portions of Hunt Area 64 of the herd unit experienced some mortality in 2020. Wyoming State Forestry is currently researching the issue, and believe a combination of drought stress and insect infestations may be the cause. Mostly found at lower to mid elevation foothills, the mortality is widespread, but does not appear to be infecting all trees within larger timber stands.

Cheatgrass control via herbicide application is on-going following wildfire events in the Laramie Range. Approximately 6,000 acres were treated between Sybille Canyon and Brittania Mountain in 2020. Monitoring completed in summer 2020, showed 100% control of cheatgrass in areas treated in 2019. A new herbicide, Rejuvra, was used on several sites in 2020. We are optimistic we will achieve high levels of control, and possibly an extended period of control herbicides we have traditionally used for the last 20 years.

Competition with elk for basic habitat requirements is likely a contributing factor for poor mule deer performance within the herd unit. Within deer hunt areas 59, 60, and portions of 64 south of Hwy 34, we continue to see exponential elk herd growth, putting strains on habitats historically and occupied mostly by mule deer.

4.) Chronic Wasting Disease Management: This is a Tier 1 surveillance herd that was prioritized for CWD sampling in 2022. Prevalence estimates and sample sizes are presented below (Table 1) for the past three years. The average sample size for the past 23 years is 102 and on several years it has reached greater than 150 samples so managers have a decent understanding of what prevalence is and how it is negatively affecting this herd unit. Managers will take this herd unit out to the public this year for input on CWD management with guidelines from the Department's CWD Management Plan.

Table 1. CWD prevalence for hunter-harvested mule deer in the Laramie Mountains Mule Deer Herd, 2018 - 2020.

Year(s)	Percent CWD-Positive and (*n*) – *Hunter Harvest Only*		
	Adult Males (CI = 95%)	Yearling Males	Adult Females
2018	**26% (n=169)**	6% (16)	10% (19)
2019	**29% (n=55)**	20% (5)	0% (11)
2020	**15% (n=72)**	16% (6)	11% (19)
2018-2020	**24% (15%-29%, n=296)**	11% (27	7% (39)

2020 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2020 - 5/31/2021

HERD: MD539 - SHEEP MOUNTAIN

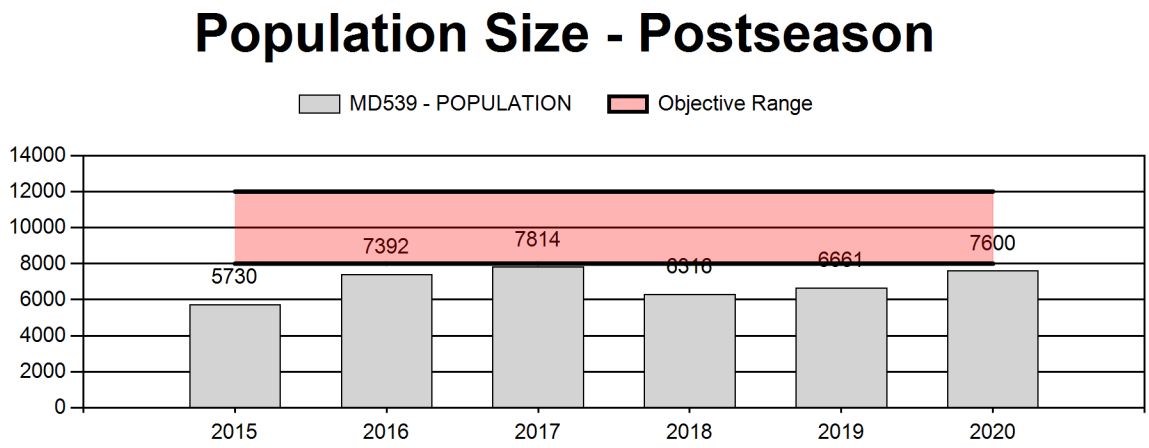
HUNT AREAS: 61, 74-77
PREPARED BY: LEE KNOX

	2015 - 2019 Average	2020	2021 Proposed
Population:	6,783	7,600	8,300
Harvest:	380	257	400
Hunters:	1,398	1,235	1,400
Hunter Success:	27%	21%	29 %
Active Licenses:	1,398	1,235	1,400
Active License Success:	27%	21%	29 %
Recreation Days:	7,308	6,830	7,600
Days Per Animal:	19.2	26.6	19
Males per 100 Females	42	32	
Juveniles per 100 Females	60	69	

Population Objective (± 20%) :	10000 (8000 - 12000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-24%
Number of years population has been + or - objective in recent trend:	20
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:	.4%	0.2%
Males ≥ 1 year old:	14%	16.0%
Total:	4%	4%
Proposed change in post-season population:	6%	5%



2021 Hunting Seasons
Sheep Mountain Mule Deer (MD539)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
61	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 14		Antlered mule deer or any white-tailed deer
74	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 14		Antlered mule deer or any white-tailed deer
75	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 14		Antlered mule deer or any white-tailed deer
76	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 14		Antlered mule deer or any white-tailed deer
77	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 14		Antlered mule deer or any white-tailed deer

2021 Region D nonresident quota: 400 licenses

2020Hunter Satisfaction: 45% Satisfied, 27% Neutral, 29% Dissatisfied

2021 Management Summary

1.) Hunting Season Evaluation: The Sheep Mountain Mule Deer Herd Unit remains below the population objective of 10,000. The 2020 post season population estimates was 7,600. The 2020 hunting season saw poor harvest due to the Mullen Creek fire which closed access to most of hunt areas 76 and 77 for the length of the season. This herd is under recreational management, however buck ratios the last five years have exceeded the recreational maximum of 29 bucks:100 does, with the five year average of 42 bucks:100 does. Maintaining a 14 day season will assist in aligning buck ratios in line with recreational guidelines.

2.) Management Objective: The management objective for the Sheep Mountain Mule Deer Herd is a post season population estimate of 10,000 mule deer. The management objective was last reviewed in 2020, maintaining a recreational management strategy of 20 to 29 bucks:100 does.

3.) CWD Management: CWD surveillance was shifted in the 2019 season to focus on specific herds instead of the blanket statewide approach. Deer herds statewide will be on a five year rotation with the goal of increase surveillance to maintain adequate samples sizes. Sheep Mountain Mule Deer was a focal herd in 2019 with a goal of 200 samples in 3 years. We increased field presence, check stations, and implemented DIY CWD sampling stations at key locations. We collected 61 samples in 2019 and 29 samples in 2020 from adult male mule deer. We will be maintaining our increased CWD sampling efforts in 2021, with the goal of collecting 110 samples to reach the goal of 200 samples in 3 years. The five year prevalence is 9.1% with a 95% confidence of 4.4%-15.3%.

4.) Research: To fill in geographical gaps in data from the 2017-2019 movement and habitat use study, 15 does were collared north of Interstate 80 in November of 2020. We collared 15

additional does south of hwy 130 in January of 2021. These collars will collect locations every two hours for two years, falling off in winter of 2023/2024.

5) Habitat and Weather: Annual precipitation in 2020 was lower than the previous five years, and 12% below the 30 year average. In fall of 2020, the Mullen Fire burned approximately 176,800 acres in the Snowy Range, with the bulk of acres burned on national forest lands in hunt areas 78 and 76. The USFS has identified at least 17,000 acres that are at risk of cheatgrass invasion throughout the forest due to fire severity, slopes and aspects, and known areas of cheatgrass prior to the wildfire. This includes acreages within the Platte Valley and Sheep Mountain mule deer herds (Hunt Areas 78 and 76). The USFS, WGFD, and numerous other partners are working together to plan for cheatgrass herbicide treatments. Funding applications have been submitted to treat up to 15,000 acres in 2021 and 2022 on US Forest Service lands. Due to the high fire severity, we anticipate some mortality of mixed mountain shrubs. Field reconnaissance in 2021 will aid in determining mortality rates. Future shrub seeding efforts may be necessary depending on mortality observed. For additional habitat and weather information please see appendix B.

Appendix A

Classification

2015 - 2020 Postseason Classification Summary

for Mule Deer Herd MD539 - SHEEP MOUNTAIN

		MALES							FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2015	5,730	83	56	47	21	0	207	19%	531	49%	347	32%	1,085	1,099	16	23	39	± 4	65	± 5	47
2016	7,392	99	104	83	23	0	309	23%	633	48%	373	28%	1,315	1,124	16	33	49	± 4	59	± 4	40
2017	7,814	54	88	73	19	0	234	23%	490	49%	277	28%	1,001	1,015	11	37	48	± 5	57	± 5	38
2018	6,316	39	39	38	15	0	131	16%	423	52%	260	32%	814	1,001	9	22	31	± 4	61	± 6	47
2019	6,661	65	60	44	13	0	182	20%	474	51%	268	29%	924	0	14	25	38	± 4	57	± 5	41
2020	7,600	32	43	26	4	0	105	16%	333	50%	230	34%	668	923	10	22	32	± 4	69	± 7	53

Appendix B

RHA and PRISM Data Analysis

SHEEP MOUNTAIN

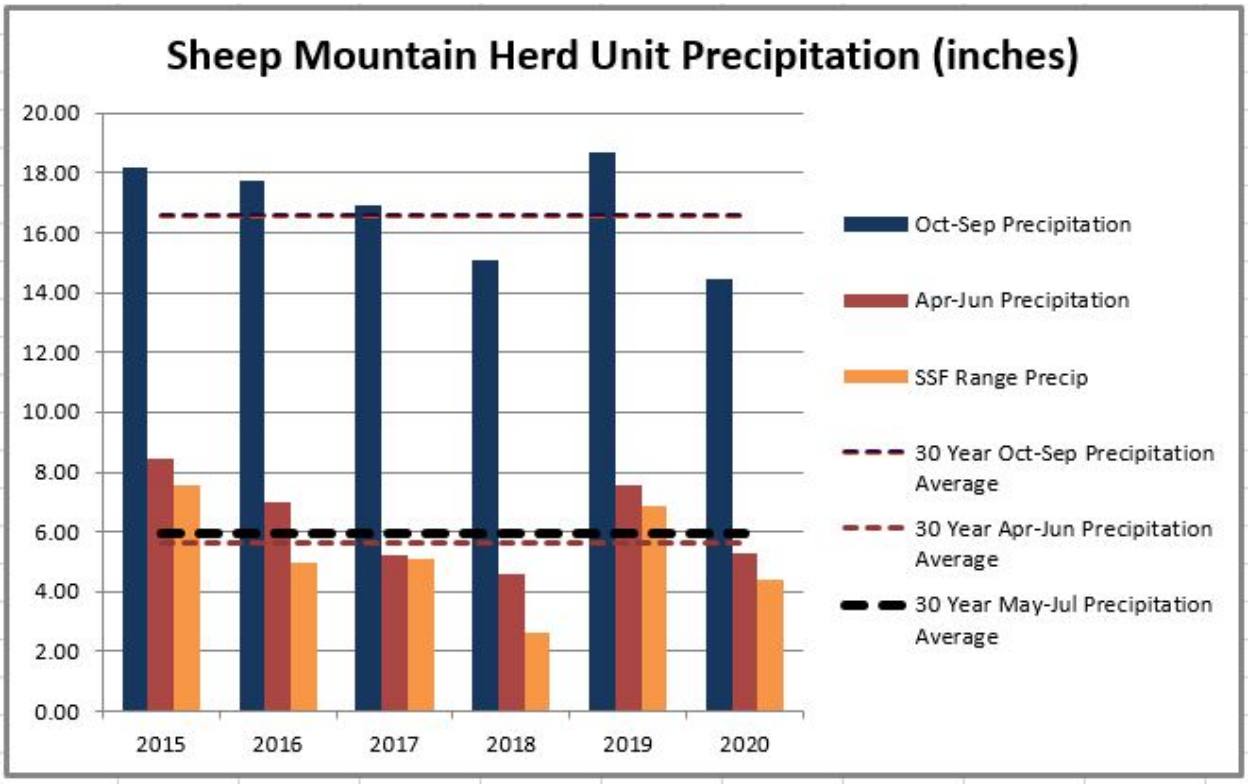


Figure 1. Parameter-Evaluation Relationships on Independent Slopes Model (PRISM) was utilized to estimate precipitation by calculating climate regressions for each Digital Evaluation Model grid cell (4 km resolution) for the Sheep Mountain mule deer herd unit.

Precipitation received in water year 2020 was lower than any of the previous 5 years. Within the 5 year review period of 2016 – 2020, annual precipitation exceeded the 30 year average in 3 of the 5 years. The greatest deficiency in growing season precipitation was observed in 2018, followed by 2020. Snowpack in high elevations plays a significant role in the annual precipitation recorded in this herd unit. Moisture received in the spring and early summer of 2016 and 2019, while mostly considered beneficial for herbaceous and woody forage production, can come in the form of wet snows and freezing rain. Late storms and freeze events may result in delayed plant phenology, and can result in added stress to mule deer does trying to meet the nutritional demands of fawning and lactation.

One spring storm event on June 8, 2020, occurred within portions of the herd unit. Eight inches of heavy, wet snow fell in Laramie and observations of up to 12” or more fell in the foothills of the Snowies. Many branches of deciduous trees, including aspens along the forest fringes, were broken by the weight of the snow. While snow did not persist, it may have been poorly timed for some mule deer fawns born within a few days of this event.

In addition to a 12% deficit in 2020 annual precipitation below the 30 year average, moisture events in the critical growth months for herbaceous and woody vegetation was also below normal. The most significant deficiencies occurred in May - July. In four of the last six years, moisture during this period was below normal. Precipitation falling in this time period, is essential for growth at high elevations in the herd unit. The importance of lush, succulent and nutritious forage availability in summer fawn rearing habitats cannot be overstated. Lack of summer precipitation led to earlier senescence of herbaceous forages across all seasonal ranges. This became evident during RHA data collection efforts, as plant identification became quite difficult by mid-July in spring/summer/fall ranges. Similar difficulties were encountered at lower elevations by the third week of June. The early curing of vegetation at high elevations likely provided the dry, fine fuels needed to carry wildfire (see comments about Mullen Wildfire below).

In fall 2020, the Mullen Fire burned approximately 176,800 acres in the Snowy Range, with the bulk of acres burned on national forest lands, including two wilderness areas. High fire severity in places is cause for concern for cheatgrass invasion in hunt area 76. The USFS has identified at least 17,000 acres that are at risk of cheatgrass invasion throughout the forest due to fire severity, slopes and aspects, and known areas of cheatgrass prior to the wildfire. This includes acreages within the Platte Valley and Sheep Mountain mule deer herds (Hunt Areas 78 and 76). The USFS, WGFD, and numerous other partners are working together to plan for cheatgrass herbicide treatments. Funding applications have been submitted to treat up to 15,000 acres in 2021 and 2022 on US Forest Service lands. Due to the high fire severity, we anticipate some mortality of mixed mountain shrubs. Field reconnaissance in 2021 will aid in determining mortality rates. Future shrub seeding efforts may be necessary depending on mortality observed.

Other areas recently burned by the Badger Creek (2018) and Squirrel Creek wildfires (2012) are still recovering. The USFS, WGFD, and other partners have intervened in these areas as well and completed aerial herbicide treatments to control competitive annuals. Aspen regeneration has been very good within the Squirrel Creek wildfire areas, so we anticipate similar results following recent wildfire activity. Some overutilization of woody riparian species has been observed, particularly in portions of the Badger Creek wildfire south of Hwy 230. Browse use can be attributed to domestic livestock, moose, and elk.

Disturbances to habitats in the northern half of the Snowy Range continue to be limited. Shrub mowing treatments were conducted on the Wick WHMA in fall 2020, including True mountain mahogany and Serviceberry shrub stands, utilized by deer in winter months. Prescribed burns in mixed mountain shrub stands are slated for fall 2021 and 2022 on the Wick WHMA, totaling approximately 1,200 acres. These treatments are located on crucial winter ranges for mule deer.

With recent approval of the USFS LaVA analysis, plans for treatments in forested habitats totaling over 300,000 acres over the next 15 years were starting to take shape. Logging of live

and dead timber, prescribed burning, and other planned and unplanned treatments were anticipated to have positive impacts on plant communities that mule deer rely upon. With the 176,800 acre Mullen wildfire, LaVA treatments that were in early planning phases, have been temporarily put on hold. After further assessment of resources in summer 2021 within the fire perimeter, and practices successfully implemented to control erosion and promote native plant species recovery, the WGFD hopes to work with the USFS on addressing habitat issues in the northern half of the Snowy Range through the LaVA process.

In 2015, Department personnel initiated the Rapid Habitat Assessment (RHA) methodology to survey important mule deer habitats. This method strives to capture large scale habitat quality metrics to better understand how the habitat is providing for the current population of mule deer. The overall end result of this effort is to provide a standardized habitat component for discussions about how mule deer objectives should or should not be adjusted, based on the general concept of carrying capacity. Data was summarized for 2015 – 2019 in order to help inform the discussion on the Sheep Mountain mule deer herd objective review. Utilizing weather and habitat conditions to help inform management decisions, the population objective was left unchanged.

Fifty one (51) RHA's were completed in the Sheep Mountain mule deer herd unit in summer 2020, analyzing 3,273.73 acres total. Significant RHA effort was completed on the northern end of the Snowies, and included important transition and winter ranges on private land south of Interstate 80. Some of the most significant findings included:

Aspen habitats that have not seen recent disturbance (e.g. wildfire in the last 20 years), are generally classified as mid to late seral. Herbivory within these stands was typically higher, as the number of aspen suckers was limited, further concentrating browse use. In many cases, browse could be attributed to elk.

In shrub and rangeland environments, most habitats assessed were classified as late seral. Later seral plant communities can often be typified by a reduction in species diversity. Overall herbivory levels in the majority of acres assessed was not considered excessive. Late seral shrub stands often exhibit signs of historic high browse use by wild and/or domestic ungulates at some point, shown in growth form and stature of woody plants. However, it is important to note that quality of woody forages produced in late seral plant communities may not meet the nutritional demands of mule deer for basic body maintenance in winter months.

Riparian habitats assessed included some areas historically inhabited by beavers. Downcutting of stream systems has occurred in places, resulting in more xeric conditions in some stream habitats. Efforts to reintroduce beavers in future years are underway. Several beavers were trapped and transplanted in 2020 to the Fourmile Creek area in the northeast portion of the Snowy Range. Successful transplants could result in improved hydrology and increased herbaceous and shrub species diversity and overall production. Increasing the green period in riparian systems can attribute to improved fawn-rearing conditions.

2020 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2020 - 5/31/2021

HERD: MD540 - SHIRLEY MOUNTAIN

HUNT AREAS: 70
PREPARED BY: TEAL CUFAUDE

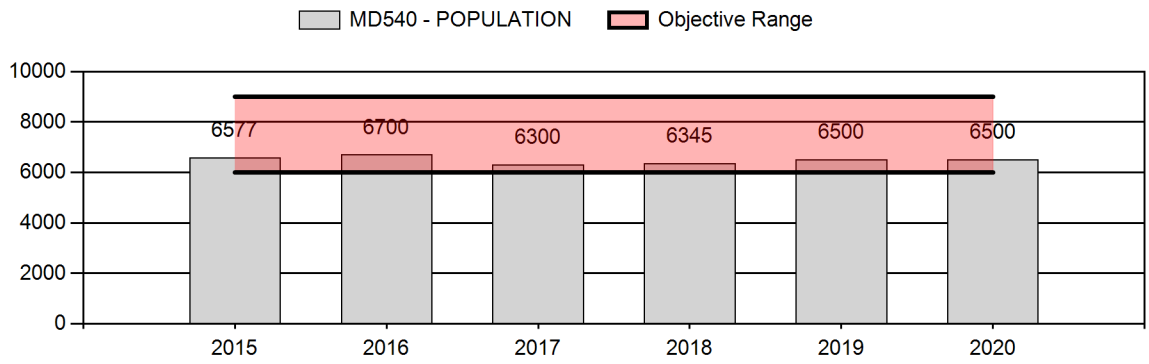
	2015 - 2019 Average	2020	2021 Proposed
Population:	6,484	6,500	6,800
Harvest:	257	226	175
Hunters:	564	637	550
Hunter Success:	46%	35%	32 %
Active Licenses:	570	637	575
Active License Success:	45%	35%	30 %
Recreation Days:	2,280	3,095	2,000
Days Per Animal:	8.9	13.7	11.4
Males per 100 Females	38	57	
Juveniles per 100 Females	59	53	

Population Objective (± 20%) :	7500 (6000 - 9000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-13.3%
Number of years population has been + or - objective in recent trend:	4
Model Date:	2/22/2021

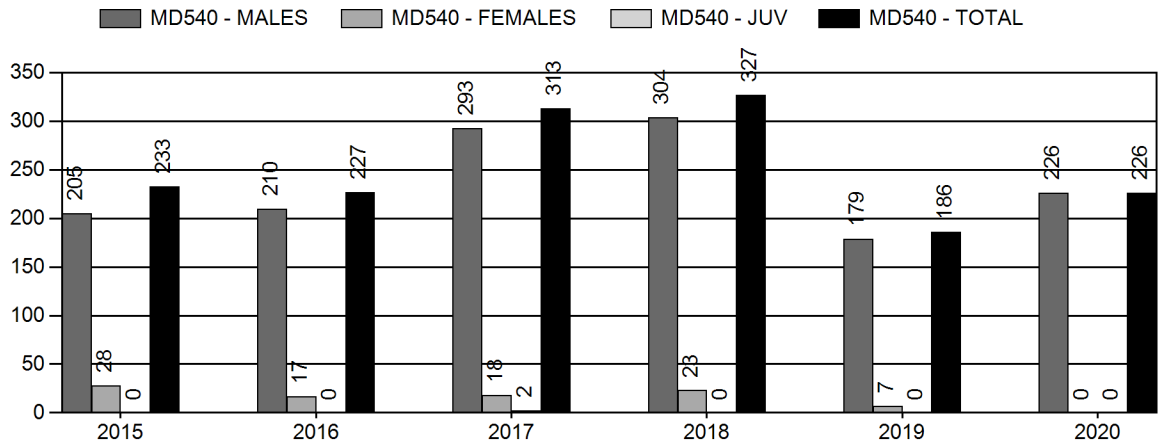
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	JCR Year	Proposed
Females ≥ 1 year old:	0%	0%
Males ≥ 1 year old:	14.3%	10.8%
Total:	3.7%	2.8%
Proposed change in post-season population:	0.64%	5.3%

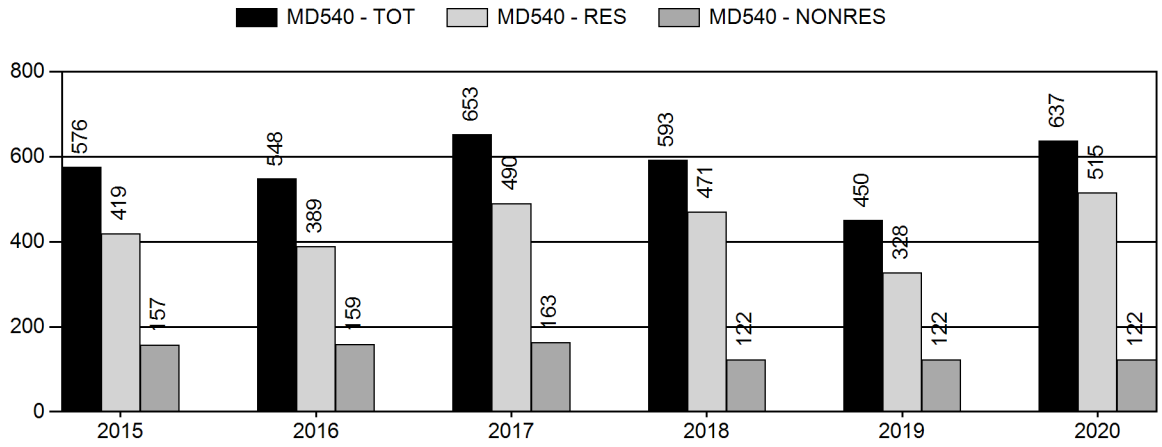
Population Size - Postseason



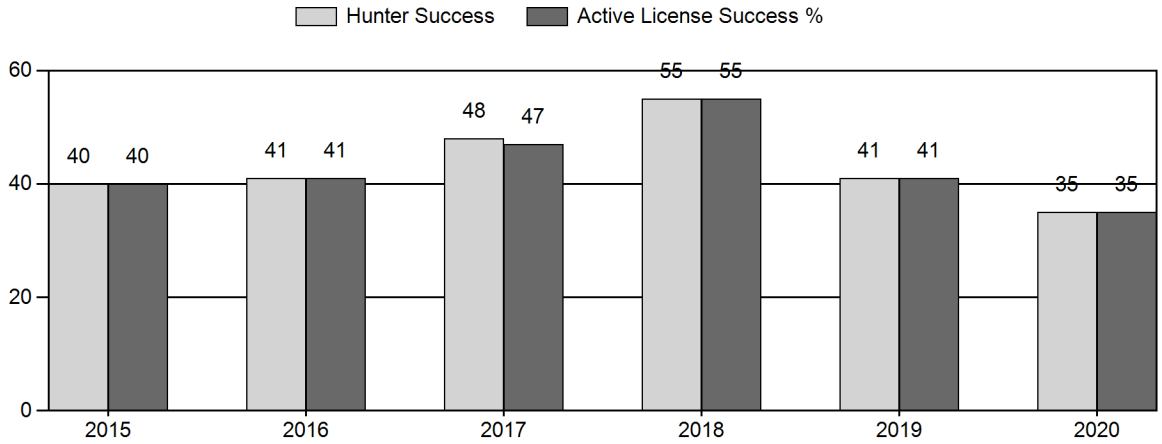
Harvest



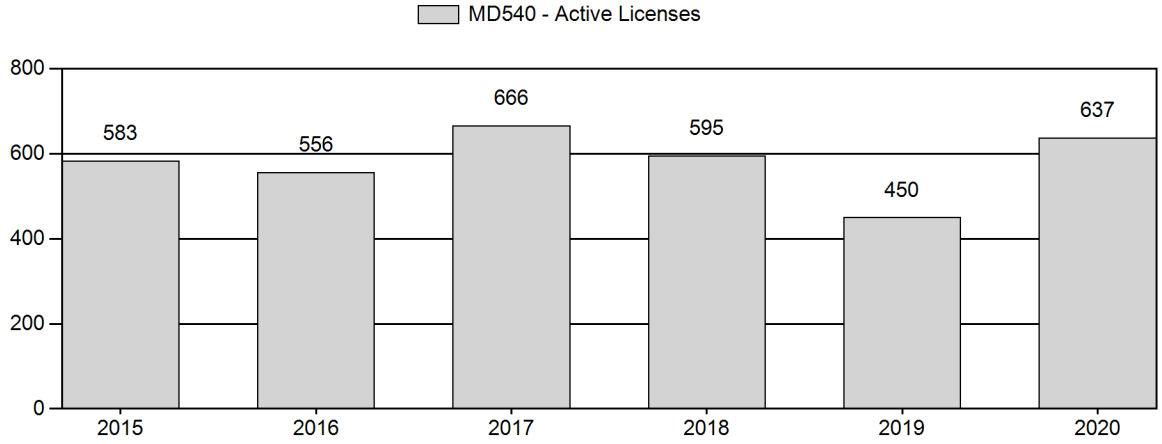
Number of Hunters



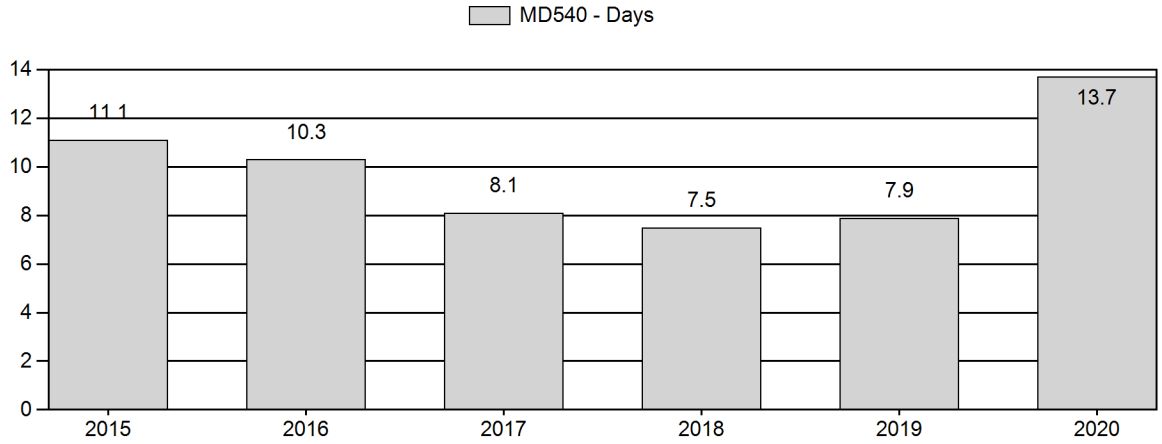
Harvest Success



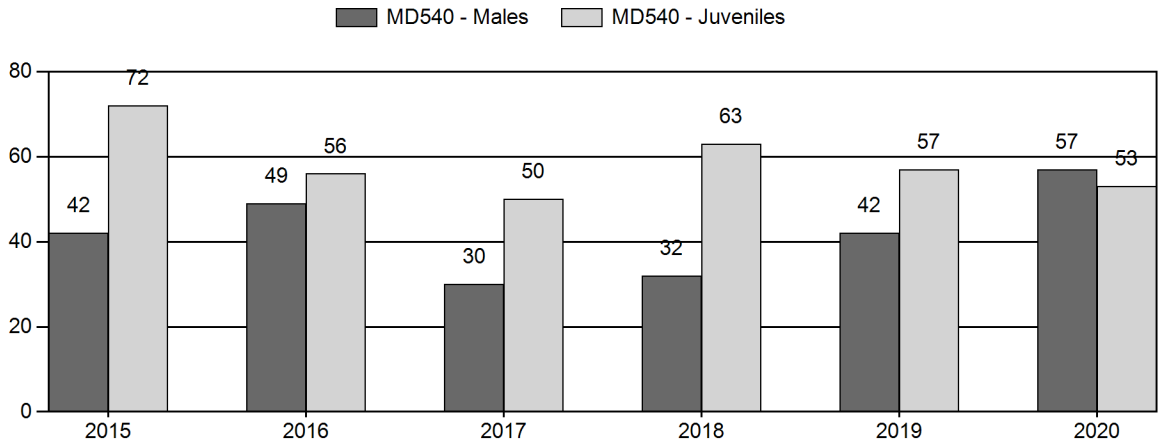
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2021 Hunting Seasons
Shirley Mountain Mule Deer (MD540)

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

2021 Region D nonresident quota: 400 licenses

2020 Hunter Satisfaction: 37% Satisfied, 26% Neutral, 37% Dissatisfied

2021 Management Summary

1.) Hunting Season Evaluation: The 2020 harvest survey report indicated 637 active licensed hunters harvested 226 mule deer for an overall success of 35%. During the 2020 hunting season, antler spread measurements (n=33) were collected from adult bucks harvested in the herd unit. Class II (20-25") bucks represented 9% of the adult bucks measured and Class I (<20") represented 91% of the adult bucks measured. The small sample size of field checked bucks limits the utility of this antler class data when monitoring management and harvest statistics. The 2020 postseason fawn ratio of 53 fawns/100 does was below the five-year average, however the classification sample size was less than adequate. Adult (>1.5 years of age) bucks were assigned to antler classes during postseason classification surveys. The total adult buck classification sample (n=42) resulted in the following: 62% Class I bucks, 33% Class II bucks, and 5% Class III bucks (Appendix A).

A seven-day general season for antlered mule deer or any white-tailed deer was prescribed in 2021. The Region D nonresident quota was retained at 400 licenses. If the projected harvest of 275 mule deer bucks and normal fawn production is attained in 2021 the predicted postseason population of 6,800 mule deer will be within the objective range of 7,500 ±20% mule deer.

2.) Management Objective Review: The management objective was evaluated in 2020 and will be reviewed again in 2025.

3.) Weather/Habitat: Precipitation levels were below normal for the 2020 biological year. Early spring precipitation occurred during April and May, but quickly diminished in early June. Precipitation events throughout the remainder of the summer were sporadic and covered very small geographic areas. NOAA weather stations in Laramie and Rawlins recorded departures from average annual precipitation of 45% and 28% respectively. Remote precipitation gauge sites established by the BLM in the upper Shirley Basin documented 50% of normal annual precipitation. Shrub conditions continue to be poor with the landscape dominated by late seral shrub plant communities.

4.) Chronic Wasting Disease Management: Chronic Wasting Disease (CWD) was first detected in the Shirley Mountain mule deer herd unit in 2006. To date, no meaningful CWD prevalence data has been collected within this herd unit and no CWD management actions have occurred. This is not a targeted surveillance herd because of the challenges associated with collecting a statistically valid sample of hunter-harvested deer.

2015 - 2020 Postseason Classification Summary

for Mule Deer Herd MD540 - SHIRLEY MOUNTAIN

		MALES							FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2015	6,577	27	18	12	1	0	58	20%	137	47%	99	34%	294	831	20	23	42	± 8	72	± 12	51
2016	6,700	19	26	22	2	0	69	24%	142	49%	80	27%	291	863	13	35	49	± 9	56	± 10	38
2017	6,300	13	23	18	3	0	57	17%	191	56%	96	28%	344	870	7	23	30	± 6	50	± 8	39
2018	6,345	27	20	15	1	0	63	16%	198	51%	125	32%	386	1,011	14	18	32	± 6	63	± 9	48
2019	6,500	19	29	16	1	0	65	21%	155	50%	89	29%	309	965	12	30	42	± 8	57	± 10	40
2020	6,500	9	26	14	2	0	51	27%	90	48%	48	25%	189	1,024	10	47	57	± 13	53	± 12	34

2020 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2020 - 5/31/2021

HERD: MD541 - PLATTE VALLEY

HUNT AREAS: 78-81, 83
PREPARED BY: TEAL CUFAUDE

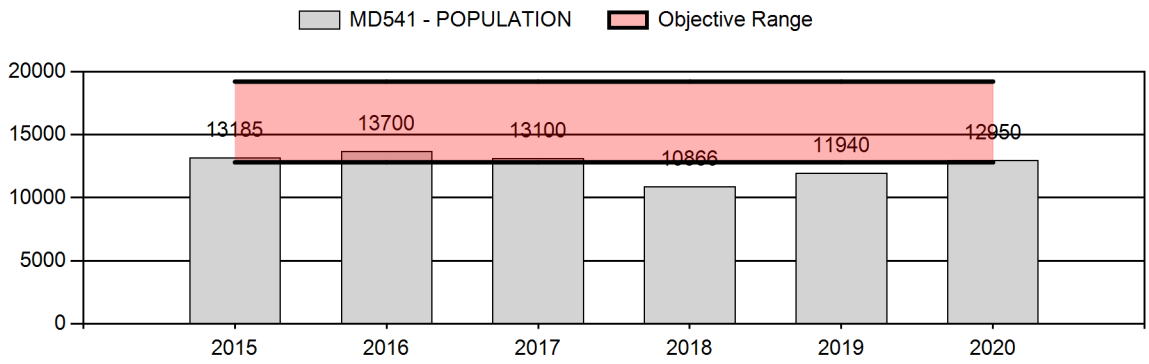
	2015 - 2019 Average	2020	2021 Proposed
Population:	12,558	12,950	13,000
Harvest:	575	408	600
Hunters:	987	749	1,000
Hunter Success:	58%	54%	60%
Active Licenses:	987	749	975
Active License Success:	58%	54%	62%
Recreation Days:	5,748	4,585	6,000
Days Per Animal:	10.0	11.2	10
Males per 100 Females	42	50	
Juveniles per 100 Females	62	70	

Population Objective (± 20%) :	16000 (12800 - 19200)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-19.1%
Number of years population has been + or - objective in recent trend:	7
Model Date:	2/22/2021

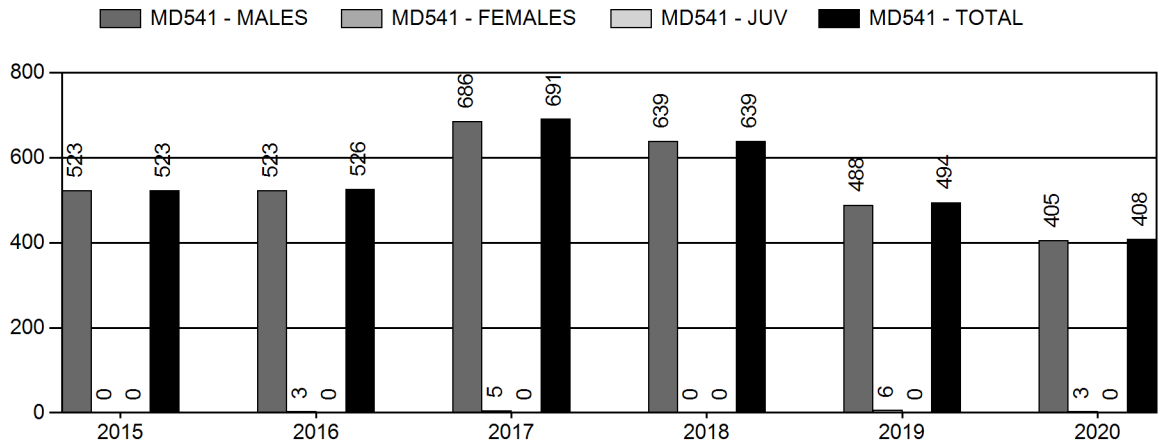
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	JCR Year	Proposed
Females ≥ 1 year old:	0.1%	0.1%
Males ≥ 1 year old:	13.8%	15.6%
Total:	3.5%	4.3%
Proposed change in post-season population:	8.9%	1%

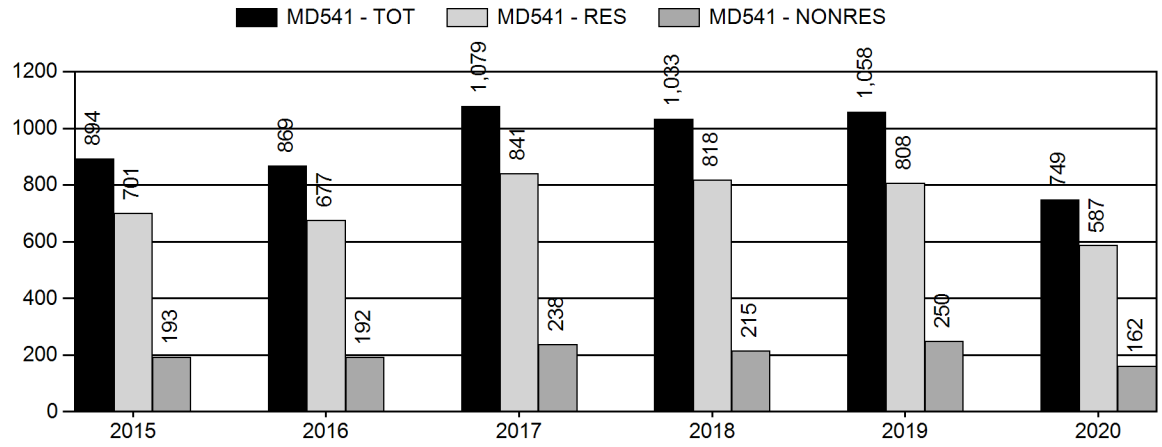
Population Size - Postseason



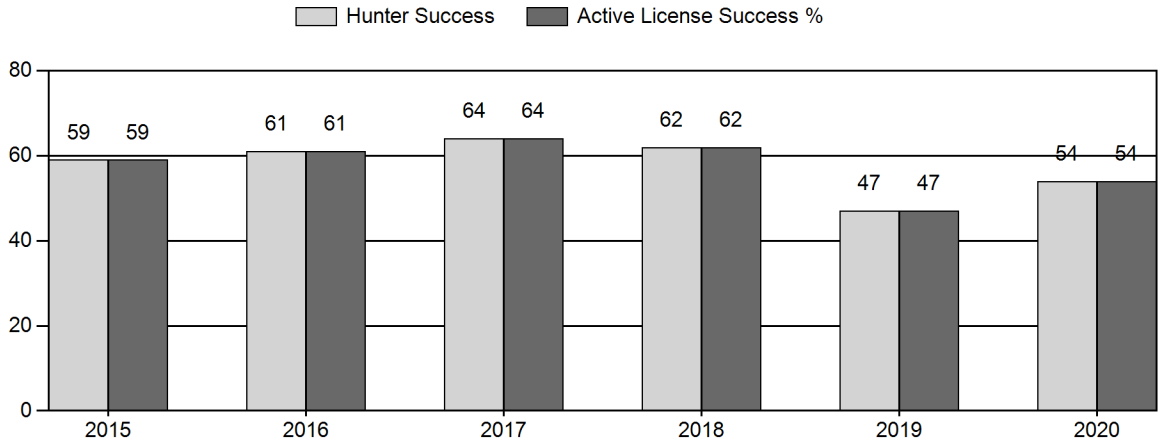
Harvest



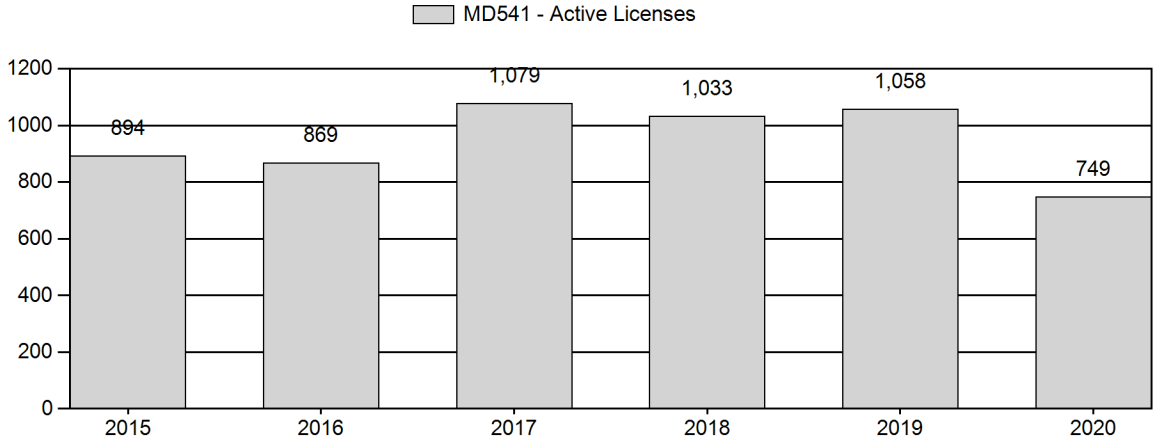
Number of Hunters



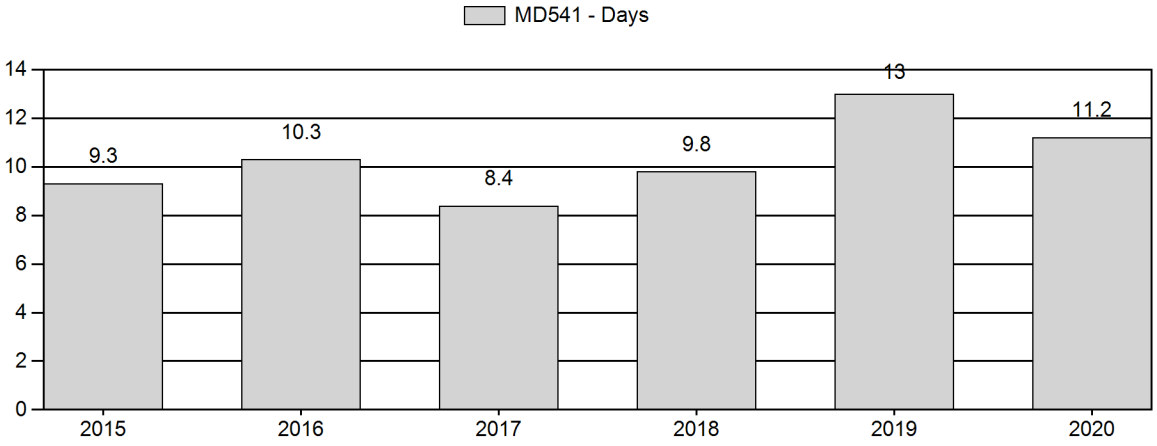
Harvest Success



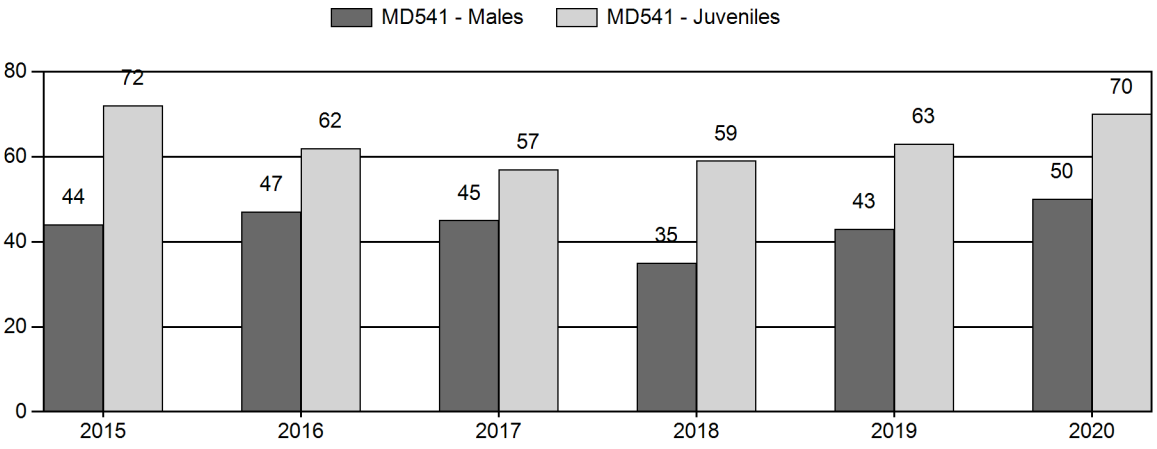
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2021 Hunting Seasons
Platte Valley Mule Deer (MD541)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
78	1	Sep. 1	Sep. 30	Oct. 1	Oct. 14	200	Antlered mule deer or any white-tailed deer
79	1	Sep. 1	Sep. 30	Oct. 1	Oct. 14	400	Antlered mule deer or any white-tailed deer
80	1	Sep. 1	Sep. 30	Oct. 1	Oct. 14	250	Antlered mule deer or any white-tailed deer
81	1	Sep. 1	Sep. 30	Oct. 1	Oct. 14	250	Antlered mule deer or any white-tailed deer

2020 Hunter Satisfaction: 64% Satisfied, 17% Neutral, 19% Dissatisfied

2021 Management Summary

1.) Hunting Season Evaluation: A total of 749 hunters harvested 405 buck mule deer in 2020. Hunter success (54.5%) and satisfaction increased and days to harvest (11.2 days) decreased, indicating hunters were generally more successful in 2020 compared to 2019. Hunter numbers were impacted by the Mullen Fire, with 198 hunters opting to carry-over and 61 hunters receiving refunds. The 2020 postseason fawn ratio of 70 fawns/100 does and buck ratio of 50 bucks/100 does exceeded the five-year averages. Postseason buck ratios were above the recreational management strategy parameters of 20-29 bucks/100 does. Adult (>1.5 years of age) bucks were assigned to antler classes during postseason classification surveys. The total adult buck classification sample (n=186) resulted in the following: 56% Class I (<20”wide) bucks, 36% Class II (20-25”wide) bucks, and 8% Class III (>26” wide) bucks (Appendix A).

The 14-day limited quota season was retained for 2021. The license quota for hunt area 78 was adjusted to accommodate carry-over licenses. With approximately 200 carry-over licenses and 200 licenses issued through the drawing, it is expected that area 78 hunter numbers will be similar to previous years (2017-19). The license quota in hunt area 81 was decreased in 2019 to accommodate fire related carry-over licenses. The postseason fawn and buck ratio and hunter success indicate the hunt area 81 license quota could be increased in 2021. If the projected harvest of 600 mule deer bucks and normal fawn production are attained in 2021 the predicted postseason population of 13,000 mule deer will be below the objective of 16,000.

2.) Management Objective Review: The objective was last reviewed in 2018 and will be reviewed again in 2023.

3.) Platte Valley Mule Deer Initiative Secondary Management Objectives: In 2012, Wyoming Game and Fish Department collaboratively developed the Platte Valley Mule Deer Plan and began to implement strategies identified to improve the quality of the hunting experience in this herd unit. These strategies included: 1.) change hunting season structure from traditional general seasons to limited quota seasons; 2.) achieve a buck harvest success rate of 40%; 3.) set a goal of at least 20% of field-checked harvested bucks meeting an antler spread of 24” or more; and 4.) 60% of the

harvest survey respondents replying they were “satisfied” or “very satisfied” with their hunting experience. During the development of these harvest parameters it was recognized that each could be affected by annual events unrelated to management decisions, such as weather during hunting seasons. To lessen the effect of these variables, these management objectives were based on a three-year running average. In 2020, the buck harvest success rate was 54%, and the three-year average was 54%. In 2020, 16% of field-checked bucks (including yearlings) were ≥24”. Yearling bucks made up 10% (n = 8) of the field-checked bucks. The 2018-20 average percentage of field-checked bucks ≥24” was 21.6%. 64% of harvest survey respondents were satisfied or very satisfied with their 2020 hunting experience, and the three-year average satisfaction was 64%.

4.) Weather/Habitat: Across the entire herd unit, precipitation from October 2019 through September 2020 was below the 30-year average. In addition to a 14% deficit in annual precipitation in 2020, moisture events in the critical growing months for herbaceous and woody vegetation were also below normal. The most significant deficits occurred in May - July. Precipitation falling during these months is essential for growth at high elevations in the herd unit. Lack of summer precipitation in 2020 led to earlier senescence of herbaceous forages across all seasonal ranges. In 2020, WGFD personnel surveyed sixteen Rapid Habitat Assessments (RHAs) in the Platte Valley herd unit, totaling 1,226.43 acres (Appendix B). These data will provide population managers and the public with documentation of the current state of mule deer habitat conditions in the Platte Valley. The Platte Valley Habitat Partnership continued to implement habitat projects across the Platte Valley herd unit. These projects included 1,090 acres of aerial cheatgrass treatments, 146 acres of juniper mastication, 22 acres of juniper encroachment work, 15 chemical acres of non-river leafy spurge treatments, and 71 acres of salt cedar treatment. In fall 2020, the Mullen Fire burned approximately 176,800 acres in the Snowy Range, with the bulk of acres burned on national forest lands, including two wilderness areas. Due to the high fire severity, we anticipate some mortality of mixed mountain shrubs. For the most part, it is expected that this fire will diversify forest communities and age classes, increase herbaceous forage quantity and quality, and stimulate aspen growth. The fire should provide an overall benefit to mule deer habitat. However, this kind of disturbance also can bring invasive species, especially cheatgrass. The USFS, WGFD, and numerous other partners are also collaboratively working to plan for cheatgrass herbicide treatments.

5.) Chronic Wasting Disease Management: Chronic Wasting Disease (CWD) was first observed in the Platte Valley herd unit in 2002. This is a Tier 1 surveillance herd and is scheduled to be intensely sampled, with the goal of sampling 200 hunter-harvested mule deer, in 2023. The three-year (2018-20) prevalence in the herd unit was 8.6%. Managers are concerned with this prevalence and plan to start gathering public input in 2022 and 2023 to determine feasible management strategies through the guidelines of the WGFD CWD Management Plan.

6.) Research: In 2018, The Platte Valley Mule Deer Migration Corridor was designated. The Platte Valley Mule Deer Migration Corridor represents high use seasonal migration corridors documented through GPS collar technology and delineated using a Brownian Bridge Movement Model. In February 2020, 45 additional mule deer does were fitted with GPS collars in an effort to better understand mule movement in this herd (Appendix C). Mangers can also use collar studies to estimate survival based the number of marked animals that survive month to month. During biological year 2020, adult doe survival was 82% (95% CI 72%-94%).

7.) Hunt Area Boundary Change: For the 2021 hunting season, hunt area 83 was eliminated and the boundaries for hunt area 80 were expanded. The new hunt area 80 boundary simplified hunting season regulations. It is not expected that deer hunting access will improve in the checkerboard portion of the area that was formerly hunt area 83, so this boundary change will impact very few hunters and landowners.

2015 - 2020 Postseason Classification Summary

for Mule Deer Herd MD541 - PLATTE VALLEY

		MALES							FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2015	13,185	143	82	130	19	0	374	21%	842	46%	604	33%	1,820	962	17	27	44	± 3	72	± 5	50
2016	13,700	96	206	250	7	0	559	23%	1,188	48%	731	29%	2,478	1,159	8	39	47	± 3	62	± 3	42
2017	13,100	64	125	114	29	0	332	22%	738	50%	419	28%	1,489	1,165	9	36	45	± 4	57	± 4	39
2018	10,866	147	200	188	33	0	568	18%	1,638	52%	971	31%	3,177	1,123	9	26	35	± 2	59	± 3	44
2019	11,940	229	308	246	40	0	823	21%	1,918	49%	1,209	31%	3,950	1,092	12	31	43	± 2	63	± 2	44
2020	12,950	57	104	67	15	0	243	23%	487	46%	340	32%	1,070	1,168	12	38	50	± 5	70	± 6	47

Weather

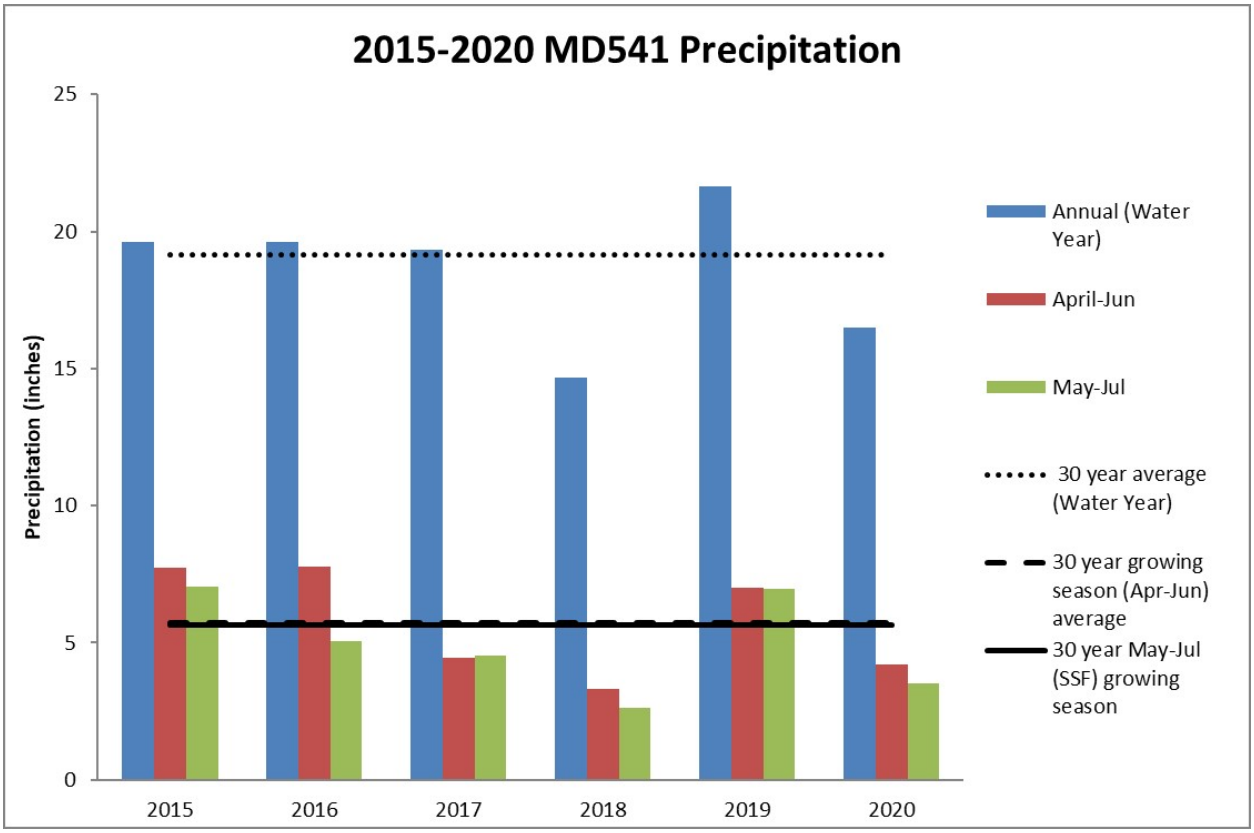


Figure 1. Parameter-Elevation Relationships on Independent Slopes Model (PRISM) estimate of annual and growing season precipitation from 2015-2020 for the Platte Valley mule deer herd unit in Carbon County, Wyoming.

Precipitation

We used Parameter-Elevation Relationships on Independent Slopes Model (PRISM) to estimate annual and growing season precipitation (PRISM Climate Group, Oregon State University, http://prism.oregonstate.edu, created 4 Feb 2004). Using PRISM, we calculated climate-elevation regressions for each Digital Elevation Model grid cell (4 km resolution) for the Platte Valley mule deer herd unit. Within the 6-year review period of 2015-2020, annual precipitation exceeded the 30-year average in 4 of the 6 years (Figure 1). The largest deficit in annual and growing season precipitation occurred in 2018, followed by 2020.

Lack of summer precipitation led to earlier senescence of herbaceous forages. This became evident during RHA data collection efforts, as plant identification became quite difficult by mid-July in spring/summer/fall ranges. Plant identification at lower elevations was increasingly difficult by

the third week of June. The early curing of vegetation at high elevations likely provided the dry, fine fuels needed to carry wildfire (see comments about Mullen Wildfire below).

Winter Severity

The 2019-2020 winter began early with significant snow hitting the higher elevations in mid-October. SNOTEL sites on the west side of the Snowy Range reported average to above-average snowpack during winter 2019-2020. SNOTEL sites on the east side of the Sierra Madres reported below average to average snowpack. Currently, SNOTEL sites at higher elevations on the west side of the Snowy Range report snow water equivalent (SWE) values ranging from 87%-104% of average, while sites on the east side of the Sierra Madres report SWE values ranging from 80%-98% of average.

Significant Events

In fall 2020, the Mullen Fire burned approximately 176,800 acres in the Snowy Range. Hunt area 78 falls within the Mullen fire burn scar. High fire severity in places is cause for concern for cheatgrass invasion. The USFS has identified at least 17,000 acres that are at risk of cheatgrass invasion throughout the forest due to fire severity, slopes and aspects, and known areas of cheatgrass prior to the wildfire. This includes acreages within the Platte Valley and Sheep Mountain mule deer herds (Hunt Areas 78 and 76). Funding applications were submitted to treat up to 15,000 acres in 2021 and 2022 on US Forest Service lands. Field reconnaissance in 2021 will aid in determining mortality rate of mixed mountain shrubs. Future shrub seeding efforts may be necessary depending on the mortality observed.

With the recent approval of the USFS LaVA analysis, plans for treatments in forested habitats totaling over 300,000 acres over the next 15 years were starting to take shape. Logging of live and dead timber, prescribed burning, and other planned and unplanned treatments were anticipated to have positive impacts on plant communities that mule deer rely upon. In light of the Mullen fire, LaVA treatments that were in early planning phases are temporarily on hold. After further assessment of resources in summer 2021 within the fire perimeter, and practices successfully implemented to control erosion and promote native plant species recovery, the WGFD hopes to work with the USFS on addressing habitat issues in the northern half of the Snowy Range through the LaVA process.

Habitat Monitoring

In 2015, Department personnel initiated the Rapid Habitat Assessment (RHA) methodology to survey important mule deer habitats. This method strives to capture large-scale habitat quality metrics to better understand how the habitat is providing for the current population of mule deer. The overall result of this effort is to provide a standardized habitat component for discussions about how mule deer objectives should or should not be adjusted based on the general concept of carrying capacity. Fewer RHAs were done this year as personnel were stretched over a larger area

than in previous years. For the Platte Valley mule deer herd unit, WGFD personnel completed seven rangeland assessments (997.1 acres), six aspen assessments (143.51 acres), and three riparian assessments (85.82 acres).

Many aspen habitats have not seen recent disturbances (e.g. wildfire in the last 20 years), resulting in many mid to late seral stage stands. Herbivory within these stands is typically moderate to severe. The number of aspen suckers observed were limited, which further concentrates browse use. In many cases, elk contributed to the high level of browse observed.

In shrub and rangeland environments, we classified most habitats as late seral stage. Later seral plant communities often have a reduction in species diversity. Overall, herbivory levels in the majority of acres assessed were not considered excessive. Late seral shrub stands often exhibited signs of historic high browse use by wild and/or domestic ungulates at some point, shown in growth form and stature of woody plants. The quality of woody forages produced in late seral plant communities may not meet the nutritional demands of mule deer for basic body maintenance in the winter months.

We assessed minimal riparian habitats in the Platte Valley herd unit in 2020. Severe herbivory was reported in one of the riparian RHAs. Successful beaver transplants and the use of beaver dam analogs could result in improved hydrology, increased herbaceous and shrub species diversity, and overall production. Increasing the green period in riparian systems can attribute to improved fawn-rearing conditions.

Forty-five (45) Platte Valley mule deer does were fitted with GPS collars in February 2020. The project area encompasses Deer Hunt Areas 78, 79, 80, and 81. The primary objective of this project is to evaluate detailed movement data. The movement data will be analyzed using a Brownian bridge movement model (BBMM) to quantify and delineate important areas used for Platte Valley mule deer migration. The BBMM results will be refined in accordance with the Executive Order 2020-1 and Wyoming Game and Fish Department's Ungulate Migration Corridor Strategy to update the designated migration corridor, stopover areas, and bottlenecks. Through the course of the project, managers will also collect information on timing of migration and doe survival. During biological year 2020, nine collared deer died (3 predated, 4 unknown causes of death, 1 legal harvest, and 1 illegal harvest). A subsequent capture event occurred in November 2020 to redeploy six collars that came off of deer mortalities. Collared deer locations from February through December are shown in Figure 1. Collars are programmed to release from the deer in November 2022. Funding for this project was provided by Department of Interior and the Knobloch Family Foundation.

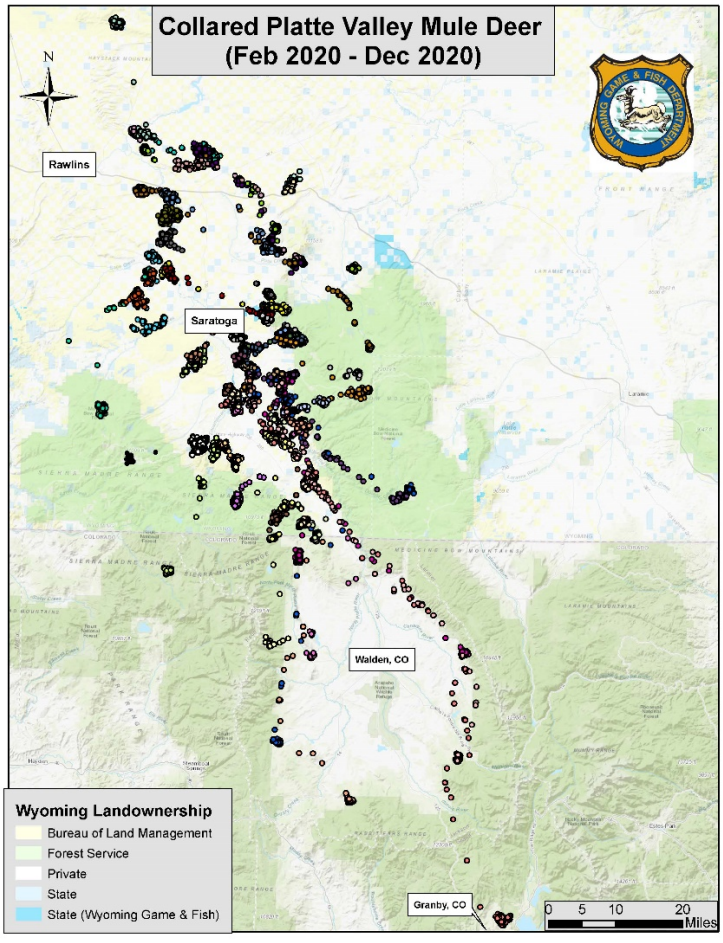
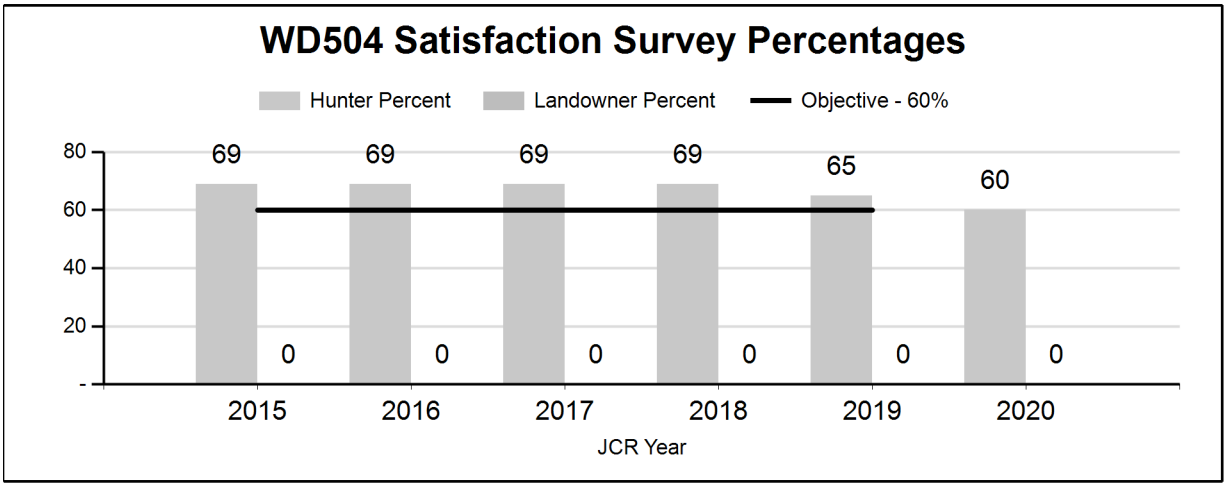


Figure 1. Platte Valley mule deer locations from February 2020 through December 2020.

2020 - JCR Evaluation Form

SPECIES: White tailed Deer
PERIOD: 6/1/2020 - 5/31/2021
HERD: WD504 - SOUTHEAST WYOMING
HUNT AREAS: 15, 59-64, 70, 73-81, 83, 161
PREPARED BY: MARTIN HICKS

	2015 - 2019 Average	2020	2021 Proposed
Hunter Satisfaction Percent	68%	60%	60%
Landowner Satisfaction Percent	0%	0%	0%
Harvest:	986	1,293	1,300
Hunters:	2,307	2,798	2,800
Hunter Success:	43%	46%	46%
Active Licenses:	2,608	3,142	3,140
Active License Success:	38%	41%	41%
Recreation Days:	10,641	13,820	13,820
Days Per Animal:	10.8	10.7	10.6
Males per 100 Females:	0	0	
Juveniles per 100 Females	0	0	
Satisfaction Based Objective			0%
Management Strategy:			Recreational
Percent population is above (+) or (-) objective:			N/A%
Number of years population has been + or - objective in recent trend:			6



2021 Hunting Seasons
Southeast Wyoming White-tailed Deer Herd Unit (WD504)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
15	3	Sept. 1	Sept. 30	Oct. 1	Nov. 30	500	Any white-tailed deer
15	3			Dec. 1	Dec. 31		Doe or fawn white-tailed deer
15	8	Sept. 1	Sept. 30	Oct. 1	Dec. 31	450	Doe or fawn white-tailed deer
59,60,64	3	Sept. 1	Sept. 30				Curt Gowdy State Park closed
59,60,64	3			Oct. 1	Nov. 30	250	Any white-tailed deer; all lands within Curt Gowdy State Park, archery only
59,60,64	3			Dec. 1	Dec. 31		Doe or fawn white-tailed deer
59,60,64	8	Sept. 1	Sept. 30				Curt Gowdy State Park closed
59,60,64	8			Nov. 1	Dec. 31	350	Doe or fawn white-tailed deer; all lands within Curt Gowdy State Park, archery only
70,74	3	Sept. 1	Sept. 30	Oct. 1	Dec. 31	50	Any white-tailed deer
70,74	8	Sept. 1	Sept. 30	Oct. 1	Dec. 31	100	Doe or fawn white-tailed deer
75,76,77	3	Sept. 1	Sept. 30	Oct. 1	Dec. 31	75	Any white-tailed deer
75,76,77	8	Sept. 1	Sept. 30	Oct. 1	Dec. 31	100	Doe or fawn white-tailed deer
78,79,80,81	3	Sept. 1	Sept. 30	Oct. 1	Dec. 31	25	Any white-tailed deer
78,79,80,81	8			Sept. 1	Dec. 31	50	Doe or fawn white-tailed deer

2020 Hunter Satisfaction: 61% Satisfied, 21% Neutral, 18% Dissatisfied

2021 Management Summary

1). Hunting Season Evaluation: The season is designed to take advantage of high densities of white-tailed deer throughout southeast Wyoming as access allows. The majority of white-tailed

deer are located on private land so the Department is limited in management of this herd unit.

2.) Management Objective Review: The Southeast WY White-tailed Deer Herd Unit's objective was last reviewed in 2019 and will be up for review again in 2024.

3.) Weather and Habitat: Annual precipitation across southeast Wyoming in areas occupied by white-tailed deer was significantly less than normal. Based on NOAA weather station data from Cheyenne, Torrington, Laramie, and Douglas, precipitation was 38% - 57% below average for the year. White-tailed deer are typically associated with riparian habitats and irrigated cropland areas. Declines in annual precipitation may have some impact on fawning and fawn rearing habitats, through decreases in forage production and associated cover heights. Because of their strong dependence on agricultural crops, noticeable declines in white-tail deer populations are not as likely in a given year unless EHD events take place.

4.) Chronic Wasting Disease: CWD samples are collected on white-tailed deer as opportunistically. Results from the Southeast Wyoming White-tailed Deer Herd Unit are located below (Table 1.). The majority of deer tested and that are positive come from Hunt Areas: 15, 59, 60 and 64

Table 1. CWD prevalence for hunter-harvested white-tailed deer in the Southeast Wyoming White-tailed Deer Herd, 2018-2020.

Year(s)	Percent CWD-Positive and (*n*) – *Hunter Harvest Only*		
	Adult Males	Yearling Males	Adult Females
2018-2020	**18%, n=120**	0% (2)	18% (59)