2018 - JCR Evaluation Form

SPECIES: Mountain Goat
PERIOD: 6/1/2018 - 5/31/2019

HERD: MG201 - BEARTOOTH

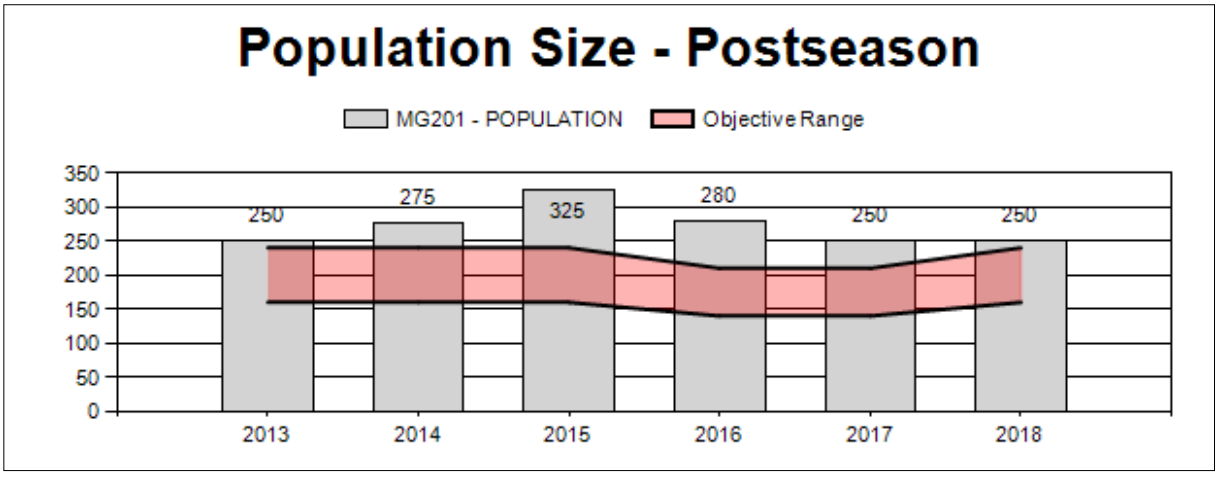
HUNT AREAS: 1, 3, 514, 999
PREPARED BY: TONY MONG

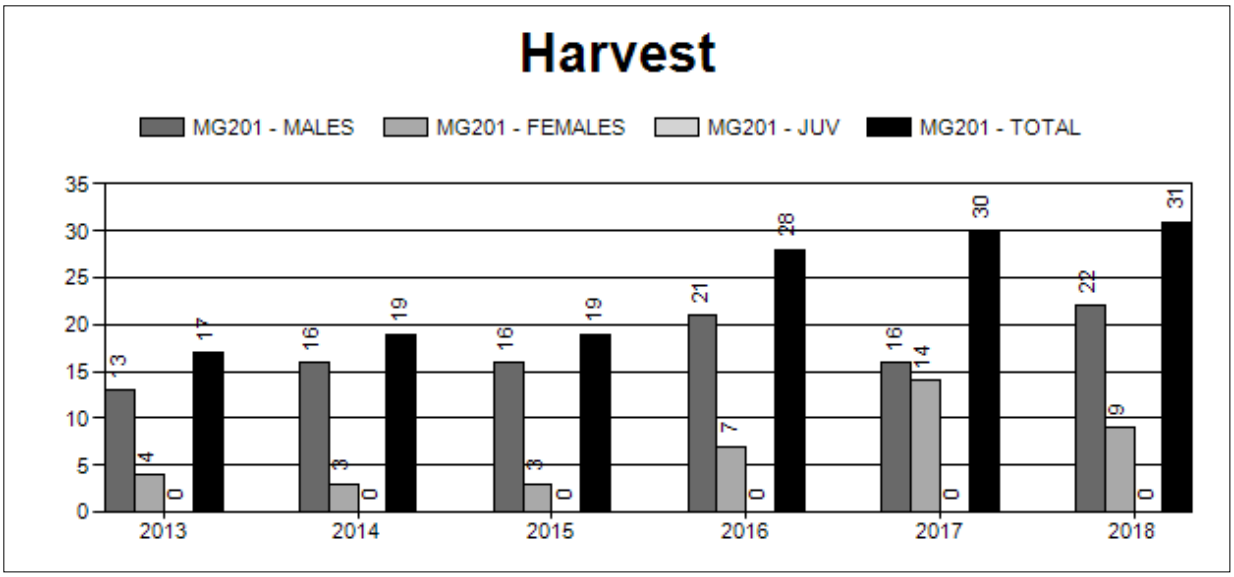
	2013 - 2017 Average	2018	2019 Proposed
Population:	276	250	230
Harvest:	23	31	32
Hunters:	24	32	32
Hunter Success:	96%	97%	100%
Active Licenses:	24	32	32
Active License Success:	96%	97%	100%
Recreation Days:	135	191	200
Days Per Animal:	5.9	6.2	6.2
Males per 100 Females	0	0	
Juveniles per 100 Females	39	38	

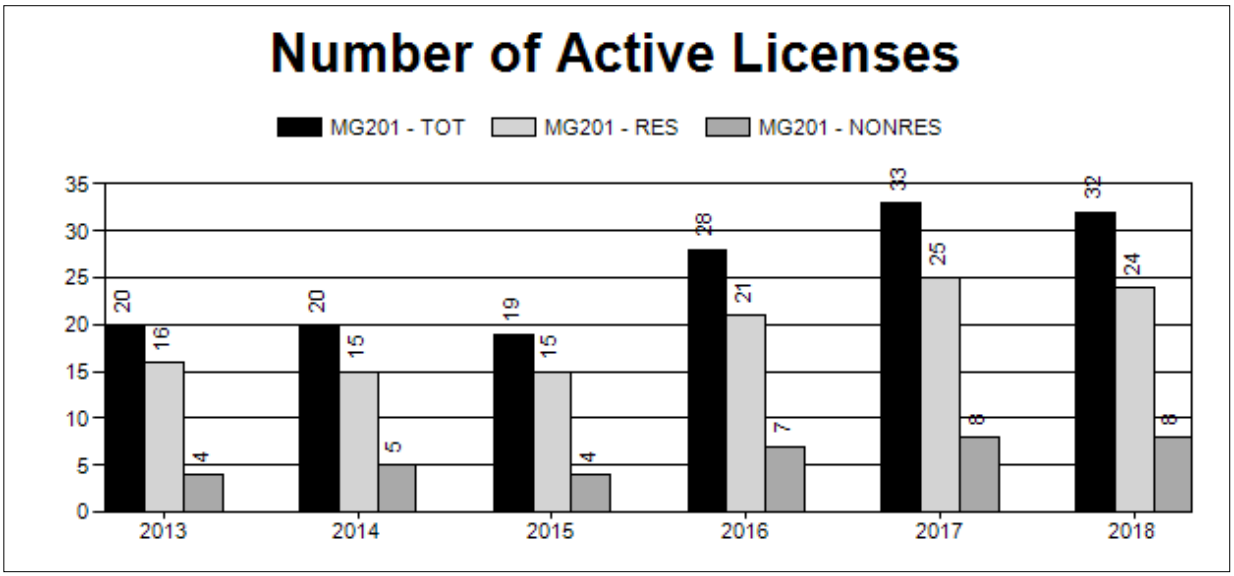
Population Objective (± 20%) :	200 (160 - 240)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	25%
Number of years population has been + or - objective in recent trend:	0
Model Date:	2/12/2019

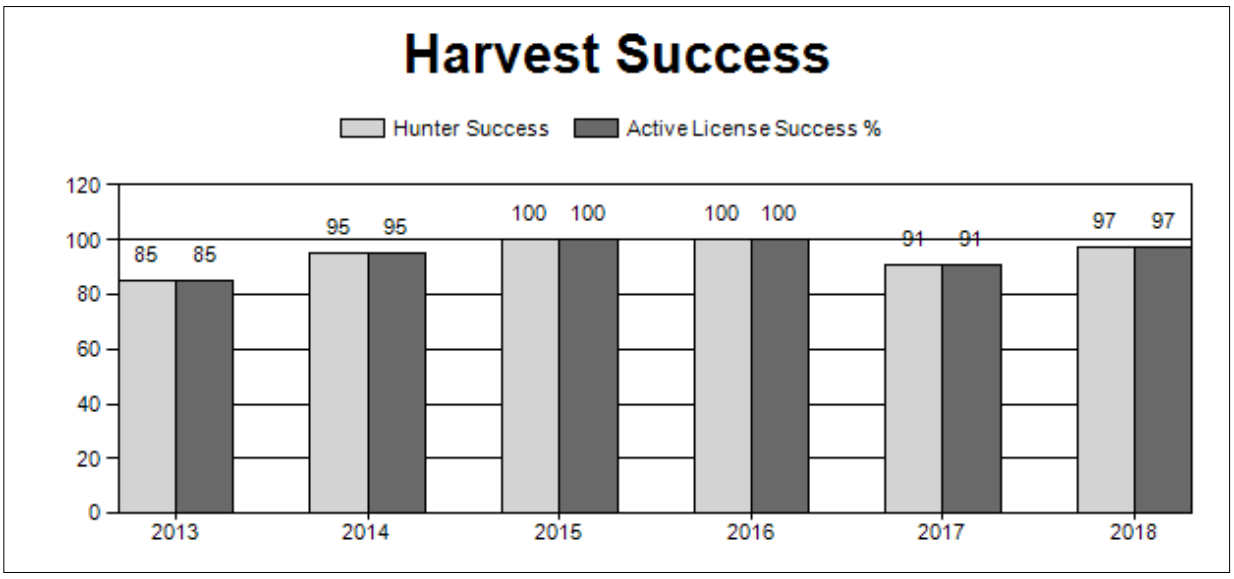
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

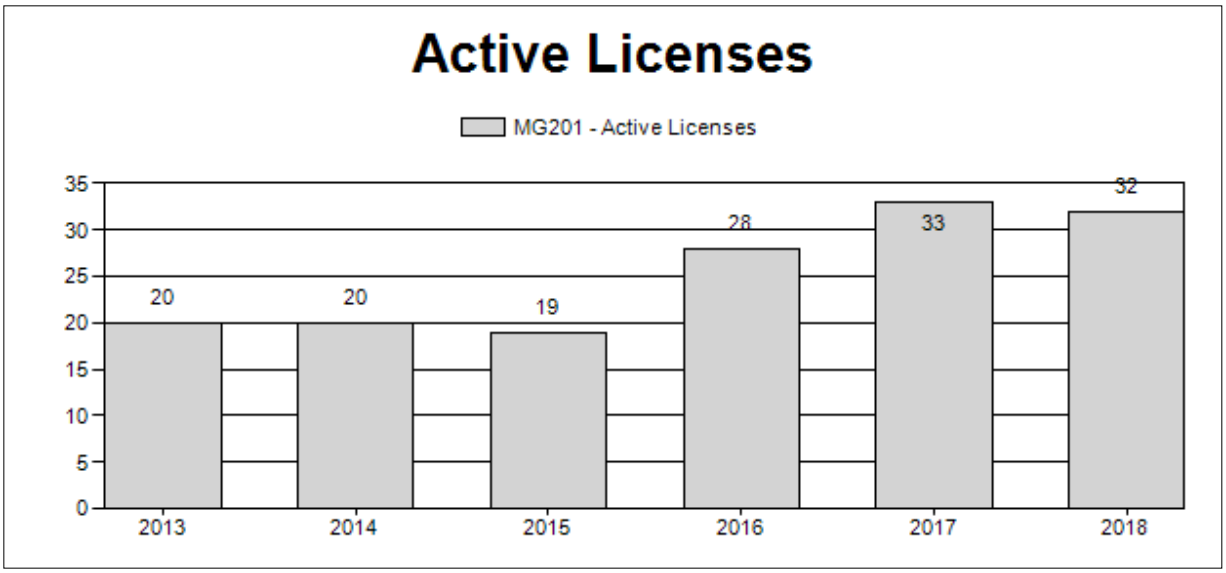
	JCR Year	Proposed
Females ≥ 1 year old:	n/a%	n/a%
Males ≥ 1 year old:	n/a%	n/a%
Total:	n/a%	n/a%
Proposed change in post-season population:	n/a%	n/a%

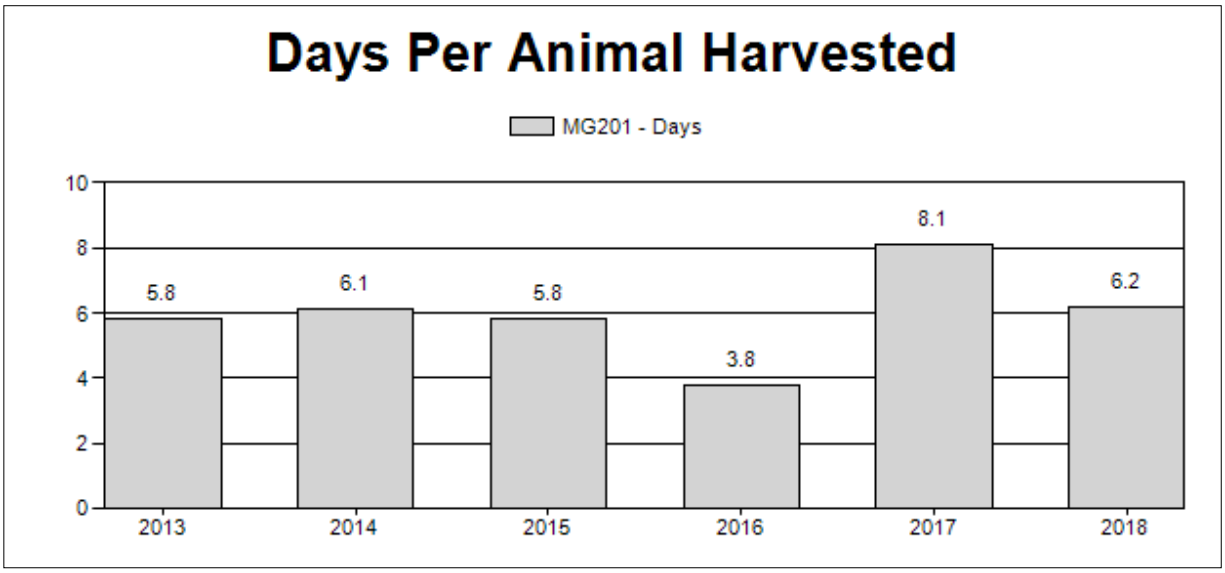


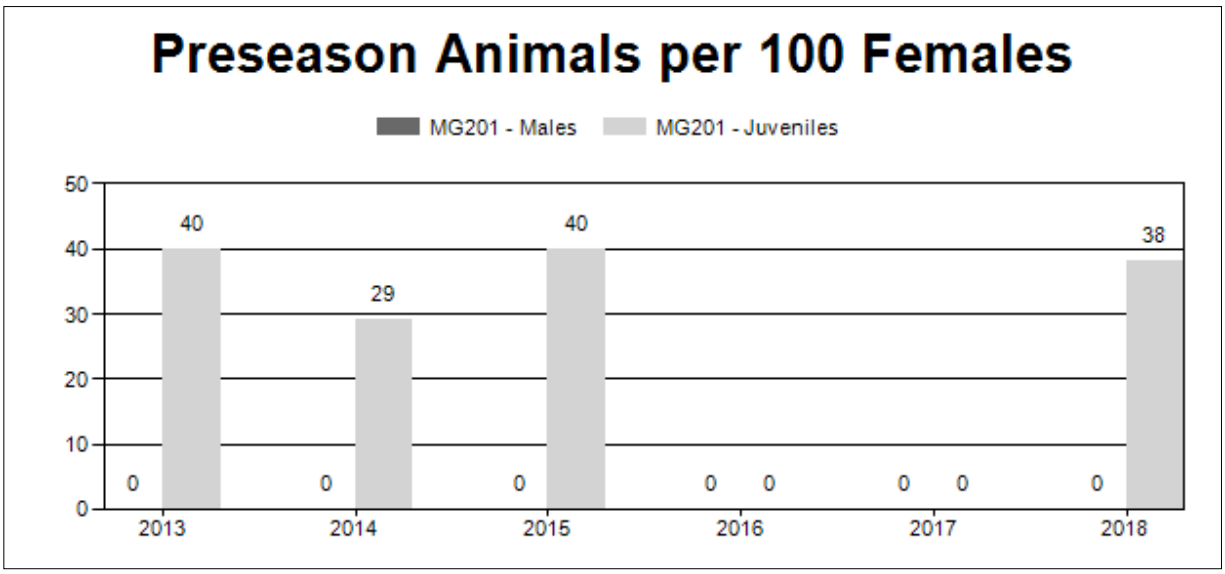

Harvest
MG201 - MALES
MG201 - FEMALES
MG201 - JUV
MG201 - TOTAL
35
30
25
20
15
10
5
0
13
4
0
17
16
3
0
19
16
3
0
19
21
7
0
28
16
14
0
30
22
9
0
31
2013
2014
2015
2016
2017
2018


Number of Active Licenses
MG201 - TOT
MG201 - RES
MG201 - NONRES
35
30
25
20
15
10
5
0
20
16
4
20
15
5
19
15
4
28
21
7
33
25
8
32
24
8
2013
2014
2015
2016
2017
2018


Harvest Success
Hunter Success
Active License Success %
120
100
80
60
40
20
0
85
85
95
95
100
100
100
100
91
91
97
97
2013
2014
2015
2016
2017
2018


Active Licenses
MG201 - Active Licenses
35
30
25
20
15
10
5
0
20
20
19
28
33
32
2013
2014
2015
2016
2017
2018


Days Per Animal Harvested
MG201 - Days
10
8
6
4
2
0
5.8
6.1
5.8
3.8
8.1
6.2
2013
2014
2015
2016
2017
2018


Preseason Animals per 100 Females
MG201 - Males
MG201 - Juveniles
50
40
30
20
10
0
40
29
40
38
0
0
0
0
0
0
0
0
2013
2014
2015
2016
2017
2018

2013 - 2018 Preseason Classification Summary																		
for Mountain Goat Herd MG201 - BEARTOOTH																		
		MALES				FEMALE		JUVENIL				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
2013	275	0	0	0	0%	125	71%	50	29%	175	167	0	0	0	± 0	40	± 0	40
2014	300	0	0	0	0%	56	78%	16	22%	72	155	0	0	0	± 0	29	± 0	29
2015	350	0	0	0	0%	216	71%	87	29%	303	207	0	0	0	± 0	40	± 0	40
2016	300	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	± 0	0	± 0	0
2017	300	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	± 0	0	± 0	0
2018	300	0	0	0	0%	166	72%	63	28%	229	0	0	0	0	± 0	38	± 0	38

2019 Proposed HUNTING SEASONS
BEARTOOTH MOUNTAIN GOAT HERD (MG201)

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
1	1	Sep. 1	Oct. 31	8	Limited quota	Any mountain goat
3	1	Sep. 1	Oct. 31	16	Limited quota	Any mountain goat
3	2	Oct. 1	Oct. 31	8	Limited quota	Any mountain goat
5	A	Sep. 1	Oct. 31	16	Limited quota	Any mountain goat

Special Archery Season Hunt Areas	Season Dates		Limitations
	Opens	Closes	
1, 3	Aug. 15	Aug. 31	Refer to Section 7 of this Chapter

Hunt Area	Type	Quota change from 2018
1	1	0
3	1	0
5	A	+16
Total	**1**	**0**

Management Evaluation
Current Post-season population Objective: 200
2017 Post-season population Estimate: 250
2018 Post-season population Estimate: 250
2018 Hunter Satisfaction: % Satisfied, % Neutral, % Dissatisfied

Herd Unit Issues
Mountain goat harvest management relies on the ability of hunters to access remote areas that contain mountain goats. In the Beartooth herd there is a mix of accessibility that may be allowing the easier access areas get hunted regularly but the more difficult areas receiving light pressure. This is creating an uneven distribution of harvest across the herd unit and may eventually impact harvest success. Recently we have added a new hunt area to this herd unit to address potential movement and establishment of mountain goats into areas that overlap with traditional bighorn sheep areas and we do not want mountain goats establishing. Hunt Area 5-A was created as a low probability of success area to allow all hunters (regardless if they have harvested a goat before or not) to have an opportunity to harvest a goat in an area where we do not want to see them establish. The original intent of the license was to make it a "General" over the counter license to be purchased by hunters that either saw a mountain goat during another hunt or knew they were going to an area where an errant goat had been spotted in previous years. Due to legislative restrictions, the "General" license concept was not an available options so the limited quota model will be used until the legislative restriction is removed.

Weather

The 2018/19 winter weather conditions have been fairly mild, with lower than normal snow fall and most of the high elevation ridges remaining open.

Figure 1. Percent of normal precipitation for Park County from January to March 2018.

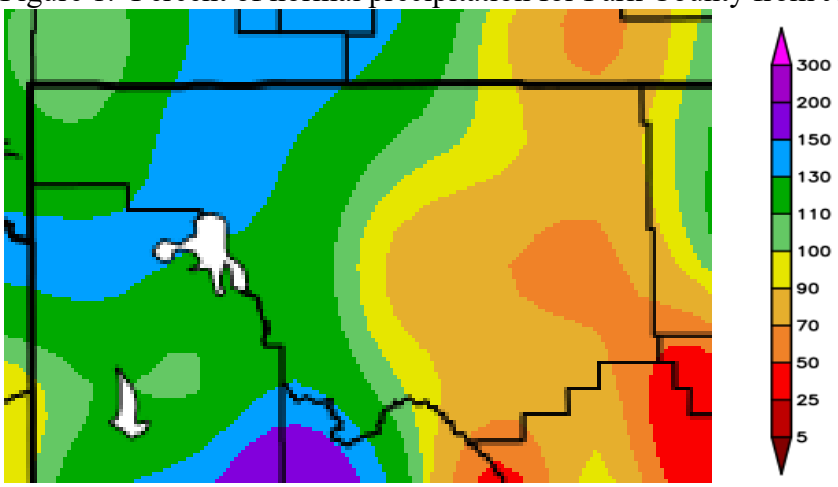


Figure 2. Percent of normal precipitation for Park County from October to December 2018.

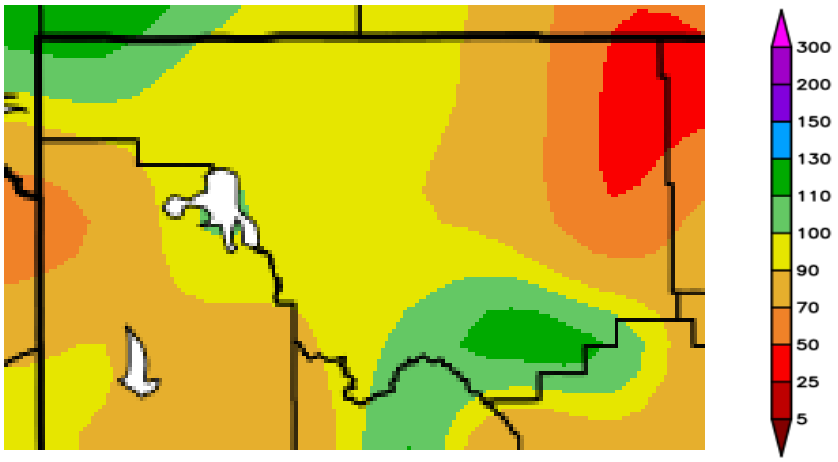
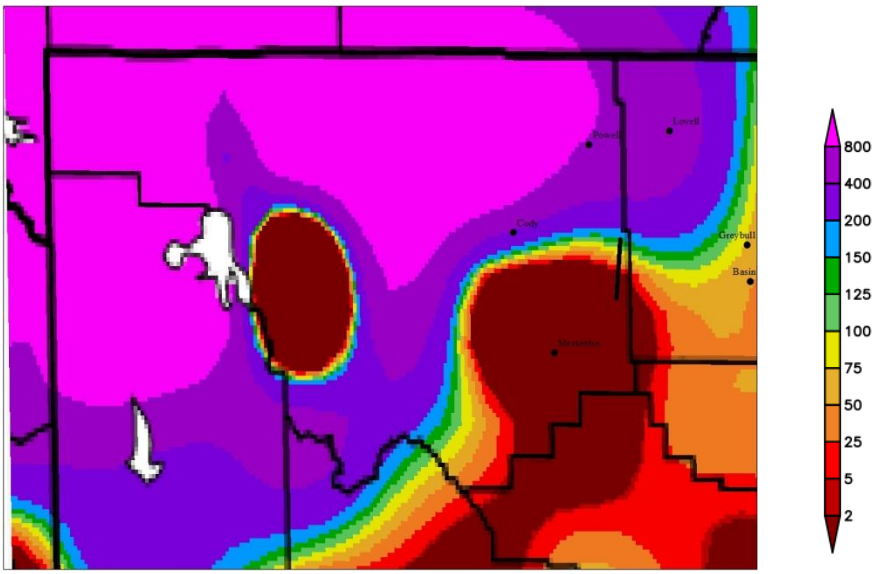


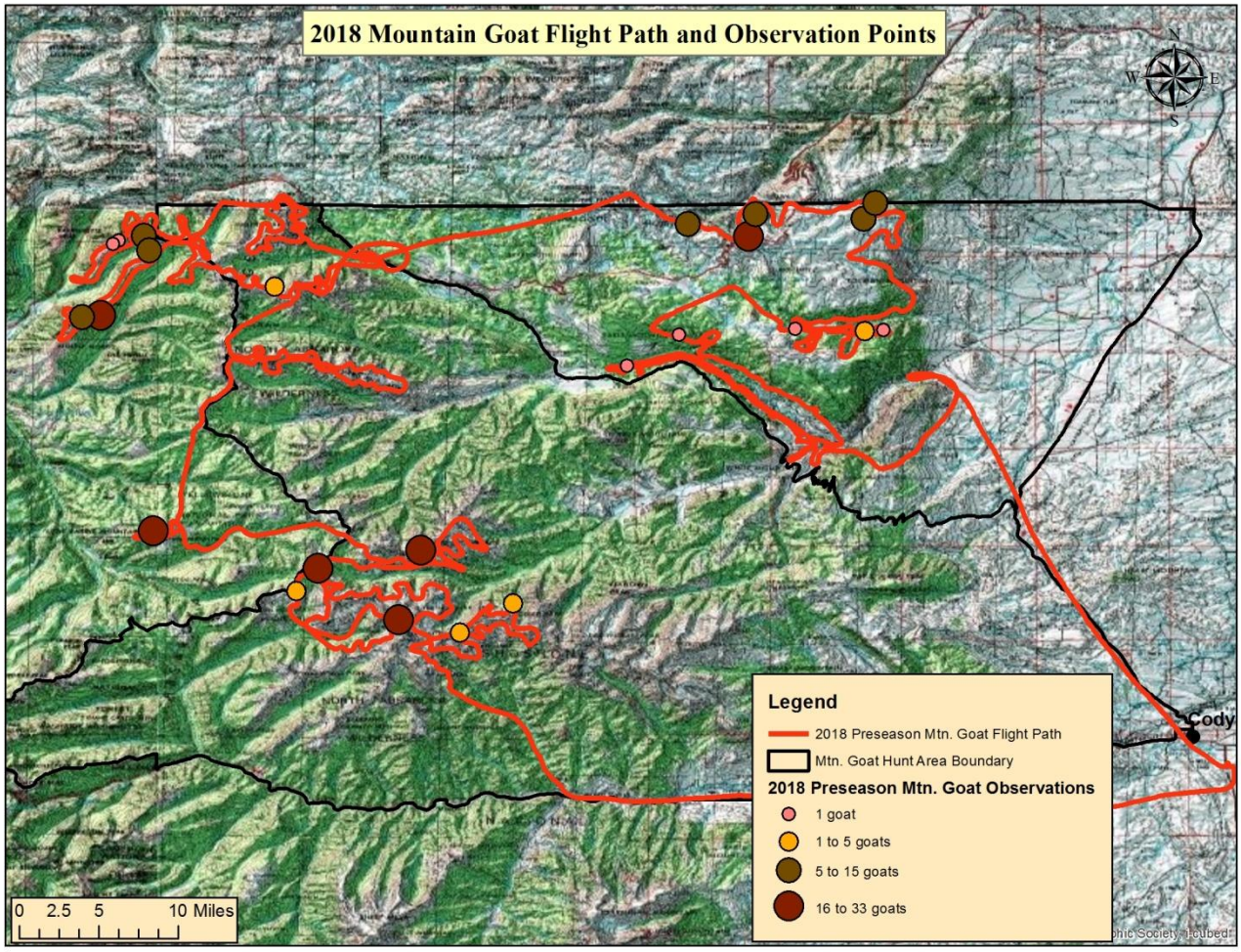
Figure 3. Percent of Normal Precipitation for Park County for February 21 to 27 2019.



Habitat
No habitat monitoring data is collected in this herd unit.

Field Data
Trend data for mountain goats is not collected every year, whereas classification data is opportunistically collected during bighorn sheep flights. The 2018 flight data indicated that numbers have dropped in Hunt Area 1 with numbers in Hunt Area 3 and the portion of Yellowstone National Park adjacent to Hunt Area 3 remaining stable (Tables 1 to 3). Very few mountain goats were seen in the Clark's Fork canyon, indicating either a drop in numbers there or a shift in distribution (Figure 4). This trend is concerning and will require close attention moving forward.

Figure 4. Flight path and distribution of mountain goats seen on the 2018 trend flight.



Harvest Data

Harvest in the Beartooth herd has been increasing over the last ten years in response to the increase in license availability. A total of 31 goats were harvested, which is the highest harvest on record. Mountain goat populations have been shown to be sensitive to nanny harvest through various studies. We have been seeing an increase in nanny harvest since 2016 in Hunt Area 1, with the highest recorded percent of nannies in the harvest occurring last year in 2017 (Table 1). Hunt area 3 has not seen as high of percent nanny harvest as Hunt Area 1 indicating a potential population decrease occurring in Hunt Area 1. Hunter effort decreased in 2018 to 6.2 days/harvest, but slightly higher compared to the 10-year-average of 5.9 days/harvest. The average age of all harvested goats in 2018 was 4.9 years, and is similar to the 5-years-average of 5.0 years.

Table 1. Management parameters for Hunt Area 1 of the Beartooth Mountain Goat Herd (Wyoming portion only), 1969-2018.

	1969-1979	1980-1992	1993-2010	2011	2012	2013	2014	2015	2016	2017	2018
Hunters	4	8	12	12	11	14	14	11	12	13	8
Harvest	3.4	7.3	11.7	11	11	12	14	11	12	13	8
Success	84.1%	95.1%	97.7%	100%	100%	86%	100%	100%	100%	100%	100%
Effort	5.4 days	3.7 days	4.5 days	3.5 days	5.2 days	6.9 days	4.6 days	7.5 days	3.3 days	5.4 days	6.6 days
Avg Age	-	-	4.5 years	5.9 years	5.1 years	5.2 years	5.7 years	4.8 years	5.5 years	4.9 years	5.6 years
% Nannies	23.5%	32.9%	32.5%	36.4%	27.3%	41.7%	14.3%	27.3%	41.7%	69%	50%
Trend Counts	19.0	104.7	125.5	-	-	125	-	102	28	-	61

Table 2. Management parameters for Hunt Area 3 of the Beartooth Mountain Goat Herd, 2011-2018.

	1993-2010	2011	2012	2013	2014	2015	2016	2017	2018
Hunters		3	4	6	6	8	16	20	24
Harvest		3	3	5	5	8	16	17	23
Success		100.0%	75%	83%	83%	100%	100%	85%	95%
Effort		9.7 days	5.3 days	3.2 days	10.4 days	3.6 days	4.1 days	6.8 days	6 days
Avg Age		3.5 years	4.8 years	4.9 years	4.5 years	5.4 years	4.5 years	4.8 years	4.2 years
% Nannies		0%	0%	20.0%	0%	0%	12.5%	29.4%	21.7%
Trend Counts		-	-	34	-	93	87	-	91

Table 3. Mountain goat trend counts in Yellowstone National Park (Soda Butte creek to Lamar Headwaters), 1969-2017.

	1969-1979	1980-1992	1993-2010	2011	2012	2013	2014	2015	2016	2017	2018
Trend Counts	-	-	13.5	-	-	74	67	108	83	-	78

Population

Due to the difficulty of distinguishing males and females during aerial surveys, mountain goats are classified as either kids or adults. Only from close observation can males and yearlings be determined. Due to the inability to distinguish between males and females, construction and validation of a functional population model is difficult. The preseason classification data shows a higher than average kid per adult mountain goat ratio. Over the last 15 years the average kid per adult mountain goat ratio has been 33 compared to the 2018 ratio of 38. There are some indications that Hunt Area 1 mountain goats have been decreasing, however, this may be a shift in distribution out of the Clark's Fork canyon area.

Management Evaluation

Management of the Beartooth herd relies heavily upon harvest information, hunter observations and trend counts. Based on these parameters for 2018, it seems that the decrease in harvest opportunity in Hunt Area 1 allowed for lower nanny harvest which should allow for the population to stabilize or increase slightly. Based on this information there were no changes to license numbers in Hunt Areas 1 or 3 for 2019. In the new Hunt Area 5 we are recommending 16 licenses to allow for enough hunters to have a license to increase the chances of removing those mountain goats from the Hunt Area.

APPENDIX A
PRODUCTION AND UTILIZATION OF SHRUB AND HERBACEOUS SPECIES ON KEY AREAS

Sagebrush Production and Utilization

Production and utilization data for sagebrush (*Artemesia tridentata wyomingensis*) are collected at ten sites in the Cody Region (Tables 1 and 2 and Figures 1 and 2). Sites were selected using a "key area" concept, whereby if utilization levels are within acceptable limits at these areas, there is reasonable assurance that utilization levels are acceptable over the entire herd unit area. Production is measured in September/October using the leader length method described in WGFD Wildlife Division Vegetation/Habitat Monitoring Protocol (August 1, 2004). Utilization is measured in April/May using a modified Cole browse method described in WGFD Wildlife Division Vegetation/Habitat Monitoring Protocol (August 1, 2004).

Table 1. Production expressed as average annual leader length in centimeters for sagebrush transects in the Cody Region.

Transect	2014	2015	2016	2017	2018	Long-term Average
Breteche	3.56	*	*	*	*	*
Aldrich	2.75	*	1.70	*	*	*
Grass Creek	2.57	3.22	3.24	3.87	2.99	2.85
Wagonhound	2.72	4.59	2.48	4.89	2.20	2.61
Dry Creek Basin	4.37	2.31	1.94	3.93	2.74	2.61
Five-mile	3.57	4.66	2.87	8.54	1.83	3.47
Denver Jake	1.36	3.92	3.81	3.29	2.62	2.09
Lightning Ridge	1.56	1.78	1.32	1.15	1.96	1.44
Alkali	1.80	1.24	1.07	2.67	4.79	2.53
Renner	2.76	3.73	1.91	4.52	4.11	3.29
Average of Transects	2.70	3.18	2.26	4.11	2.91	2.29

*Not read

Table 2. Utilization expressed as percent leaders browsed for sagebrush transects in the Cody Region.

Transect	2014	2015	2016	2017	2018	Long-term Average
Breteche	7.4	*	11	*	*	18.75
Aldrich	0.60	0.00	1.80	0.00	*	4.94
Grass Creek	0.00	0.00	0.00	1.00	0.00	1.57
Wagonhound	17.60	8.20	7.00	18.40	8.40	15.06
Dry Creek Basin	20.60	35.20	25.60	48.00	41.40	26.79
Five-mile	20.20	21.20	28.20	22.40	3.80	17.30
Denver Jake	1.60	2.40	6.60	8.20	2.40	11.62
Lightning Ridge	0.00	2.00	9.40	3.80	2.20	4.24
Alkali	4.80	10.20	8.20	17.20	4.60	11.01
Renner	13.40	1.00	1.20	0.80	0.00	3.28
Average of Transects	8.62	8.91	9.90	13.31	7.85	12.08

*Not read

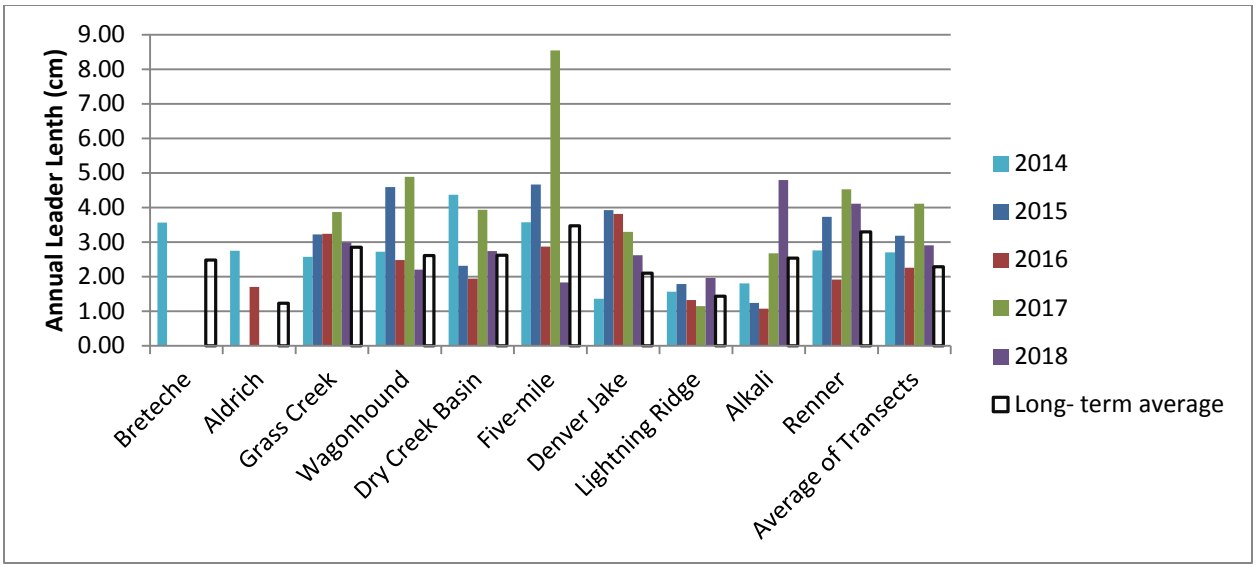


Figure 1. Average annual leader length for sagebrush transects in the Cody Region

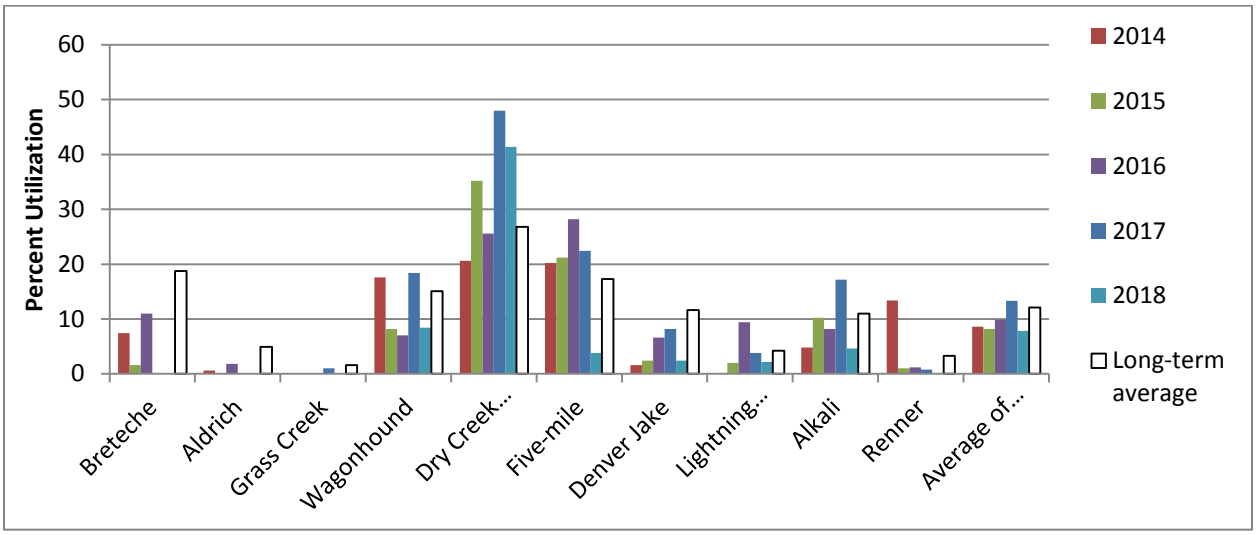


Figure 2. Percent utilization for sagebrush transects in the Cody Region

Curlleaf Mountain Mahogany Production and Utilization

Production and utilization data for curlleaf mountain mahogany (*Cercocarpus ledifolias*) are collected at two sites in the Cody Region (Table 3 and Figures 3 and 4). Sites were selected using a "key area" concept, whereby if utilization levels are within acceptable limits at these areas, there is reasonable assurance that utilization levels are acceptable over the entire herd unit area. Production and utilization are measured in September/October and April/May, respectively, using the twig length measurement method described in Utilization Studies and Residual Measurements, BLM Technical Reference 1734-3 (1996).

Table 3. Production expressed as average annual leader length in centimeters for curlleaf mountain mahogany transects in the Cody Region.

Transect	2014	2015	2016	2017	2018	Long-term Average
Red Canyon	4.13	5.49	4.46	5.32	5.39	4.72
Davis Draw	4.77	5.73	4.00	5.04	6.79	5.09
Average of Transects	4.45	5.61	4.23	5.18	6.09	4.90

Table 4. Utilization expressed as average annual leader length in centimeters and percent of total leader length removed for curlleaf mountain mahogany transects in the Cody Region.

Transect	2014	2015	2016	2017	2018	Long-term Average
Red Canyon	44	61	61	57	62	47
Davis Draw	70	63	79	76	53	61
Average of Transects	57	62	70	67	58	55

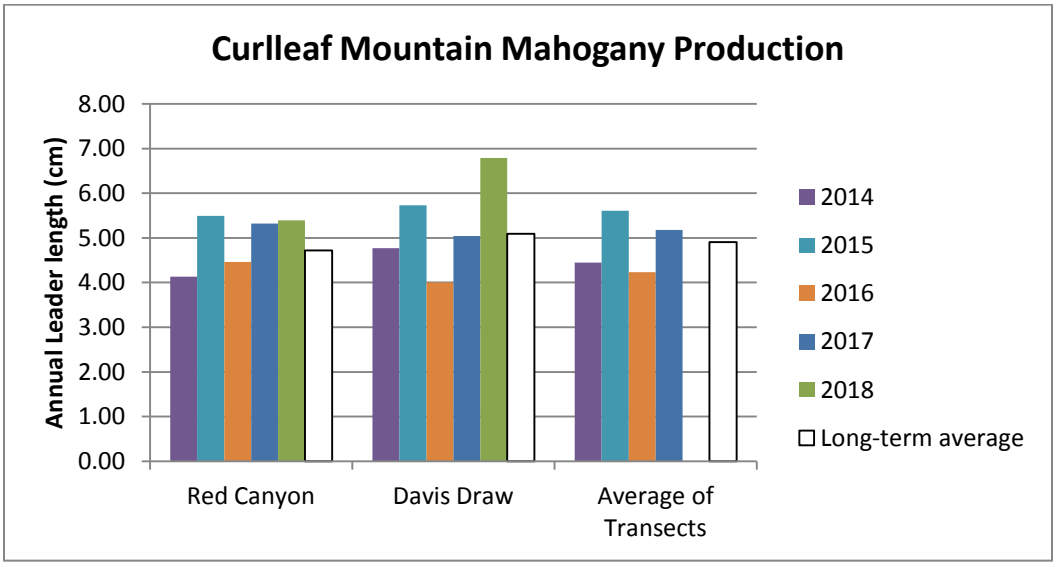


Figure 3. Average annual leader length for curlleaf mountain mahogany transects in the Cody Region.

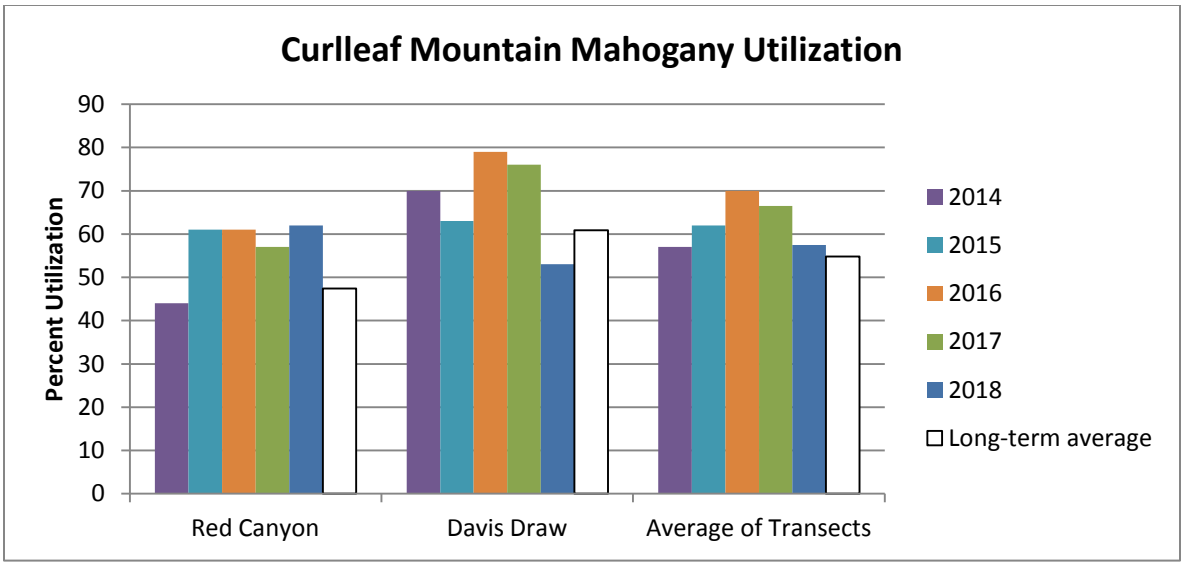


Figure 4. Average percent utilization for curlleaf mountain mahogany transects in the Cody Region.

Herbaceous Production and Utilization

Production and utilization data for herbaceous forage (grasses and forbs) are collected at six sites in the Cody Region (Tables 4 and 5 and Figures 5 and 6). Sites were selected using a "key area" concept, whereby if utilization levels are within acceptable limits at these areas, there is reasonable assurance that utilization levels are acceptable over the entire herd unit area. Production is measured after peak seed ripe of key grass species by clipping and weighing samples. Utilization is measured by clipping and weighing samples inside and outside of a range cage just prior to green-up in the spring. Utilization is assumed to be primarily by elk unless noted. Methods can be found in WGFD Wildlife Division Vegetation/Habitat Monitoring Protocol (August 1, 2004).

Table 5. Production in pounds per acre for herbaceous transects in the Cody Region.

Transect	2014	2015	2016	2017	2018	Long-term Average
Trail Creek	563	546	440	*	*	487
Riddle Flat	525	408	606	608	*	470
Painter Gulch	375	1110	726	723	*	552
Little Bald Ridge	650	892	352	473	*	490
Teepee Gulch	638	755	392	805	*	489
Rose Creek	567	640	790	697	660	466

*Not read

Table 6. Percent utilization for herbaceous transects in the Cody Region.

Transect	2014	2015	2016	2017	2018	Long-term Average
Trail Creek	*	*	42	*	*	42
Riddle Flat	75	81	67	89	*	73
Painter Gulch	0	47	47	61	*	43
Lt Bald Ridge	67	58	85		*	72
Teepee Gulch	79	73	68	77	*	78
Rose Creek		0	5	31	24	31

*Not read

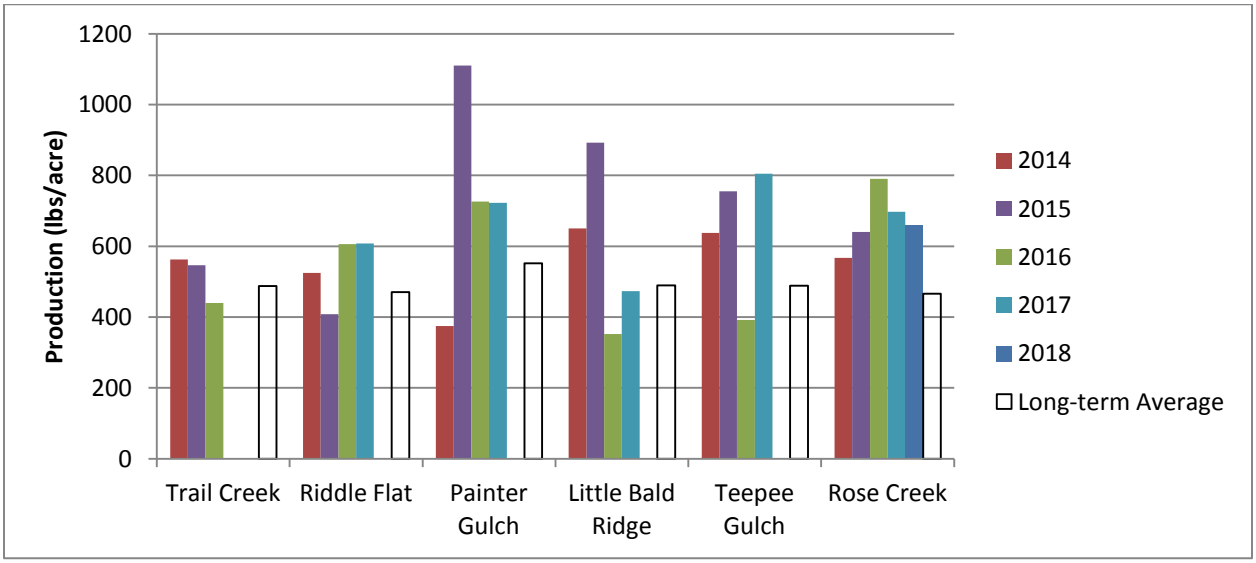


Figure 5. Production for herbaceous transects in the Cody Region.

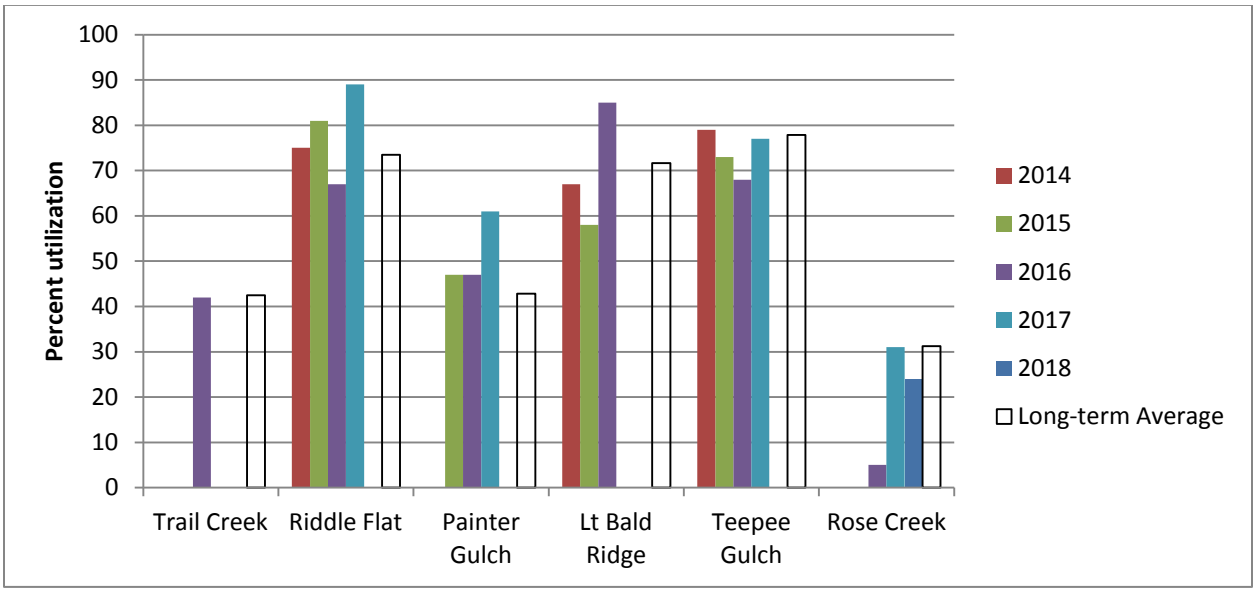


Figure 6. Percent utilization for herbaceous transects in the Cody Region.