2018 - JCR Evaluation Form

SPECIES: Bighorn Sheep
PERIOD: 6/1/2018 - 5/31/2019

HERD: BS200 - ABSAROKA

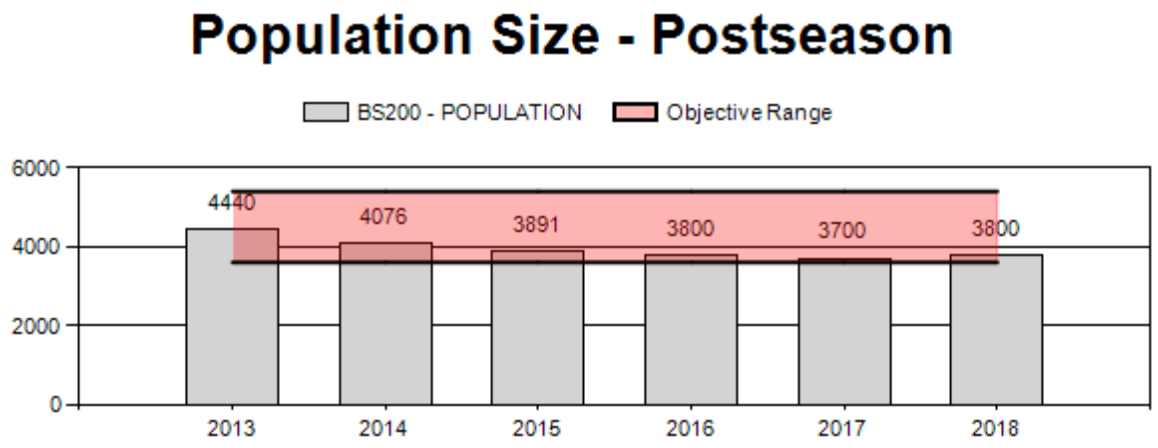
HUNT AREAS: 1-5, 22, 999
PREPARED BY: TONY MONG

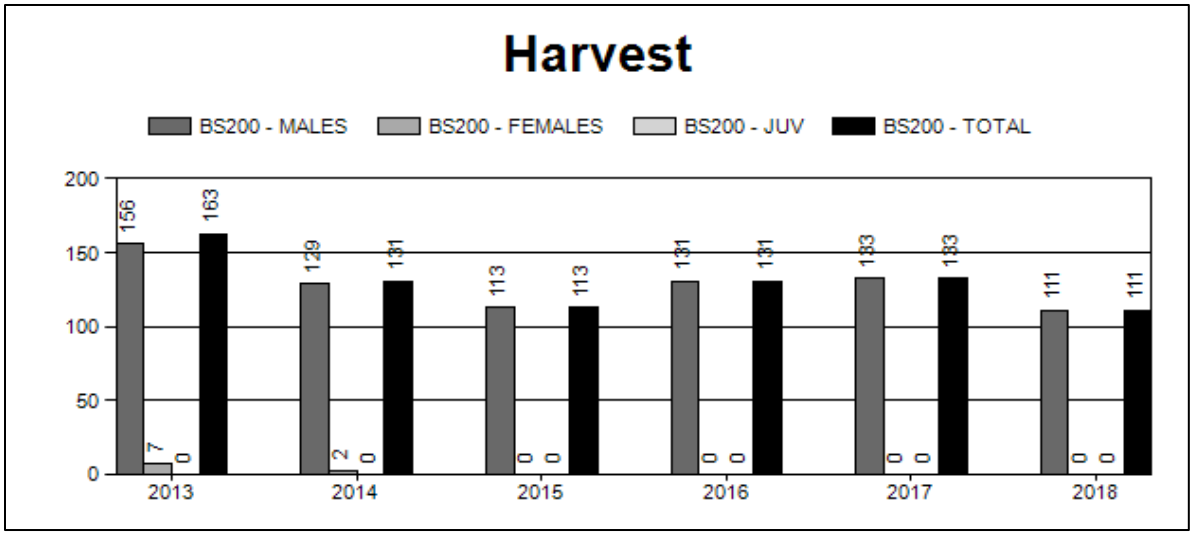
	2013 - 2017 Average	2018	2019 Proposed
Population:	3,981	3,800	3,800
Harvest:	134	111	100
Hunters:	161	151	130
Hunter Success:	83%	74%	77%
Active Licenses:	161	151	130
Active License Success:	83%	74%	77 %
Recreation Days:	1,330	1,286	1,200
Days Per Animal:	9.9	11.6	12
Males per 100 Females	38	50	
Juveniles per 100 Females	26	23	

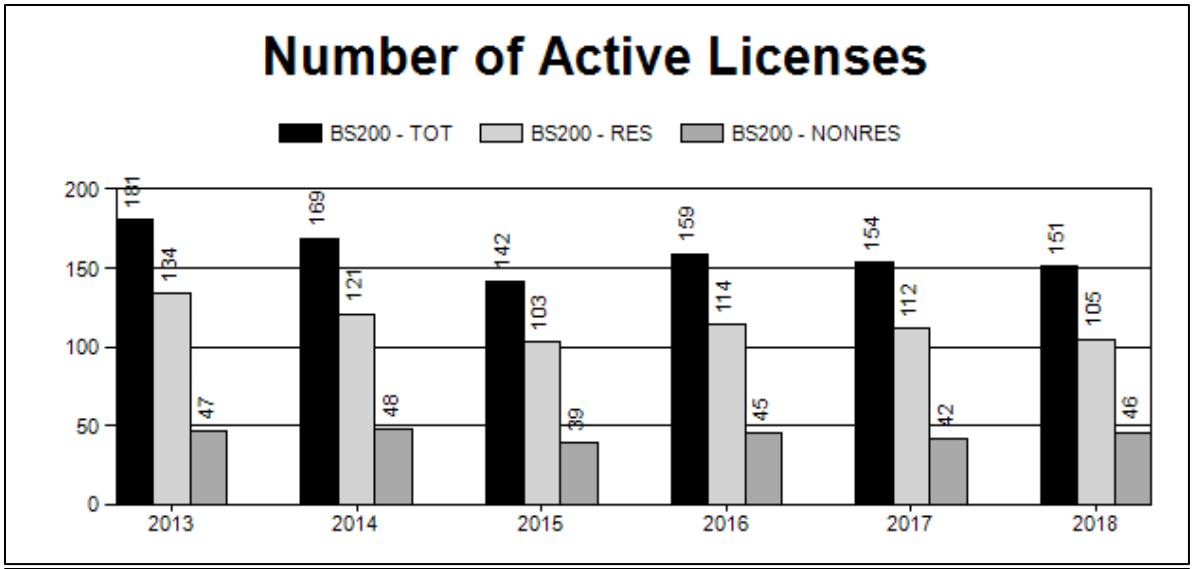
Population Objective (± 20%) :	4500 (3600 - 5400)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-15.6%
Number of years population has been + or - objective in recent trend:	0
Model Date:	02/22/2019

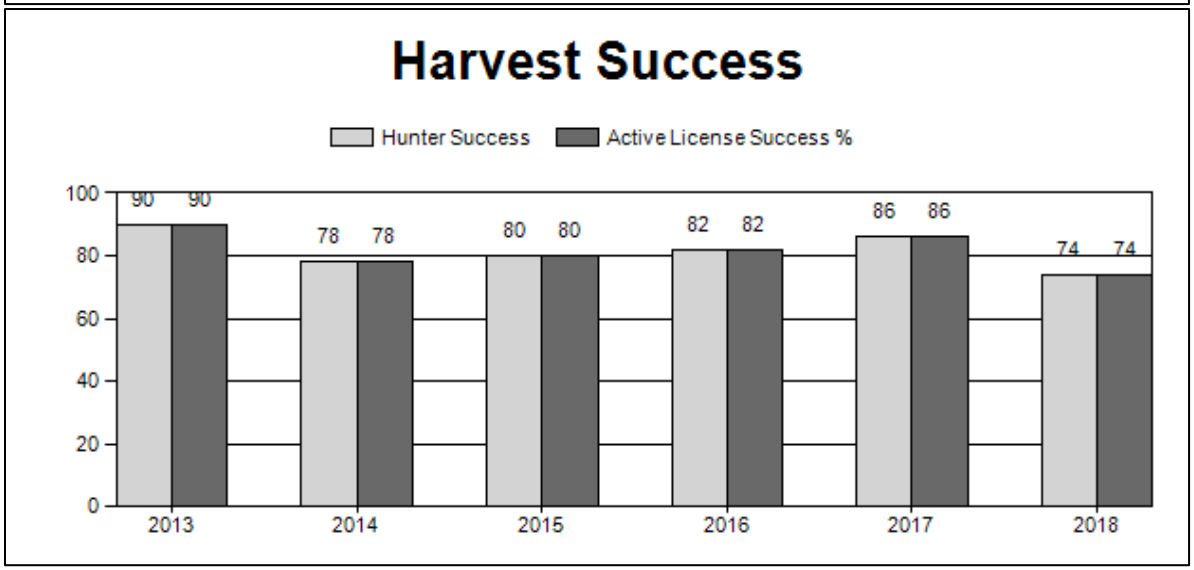
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

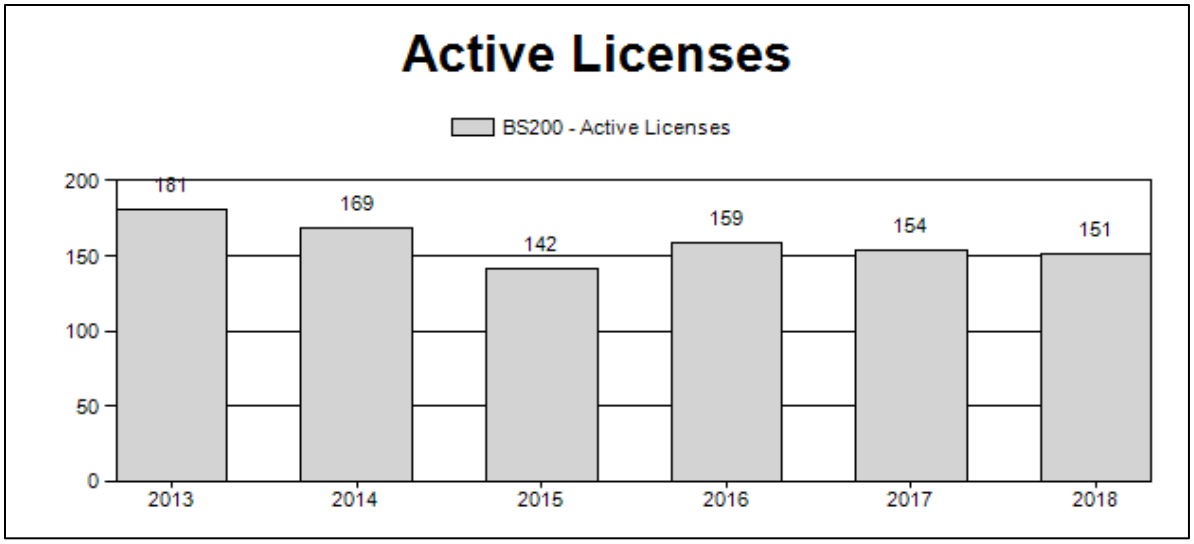
	JCR Year	Proposed
Females ≥ 1 year old:	n/a%	n/a%
Males ≥ 1 year old:	n/a%	n/a%
Total:	n/a%	n/a%
Proposed change in post-season population:	n/a%	n/a%

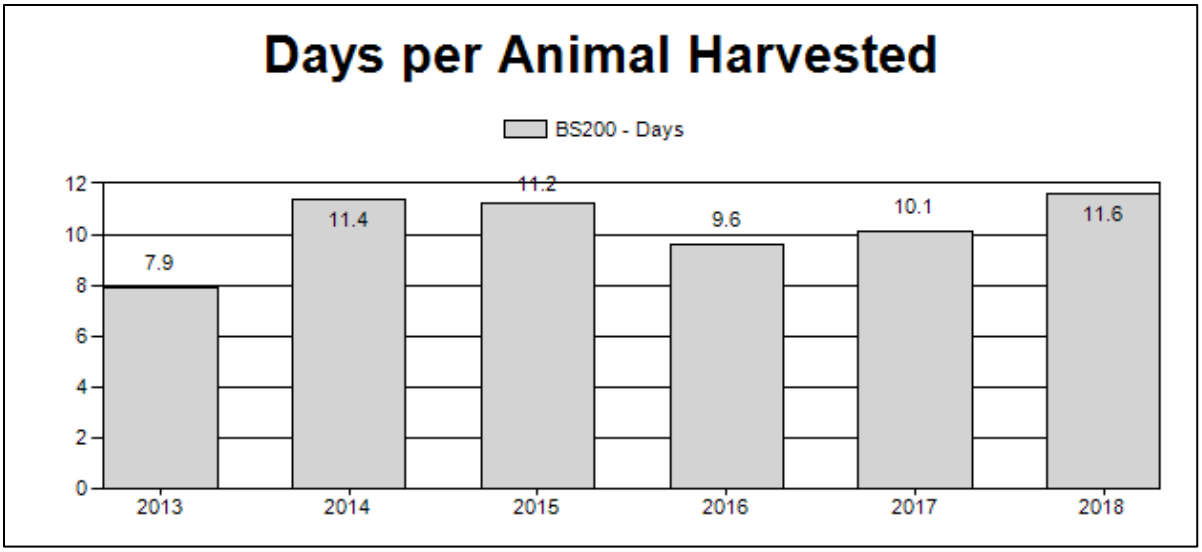


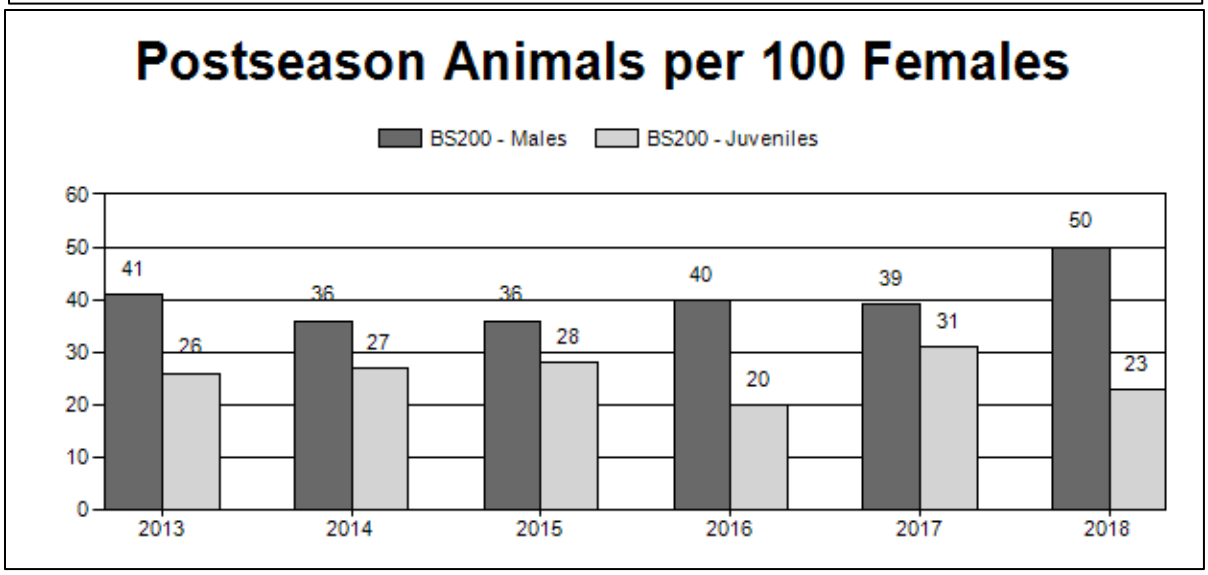

Harvest
BS200 - MALES
BS200 - FEMALES
BS200 - JUV
BS200 - TOTAL
200
150
100
50
0
156
7
0
163
129
2
0
131
113
0
0
113
131
0
0
131
133
0
0
133
111
0
0
111
2013
2014
2015
2016
2017
2018


Number of Active Licenses
BS200 - TOT
BS200 - RES
BS200 - NONRES
200
150
100
50
0
181
134
47
169
121
48
142
103
39
159
114
45
154
112
42
151
105
46
2013
2014
2015
2016
2017
2018


Harvest Success
Hunter Success
Active License Success %
100
80
60
40
20
0
90
90
78
78
80
80
82
82
86
86
74
74
2013
2014
2015
2016
2017
2018


Active Licenses
BS200 - Active Licenses
200
150
100
50
0
181
169
142
159
154
151
2013
2014
2015
2016
2017
2018


Days per Animal Harvested
BS200 - Days
12
10
8
6
4
2
0
7.9
11.4
11.2
9.6
10.1
11.6
2013
2014
2015
2016
2017
2018


Postseason Animals per 100 Females
BS200 - Males
BS200 - Juveniles
60
50
40
30
20
10
0
41
26
36
27
36
28
40
20
39
31
50
23
2013
2014
2015
2016
2017
2018

2013 - 2018 Postseason Classification Summary																		
for Bighorn Sheep Herd BS200 - ABSAROKA																		
		MALES				FEMALE		JUVENIL				Males to 100 Females				Young to		
Year	Post Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2013	4,440	13	304	317	25%	775	60%	200	15%	1,292	1,596	2	39	41	± 3	26	± 2	18
2014	4,076	19	432	451	22%	1,246	61%	342	17%	2,039	1,807	2	35	36	± 2	27	± 2	20
2015	3,891	30	177	310	22%	856	61%	238	17%	1,404	528	4	21	36	± 2	28	± 2	20
2016	3,800	33	412	445	25%	1,116	62%	226	13%	1,787	0	3	37	40	± 2	20	± 1	14
2017	3,700	29	201	358	23%	907	59%	284	18%	1,549	0	3	22	39	± 2	31	± 2	22
2018	3,800	21	243	264	21%	771	61%	219	17%	1,254	0	3	32	34	± 3	28	± 2	21

2019 HUNTING SEASONS
ABSAROKA BIGHORN SHEEP HERD (BS200)

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
1	1	Sep. 1	Oct. 31	12	Limited quota	Any ram
2	1	Sep. 1	Oct. 31	20	Limited quota	Any ram
3	1	Sep. 1	Oct. 31	32	Limited quota	Any ram (25 residents, 7 nonresidents)
4	1	Sep. 1	Oct. 31	24	Limited quota	Any ram
5	1	Sep. 1	Oct. 31	32	Limited quota	Any ram (25 residents, 7 nonresidents)
22	1	Sep. 1	Oct. 31	4	Limited quota	Any ram
22	1	Oct. 1	Oct. 31			Any ram, also valid in Area 5

Special Archery Season Hunt Areas	Type	Season Dates		Limitations
		Opens	Closes	
1-5, 22	1	Aug. 15	Aug. 31	Refer to Section 3 of this Chapter

Hunt Area	Type	Quota change from 2018
1	1	-8
2	1	-4
3	1	No Changes
4	1	0
5	1	-9
22	1	No Changes
Total		**-21**

Management Evaluation

Current Postseason Population Management Objective: 4500
Secondary Objective: Average age of harvested rams: 6-8 years
2018 Postseason Population Estimate: 3,800
2019 Proposed Postseason Population Estimate: 3,800

Herd Unit Issues

The Absaroka bighorn sheep herd is the combination of 5 subherds (HU201 Clark's Fork, HU202 Trout Peak, HU203 Wapiti Ridge, HU204 Yount's Peak, HU205 Franc's Peak) that inhabit the Absaroka Mountain Range. These subpopulations were combined into one herd for two reasons 1) interchange between all of these herds is most likely occurring and 2) simplification of annual report writing. Because of the complexity of managing bighorn sheep based mostly on the harvest statistics, population trends and field observations within each Hunt Area (1 – 5) the intent is to create a single report with sub-reporting for each of the Hunt Areas so that information for each of the new Hunt Areas can be easily found. Herd-wide, common

issues facing the bighorn sheep include understanding disease dynamics, space competition with mountain goats and difficulty in obtaining consistent reliable population data. Due to the location of wintering sheep, weather conditions (wind/snow) are not consistent and do not allow for regular collection of classification data. Better methods of understanding population dynamics need to be explored in order to gain more consistent insight into the bighorn populations in the Absaroka herd.

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.

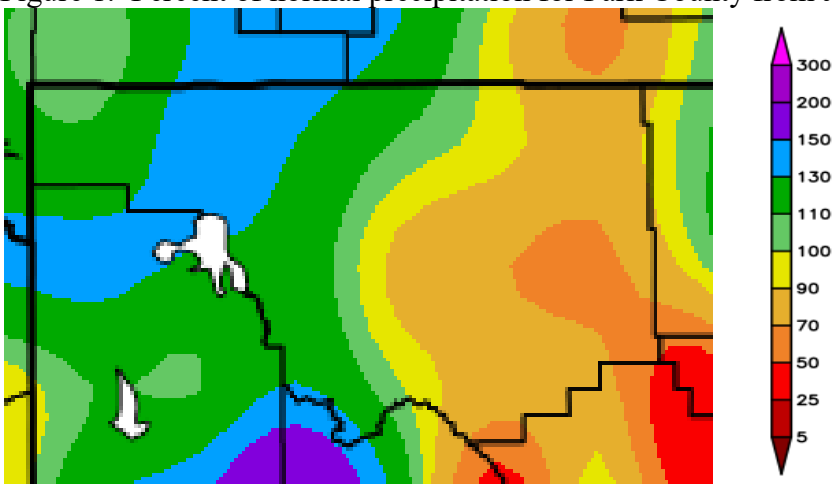
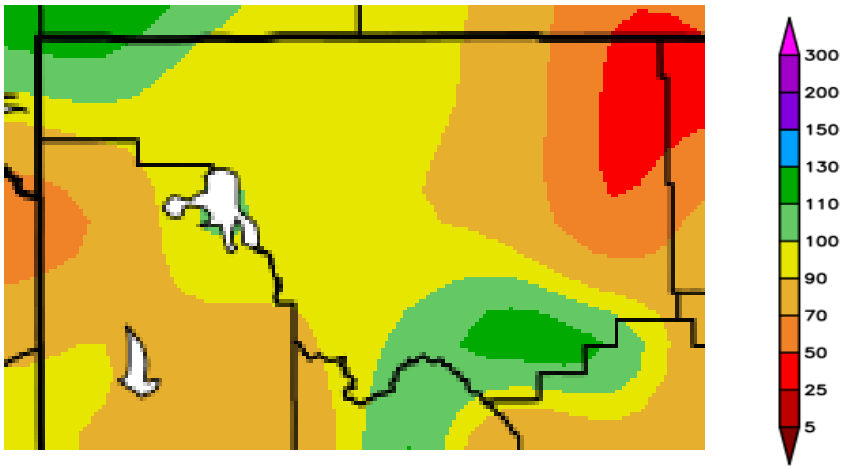


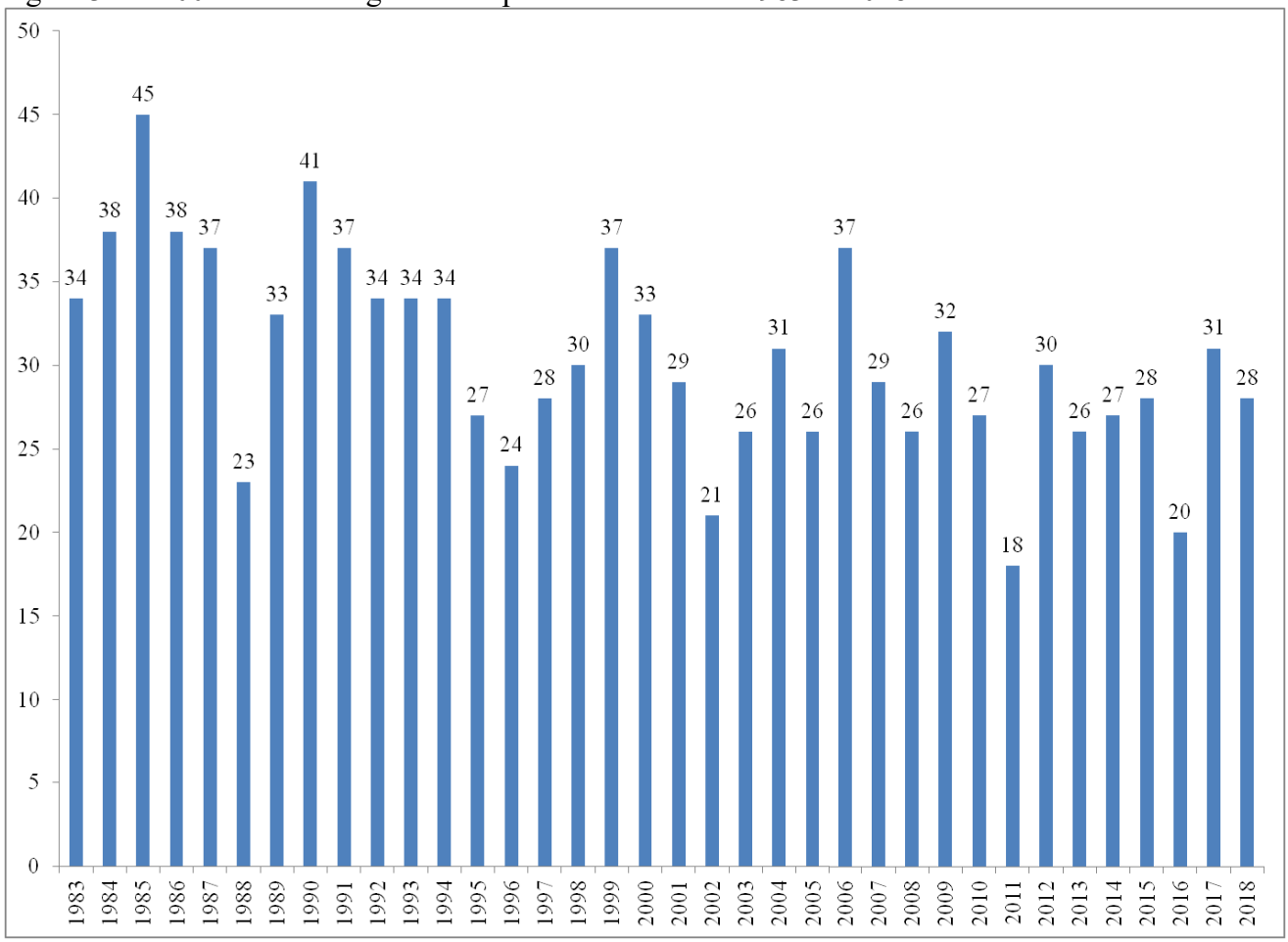
Figure 2. Percent of normal precipitation for Park County from October to December 2018.



Habitat
No habitat monitoring data is collected in this herd.

Field Data
The Absaroka herd has had relatively stable lamb to ewe ratios over the last 10 years (average 27:100 ewes, range = 18:100 to 32:100) with the lowest ratios occurring in years with difficult winters (2016-2017, 2010-2011). The current lamb to ewe ratio for the herd shows a declining trend but is slightly higher than the last 10 year average (27:100 ewes) at 28:100 (range = 18:100 to 32:100 ewes). The long-term trend shows that the earliest data collection period (1983 to 1992, average 36:100 ewes, range = 23:100 to 45:100) has a higher average lamb ratio compared to the most recent data indicating a range wide change in habitat, predation, disease or other influences (Figure 3). Ram ratios seem to be more stable with a slight decrease in average ram ratio over the last 35 years. The most recent 10 years yield an average ram ratio of 41:100 (range = 36:100 to 46:100) which is slightly lower than the long term (35 year) average ratio of 43:100 (range = 34:100 to 54:100) and the earliest data collection period (1983 to 1992) of 45:100 (range = 34:100 to 51:100).

Figure 3. BS200 Absaroka bighorn sheep lamb ratios from 1983 to 2018.



Individual hunt area field data

Hunt Area 1 (Clark's Fork)
Collecting classification in this Hunt Area is extremely difficult and has been highly variable over the last 10 years due to wind conditions that occur in late winter. We were able to fly this area in December of 2018. We counted 120 sheep and found with a high lamb ratio of 44 but a low adult ram ratio of 18. Data from the last 10 years has yielded 8 sampling years and an average lamb ratio of 29:100 (range 18:100 to 50:100) which is slightly lower than the average of all sampling years (20) of 32 lambs: 100 ewes (Table 1). Ram ratios are even more variable with the average ram: ewe ratio over the last 10 years (8 sampling years) being 28:100 but ranging from 13:100 to 43:100 (Table 1). Due to the variable nature of data collection in this Hunt Area it can be difficult to interpret the data annually.

Table 1. Hunt Area 1, Clark's Fork, bighorn sheep classification information from 2009 to 2018. Blank cells indicate no data collected that year.

Year	Lamb:Ewe	Ram:Ewe
2009		
2010	28	24
2011		
2012	40	34
2013	50	13
2014	22	27
2015	21	43
2016	18	43
2017		
2018	44	21

Hunt Area 2 (Trout Peak)
Collecting classification in this Hunt Area is extremely difficult and has been highly variable over the last 10 years due to wind conditions that occur in late winter. Data from the last 10 years has yielded 8 sampling years and an average lamb ratio of 27:100 (range 19:100 to 37:100) which is slightly lower than the average of all sampling years (32) of 33 lambs:100 ewes (Table 2). If we look at sampling from 7 and 8 years ago which would influence our prime age rams available for the 2018 and 2019 seasons we see low lamb ratios of 26 both years. This may have some influence on the availability of older age class rams for the 2019 season. Ram ratios are even more variable with the average ram:ewe ratio over the last 10 years (8 sampling years) being 38:100, but ranging from 23:100 to 65:100 (Table 2. Due to the variable nature of data collection in this Hunt Area it can be difficult to interpret the data annually.

Table 2. Hunt Area 2, Trout Peak, bighorn sheep classification information from 2009 to 2018. Blank cells indicate no data collected that year.

Year	Lamb:Ewe	Ram:Ewe
2009	29	33
2010	26	41
2011	26	41
2012		
2013		
2014	31	31
2015	25	24
2016	20	23
2017	37	46
2018	40	23

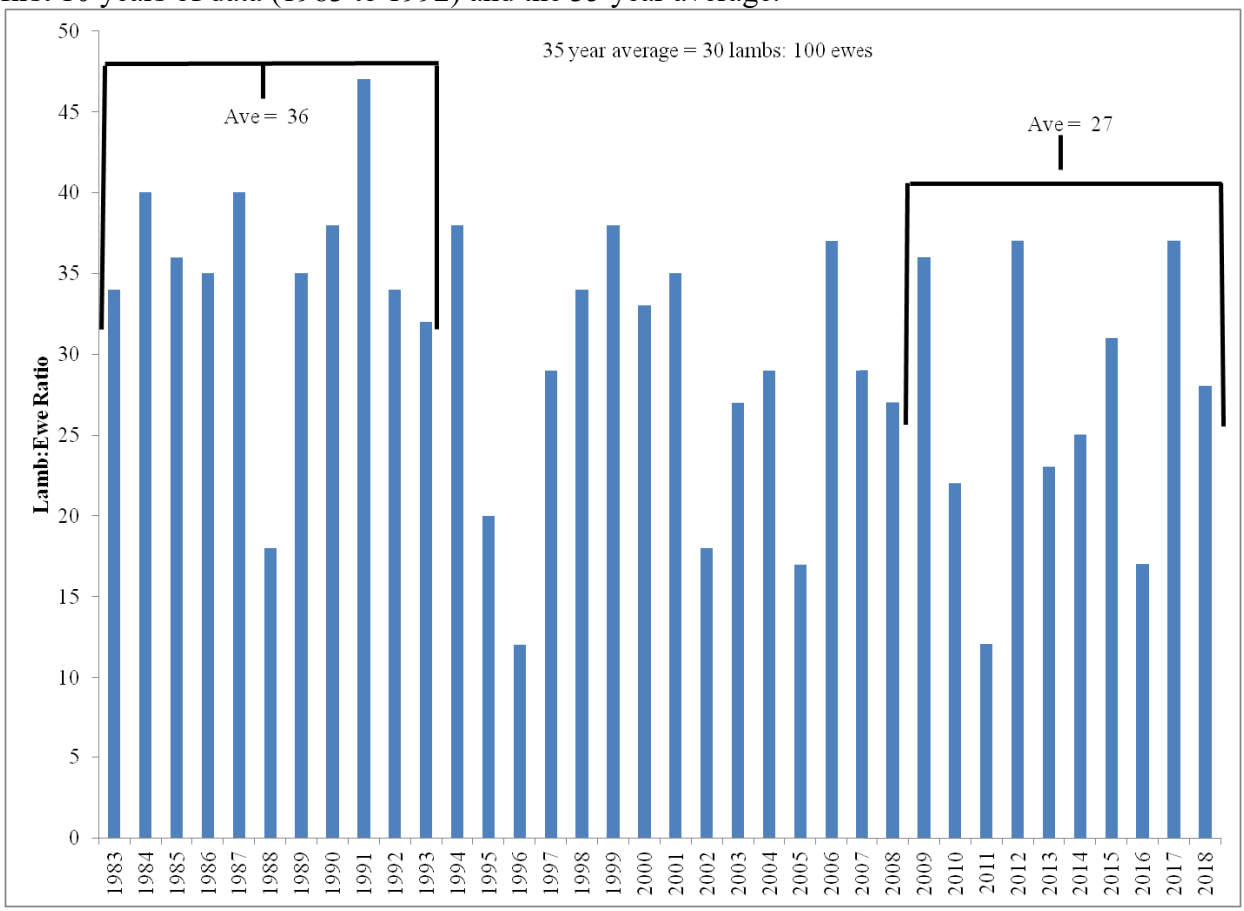
Hunt Area 3 (Wapiti Ridge)

The collection of classification data in Hunt Area 3 has been more consistent than Hunt Areas 1 and 2 yielding more reliable data. Average lamb ratios have been lower over the last 10 years compared to long term data (35 years) and the earliest 10 years of data collection (1983 to 1992) (figure 4). Ram ratios are showing a downward trend over the last 35 years with the last 5 years (average = 28:100:100, range = 20:100 to 38:100) being considerably lower than the long term (average 39:100, range 20:100 to 57:100) and the earliest 10 years of data (1983 to 1992, average 44:100, range = 29:100 to 57:100). This is a correlation with the decrease in lamb ratios but we should monitor this closely.

Table 3. Hunt Area 3, Wapiti Ridge, bighorn sheep classification information from 2009 to 2018.

Year	Lamb:Ewe	Ram:Ewe
2009	36	32
2010	22	32
2011	12	36
2012	37	35
2013	23	20
2014	25	24
2015	31	27
2016	17	38
2017	37	33
2018	28	25

Figure 4. Hunt Area 3 historic lamb ratios with averages of the last 10 years (2009 to 2018), the first 10 years of data (1983 to 1992) and the 35 year average.



Hunt Area 4 (Yount's Peak)
Hunt Area 4 has an interesting dynamic between lamb and ram ratios compared to the other areas. Despite having the lowest lamb ratio of the hunt areas (10 year average 26:100, range 17:100 to 36:100) Hunt Area 4 has the highest ram ratios (10 year average 41:100, range = 30:100 to 49:100, Table 4).

Table 4. Hunt Area 4, Yount's Peak, bighorn sheep classification information from 2009 to 2018. Blank cells indicate no data collected that year.

Year	Lamb:Ewe	Ram:Ewe
2009		
2010	21	30
2011	17	48
2012	21	30
2013	23	44
2014	36	44
2015	27	39
2016	26	41
2017	23	49
2018	31	36

Hunt Area 5 (Franc's Peak)
Since the winter die-off of 2011/12 it still appears sheep numbers in Hunt Area 5 continue to struggle. Winter classification/trend surveys of the Greybull River drainage show about a 40% decline in the number of sheep counted over the past 10 years, with only 183 sheep counted in 2018 compared to over 400 on average before the die-off. The lamb ratio in 2018 was only 18:100 ewes, with the previous 5-year average being 24:100.

Table 5. Hunt Area 5, Franc's Peak, bighorn sheep classification information from 2009 to 2018.

Year	Lamb:Ewe	Ram:Ewe
2009	35	61
2010	42	80
2011	16	43
2012	30	61
2013	31	73
2014	22	72
2015	31	70
2016	21	41
2017	30	37
2018	18	72

Harvest Data for the Absaroka Bighorn Sheep Herd

There has been some variability in harvest statistics between hunt areas within the Absaroka herd over the last 6 years (Table 6). Overall success has been high with a 5 year average of 84% (range = 78% to 90%). Harvest success on average is much better over the last 10 years (81%) compared to the earliest data we have from 1983 to 1992 (67%). There seems to be a slight increasing trend in overall average age of rams in the herd unit, however it is a very small increase (Figure 6).

Figure 5. BS200 Absaroka bighorn sheep herd average age of ram harvest.

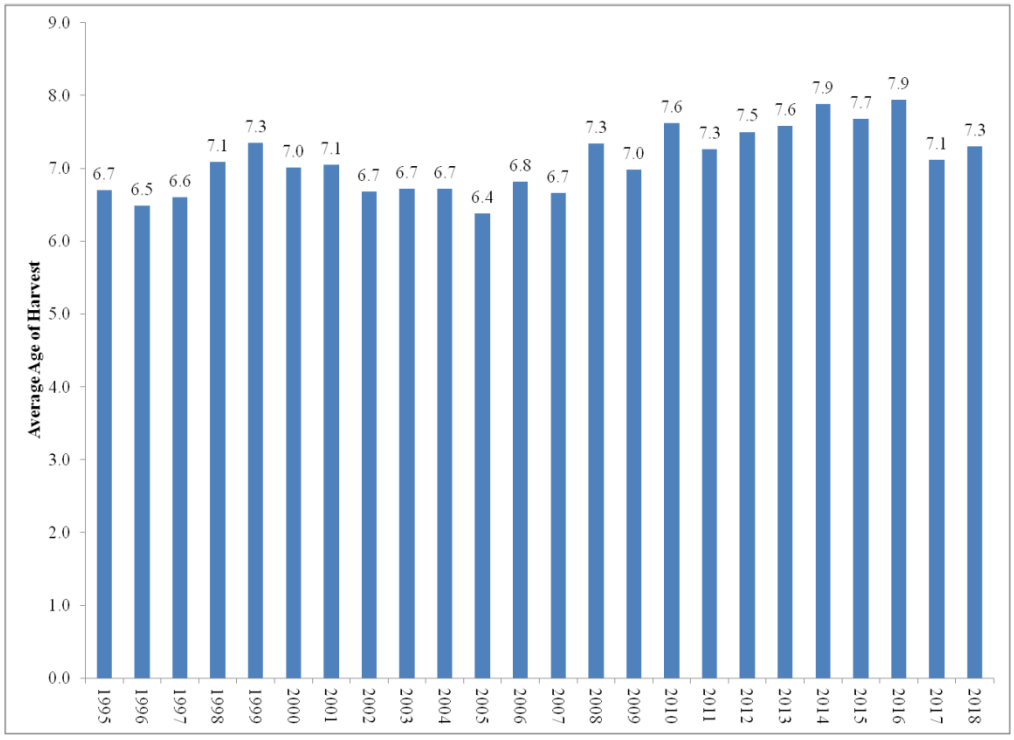


Table 6. Harvest parameters for the Absaroka bighorn sheep herd, 2013-2018.

	2013	2014	2015	2016	2017	2018
Permits	181	169	142	159	154	151
Harvest	156	129	121	131	133	111
% Success	96%	78%	85%	82%	78%	74%
Effort (days/ram)	7.9	11.4	11.0	9.6	10.1	11.5
Avg. Age	7.6	7.9	7.7	7.9	7.1	7.3

Individual hunt area harvest data and management

Hunt Area 1 (Clark's Fork)

We saw a dramatic decrease in harvest success and a similar dramatic increase in days to harvest in 2018 compared to previous years (Table 7). We are uncertain on why this occurred as we observed no indication from the number of pickup heads in the area and the lamb ratios (from the years we are able to collect the data) does not indicate a population level issue. There could have been many different factors that culminated during last year's season. In addition to the potential population issues the weather was extremely mild last year during the season with very little snow and warmer temperatures. Sheep numbers in Hunt Area 1 can be influenced by the movement of sheep from Yellowstone National Park (YNP) into the Hunt Area. The mild temperatures and low snow fall may have allowed more sheep to remain in the YNP area rather than moving into Hunt Area 1. Right now managers want to be cautious moving forward with harvest until we better understand the factors causing the low harvest success and difficult hunting conditions experienced in 2018.

Table 7. Harvest parameters for the Clark's Fork bighorn sheep Hunt Area 1, 1968-2018 (Wyoming portion only).

	1973-1991	1992-1997	1998-2002	2003-2006*	2007-2014*	2015*	2016*	2017*	2018*
Permits	24	20	16	16	20	20	20	20	21
Harvest	11.9	10.7	10.6	14.3	14.0	19	18	19	9
% Success	53.5%	52.9%	67.7%	90.3%	70.0%	95.0%	90.0%	95.0%	42.9%
Effort (days/ram)	16.7	17.7	16.7	10.3	17.0	12.7	9.2	12.0	36.6
Avg. Age	6.6	6.9	7.0	6.4	7.1	8.0	6.5	6.3	6.3
% Rams > 8 Yrs	31.7%	26.7%	32.0%	21.1%	37.8%	61.1%	22.2%	33.3%	11.1%
% Rams < ¾ Curl	-	-	-	15.9%	6.3%	5.6%	0.0%	11.1%	22.2%
Pickup Heads				4**	3**	3	3	3	1

* "any ram" regulation in place
** average

Hunt Area 2 (Trout Peak)

Despite reasonable harvest statistics in 2018, there are indicators that there may be some population level issues occurring in Hunt Area 2. We have seen an increase in pickup heads in the area over the last 5 years (2004 to 2013 avg. = 4 per year; 2014 to 2018 avg. = 11 per year). This data coupled information gathered from hunters and outfitters indicate that we may have good numbers of young rams, but are struggling with the numbers of older age class rams. The increase in pickup heads along with the relatively mid-range of the average age of pickup head rams (avg. = 6.6 range 2 to 11) is most concerning and does indicate possible impacts from a tough winter in 2016/17 in addition to the potential for a disease caused loss of animals. As mentioned above in the field data section, lamb ratios from 7 and 8 years ago seem to be relatively low at 26, which could also be negatively influencing the number of prime age rams available for harvest in 2019.

Table 8. Harvest parameters for the Trout Peak bighorn sheep Hunt Area 2, 1978-2018.

	1978-1996	1997-2002	2003	2004-2013*	2014	2015*	2016*	2017*	2018*
Permits	32	24	28	25	24	24	25	25	24
Harvest	18.8	15.2	16	19.1	27	17	21	23	19
% Success	61.0%	63.8%	61.5%	78.7%	78	74%	75%	92%	79.2%
Effort (days/ram)	18.2	16.0	25.1	12.6	12.0	10.5	13.1	8.8	9.2
Avg. Age	5.9	6.7	6.6	7.1	7.9	7.3	8.3	7.9	7.2
% Rams > 8 Yrs	19.5%	25.6%	18.8%	33.1%	52.4%	29.4%	57.1%	43.4%	31.6%
% Rams < ¾ Curl	-	-	-	4.0%	-	5.9%	4.8%	4.3%	5.3%
Pickup heads	-	-	4	4**	11	13	13	5	11

*any ram regulation in place
** average
+ 25 permits were issued in 2006, 2007, and 15 and 28 permits were issued in 2008 and 2009, respectively due to the Gunbarrel Fire.

Hunt Area 3 (Wapiti Ridge)

We saw a return to normal harvest statistics in 2018 after decreasing licenses in Hunt Area 3 from the previous year. The previous 3 years had seen a drop in harvest success averaging 76.7% compared to 85.3% from the 5 years previous to those years. In response to the lower success, slightly higher days to harvest and information from hunters and outfitters we lowered those licenses. We feel comfortable with permit levels currently and will continue to monitor population and harvest data in order to raise those licenses back up previous levels.

Table 9. Harvest parameters for the Wapiti Ridge bighorn sheep Hunt Area 3, 1978-2018.

	1978-1983	1984-1985	1986-1992	1993-1999	2000-2004*	2005-2012*	2013-2014*	2015*	2016*	2017*	2018*
Permits	32	36	40	44	48	46	40	40	40	40	31
Harvest	22.5	29.5	36.1	36.9	38.0	36.5	35.0	30	30	32	27
% Success	69.3%	81.2%	83.0%	79.0%	77.6%	81.4%	90.9%	75.0%	75.0%	80%	87.1%
Effort (days/ram)	11.3	9.3	8.6	9.0	9.8	10.3	8.75	13.4	8.2	12.9	9.3
Avg. Age	5.9	7.1	6.9	7.1	6.8	6.7	7.5	7.3	7.7	5.8	6.6
% Rams > 8 Yrs	12.8%	49.2%	41.5%	35.1%	31.0%	29.3%	50.3%	43.3%	53.3%	31.3%	37.0%
% Rams < ¾ Curl	-	-	-	-	8.4%	8.6%	7.1%	13.3%	13.3%	22.6%	22.2%

* “any ram” regulation in place

Hunt Area 4 (Yount's Peak)

In Hunt Area 4 we have had some conflicting reports versus field and harvest data being collected. There were initially negative reports from hunters and outfitters in relation to the number of rams available during the 2018 season. However, harvest reports and a classification flight do not indicate a major population issue. Harvest success increased from 2017 and days to harvest remained unchanged from 2017. The last 2 years average days to harvest of 10.4 is only slightly higher than the previous 10 years average of 9.8 days/harvest. Weather could have played a role in the distribution of sheep during the 2018 season causing the discrepancy between hunter reports and the data we are collecting.

Table 10. Harvest parameters for the Yount's Peak bighorn sheep Hunt Area 4, 1984-2018.

	1992-1995	1996-2000*	2001-2004*	2005-2008*	2009-2011*	2012*	2013-2014*	2015*	2016*	2017*	2018*
Permits	48	32	36	40	46	28	20	20	23	22	24
Harvest	28.3	22.6	32.3	34.0	32.7	18	16.5	16	19	16	19
% Success	62%	74%	87%	83.3%	75.4%	58.1%	79.5%	76%	90%	73%	79.2%
Effort (days/ram)	15.0	8.4	7.9	8.2	10.5	12.4	9.8	8.9	8.4	10.3	10.4
Avg. Age	6.5	6.7	7.3	7.3	7.5	7.2	7.9	8.3	8.8	8.1	8.3
% Rams > 8 Yrs	17.5%	33.3%	44.1%	32.7%	47.6%	22.2%	61.7%	68.8%	68.3%	56.3%	63.1%
% Rams < ¾ Curl	-	11.9%	15.0%	7.2%	5.9%	5.6%	11.7%	9.1%	5.1%	12.5%	10.5%
Pickup heads	-	-	8**	6**	7**	8	8**	5	13	7	9

* "any ram" regulation in place
** average

Hunt Area 5 (Franc's Peak)

Managers have seen a decrease in harvest success and higher number of pickup heads in this area in 2018. Harvest success has dropped off from the previous 3 year average of 88% to 77% and pickup head numbers have increased to previous die off levels (Table 11). These data are concerning and will lead to more conservative seasons in order to determine the impact of the 2016/17 winter on the population.

Table 11. Harvest parameters for the Franc's Peak bighorn sheep Hunt Area 5, 2008-2018.

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Permits	72	69	75	63	76	63	53	37	34	45	47
Harvest	69	60	68	55	68	57	40	30	31	41	36
% Success	96	86.9%	90.6%	87.0%	90.0%	90.5%	75.5%	81.0%	91.0%	91.0%	76.6%
Effort (days/ram)	7.9	5.8	6.8	7.3	7.0	7	13.5	10	8.7	7.5	7.9
Avg. Age	7.4	7.7	7.9	7.6	7.5	7.8	8.2	7.5	8.4	7.5	8.1
% Rams > 8 Yrs	21.2%	25.0%	27.9%	30.9%	21.7%	24.6%	36.6%	26.7%	39.4%	35.0%	27.8%
Pickup heads	22	14	28	34	54	51	25	22	29	17	40

Population

The current post-hunt population model estimates for 2018 indicate we are within the objective range (3,600 to 5,400). We chose the TSJ, CA model based on the lowest AICc value and what we believe to be the best representation of the actual population trend. Because this is a relatively new model it will take more time to understand the utility of this overall population model for the management of the herd and individual hunt areas within the herd unit. It seems to be a reasonable representation of the population; however, better survival rate data would be helpful.

Management Summary

The 2019 hunting seasons should result in the overall increase in the herd unit ram population and specifically within Hunt Areas 1, 2 and 5 should relieve pressure on the ram population to allow for an increase in age of harvested ram and harvest success rates. Our current work on combining 5 sub-populations into the JCR database will take several iterations since we are combining the data from 5 herds into one, while still maintaining the ability to collect data and make management decisions at a sub-herd level. Overall we decreased licenses in Hunt Areas 1, 2 and 5 due to potential lower population numbers, low productivity and fewer rams available for harvest.

2018 - JCR Evaluation Form

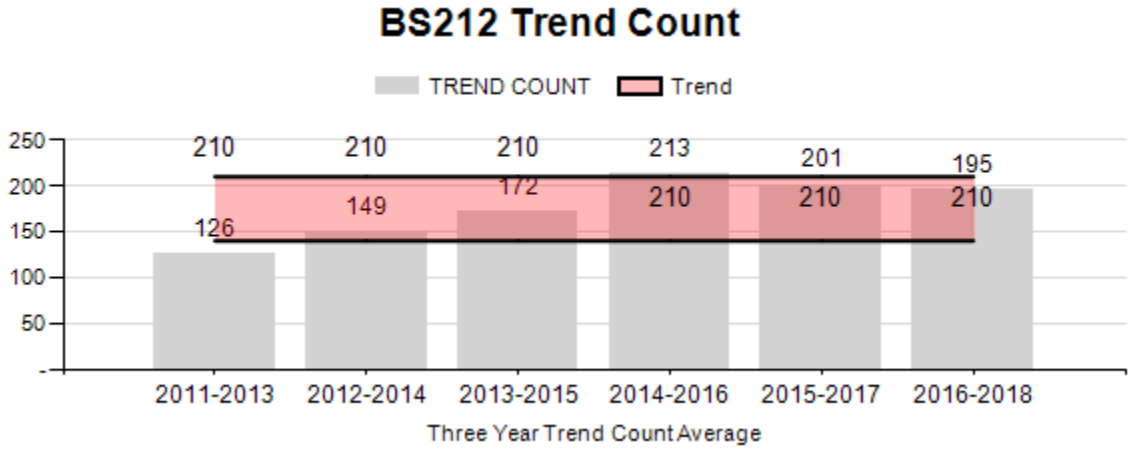
SPECIES: Bighorn Sheep
PERIOD: 6/1/2018 - 5/31/2019
HERD: BS212 - DEVIL'S CANYON
HUNT AREAS: 12
PREPARED BY: SAM STEPHENS

	2013 - 2017 Average	2018	2019 Proposed
Trend Count:	191	144	210
Harvest:	4	5	6
Hunters:	4	5	6
Hunter Success:	100%	100%	100%
Active Licenses:	4	5	6
Active License Success	100%	100%	100%
Recreation Days:	26	15	24
Days Per Animal:	6.5	3	4
Males per 100 Females:	44	35	
Juveniles per 100 Females	63	37	

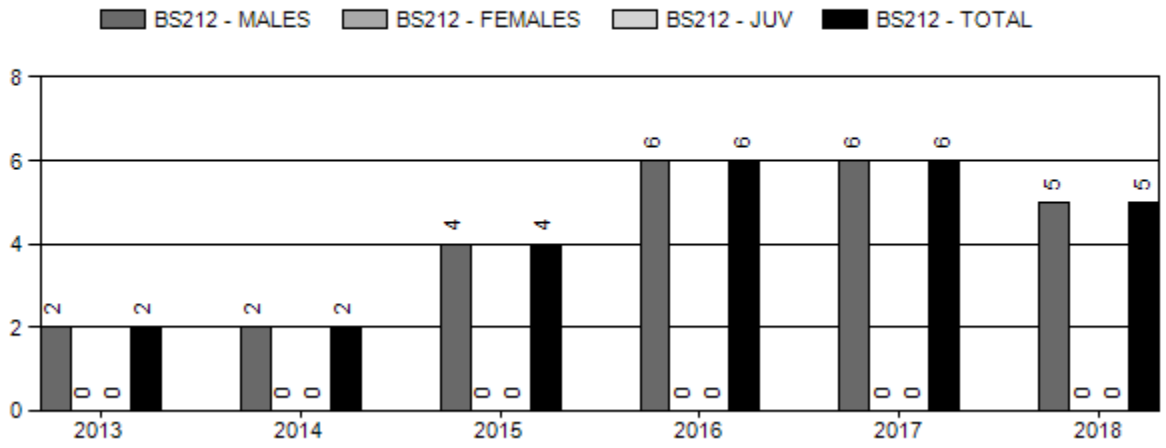
Trend Based Objective (± 20%)	175 (140 - 210)
Management Strategy:	Special
Percent population is above (+) or (-) objective:	-17.7%
Number of years population has been + or - objective in recent trend:	0

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

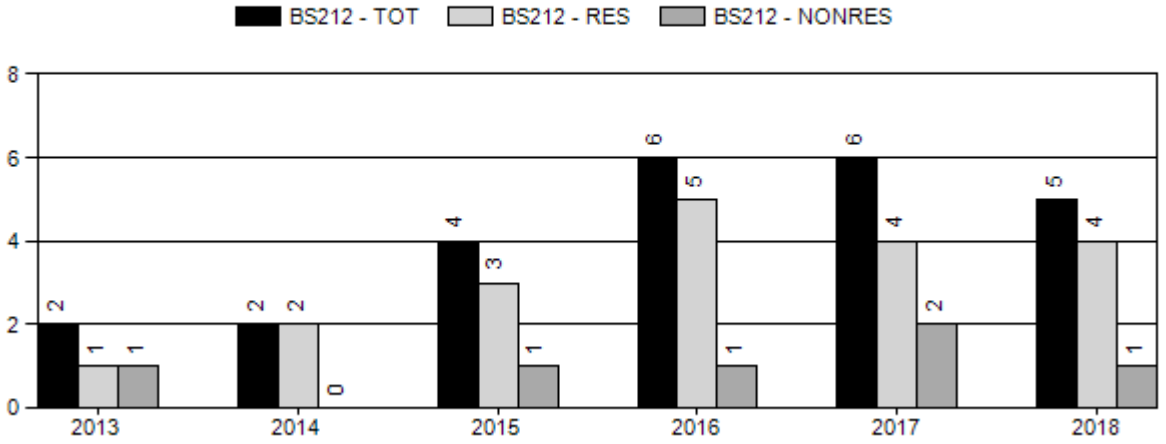
	JCR Year	Proposed
Females ≥ 1 year old:	0%	0%
Males ≥ 1 year old:	12%	8%
Juveniles (< 1 year old):	0%	0%



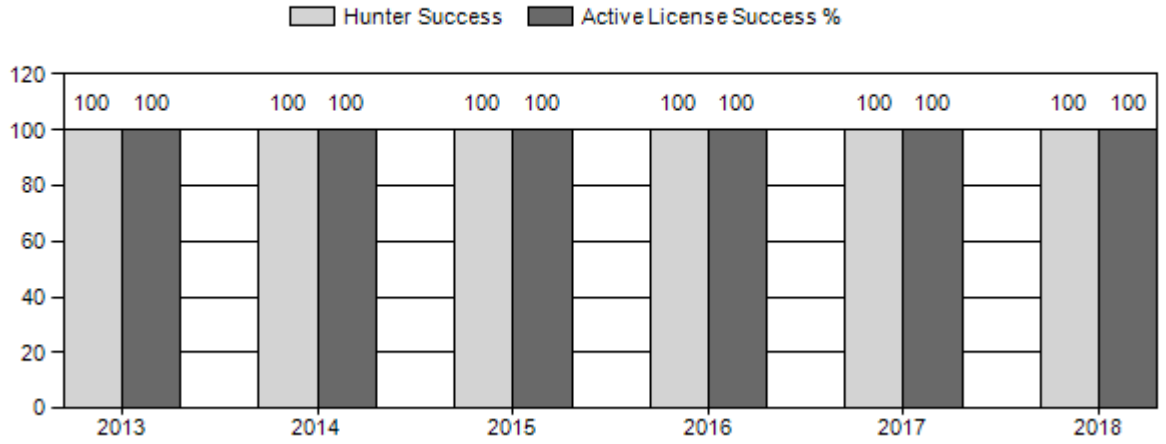
Harvest



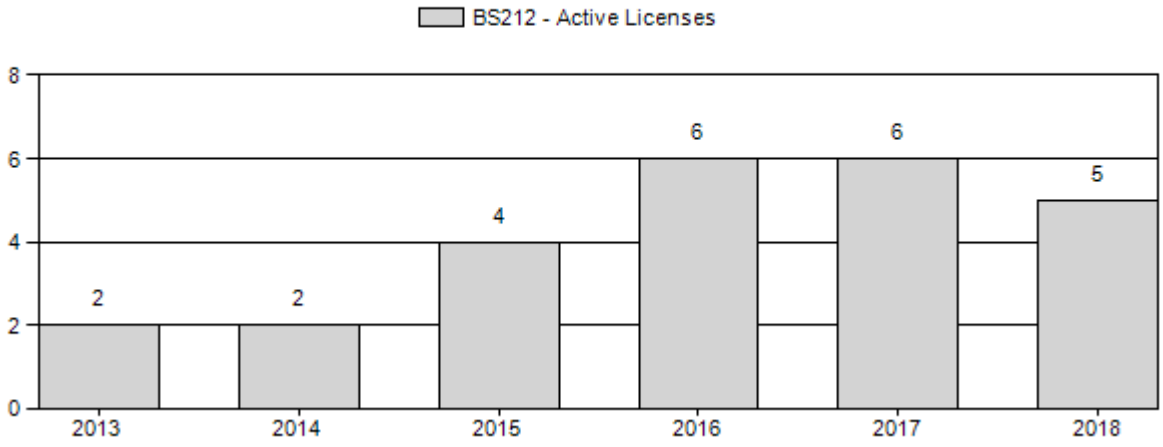
Number of Active Licenses



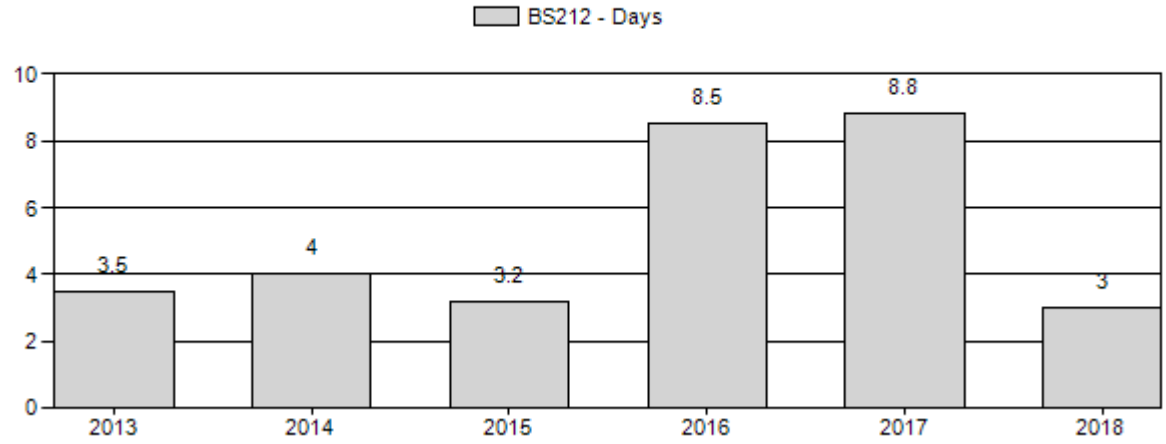
Harvest Success



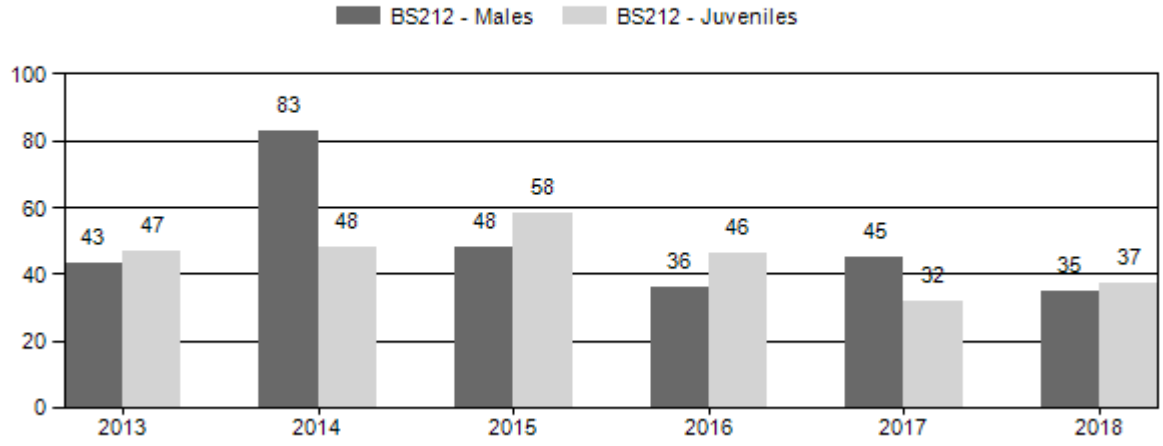
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2013 - 2018 Preseason Classification Summary

for Bighorn Sheep Herd BS212 - DEVIL'S CANYON

		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
2013	0	0	32	32	23%	74	52%	35	25%	141	143	0	43	43	± 0	47	± 0	33
2014	0	0	76	76	36%	92	43%	44	21%	212	136	0	83	83	± 0	48	± 0	26
2015	0	0	0	38	23%	80	49%	46	28%	164	167	0	0	48	± 0	58	± 0	39
2016	0	0	52	52	20%	145	55%	66	25%	263	152	0	36	36	± 0	46	± 0	34
2017	0	0	45	45	25%	100	56%	32	18%	177	0	0	45	45	± 0	32	± 0	22
2018	0	0	29	29	20%	84	58%	31	22%	144	0	0	35	35	± 0	37	± 0	27

2019 HUNTING SEASONS DEVILS CANYON BIGHORN SHEEP HERD (BS212)

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
12	1	Aug. 15	Oct. 15	6	Limited quota	Any ram (4 residents, 2 nonresidents)

Special Archery Season Hunt Areas	Type	Season Dates		Limitations
		Opens	Closes	
12	1	Aug. 1	Aug. 14	Refer to Section 3 of this Chapter

Management Evaluation

Current Trend Count Management Objective: 175
Management Strategy: Special
2018 Trend Count: 144
Most Recent 3-year Running Average Trend Count: 195

Herd Unit Issues

A formal objective of 175 bighorn sheep based on a summer aerial trend count, calculated on a 3-year running average was established for the Devils Canyon bighorn sheep herd during the 2015 public herd unit review. In prior years, an informal goal of 200 bighorn sheep was set when the first sheep were translocated into the area in 1973 and subsequent translocations from Oregon in 2004 and Montana in 2006. The management goals for this herd are three-fold: provide a disease-free source stock for in-state translocations, provide ram hunting opportunity, and limit comingling with domestic sheep. The Devils Canyon herd occupies mostly public lands managed by the Bureau of Land Management, which are designated a "cooperative review area" by the Wyoming State-wide Bighorn/Domestic Sheep Interaction Working Group. Bighorn National Forest (BNF) lands are designated a "non-emphasis" area by the same group. To keep separation between wild and domestic sheep, an agreement is in place where any wild sheep in and south of Cottonwood Canyon are to be removed by WGFD. The WGFD conducts clearance flights each spring before domestic sheep trail up the Highway 14A stock trail. In addition, BNF and WGFD personnel conduct ground surveys before sheep trailing in the spring and fall to ensure no comingling occurs.

Weather

Temperature and precipitation data referenced in this section were summarized for the Bighorn Basin (Climate Division #4) by the National Oceanic and Atmospheric Administration at https://www.ncdc.noaa.gov/cag/divisional/time-series. Thirty-year averages constitute that spring 2018 experienced warmer temperatures and below average precipitation. Average temperature and precipitation for summer months were both above average. During the fall of 2018, precipitation was significantly below average and temperatures above normal. Temperatures were above normal for December and January, turning colder than average in February.

Precipitation was near normal for December and January. Overall annual conditions for 2018 were considered to be cooler temperatures than 2017 but still warmer than the thirty year average, whereas precipitation was near normal at 15".

Habitat

Cheatgrass has become established on some sites. No anthropogenic development currently affects this population or habitat. There is limited farming consisting of irrigated pastures on a small portion of private land. Bighorn sheep are attracted to those pastures, especially during drought years. The landowners have commented on the concentration of sheep on those pastures, but have not requested management to remove or reduce their numbers so far. The lack of available water sources near the rim of Devils Canyon may impact the distribution of bighorn sheep.

Field Data

Pre-season aerial classification surveys give the most consistent population trend estimate. However, some surveys prior to 2012 were not conducted across all areas used by sheep and effort (flight time, aerial vs. ground) is consistent only in recent years. During the July 2018 classification survey, we counted a total of 144 bighorn sheep, of which 84 were ewes. We observed 29 rams (4 class I rams, 3 class II rams, 14 class III rams, and 8 class IV rams) for a ratio of 35 rams:100 ewes. We observed 31 lambs for a ratio of 37 lambs:100 ewes. Flight time and area surveyed in 2018 was consistent with the previous 5 years. Thirty-five rams (Class 2Class 4) seen 3 weeks prior, were not seen during the flight. Transplanting ~120 sheep out of this herd starting in March 2015 likely had the desired effect of decreasing the population to objective. The current 3-year running average is 195 sheep, which is within 20% of our objective of 175 sheep. On February 18, 2017 we deployed 4 GPS collars by Telonics on rams on the eastern shore of Bighorn Lake to learn more about the movements of the "armpit rams". Approximately 12-20 rams are regularly observed near the armpit mine and cabin located between the Devils Canyon herd and the Bighorn Canyon herd stretching into Montana. Locations of one collared ram indicate that in November of 2018 that sheep crossed the reservoir and spent one day on the west side of Bighorn Reservoir, likely comingling with bighorn sheep from the Bighorn NRA sheep population.

Harvest Data

Harvest statistics provide little information about this population's trend. Only 1-2 licenses were issued each year from 2008-14 with 100% hunter success. Four licenses were issued in 2015, and 6 were issued in 2016-18 with 100% hunter success. In 2018 one hunter was unable to hunt which accounts for only five rams being harvested. Recreation days and days per harvested animal vary depending on the amount of time each hunter allocated to his/her hunt.

Population

One landowner controls key access to the highest concentration of bighorn sheep in Devils Canyon and traditionally requests a low number of ram licenses each year due to hunter crowding concerns. We work closely with the landowner to develop acceptable management. Devils Canyon sheep occupy a relatively small area where rams are highly visible and habituated

to human activity, resulting in a high probability of conflict among hunters. We are maintaining 6 ram licenses for 2019.

Maintenance of this herd at objective requires the removal of female sheep. This herd is very productive with a 5-year average (2013-2018) lamb ratio of 44 lambs:100 ewes. The severe 2016-2017 winter likely caused the low lamb ratio of 32:100 observed in July 2017 and subsequently impacted the relatively low 2018 ratio of 37:100. One of the main management goals of this herd is to provide source-stock for in-state translocations. While recent translocations have moved sheep to the Ferris and Seminoe Mountains (Table 1), the Ferris/Seminoe herd is nearing objective. Finding new areas to translocate Devils Canyon sheep to in the future may prove challenging. Issuing ewe licenses is not feasible, as most of the ewes are found on private land, and the landowner is resistant to ewe hunting.

Date	Total Captured	Ewes	Rams	Lambs	Capture Mortality
30 January 2010	12	9	1	2	0
6 March 2015	25	21	3	1	0
20 February 2016	25	21	3	1	1
18 February 2017	24	20	3	1	3
4 December 2017	20	17	3	0	0
4 February 2018	23	20	3	0	0

Table 1. Number of bighorn sheep captured from the Devils Canyon herd for transplant to the Seminoe/Ferris Mountains, Wyoming, 2010-2018.

Management Summary

Our current management strategy in Hunt Area 12 is two-fold: one (1) to translocate ewes and lambs to maintain the population at objective, thereby decreasing the likelihood of wandering Devils Canyon sheep. Also, maintaining a good working relationship with the landowner is a high priority and critical for successful management of this herd, especially when allocating hunting licenses. With a quota of 6 ram licenses, Hunt Area 12 will oscillate between 1 and 2 nonresident licenses each year.