

2016 - JCR Evaluation Form

SPECIES: Bighorn Sheep

PERIOD: 6/1/2016 - 5/31/2017

HERD: BS609 - WHISKEY MOUNTAIN

HUNT AREAS: 8-10, 23

PREPARED BY: GREG
ANDERSON

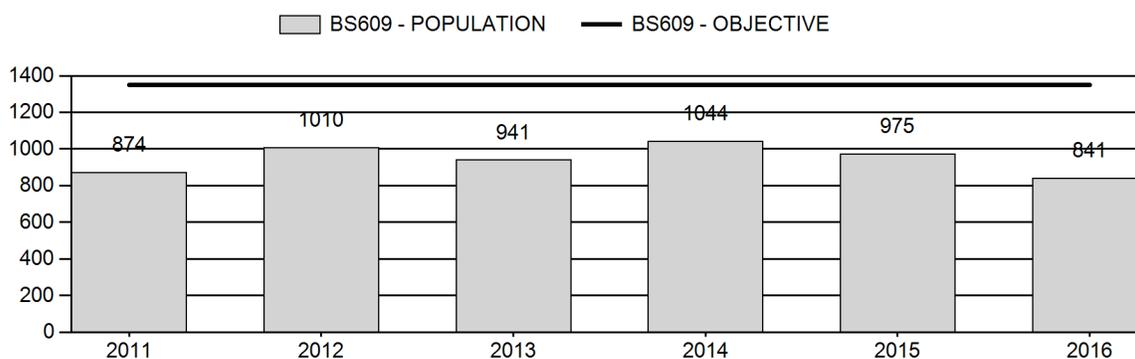
	<u>2011 - 2015 Average</u>	<u>2016</u>	<u>2017 Proposed</u>
Population:	969	841	842
Harvest:	15	14	15
Hunters:	23	22	27
Hunter Success:	65%	64%	56%
Active Licenses:	23	22	27
Active License Success:	65%	64%	56%
Recreation Days:	210	374	350
Days Per Animal:	14	26.7	23.3
Males per 100 Females	49	47	
Juveniles per 100 Females	30	18	

Population Objective (± 20%) :	1350 (1080 - 1620)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-37.7%
Number of years population has been + or - objective in recent trend:	10
Model Date:	02/16/2017

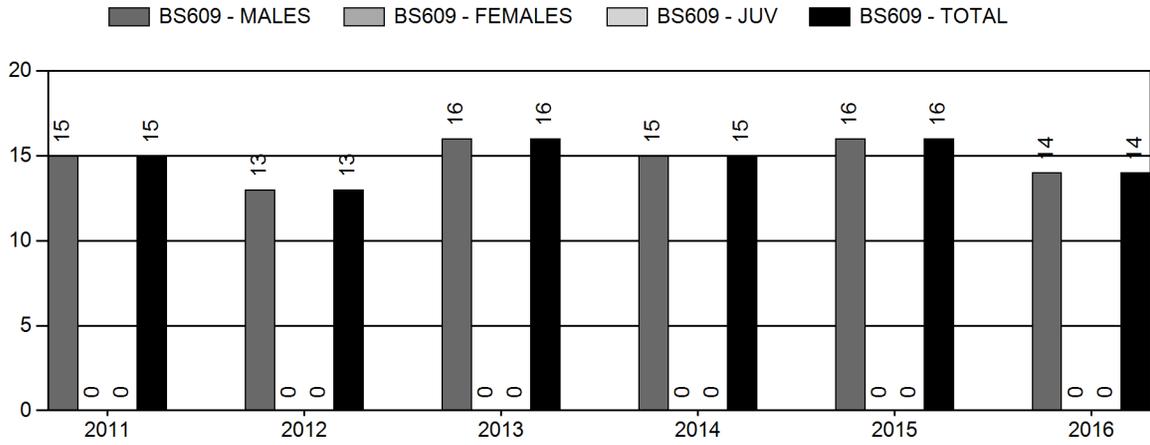
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	0%	0%
Males ≥ 1 year old:	6%	7%
Total:	2%	2%
Proposed change in post-season population:	-8%	0%

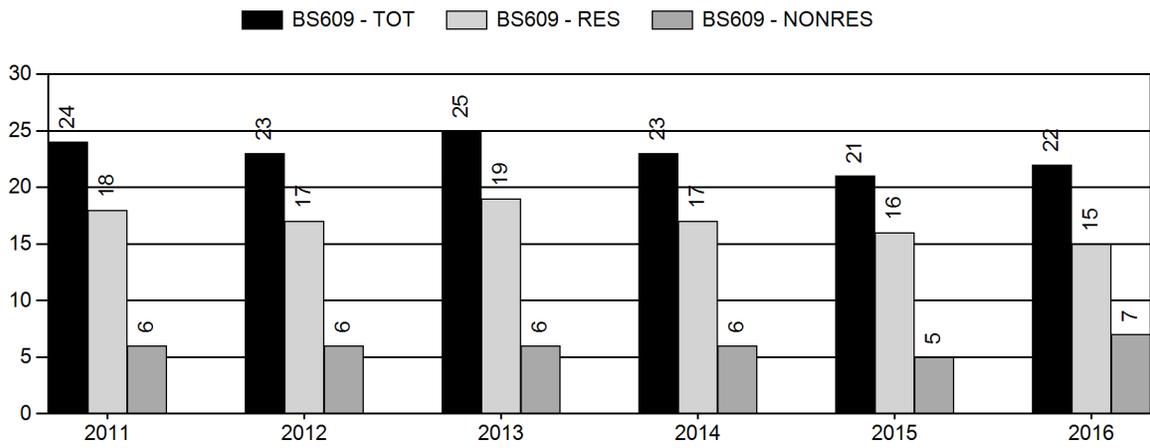
Population Size - Postseason



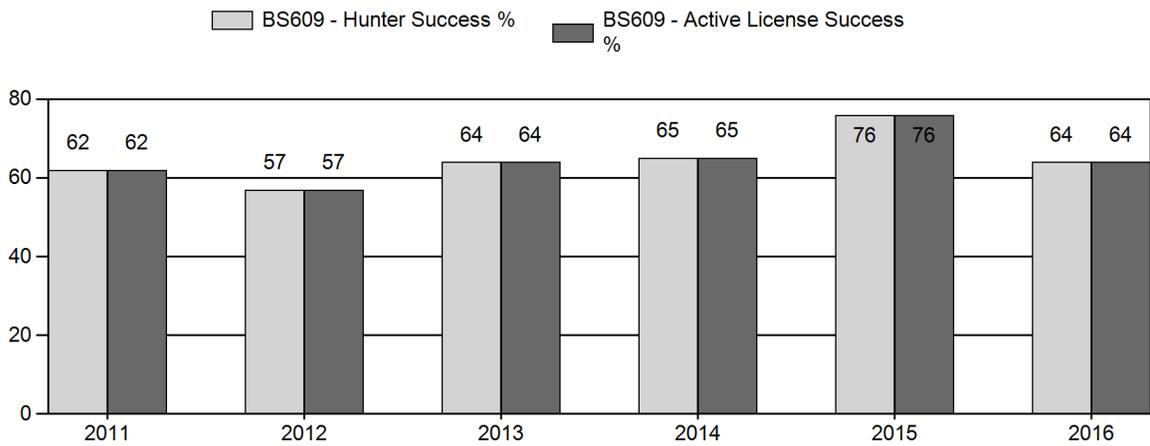
Harvest



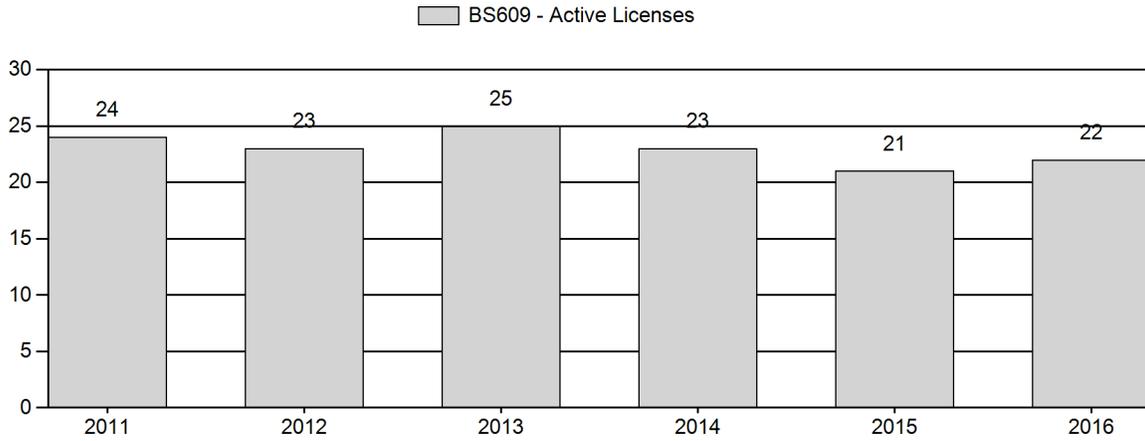
Number of Active Licenses



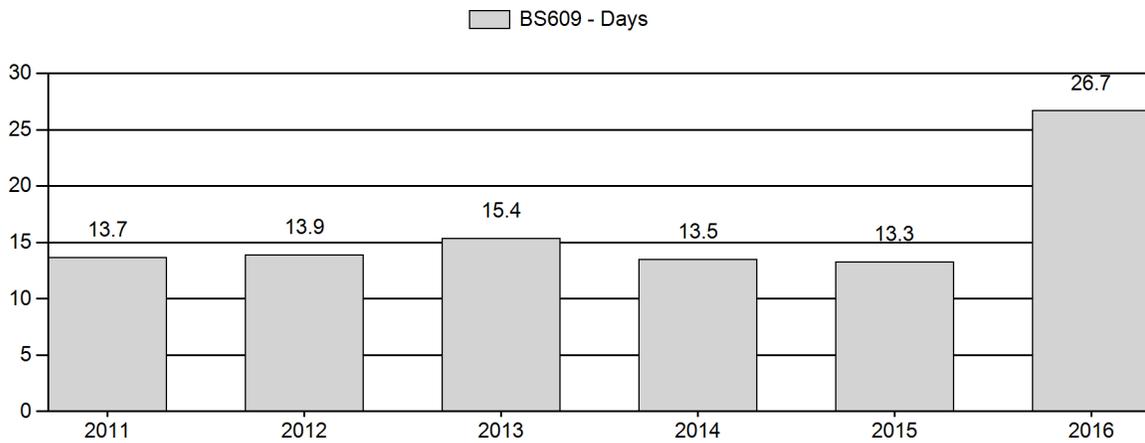
Harvest Success



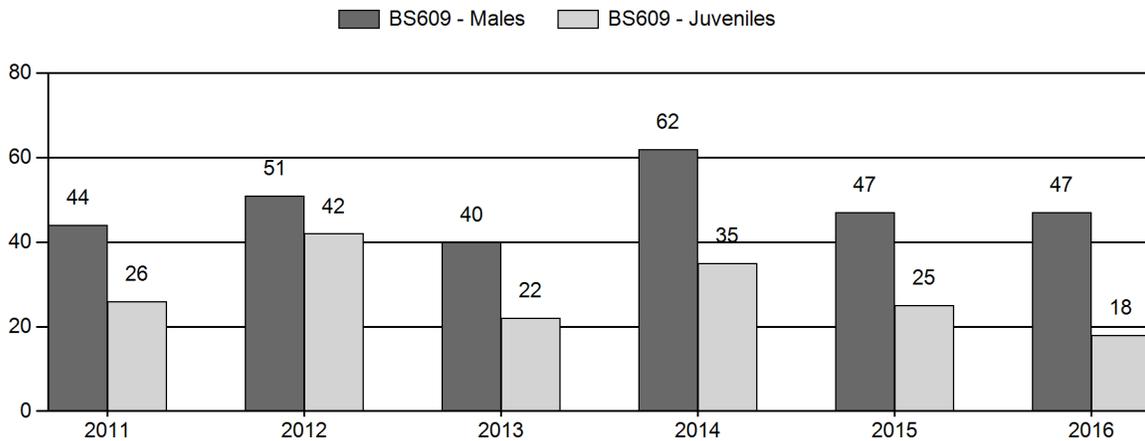
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2011 - 2016 Postseason Classification Summary

for Bighorn Sheep Herd BS609 - WHISKEY MOUNTAIN

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2011	874	15	83	98	26%	223	59%	58	15%	379	328	7	37	44	± 5	26	± 4	18
2012	1,010	14	149	163	26%	320	52%	133	22%	616	496	4	47	51	± 4	42	± 3	28
2013	941	16	79	95	24%	240	62%	53	14%	388	365	7	33	40	± 5	22	± 3	16
2014	1,044	22	132	154	31%	249	51%	88	18%	491	559	9	53	62	± 6	35	± 4	22
2015	975	24	128	152	27%	323	58%	81	15%	556	0	7	40	47	± 4	25	± 3	17
2016	841	9	93	102	28%	217	60%	40	11%	359	396	4	43	47	± 5	18	± 3	13

**2017 HUNTING SEASONS
WHISKEY MOUNTAIN BIGHORN SHEEP (BS 609)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
8	1	Sep. 1	Oct. 31	12	Limited quota	Any ram
9	1	Aug. 15	Oct. 15	4	Limited quota	Any ram
10	1	Aug. 15	Oct. 15	8	Limited quota	Any ram
Archery						
8		Aug. 15	Aug. 31			Refer to section 3 of this chapter
9		Aug. 1	Aug. 14			
10		Aug. 1	Aug. 14			

Hunt Area	Type	Quota change from 2016
Total		

Management Evaluation

Current Postseason Population Management Objective: 1,350

Management Strategy: Special

2016 Postseason Population Estimate: ~850

2017 Proposed Postseason Population Estimate: ~850

Management Issues

The post-season population objective for this herd is 1,350 sheep and it is classified as special management. The current objective was originally adopted in 2002. In 2013 the Department conducted an objective evaluation and review including a public meeting. The objective was left at 1,350 following the 2013 review. The herd has been below objective for over two decades following a catastrophic, all-age pneumonia die-off in 1991. The population continues to languish below objective primarily due to low recruitment associated with persistent lamb pneumonia. The Department collected blood samples from 47 sheep in 2012 and 22 sheep in 2014 to document the presence and frequency of various pathogens. In 2015, 20 sheep were

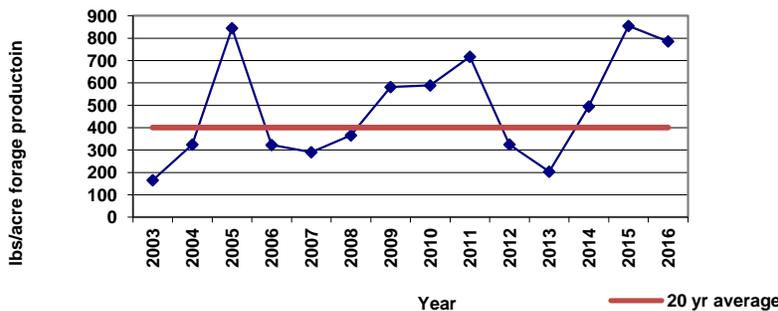
outfitted with GPS collars as part of a 3-year study tracking body condition, lamb production, and overall health of the 20 collared ewes. The monitoring will allow comparisons between ewe health and environmental conditions.

Habitat/Weather

The Whiskey Mountain bighorn sheep herd occupies the northern Wind River Mountain Range. The majority of sheep winter at sites located along the very northern tip of the Wind River Mountains. Some sheep winter at high elevation along the continental divide and scattered throughout the west slope of the mountains. Sheep disperse from the wintering sites to populate the entire northern portion of the Wind River Mountains in the summer and fall. Much of the sheep habitat is located in wilderness areas and remains undisturbed. Important winter range sites in the upper Wind River Valley are part of the Department’s Whiskey Mountain WHMA and are also relatively undisturbed.

Despite protection from development and disturbance, the condition of key winter range throughout this herd unit is still subject to change based on environmental conditions. In 2012 and 2013, sheep range throughout the herd unit was impacted by extreme drought. Casual observations both years suggest vegetation production was quite low at high elevation summer range. Based on data from vegetation monitoring transects, herbaceous production on winter range in both 2012 and 2013 was well below average for the area (Fig. 1). In contrast to the previous 2 years, vegetation production throughout the herd unit was quite good in 2014 and was even higher in 2015 and 2016. In 2016 average production across all monitoring sites on winter range was 786 lbs/acre and well above the 20-year average of 401 lbs/acre. Again, based on casual observations, it appeared forage production was also good at high elevation summer range sites. Body condition of sheep entering winter appeared to be very good. Despite appearing to enter winter in good body condition, preliminary results from monitoring collared sheep in December, 2016 indicate adult ewes in this population continue to have less fat and lower body mass than sheep in other herds.

Figure 1. Annual, herbaceous forage production on bighorn sheep winter range



Field/Harvest Data/Population

Classification data yielded a lamb/ewe ratio of 18/100 in 2015 (Fig. 2). This was the lowest recruitment ratio over the past 10 years. The low recruitment level was corroborated by re-capture of 15 collared ewes in December, 2016. Only 1 of the 15 re-captured sheep had a lamb.

Also concerning was the low sample size obtained during classification surveys. Over the past 5 years, the classification sample has averaged 486 sheep in the herd unit. In 2016, personnel were only able to find 359 sheep. In particular personnel found far fewer sheep than normal in hunt area 10 and the lamb/ewe ratio was remarkably low in the area at 11/100. Reasons for the low recruitment ratios and sample sizes at these sites are unknown as it appeared forage conditions were good throughout the year and environmental conditions were mild. Personnel do not believe a major die-off occurred during the summer or fall since no collared ewes in the herd unit died from unknown causes (one collared sheep was predated by a mountain lion). Despite low recruitment for much of the last 20 years, the ram/ewe ratio has remained fairly stable over that time period. Since 2011 the ram/ewe ratio steadily increased and peaked at 62/100 in 2014 (Fig. 3). The ram/ewe ratio remained exactly the same as in 2015 at 47/100.

A population model developed in 2012 behaved predictably with the addition of data in 2016. For 2016, the TSJ/CA version of the model was selected to track the population. As in past years, this model had a higher AIC value than 2 other models, but it was the only version to produce reasonable population estimates. Both the CJ/CA and SCJ/SCA models produce estimates of less than 500 sheep annually for the past 10 years and show a declining population. Many of the estimates produced by these 2 models are well below the number of sheep personnel classified on a given year. Indications are the TSJ/CA model does a fair job of simulating the population. The model simulates a long, steady decline in the sheep population from the late 1990's through 2010. The population then increased in 2012 and remained fairly stable through 2015. The model indicates a population decline of about 8% in 2016 to approximately 850 sheep.

Harvest success in the herd unit was 64% in 2016 which was essentially the same as the 5-year average of 65%. This included success rates of 75% in hunt area 9, 60% in hunt area 10, and 62% in hunt areas 8/23. It should be noted 3 resident hunters elected to carry licenses over to the 2017 season due to problems associated with the Lava Mountain fire. The average age of rams harvested in areas 8/23 remained essentially unchanged between 2014 and 2016 (Fig. 4). The average harvest age increased in both hunt areas 9 and 10. In area 10 the average age of harvest increased from 6.3 in 2015 to 7.7 in 2016 and was higher than most recent years. The average age of harvested rams in 9 increased from 4.5 in 2015 to 7.4 in 2016. Average age in area 9 tends to fluctuate more dramatically than most areas due to low harvest levels. Overall, the average age of harvested rams does not reveal any significant demographic trend in any hunt areas throughout the herd unit over the past 10 years.

Figure 2. Ten-year recruitment history in the Whiskey Mountain Bighorn Sheep Herd

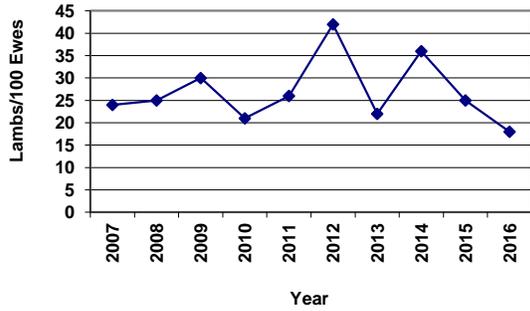


Figure 3. Ten-year history of the ram/ewe ratio in the Whiskey Mountain Bighorn Sheep Herd.

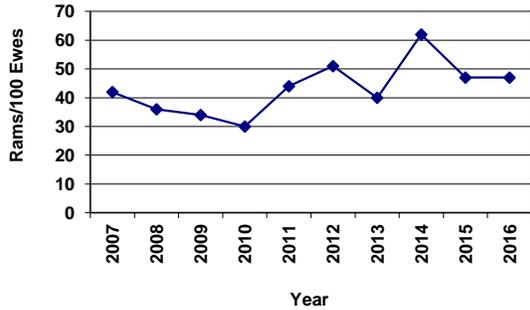
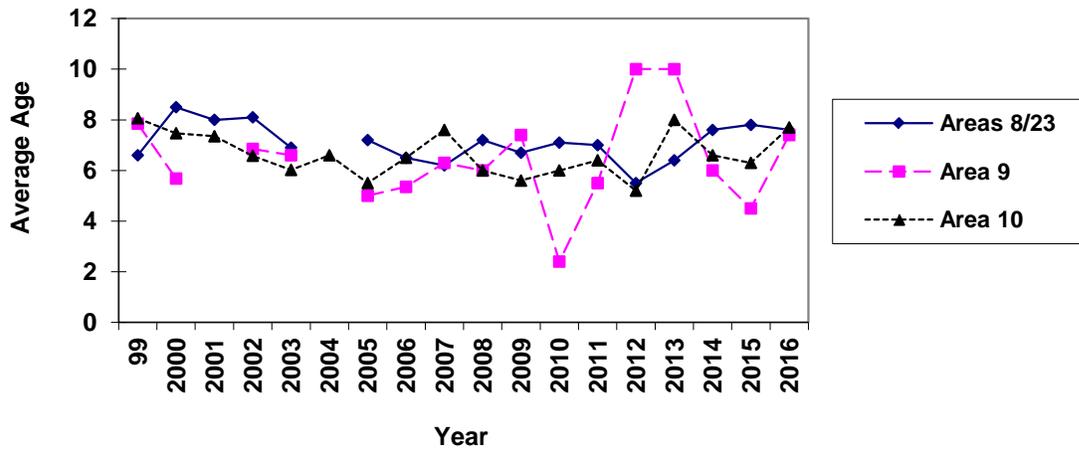


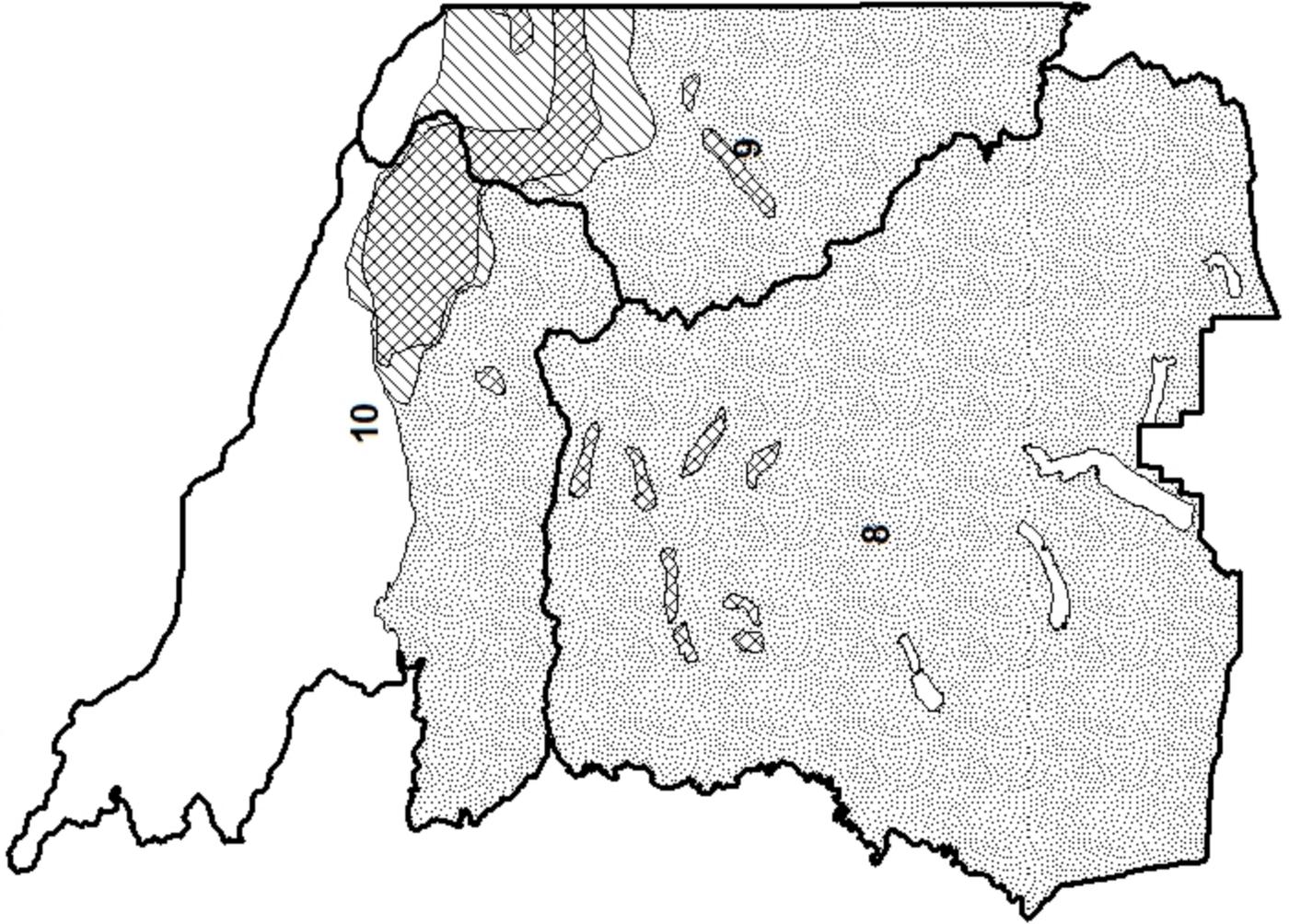
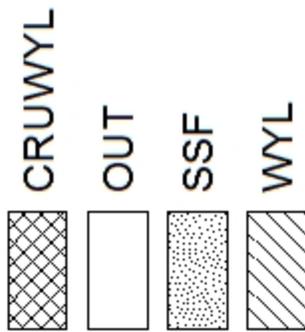
Figure 4. Average age of rams harvested in the Whiskey Mountain Bighorn Sheep Herd.



Management Summary

Overall, indications are this population declined in the past year. The population continues to be below objective. Given indications of a population decline over the past year, but no indication of a decline in ram numbers, license numbers for the 2017 hunting season will remain unchanged. With 24 licenses issued throughout the herd unit and 3 carry over licenses, hunters are expected to harvest 15 rams in 2017. The population is expected to remain stable in 2017 at about 850 animals.

Whiskey Mountain Bighorn Sheep Seasonal Range Hunt Areas 8, 9, 10 Revised 2012



2016 - JCR Evaluation Form

SPECIES: Bighorn Sheep

PERIOD: 6/1/2016 - 5/31/2017

HERD: BS615 - FERRIS-SEMINOE

HUNT AREAS: 17, 26

PREPARED BY: GREG HIATT

	<u>2011 - 2015 Average</u>	<u>2016</u>	<u>2017 Proposed</u>
Population:	70	130	200
Harvest:	1	2	2
Hunters:	1	2	2
Hunter Success:	100%	100%	100 %
Active Licenses:	1	2	2
Active License Success:	100%	100%	100 %
Recreation Days:	3	42	20
Days Per Animal:	3	21	10
Males per 100 Females	83	90	
Juveniles per 100 Females	79	79	

Population Objective (± 20%) :	300 (240 - 360)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-56.7%
Number of years population has been + or - objective in recent trend:	32
Model Date:	None

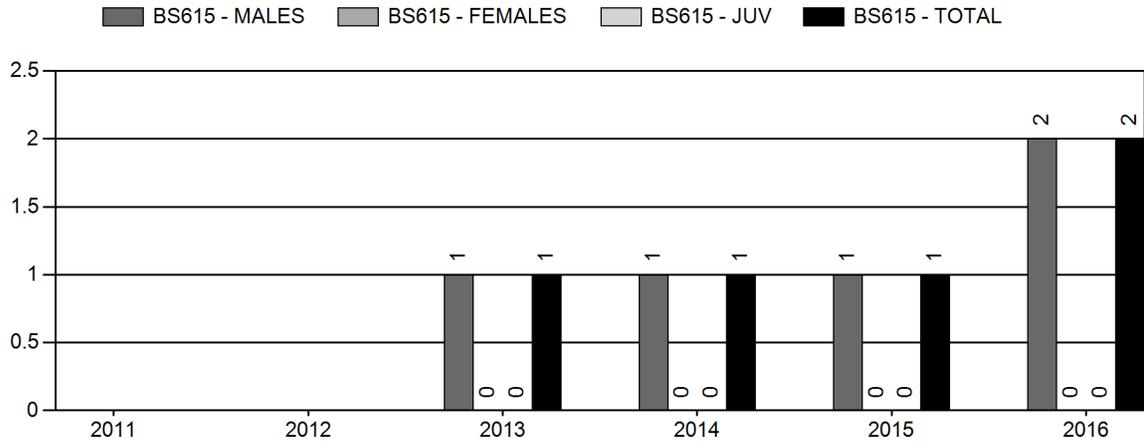
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	0%	0%
Males ≥ 1 year old:	6%	6%
Total:	1%	1%
Proposed change in post-season population:	+50%	+54%

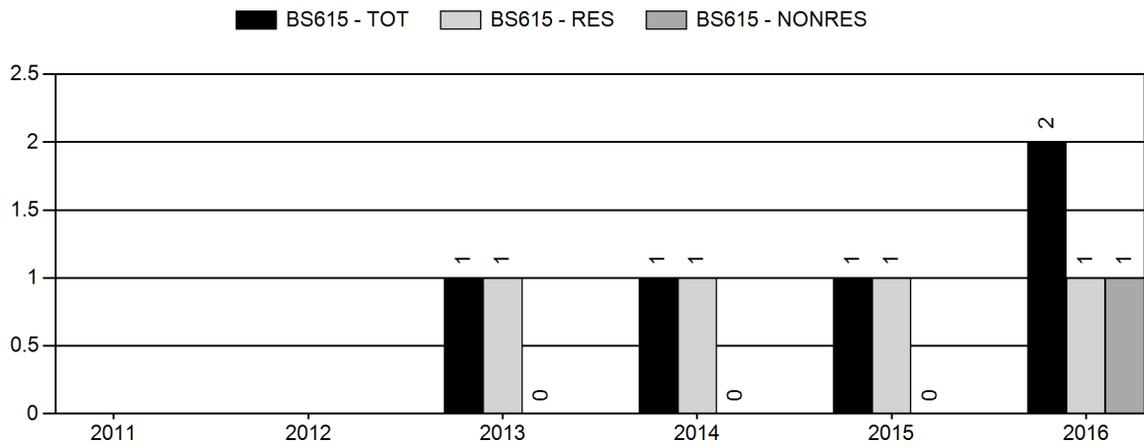
Population Size - Postseason



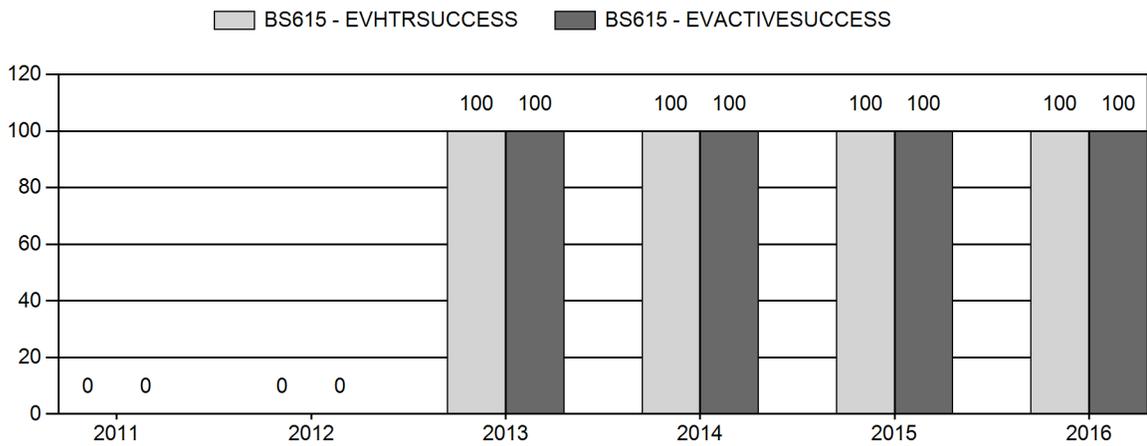
Harvest



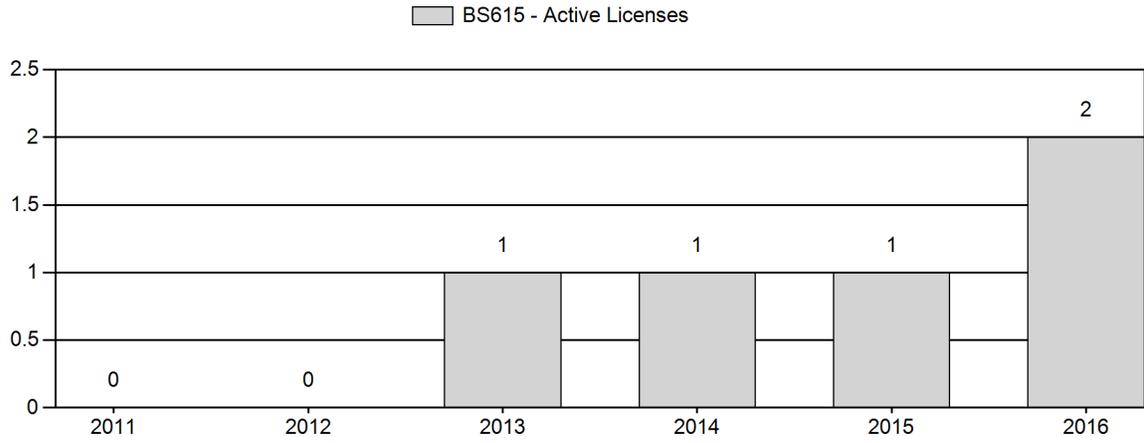
Number of Active Licenses



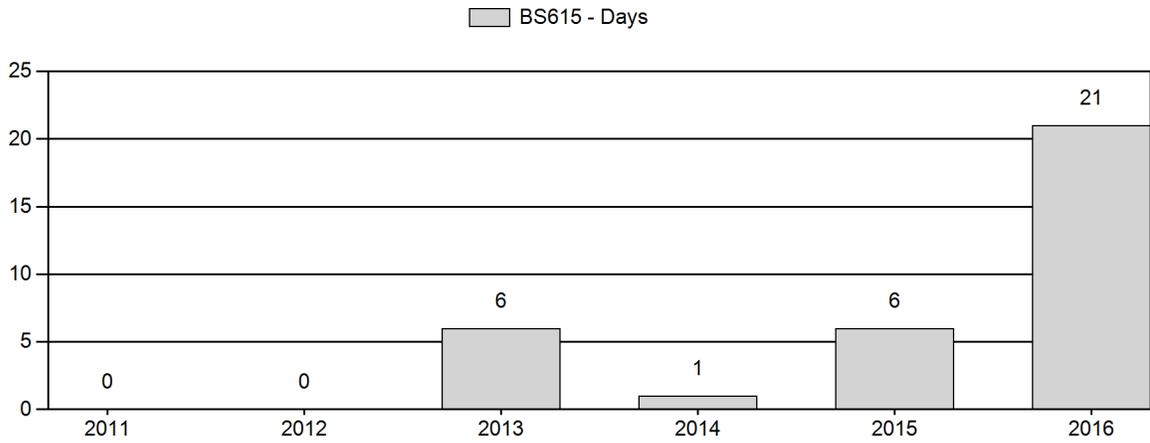
Harvest Success



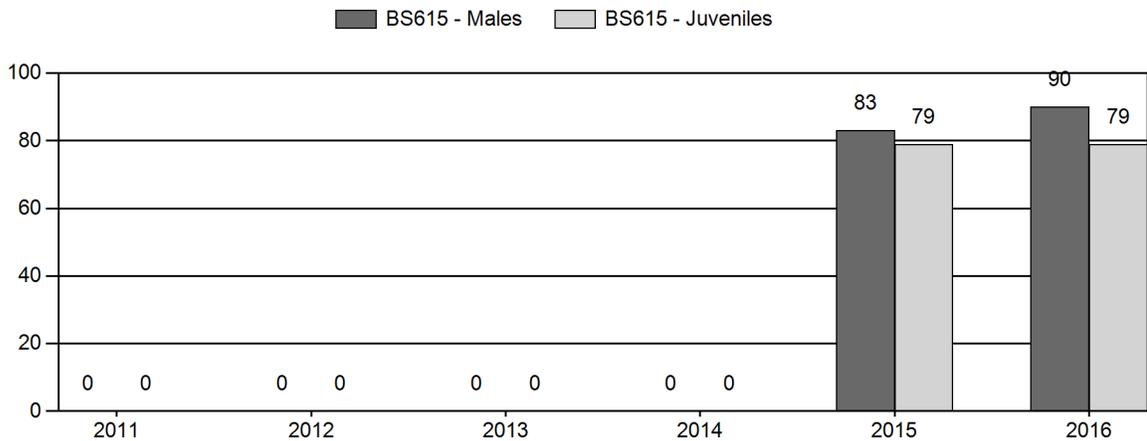
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2011 - 2016 Postseason Classification Summary

for Bighorn Sheep Herd BS615 - FERRIS-SEMINOE

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2011	65	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	± 0	0	± 0	0
2012	65	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	± 0	0	± 0	0
2013	55	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	± 0	0	± 0	0
2014	65	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	± 0	0	± 0	0
2015	100	1	19	20	32%	24	38%	19	30%	63	97	4	79	83	± 20	79	± 19	43
2016	130	0	26	26	33%	29	37%	23	29%	78	0	0	90	90	± 20	79	± 18	42

**2017 HUNTING SEASONS
FERRIS-SEMINOE BIGHORN SHEEP HERD (BS615)**

Hunt Area	Type	Dates of Seasons		Quota	License	Limitations
		Opens	Closes			
17, 26	1	Sep. 1	Oct. 31	2	Limited quota	Any ram (2 residents)
Archery 17		Aug. 15	Aug. 31			Refer to Section 3 of this Chapter

Hunt Area	License Type	Quota change from 2016
17	1	0
Herd Unit Total	1	0

Management Evaluation

Current Postseason Population Management Objective: 300

Management Strategy: Special

2016 Postseason Population Estimate: ~130

2017 Proposed Postseason Population Estimate: ~200

Herd Unit Issues

The management objective for the Ferris-Seminole Bighorn Sheep Herd Unit is a post-season population objective of 300 sheep, established in 1984 and last publicly reviewed in 2016. As with all bighorn sheep herds, management strategy is “special” management.

Bighorn sheep were first reintroduced into the Ferris Mountains in the late 1940's with two small transplants, one of which consisted of desert bighorns from Nevada. Neither produced a viable population. Slightly larger transplants were made into the Seminole Mountains in the 1950's and 1960's, but numbers never increased appreciably. A total of one hundred bighorn sheep from the Whiskey Mountain herd were released on the Morgan Creek Unit in the Seminole Mountains in 1978 and 1980 and, after initial losses and dispersal, a reproducing population was established. Survival of transplanted animals was high, and animals were successfully recruited into the population, but growth rate for the herd was low. To expand the herd's size and range, another 100 bighorn sheep from Whiskey Mountain were released in the Muddy Creek drainage of the Ferris Mountains in January of 1985. Dispersal was high, but roughly 40 to 60 of the sheep remained in the herd unit. As with the Seminole transplant, survival of transplanted animals was good.

Poor lamb survival during summer months was a major problem for this reintroduced herd, in both the Seminoe and Ferris portions, with few yearling bighorns recruited each year. Three summers of intensive monitoring identified poor forage quality as the most likely cause of lamb loss. Few losses to predation were found, with numerous lambs dying untouched on lambing grounds. No herd threatening diseases were identified. The source population for these transplanted sheep was the Whiskey Mountain herd by Dubois, where sheep are adapted to high elevation summer habitats and lambled in the first half of June. In the Ferris and Seminoe Mountains, sheep were in essentially low elevation year-long range where much of the lush spring growth is cured and gone by the time lambs were born. Low recruitment failed to replace natural mortality and the herd steadily declined. By 2003, there were estimated to be fewer than 15 sheep remaining in this population.

Forty low elevation, non-migratory bighorn sheep from Oregon and 12 surplus sheep from the Devil's Canyon herd in Wyoming were transplanted into the Seminoe Mountains in 2009 and 2010. These animals typically lamb 4-6 weeks sooner than the high-elevation migratory sheep brought in from Dubois and lambing appears to be better synchronized with spring green-up for the Seminoe and Ferris habitats. About a half dozen of these sheep established themselves in the Bennett Mountains east of Seminoe Reservoir and have successfully reproduced and recruited young animals. Habitats there appear to be suitable for bighorns, and the herd unit boundary was expanded to encompass the ranges of these animals in a new Hunt Area 26.

Indications are these sheep are reproducing well in the Seminoe and Bennett Mountains, and an additional transplant of low-elevation, non-migratory, early-lambing sheep from the Devil's Canyon herd were released into the Ferris Mountains in February of 2016 to expand their range. The 2011 prescribed natural fire and 2012 wildfire on the eastern end of the Ferris Mountains provide improved habitats for these bighorn, and telemetry shows most ewes making almost exclusive use of those burned habitats, with good lamb production. An additional transplant into the east Ferris Mountains of 22 bighorn from the Devil's Canyon herd was made in February 2017.

Weather

Record precipitation in 2015 produced exceptional vegetative growth, improving lamb survival, and was followed by another wet spring in 2016. High lamb production was seen again in 2016 as a result. Condition of bighorn sheep going into the 2016-17 winter is expected to have been good because of high forage production. The 2016-17 winter had numerous periods of bitter cold with significant snowfall, continuing through February. While winter losses may have been above average, collar data of transplanted sheep did not show any excessive losses.

Habitat

Decades without fire resulted in decadent shrub stands encroached by conifer in this herd unit. Severe drought reduced the quantity and quality of forage in 2012 and 2013. Two browse transects have been established in this herd unit, but one was burned by fire in 2012 and the other was not read in 2016. While no herbaceous habitat transects are established within this herd unit, herbaceous forage production appeared to be exceptional due to the increased precipitation.

Herbaceous production measured on the Morgan Creek WHMA in the Seminole Mountains was exceptionally high in 2015.

Over the past several years the Rawlins BLM has implemented prescribed burns in the Seminole and Ferris Mountains, partly to address conifer encroachment while also rejuvenating decadent mountain mahogany, aspen and bitterbrush stands. In the summer of 2012, two large wildfires in the Seminole Mountains and the eastern Ferris Mountains burned thousands of acres, including occupied bighorn habitat. In addition to opening habitats adjacent to rocky escape cover, the prescribed burns should benefit bighorn sheep productivity with herbaceous cover and return of young vigorous shrub complexes. Forage benefits from the wildfires will be longer term.

The Seminole Fire burned over 3,800 acres in the Seminole Mountains including areas within Morgan Creek WHMA. The Rawlins BLM again coordinated and funded aerial application of Plateau® to inhibit cheatgrass spread on BLM and WGFD managed areas within the fire perimeter. The wildfire enveloped several previously planned prescribed burns, although not with the desired prescriptions. Plans for additional prescribed fires in both the Seminole and Ferris Mountains have been accelerated to take advantage of the secure fire breaks provided by the 2012 wildfire. Current plans call for the use of prescribed fire between Young's Pass and the 2011 and 2012 burn areas on the Ferris Mountains in fall of 2017.

Field Data

Obtaining reliable classification samples from small populations is difficult because, statistically, the majority of the population must be included in the sample to have any confidence in the resulting ratios. These low elevation sheep do not congregate in restricted, well-defined winter ranges like many herds in high mountain valleys, having instead the option to move wherever winds have exposed forage.

Fifty-three bighorn sheep were classified during helicopter surveys for mule deer in December 2016, on the south slopes of the Seminoes and the eastern end of the Ferris Mountains. Another 25 sheep were classified along the north slope of the Seminoes during elk classification flights in early February 2017, yielding a total sample of 78 sheep classified out of an estimated population of 130 animals. The sample did not include any sheep on the south slopes of the Bennett Mountains, which are presumed to number ~15-20 sheep.

Lamb production was exceptional again in 2016, presumably a consequence of the continued precipitation. Twenty-three lambs were found in the classification sample, matching the 2015 lamb:ewe ratio of 79:100. Even if the high ratio is a result of a statistically inadequate sample size, 23 lambs is a significant improvement over the one or two lambs that used to be found in this herd when it consisted of sheep from a high-elevation, migratory source herd. While only three of the sheep in the sample came from the Ferris Mountains, anecdotal reports indicate lamb production was high in that part of the herd unit as well.

Classifications also confirmed 26 rams, for a ram:ewe ratio of 90:100. Again possibly an artifact of the small sample, these data do indicate there are more than enough rams in the herd for the harvest proposed in 2017.

Harvest Data

The resident hunter in this area harvested a 5-year old ram in 2016 while the non-resident harvested a 3-year old ram. The two hunters reported a combined 42 days of hunting, compared to six days by the single hunter in 2015, a single day for the hunter in 2014 and six days for the hunter in 2013. One ram was harvested off the Morgan Creek WHMA, and the other from the crest of the Seminoes on the south side. Of the three rams harvested prior to 2016, two were taken from the ridges on the south face of the Seminoe Mountains, and one came from the north slope of the Seminoes. It is surprising that the two rams harvested in 2016 only averaged four years of age, while quite a few older rams were included in the classification sample.

Population

No model exists for this small herd and with limited classification data, one is not likely in the near future. Current population estimates are based upon limited observations of bands in the Seminoe, Ferris and Bennett Mountains. Based upon known mortality of telemetered bighorns, losses during the 2012-13 winter were probably high, and the herd was estimated to be between 60 to 70 sheep at post-hunt 2014, roughly the same size as after the 2010 transplants. Lamb production was high in 2015 and 2016, and the herd is estimated near 130 animals at posthunt 2016, prior to the 2017 transplant. While lamb production is unlikely to remain at the level seen in 2015 and 2016, recovery of burned areas should improve the quantity and quality of forage available for gestating and lactating ewes and the herd is expected to continue to increase.

Twenty-four low-elevation, non-migratory, early-lambing bighorn sheep from the Devil's Canyon herd near Lovell were released in Miner's Canyon on the east end of the Ferris Mountains on 21 February 2016. All but the single male lamb and one ewe were marked with satellite-uplink telemetry collars. To date, only two ewes have been lost, one to lion predation and the second to apparent physical distress during lambing.

Twenty-two more bighorn sheep from Devil's Canyon were released at the same site in Miner's Canyon on 19 February 2017. Addition of these 18 ewes, 1 male lamb and 3 young rams should raise the herd near 150 sheep, and all ewes were pregnant at capture. Transplant of 18 more sheep was planned for early March, but had to be postponed due to concerns the mortality of a ewe during capture may have been pneumonia related. Days later, tests revealed that was not the case, but the window of opportunity for safe transplant of pregnant ewes had passed. Another ewe died soon after release, and based upon her physical struggles at release was also presumed to be due to capture stress. A third ewe was killed by a lion in April near the release site. If lamb production remains high in 2017, this herd should be approaching 200 animals by posthunt 2017. If feasible, further transplant of sheep from Devil's Canyon into this herd is planned for winter 2017-18.

Management Evaluation

The population was first hunted in 1983, with two rams being harvested by four hunters. Minimal hunts with only four licenses were held each year through 1989, with a total of 21 rams being harvested by 28 hunters. Illegal killing of both rams and ewes was a problem during this period, but decline of the herd was attributed to late lambing of the high elevation sheep used to re-establish this population being asynchronous with plant phenology in these lower mountain

ranges. With better adapted “low-elevation, early lambing sheep” introduced into this herd, that issue appears to be resolved.

Non-consumptive use of this herd is high, particularly in the Seminole Mountains near Seminole State Park and the Miracle Mile. Classification and transplant data indicate there are at least 32 rams available in the Seminole, Ferris and Bennett Mountains, several of which should be nearing true trophy age classes. With these numbers of trophy animals available, 2 licenses are issued again in 2017. To satisfy the 25:75 split between non-resident and resident hunters, both of these licenses need to be issued to a resident.

Opening and closing dates are the same used in this herd during the 1980s, the same as in the past four years and comparable to most other sheep areas in the state. Archery season dates are standard for most areas.

Bighorn Sheep
Ferris (615)
08/1999

