

## **2017 Alpine Rocky Mountain Bighorn Sheep Surveys**

### **Pecos**

The Pecos survey was flown from first light July 24, 2017 through an entire fuel load, the helicopter was ‘topped-off’ at Santa Fe Airport and the Santa Fe Baldy portion was high-graded (i.e., flown quickly, focusing on key areas) with no bighorn observed. As in 2016 the weather and light were exceptional. A total of 277 bighorn was observed in 32 groups in 2.5 hours of observation time for a rate of 111 bighorn/hour. This is a decline from the 2016 survey where 342 bighorn were observed in 53 groups. Only 132 ewes were seen from a potential of 243 observed in 2016 (55%) This compares with the 92 rams observed which is 93% of the observation a year ago (n=99) suggesting that bighorn sheep, particularly ewes were missed rather than died over-winter. The observed lamb:ewe ratio of 38:100 is essentially identical to the mean of the last 3 helicopter surveys (39:100 from 2014-2016). The question of where could there be 80-100 unobserved bighorn ewes/lambs is enigmatic. S. Liley stated there had been a report of a large group of bighorn sheep seen southeast of Rincon Bonito in an area that I do not traditionally fly. We will incorporate that potential habitat in a 2018 survey.

A ewe draw-hunt (30 permits) was initiated in 2017, in response to the high number of bighorn observed during the 2016 survey. A minimum of 12 ewes were harvested (?? of 30 hunters reporting). This equates to ~5% of the bighorn observed in 2016 and 9% of the 2017 observation. Because 2 cohorts of rams (i.e., 1 y.o. and 2 y.o.) are included in the ‘ewe’ total, the percentage harvest is higher. The number of ram permits was increased from 5 to 10 for the 2017 season. A minimum of 9 rams was harvested, with the success of 1 hunter undetermined.

The population estimate is unknown and although it seems unlikely that the 2016-17 winter would have caused such a steep decline in the ewe/lamb component of the population I hesitate to make any new recommendations pending a future helicopter survey.

The current population estimate of 375 (350-400) is slightly above a target of 350 with a 2017 lamb cohort to be born prior to a potential hunt in 2017. Therefore it is our recommendation that the ewe hunt in the Pecos, be opened for the 2017-18 hunt season. This is prior to the quadrennial opening of the Big Game Rule and will require some lead-time relative to SGC Meetings. To harvest 12-24% (~25-50 ewes) of the 2017 ewe population will require ~62 permits which is the total Rocky Mountain ewe allotment statewide. Simultaneously, we recommend cessation of the ewe hunt in the Latir and will not hunt or trap ewes in Wheeler Peak. However, in 2018 we may require ewe hunts in all 3 alpine populations, and perhaps Rio Grande Gorge as well—which presently has no ewe hunt on the books. Therefore the total number of ewe permits permissible and the locations in which ewes may be harvested needs to be increased in the next rule cycle. We recommend distributing ewe hunters across multiple ewe hunt periods to distribute the pressure. We are working under the assumption that ewe hunters in the Pecos will spatially self-regulate. However, pressure is likely to be greatest in locations that are

easiest to access. Subpopulations of ewes in the Pecos may not rapidly provide demographic support to overharvested subpopulations. To address some of this we can send a letter to all Pecos ewe hunters with a list of all possible trailheads. To understand how this management action is working we need to require mandatory bighorn harvest reporting (including location harvested).

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The conservative harvest of 10 rams, equates to 10% of all rams observed, 21% of observed CIII/CIV, and 3% of a population estimate of harvest, during the last decade as this population has recovered, will allow for an increase in the number of ram permits for the 2017-18 season. Our recommendation is to increase the total to 10 permits in 2017-18. This number is liberal based on total bighorn (2.6% vs. 2.5%) but conservative based on the number of CIII and CIV rams (19% vs. 25%).

Table 1. Bighorn sheep observed in the Pecos Wilderness 2008-2016.

Year	No. Groups	Total	Adult 'Ewe'	Yrlg. Ewe	Lambs	Class I	Class II	Class III	Class IV	Total Rams
2008s		121	53		16	4	10	19	19	52
2009s	19	98	47		14	5	4	15	11 (1)	36
2010w	12	85	39		5	1	9	19	12	41
2010s	14	103	48		17	4	7	11	16	38
2011f		122	49	9	19	17 (7)	8	14	6	45
2012s	20	118	69		10	4	8	10	17	39
2013f		126	51	6	38	10	4	6	4	24
2014s	23	218	118		47	7	17	9	20	53
2014f	11	122	51	8	29	13 (6)	4	6	6	29
2015s	43	252	119		45	13	22	18	31	88
2015f		189	90	16	43	19 (11)	6	6	9	40
2016s	53	342	171	3	69	28	18	18	35	99
2017s	32	277	134		51	7	36	26	23	92

### Wheeler Peak

There was no helicopter survey flown in 2017 because of weather conditions. A 1-day ground census was conducted by ER and CR on August 15th, 2017. High wind, which subsided late in the survey, made for less than ideal conditions. A total of 182 bighorn was observed in 22 groups in 1.3 hours of observation time. The observation rate was 137 bighorn/hour. The lamb:'ewe' ratio was 51:100 (37:72) during the helicopter survey and 48:100 during a ground survey. In the non-Goldhill portion of the range the ratio was 32:100 (22:38). Although the number of bighorn seen is higher than last year (182 vs. 142) bighorn on the Taos Pueblo are never surveyed during helicopter flight. Only a single ewe was seen in the vicinity of the La Cal trap site which is unprecedented.

On Goldhill, 2 marked-ewes from Red River Valley (RRV) were observed during a ground survey on July 12th and 1 eartagged ram was observed during the helicopter survey. Therefore ~19 marked bighorn were not observed. These sheep were likely in the RRV but it is possible that they were missed during the helicopter survey. An analysis of the GPS data by Arcadis biologists should shed some light on the distribution and landscape use of these sheep.

NMDGF did not salt the La Cal trap site but instead salted the Fraser Mountain site on private land in 2015 and 2016. The objective for this herd is ~300-325, at which point a

trap is necessary. With a population estimate of just 230-275 we do not propose a trap or a ewe hunt for 2017.

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Table 2. Bighorn sheep observed in the Wheeler Peak Wilderness 2008-2017.

Year	No. Groups	Total	Adult 'Ewe'	Yearl. Ewe	Lambs	Total Rams	Class I	Class II	Class III	Class IV	UNID Ram
2008		216	112		35	69	10	38		21	
2009	32	155	60		32	59	3	17	18	21	
2010*	17	136	49		18	69	1	9	22	26	11
2010**		221	72		27	122	9	24	39	37	13
2011***		252	82	10	44	122	20	33	39	24	
2012*	25	184	78		33	74	10	22	13	28	
2014*	28	217	114		37	66	8	13	24	15	
2015*	24	142	63		17	62	7	14	11	23	7
2015g	16	71	33	3	5	21	7	6	5	3	9
2016g	12	102	43	5	23	31	3	8	11	9	
2016*	22	182	72		37	73	12	17	16	28	
2017***											

\*USFS side helicopter only

\*\*Includes ground survey data from Taos Pueblo and USFS/private lands.

\*\*\*No helicopter survey this year

### Latir

This survey was flown also cancelled on July 25<sup>th</sup>, 2017, however I was able to reschedule this at the end of the elk surveys on October 5<sup>th</sup>, 2017. A total of just 34 bighorn sheep, 26 'ewes', 4 lambs, and 4 rams was observed in 49 minutes for an observation rate of 42 bighorn sheep/hour. The lamb:'ewe' ratio was 15:100 from the helicopter and 18:100 from the ground survey conducted July 9, 2016. The count on the ground survey was 42 total with 22 ewes, 4 lambs, 15 rams and 1 unknown sheep.

The low lamb:ewe ratio is concerning, especially because there was a relatively mild winter coupled with the lowest population density in years. There was no evidence of coughing bighorn during the ground survey. One hunter (R. Payne), reported 26 rams and ~60 ewes and lambs which is substantially more than either of the 2 NMDGF surveys. We will continue to monitor this herd closely in the coming year.

A minimum of 14 ewes was harvested during the 2015 rifle and archery season. If we simulate the population and take the 43 ewes seen during the 2015 ground survey, plus ½ the 18 lambs there would be 51 ewes, minus 14 harvested, would result in a total of 37 ewes remaining (of which we only saw 26 during the helicopter survey). Based on the Payne observation, 37 ewes with 20 lambs would equal the ~60 ewes and lambs reported. It appears that the hunting pressure on both rams and ewes has made these bighorn much less visible likely because they are using the edge of the timberline. The 2016-17 rifle ewe hunt extends until February 25, 2017. It is also possible that some ewes may be killed in the Red River corridor.

Table 3. Bighorn sheep observed in the Latir Wilderness, July 2009-2017.

Year	No. Grp.	Total	Adult 'Ewe'	Lambs	Class I	Class II	Class III	Class IV	Unk
2009	7	62	43	19					
2010	10	84	39	21		2	15	3	
2011		108	53 (5)	23	13		13	6	
2012	10	70	41	17	1	4	2	5	
2014	9	73	43	11	2	4	5	8	
2015g	5	84	43	18		5	11	5	2
2015h	5	48	29	14		1	1	3	
2016g	7	42	22	4	5	2	6	2	1
2016h	5	34*	26	4		1	1	2	
2017g									
2017h									

\*26 rams and ~60 ewes and lambs reported by Payne hunter

### Culebres

A helicopter survey was flown July 25, 2017, just before weather conditions deteriorated resulting in the cancellation of the Wheeler Peak and Latir surveys. Forty-two bighorn were observed in 3 groups (Table 4). A ground survey was conducted on August 3rd, 2017. The total includes bighorn observed the night prior to the survey by L. Bernal and assumed to have been missed, and 7 bighorn seen at distance by L. Vigil that were not classified. This was the most bighorn confirmed in this herd (Table 4). The lamb:ewe ratio was 36:100 in the helicopter survey and was also 36:100 in the ground survey using all yearlings in the denominator. For just adult ewes the lamb:ewe ratio was 57:100.

Table 4. Bighorn sheep observed in the Culebres Mountains 2010-2017.

Year	Groups	Total	Adult 'Ewes'	Yearl. Ewes	Lambs	Class I	Class II	Class III	Class IV
2010	2	14					7	5	2
2011	3	17	7		3	2	3		2
2012	2	15	8	2	2	3			
2013	1	27	19		7	1			
2014	2	35	25		8	1	1		
2015h	3	17	12		5				
2015g	3	12	5		1	1	5		
2016h	3	42	25		9	2	2	2	2
2016g	7	44*	14	7	8	3 (2)	1	2	
2017h									
2017g									

\*total includes 7 unidentified bighorn

### Jemez

The Jemez herd was established August 2014 with the release of 45 bighorn sheep. There was no complete survey conducted in 2015. Therefore the ground survey conducted on June 20, 2016 was the best count since the original release. A total of 55 was observed and 6 additional sheep were accounted for. These included 2 radiomarked CIV rams, 2 ewes that were heard with radio-telemetry but not observed, and 2 yearling rams that were captured on a camera in Bandelier National Monument a week prior to the survey. Therefore the minimum count was 61, including 3 rams added in 2016. A group observed in lower-Cochiti Canyon was never completely seen and therefore sheep were almost certainly missed in this group. The lamb:ewe ratio was 46:100 excluding this group. Four bighorn ewes with GPS radiocollars have died since the original release. The 2 CIV rams captured in August 2014 were culled by sport hunters in late-August to avoid breeding female 2-year-olds that they would have sired during the winter 2014-15.

Table 5. Bighorn sheep observed in the Jemez Mountains 2014-2016.

Year	Groups	Total	Adult 'Ewes'	Yearl. Ewes	Lambs	Class I	Class II	Class III	Class IV
Aug '14	Original	45	23	3	10	2		1	1
June '16	61	61	27	2	15	7	3	4	3

### Red River Valley

During a dart capture in late-March, 65 unreplicated bighorn sheep were observed and 5-10 rams seen subsequent to the operation, were missed. A minimum of 3 bighorn were killed by road-strike this spring for a total of 7-8 bighorn sheep that have been killed since August 2015. Three rams (2, 2-y.o. and 1 mature ram) were darted and released in the Jemez population. We are awaiting analysis of the GPS radiocollar data from Arcadis (environmental contractor for the Chevron mine). These data will provide daily locations from February 2015 to February 2016. In the combined ground and helicopter survey of Goldhill, only 3 of potentially 23 marked bighorn sheep were observed. This suggests that a large proportion of these bighorn now spend most or all of the year in the Red River Valley. An ear-tagged ewe was reported to have been killed by a mountain lion on the Questa Mine during summer 2016.

Table 6. Summer lamb:ewe ratios and population estimates for Rocky Mountain bighorn sheep populations in New Mexico, 2016.

Herd	L:E (lambs/100 ewes)	Population Estimate
Pecos	40:100 (69)	350-400
Wheeler Peak	51:100 (37)	230-275
Latir	15:100 (4)	85-100
Culebres	36:100 (9)	45-50
Rio Grande Gorge		300-330
Dry Cimarron		125-150
San Francisco River		75-90
Turkey Creek		20-25
Manzanos		40-45
Jemez	46:100 (15)	60-75
Red River Valley		80-100
Totals		1410-1640 Midpoint=1525