2019 Alpine Rocky Mountain Bighorn Sheep Surveys + 1ˢᵗ Jemez Survey

Pecos

The Pecos survey was flown from first light July 16, 2019 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 6 rams observed. At least 4 of these rams had been photographed the previous week on Penitente Peak. This is likely the largest group of bighorn ever observed in this portion of the habitat. A total of 289 bighorn was observed in 41 groups in 2.7 hours of observation time for a rate of 107 bighorn/hour. This is a decline from the 2018 survey where 324 bighorn were observed. This decline of 35 is primarily accounted for by a decline of 38 lambs compared to 77 in 2018 and the minimum harvest of 20 (11 ewes and 9 rams). Despite the ewe harvest and a relatively severe winter the majority of the mortality appears to have been in the lamb and yearling cohorts. The observed lamb:ewe ratio of 23:100 is the lowest since 2007.

A ewe draw-hunt (30 permits) was initiated in 2017 and was conducted in 2018 as well. A minimum of 13 ewes was harvested (13 of 20 hunters reporting—65% success rate). This equates to ~5% of the 'ewes' observed in 2016 and ~10% 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 of ewes harvested is underestimated.

The harvest of 10 rams, equates to 12-15% of all rams observed, 20-25% of observed CIII/CIV, and ~2.7-3.0% of the mean population estimate based on the 2018 and 2019 helicopter surveys.

Table 1. Bighorn sheep observed in the Pecos Wilderness 2008-2019.

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
2018s	34	324	178	1	77	13	15	12	28	68
2019s	41	289	167		38	13	21	18	32	84

s) spring; f) fall; w) winter

Wheeler Peak

The 2019 helicopter survey data are reported and then combined with bighorn considered additional based on notes of hunter J. Mouttet (JM) that scouted for 15 days. This survey was flown the morning of July 17th. In 1.4 hours of observation time, 176 bighorn were observed in 23 groups for an observation rate of 126 bighorn/hr. The fidelity of bighorn to the Goldhill portion of the range warrants the addition of sheep seen by JM. In the helicopter there were 28 rams observed versus 39 by JM. Therefore we have added 11 rams to the total. We only saw 12 ewes and a single lamb versus 42 ewes and 22 lambs seen in a single day by JM. Therefore we have added 30 ewes and 21 lambs to the total. In the Wheeler complex we saw 23 rams in the CII-CIV size class versus 47 counted by JM. Therefore we've added 24 'mature' rams to the total.

Table 2. Bighorn sheep observed in the Wheeler Peak Wilderness 2008-2019.

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***		133	77	5	32	19	10	3	6		
2018	21	174	81		33	60	18	11	11	20	
2019	23	176	96		14	61	14	5	10	23	(9) +5
2019****	n/a	262	126		35	96	14	73 combining 3 classes			5?

*USFS side helicopter only
**Includes ground survey data from Taos Pueblo and USFS/private lands.
***No helicopter survey this year
****Totals w/ hunter J. Mouttet observations included

Latir

This survey was flown after the Wheeler Peak survey on 7/17/19. A total of 55 bighorn sheep was observed, including 21 rams versus 12 rams seen in last year's survey. The entire survey was flown in 35 minutes (0.6 hr). A ground survey was conducted on 8/29/19 via Latir Lakes (RCCLA access). We found 27 ewes versus 33 from the helicopter and no rams. The lamb:ewe ratio was 3:100 from the helicopter with just a single lamb and 26:100 from the ground survey with 7 lambs observed. Fifteen CIII and CIV rams were observed from the helicopter with one CIII harvested post-survey. Three

rams were seen above the Latir lake campground. The minimum known population was 61.

The low lamb:ewe ratio for the fourth year in a row is concerning, although 7 lambs seen in 2019 is the best since 2015. Between 2009 and 2015 we documented an average of 18.2 lambs during the surveys. The mean the last 4 years is 4.8. There has been no evidence of coughing bighorn during the ground survey the last 4 years.

Because just 4 CIII/CIV rams were known following the 2018 hunt, the number of permits was reduced from 2 to 1 for the 2019 season. However, the higher number of rams observed during the helicopter survey justify increasing the number of permits for the 2020 season. The standard metrics would be ~2 permits based on 10% of all rams or ~4 permits based on 25% of CIII and CIV rams.

Table 3. Bighorn sheep observed in the Latir Wilderness, 2009-2019.

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		43	30	3	2	7		1	
2017h	5	43	18	5	2	7	6	5	
2018h	5	43	28	3	2	4	3	3	
2019h	7	55	33	1	2	4	8	7	
2019g	1	36	27	7	2				

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

Culebres

A helicopter survey was flown July 17, 2019. Thirty-eight bighorn sheep were observed (Table 4). A ground survey was conducted on August 3rd, 2017 and increased the observed number to 63 and several additional mature rams were observed in the fall. This was the most bighorn confirmed in this herd (Table 4). The lamb:ewe ratio was 28:100 in the helicopter survey and was 66:100 in the ground survey using all yearlings in the denominator. The addition of 3 adult ewes from the helicopter survey resulted in 14 more lambs. The 2 potential explanations are that different ewes and lambs crossed over or lambing occurred after the helicopter survey on July 25. For adult ewes the lamb:ewe ratio was 75:100.

Table 4. Bighorn sheep observed in the Culebres Mountains 2010-2019.

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	4	38	25		7	1	0	5	0
2017g		63	28	4	21	1	3	1	
2018h	4	52	31		18	1		1	1
2018g		50	33		16	1			
2019h	4	48	32		15	1			
2019g		48**	22	4	10	5	2	1	1

*total includes 7 unidentified bighorn
**total included 3 unidentified bighorn

Red River Valley

This herd was not surveyed and the population status is unknown. Table 6 continues to use the 2017 estimate of 60-80.

Table . Summer lamb:ewe ratios and population estimates for Rocky Mountain bighorn sheep populations in New Mexico, 2019.

Herd	L:E (lambs/100 ewes)	Population Estimate
Pecos	23:100 (38)	310-360
Wheeler Peak	28:100 (35)	265-300
Latir	3:100 (1)	60-75
Culebres	47:100 (15)	55-60
Rio Grande Gorge	*	410-455
Dry Cimarron	*	170-190
San Francisco River	*	75-90
Turkey Creek	*	30-35
Manzanos	*	65-85
Jemez	36:100 (20)	140-160
Red River Valley	*	60-80
Totals		1640-1890

		Midpoint=1765

- ** Did not survey in summer2019*