

Fall 2015 Synopsis: Bighorn sheep helicopter surveys in the San Andres, Caballos, Fra Cristobals, Big Hatchets, and San Francisco River/Double E

Helicopter surveys took place from October 24-29, 2015. Caitlin Ruhl and Nicole Quintana were the NMDGF observers and Earl Watters the pilot for all surveys. The San Andres survey was a cooperative effort with WSMR and SANWR. The Fish and Wildlife Service funded a second helicopter and also supplied the three additional observers Mara Weisenberg, Gilbert Villegas, and Pat Mathis. The weather was ideal for almost the entire week and caused no serious interruptions in survey efforts. Good weather conditions permitted long flight times on every survey.

SAN ANDRES--10/24/15 & 10/25/15

The San Andres survey was last flown in 2012. Cooperative weather allowed for the longest flight time in decades of surveying. Two helicopters surveyed for a combined 17.85 hours on October 24th and 25th. C. Ruhl and G. Villegas (WSMR) flew with pilot E. Watters, while N. Quintana, M. Weisenberg/P. Mathis were observers with pilot Cam Stallings. This survey resulted in a total of 174, the most bighorn ever seen in a San Andres helicopter survey. The estimate for this population is 180-220. The largest group of bighorn observed included 18 animals and the average group size was 3.22. Crews saw a total of 54 groups. The ram:ewe:lamb (R:E:L) was 89:100:14.

Five collars were observed by helicopter crews. There are 5 functioning radiocollars on the SANWR, but an unknown number of nonfunctioning collars on live animals. At least one radiocollar observed was nonfunctioning, making the mark-resight estimate 4 of 5 at best. The observed L:E ratio was low. It should be noted that there was wide variation in lamb size. One lamb observed was estimated at 2 months old or younger. This diversity of lamb appearance may have complicated identification. If we were to add all female yearlings and a comparable number of Class I rams assuming they were actually the oldest of the lamb crop, L:E would be 25:100.

Crews flew 18 out of 21 survey blocks compared to 13 in 2012, 10 in 2008, and 7 in 2007. At first glance, the increase from 102 bighorn observed to 174 in a period of 3 years seems improbable (that would mean a 20% increase each year). However, there were 5 blocks surveyed in 2015 that were not surveyed in 2012, resulting in an additional 26 bighorn. When only comparing blocks flown in both surveys, there were 148 bighorn (2015) compared to 102 (2012). This difference results in a rate of increase around 13%. Recognizing that this is a rudimentary interpretation of the data, the observed increase in raw count seems more credible in this context and demonstrates the significance of longer survey time.

Important notes on distribution include that 11 bighorn were found on Sheep Mtn. in Block 20 and 26 bighorn were seen from units 8-11. These blocks are not currently included in the hunt area. The bighorn observation rate was 9.7 bighorn sheep/hour.

While ram harvest could certainly be increased based on numbers alone, the unique logistical factors involved in hunting this range must be considered. Results from this survey will be highly valuable as we move forward with partners from SANWR, and WSMR in the management of the San Andres bighorn. The numbers from this survey exceeded expectations and provide the opportunity to explore increased management and research opportunities.

Table 1. San Andres surveys 2007-2015

Year	Total	Ewes	Y. Ewes	Lambs	CI	CII	CIII	CIV	Total Rams	Type/Time
Aug 07	72	36		12	4	4	12	4	24	A (7.6)
Oct 08	73	31	5	9	6	8	11	3	28	A (12.6)
Dec 09	69	32	3	12	4	3	10	5	22	G
Oct 10	115	44	8	15	8	14	15	11	48	
Oct 12	102	56	2	11	1	10	7	15	33	A (15.8)
Oct 15	174	81	4	12	7	20	19	30	76	A (17.9)

Table 2. All blocks flown in 2015

San Andres		Females			Males										
Block	Tot	A	Y	U	Juv	I	II	III	IV	U	# Groups	Or yx	Jav	Survey Time (hrs)	Pilot
<u>1</u>	73	37	1		5	2	11	2	14	1	15			1.95	EW
<u>2</u>	18	11			0			2	5		5			1.73	EW
<u>3</u>	10	4	1		1		3	1			5			0.92	CS
<u>4</u>	17	8			2	1		4	2		8		4	1.68	EW
<u>5</u>	5	1	1				1	2			3	2	4	0.62	CS
<u>6</u>	6	4				1		1			3	11		0.67	CS
<u>7</u>	0										0	3		0.35	CS
<u>8</u>	3	1			1		1				2			0.98	CS
<u>9</u>	8	5			1	1	1				2	18		1.87	EW
<u>10</u>	13	4				2	1	5	1		3			0.83	CS
<u>11</u>	2	1						1			2			0.67	CS
<u>13</u>	0										0			0.67	CS
<u>14</u>	4	2			1				1		2	14		0.65	CS
<u>15</u>	4							1	3		2	1		1.9	EW
<u>17</u>	0										0	10		0.4	EW
<u>18</u>	0										0			0.37	CS
<u>19</u>	0										0	15		0.52	CS

20	11	3	1		1		2		4		2			1.08	EW
TOTS	174	81	4	0	12	7	2	19	30	1	54	74	8	17.85	

CABALLOS AND FRA CRISTOBALS—10/26/2015 & 10/27/2015

The desert bighorn censuses in the Caballos and Fra Cristobals occurred on sequential days. Record numbers (during bighorn surveys) of bighorn sheep were documented in both mountain ranges.

CABALLOS—Survey time in the Caballos was 6.38 hours. The total number of bighorn seen in the Caballo survey was 115. The bighorn sheep observation rate was 18 per hour. Throughout the survey 30 groups were seen for an average group size of 3.83. The largest group observed had 15 bighorn. R:E:L was 102:100:28. More than half of the bighorn documented were seen on Redhouse Mountain, at the southern end of the Caballo range. Sixty bighorn were observed in this area, including 25 rams. These findings are also supported by Tyson Hatch, an experienced bighorn guide that identified 25 rams and had seen 58 bighorn on Redhouse. Given the corroboration between air and ground observations we believe that the detection of bighorn was better than the standard index of 78%, although this value is encompassed in the upper portion of the estimated range. The population estimate is 125-150.

Four collared bighorn were identified during the survey. However, there is currently only 1 functioning collar (this ewe was observed). Seven collars stopped working this year and were last heard in April. Other additional non-working collars are potentially present. Given the uncertainty of the number of collars on live sheep, a mark-resight estimate would be entirely speculative. The bighorn observation rate was 18.0 bighorn/hour

Public draw permits could potentially be increased from 3 to 4 for the 2016-2017 license year. However, this decision should be evaluated after this year’s hunt. Thus far, hunters (both public and auction) have had difficulty finding “trophy” rams. Management objectives relating to hunt quality will be carefully considered in this decision making.

Table 3. Caballo surveys 2010-2015

Year	Total	Ewes	Y. Ewes	Lambs	CI	CII	CIII	CIV	Total Rams	Type/Time
Nov 10	60	18	3	16	3	10	7	3	23	G
May 11	50	21	6	10	2	2	7	5	16	A (3.8)
Nov 12	93	37	4	18	4				30	G
Oct 13	85	34	3	13	9	8	9	9	35	A (5.8)
Oct 14	67	30	1	7	2	7	9	11	29	A (5.4)
Oct 15	115	48	2	14	3	18	10	20	51	A (6.4)

FRA CRISTOBALS— Five ground observers from NMRPI were present in addition to the NMDGF helicopter crew. This includes C. Kruse, H. Prude, M. Keeling, E.D. Edwards, and

Dan. A total of 221 desert bighorn were observed and 6 collared sheep out of 7 known functioning collars were seen from the helicopter. The ground team observed 62 sheep and 3 collars. The survey documented 43 groups and an average group size of 5.14. The largest group had 35 bighorn. The observation rate of 42.2 bighorn/ hour is more than double the next highest observation rate during this week of surveys. The estimated size of this population is 230-260. The upper end of the estimated range encompasses the mark-resight estimate (85%). Air and ground crews felt positive about coverage on the mountain and sightings as well as non-sightings correlated well between ground and air crews.

A survey of this population had been conducted 5 months prior in May 2015. In comparing notes the only addition is in the ewe column (36 added), otherwise all other classes are similar. The R:E:L was 58:100:28. Additional observations include that some portion of lambs was young enough to have been born since the May 2015 survey.

The number of ram permits for the Frases will likely remain at 12 for the 2016-2017 license year. Based on the minimum counts from this survey, this level of harvest (*in italics*) will be above general western state standards: % of Total (1.3-3.5%)—*5.4%* ; % of All Rams (7-12 %)—*17.6%* ; % of CIII & CIV Rams (20-30%)—*33%* (WSF 2007)¹. While these levels are higher than the average measures, they will not be harmful to population health and a more liberal harvest will provide increased hunter opportunity.

Table 4. Fra Cristobal surveys 2011-2015

Year	Total	Ewes	Y. Ewe	Lambs	Unk	CI	CII	CIII	CIV	Total Rams	Type/Time
May 11	190	68	7	27		25	20	18	25	88	A (3.8) G
May 12	72	26		24	10	2	6		4	12	G(8)
May 13	111	53g	6	26	5	6	4	10	1	22	G (17)
Oct 13	201	76	16	24	3-4	18	31	14	18	81	A (6.1)
May 14	354	140	13	70		19	37	51	24	131	G
May 15	193	72	8	31	1	15	21	28	17	81	A (5.4) G
Oct 15	221	108	10	34	1	10	22	14	22	68	A (5.4) G

¹ Wild Sheep Foundation (WSF), 2007. Ram Harvest Strategies for Western States and Provinces. Biennial Symposium of Northern Wild Sheep and Goat Council, 16:92-98.

BIG HATCHETS--10/28/2015

This was the first census conducted in the Big Hatchets since the transplant of 66 bighorn in November 2014. A total of 99 bighorn was documented in 23 groups for an average group size of 4.3. The largest group size was 13 bighorn. The survey time was 6.42 hours. The R:E:L (68:100:30) was similar to the observed ratio in 2014. Sightability in the Big Hatchets seems lower than other desert bighorn ranges in NM due to terrain complexity, size, and this survey's low mark-resight estimate. The subsequent estimate for the Big Hatchets is 120-150.

Marked animals seen included 26 collared bighorn. We suspect there to be 46 collared bighorn in the Big Hatchets so adding the 20 missed (11 ewes/9 rams) results in a minimum count of 119. The Big Hatchet terrain requires the survey to be flown faster compared to other ranges, and the light brown collars on recently transplanted sheep were less conspicuous than older colored collars, so it is possible that we failed to detect collars on observed bighorn. However, according to last year's count and transplant records, rams were likely missed in 2015.

We knew of 58 rams as of November 2014 (includes rams observed in Oct. survey and rams added in Nov.). After factoring in known losses we would expect to see around 48 (20 collars), but during this survey only detected 34 (11 collars). Recognizing that mortality amongst uncollared rams is unknown, these results affirm that 9 collared rams were missed. Although there hasn't been evidence of significant movements of sheep between the Little and Big Hatchets it has been known to occur. Typically these surveys are flown back to back, but due to a drinker installation project this spring in the Little Hatchets, the surveys for the Little and Big Hatchets were flown separately. If bighorn had moved north to the Little Hatchets between surveys they would be unaccounted for.

As the Hatchets have historically been a range with trophy quality desert rams, a continued conservative harvest strategy seems pertinent. It is recommended that permits remain at 6 for 2016-2017.

Table 5. Big Hatchet surveys 2010-2015

Year	Total	Ewes	Y. Ewes	Lambs	CI	CII	CIII	CIV	Total Rams	Type/Time
BHJun10	57	22		11	2	4	7	12	25	A(3.5)
BHMay11	47	12	4	9	6	1	9	6	22	A (4.4) 15 fr RR/FC 13e2r
BHOct12	71	27		13	4	8	6	13	31	A(5.1)
BHOct13	51	21	2	1	9	5	6	7	27	A (5.7)
BHOct14	47	18	1	6	3	9	4	6	22	A (4.4)
BHNov14	113	46	1	6					58	Transplant 66 (40FC/26RR)
BHOct15	119*	47	3	15	2	7	6	19	34	A (6.4)

*99 observed+20 missed collars

SAN FRANCISCO RIVER AND DOUBLE E—10/29/2015

SAN FRANCISCO-- The only exception to a week of great weather was the overcast skies and a light rain that occurred for the first 20-30 minutes of the San Francisco River survey. The survey was flown in 3.22 hours and 47 bighorn were observed for a rate of 14.6 per hour. Fifteen bighorn was the largest group size. This total was higher than 2011-2013 surveys although not near the 72 observed last year. The R:E:L ratio was 87:100:19. The estimated population size is 50-75.

For the first leg of the survey (Alma Box to Sundial), 6 of 7 groups were seen on the west side of the river. Several of those groups were found in P:J country that would not be described as open. As in most years, the portion between the confluence of Big Dry and the state-line was flown on a ‘high-grade’. We observed 15 bighorn near the state line (one group of 12). Two collars were observed during this survey, but they are non-functioning.

Although this year’s harvest of San Francisco and Turkey Creek has yet to occur, the number of rams seems sufficient enough to allow another year of harvest at the same level of 2 permits.

Table 6. San Francisco River surveys 2010-2015

Year	Total	Ewes	Y. Ewes	Lambs	I	II	III	IV	Unk	Total Rams	Type/Time
Oct 10	44L	16	1	2	6	4	4	10	1	24	A (1.6)
Dec 11	17	6		2		1	5	3		9	A (2.1)
Oct 12	11	4		3			1	2			A (2.2)
Oct 13	25	8		8	2		5	3		10	A (3.7)
Oct 14	72	27	2	16		1	12	6	8	27	A(2.2)
Oct 15	47	21	2	4	2	1	10	7		19	A(3.2)

DOUBLE E (Turkey Ck)—The crew spent 1.88 hours surveying bighorn habitat on and near the Double E Ranch, a recently acquired NMDGF property. Eleven bighorn were observed on this survey, but there have been other sightings from department personnel and contractors spending time on the Double E. The best observation, and minimum count for the Double E, was a group of 16 including one collared ewe and a minimum of 2 lambs (a photograph with 12 sheep was provided). The L:E is 25:100 at best. These sheep were in the cliffs north of the camp at the property entrance on Bear Creek.

Given the lack of suitable areas for new Rocky Mountain bighorn reintroductions, in the future, excess bighorn from New Mexico’s alpine herds will likely augment populations in the Jemez or Turkey Creek via Double E. Resident bighorn on the Double E would be helpful in the event of a transplant as newcomers would be less likely to widely disperse upon arrival.

Table 7. Turkey Creek bighorn on Double E

Year	Total	Ewes	Y. Ewes	Lambs	I	II	III	IV	Unk	Total Rams	Type/Time
Sep 2015	16	7	1	2					6	?	G
Oct 2015	11	5	1	2			2	1		3	A (1.88)

2015 LAMB EWE RATIOS AND POPULATION ESTIMATES FOR DESERT AND ROCKY MOUNTAIN BIGHORN SHEEP IN NEW MEXICO

Table 8. Population estimates for desert bighorn sheep populations in New Mexico, 2015. Minimum number of lambs observed in parentheses.

Herd	L:E (lambs/100 ewes) w/ yearlings	Population Estimate
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Fra Cristobals	39:100 (31)* 28:100 (34)	230-260
Caballos	28:100 (14)	125-150
Peloncillo	29:100 (12)*	90-100
Little Hatchets	31:100 (10)*; Eric's obs. in July	75-85
Big Hatchets	30:100 (15)	120-150
Sierra Ladron		70-80**
San Andres	14:100 (12)	180-220
Totals	(97)	890-1030 Midpoint = 960

*Spring ratio, **2014 survey

Table 9. Lamb:ewe ratios and population estimates for Rocky Mountain bighorn sheep populations in New Mexico, 2015.

Herd	L:E (lambs/100 ewes)	Population Estimate
Pecos	38:100	260-290
Wheeler Peak	30:100—15:100*	215-260
Latir	42:100	125-145
Culebres	42:100	20-25
Rio Grande Gorge	**	265-290
Dry Cimarron	58:100 (27)	115-130
San Francisco River	19:100 (4)	50-75
Turkey Creek	*no survey	20-25
Manzanos	33:100, 35:100**	52-60
Jemez	**	50-55
Red River Valley	no survey	40-50
Totals		1212-1405 Midpoint=1308

*First ratio from helicopter—second from ground survey weeks later **November rut census