Fra Cristobal Bighorn Survey

The spring survey was flown on May 12, 2017. Pilot E. Watters, E. Rominger, and C. Ruhl performed the survey which included 5.75 hours of observation time. No ground observers were present on the mountain. The minimum count for this survey is 272. This includes the 265 detected plus 7 known missed sheep (6 collars, 1 uncollared). A total of 40 groups was encountered, and two large groups were observed in the second block (GS=46 and 64). The average group size was 6.5, while the median group size was 3. A minimum of 40 lambs was observed. The bighorn observation rate throughout the survey was 46.1 bighorn/hr with a wide range of rates by block [1-144.6 bighorn/hr] (Table 2).

This was the second in a series of aerial surveys that will be used to create a population estimation model for the Fra Cristobal range. As we are in the data collection phase, a statistically derived estimate is not available yet. Given the number of missed collars (n=6), and the proportion of collared:uncollared groups during this survey (1:2.33), our best guess is that 20 groups were missed. If we use the median group size, 60 sheep are added, leading to a projected midpoint estimate of 325 (300-350). This range also encompasses the Lincoln-Petersen estimate (n=341) based on the number of collars seen.

Updated survey protocol now includes collecting sightability data (covariates [habitat surrounding sheep, etc.], missed collars) and double observer detection histories, in addition to typical count and classification. These data will allow biologists to quantify the number of sheep missed. The new survey procedure involves dividing the mountain range into a series of 6 blocks to facilitate timely evaluation of missed collars upon completion of each block. Missed individuals are then tracked down and group size is recorded. During this May survey the tracking of missed collared sheep was not successful due to telemetry equipment issues (both receiver and antennae). Several attempts were made to locate such individuals, but after significant time expenditure and failure to observe, this part of the protocol was abandoned for the remainder of the survey. Based on GPS data for the two cases of missed sheep that were seriously pursued, both individuals stood in the same location while the helicopter was in close proximity. The helicopter was close enough that observers had a chance to detect so it is likely that at least these two missed sheep were either singles or were in small groups. The next survey for this study is to occur in October 2017.

There will be 8 ram permits in the Fras during the 2017-2018 license year. This harvest level (in italics) fits within or just below general western state standards using the known number of rams: % of total rams (7-12 %)—*9.2%*, % of CIII & CIV Rams (20-30%)—*19.5%*) (WSF 2007)[1]. This is a decrease from the 12 total permits offered in the past two hunting years, but is recommended given the decline in class IV rams observed since 2015. A future removal of predominantly ewes is recommended for the purpose of maintaining a healthy population in the Fras and facilitating an augmentation to another desert range. NMDGF will submit a proposal to NMRPI suggesting an autumn 2017 capture.

Table 1. NMDGF Fra Cristobal surveys 2011-2017

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 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
Dec 16	263	110		68	2	2	39	28	13	83	A (5.3) G
May 17	272	138	7	40		14	32	31	10	87	A (5.7)

Table 2. Comparison of recent survey statistics by block

Block	MAY 12, 2017							DECEMBER 7, 2016						
	Time (min)	No. * Sheep	No. * Groups	Sheep/ hr	Time (min)/Obs	Miss GPS	Post-Add [T]	Time (min)	No. * Sheep	No.* Groups	Sheep/ hr	Time (min)/Obs	Miss GPS	Post-Add
1	62	1	1	1.0	62			58	82	12	84.8	4.8	2	8
2	56	135	6	144.6	9.3			40	72	5	108	8.0	1	4
3	47	81	18	103.4	2.6	5	6	56	22	7	23.6	8	1	1
4	94	10	3	6.4	31.3	1	1	80	36	3	27	26.7	2**	2
5	43	2	1	2.8	43			45	23	3	30.7	15	1	3
6	43	36	11	50.2	3.9			38	3	1	4.7	38	0	7[N]
Total	5.75 hr	265	40	46.1	8.6	6	7	5.28 hr	238	31	45	10.2	7	25

* only includes sheep detected during regular survey
**Group size for one of these missed collars is unknown
[T] Group sizes for missed collars not obtained.
[N] Group outside of survey area