BC Environment

SHEEP INVENTORY COMPLETION REPORT
MISSION RIDGE TRANSPLANT
G.I.A. Project 93-EM09
By F.E. Harper

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INTRODUCTION:

This report summarizes the results of the sheep inventory portion of the California Bighorn sheep transplant to Mission Ridge planned for January 1994. We counted a total of 652 sheep on the Fraser River sheep winter ranges on November 23 and 24, 1993. Survey conditions were ideal: Temperature -12° to -18° celsius, wind nil, clear skies, and a skiff of snow had fallen November 20. Also, the sheep were well into the breeding season, maximizing the sightability of rams.

METHODOLOGY:

Three observers using a Bell 206 helicopter surveyed all known sheep winter ranges along the east side of the Fraser River between Lillooet and Canoe Creek (Figure. 1). The area was divided into sub-units, and parallel transects were flown to give 100% coverage of each sub-unit. All sheep sighted were classified as to: ewe, lamb or ram. Additionally, each ram was classified as follows: Class 1 = less than 1/2 curl, Class 2 = 1/2 to 3/4 curl, Class 3 = 3/4 to full curl and Class 4 = full curl or greater (including the broomed portion). The locations of all sheep sighted were recorded directly onto maps (1:100,000 scale). It is guesstimated that at least 80% of all sheep present were counted during the survey.

Subjective evaluations of habitat condition were made throughout the survey.

RESULTS:

A total of 652 sheep were counted within Wildlife Management Units, 3-17 and 3-31 (Table 1). Lamb:ewe ratios were 38:100 in 3-17, and noticeably lower at 26:100 in 3-31.

Table 1. California Bighorn Sheep survey results for M.U.'s 3-17 and 3-31 - November 23 & 24, 1993

M.U.	RAMS	EWES	LAMBS	U/C*	TOTAL SHEEP	RAM:EWE:LAMB RATIO
3-17	51	110	42	0	202	46:100:38
3-31	107	261	69	12	450	41:100:26
TOTAL	158	372	111	12	652	42:100:30

* Unclassified

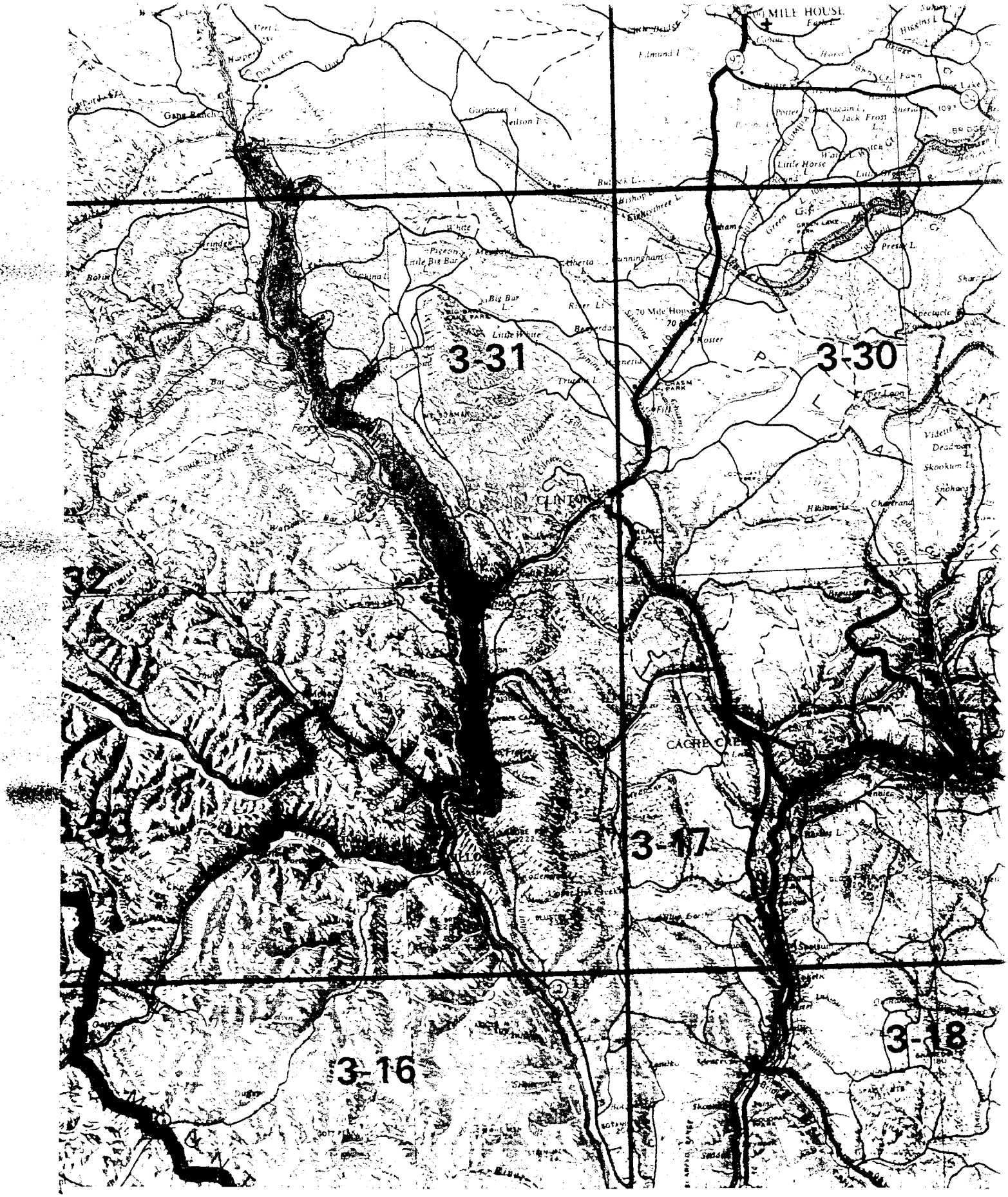

Figure 1: California Bighorn sheep winter ranges surveyed (Area shown in green), November 23 and 24, 1993.

Previous counts in 3-31, found lamb:ewe ratios of 42:100 in March 1989, 52:100 in March 1990 and 33:100 in November 1992 (Table 2). Comparatively, lamb:ewe ratios appear to be stable in Managements Unit 3-17. Since a 30:100 recruitment rate to 6 months of age is assumed necessary to maintain a sheep population in this area, the sheep herd in 3-31 could be starting a decline.

Table 2. Ram:Ewe:Lamb Ratios of California Bighorn Sheep in M.U. 3-17 and 3-31, 1989, 1990, 1992 and 1993

M.U.	DATE	TOTAL SHEEP COUNTED	RAM:EWE:LAMB RATIO
3-17	MAR/89	110	89:100:39
	MAR/90	159	67:100:51
	NOV/92	172	65:100:39
	NOV/93	202	46:100:38
3-31	MAR/89	496	42:100:42
	MAR/90	525	52:100:52
	NOV/92	468	49:100:33
	NOV/93	450	42:100:26
TOTAL	MAR/89	606	53:100:41
	MAR/90	684	54:100:48
	NOV/92	640	53:100:36
	NOV/93	652	43:100:30

Ram:ewe ratios were 46:100 in 3-17 and 41:100 in 3-31 (Table 1). These ratios are lower than observed in previous counts (Table 2), but still adequate to ensure full breeding of ewes. However, only 3 of the 158 rams classified were Class 4 (Table 3). Generally a ram must be 6 years or older to reach Class 4 status.

Table 3. Ram Classification of California Bighorn Sheep in M.U.'s 3-17 and 3-31 November 23 & 24, 1993

M.U.	NO. RAMS IN EACH CURL CLASS				% RAMS IN EACH CURL CLASS			
	1	2	3	4	1	2	3	4
3-17	15	21	13	2	29	41	26	4
3-31	19	60	27	1	18	56	25	1
TOTAL	34	81	40	3	22	51	25	2

Previous surveys also observed a low proportion of Class 4 rams (Table 4). Hunting mortality is believed the primary cause of this low proportion of older age rams.

Table 4. Ram Classification of California Bighorn Sheep in M.U. 3-17 and 3-31, 1989, 1990, 1992 and 1993

M.U.	DATE	NO. RAMS IN EACH CURL CLASS				TOTAL	% RAMS IN EACH CURL CLASS			
							1	2	3	4
3-17	MAR/89	11	11	19	2	43	26	26	44	4
	MAR/90	13	26	9	0	48	27	54	19	0
	NOV/92	8	17	22	0	47	17	36	47	0
	NOV/93	15	21	13	2	51	29	41	26	4
3-31	MAR/89	26	29	28	7	90	29	32	31	8
	MAR/90	20	52	22	0	94	21	55	24	0
	NOV/92	20	56	42	0	118	17	47	36	0
	NOV/93	19	60	27	1	107	18	56	25	1
TOTAL	MAR/89	37	40	47	9	133	28	30	35	7
	MAR/90	33	78	31	0	142	23	55	22	0
	NOV/92	28	73	66	0	165	17	44	40	0
	NOV/93	34	81	40	3	158	22	51	25	2

Habitat conditions were fair to very poor throughout the Fraser River sheep ranges. Overgrazing has reverted most of the climax bunchgrass-sage plant communities to early seral plant communities of pasture sage, sandberg bluegrass and cheat grass. Virtually all of the overgrazing is attributable to domestic livestock (cattle and horses), although the bighorn sheep have overgrazed some areas. Private lands, which occupy about 10% of the sheep ranges, are the most abused (see photographs). Alfalfa fields on these private lands do however provide winter forage for some of the sheep, thereby offsetting some of the overgrazing impact.

DISCUSSION:

The sheep population in Management Unit 3-17 appears to be increasing slightly. Numbers counted have almost doubled since surveys began in 1989, and lamb recruitment is above the 30 lambs per 100 ewes needed to maintain the population. Conversely it appears that the sheep population in Management 3-31 is declining. Numbers have decreased slightly, and lamb recruitment appears to have declined below the minimum requirement.

The habitat in 3-17 is generally in better condition than in 3-31. The natural grasslands are generally in fair condition, and there is a high proportion of alfalfa fields. This is about to change, as most of the alfalfa fields are being converted to Ginseng production, from which the sheep will be excluded.

The grasslands in 3-31 are much heavier grazed by livestock than in 3-17 and are in poor to very poor condition. There are also few alfalfa fields. Whether the low lamb recruitment in 3-31 is directly attributable to this poor range condition is not known.

Reliable information from two keen sheep hunters who often count sheep in the area, indicates that lamb production in June is high, ie; at least one lamb for every ewe. They also report that by fall there are few lambs left. It is noteworthy that in 3-31 they counted 29 lambs per 100 ewes in the fall of 1993, compared to the 26 lambs per 100 ewes we observed. They blame coyote predation.

Coyote predation cannot be ruled out, and it may be linked to the overgrazed range conditions. Overgrazed ranges generally have a low density of small mammals, the primary source of food for coyotes. Climax natural grasslands, and alfalfa fields generally have a relatively high density of small mammals. We observed greater than 30 lambs per 100 ewes in all alfalfa field areas.

Regardless, the evidence indicates that the Fraser River sheep population is over habitat carrying capacity. Steps are underway to correct the domestic livestock overgrazing on crown lands, but any significant recovery will take years. Unless the sheep population is kept in balance with available food supply, a major die-off is probable. Recent winters have been milder and drier than normal; a severe winter will undoubtedly result in many sheep dying.

The ewe-lamb hunting strategy initiated in 1992 to help stabilize sheep numbers has been very unpopular with land owners in the area. Consequently many private lands were closed to hunting in 1993, which effectively denied hunter access to the sheep. As a result, the ewe-lamb hunting strategy will not effectively reduce or stabilize sheep numbers. Coyote predation could be an effective buffer to help maintain a closer balance between sheep numbers and available food. Transplanting sheep to historic California sheep ranges will also be used to help stabilize numbers.

The low proportion of older age rams in the population is directly attributable to excessive hunter kill. Approximately 25 rams per year are killed by hunters under an open season 3/4 curl or greater restriction. It appears that nearly every legal ram in the population is killed annually. Essentially, only the few rams isolated from hunters by geography or private land escape.

A minimum post hunting season proportion of 10 % Class 4 rams is needed to maintain genetic diversity and social order within the ram population. It is also needed to meet the trophy desires of most sheep hunters. Consequently, a new hunting strategy will be implemented in 1994 to reduce the ram harvest by 50%.

COST BREAKDOWN:

The survey required a total of 8.2 hours helicopter time, for a total cost of $5,651.62, plus 7% Goods and Services Tax ($395.61) if applicable.

ACKNOWLEDGEMENTS:

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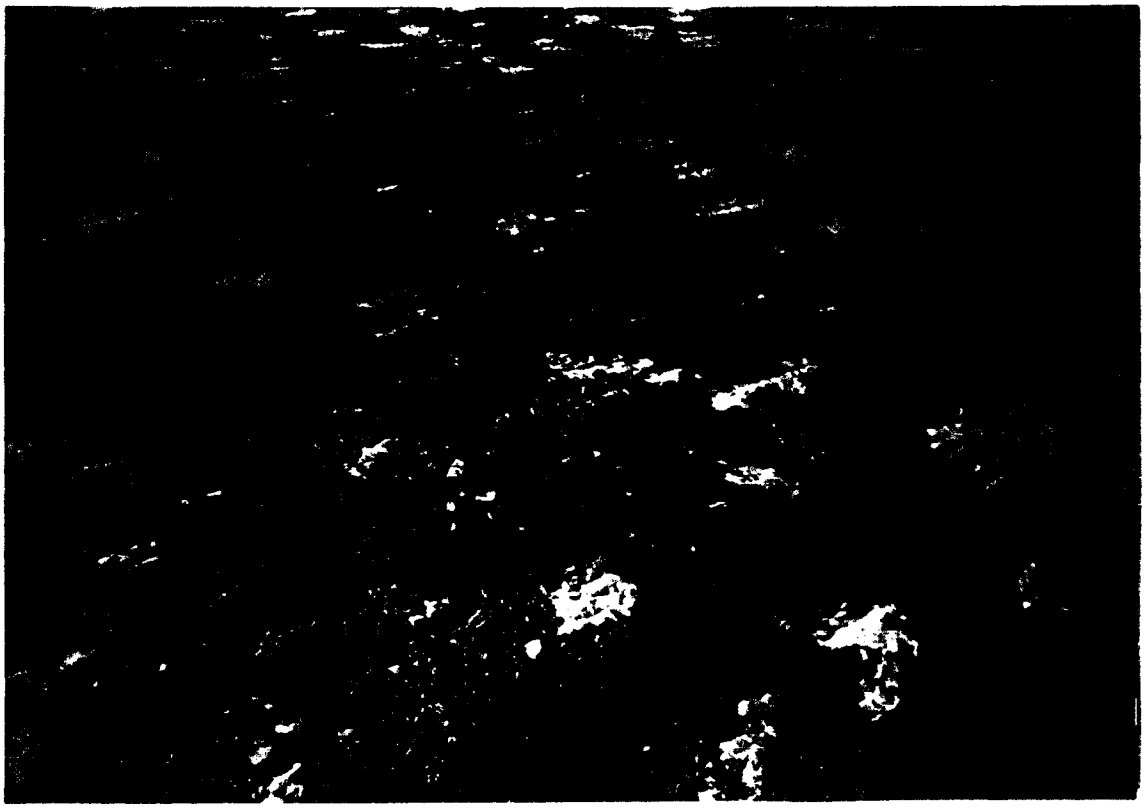
Overgrazed range in foreground with alfalfa fields across river



Close-up of severely overgrazed sheep range - Note horse manure near center of photo.

Overgrazed range in foreground with alfalfa fields across river

Close-up of severely overgrazed sheep range - Note horse manure near center of photo.