AERIAL CENSUS OF UNGULATES, ELK ISLAND NATIONAL PARK, WINTER 1965-66

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AERIAL CENSUS OF UNGULATES, ELK ISLAND NATIONAL PARK, WINTER 1965-66

Two aerial surveys of ungulates were carried out in Elk Island National Park during the winter of 1965-66. The entire park was surveyed on each occasion. Duplicating the survey served to indicate the constancy of such counts made in that area. The South Area (Isolation Area) was surveyed on December 10, 1965 and January 19, 1966; the North Area (Main Park) on December 9, 1965 and January 20, 1966. Incomplete snow cover during the December counts provided poor conditions for observation, and the figures obtained are lower than expected. However, a survey at that time was necessary to determine the numbers and location of bison which were not baited into the corrals for disease tests, since those animals were to be field-shot as part of the bison herd reduction program of December 13 - 17, 1965. Duplication of the survey was delayed until suitable weather and snow conditions existed.

METHODS

Techniques were the same as those outlined by Blood (1964). A Helio-Courier aircraft was chartered from Courier Flights Ltd. of Edmonton, and piloted by Mr. Al Bowles. Animal counts were made by the author and Wildlife Technician, J. R. McGillis. Park Wardens, Bob Jonas and George Babbage, served as navigators on December 9 and 10 respectively. Technician, Walter Krivda, and Park Warden, Syd Mortemore, served in that capacity on January 19 and 20 respectively. The help of those people is gratefully acknowledged.

In the December 9 - 10 count only those bison outside the corrals were counted. By the time of the second count, all bison had been removed from the South Area, except the small group of wood bison in the C. W. S. study area.

Daily survey conditions are given in Table 1.

Table 1. Daily Survey Conditions, Winter 1965-66.

DATE	AREA	TIME ON TRANSECTS	TEMP.	SKY	SNOW COVER
12- 9-65	North	9:30-11:45 A.M. 1:30- 3:00 P.M.	25°	Clear and sunny	4" old snow, poor background
12-10-65	South	9:25-11:15 A.M.	8°	Sunny	4" old snow, poor background
1-19-66	South	9:45-11:45 A.M.	-20°	Sunny	18" new snow, good background
1-20-66	North	10:50- 1:10 P.M. 2:30- 4:15 P.M.	-20°	Hazy sun	18" new snow, good background

OBJECTIVES

1. To determine location of all free-ranging bison immediately prior to the herd reduction of December 13 - 17, 1965.
2. To assess population status of elk, moose and deer in the park.
3. To study the variability between duplicated aerial counts of cervids in Elk Island Park.

RESULTS AND DISCUSSION

A summary of animals observed is presented in Table 2. Group size data are presented in Table 3. Population levels in the C. W. S. Study Area are summarized in Table 4. Tables 5 and 6 give the numbers of animals observed by transect.

Location of bison.

During the December counts, 4 bison were located in the South Area and 18 in the North Area. These figures agreed with numbers expected by Park Wardens on the basis of known bison numbers in the feedlots. Locations of those animals were marked on park maps so that they could be found by hunters on the ground and shot. No bison were seen in the South Area during the January survey, and the objective of removing all bison from that area appears to have been accomplished.

Table 2. Summary of Aerial Survey Results, Elk Island National Park, Winter 1965-66.

	DEC. COUNT	JAN. COUNT	PERCENT[1] DIFFERENCE	DENSITY[2]	JAN. 1964 COUNT	PERCENT[3] INCREASE
NORTH AREA						
Elk	217	275	21	5.5	240	14.6
Moose	276	332	17	6.6	168	97.6
Deer	33	38	13	0.8	67	-43.3
SOUTH AREA						
Elk	11	12	8	0.5	13	-7.7
Moose	132	164	20	6.6	112	46.4
Deer	107	98	8	4.0	169	-36.7

1 Difference between Dec. and Jan. counts expressed as percent of highest count.

2 Animals per square mile based on 50 sq. mi. in North Area and 25 sq. mi. in South Area. Highest counts are used.

3 Increase over 2-year period since last survey.

Variability of the counts.

Except for the deer count in the South Area, all ungulate counts in both areas were lower in December than in January. These differences appear attributable to poor conditions for observation during the earlier survey. In the winter of 1963-64, the earliest of two complete counts was carried out while snow cover was sparse, and was lower for all cervids in both areas than a later survey carried out when snow was fresh and deep (Blood 1964). That survey and the present one both indicate the importance of a good background of snow when conducting aerial surveys. It is felt that the January 1966 count is an accurate estimate of actual population levels. Approximately 20% of the moose and elk appear to have been missed on the first count. Considering the small size of deer, the December and January results are remarkably close.

Herd increment.

If the January 1966 totals in Table 2 are considered to be reliable estimates of park ungulate populations, then comparison with maximum counts of the last previous census will yield increment figures for the two-year period between surveys. On this basis moose increased greatly in both areas, and elk increased slightly in the North Area. Elk numbers are too low in the South Area to draw any meaningful conclusions. Deer numbers decreased in both areas, and this is consistent with wardens' reports of heavy deer mortality during the severe winter of 1964-65. Moose appear better adapted to a northern existence then either deer or elk, and this is certainly evident from the extent of their range in arctic areas. The bad winter of 1964-65 appears to have had no effect on the rate

of increase of the moose population. Moose increased at a rate of about 40% per year in the North Area, and 21% per year in the South Area during the period January 1964 to January 1966. Rates of increase for moose in those two areas during the 3 years previous to the slaughter of December 1963, were 37 and 32% respectively. Thus moose appear to be maintaining their high rate of increase in the North Area, but to be slowing down somewhat in the South Area. It is not unreasonable to expect a rate of increase of 40% annually in a moose population which is below the carrying capacity of its range. Moose densities of nearly 7 per square mile are higher than usually found in prairie parkland habitat. For example, Maliepaard (1963) reported moose densities ranging from 0.2 to 2.4 per square mile in 16 survey units in both boreal and parkland habitat in Saskatchewan.

Elk in the North Area have only increased about 7% per year since January 1964. The only logical interpretation appears to be that the severe winter weather of 1964-65 caused some mortality among elk. Food supply, in itself, does not appear to be limiting elk population increase, and the elk herd in the North Area is known to have been in excess of 600 in the 1950's.

Marked differences in deer densities in the North and South Areas have also been noted in past surveys, and no logical explanation is apparent. Habitat in both areas is quite similar.

Antler shedding.

A number of bull elk groups ranging in size from 2 or 3 to 13 were observed, and all but one animal still had both antlers. One was observed with only one antler, and another which appeared to have one antler broken off several inches above the base.

Two moose were observed which had only one antler and presumably had shed the other. A few very large moose, which would be expected to shed their antlers earlier than younger bulls, still retained both antlers. Although numbers of moose with antlers were not recorded, it appeared that at least one half of the bulls had not shed their antlers by January 19 or 20.

Group size.

Moose groups were of almost identical average size in South and North Areas, and very close to averages recorded in 1963-64. Moose groups varied in size from 1 to 6. Elk groups varied from 1 to 51. Cow groups were largest. The largest bull group contained 13 animals. Mean size of elk and deer groups was also similar to that recorded in 1963-64. Deer groups were of similar mean size in both North and South areas even though population density varied considerably in the two areas. Deer group size ranged from 1 to 5.

Table 3. Mean Group Sizes for Ungulates Observed from the Air, December 1965 and January 1966.

	MOOSE		ELK		DEER	
AREA	NO.*	MEAN	NO.	MEAN	NO.	MEAN
NORTH						
Dec.	136	2.0	33	6.5	14	2.4
Jan.	174	1.9	60	4.6		
SOUTH						
Dec.	68	1.9			48	2.2
Jan.	85	1.9			41	2.4
COMBINED						
Dec.	204	2.0			62	2.3
Jan.	259	1.9				

*Number of groups observed

Wildlife Service Study Area.

Survey results for the 3-square-mile C. W. S. Study Area are given in Table 4, and compared with previous surveys. Moose numbers have increased considerably, as in the remainder of the park, but elk and deer numbers appear to have remained relatively constant in size. Elk in the study area consisted of a group of 3 cows (one believed to be a yearling), and one adult bull.

Table 4. Ungulate Populations, C. W. S. Study Area.

Date	Mar. 1963	Jan. 1964	Mar. 1965	Jan. 1966
Aircraft	Helicopter	Fixed wing	Helicopter	Fixed wing
No. Elk	2	3	4	4 (1.3)*
No. Moose	17	20	16	25 (8.3)
No. Deer	8	15	16	16 (5.3)

*Figures in parentheses indicate density in animals per square mile.

Coyotes.

In the North Area, 10 coyotes were observed on December 9, and 5 on January 20. No coyotes were seen in the South Area on December 10, but one was observed there on January 19. Coyotes are easily missed from the air, and the above figures are probably considerably lower than actual coyote numbers in the park.

RECOMMENDATIONS

1. For management purposes, duplicated aerial surveys involving complete coverage of the park should be carried out every two years.

2. Methods and procedures employed in past surveys should be followed in the future. This will assure a maximum standardization of technique so that results of all surveys will be comparable.

SUMMARY

An aerial survey of ungulate mammals was carried out at Elk Island National Park in December 1965 and January 1966. Because of poor snow conditions, counts in December appeared to be lower than actual population levels. Populations of 275 elk, 332 moose, and 38 deer in the North Area, and 12 elk, 164 moose and 107 deer in the South Area, have been determined. These figures, based primarily on the January survey, are considered sufficiently precise for management purposes. Moose appear to have increased very rapidly in both areas over the 2-year period since the last survey. Elk have increased (in the North Area) very little. Reasons for this are suggested. Deer numbers appear to have declined in both areas. Population data for the C. W. S. Study Area are also presented, and mean group sizes for the three cervid species are tabulated.

LITERATURE CITED

Blood, D. A. (1964) Aerial census of ungulates, Elk Island National Park, November 1963 and January 1964. Typewritten report, C. W. S. Report Library, 18 pp.

Maliepaard, H. (1963) Aerial survey of big game in Saskatchewan 1954-1963. Sask. Dept. Nat. Res., Wildl. Br., Mimeo. Report, 24 pp.

Table 5. Animal Observations, Park North of Highway 16.

Interval between flight lines	DECEMBER			JANUARY		
	Elk	Moose	Deer	Elk	Moose	Deer
1-2	0	2	1	0	0	7
2-3	0	10	0	0	0	0
3-4	0	4	1	0	10	0
4-5	0	4	3	60	0	2
5-6	1	0	1	8	1	0
6-7	0	6	0	0	6	0
7-8	0	1	0	0	8	0
8-9	0	7	1	0	15	6
9-10	0	4	0	4	3	0
10-11	6	0	0	3	0	0
11-12	14	0	0	0	0	0
12-13	0	0	3	0	2	0
13-14	11	0	0	0	2	0
14-15	1	0	0	0	7	0
15-16	0	2	2	0	9	2
16-17	1	3	0	12	10	2
17-18	0	12	0	2	14	0
18-19	0	10	2	0	16	0
19-20	0	12	3	0	10	1
20-21	4	12	4	6	19	0
21-22	0	8	4	4	13	0
22-23	43	11	0	6	16	2
23-24	58	12	0	0	4	0

Table 5 Continued

Interval between flight lines	DECEMBER			JANUARY		
	Elk	Moose	Deer	Elk	Moose	Deer
24-25	0	12	0	0	14	0
25-26	13	17	0	0	13	2
26-27	0	24	0	1	12	2
27-28	0	21	0	11	13	1
28-29	2	9	1	4	13	0
29-30	25	6	1	13	12	0
30-31	3	8	0	7	11	0
31-32	7	3	0	9	4	0
32-33	2	13	0	7	14	0
33-34	0	6	0	4	6	1
34-35	3	1	0	0	5	0
35-36	2	8	1	7	7	0
36-37	0	1	0	14	7	0
37-38	2	5	4	4	6	4
38-39	2	7	0	3	8	5
39-40	4	7	0	3	10	1
40-41	13	9	1	9	5	0
41-42	0	2	0	0	4	0
42-43	0	0	0	0	3	0
TOTALS	217	276	33	275	332	38

Table 6. Animal Observations, Park South of Highway 16.

Interval between flight lines	DECEMBER			JANUARY		
	Elk	Moose	Deer	Elk	Moose	Deer
40-41	0	8	2	0	0	0
41-42	0	3	0	0	4	0
42-43	0	4	4	0	1	3
43-44	0	10	6	3	13	15
44-45	0	11	5	0	8	12
45-46	1	4	1	0	8	10
46-47	9	13	6	0	18	5
47-48	0	2	1	0	13	9
48-49	0	13	14	0	16	4
49-50	1	5	10	0	15	10
50-51	0	2	23	4	8	2
51-52	0	11	18	4	25	8
52-53	0	16	4	0	15	2
53-54	0	14	4	0	11	8
54-55	0	6	6	0	4	3
55-56	0	2	3	1	4	7
56-57	0	8	0	0	1	0
57-58	0	0	0	0	0	0
TOTALS	11	132	107	12	164	98