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C.R. Hook

PRELIMINARY DATA
NOT FOR PUBLICATION

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Aerial Beaver Census, Prince Albert Park, 1957.

Following verbal instructions received from the Chief Mammalogist of the Canadian Wildlife Service, an aerial census of beaver was carried out in Prince Albert Park, October 16 and 17.

The purpose of the survey was to determine the trend in the beaver population of the park, and an estimate of beaver numbers.

Previous aerial surveys of beaver in Prince Albert Park have been made by J.S. Tener, October 15 and 16, 1954 October 5 and 6, 1955, and by A. Radvanyi, October 16 and 17, 1956.

The technique used in the current survey was essentially the same as that of the previous surveys. A Cessna 180 aircraft piloted by J. Tallis was chartered from Saskatchewan Government Airways. Twenty-five east-west transects were flown traversing the park at 2 mile intervals. The same transects were followed as in previous surveys. They are designated as numbers 1 to 25 beginning two miles south of the north boundary of the park. The writer counted on the right side of the plane throughout the survey. Warden H. Gange counted from the left side on transects 1 to 12 and Warden C. Millard counted from the left on transects 13 to 25.

Surveying was at cruising speed which was about 115 miles per hour.

A height of 600 feet from the ground was maintained as nearly as possible through the survey. A band of red tape was stuck in each wing strut and a mark on the corresponding window. The observers sighted on these to determine the edges of the transect. In flying transects 1 to 12 an angle of 47°, 45' from the vertical was used resulting in a transect width of 1/8 mile on each side and a total width of 1/4 mile. It was decided that effective counting could be done on a wider strip. Therefore on transects 13 to 25 the strut markers were moved to indicate angles of 65°, 34'. This resulted in a strip width of 1/4 mile on each side of the plane, and a total transect width of 1/2 mile.

Each transect was divided into an east and a west half and the observations recorded separately.

A feedbed was considered evidence of a colony. In a few cases dams or lodges were seen which appeared in active condition. They were considered evidence of a colony even though no feed bed could be seen.

The sky was clear on both days of the survey. On October 16 there was slight turbulence. October 17, flying

was fairly smooth.

Accuracy of Aerial Survey

A.M. Pearson assisted by W.N. Holsworth and J. Settee, working on foot, made an accurate count of the beaver colonies in an eight mile segment of transect 18. That segment runs west from Range 3, the north-south line running down the center of the park. The count was made September 4 to September 6.

At the time of the ground count, five orange marker flags were set up, to be a guide in the aerial survey. It was hoped that they would make it possible in the aerial survey to identify the boundaries of the ground transect. However, the flags couldn't be seen in the aerial survey. Possibly in the intervening period they had been blown away or removed by birds or perhaps they were still present but couldn't be recognized from the air. At the time of the survey there was very little wind to unfurl the flags.

The pilot followed the map closely and advised the observers at the time the plane passed over the beginning and end of the ground-counted transect.

The aerial survey of the strip was flown from west to east. Flook occupied the front right hand position and Millard the rear left position.

The ground count showed 7 active colonies on the south half of the 8 mile transect. Structures observed there, were 7 active lodges, 1 dam, 2 dead lodges, and 2 lodges of doubtful occupancy. In the aerial survey 6 active colonies were recorded by Flook on the south half of the transect. Structures observed were 6 active lodges, 6 feedbeds, 1 dam, and 3 dead lodges.

On the north half of the 8 mile strip, the ground count showed one active colony. Structures noted were 1 active lodge, 1 dam, and 2 dead lodges. In the aerial survey Millard did not observe any sign of beaver activity.

In terms of active colonies, 6/8 or 75% of the colonies present on the transect were seen in the aerial survey by both observers. Considering only the front observer, 6/7 or 85% of the colonies present on the transect were observed in the aerial survey.

Several reasons for the error can be suggested. The line flown could have been a short distance north or south of the center line of the ground transect. The strip viewed might then have contained only 6 colonies. The plane may have been flying at a height slightly less than 600 feet. That would result in a strip being viewed which was less than 1/2 mile wide. The narrower strip may have contained only 6 colonies. It is possible that two of

the lodges occupied by beaver September 4 to September 6 may have been abandoned by October 17. That is not likely, but if it was the case then there was no error. Perhaps the transect was flown exactly on course and at the correct height but two colonies were simply overlooked.

The results of the ground check indicate that errors are present in aerial beaver surveys but do not indicate that they are of alarming magnitude.

Beaver Population Levels

The observations of beaver structures in the 1957 survey are presented in appendices 1 and 2. These data are presented according to transect. The observations of the right hand observer are in appendix 1 and those of the left hand observer are in appendix 2.

The number of active colonies recorded on each transect is presented in appendix 3. Observations are presented according to observer and according to the quarter of the park in which they occurred.

The numbers of active colonies recorded in the surveys of 1954, 1955, 1956 and 1957 are compared in table 1. Only observations of the right hand observer are used in this table in order to be consistent with data collected in 1954 and 1955. The numbers of colonies recorded on transects in the north half

of the park in 1957 were doubled to obtain the figures in the table. That is because the strip surveyed there was half as wide as that of the previous surveys.

Table 1. Trend in Numbers of Active Beaver Colonies Counted in Four Surveys

	1954	1955		1956		1957	
Section of Park	Colonies	Colonies	Trend	Colonies	Trend	Colonies	Trend
N.E. Quarter				32		28	-12%
N½W. Quarter				58		52	-10%
North Half	76	85	+12%	90	+6%	80	-11%
S.E. Quarter				118		77	-35%
S.W. Quarter				121		55	-55%
South Half	136	165	+21%	239	+45%	132	-45%
Total of All Transects	212	250	+18%	329	+32%	212	-36%

The data presented in table 1 indicate that the number of beaver colonies increased moderately between 1954 and 1955, increased abruptly from 1955 to 1956, and then from 1956 to 1957 dropped to about the 1954 level.

The apparent increase in both 1955 and 1956 was greater in the south half of the park. The decline in number of colonies observed was also greater in the south half of the park. The apparent decline in numbers of colonies during the past year was particularily great in the south west quarter of the park.

The relatively high count in 1956 may be partly accountable to technique. In that year the survey was flown at the lowest height and slowest speed (300 feet and 80 m.p.h.). In the other three surveys the height was 600 feet, and the speed 100 m.p.h. in 1954, 90 m.p.h. in 1955, and 115 m.p.h. in 1957. However it is probable that in 1956 the beaver population was actually at a peak and a sharp decline has occurred during the past year.

During the 1957 aerial survey, several beaver lodges were observed in small potholes which were almost or completely dry. They were mostly in the southern half of the park. Those lodges in potholes that were completely dry appeared to have been abandoned. Some of those located in potholes with a little water had newly built feed beds. Likely, many beaver in such potholes will be frozen out this winter.

In the southern part of the park there seem to be more small potholes than in the north. Also there is a heavier beaver population, and a greater abundance of aspen and willow for food for beaver. Under these conditions beaver have occupied small potholes in seasons when there was adequate water. They have deepened the potholes and extended their margins by digging runways and canals. However, in a dry season such as this one the beaver apparently are unable to retain water in many of the smaller potholes.

In August, the writer with A.M. Pearson inspected a beaver colony in a small pond on the west side of the main highway south of Waskesiu. At that time only the runways and canals contained water and the beaver had so deepened these that the greatest depth was about 30 inches. The beaver had abandoned the original island lodge and were apparently occupying a lodge built against the road grade. The writer visited the site October 17 and found it completely without water and abandoned. Another colony located on the west side of the highway a few miles farther south was also visited October 17. It was a deeper pothole than the first and was still occupied by beaver. A feed bed had been built in the small pond remaining. However, the water remaining was barely sufficient to surround the feed bed.

It wasn't possible to sound it accurately but the depth was probably less than four feet. That lodge should be checked in the spring to learn the fate of the beaver.

The apparent decline in numbers of occupied lodges may not represent a proportionate decline in numbers of beaver. Likely some beaver that have abandoned dried up sites have moved into ponds already occupied. A resulting enlarged group of beaver with one large feed bed would have been recorded as one colony in the survey.

An estimate of the number of active beaver colonies in the park based on the count of the right observer is 2,000 colonies. Using Radvanyi's estimates of average numbers of 6.7 or 8.2 beaver per lodge, estimates of the current population are 13,400 or 16,400 beaver.

Big Game Observations

Big game observations made during the current survey are summarized in appendix 4. Forty five moose and 30 elk were recorded by both observers. Many animals are overlooked when flying when the ground is free of snow. The proportion of animals which are overlooked varies with observers, behavior of the animals and other factors. For these reasons the current survey does not justify any conclusions concerning trends in big game populations.

Conclusion

Dr. Banfield in a memorandum to A. Radvanyi dated April 10, 1956 in which he outlined the purpose of the beaver study in Prince Albert Park stated, "We are faced with the alternative of letting "nature" take its course. ---- We propose to initiate a long term biological study of the "natural" fluctuations commencing this year."

It appears that natural fluctuations of considerable magnitude are now taking place. Climate may be an important factor influencing the fluctuations. The meteorological data available for the park area should be studied with that in mind. The beaver study should be continued. The situation existing in Prince Albert National Park lends itself very well to research in beaver ecology. The study should help us to understand better the place of beaver in the biotic community existing in the park, provide information which will be useful in planning management of beaver in areas where they are utilized for fur, and obtain information of academic significance.

Donald R. Flook

Donald R. Flook,
Wildlife Biologist.

Edmonton, Alta.
November 4, 1957.

Appendix 1. Raw Data, Right Observer, 1957

Transect No.	Eastern Half					Western Half				
	Feed Beds	Active Lodges	Active Dams	Dead Lodges	Old Dams	Feed Beds	Active Lodges	Active Dams	Dead Lodges	Old Dams
1	2	1	4	1	0	1	1	0	1	0
2	0	0	0	2	2	2	2	1	2	0
3	0	0	0	1	2	1	2	1	0	0
4	0	1	0	0	0	1	1	0	0	0
5	0	0	0	1	0	2	1	0	0	2
6	0	0	0	0	0	2	2	1	1	0
7	4	4	3	1	0	1	1	0	1	0
8	0	0	0	0	0	1	1	0	0	0
9	0	0	1	0	0	1	1	1	2	0
10	1	1	1	1	0	2	2	0	0	0
11	2	2	1	0	0	4	4	0	0	3
12	0	0	0	0	0	4	5	2	0	5
13	2	2	0	1	1	2	3	0	1	2
14	2	1	4	1	0	3	4	3	1	1
15	9	10	7	3	4	6	6	3	3	0
16	7	7	9	3	4	7	7	3	6	0
17	6	6	3	3	4	5	5	4	3	2
18	7	7	2	1	0	7	7	1	3	0
19	7	7	3	4	3	4	4	3	2	0
20	4	4	2	5	0	3	4	1	3	0
21	4	4	2	1	0	1	1	2	0	0

(cont'd.) Appendix 1. Raw Data, Right Observer, 1957

Transect No.	Eastern Half					Western Half				
	Feed Beds	Active Lodges	Active Dams	Dead Lodges	Old Dams	Feed Beds	Active Lodges	Active Dams	Dead Lodges	Old Dams
22	7	6	1	1	0	7	6	11	0	0
23	7	7	2	6	1	1	0	2	1	0
24	3	3	1	1	0	1	1	0	1	4
25	8	9	1	1	0	1	2	1	0	0

Appendix 2. Raw Data, Left Observer, 1957

Transect No.	Eastern Half					Western Half				
	Feed Beds	Active Lodges	Active Dams	Dead Lodges	Old Dams	Feed Beds	Active Lodges	Active Dams	Dead Lodges	Old Dams
1	1	1	1	0	0	1	0	0	0	0
2	0	0	0	1	0	5	4	0	0	0
3	1	1	0	0	0	3	3	7	4	0
4	5	4	0	3	2	0	0	2	0	0
5	2	2	1	0	1	2	1	0	4	1
6	1	1	0	2	1	0	0	1	1	1
7	1	1	0	0	1	4	3	0	5	0
8	1	1	0	0	0	1	1	0	1	0
9	1	1	0	4	0	3	3	0	4	0
10	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	4	3	0	4	0
12	0	0	0	1	0	2	2	3	3	0
13	4	4	0	1	0	2	2	0	2	0
14	0	1	1	0	0	2	2	0	2	0
15	6	10	2	2	1	5	5	4	0	1
16	3	3	0	0	0	4	5	0	2	4
17	8	8	1	2	3	4	4	4	1	0
18	2	3	0	3	2	7	7	2	1	2
19	4	4	9	1	4	4	4	1	0	1
20	8	9	6	1	2	2	2	0	0	0
21	3	3	0	2	0	3	3	2	1	0

(cont'd.) Appendix 2. Raw Data, Left Observer, 1957

Transect No.	Eastern Half					Western Half				
	Feed Beds	Active Lodges	Active Dams	Dead Lodges	Old Dams	Feed Beds	Active Lodges	Active Dams	Dead Lodges	Old Dams
22	4	5	0	1	0	2	2	0	2	2
23	5	6	0	1	0	1	2	0	0	0
24	2	2	0	0	0	2	2	2	0	0
25	10	10	1	1	0	1	2	1	0	0

Appendix 3. Number of Active Colonies on Transects 1957

Transect No.	East Half			West Half			East & West
	Right Observer	Left Observer	Both Observers	Right Observer	Left Observer	Both Observers	Both Observers
1	6	4	10	2	2	4	14
2	0	0	0	4	10	14	14
3	0	2	2	4	12	16	18
4	2	10	12	2	4	6	18
5	0	6	6	4	4	8	14
6	0	2	2	6	2	8	10
7	8	2	10	2	8	10	20
8	0	2	2	2	2	4	6
9	2	2	4	4	6	10	14
10	4	0	4	4	0	4	8
11	6	0	6	8	8	16	22
12	0	0	0	10	4	14	14
Totals North	28	30	N.E. Quarter 58	52	62	N.W. Quarter 14	172

(cont'd.) Appendix 3. Number of Active Colonies on Transects 1957*

Transect No.	East Half			West Half			East & West
	Right Observer	Left Observer	Both Observers	Right Observer	Left Observer	Both Observers	Both Observers
13	2	4	6	3	2	5	11
14	3	2	5	4	2	6	11
15	10	10	20	6	8	14	34
16	8	3	11	7	5	12	23
17	6	8	14	6	4	10	24
18	7	3	10	7	7	14	24
19	7	4	11	6	4	10	21
20	4	9	13	4	2	6	19
21	4	4	8	1	3	4	12
22	7	5	12	7	2	9	21
23	7	6	13	1	2	3	16
24	3	2	5	1	2	3	8
25	9	10	19	2	2	4	23
Totals South	77	70	S.E.147 Quarter	55	45	S.W.100 Quarter	247
Totals N.& S.	105	100	205	107	107	214	419

* On transects 1 to 12 the number of colonies on the 1/4 mile strip was estimated by doubling the number of colonies on the 1/8 mile strip surveyed. On transects 13 to 25 the width of strip surveyed was 1/4 mile on each side of the aircraft.

Appendix 4. Big Game Observations, 1957
Aerial Beaver Survey

Species	N.E. Quarter	N.W. Quarter	North Half	S.E. Quarter	S.W. Quarter	South Half	Entire Park
Moose	1	14	15	11	19	30	45
Elk	0	11	11	16	3	19	30

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57-4 Flook, Donald R.
Aerial beaver census
- Prince Albert National
Park, 1957.

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