Radvanyi, A.
Aerial survey of beaver colonies - Prince Albert National Park, 1960.
Edmonton, 1960.

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1. Beaver - Surveys - Prince Albert National Park. 2. Prince Albert National Park. I. Title.

Aerial Survey of Beaver Colonies
Prince Albert National Park, 1960.

Introduction.

Annual aerial surveys of beaver colonies have been carried out by Canadian Wildlife Service personnel since 1954 as part of a long term study of beaver ecology in Prince Albert Park. These surveys have accorded valuable information on the numbers of beaver colonies within the park and have indicated trends within the resident beaver population.

The surveys have been conducted at approximately the same time of each year: October 15th and 16th, 1954, and October 5th and 6th, 1955 by J.S. Tener; October 16th and 17th, 1956 by A. Kadvanyi; October 15th and 16th, 1957, 1958 and October 16th and 17th, 1959 by D.H. Flook. The 1960 survey was carried out during October 14th and 15th by A. Kadvanyi.

Procedures.

The same procedures were followed as nearly as possible during the present aerial survey, as had been employed during the previous year. A float-equipped Cessna 180 aircraft was chartered from the Saskatchewan Government Airways. For the fourth consecutive year the plane used on the survey was piloted by Mr. J. Tallis. As in the previous six years, twenty-five east-west transects traversing the park at two mile intervals were flown. The transects number from one to twenty-five, number one being located two miles south of the

park's northern boundary. The writer occupied the right front position (1), Mr. Holsworth at right rear (2) and A. Lovaas left rear (3). Geometric calculations, an abney level and ribbon markers tied to the wing struts of the aircraft were used to indicate the outer margins of the quarter mile wide transects being observed on either side of the aircraft. The right rear observers could further ascertain this outer limit by checking with the front observer whether the shadow of the aircraft fell within, outside or on the one-quarter mile observation boundary. An attempt was made by the pilot to keep the aircraft at a cruising speed of 115 m.p.h. and an elevation of six hundred feet above the ground. Each transect was divided into an east and a west half and the pilot indicated to the observers the moment this mid point was crossed. Observations along each one-half transect were recorded separately. Twelve and one-half transects were flown October 14. The remainder were completed the following day.

Generally sunny skies prevailed during the first day of the survey but winds gusting up to 20 m.p.h. caused considerable turbulence on the flight. Thin patches of snow remained on the ground in the northern half of the park from a light snowfall earlier in the week but it was felt that this was not of sufficient thickness to hinder observations on beaver lodges, or in determining whether the lodges were active or inactive. A thin layer of high stratus clouds

covered most of the sky during the second day. The wind had dropped considerably making for near perfect weather for the second day of the survey.

The recording of an active colony was based on one or more of the following criterion; a lodge in good repair, i.e. recently well covered with mud and sticks; the presence of a newly established feed pile near a lodge, whether the lodge was in good repair or not; the presence of a feed pile alone, whether the lodge was possibly obscured from view or was in the form of a bank lodge; the presence of one or more dams in good repair; and the presence of several trees freshly cut down by beaver along the margin of small potholes which fell within the quarter mile wide observation strip. The observations on beaver colonies were recorded as to whether they occurred on streams, lakes or potholes, whether they were active or inactive (dead) and as to which half of each transect line they occurred in.

Observations made on big game animals noted within the transect widths were also recorded by half transect length units.

Observations and Discussion.

The observations on both active and dead beaver colonies located on creeks, lakes and potholes as recorded by each of the three observers on the 1960 survey are shown in appendices 1, 2 and 3 respectively. In appendix 4 these data have been summarized to indicate the number of active and dead colonies recorded by each observer for each quarter sector of the park.

The number of active colonies recorded along each transect by each observer has been summarized in appendix 5.

The numbers of active beaver colonies counted in each quarter and half section as well as the total for all sections of the park during the seven successive aerial surveys since 1954 are shown in Table I. Indicated in the same table are percentage trends. Each percentage trend has been calculated in terms of the count of one year as compared with the count of the year immediately preceding it. Only the observations of the writer were used in the 1960 figures. A year to year comparison of the number of active colonies recorded by the front observer but in which the trend is calculated by comparison with the 1954 figures is shown in Table 2. These data are shown graphically in Figure I.

The observations on moose and elk recorded during the course of the aerial survey by each of the observers have been summarized in appendix 6. In addition to these Lovaas recorded sighting four bears along the west portion of transect 15, one bear along the eastern half of transect 18 and a third bear along the eastern half of transect 20. Holsworth recorded seeing one woodland caribou along the western half of transect 20, a fox along the western half of transect 22 and a bear along the western half of transect 24. The writer noted a deer along the western sector of transect 25.

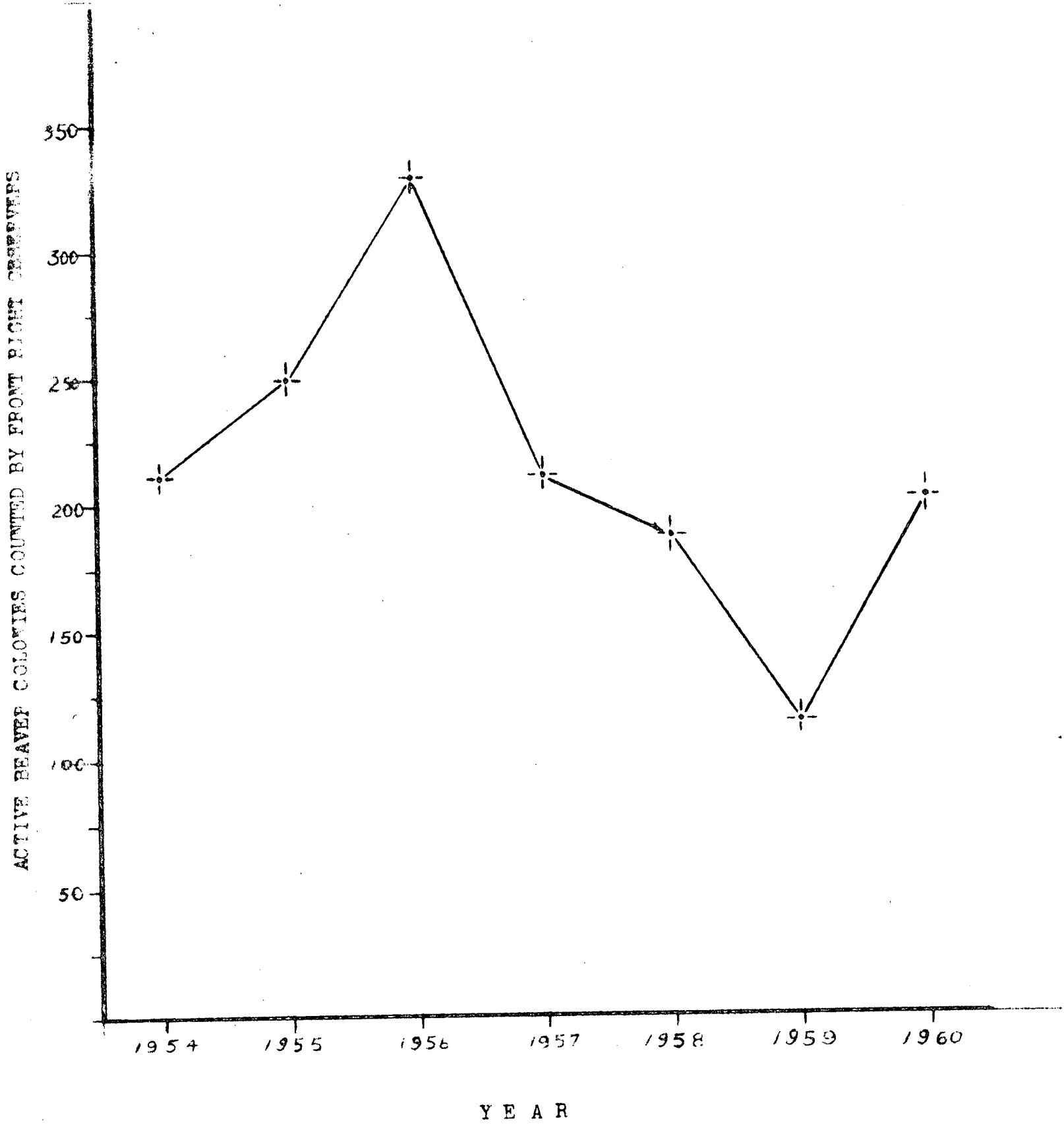
Table 1. Trend on Numbers of Active Beaver Colonies Counted in Seven Successive Aerial Surveys

Section of Park	1954	1955		1956		1957		1958		1959		1960	
	COLONIES	COLONIES	TREND	COLONIES	TREND	COLONIES	TREND	COLONIES	TREND	COLONIES	TREND	COLONIES	TREND
N.W. ¼				58		52	-10%	40	-23%	27	-32%	25	-7%
N.E. ¼				32		28	-12%	23	-18%	17	-26%	22	+29%
N. half	76	85	+12%	90	+6%	80	-11%	63	-21%	44	-30%	47	+7%
S.W. ¼				121		55	-55%	63	+15%	36	-43%	77	+114%
S.E. ¼				118		77	-35%	62	-19%	35	-43%	78	+123%
S. half	136	165	+21%	239	+45%	132	-45%	125	-5%	71	-43%	155	+118%
Totals for all Sections	212	250	+18%	329	+32%	212	-36%	188	-11%	115	-39%	202	+76%

Table 2. Trends on Numbers of Active Beaver Colonies Counted by Front Observers in Seven Successive Aerial Surveys (Trends based on 1954 base)

Year	Colonies	Trend
1954	212	
1955	250	+18%
1956	329	+55%
1957	212	+ - 0%
1958	188	-12%
1959	115	-46%
1960	202	- 5%

Fig. 1. Active Beaver Colonies Observed by Front Observers on Seven Successive Aerial Surveys



As indicated in Table I an increase in the number of active beaver colonies was recorded in all sectors of the park except for the north west quarter as compared with comparable figures for 1959. Over the whole of the park this increase would appear to amount to 76% over that of the previous year. It must be remembered, however, that weather-wise, the 1960 aerial survey was carried out under much more ideal conditions than had occurred at the time of the 1959 survey. It would appear to be more meaningful to examine the trend in the beaver population of the park in terms of the present count as compared with a fixed base - i.e. that of 1954. - as shown for the consecutive surveys in Table 2. While there may have occurred a 76% increase in the number of active beaver lodges counted in the 1960 survey, this trend is, however, a 5% decrease from that of the 1954 number of active colonies. As seen in Figure I the population picture on the whole does not appear to have changed significantly from that recorded during the years 1954, 1957 and 1958. If, in actuality, a low in the beaver population had occurred in 1959, the present trend may be toward another increase in the number of beaver in the park.

While the east and west quarters of the park appear to be similarly endowed with beaver colonies, the southern half of the park has twice as many colonies than has the northern half. This is understandable in terms of the more favourable

beaver habitat found in the southern half of the park.

While no attempt was made to record impressions concerning the water levels in smaller potholes in which active beaver lodges were seen to occur, each of the observers felt that in numerous instances it would be problematic whether beaver could survive a severe winter under such low water-level conditions.

As with beaver, moose and elk are more abundant in the southern half of the park than in the northern half. No elk were observed along any of the transects flown in the northern half of the park.

Conclusions.

The 1960 aerial survey indicated a seventy-six per cent increase in the population of beaver in the park as compared with the 1959 survey figures. The beaver population differs only slightly from the levels recorded in 1954, 1957 and 1958. Twice as many active beaver colonies were counted in the southern half of the park as in the northern half. Using the figures of 637 miles of transect, one-quarter mile observation strip on either side of the aircraft, the figures 6.7 and 8.2 beaver per lodge as calculated by the writer in 1956, and the writer's count of 802 active lodges in the current survey, it is estimated there are between 13,000 and 16,000 beaver within the boundaries of the park.

As with beaver the greater proportion of moose and elk were concentrated in the southern half of the park where deciduous forest and numerous small potholes are the dominant ecological features.

Recommendations.

One major peak in the population of beaver in Prince Albert Park was recorded in 1956. At the present time indications are that the population is either stable or on a slight increase. It is recommended that the aerial survey portion of the study of beaver in the park be continued during the fall of 1961 in order to ascertain whether or not another cyclic peak is about to occur. It would be very useful to know what is the duration of beaver population cycles if they do occur with any consistency.

The dates set for the survey should be made more flexible and in keeping with the climatic tendencies of each particular year rather than being set for any fixed dates. In that way the participants may be able to carry out the survey as soon as the leaves have fallen and before any hindering snowfall such as that with which the 1959 observers had to contend.

No attempt has been made in this report or in any previous survey report to correlate beaver population trends with meteorological data. This should be done and, time permitting, will be investigated this winter.

In connection with future aerial surveys it would appear to be advisable to obtain data on what percentage of potholes supporting active beaver colonies have such low water levels that it would be problematical as to whether the colonies survive a severe winter.

A. Radvanyi

Edmonton, Alta.
November 9, 1960.

A. Radvanyi
Wildlife Biologist.

1960 P.A.N.P. Aerial Beaver Survey

Appendix 1. Colonies counted by Right front observer

East half	Creeks		Lakes		Potholes	
Transect #	Active	Dead	Active	Dead	Active	Dead
1		1			1	1
2					1	1
3	2					
4						1
5					1	
6			1			
7	2				1	
8					1	1
9			2		1	
10			1		1	1
11				1	2	1
12					5	
Total N.E.	4	1	4	1	14	6
West half						
1					1	2
2				1	1	1
3	2		1			
4		3			1	1
5					2	
6			1	1	2	
7						3
8					2	2
9					1	1
10					5	2
11					1	3
12					5	
Total N.W.	2	3	2	2	21	15

Right front observer

East half	Creeks		Lakes		Potholes	
Transect #	Active	Dead	Active	Dead	Active	Dead
13		1			4	
14	3					2
15	2	1			8	2
16	4				9	
17	2				5	4
18	5		1		4	
19	6	1			3	2
20	3	1			2	2
21	1				1	
22	1				1	
23	4		1	2	2	3
24					2	
25	1			1	3	1
Total S.E.	32	4	2	3	44	16
West half						
13	1	2			3	4
14	2	1			3	
15	1		1		9	1
16	2				7	3
17	4	1			2	1
18			1		8	1
19	4	2			3	
20					5	3
21	1		1	1	2	3
22	2		1		1	1
23	3				3	
24	2	1			4	1
25	1					
Total S.W.	23	7	4	1	50	18

1960 P.A.N.P. Beaver Survey

Appendix 2. Colonies counted by Right Rear Observer

East half

Transect #	Creeks		Lakes		Potholes	
	Active	Dead	Active	Dead	Active	Dead
1			2			
2						1
3				1		
4						
5						
6						
7					1	1
8						
9				1		
10			1	1	1	1
11			1	1	1	
12	1				1	1
Total N.E.	1		4	4	4	4
West half						
1	1				1	1
2		1	1		2	
3	3		1			
4		5				
5			1			
6		1	2		1	4
7					1	5
8				1	1	2
9			1			1
10				1		4
11		1		1	1	
12	2	4			2	2
Total N.W.	6	12	6	3	9	19

Colonies counted by Right Rear Observer

East half

	Creeks		Lakes		Potholes	
Transect #	Active	Dead	Active	Dead	Active	Dead
13	1	1			1	
14	3					2
15		1			2	7
16	7	5			2	2
17		1			3	6
18	1			1	3	3
19	2	2			2	4
20		2			1	
21		1				
22		1				
23	1	2	2	1	2	1
24					2	
25	3				2	1
Total S.E.	18	16	2	2	20	26
West half						
13					1	7
14		3			1	1
15					8	4
16	1			1	5	6
17	1	2			3	2
18					5	2
19	2	4			4	2
20						5
21	1	1		2	1	
22	1				1	1
23	1	1			2	
24		1			3	1
25						
Total S.W.	7	12		3	34	31

1960 P.A.N.P. Beaver Survey

Appendix 3. Colonies counted by Left Bear Observer

East half

Transect #	Creeks		Lakes		Potholes	
	Active	Dead	Active	Dead	Active	Dead
1	1	1				
2			1			1
3					1	
4					1	1
5		1				
6		1				
7					1	
8				1		
9			1			
10						1
11						
12	2					
Total N.E.	3	3	2	1	3	3
West half						
1					1	
2	1		1	1		
3		3			1	1
4					1	2
5	1	1			1	
6	1					4
7			1			1
8						1
9			3	1		1
10			2	1	1	
11		2	1	1		1
12	1		1	1	1	
Total N.W.	4	6	9	5	6	11

1960 P.A.M.P. Beaver Survey

Colonies counted by Left Rear Observer

East half

Transect #	Creeks		Lakes		Potholes	
	Active	Dead	Active	Dead	Active	Dead
13		1			2	
14						
15	1	2	2		5	1
16	1	1				1
17	4	3			5	1
18	2	1			2	2
19	2	1			5	
20	3	1			2	1
21						
22						
23			1	1	2	1
24						
25	1				5	4
Total S.E.	14	10	3	1	28	11
West half						
13	1	1	1		4	4
14	1				6	
15	1	3	1		3	1
16	4	1		1	2	1
17		2				2
18	4				5	2
19	2					
20	1		1			
21		1				1
22	3				1	
23	3				1	
24		1			1	
25		2				
Total S.W.	20	11	3	1	23	11

Appendix 4.

P.A.W.F. 1960 Beaver Survey

Observer & Position	N.W. Sector Creeks Act.	Creeks Dead	Lakes Act.	Lakes Dead	Potholes Act.	Potholes Dead	Totals Act.	Totals Dead	Totals Sum	N.E. Sector Creeks Act.	Creeks Dead	Lakes Act.	Lakes Dead	Potholes Act.	Potholes Dead	Totals Act.	Totals Dead	Totals Sum
Radvanyi Front Rt. (1)	2	3	2	2	21	15	25	20	45	4	1	4	1	14	6	22	8	30
Holsworth Rear Rt. (2)	6	12	6	3	9	19	21	34	55	1		4	4	4	4	9	8	17
Lovaas Left Rear (3)	4	6	9	5	6	11	19	22	41	3	3	2	1	3	3	8	7	15
	S.W. Sector									S.E. Sector								
Radvanyi (1)	23	7	4	1	50	18	77	26	103	32	4	2	3	44	16	78	23	101
Holsworth (2)	7	12		3	34	31	41	46	87	18	16	2	2	20	26	40	44	84
Lovaas (3)	20	11	3	1	23	11	46	23	69	14	10	3	1	28	11	45	22	67

Appendix 5.

Number of Active Beaver Colonies Counted on 1960 Survey

North ½ Transect #	WEST HALF Right Front Observer (1)	Right Rear Observer (2)	Left Rear Observer (3)	Total (1)&(3)	EAST HALF Right Front Observer (1)	Right Rear Observer (2)	Left Rear Observer (3)	Total (1)&(3)	Total W.& E. Observer (1)&(3)
1	1	2	1	2	1	2	1	2	4
2	1	3	2	3	1		1	2	5
3	3	4	1	4	2		1	3	7
4	1		1	2			1	1	3
5	2	1	2	4	1			1	5
6	3	3	1	4	1			1	5
7		1	1	1	3	1	1	4	5
8	2	1		2	1			1	3
9	1	1	3	4	3		1	4	8
10	5		3	8	2	2		2	10
11	1	1	1	2	2	2		2	4
12	5	4	3	8	5	2	2	7	15
Totals N ½	25	21	19	44	22	9	8	30	74
South ½									
13	4	1	6	10	4	2	2	6	16
14	5	1	7	12	3	3		3	15
15	11	8	5	16	10	2	8	18	34
16	9	6	6	15	13	9	1	14	29
17	6	4		6	7	3	9	16	22
18	9	5	9	18	10	4	4	14	32
19	7	6	2	9	9	4	7	16	25
20	5		2	7	5	1	5	10	17
21	4	2		4	2			2	6
22	4	2	4	8	2			2	10
23	6	3	4	10	7	5	2	9	19
24	6	3	1	7	2	2		2	9
25	1			1	4	5	6	10	11
Totals S ½	77	41	46	123	78	40	44	122	245
Totals N & S	102	62	65	167	100	49	52	152	319

Appendix 5.

Moose and Elk Observations - P.A.N.P. Aerial Survey, Oct. 1960.

	WEST HALF						EAST HALF						BOTH HALVES					
Observer:	(1)		(2)		(3)		(1)		(2)		(3)		(1)		(2)		(3)	
Transect #	Moose	Elk	Moose	Elk	Moose	Elk	Moose	Elk	Moose	Elk	Moose	Elk	Moose	Elk	Moose	Elk	Moose	Elk
1	3		1										3		1			
2	1		1										1		1			
3			4												4			
4																		
5																		
6																		
7																		
8																		
9																		
10			1								1				1		1	
11			2												2			
12	2		2										2		2			
Total N ♀	6		11								1		6		11		1	
13	5		4		1				2		1		5		6		2	
14	3		5		1		1		1		1		4		6		2	
15	1		2	2	9	2			1				1		3	2	9	2
16	1		3		3	2			2	1			1		5	1	3	2
17	3		3	1	7		2		4		4		5		7	1	11	
18	2	1	4	1	4		5	1	8		1	1	7	2	12	1	5	1
19	1		1		1		4	4	5	4	8		5	4	6	4	9	
20	3	4	10	2	1	5	17	18	17	12	7		3	22	27	14	8	5
21	2		3	1			5	7	13		8	9	7	7	16	1	8	9
22		1	2		1				3		2			1	5		3	
23	1		3		6		2		2			2	3		5		6	2
24	1		2		2		1		1				2		3		2	
25					3				1						1		3	
Total S ♀	23	6	42	7	39	9	20	30	60	17	32	12	43	36	102	24	71	21
Total N & S													49	36	113	24	72	21

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