

✓  
YUKON ENERGY, MINES  
& RESOURCES LIBRARY  
PO Box 2703  
Whitehorse, Yukon Y1A 2C8

INVESTIGATIONS INTO THE STATUS OF THE  
FINLAYSON LAKE CARIBOU HERD  
MARCH 1981 TO OCTOBER 1982

QL737  
.U55  
I58

Interim Report  
October 1982  
Richard Farnell  
Caribou Technician



0054-94660  
QL737  
•USS  
I58

NORTHERN AFFAIRS PROGRAM INFORMATION CENTRE

INVESTIGATIONS INTO THE STATUS OF THE  
FINLAYSON LAKE CARIBOU HERD  
MARCH 1981 TO OCTOBER 1982

Interim Report  
October 1982  
Richard Farnell  
Caribou Technician

## TABLE OF CONTENTS

	Page
Abstract	1
List of Tables	2
List of Maps	3
Introduction	4
Objectives	6
Methods	7
Results	8
Late Winter Distribution	8
Capture Results	11
Radio Tracking and Classified Counts	14
Spring Migration and Calving Distribution	16
Post Calving Distribution and Composition	19
Fall Rutting Distribution, Composition and Population	
Estimation	22
Harvest Analysis	29
Predators	32
Discussion	41
Management	47
References	50

ABSTRACT

Inventory efforts from March 1981 to October 1982 in the east central Yukon identified the Finlayson Lake Caribou Herd as the dominant population in the region. A census attempt was made and composition statistics were gathered. Home range use pattern and migratory traditions were determined. The overwinter calf survivorship of the 1981 cohort was 29:100. Initial calf crop for the 1982 cohort was 42:100. The fall long yearling recruitment was 7.7:100 or 4.5 percent of the population. By fall the calf crop was declined to 16.5:100. Percentages are below the expected natural mortality rates. A skewed immature bull/mature bull ratio of 50.11/49.9M suggests that negative recruitments has taken place for 3 to 5 years. Overhunting has aggravated this situation and the herd may be declining at 11.1 percent annually. Wolves are considered to be abundant, and the probable cause of poor recruitment. A management program is discussed.



LIST OF TABLES

TABLE #		PAGE
1	Sex, Age and Physical Measurements of Caribou Captured in East Central Yukon, March - April, 1982.	
2	Finlayson Lake Herd Composition counts - April 6, 1982	
3	Finlayson Herd Radiocollar Relocations, Direction and Distance of Travel and Habitat Selection.	
4	Post Calving Relocations, Antler Condition, habitat Selection and Composition, June 1982.	
5	Composition of the Finlayson Lake Herd Taken in Three Increments Across the Rut Distribution, October 1982.	
6	Resident and Non-Resident Harvest from Finlayson Lake Caribou Herd.	
7	Questionnaire: Native harvest of Caribou Near Ross River.	

LIST OF MAPS

MAP #	PAGE
1 Late Winter Distribution of Woodland Caribou in the East Central Yukon, March 1982.	
2 Capture Locations and Collar-Code Numbers, March - April 1982.	
3 Calving Site Relocations, May 1982.	
4 Post Calving Relocations, June 1982	
5 Early Fall Relocations, September 1982.	
6 Rut Relocations, September 1982.	
7 Home Range Boundary, Stratified Physiographic Units, and Units Surveyed.	
8 G.M.S. Used for Determining Resident and Non-Resident Harvest of the finlayson-Lake-Herd.	

INTRODUCTION

With the discovery and proposed extraction of minerals in the MacMillan Pass-Howards Pass area, with two hydroelectric proposals, the Hoole Canyon and Ross River dam sites, in conjunction with a reported existing high level of both resident sport and native hunter caribou harvest, has necessitated conducting a basic inventory, and status assessment of the caribou populations in the East central Yukon.

Some data exists on two principal woodland caribou herds shared with the N.W.T. The Redstone herd and the Nahanni Herd have seen previous work all or in part from investigations by Simmons (1970), Archibald (1974), Gill (1978), Nette (1981), Mossop and Hayes (1981), Farnell and Nette (1981), and more recently by Lortie (1982). A study proposal involving a joint effort by yukon and N.W.T. to further inventory and cooperatively manage these herds is currently under review.

With the exception of a few game surveys aimed at other species, namely Hoefs and Lortie (1976, Nette (1981) and Farnell and Nette (1981), no data has been gathered regarding the expression of caribou herds



known to range wholly in the Yukon within this region. For this project it is my purpose to provide the basic data required to manage these caribou.

Experience from past inventory efforts of woodland caribou populations have taught us to calculate numbers strictly on a herd basis during key life cycle periods rather than density estimate extrapolations over broad areas. In this way, populations levels and trends may be attributed solely to discrete populations occupying a traditional home range and conclusions may not provide potential error compounded across other herd distributions. More importantly existing trends provide insights from composition counts principally, sex ratio, initial calf crop, overwinter calf survivorship, and evaluation of yearling recruitment vs known harvest and natural mortality.

This project began March 1981 and shall be completed March 1983 when a comprehensive final report shall be written. Funding for the study was \$40,000 and comes solely from the Y.T.G. Further monitoring and refinements of data shall be considered for the 1983-84 fiscal year given recommendations and/or regulation changes proposed by this work are considered.

I would especially like to acknowledge the assistance of the Ross River Regional Conservation Officer, Jerry Milchelski, whose generous support

made many of my field efforts successful. Others providing very helpful assistance were Chris Gustafson, Janet McDonald, John Witham, Hammond Dick and Grant Lortie.

#### OBJECTIVES

1. Range Tradition - through radiotelemetry techniques determine boundaries, winter range, calving grounds, summer range, rutting grounds, migration routes and timing for the herd or herds found in the east central Yukon.
2. Reproductivity - determine the reproductive success of these caribou by conducting sex and age composition counts during late winter (March) for over winter calf survivorship, spring and summer (May-June for initial calf crop at calving and post-calving time, and overall population composition during the rut (October).
3. Population Size - conduct a population estimate utilizing a stratified sampling technique during the peak of the rut in early October.
4. Natural Mortality - by determining the cause of death of any stationary radio-collared individuals which constitute a sample of the herd, and making an assessment of predator abundance through observations made incidental to these survey efforts.
5. Hunter harvest - Review and tabulate the sport hunter harvest questionnaire results from 1978 to present, non-resident harvest,

and conduct house to house interviews of a sample of the principal native hunters in the region.

#### METHODS

The March work used 21 hours of (ski equipped) Cessna 185 time to prelocate caribou for marking and to delineate winter distribution. Fifteen hours of Bell 206 helicopter time were also used to live capture and radiocollar caribou. Russell-Farnell (1980) describe the net gun capture method.

The April component, used 10.5 hours of Piper PA18 fixed wing time to locate caribou for capture and again assess distribution. 9.8 hours of Bell 206 helicopter time was used in radio tracking, previously collared animals and, on the basis of these locations, conduct classified counts. An incidental objective to the April work, was to locate and live capture wolves for radiocollaring with the net gun technique used on caribou.

In May, 11.4 hours of Cessna 206 fixed wing time was flown to relocate collared cows during the suspected peak of calving.

During June, 9.9 hours C-206 fixed wing time was used to relocate all collared caribou immediately post-calving. 12.7 hours Bell 206 helicopter time was used to conduct classified counts centered around previously located bands. An additional 8.6 hours of Cessna 206 time was flown later in the month to determine observability in mountainous snowpatch areas of caribou for a post-calving photo census effort.



In early September, 8.3 hours C-206 fixed wing time was used to relocate radio collars on early fall ranges and assess degree of pre-rut herding behavior for census and composition count efforts. In late September 9.0 hours of C-206 fixed wing time was used to relocate marked caribou and stratify the herds rutting distribution for a systematic census effort.

During early October, 14 hours of Bell 206 time was used to survey stratified physiographic units, conduct 100 percent coverage and counts in a sample of these units, relocate collared individuals, and retrieve collars from stationary signals.

In addition to these surveys a house to house interview method of determining harvest levels and hunting area selection was conducted in the Ross River Indian Village. Renewable Resources resident and non-resident harvest records were reviewed and tabulated.

Throughout our field efforts long time residents, trappers and hunters within the study area were interviewed for background information regarding the traditional range use of caribou, harvest levels and predator abundance.

## RESULTS

### LATE WINTER DISTRIBUTION

By mid March, 1982, Woodland Caribou had segregated into two distinct and possibly three wintering groups; the Fortin-Finlayson group, the Tay Lake group and a group near Lewis Lake. The extent of the respec-

pective distributions and concentration areas are depicted on Map 1. Suspected patterns of movement based on an interpretation of older sign evident on previously shared and peripheral range are indicated.

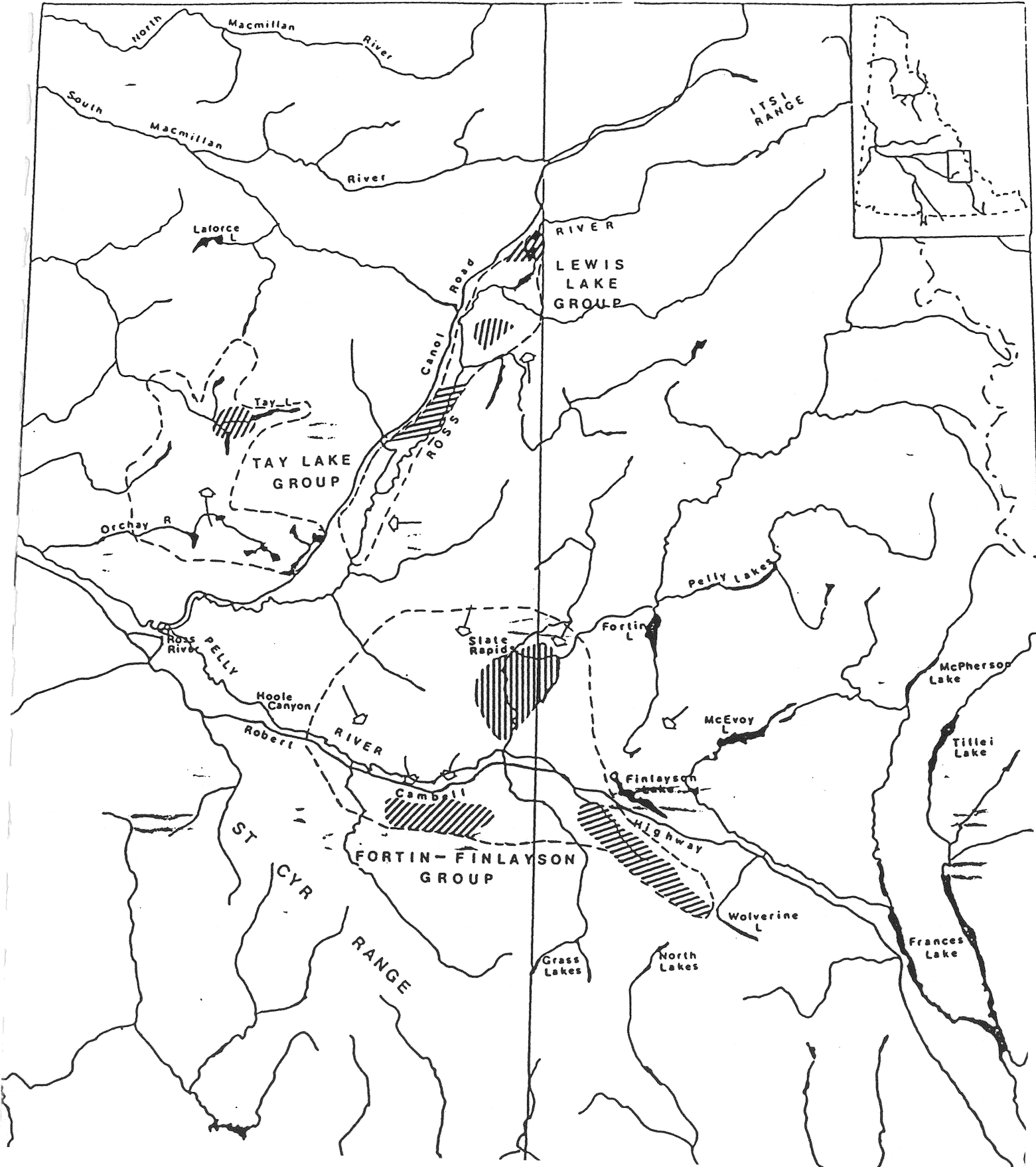
The Finlayson group occupied winter range reported previously by Hoefs and Lortie (1976). Popular access afforded by the Campbell Highway and an extended record of annual harvests indicate the traditional use of this winter range.

The use of the Ross River lowland between False Canyon and Sheldon Lake as winter range was not clearly understood. However, it is now established that this range paralleling the North Canal Road is important in some years. Follow up work, now has the advantage of radio telemetry to define population discreteness and use of winter ranges.

In April, the distributions mapped in March had not changed significantly except that some caribou of the Finlayson group had crossed the Campbell Highway and started into the higher terrain to the south. Evidently the movement from their winter range to calving and summer ranges had begun. Similarly, caribou in the Ross River lowland were still evident, but in much reduced numbers. Of two individuals collared in March, one (M-45) had moved approximately 35 miles directly south into the range of the Finlayson group. The other collar (M-44) was not found, but the unexpected movement of M-45 introduces the possibility that the caribou wintering along the Canal Road were Finlayson caribou.

# MAP 1. LATE WINTER DISTRIBUTION OF WOODLAND CARIBOU IN THE EAST-CENTRAL YUKON, MARCH 1982

○ DISTRIBUTION      ▨ CONCENTRATION AREA      ⇨ MOVEMENT TREND





## CAPTURE RESULTS

In all, 21 caribou were live captured and radio collared. Fifteen individuals of the Finlayson group (L series) were marked in March; 14 from the Slate Rapids concentration and one from a minor concentration south of the Campbell Highway.

Three caribou from the Tay Lake concentration were marked in March (M series) as well as two individuals, M44 and M45 on the Ross River lowland. At the time, these caribou were thought to be a part of the Tay Lake group. Weather conditions and equipment malfunction prevented the capture of caribou from the minor concentration in the Lewis Lake area in March. However, in April, one adult female (N 53) was captured and marked at Lewis Lake.

The success of this marking program is substantiated by the remarkable efficiency of the technique with no resulting capture mortalities or injuries. This experience, however, did result in the loss of two nets (still attached to caribou but not entangling them). Both of these incidents were a result of attempting to capture caribou on small lakes adjacent to timber. Before a second net could be employed, the target animals were able to reach timbered cover.

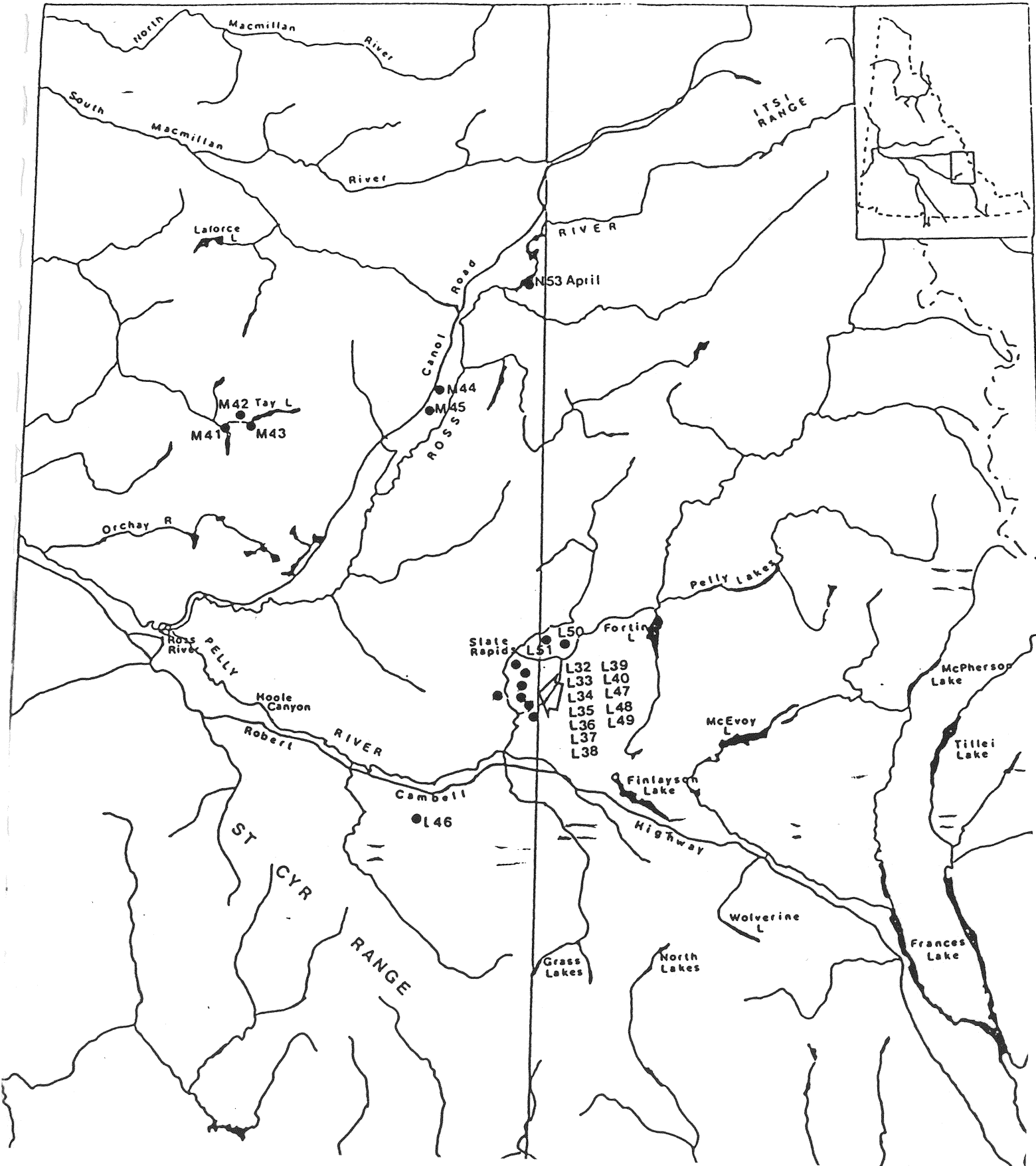
The sex, age and seven physical movements associated with the live capture are summarized on Table 1. Capture locations and collar code numbers are noted on Map 2.

Our one attempt at live capturing and radio collaring a wolf in April

TABLE 1. SEX, AGE AND PHYSICAL MEASUREMENTS OF CARIBOU CAPTURED IN EAST CENTRAL YUKON, MARCH - APRIL, 1982.

Collar #	Age	Sex	Heart Girth (cm)	Total Length (cm)	Ear Length (cm)	Tail Length (cm)	Hind-foot Length (cm)	Shoulder Height (cm)	Chest Height (cm)	Collar Color
1. L-32	Adult	♀	131.0	219	15.0	19.0	42.5/61.0	-	-	Lime-green
2. L-33	Adult	♀	135.0	232	15.0	17.0	46.0/60.5	-	58.0	Lime-green
3. L-34	Adult	♀	131.5	209	14.5	16.5	40.0/59.0	114.0	60.0	Lime-green
4. L-35	Adult	♀	-	-	-	-	-	-	-	Lime-green
5. L-36	Adult	♀	141.0	213	14.5	17.0	40.0/60.5	118.0	62.0	Blue
6. L-37	Adult	♀	139.0	222	14.0	18.5	44.5/60.5	-	66.0	Blue
7. L-38	Adult	♀	133.0	243	14.8	16.0	41.5/55.5	-	65.0	Blue
8. L-39	Adult	♀	129.0	200	13.5	14.0	39.0/58.0	118.0	63.0	Blue
9. L-40	Immature	♂	-	-	-	-	-	-	-	Blue
0. M-41	Immature	♀	-	-	-	-	-	-	-	Red
1. M-42	Adult	♀	122.0	204	14.0	14.0	42.0/58.0	-	60.0	Red
2. M-43	Calf	♀	116.5	72.5	12.0	7.0	38.0/52.0	99.0	54.0	Red
3. M-44	Immature	♂	141.0	213	16.0	16.0	44.0/60.5	-	70.0	Red
4. M-45	Adult	♀	147.0	222	14.5	16.0	39.5/55.0	-	-	Red
5. L-46	Adult	♀	139.0	206	15.0	13.0	40.0/57.5	-	57.0	White
6. L-47	Adult	♀	140.0	207	15.0	14.0	39.5/55.0	-	65.0	White
7. L-48	Adult (small)	♀	131.0	217	14.5	-	43.0/58.0	112.5	69.0	White
8. L-49	Adult	♀	142.5	223	14.0	15.0	40.5/56.0	115.5	63.0	White
9. L-50	Adult	♀	119.0	212	14.0	14.0	41.5/59.0	118.0	56.0	White
0. L-51	Adult	♀	135.5	206	14.0	15.5	40.0/56.5	-	66.0	White
1. N-53	Adult	♀	131.5	213	13.5	14	40.5/56.0	123	63.0	Orange

MAP 2. CAPTURE LOCATIONS AND COLLAR-CODE NUMBERS  
• MARCH - APRIL, 1982





was unsuccessful. While we were able to get a net over a small wolf on an open lake, he evaded capture by simply turning and backing out of the net. Subsequent attempts on this individual were unsuccessful, as he quickly adopted evasive manoevers that outwitted the considerable skill and capability of helicopter pilot Witham. Further, wolves refuse to flush from cover into the open, their response to a low hazing of the helicopter is to simply find the thickest cover they can and hide in it. The net capture of wolves may be possible in open alpine habitat or on large lakes.

#### RADIO TRACKING AND CLASSIFIED COUNTS

In April, the radio tracking of caribou collared in March resulted in the relocation of every collar in the (L series) Finlayson group. No attempt was made to relocate caribou collared at Tay Lake (M-41, M-42, and M-43). Incidental to capture work on wolves and caribou near Lewis Lake, we secured a relocation on M-45 as noted earlier. Both M-44 and M-45 were observed by pilot Witham on April 10, 1982 in the immediate vicinity of their capture on March 19.

The criteria for sex and age segregation counts used are described in Russell and Farnell (1980). Because of the high degree of sexual segregation at this time of year and also because we tended to select cow/calf bands through radio tracking females the male cohort is poorly represented. The most meaningful data here and our primary objective is calves per 100 cows or overwinter calf survivorship. The classification counts on the Finlayson herd are summarized in Table 2, and yielded a calf survivorship of 29 calves/100 cows.

TABLE 2. FINLAYSON LAKE HERD COMPOSITION COUNTS - APRIL 16, 1982.

Obs. #	♀	C	Y	Imm. ♂	♂	T	Collar & Color	Map. Ref. #	Comments
1	13	3	1	1	-	18	L-46(W)	1	
2	12	2	-	1	6	21	L-48(W)	2	
3	6	2	-	-	-	8		3	L-38 in vicinity
4	14	6	1	1	-	22	L-36(W)	4	
5	6	2	2	1	-	11			
6	8	3	1	1	-	13	L-51(W)		
7	2	-	-	-	-	2		5	
8	2	-	-	-	-	2			
9	2	1	-	-	1	4			
10	6	-	-	-	-	6	L-50(W)	6	
11	15	3	1	3	1	23			
12	19	5	-	-	-	24		7	L-34 in vicinity
13	2	2	1	3	1	9			
14	12	3	1	-	-	16		8	L-33 in vicinity
15	4	3	1	-	-	8			
16	15	4	-	1	-	20		9	
17	8	3	-	-	-	11			
18	4	1	-	-	-	5	L-35(G)	10	
19	3	2	4	2	1	12			
20	20	3	-	-	-	23	L-37(B)	11	
21	9	5	1	1	-	16			
22	2	-	-	-	-	2	L-39(B)	12	
23	4	-	-	1	-	5			
24	8	2	-	-	-	10	L-47(W)		
25	3	-	-	-	-	3		13	
26	3	1	-	-	-	4	L-49(W)		
27	14	-	1	-	5	20	L-32(G)	14	
28	6	-	1	1	-	8			
29	12	4	-	-	-	16	L-40(B)	15	
30	7	-	-	1	-	8			
31	3	-	-	1	1	5		16	
32	1	7	-	-	-	8			
33	2	2	-	-	-	4			
34	1	3	1	0	1	6			

248 72 17 19 17 373 72/248=0.29=29 calves/100♀

SPRING MIGRATION MOVEMENTS AND CALVING DISTRIBUTION

Attempts to relocate the Tay Lake caribou were unsuccessful. Weather permitted only coverage from a north-south line between Swim Lakes to LaForce Lake east to the North Canal Road. It became apparent that M-41, M-42 and M-43 may be individuals not associated with the Finlayson group, ranging further north or west. Peripheral caribou M-44, M-45 and N-53 captured in the Ross River lowlands and Lewis Lake, are associated with the Finlayson Herd. Their movements tended south and east parallel to calving Finlayson caribou.

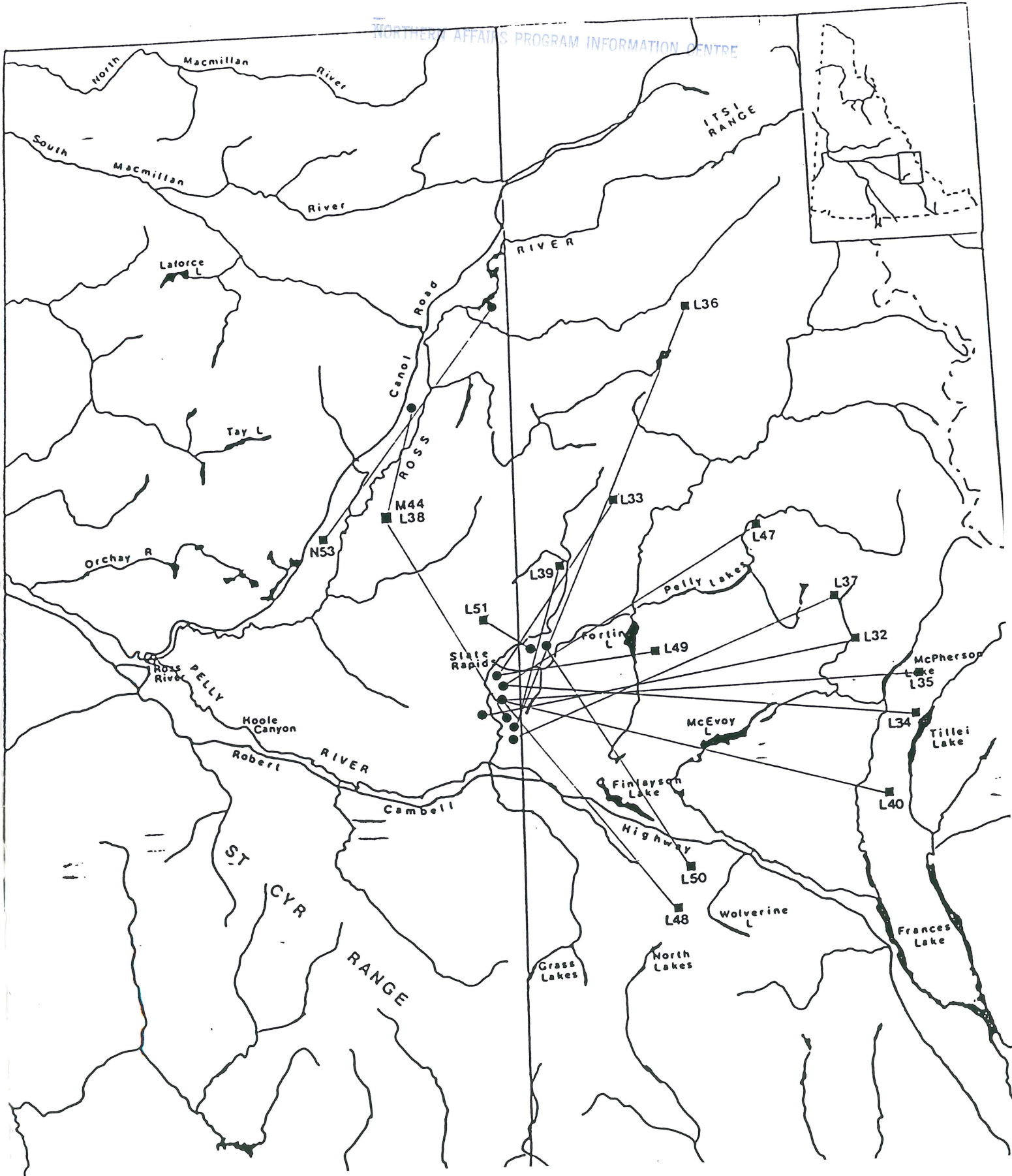
In contrast to an anticipated southward movement into the St. Cyr Range from the core wintering area at Slate Rapids, these Finlayson Herd radio-collared caribou moved away from that area in a 180° arc stretching from Wolverine Lake in the southwest continuously to the headwaters of Big Timber Creek in the northwest. Table 3 presents the basic direction and distances travelled, and Map 3 presents the specific calving relocation sites for each individual.

All but two Finlayson Herd caribou were relocated. They may have been in the region of the upper Big Campbell or Hoole River in the St. Cyr Range, which was not covered. Interestingly and in contrast to results from other Yukon woodland caribou herds, which select calving sites on steep mountain slopes, virtually all individuals were relocated in a forested habitat. Intensive low level searching immediately over the signal on four individuals could not produce a visual sighting. The remaining relocations were made high level for efficient searching.

TABLE 3 Finlayson Lake Herd Radiocollar Relocations, Direction and Distance of Travel and Habitat Selection

Collar Code	Sex	Age	Distance (mi)	Direction	Habitat	Terrain
L-32	♀	Adult	49.0	East	Moderate Spruce	Rolling
L-33	♀	Adult	27.0	Northeast	Dense Spruce	Mountainous
L-34	♀	Adult	50.5	East	Dense Spruce	Flat
L-35	♀	Adult	50.0	East	Moderate Spruce	Flat
L-36	♀	Adult	57.0	North	Moderate Spruce	Rolling
L-37	♀	Adult	42.0	Northeast	Moderate Spruce	Flat
L-38	♀	Adult	26.0	Northwest	Moderate Spruce	
L-39	♀	Adult	21.0	North	Sparse Spruce	Rolling
L-40	♀	Immature	49.0	East	Dense Spruce	Rolling
M-44	♂	Immature	10.0	Southeast	Sparse Spruce	Rolling
M-45	♀	Adult	NOT RELOCATED			
L-46	♀	Adult	NOT RELOCATED			
L-47	♀	Adult	34.5	Northeast		
L-48	♀	Adult	32.0	Southeast	Subalpine	Mountainous
L-49	♀	Adult	19.0	East		
L-50	♀	Adult	34.0	Southeast	Subalpine	Mountainous
L-51	♀	Adult	8.0	Northwest	Moderate Spruce	Rolling
N-53	♀	Adult	32.0	Southwest	Dense Spruce	Flat

MAP 3. CALVING SITE RELOCATIONS, MAY 1982 ■



POST CALVING DISTRIBUTION AND COMPOSITION

Early June relocation surveys found sixteen of the eighteen radio-collared Finlayson Herd individuals deep into their summer range. Habitat selection was tending from spruce forested areas to mountainous alpine areas. Composition counts were conducted on all marked individuals including associated bands. Group sizes were unfortunately yielding a poor sample size. Using all individuals counted, the calf crop was 38 calves/100 cows, and using only the marked females calf production as a sample of the herd yields a calf crop of 42 calves/100 cows. All female caribou observed had cast their hard antlers indicating complete post-partuition. Peak of calving was probably between 25 May and 7 June somewhat later than previously examined herds. Table 4 presents a list of the collared individuals relocated, their antler condition, habitat selection, and composition. Relocation sites are given on Map 4. An adult cow observed to die from unknown causes south of Ross River was autopsied. Lung-liver-heart-bone and vaginal discharge specimens were obtained and forwarded to the Western College of Veterinary Medicine, Saskatoon, Saskatchewan. The probable cause of death may have been a uterine infection.

Late June survey efforts to attempt a minimum population count by photographing post-calving aggregations on snowfields proved futile. This mid-afternoon survey did find some caribou selecting snowpatches, however, band sizes were too small to justify comprehensive coverage and photography. The June fly harrassment level was not conducive to aggregation formation.

TABLE 4.

## POST-CALVING RELOCATIONS, ANTLER CONDITION, HABITAT SELECTION, AND COMPOSITION, JUNE 1982

SURVEY POINTS	COLLAR	ANTLERS	HABITAT	FEMALE	CALF	YEARLING	MALE
1.	N-53	None	Spruce	1		1	
2.	L-36	None	Spruce	1	1		
3.	M-41	None	Spruce	1	1		
4.	L-46	None	Spruce	1			
5.	L-48	None	Alpine	1	1		
6.	L-38	None	Spruce	1	1		
7.	M-44	None	Spruce				1 1
8.	L-39	None	Spruce	1			
9.	L-50	Velvet	Alpine	1			
10.	L-49	None	Spruce	1			
11.	L-35	None	Spruce	1			
12.	L-47	None	Alpine	1	1		
13.	L-37	None	Alpine	1			
14.	L-51	None	Alpine	1			
15.	L-40	Velvet	Sub Alpine			1	1
16.	L-32	None	Spruce	1	1		

TOTAL	14	6	2	3
PER CENT	56	24	8	12
/100 Cows		42.9	14.3	21.4

NORTHERN AFFAIRS PROGRAM INFORMATION SERVICE





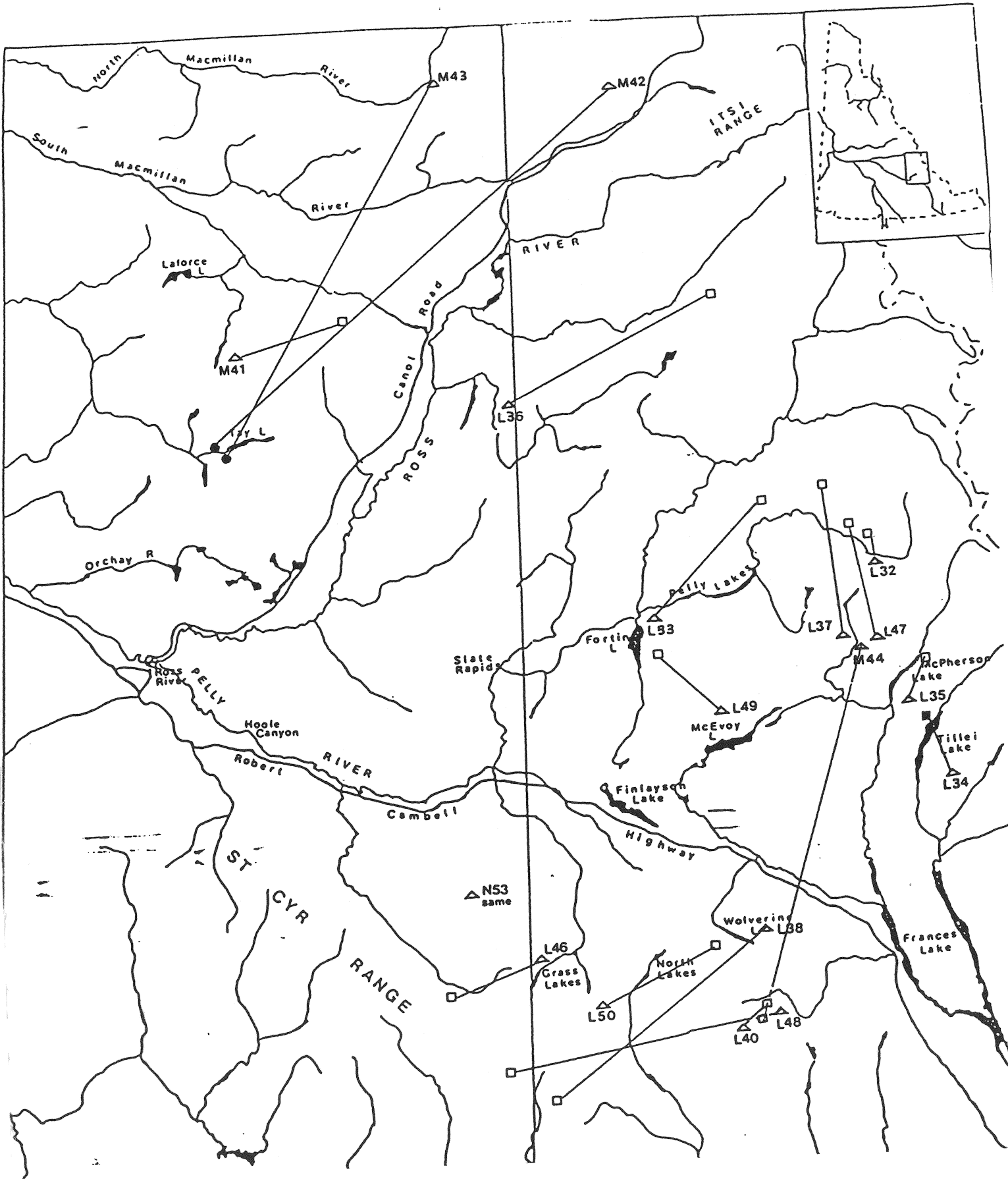
FALL RUTTING DISTRIBUTION, COMPOSITION AND POPULATION ESTIMATION

Early September surveys found radio-collar movement trends generally reversing direction and concentrating. Caribou summer bands were coalescing at two regions within the summer range. Along the low elevation plateau mountains on the north flank of the St. Cyr Mountains near Grass Lakes, North Lakes and Wolverine Lake, and north of the Robert Campbell Highway in the high mountains from Fortin Lake to McPherson Lake. Thirteen of the eighteen radio-collared Finlayson Caribou were relocated. Rutting grounds became apparent. Adult female M-44 moved from a post-calving relocation near Wolverine Lake to a pre-rut relocation, 15 miles northwest of McPherson Lake crossing the Robert Campbell Highway between surveys.

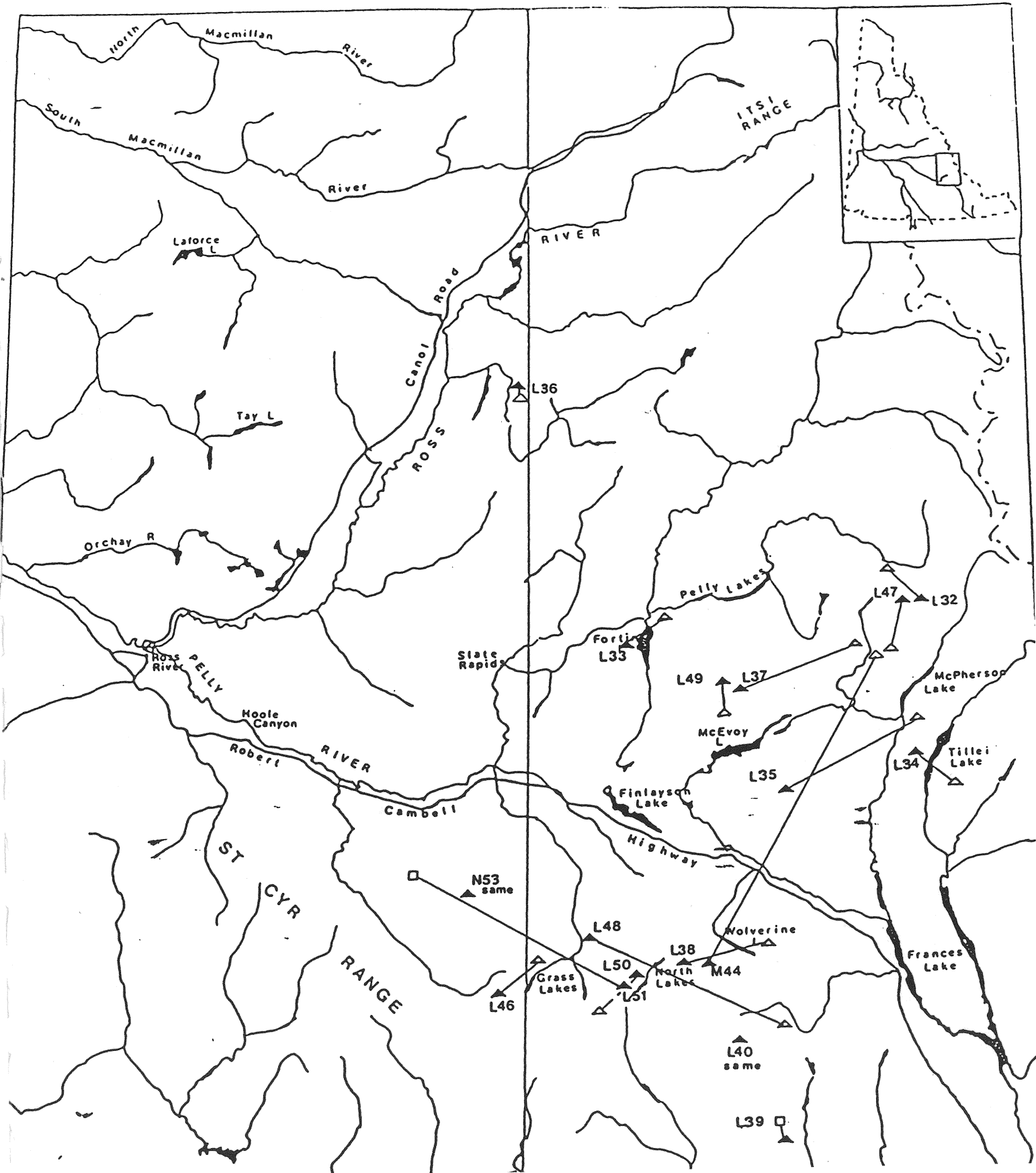
An intensive search effort for the three Tay Lake Caribou found M-41 just north of Tay Lake itself. This immature cow probably spent the entire summer near that vicinity. The adult cow M-42 and calf M-43 were located north of the MacMillan River. The Tay Lake group were exhibiting a unique range tradition suggesting that they are in fact members of a discrete population (Tay Lake Herd) that do not exchange animals with the Finlayson Herd. ~~The~~ home range boundary for the two herds probably occurs roughly along the North Canal Road. Map 5 presents early September relocations and movements from the previous post-calving distribution.

Late September relocation surveys found rutting distribution in be largely the same (Map 6). A total of seventeen of the eighteen Finlayson collared individuals were relocated. Despite extensive

MAP 5. EARLY FALL RELOCATIONS, SEPTEMBER 1982 ▲



MAP 6. RUT RELOCATIONS, SEPTEMBER 1982 ▲









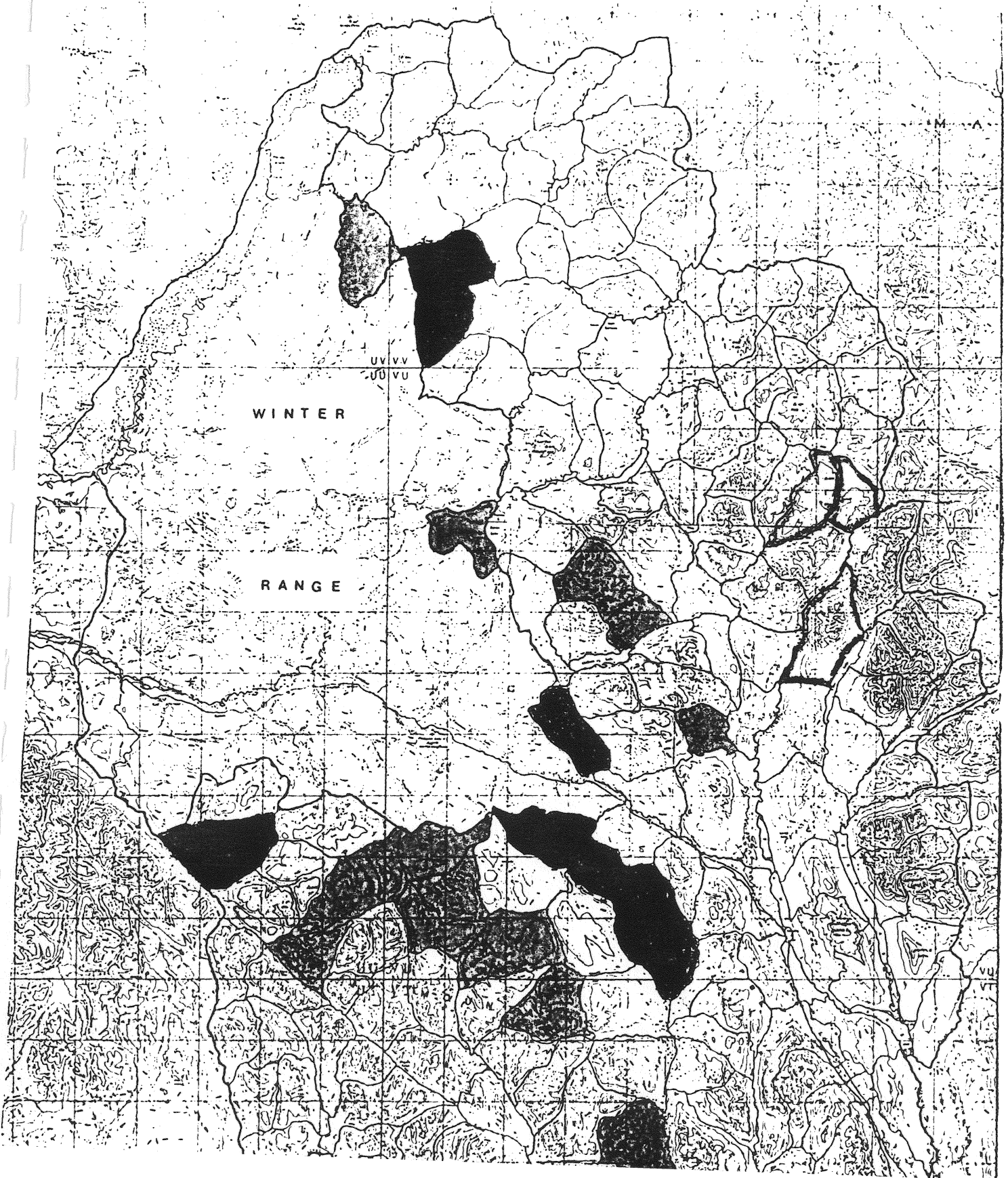
coverage with telemetry equipment working extremely well, (some signals were picked up 80 miles distant) we were not able to relocate M-45. The disappearance of this individual since April leads me to believe that this adult cow may have been killed by predators. The transmitters antenna may have been chewed off, thus destroying signal strength for adequate long distance reception. No search effort was made to relocate Tay Lake Herd collars in late September.

Upon completion of these fixed wing surveys, the home range of the Finlayson Herd as determined by winter and post-calving, summer relocations was determined. The summer range was then stratified into three strata based on suspected densities during rut distribution. Medium size physiographic units were stratified as primary strata if one or more radio-collared individuals occurred within the unit. All units bordering a primary were assigned a secondary strata classification and all other units were classed as tertiary strata. The resulting stratification and units surveyed are presented on Map 7.

Despite all our efforts to survey the primary strata completely and obtain large samples of secondary and tertiary, weather precluded total coverage over the preceding six days. During the later stages of these helicopter surveys we discovered that some radio-collared individuals had moved into adjacent survey units despite their relatively sedentary behavior during rut. I decided at this point to keep the data we had generated with acceptable methods covering three-quarters of the rut distribution and devise a "ball park" estimate of population size rather than a more precise statistically testable estimate which required

MAP 7. Home Range Boundary, Stratified Physiographic Units, and Units Surveyed.

- |   |                           |  |                    |
|---|---------------------------|--|--------------------|
|  | Primary Caribou Stratum   |  | Primary Unsampld   |
|  | Secondary Caribou Stratum |  | Secondary Unsampld |
|  | Tertiary Caribou Stratum  |  | Tertiary Unsampld  |



complete coverage. Another problem faced with this population estimation was that bands associated with three of the seventeen radio-collared caribou were located in dense spruce forests. This represents and suggests that 17.6 percent of the herd may have been located in poor observability habitat. We were surveying alpine areas exclusively. We, therefore, counted and classified 1,244 caribou over three quarters of their presumed distribution. Based on these results, I believe the Finlayson Herd numbers from 2,000 to 2,500 caribou.

Composition count results as given on Table 5 yielded a sex ratio of 45.8 bulls per 100 cows, a long yearling recruitment of 4.5 percent, and a fall calf crop of 16.5 calves per 100 cows. The fall calf cohort was down drastically from the initial calf crop of 42.9 calves per 100 cows. The ratio of immature bulls to mature bulls was all but equal at 50.1/49.9M, which very unusual. Most I/M bull ratios in caribou herds are around 75/25. Percentages and ratios were consistent across the herd distribution.

Two collared caribou L-40 and L-53 were found as stationary signals. Ground investigations found the remains of both, with evidence that they were killed by predators, probably wolves. By comparing tooth wear with plates given by Miller (1974) I estimated the age of N-53 at +13 years. N-40 was 15 months old. Incidental to these surveys we found an adult cow dead from undetermined causes, similar to the caribou found in June. We airlifted this caribou out and froze the carcass. Autopsy results a pending at this writing.

TABLE 5

COMPOSITION OF THE FINLAYSON LAKE HERD TAKEN  
IN THREE INCREMENTS ACROSS THE RUT DISTRIBUTION, OCT. 1982

	FEMALE	CALF	YEARLING	IMMATURE MALE	MATURE MALE	TOTAL
TOTALS	164	36	13	30	45	288
PER CENT	57.3	12.5	4.5	10.4	15.6	
/100 COW		21.9	7.9	18.3	27.4	
TOTALS	414	68	37	104	99	722
PER CENT	57.3	9.4	5.1	14.4	13.7	
/100 COW		16.4	8.9	25.1	23.9	
TOTALS	318	53	19	64	68	522
PER CENT	60.9	10.2	3.6	12.3	13.0	
/100 COW		16.6	6.0	20.1	21.3	
TOTALS	732	121	56	168	167	1244
PER CENT	58.8	9.7	4.5	13.5	13.4	
/100 COW		<u>16.5</u>	<u>7.7</u>	<u>22.9</u>	<u>22.8</u>	



HARVEST ANALYSIS

NORTHERN AFFAIRS PROGRAM INFORMATION CENTRE

For exclusion of caribou harvested from bordering herds, we selected the game management subzones as depicted on Map 8 to use for determining the resident and non-resident sport hunter harvest. The resident sport hunter harvest estimate is based on returns from questionnaires sent to hunters from 1978 to 1980, (Table 6). The returns from the 1981 questionnaires have not been tabulated at the time of this writing. The non-resident sport hunter harvest data comes from compulsory reports in the form of guide returns. Teslin Outdfitters is the only guiding operation in the home range of the Finlayson Herd. They alternate their hunts for two year intervals between a base camp at Fire Lake and Ice Lakes further south. Resident hunters appear to key in on the fall migration pattern and hunt post-rut caribou crossing the Campbell Highway in the vicinity of Finlayson Lake.

Unfortunately, there are no records available for a native harvest analysis. However, house to house interviews conducted by Canadian Wildlife Service technician, Hammond Dick on our behalf, did produce some basic background. Out of 46 households in the Ross River Indian Village, the principal hunters of 19 households, which constitutes 41.3% of homes, were interviewed. The following questions were asked:

1. Number of families in household?
2. Number of eligible hunters in household?
3. Where they hunt most?

N. Canol Road

Robert Campbell Highway

MAP 8. G.M.S. Used For Determining Resident and Non-Resident Harvest of the Finlayson Lake Herd

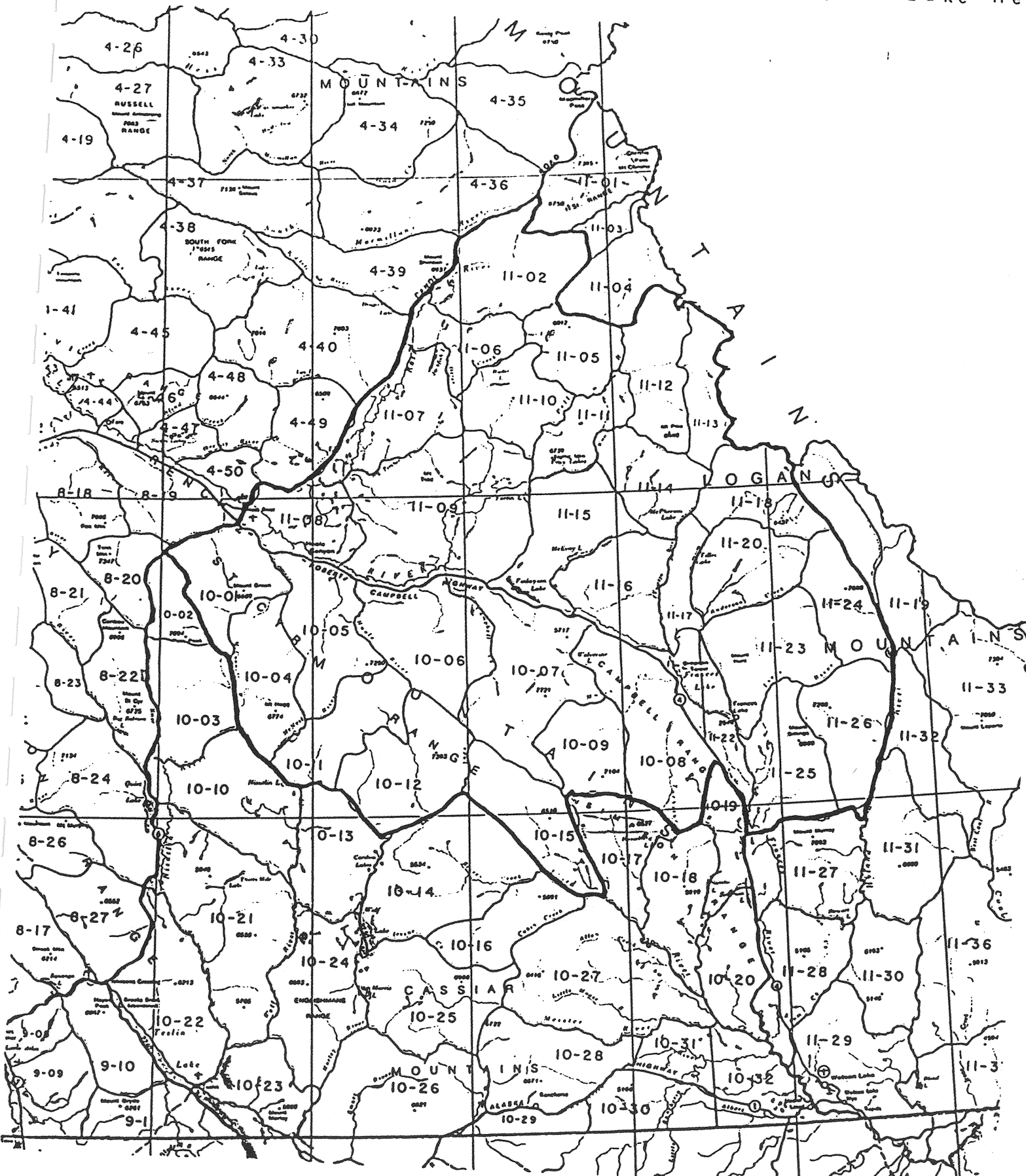


TABLE 6

RESIDENT AND NON RESIDENT HARVEST  
FROM FINLAYSON LAKE CARIBOU HERD

G.M.S.	RESIDENT			NON-RESIDENT			
	78	79	80	78	79	80	81
11-02	3	4	2	-	-	-	-
07	-	-	-	-	-	-	-
08	1	-	1	-	-	-	-
09	1	-	-	-	-	-	-
15	6	7	7	-	-	-	-
16	-	1	-	-	-	-	-
21	1	4	2	-	-	-	-
22	1	6	4	-	-	-	-
23	1	9	3	-	-	-	-
24	3	3	9	-	-	-	-
25	2	2	1	-	-	-	-
26	5	13	3	-	-	-	-
10-01	-	1	1	-	-	-	-
06	-	-	2	-	-	2	-
07	5	8	8	-	-	8	15
08	-	1	-	-	-	2	-
09	-	-	-	-	-	2	-
TOTALS	29	59	44	-	-	14	15
AVERAGE		44				14.5	
THREE YEAR AVERAGE			53.6				

4. How many caribou taken in 1981?
5. Are there more caribou now or years ago?
6. Is the hunting effort increasing or decreasing?
7. Are there more wolves now or years ago?

The answers to these questions are presented on Table 7. We also learned that native hunters from Carmacks, Faro and Watson Lake hunt caribou of the Finlayson Herd, but to a lesser degree than Ross River. The average number of caribou taken per household during 1981 in our sample was 1.8. If we extrapolate this average to the remaining 27 households, our total harvest by Ross River natives for 1981 was probably 83.6 caribou. If we assume this to be an average take by native hunters and in addition to the reported resident and non-resident sport hunter average, the average annual hunter kill from the Finlayson Herd is probably around 137 caribou, not counting poaching.

#### PREDATORS

Throughout the field effort we were continually made aware of the Ross River Indian bands mobility and desire to live and work on the land. Virtually throughout the home range of the Finlayson Herd, we observed sign of trappers or hunters habitating the country. In general, the drift of feelings we received from people interviewed was that wolves were high. P. Rogers (pers. comm.) observed a pack of 31 wolves on Frances Lake during the winter of 81-82. We found incidental to surveys that wolves and wolf sign were common. The largest pack observed by us was 8 near McEvoy Lake. Wolves appeared to be most abundant on the Finlayson Herd winter range. Farnell and Nette 1981, incidental to

TABLE 7. Questionnaire: Native Harvest of Caribou near Ross River

#	No. of Family/Families in House	No. of Eligible Hunters in House	Where Hunt Most			Kill Data 1981	Are There More		Are There More Caribou		Are There More Wolves	
			N. Canol Rd.	E. Robert Campbell	Both		Now	Before	Decreasing	Increasing	Now	Before
1	1	5	X			2		X	X		X	
2	2	3	X			3		X	X		X	
3	1	1	X			4		X	X		X	
4	2	2		X		2		X	X		X	
5	1	3		X		1		X	X		X	
6	1	0		X		1		X	X		X	
7	1	2		X		2		X	X		X	
8	1	1			X	1		X	X		X	
9	1	2			X	1		X	X		X	
10	1	1		X		1		X	X		X	
11	1	1		X		1		X	X		X	
12	1	2		X		2		X	X		X	
13	2	3	X			3		X	X		X	
14	2	1		X		1		X	X		X	
15	1	2	X			2		X	X		X	
16	1	2		X		1		X	X		X	
17	1	1		X		2		X	X		X	
18	1	2		X		2		X	X		X	
19	1	2		X		3		X	X		X	
						35						

22.

.40.

a moose survey observed sign of minimum 31 wolves largely on this winter range.

DISCUSSION

-Based on our surveys, and previous inventory, in conjunction with what local knowledge we obtained from long time residents, suggests that the Finlayson Herd range use pattern is highly traditional. Initially, we assumed that the winter range distribution of caribou in the Pelly River, Fortin-Finlayson Lake lowlands, was that of a discrete herd which probably summer ranged in the St. Cyr Mountains to the south.

The telemetry aspect of our study demonstrated that the Finlayson Herd in fact winter ranges over a much broader area. The movements of the marked caribou M-44, M-45 and N-53 suggests quite strongly that caribou inhabiting the Ross River lowlands, north to Sheldon Lake, and east to around Otter Lake are Finlayson Herd animals. I suspect that the early winter distribution is probably much more scattered across this winter range based on caribou sign observed by Farnell-Nette (1981). Concentration areas like those observed at Lewis Lake and Slate Rapids form during March and April. If concentrations form at or near these localities again this year then we will have identified the core winter for this herd. This I hope should have some bearing on evaluations of the Ross River and Hoole Canyon hydroelectric proposals. As reservoirs from either of these dams would inundate large tracks of this winter range and influence the movements and habitat use pattern of the herd. Habitat destruction, increased access and recreational hunting played principal roles in the decline of B. C. caribou herds (Bloomfield, not dated).

During winter I expect overlap with the Tay Lake, which seem to utilize the Orchay-Marjorie-Tay Lake region, to occur commonly. Exchange of animals during the spring migration is highly unlikely. Telemetry tests conducted by Russell-Farnell (1980, 1981) between the Hart River, Bonnet Plume, and Porcupine Herds demonstrated a high degree of home range loyalty and discreteness between herds after wintering on the same range. The movements of M-41, M-42 and M-43 to summer ranges well away from those of the Finlayson Herd indicate that these caribou are from a discrete population that should be managed separately.

The winter range tradition of the Finlayson Herd by selecting lowlands in the snowshadow region on the lee side of the Pelly Mountains follows the "low of least effort". Much the same as caribou winter distributions found by Bergerud (1978) in British Columbia, Lortie (1982) in the Northwest Territories and Russell-Farnell (1980/1982), in Yukon. In those cases caribou were selecting light snowfall areas on the northeast flank of mountain ranges and avoiding the heavy snowfall areas facing maritime weather flow from the southwest. The same pattern exists here and emphasizes the importance of these areas to herd habitat management.

---

During summer surveys, I was impressed with the potential carrying capacity of this winter range. It is an excellent open canopy spruce-lichen community that could probably support twice the number of caribou utilizing it at present. Caribou densities on the mainland of North America in relatively undisturbed predator-prey equilibriums are commonly



1 caribou per square mile ( $2.59 \text{ km}^2$ ) (Bergerud, not dated). This uniform density has been observed for the Porcupine Herd for over a decade. The area inhabited by the Finlayson Lake herd as determined by radio-collared movements and distributions observed during these surveys is 7,343 square miles. If the population is an estimated maximum 2,500 animals, the resulting density is .34 caribou per square mile. There is no reason to believe that range carrying capacity is dictating this density.

During winter the herds are exposed to the Robert Campbell Highway and the North Canal Road. This factor in addition to the mobility created by snowmobiles enables a large scale native harvest. Increased access by construction of a new road to the mineral deposit at Howards Pass could aggravate this situation.

Calving site selection by Finlayson herd cows contrasts with that found by Bergerud (1978), Russell-Farnell (1980/1981), and Archibald (1974) in adjacent woodland caribou herds. While Finlayson cows are selecting dense spruce forest habitats to have their calves, the latter herds select high alpine ridges and talus slopes as calving sites. I believe that the Finlayson calving site selection is vulnerable to higher predation rates and may be a partial explanation for poor reproductive success. Unfortunately, but not dissimilar to other herds, calving distribution is scattered, making examination of initial calf crops difficult. The solitary nature of cows during this life cycle period will always produce poor sample sizes. In the future, either large sample sizes of radio-collared cows should be used or this survey should be abandoned for

post-calving surveys. I believe that the calving period and peak of calving for this herd probably runs later 25 May to 6 June than that of the Redstone, Bonnet Plume, and Hart River Herds which peak around 22 May.

As marked caribou moved off the winter range for summer pastures, we didn't expect to find them utilizing portions of the Logan Mountains to the east. Previously we had thought that the caribou in that specific region were individuals from the Nahanni Herd which winters in the N.W.T. I now believe that the summer range boundary probably lies somewhere between Frances Lake and the Cantung Road. Once again overlap occurs but no exchange of animals is expected. The spring migration finds caribou moving into a summer range which extends from around Otter lake to the north in a 180° arc to the Upper Hoole River to the south. I believe post-calving aggregations occur during most years by late July. The late spring of 1982 probably delayed fly eruption and postponed this fly harassment escape behavior.

During aggregation formation when hundreds of caribou can be counted is the best time to sample calf production for this herd. Because of the rather large and mountainous summer range that is occupied, population estimation by photocensus methods is not practical.

Fall migration seems to find some long distance movements (M-44). For the most part, the herd seems to coalesce into two centres of habitation by rut. The core of the summer range appears to be along mountainous plateaus on the Tuchtua River, and north of the Campbell Highway,

in the steeper mountains from Fortin to Tillei Lake. During this period the southern segment sees some non-resident hunting pressure, only during two year intervals. By 28 September large rutting herds form principally around Wolverine-North Lakes to the south and McEvoy Lake to the north. It is during this period when sex and age composition is mixed and population visibility high, that the most meaningful demographic data can be obtained. By October 15 rutting behavior subsides and as fall storms persist the herd gradually migrates back to the winter range. The southern segment of the herd migrates along a corridor crossing the Campbell Highway from Big Campbell Creek to just east of Finlayson Lake. Sport hunters take advantage of the caribou availability at this time and over the years a "firing line" has been established. Radio-collar movements suggest that caribou may be exposed to the Campbell Highway during any month of the year.

Demographic data gathered so far during this study indicate that the Finlayson Herd, population maximum 2,500 caribou, is declining due to negative recruitment, as a result of poor reproductive success, and heavy hunting pressure. Over winter calf survivorship (10 month old, recruitment) should be considered low at 29 ca/100 females. In contrast during this same period the Bonnet Plume Herd spring counts yielded a calf survivorship of 55 ca/100 females, Russell-Farnell (file report), in a range where wolf densities are considered to be low. Mortality rates during the second summer of life are higher than that expected of adults constituting 26.5% of the short yearlings and yielding a fall long yearling (15 month old, recruitment) ratio of 7.7 yr/100

female or 4.5 percent of the standing fall population. It is this percentage of the population that constitutes true recruitment. We can expect long yearling mortality rates to equal that of adults. If we assume that natural mortality rates for adults in a range where wolves are abundant is 10 percent (Bergerud 1979) than long yearling recruitment is not offsetting natural mortality. Therefore this herd has to be unstable and declining. The harvest is averaging say 140 annually, 15.6 percent of the population is therefore succumbing to mortality. This means that the herd could be declining at a rate of 11.1 percent annually. The ratio of immature bulls to mature bulls (49.91/50M) is for the most part equal. Normal ratios are usually 741/25M, suggesting that poor recruitment of young animals into this population has been happening for 3 to 4 years.

The poor calf crop measured during spring 1982 does not mean that negative recruitment is due to reduced fertility. The 1982 initial calf production of 42.9 ca/100 female is low. The expected average annual initial production should be near 80 ca/100 female. Calf production spring 1982 for the Burwash Herd was 24.6/100 (Larsen, uplsh data) and for the Porcupine Herd 42/100 (Russell-Farnell, in prep). The overall poor caribou calf production for 1982 was probably due to the late spring. This poor calving success occurred across Yukon ranges experiencing a wide variety of variable population growth limitations. More importantly, the Finalsyon Herd calf crop dropped from 42.9 ca/100 female to 16.5 ca/100 female in four months. A summer mortality rate of 38.5 percent. This emphasizes the need for 1983 composition counts to determine the overwinter calf survivor ship for this cohort. If

we consider the 18 radio-collared individuals a fair cross section and sample of the herd, and use only the two confirmed predator related mortalities, the resulting natural mortality rate is 11.1 percent.

I believe the Finlayson Herd is an unstable population declining as a result of intensive predation rates and overhunting.

#### MANAGEMENT

To stop the decline of the Finlayson Lake Caribou Herd and provide a population level that can produce a sustained yield that insures the economic benefit currently being utilized by hunters, a rehabilitation management program must be conducted. The herds sex ratio at 45.8 males/100 females or 31.4 percent can provide a harvestable surplus for hunters during an interim management program. Bergerud (1971) documented a much lower caribou sex ratio of 22.8 percent bulls, which resulted from 10 years of legal stag hunting only, and did not cause any measurable reduction in herd fertility. I propose we save as many reproductive cows as possible, and reduce the harvest, yet provide a measure of hunting opportunity, with a bull caribou only season. This season should be put in place for a term of three years and fall composition counts should be conducted to monitor sex ratio.

A wolf control program should be instituted, likewise for three years, within the confines of the Finlayson herd home range. If 25 to 30

During this period of time I believe

a "predation lag" situation will develop. Positive recruitment and herd growth will exceed natural mortality rates until a high equilibrium has been reached. In the high predator-prey equilibrium there shall be more wolves than there are now. There shall also be a real harvestable surplus of caribou for hunters. Late winter, spring and fall composition counts should be conducted to monitor herd recruitment and document an expected significant population increase. Initial wolf removal should be done by this department incidental to late winter field efforts. Regulations affecting wolf hunting, should be reviewed and liberalized. The open season for wolves should be extended to 1 April to 31 March in this region. An open aerial hunting season from 1 January to 30 April on a permit basis should be considered.

Caribou management strategies should be incorporated into increasing development plans. Industrial programs as they arise should follow strict guidelines for activity in this caribou range. The winter range and migration corridors should be protected.

REFERENCE

- Hoefs M., Lortie G., 1976. "Big Game Inventory, Game Management Zone #11."  
(Renewable Resources Files.)
- Archibald P.L., 1974. "Some Observations of a Woodland Caribou Population  
in the Mackenzie Mountains." (C.W.S. Inservice Report.)
- Gill D., 1978. "Large Mammals of the MacMillan Pass Area Northwest Territories  
and Yukon."
- Nette T., 1981. "Sheep Inventories MacMillan Pass/Canol Road Area."  
(Unpublished - Department of Renewable Resources, Y.T.G.)
- Hayes B., Mossop D., 1981. "Nesting Raptor Populations in the MacMillan Pass  
North Canol Road Area." (Unpublished - Department of Renewable Resources  
Y.T.G.)
- Russell, D., Farnell, R., 1980. "Wernecke Mountain Caribou Studies".  
Progress Report, October, 1980. Prepared for Pam Ocean Oil Ltd.  
Unpublished, Department of Renewable Resources, Y.T.G.)
- Russell, D., Farnell, R. 1981. "Wernecke Mountain Caribou Studies". Progress  
Report, October 1981. Prepared for Pam Ocean Oil Ltd. Unpublished,  
Department of Renewable Resources, Y.T.G.)
- Farnell, R., Nette, T., 1981. "Moose/Caribou Investigations in the MacMillan  
Howards Pass Development Area". Unpublished interim report.  
Department of Renewable Resources, Y.T.G.
- Bergerud, A.T., 1978. "The Status of Caribou in British Columbia."  
Fish and Wildlife Branch, Province of British Columbia.
- Bergerud, A.T., 1971. "Hunting of Stag Caribou in Newfoundland."  
University of Victoria.
- Bergerud, A.T., 1979. "A Review of the Population Dynamics of Caribou and  
Wild Reindeer in North America." University of Victoria.
- Bergerud, A.T., Not Dated. "The Natural Population Control of Caribou."  
University of Victoria.
- Bloomfield, M., Not Dated. "The Impact of Development, Settlement and  
Associated Activities on Mountain Caribou in Central British Columbia,  
Canada." Department of Energy and Natural Resources, Fish and Wildlife  
Division, Alberta.