An Analysis of the Distribution of Woodland Caribou from Sighting Forms

by

Rob Hugg
Wildland Recreation Technology

1986

Submitted to Tim Trottier and
Len Dunsford in partial fulfillment
of the requirements of
WR271 Practicum Project

Summary

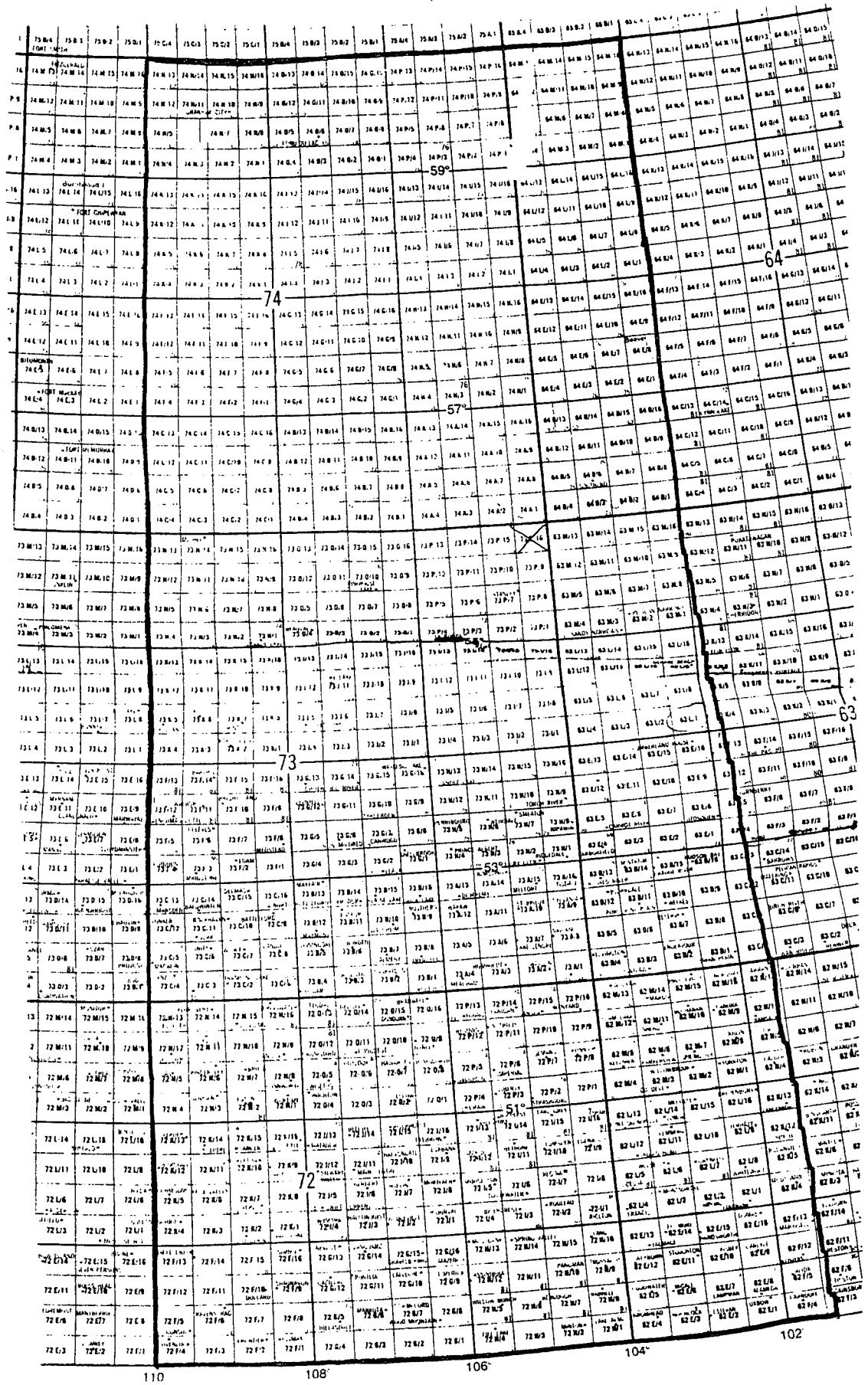
The purpose of this report is to document the distribution of woodland caribou in northern Saskatchewan and summarize the data collected on woodland caribou sighting forms compiled by Tim Trottier. Discussed in this report is: herd structure, sex and age observations, herd size, seasonal distribution and habitat preferences of the woodland caribou of northern Saskatchewan.

Table of Contents

Table of Contents (cont'd)

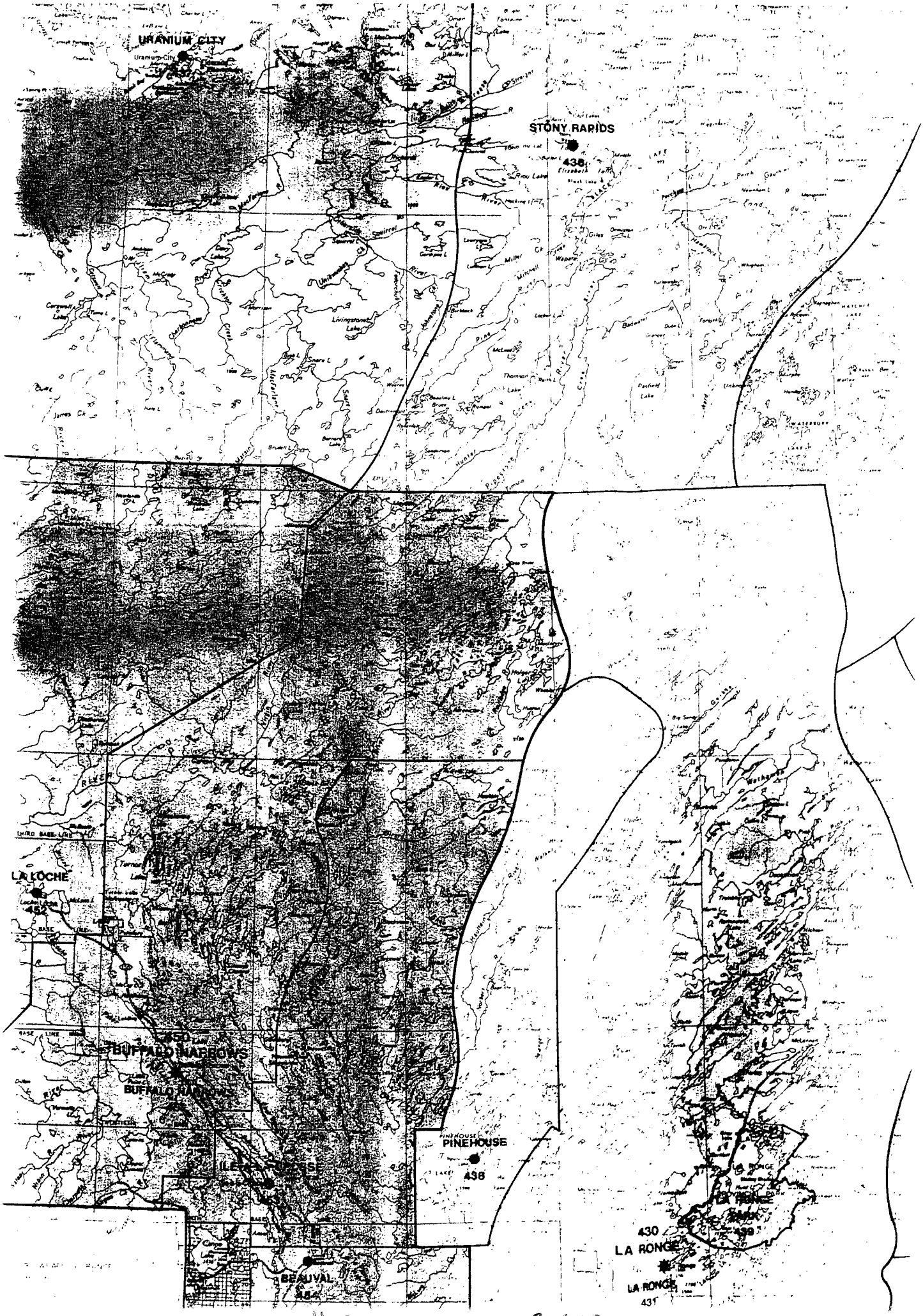
List of Appendices

List of Tables

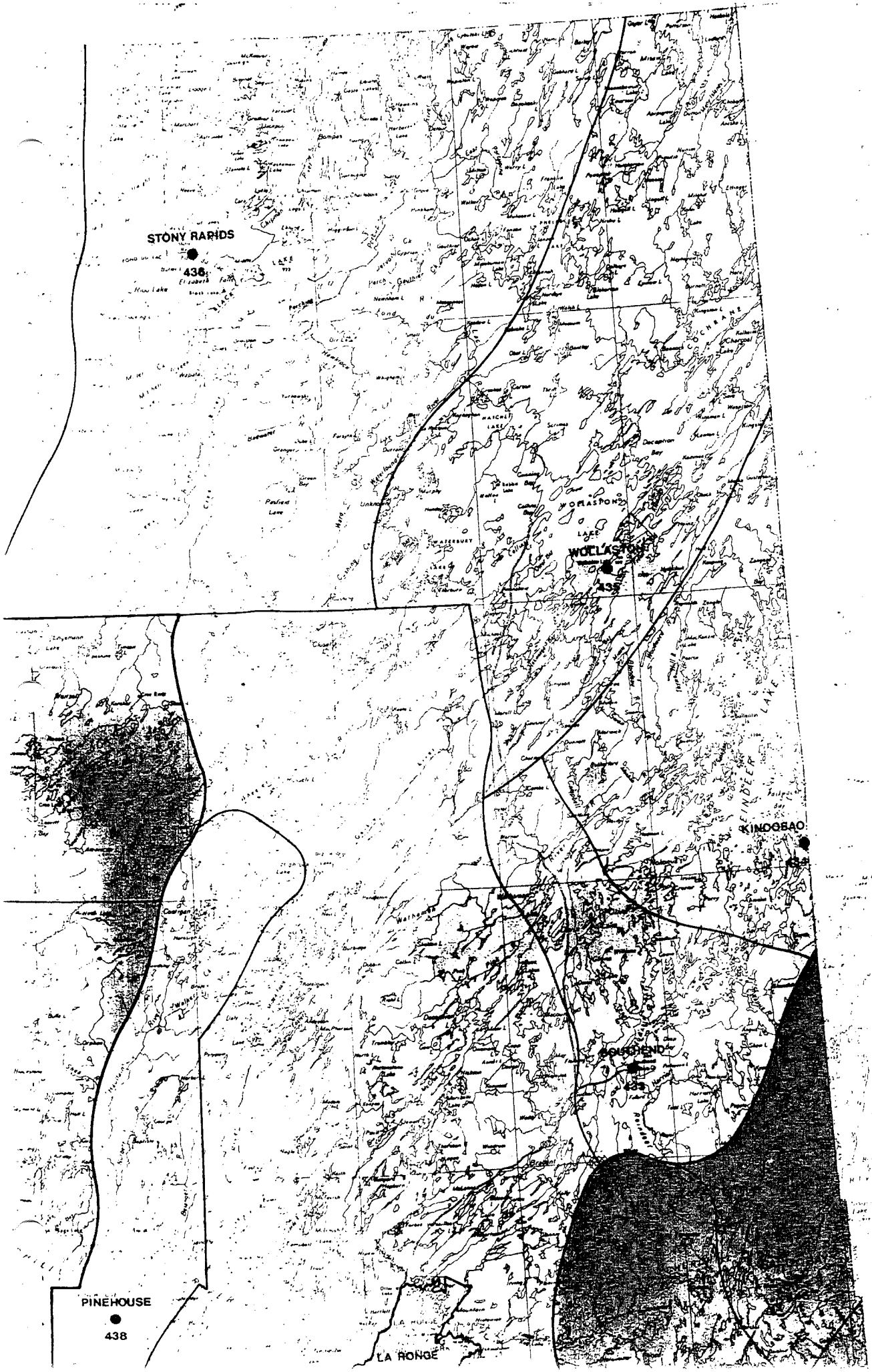


Key MAP #1

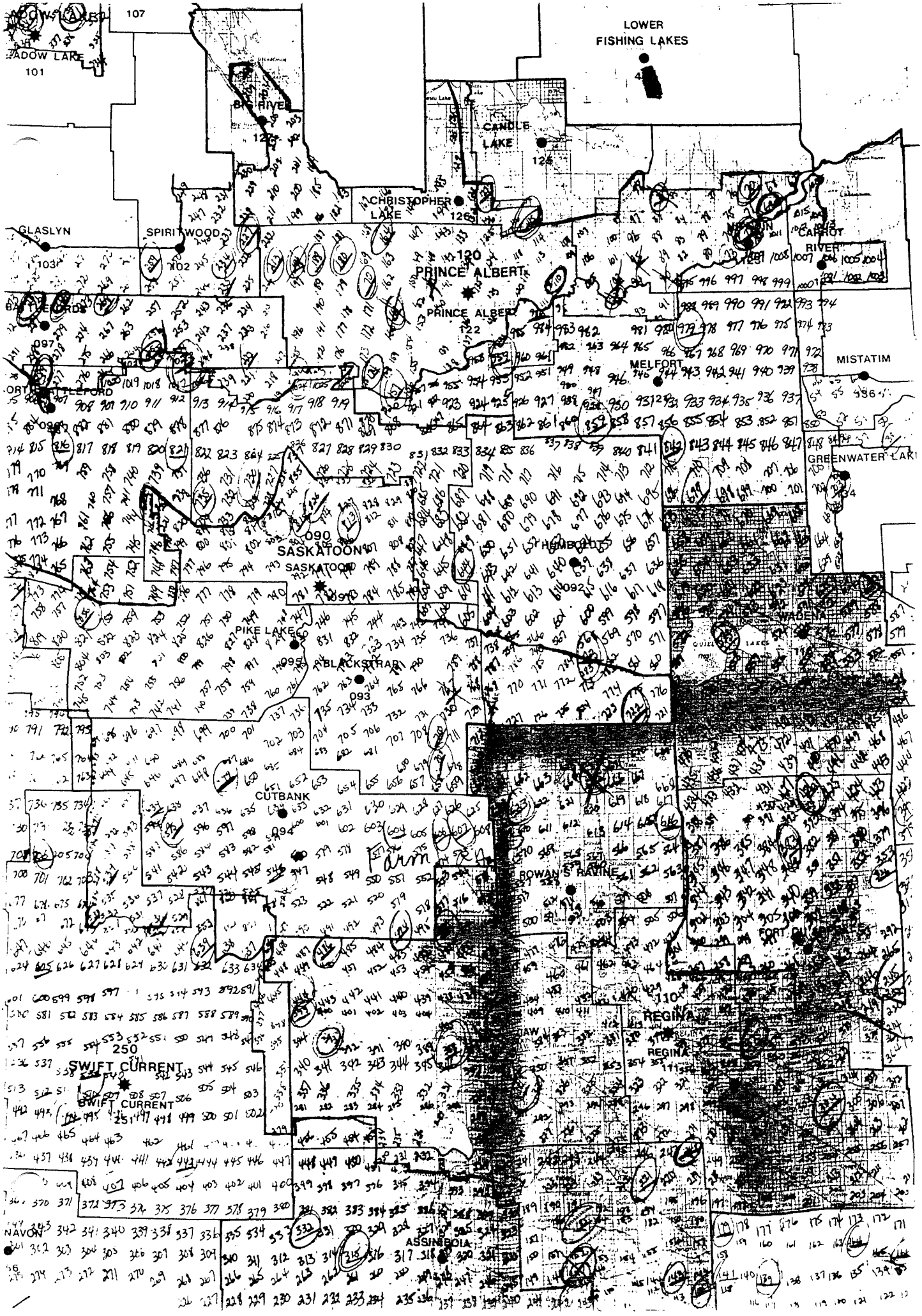
Scale 1:8,000,000



#2 Scale 1:2,400 000


STONY RAPIDS
436
WOLLASTON
435
KINOOSAO
SOUTHEND
433
PINEHOUSE
438
LA RONGE

icey map 3


LOWER
FISHING LAKES
CANDLE
LAKE
CHRISTOPHER
LAKE
GLASLYN
SPIRITWOOD
PRINCE ALBERT
MELFORT
MISTATIM
CARROT
RIVER
GREENWATER LAKE
HUMBOLDT
WADENA
SASKATOON
PIKE LAKE
BLACKSTRAP
CUTBANK
BOWAN'S RAVINE
REGINA
SWIFT CURRENT
ASSINIBOIA
NAVON

Key map
4

Introduction

"Woodland Caribou distribution in Saskatchewan is not accurately documented and its population size is unknown." "We (the Wildlife Branch) suspect that resource use and hunting are impacting the Woodland Caribou population (Tim Trottier, 1986)." For these reasons I have analyzed and summarized approximately 300 woodland caribou sighting forms that have been collected by regional biologist Tim Trottier of the Wildlife Branch. These sighting forms have been collected and stored over the years with the majority of forms dating back to the 1985 calendar year. The sightings took place all over northern Saskatchewan with Hudson Bay being the southern border and Lake Athabasca being the northern border. The eastern border extends into Manitoba and the western border extends into Alberta. This report contains a summary of these sighting forms including:

1. The distribution and occupational patterns of woodland caribou in northern Saskatchewan.
2. Habitat types required by the caribou for each season.
3. Age and sex ratios of animals sighted.
4. Herd structure and trends or change in structure.

1.0 Background information on Rangifer tarandus caribou.

1.1 Habits

Caribou are primarily diurnal, that is they are

most active during the day. They are excellent swimmers and float unusually high in the water. During the winter months they can be seen sunning themselves on the ice of frozen lakes. "Reindeer are gregarious and are usually observed in bands from ten to fifty individuals or in loose herds... which are social groups consisting of different sex and age groups at different seasons. "Caribou found in groups develop herd behavioral patterns: for example, they become much more indifferent to humans and predators, although individual animals will usually be harder to approach (Banfield 1974)." Therefore we can assume that caribou will be easily seen during the summer and winter months during the day.

1.2 Habitat requirements

In the winter woodland caribou require a combination of habitats such as open wind-swept muskeg and mature climax spruce stands. The muskeg will provide shrubs, sedges and grasses which will remain fairly accessible due to scouring by the wind. Mature spruce stands will harbour rich lichen growth and also provide cover, wind protection, snow interception and a warmer environment due to conduction from the trees. The ice on lakes acts

as a highway making remote islands and patches of muskeg more accessible.

The caribou's requirements during snowfree months are somewhat the same but for different reasons. Muskeg will now have new succulent plant growth while spruce and jackpine stands will give shade and provide lichens and mushrooms. The edges of open fens and heaths are frequented as they provide both cover and food.

1.3 Times of concentration

There are three major periods of concentration for the woodland caribou. The first period occurs in late winter prior to the spring migration. This period would commence in early March to April. The second period is during the fawning period. This period begins in mid May to early July. The final period of concentration is during the rut which commences in early October.

1.4 Sensitivity to man

Since the woodland caribou are primarily diurnal and herd behavioral patterns make them less afraid of man, the caribou are easily hunted and large numbers can be killed at a time. Increased logging

activity has made caribou range accessible and clearcuts have reduced suitable habitat for the caribou. Also caribou can easily be poached especially during the winter when they are often seen sunning themselves on the ice. Lastly, man's attitude about the caribou must change. On several sighting forms, trappers and hunters bragged about shooting four caribou, or shooting three to give to their dogs or even chasing down a caribou on lake ice and killing it with an axe. It is this attitude combined with decreasing habitat that has reduced caribou numbers, not just wolves.

2.0 The suitability of northern Saskatchewan as woodland caribou habitat

2.1 Vegetation

Northern Saskatchewan consists of a mosaic of vegetation and has habitat types such as: dense coniferous forests, mixed forests, open and treed muskeg as well as upland or ridged coniferous forests. Muskeg habitats provide sedge, grass, shrubs and other herbs for browsing. Upland forests provide shade, mushrooms, lichens and herbs while mixed and deciduous forests provide mushrooms, shrubs such as poplar, birch and alder as well as

some grasses and herbs.

2.2 Landscapes

Northern Saskatchewan has a variety of landscapes of mainly glacial and fluvial origin. There are large deltas, flood plains and patches of muskeg as well as habitat called upland formed by glaciers pushing up a large amount of land forming an island. Ice breaks off around these islands and forms a lake. Eskers and drumlins are also quite common in northern Saskatchewan resulting in gently rolling and undulating topography.

3.0 The survey

3.1 Objectives

The objectives of the survey are to find out the distribution of woodland caribou in northern Saskatchewan as well as determine the herd structure, the habitat they require and sex and age observations of the groups sighted.

3.2 Survey methods

Two survey methods were used to obtain the data collected on the sighting forms. These are as follows.

3.2.1 Completion of the sighting forms by trappers, hunters, biologists and tourists

Woodland caribou sighting forms were given to conservation officers and biologists throughout the northern half of the province. These forms were then filled out by local hunters, trappers, northern residents and biologists and were then forwarded to regional biologist Tim Trottier who was assigned this project. These people were asked to record any sightings of either tracks or the animals that they had witnessed and could recall accurately.

3.2.2 Telephone interviews

During the first week of this project I interviewed over the telephone approximately twenty people for information regarding caribou sightings or tracks. These people consisted mainly of conservation officers and biologists but some trappers, pilots and forest officers were interviewed also. These people gave me the date and location of specific sightings and also the names of people they thought might be able to help.

3.3 The woodland caribou sighting form

There were some problems at first with the caribou sighting forms. People found it long and they did not want to take the time to fill it out. Tim Trottier then designed a new sighting form which made it easier to fill out the information. Information needed for the survey includes: the date, the observers name, the location and UTM coordinates, either the tracks or the number of animals seen and the habitat the animals were in. Other questions the sighting forms ask about include: the feeding behavior, other wildlife signs, temperature and atmospheric conditions as well as a section for comments. People who did the survey were encouraged to enclose a map with the sighting form. Please see Appendix I to view both the original and the new sighting forms.

3.4 Procedure

After collecting all the information I could, I then went through the sighting forms and separated the forms into two groups; forms that were actual sightings and forms which were about tracks or spoor only. Following this I began analyzing each separate groups to determine the seasonal habitat and

distribution of caribou, the yearly location of animals, herd structure and sex and age observations.

4.0 Results of the tracks and spoor division

There were only 58 reports of tracks identified to be woodland caribou and these instances were reported between the years of 1977 and 1986. Because of the small amount of reports it is hard to make assumptions or analyze this information and come to a definite conclusion. We must also assume that the people who reported the tracks definitely can recognize and distinguish between caribou and moose or deer tracks. The information found out in this group may not be stable enough to base conclusions on, however, it certainly can back up conclusions made in the sightings only grouping.

4.1 Location vs. year

The sightings of tracks took place over a very large area and the descriptions (of the locations) were often vague. There were only two locations with repetitive sightings over the years and these locations were: 20 miles NE of Weyakwin and the area around the portage between Nmeiben Lake and Hives Lake. Please turn to Appendix II to view a table of the location vs. year (group size).

4.1.1 Analysis of Location results

There are many explanations for the lack of results in this grouping. The first, many people will not come in and report tracks. Next, tracks are easily covered or are undistinguishable after a snow fall or a couple of hot days. The final reason is, we do not accurately know the distribution of the caribou and people looking for them cannot cover the extensive range the caribou cover.

4.2 Seasonal Habitat

Two conclusions can be noted from the habitat vs. month data analysis. The first is, treed muskeg was the favored habitat throughout most of the fall and spring with 5 repetitive sightings or 41% of the occurances in December, 36% of all occurances in January and 33% of all occurances in March. The rest of the occurances were distributed throughout areas such as jackpine ridges, mixed forest and open muskeg. In snow free months from May to September jackpine and black spruce ridges had the most repetitive track sightings. Please refer to the next page to view (Table I) the habitat vs. time of year data.

Table I Habitat vs. time of year (group size) for the tracks only grouping

Habitat	Time of year (group size)												
	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	April	TOT
Treed Muskeg					2		4,5	11,2,1 17,1	3,4,3 15	7	5,10 2	15	18/106
jP, bS ridges	2,1		1	5	4,1		2	4	15		6,5		11/46
mixed				3					1		5		3/9
Lakes/Lakeshore							4,1	6	3,7	5,7	6		8/39
Upland forest				1			2				6		3/9
Cut overs			1		2,1	1,1	1		1				8/9
Burns									11,5				2/16
Agricultural													0/0
Open muskeg							20	3,2,1,3 8					7/43

4.2.1 Analysis of the seasonal habitat data

Track spotting is easily influenced by weather conditions. Open frozen lakes and muskeg may also be scoured by wind which may blow away tracks. One final conclusion or assumption that can be made is that burns, agricultural and cut over areas are not often frequented by woodland caribou.

5.0 Actual sighting results

There were almost 200 sighting forms documenting woodland caribou sightings. The assumptions we can make for this data will be more accurate because of a larger sample size.

5.1 Location vs. years sighted

Caribou sighted in this grouping were sighted between 1960 and 1986 with the majority of sightings occuring in 1985. Again there are many locations with only a few locations having repetitive sightings. These locations also were not very descriptive. Little Bear Lake and the area around mile 64 on highway 106 had the greatest number of repetitive yearly sightings with sightings on five different years totalling 13 animals and 16 animals

respectively. Next was the Besnard Lake area with six total sightings on four different years totalling seven animals. Finally there was Nmeiben Lake, Sled Lake, mile 104 on highway 106 and the Potato Point/Mollard Island area on Lac La Ronge that had sightings on three different years totalling 22, 18, 12, and 15 animals respectively. There were also some large single occurance sightings that took place such as: 100 at Malcolm Island in 1979, 30 caribou at Hudson Bay in 1960 and 30 caribou at Weyakwin Lake in 1971. For all of the results please see Appendix III for a table showing all locations from 1960 to 1986. Also refer to attached map.

5.1.1 Analysis of the location results

Some of these locations such as Lac La Ronge, Nmieben Lake and miles 104 and 64 of highway 106 may have had multiple sightings only because of the higher concentrations of people present at these sights. Therefore it cannot be assumed really that there are greater numbers of caribou here or that this range is more important than other ranges. Continuing information should be gathered in order to determine trends in the caribou herds.

5.2 Habitat vs. time of year data

To view the results in tabular form please turn to table II on the following page.

5.2.1 Fall season data

In the fall from September to November it was found that jackpine and black spruce ridges are the favored habitat by woodland caribou. There was 26 sightings totalling 136 animals in this region during the fall months. The next favored habitat was treed muskeg having 11 sightings for a total of 58 animals. Upland forest was the next highest having 6 sightings totalling 116 animals.

5.2.2 Winter season

It was hard to distinguish the habitat preferred by caribou during the winter season. Twenty four sightings took place on lake ice resulting in 159 animals being counted. In habitat consisting of jackpine and black

Table II Habitat vs. time of year (group size)

Habitat	May	June	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
Treed Muskeg	1	1,1	1	1,1	1,3,3	3	2,30,7 4,1,4,1		2.5.3	1	12	3	23 sightings 86 animals
jP, bS ridges	1,1	1,5,1 1,3,1	1,3,1	1,1	4,2,4,2	1,5,8 2,2,4	5,9,3,1,1 4,1,1,30 20,12,7,3 4,1	2,1,5	4,18	1	12	3	47 203
Mixed Forest	1	3	4,1,1,2		1,1,3	5	1,13,2	3,3,3		7		1	17 54
Lakes/ Lakeshore							2,1	15,4,30	3,4,8 6,1,1	1,1,7	9,3,6,5 11,1,13	8,7,9 8,8	26 162
Upland Forest		2,2,2,1	1	1,2,4 1,2	1,1	1	3,4,6 100	7					19 141
Cutovers			2		1,2,1		5,3,5,3 6				4		10 31
Burns	1	3,7		6			2,25						6 34
Deciduous		1											1 1
Open Muskeg	2,1,3,3	1	7,3	24,5	2,1,2	8,2,1	9,2,2	7,3,1,1	3	2			29 98
Open Water			1,1	1,1,1	1,9,1,1,1 1,1,4,1,3								14 27

spruce stands, there was eight sightings resulting in 45 animals being counted. Obviously in this case it is very easy to see animals on open ice and this caused the over representation of this data.

5.2.3 Data from May to August

Black spruce and Jackpine ridges seemed to be the favoured habitat for caribou through the months of May to August. There were 13 sightings in this habitat and a total of 21 animals were counted. Upland forest and open muskeg seemed to be the next favorite habitats having 10 and five sightings respectively totalling 18 and 40 animals respectively. Treed muskeg and mixed forest had the next highest totals with six sightings for six animals and six sightings for 12 animals respectively.

5.3 Herd structure data

The most frequent caribou sightings was that of mature bulls with a total of 30.2%. The next most frequent occurance was that of bulls and cows, they accounted for approximately 21% of the sightings.

Cows only were sighted approximately 19% of the time. The last two groups were Bulls cows and calves and cows and calves. These sightings occurred 16% and 14% of the time respectively. There were several unknown sightings which could not be mixed in with this data. Unknown sightings accounted for 32% of all sightings and totalled 308 animals. To view the herd structure table, please refer to Appendix IV.

5.4 Age and sex observations

It is difficult to determine a trend in populations or age and sex from the caribou sighting forms because most of the sightings date back to 1985. There are very few sighting forms prior to 1981 so no assumptions can be made. In 1985 there were 69 sightings for a total of 123 animals sighted. Of these 123 animals 49 could not be identified for sex and age. There were 23 bulls sighted which accounted for 31% of the known animals sighted. Twenty six cows were sighted which accounted for 35% of the population and 14 calves were sighted which accounted for 18.9% of the known animals. Prior to 1980 there was several occurances of herds ranging from 10 to 100 animals, after 1980 the

largest herd size recorded was that of 12 animals. Finally, male caribou (bulls) were tied with cows for the greatest number of sightings with a total of 76 occurances each. Please turn to the following page to view Table III - sex and age observations.

6.0 A summary of sighting forms that could only be used as reference material.

6.1 Herd size

Several sighting forms have stated that people used to witness large herds of caribou during migration periods. Sightings dating back to 1933 state that herds with as many as 40-50 animals were sighted in the Candle Lake area. In 1979 a herd of 100 animals was sighted near Malcolm Island. After 1980 very few large herds have been sighted and this is where most of the information comes from.

6.2 Reasons for decreasing caribou herds

On the comments section of the caribou sighting forms many people have guessed at why there has been a decline in the numbers of caribou. Some have blamed wolves, but only a very few sighting forms said that they had seen wolf tracks or wolf-killed caribou carcasses. The next guess was

Table III - Age and sex observations

Age & Sex	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	Total
BULLS	1				3	9						1	1,1,1		1,1	1,1	3,1 1,1	1,1 1,1		1	2,3,1 2,3,2 1,3,1 1,1	1,2,1 1,1,1	3,1,1 1,1,1	1,1 1,1	1,1 2,1	2,1,1 1,1 2,1,1 1,1,1 1,1,1 1,1,1 1,1,1	2,1	76 sightings 105 caribou
COWS													2,3 1,1	2	1,2	1,1	3	1	1,7,1	1	1,2,2 2,2,1 1,2	1,1,1	1,1 1,5,1	1,1,1 3,9,1 6,2,1	1,1,1 4,1,1 1	2,2,2 2,1,1 1,1,1, 1,1,1 1,1,1 1,1,1	2,2,3 2,3,1	76 124
CALVES																	1				1,1,1	2	1	1,1 2,1	1,1,2 2,1	3,1,2 1,1,1 1,1,1 2	1,1	27 35
UNKNOWN						5	30			2	5	7,30		9		8	3,1	6,6 1,6	8,2 13,5	3,3 24,5 100	2,1 7	4,1 6,3 7,2	15,6 3	1,4	3,20 12,7 3,3,1	12,1 1,1 4,2,3 4,7,12 1,1,4 3,1	8,7 9,3 8,10 3,8 5,11	72 514
TOTAL	1/1				1/3	2/14	1/30			1/2	1/5	3/38	8/11	2/11	4/5	5/12	8/14	9/24	7/37	7/137	26/52	15/35	17/44	20/36	23/71	69/123	20/90	

the increase in timber harvesting. Survey results show that clearcuts are very seldom used by caribou which means that this may be a valid point. The final point is the mismanagement of abuse of the resource. I came across several sighting forms where trappers had killed up to four animals for their dogs. A northern pilot told me a story about an Indian trapper who had a knee deep pile of caribou hides at his cabin and was tanning them. When he was asked if there was caribou around he claimed there was a few. Surely the killing of caribou in such abundance must have an influence on the population.

Conclusions:

After analyzing the caribou sighting forms in some detail I can conclude that with a fairly high level of confidence that:

1. Areas such as: Nmeiben Lake, Besnard Lakd, Little Bear Lake and some islands on Lac La Ronge, have and have had populations of woodland caribou around them for some time. Care must be taken to manage these herds.

2. Mile 64 on highway 106 and mile 104 on highway 106

had several sightings on different years and must be the location of a fall migration. There should be stricter hunting regulations and road signing in this area.

3. Favoured fall habitat is jackpine or black spruce ridges followed closely by treed muskeg and upland forests.

4. Jackpine and black spruce ridges seemed to be the favored spring/summer habitat for caribou, this is followed closely by open muskeg and upland forest.

5. Bulls are the most often sighted caribou, being sighted approximately 30.2% of the time.

6. From the age and sex observations I can conclude that there are approximately 5% more cows than bulls and there is a very low percentage of calves (18%) that have been sighted.

7. Caribou herds, although there is no real evidence to base it on, are decreasing.

8. Decreased habitat and increased access due to logging may be part of the cause of decreased caribou numbers.

Recommendations:

1. Two types of Woodland Caribou sighting forms should be designed, one for the public and one for biologists, technicians and consultants. Maps should be enclosed with all sighting forms.

2. Tightening of hunting and trapping regulations or increased penalties for the poaching or over hunting of caribou.

3. An indepth study should take place on the identification of caribou herds and their range.

4. Logging regulations may have to be tightened in areas where it is found that caribou populations exist.

5. Due to the low amount of calves sighted, a calving survey may have to be done.

Complimentary close:

More research is necessary for the proper management of the woodland caribou of northern Saskatchewan. Without the proper background information and management planning, caribou numbers may drop to the endangered level.

Works Cited

Banfield, A.W.F. 1974. The mammals of Canada. University of Toronto Press, Toronto, Ontario. 440 pp.

Trottier, Tim. 1986. Contract for practicum.

Bibliography

Hamburg, Morris. 1977. Statistical analysis for decision making. Harcourt, Brace, Janovich Inc., New York, New York. 801 pp.

Kelsall, J.P. 1968. The migratory barren-ground caribou of Canada. The Queens Printer, Ottawa, Ontario. 340 pp.

Statistics Canada, 1980. Finding and Using statistics: a basic guide from Statistics Canada. The Queens Printer, Ottawa, Ontario. 59 pp.

Trottier, Tim, ed. 1986. Woodland Caribou sighting forms. 280 pp.

Appendix I

Example of Woodland Caribou sighting forms.

NEW

WOODLAND CARIBOU GROUND RECONNAISSANCE - Data Form

Date_____ Observer Name_____

Wind Speed & Direction_____ Temperature (^{0}C)_____

Last Snow Date_____ Snow Depth(cm)_____ Level of Crust(if any)_____

Location (attach F.I. or 1:1 Map)#_____ or UTM co-ordinates_____

Odometer (start)_____ Stop_____ Trail I.D._____

Tracks Seen: Bull_____ Cow_____ Calf_____ Unknown_____

Age of Tracks: Fresh_____ Recent(2-7 days)_____ Old(1 wk plus)_____

Numbers Seen: Bull_____ Cow_____ Calf_____ Unknown_____

HABITAT (Choose one or more types to describe)

Bog Type/Open(treeless with sphagnum)
/Treed Muskeg (black spruce, labrador tea, sphagnum)
(tamarack, willow, sedge)

Bog Forest/Black Spruce (+70%)_____ Jack Pine(+70%)_____ Mixed_____

Mixed Forest/Softwood-Hardwood Upland_____

Burned Over_____ Cut Over_____

Lake_____ Stream_____

Understory (describe)_____

FEEDING BEHAVIOR:

Browsing (arboreal lichens)_____ Grazing/Cratering(lichens)_____

(shrubs)_____ (Forbes)_____

OTHER WILDLIFE SIGNS (numbers if possible)

Moose_____ Deer_____ Elk_____

Upland Game Birds_____ Wolves_____ Other_____

COMMENTS:

OLD

WOODLAND CARIBOU SIGHTING FORM

OBSERVER NAME: _____

DATE: _____ YEAR: _____

TIME (TWENTY FOUR HOUR CLOCK): _____

TEMPERATURE: _____ ^{o}C

MAP LOCATION: UTM Coordinates _____

Nearest Landmark _____

HABITAT (Describe): Wetland _____

Dryland (Upland) _____

Coniferous _____

Deciduous _____

Mixed _____

Burned _____

Unburned _____

Agricultural _____

Other _____

NUMBER SIGHTED: Adult Male(s) _____

Adult Female(s) _____

Calf(ves) _____

TRACKS ONLY: _____

CARCASS(ES) FOUND: Adult Male(s) _____

Adult Female(s) _____

Calf(ves) _____

PREDATOR(S); SCAVENGER(S): Species _____

Observed _____

Tracks _____

Other _____

COMMENTS: _____

_____

_____

_____

_____

*Return to Regional Biologist, La Ronge, Sask.

Appendix II

Location vs. Year tables for tracks only.

TABLE I Location vs Year (Group size)

Location	Year (Group size)									
	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Wheeler River									2	
Narrow Hills	11									
Mari Lake									6	
Russel Lake								5		
Whistigo Lake									5	
20 m. NE of Weyakwin									12	1,3,4,1
SE of Mclure Lake									6	
Ford Bay Lake Athabasca										6
Mudd Lake										1
Bugg Lake									3	
Johnson River									4	
McDermott Lake									5	
Tomison Lake										10
Hanson Lake									2,4	
Clam Lake									4,1	
Meyomoot Lake									4	
Big Island - Lac La Ronge									3	
Nmeiben Lake - Hives Lake					6				3,2	
Howard Lake									7	
Suggi Lake									8	
Casset Lake									1	
Tyrell Lake									1	
Macoun Lake									5	
Wapus Lake							2			
Ibister Lake									11	
NE Vermet Lake							7			
Muskeg Lake										1
50 Km N.W. Weyakwin									2,1	

TABLE I Location vs Year (Group size) cont...

Location	Year (Group size)									
	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Smeaton									3	
Mile 40 Hw 120									1	
Two Forks Bridge-Hw 2								20		
Molanosa Lake									1	
Woody Hills										5
3 Km N. of Molanosa									1	
1.5 Km S. of Wapawekka Lake					15					

Appendix III

Location vs year tables for caribou sightings.

TABLE III - Location vs Year - for sightings only

Location	Year (Group size)																										
	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
Jasinahigan Lake																											4	
Besnard Lake																						1,1	1	1,2			1	
Egg Lake																									1			
Small Lake NW of Egg Lake																								6				
Timber Cove																								1				
Kirkpatric Lake																											1	
Atti Lake																											1	
Mari Lake																											1,3	
Lower Foster Lake																											1,3 1,2	
Clam Lake																									1			
Caldwell Lake																				7								
Finkney Lake																						1						
Johnson Lake																											2,2	
Reindeer Lake																											3	
Malcolm Island																					100							
Cathaman Island																											4	
Co-op Point Hill																				13								
Tree Lake (Ispatinow Island)																								4				
Sequpre Creek																	1											
Powell Lake																											7	
Bittern Lake and Wolftrap Lake																							6					
Immaliu and Meyakumew Lakes																								1	4			
Salantyne River														1														

TABLE III Location vs Year - for sightings only

Location	Year (Group size)																											
	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
Greenbush River																2												
Overflow Lake																									4	20,12 7,3		
Over flow River																									18			
Leak Lake																										1		
Ibister Lake																										6		
1.5m E of Hudson Bay								30																				
Piprell Lake																											2	
Waterhen Lake														1														
Murison Lake																											2	
14 m N of LaLoche																											1,1,1	
NE of Cinder Lake																							3					
Kazan Lake																								2				
Learn Lake																							4					
McTavis Lake																							7					
Pinehouse Lake																									5		1	
Pisew Lake																							1					
East Bay- Dore Lake																												3
Blackstone Lake																											1	
Cumberland Lake																										1		
Granite Lake																										2	3	
3m S of Logue Lake																											3	
Dechambault Lake																									3		1	
Maligne Lake																											1	

TABLE III Location vs Year - for sightings only

Location	Year (Group size)																											
	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
Reserve								5																				
2.5 Km N of Squaw Rapids Dam																						1						
SE corner of Waskesiu Lake																			6									
Kakinagmak Lake																											12	
NE of Greene Lake																											7,3	
Keafe Lake																												8
Baxter Lake																												7
Matsley Lake																												9
Nmieben Lake																								15			1	3,3
Hanson Lake																								2,2 1			2,2	
Annabel Lake																							1					
Wild Lake																											2	
Russel Lake																											5	
Crean River crossing Hw #2																						3				2,2		
Overflow River																		1									1	
McConechy Lake		1																										
Devil River (Weyakwin Lake)																										1		
Fur River road														4	9													
East Trout Lake																				8						4	1	
Norbert Lake																												3
Sevior Lake																												8
Agumic Lake																												9
Swan Lake road and Dore Lakr																												4

TABLE III - Location vs Year - for sightings only

Year (Group size)

Location	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
3m E of Mclean Lake																												3
Pelican Narrows																												8,10,1
Wabena Lake																									2			
W side Macoun Lake																											1,22	
17m E of Fishing Lake																										3		
Sled Lake																		9		7	1	1						
M. 105 Hanson Lake Road														1													4	3,5
Ruby Lake																3												
Weyakwin Lake													30								3						2	
Molanosa Lake																	1											
Cumberland Delta																									3	3		
W side Mariache Lake																											3	
Km 150-Key Lake rd																											2	
Stuart tower																								3			1	
Grassy Lake tower																			1				1					
0.5Km S-Montreal Lake																		1				3,3 3	1				1	
MacLennan Lake																						5,5			1		1	
5 1/2 Km E of Dam on Montreal River																			31									
Meyamoot Lake						3																						
Hell Diver Lake																						2						
S-Little Bear Lake							9							1			1	1	1									
Mile 104 Highway 106												5							6					1				
mile 36-64 Highway 106													1	7	2			1			5							

TABLE III - Location vs Year - for sightings only

Location	Year (Group size)																											
	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
Dupuis Lake										2																		
mile 65 Hanson Lake Road																					3							
35 m E of lower Fishing Lake																											1	
Wapawekka Lake																	5							1,1		3		
Lac la Ronge - Mollard Isl. Pot. Point																					1	6		8				
Clark Lake																											2,3	
Junction of Stony Creek Road with Hanson Lake Road																								1				
Torch Rv. & Hw 106																						2		1				
Costigan Lake																							4					

Appendix IV

Herd structure data table

Herd Structure data/Year

Structure	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	1	2
BULLS					3							1	1,1			1,1	1,4	1,1,1 1,1		1	3,3 1,3	1,2 1	1,1,1 1,1,1	1	1	1,1,1 1,1,1 1,1,1 1		30.2	52
COWS													1,1	2		1,1	1	1	1,1	1	1		1,1,1	1,4	1	1,1,1 1,1	3,1	19	30
BULLS & COWS													3,3		2,3		9		4,8	3	3,2 7,2 3		8,2	3	2	2,3 2,2 5,2 3,2	4,4	21	96
BULLS COWS CALVES						5	30											30		24 100	5,5	4,4	4	3,3	3,2 12,7,3	7,5 3		16	277
COWS CALVES																			7				2	2,4 18	2,6 3	2,2 2,2 2,2 2,2 2,3	3,3	14	67
UNKNOWN GROUPS	1					10			2		5	30 7		9		8	1	6,1 6	6	7,3 13,5	2,1,6	4,1,6 3,7	15,3 6	1,5	3,4 3,1	12,1 4,2,1 1,4,2 1,3,7 1,1,3 1	8,7,9 3,8,9 3,8,5 11	32	308

1 - % of total occurances

2 - Total # of animals

Appendix V

Contract for Practicum

WILDLAND RECREATION TECHNOLOGY

CONTRACT FOR PRACTICUM

Date: 10 April 1986

It is agreed between the student Rob Hugg of the Selkirk College Wildland Recreation program and Tim Trottier of Wildlife/DPRR-Sask. that the student will undertake study and field work on the project Woodland Caribou Status and Distribution in Saskatchewan from April 28, 1986 to May 16, 1986.

PROJECT DESCRIPTION

1. Purpose and Scope:

   Woodland Caribou distribution in Saskatchewan is not accurately documented. Its population size is unknown. We suspect that resource use and hunting are impacting the woodland caribou population. To examine the effects of such impacts we must learn more about distribution.

2. Objectives:

   To document the distribution of woodland caribou in Saskatchewan. Sighting forms have been circulated across Saskatchewan and returned with information on the species. What needs to be done now is to summarize that information so that it can be referenced in relation to resource development and hunting.

3. Methods and Procedures:

   a) interview people to obtain further sighting information.
   b) conduct a literature search of department files for distribution information.
   c) separate the forms by year relating it to location.
   d) separate the forms by habitat relating it to time of year (month-season).
   e) separate forms where only tracks or other signs were observed, from those forms with actual sightings.
   f) provide a sex and age breakdown from actual sightings.
   g) map locations on 1:1 topo maps and a map of Saskatchewan
   h) introduction to fieldwork related to the study.

..../2

4. Time Line and Work Schedule:

   Week One - interview people, literature search, begin summarizing data forms.

   Week Two - summarize data forms.

   Week Three - finish data forms, spend time in the field with biologist.

RESPONSIBILITIES OF STUDENT

1. Work in two or three locations including Saskatoon, Prince Albert and La Ronge.
2. Provide summary information in the form of tables, maps and graphs, re: Woodland Caribou Study.
3. Observe and assist biologist in field investigations as an introductory exercise to the study.
4. Provide means of transportation from city to city, to work and back, etc., unless accompanied by the biologist.
5. Provide means of accommodation, meals and incidental expenses.

RESPONSIBILITIES OF AGENCY/ADVISOR

1. Provide instruction, equipment and stationary supplies necessary to do the office work, including office space.
2. Provide expenses for lodging, meals, and travel while in Saskatoon, Prince Albert, La Ronge and area as it relates to the work.

ADDITIONAL CONSIDERATIONS

The student may, at his discretion, wish to assist the biologist with other biologist work in the La Ronge Region. Such opportunity could arise if the student completes his responsibilities before the three weeks are up.

Signatures:

Student _____

Agency/Contact/Advisor _____

Instructor _____