

Central Selkirk Caribou Project 1998

FRBC Contract KB96172-IN Annual Report

October 1997 to April 1998

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Ministry of Environment, Lands and Parks

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Executive Summary

The Forest Renewal BC Central Selkirk Caribou Habitat Inventory Project is a joint initiative begun in November of 1996, involving Pope & Talbot Limited, Slocan Forest Products, and the Ministry of Environment, Lands and Parks. The project encompasses previous caribou telemetry work that was started in 1992. During the period from 1992 to the winter of 1996, the aerial telemetry monitoring was conducted by Mike Super and Dave Mair from Revelstoke. Project direction was provided by Guy Woods from Ministry of Environment, Lands and Parks, Nelson Regional Office.

Under the FRBC multi-year agreement, monitoring of radio-collared caribou previously fitted with VHF radio-collars has continued, albeit in a discontinuous fashion. From November of 1996 to May of 1997, aerial monitoring of radio collared caribou, necropsy on caribou mortality, winter field tracking, and field habitat assessments were conducted. Due to budget suspension, no field assessments or telemetry monitoring was conducted from May of 1997 to October of 1997, other than two telemetry flights during the summer conducted out of Revelstoke by Parks Canada. The information for the November to September period is contained in the *Central Selkirk Caribou Project Annual Report, September 1997*.

Starting again in October of 1997 until March 31, 1998, telemetry monitoring and field assessments of caribou use sites were conducted consistent with the previous year methodologies. This report covers this period. No spring, summer, or early fall caribou telemetry monitoring or field inventory has been conducted to date under the terms of this project agreement.

There are presently 17 active radio collars being monitoring within the study area. Since 1992, there has been 11 mortality of caribou equipped with radio collars. Eight of the mortalities occurred during the last year. In most of these cases, the cause of the mortality could not be determined (i.e., too much time between aerial telemetry flights and discovery of the mortality). There was one caribou mortality in early January of this year, apparently the result of cougar predation. To date, more mortality of collared caribou has occurred in the summer (when there has been no funding in place to conduct telemetry and field work) than the winter.

There were a total of ten telemetry flights resulting in 206 telemetry point locations during the October to April project period. This brings the total number (since 1992) to 1,103 point locations for caribou. Inclement weather in the critical early winter period was a significant problem this winter for telemetry crews – limiting opportunities probably more so than it has in previous years. Field habitat measurements and caribou tracking by field crews continued with a total of eight field sites successfully assessed.

Caribou habitat use this winter appeared to reflect unusual snow conditions. Until late December there was little to no ground snow below 1300 meters in elevation, and the caribou generally remained at higher than normal elevations. In late December/early January, when snow began to accumulate, many caribou appeared to select habitats at lower elevations than usual for this time of year. The traditional movement of caribou from low elevation early winter habitats to high elevation late winter habitats occurred in late January. Except for the late winter season, the Central Selkirk caribou continue to exhibit an apparent affinity for ecotone, or transition habitats at elevations between 1200 to 1800 meters.

Plans to capture and collar 7-8 additional caribou at the end of March this year were scuttled by helicopter mechanical problems and a budgetary year-end that does not accommodate such uncertainties.

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1.0 Introduction

The goal of the Central Selkirk Caribou Inventory Project is to provide resource managers with information on caribou distribution, abundance, habitat selection, seasonal habitat use patterns, and stand/landscape level forest habitat requirements in the Central Selkirks. It is intended to be a four-year project involving a partnership between BC Environment, Slocan Forest Products and Pope & Talbot Limited. This project is currently one of four on-going caribou telemetry projects underway in the Kootenay region.

The initial FRBC caribou inventory project was implemented in September of 1996. Aerial monitoring of previously radio-equipped caribou, follow-up field tracking, and baseline data sampling of caribou use sites began immediately following project approval. Unfortunately, project work was ceased at the end of April 1997 due to budget suspension. It should be noted that spring, summer, and early fall caribou telemetry point location information for 1997 was subsequently limited to two aerial telemetry flights (conducted out of Revelstoke by Parks Canada) and no spring, summer or fall field sampling. Background on this project including an historic review of caribou distribution and abundance and the 1996/97 project results and maps can be found in the *Central Selkirk Caribou Project Annual Report, September 1997*.

In September of 1997, a revised FRBC Central Selkirk caribou inventory project proposal was agreed to. This annual report thus covers works conducted between September 1997 to April 1998.

The Central Selkirk caribou inventory project area is located within the Central Columbia Mountains and the southern portion of the North Columbia Mountains Ecosections and covers approximately 610 square kilometers (Figure 1). The area is characterized by steep mountainous terrain and dominated by three biogeoclimatic zones; the Interior Cedar-Hemlock (ICH) zone, the Engelmann spruce – Subalpine fir (ESSF) zone, and the Alpine Tundra (AT) zone.

Existing information on caribou distribution and abundance is limited to telemetry information gathered since 1992, two population censuses conducted in 1995 and 1996, winter field tracking and assessments in 1996 and 1997, and local knowledge. Habitat requirements have largely been extrapolated from other Mountain caribou inventory/research projects and observations of non-collared caribou. Non-winter caribou habitat assessments have been limited to work conducted by Harling, Snyder and Herbison back in 1974/5. Of note, but not statistically substantiated, is that the Central Selkirk caribou appear to select, except for the late winter season, transitional forest habitats.

In a provincial context, the Central Selkirk caribou are ranked sixth out of 13 caribou sub-populations for conservation purposes based on assessment of population viability, vulnerability, habitat protection and habitat capability/suitability. In terms of socio-economic impact assessment of managing for caribou, the Central Selkirks is ranked as having potentially the highest impacts in the province based on consideration of timber supply impacts, economic dependency of communities, employment and external factors such as tourism and world markets.

In regards to the existing project, no non-winter field assessments have been conducted within the project area to date because of budget limitations. Telemetry point location over the past years is also limited. Should such inventory deficiencies continue for the coming year or beyond, it will make proposed seasonal habitat analysis, evaluation, and capability/suitability mapping questionable.

Acknowledgements

The dedicated efforts of Doug and Paul Seaton in winter field tracking and habitat measurements are acknowledged. Also acknowledged are the long, demanding flight hours put in by Neil Munro and Chris Royals in conducting fixed wing aerial telemetry flights to locate the collared animals. Neil also recorded flight results and assisted in identifying sites for field crews to conduct winter field sampling of caribou use sites. John Flaa and Bruce McLellan continued to conduct necropsy on collared caribou mortalities. Donna Underwood recently took over as contract coordinator for industry and Michael Panian acted as contract monitor. A special thank you goes out to Rhiannon Daloise for providing professional clerical services during rather trying times.

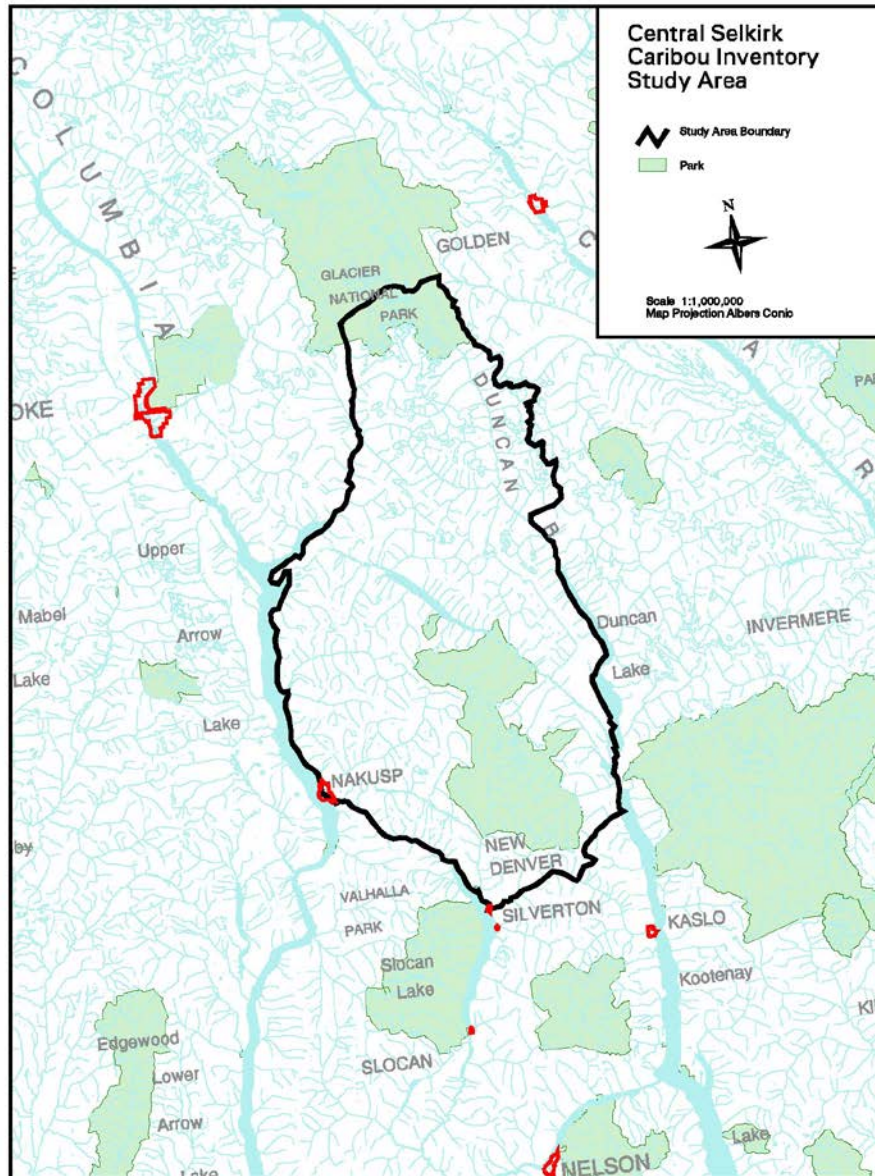


Figure 1: Central Selkirk Caribou Project Area

2.0 Annual Report

Module 1: Project Coordination

In addition to ensuring that administrative, organizational, safety, and contract requirements were met, the project biologist was also responsible for ensuring coordinating, supervising and participating in the modules described below. A meeting and discussions were held with Pope & Talbot, Slocan Forest Products, and Meadow Creek Cedar representatives regarding project results and additional caribou inventory requirements relative to overall project goals and industry needs. As a result of this meeting, Meadow Creek Cedar has expressed interest in being a contributory partner to the existing project.

Module 2: Caribou Capture, Collaring, Collar Maintenance and Mortality Information

Introduction

The objective of this module was to maintain radio-collars on roughly ten percent of the total Central Selkirk estimated caribou population of 230-260 animals, or 23 to 26 caribou within the project area. Due to collared caribou mortality over the years, only 17 of 28 collars remain active. To date, irrespective of collared caribou mortality over the years, no existing collars have failed or malfunctioned.

Methods

It was planned to use aerial net gunning to capture and equip seven to eight additional caribou with radio collars at the end of March 1998. The capture process was to use a specially equipped Hughes 500 helicopter, experienced pilot, netgunner, and trained ground crew. However, a combination of mechanical problems with the specially equipped helicopter on March 29th and a March 31st fiscal year end has negated these plans.

Since 1992, when caribou were first captured and equipped with radio transmitters, necropsy on collared caribou mortality has been performed by Dr. Bruce McLellan and John Flaa. Through mutual agreement, this arrangement has been continued with respect to the current project. Site investigations and necropsy on caribou mortality is conducted as soon as possible after the mortality is discovered.

Results

The total number of presently active radio collars for the Central Selkirk caribou population remains at 17 animals.

There was only one mortality of a collared caribou during this reporting period. It occurred in the Duncan valley near Hall Creek. The animal was a female that was captured and collared the previous March. The cause of death appears to have been cougar predation, based on the presence of puncture wounds in the neck and a non-scattered carcass. (J. Flaa, pers. comm.). Additional laboratory analysis for fecal, teeth, jaw, femur, and rumen samples (where collection of such samples was feasible) is pending.

Table 1: Central Selkirk Radio Collared Caribou

Identifier Number	Collar Frequency	DATE COLLARED	Location	Status ¹	Sex
54	150.115	Feb. 1992	Duncan		M
55	150.133	Feb. 1992	Duncan		F
53	150.150	Feb. 1992	Duncan	Dead 1993	F
1	151.060	March 1995	Fitzstubbbs		M
2	151.070	March 1995	Wood	Dead 1997	F
3	151.150	March 1995	Ione Falls	Active	F
4	151.176	March 1995	Wood	Dead 1997	F
5	151.015	March 1995	St. Leon	Dead 1997	F
6	151.036	March 1995	Turner		F
7	151.090	March 1995	Cape Horn		M
8	151.099	March 1995	Cape Horn/Wilkie	Dead 1997	F
9	151.045	March 1995	Hill		F
10	151.079	March 1995	Hill		M
11	151.119	March 1995	Halfway	Dead 1997	F
12	151.184	March 1995	Wilkie		F
13	151.130	March 1995	Halfway	Dead 1995	
14	151.110	March 1995	Healy	Dead 1996	F
15	151.025	March 1996	Lardeau		F
16	150.810	March 1996	Silvercup		F
17	151.006	March 1996	Humphries		F
18	151.434	March 1996	Payne Creek	Dead 1997	F
19	151.260	March 1997	Mt. Goat Creek		F
20	151.110	March 1997	Swedish	Dead 1998	F
21	151.206	March 1997	Swedish		F
22	151.142	March 1997	Mt. Johnson	Dead 1997	F
23	151.195	March 1997	Mt. Johnson		M
24	151.330	March 1997	Gallo/Tenderfoot		F
25	151.412	March 1997	Gallo/Tenderfoot		F

¹ Where the field is blank, the collars are presently active.

DISCUSSION

Additional collaring of caribou is still required in order to maintain an adequate sample size. It is hoped that this will be accomplished in April, 1998. In addition, collared caribou distribution relative to population distribution has not been representative as gaps in coverage exist throughout portions of the project area that are occupied by caribou. Eight mortalities of collared caribou in the past year have contributed significantly to this problem. These gaps combined with a failure to conduct spring to fall stand level field assessments and telemetry flights due to funding decreases will certainly influence the statistical validity and applicability of final products.

There have been a total of eleven mortalities of radio-collared caribou since the first collars were fitted in 1992. Eight of these mortalities have occurred over this past year. In most of the cases, the cause of the mortality could not be determined (i.e., too much time between aerial telemetry flights and discovery of the mortality) due to funding decreases. To date, more mortality of collared caribou has occurred in the summer (when there has been no funding in place to conduct telemetry and field work) than the winter.

No population census was conducted in the spring of 1998 due to funding constraints and the fact that two population censuses had been conducted in the past two years.

Module 3: Aerial Monitoring of Radio-collared Caribou

Introduction

Weather permitting, aerial surveys were conducted in order to locate radio-equipped caribou and to provide point source location data on population distribution and habitat use. The objective of this module was to gather point location data on each radio-collared caribou weekly from November 1st to January 31st (weather permitting) and monthly from the beginning of February to the end of October.

Methods

Radio-collared caribou were located using a twin engine Cessna 337 fixed-wing aircraft and a Lotek STR1000 scanning receiver. Monitoring flights were attempted weekly from the beginning of November to the end of January and monthly thereafter. Following each flight, the observer-recorder provided the field crew with grid coordinates for a specific point location to facilitate next day field tracking and habitat data collection. This year, the telemetry observer/recorder, in consultation with the project coordinator (both located in Nelson) provided this direction to field crews.

After each flight the observer-recorder also plotted the aerial point locations on TRIM/forest cover maps for recording observations made during the flight pertaining to habitat selection and caribou behavior. This information was entered into a Microsoft Access database.

At the request of Guy Woods, Wildlife Biologist, Ministry of Environment, Lands & Parks, Nelson, aerial monitoring of collared-wolf radio frequencies in the Duncan River area was also conducted in conjunction with caribou telemetry work.

Results

Between October 1997 and the end of March 1998 there were 10 telemetry flights resulting in a total of 206 collared caribou point locations. This brings the total for the Central Selkirk caribou project (including telemetry dating back to 1992) to 1,103 telemetry point locations.

A map depicting caribou point locations, by season of use, from October 1997 to the end of March 1998 is provided in Appendix 2.

With regards to monitoring for collared wolves, no radio collar frequencies have been picked up to date.

Discussion

The original project objective was to gather point location data on each collared caribou at least once per week from November 1st to January 31st (weather permitting) and bi-weekly for the remainder of the year. The revised proposal for the period covering this report identified weekly flights from November to January 31st and once a month flights from February to the end of September.

Inclement weather severely hampered the ability of the telemetry crew to conduct aerial monitoring activities this winter. This is reflective of only 10 successful flights being conducted over a twenty-five week period. During the critical early winter period (November to mid January) there were only six successful telemetry flights. There were also a couple of instances when flight schedules conflicted with other radio telemetry project requirements in the Nelson area.

Caribou habitat use reflected the unusual snow conditions of this winter. Until late in December, there was little to no ground snow below 1300 meters elevation and the caribou remained at relatively higher elevations than usual. In late December/early January, when the ground snow started to accumulate, some caribou continued to select and use lower elevation forest habitats. Interestingly, in late January, the animals seemed to move to their traditional high elevation late winter ranges in fairly sudden order.

There was an incidental observation in January of 5 non-collared caribou swimming across the Arrow Lakes, near Nakusp, to the west side of the reservoir.

Module 4: Habitat Measurements and Mapping

Introduction

Between October 1997 and March 1998 habitat field measurements and observations of caribou use sites were conducted within one to two days following each telemetry flight - weather and crew safety factors permitting. The objective was to conduct habitat measurements, at the site level for collection and identification of fine filter habitat attributes.

Methods

Following completion of aerial telemetry surveys, a trained field crew used information provided by the telemetry flight observer/recorder to conduct field tracking and habitat measurements of caribou use sites. The methods developed last year and described in the September 1997 Annual Report was used. Field sampling locations were based on site accessibility, resource development considerations and crew safety.

To briefly reiterate, six transects (2m x 50m) were established at each site, three along caribou foraging paths and three randomly located in straight lines (Figure 3). Information recorded on each transect included ski pole and basket penetration depth, caribou hoof sinking depth, tree species, tree diameter, tree vigor class (including down trees), lichen genus and abundance below and above 1.8 meters, shrub cover (when visible), caribou feeding intensity and field observation notes on caribou behavior.

Following site sampling of caribou use areas, field crews entered the data into a Microsoft Access database (Appendix 3).

Results

A total of 8 different caribou use sites were sampled between October 1997 and March 1998. The field sampling involved five different caribou collar frequencies. Dates, caribou collar frequency numbers and site locations are listed in Table 2 below. To date, there has been no detailed analysis of the field data.

Table 2: Central Selkirks Caribou Project –Winter Field Sampling Record For November 1977 To The End Of March 1998

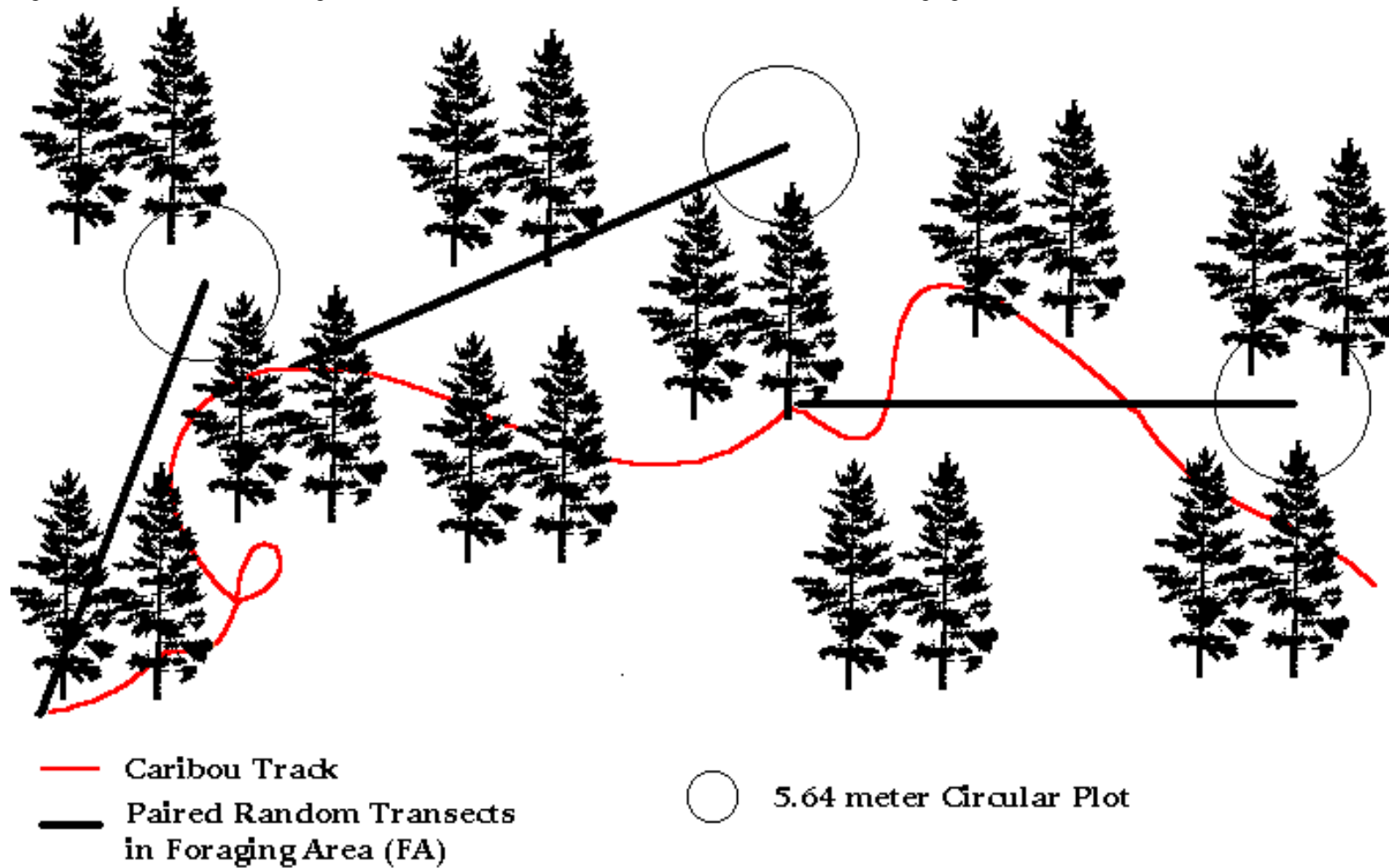
Identifier Number	Collar Frequency	Date Sampled	Location
6	151.036	November 11, 1997	Mt. Abriel
3	151.150	November 13, 1997	Mt. Abriel
6	151.036	November 13, 1997	Mt. Abriel
21	151.206	December 28, 1997	Trout Lake
23	151.195	February 3, 1998	Rue de Beau
6	151.036	February 11, 1998	Cape Horn
7	151.090	February 11, 1998	Gardner
7	151.090	February 25, 1998	Kuskanax (2 nd North Fork)

DISCUSSION

Consistent with some of the previous year's findings, four of the sites sampled were in ecotone Hemlock, Spruce Subalpine fir mixed forest stands. Although no detailed habitat selection analysis has been conducted, the Central Selkirk caribou appear to show an affinity for forest transition habitat types. The other four sites sampled were in Subalpine Fir- Spruce stands. In the ecotone, or transition forest stands the caribou were recorded feeding on blowdown, false box, and lichen on trees recently felled from logging. In the subalpine fir stands they were foraging lichen directly from tree branches.

To date, no summer field sampling has been conducted to support the identification and measurement of fine filter habitat attributes and site features required to conduct capability/suitability assessments and/or modeling. Especially important to resource planners is the linkage of coarse level seasonal habitat requirements to fine filter stand level attributes. This information will be key to developing stand and site characteristics to assist in resource planning, habitat mapping and habitat selection analysis.

Figure 2: Schematic Diagram of Caribou Use and Random Transects used to Assess Foraging Selection



Module 5: Geographic Information Systems (GIS) Support

The caribou radio telemetry results have recorded on a Geographic Information System (GIS) using an Arcinfo platform. Telemetry point locations have been mapped to display seasonal habitat use and caribou distribution within the project area. A map of individual radio-collared caribou point locations, coded by season of use, is provided in Appendix 2.

3.0 Literature

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Woods, Guy. Ministry of Environment, Lands & Parks, Nelson, British Columbia, pers.comm.

Appendix 1

Central Selkirks Caribou Project - Explanation to accompany database files in Access 97

NOTE: The following files have also been provided in ArcInfo format with the same names.

Module 3

File name: **CS_TELEMTRY 92_98**

Contents: Aerial telemetry locations from 1992 to end of March 1998, and habitat data recorded primarily from forest cover and Trim maps. This database was originally created by John Flaa (Glacier National Park, Revelstoke). It will be noted that the UTM recording system used in this database requires that two zeros be added to the right side of northing and easting numbers shown. John set it up this way to save space and to reflect the appropriate accuracy level of the locations.

Module 4

File Name: **CS_FIELD 97_98**

Contents: Habitat attribute data recorded from field measurements at collared caribou use sites. This was set up as a “relational” database, in which tables containing data on different attributes at the same sites are linked through a common primary key, termed the “telemetry code”. The telemetry code also serves to link this database with the CS Telemetry database. The telemetry code is built out of year/month/date_caribou identifier number.

The four tables used for recording field attributes are described below. Each table represents a different set of measurements (i.e., different attributes, different intervals or plot shapes), but all in the same general site area and in some cases, on the same square inch of ground. See Figure 3 for an illustration of how the data recorded in the tables is collected in the field.

KEY TO TABLES

Table 1: Caribou Field Site Data

This is location, site, and stand information recorded in the general area of the transects and plots. This information is usually recorded at the P.O.C, before and/or after the transects and plots have been done. This table is linked with the transect and circular plot data through the Transect ID number and the telemetry code.

Table 2: Caribou Transect Data

This is data on trees and lichen abundance recorded at noted distances along the 50m x 2m transects, Foraging Area and Caribou Trail transects (total of six transects per site).
The data in this table is linked to its appropriate site by the Telemetry Code.

Table 3: Caribou Circular Plot Data

This is data on trees, shrubs and lichen recorded in circular plots at the ends of Foraging Area transects (total of three circular plots per site). It is linked to its respective transect through the Transect ID number and through this to the site.

Table 4: Caribou 10m/Snow Data

This is data recorded at 10 metre intervals along each transect, on snow, lichen blowdown, false box, and crown closure. There is one of these table for each of the six transect tables. It is linked as above.

Appendix 2
Point Location Map

Appendix 3
Data Diskettes