

**POTENTIAL WILDLIFE HABITAT AREAS
(WHA) FOR WOODLAND CARIBOU:
DAWSON CREEK TSA
2004**

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EXECUTIVE SUMMARY

Within the Dawson Creek TSA, several populations of northern ecotype woodland caribou (*Rangifer tarandus caribou*) have been identified in the Identified Wildlife Management Strategy (IWMS) as being affected by forest or range management on crown land. Wildlife Habitat Areas (WHAs) are to be established for calving and rutting habitat, connectivity corridors and mineral licks within the ranges of these populations. The purpose of this report is to document habitat use of four populations (Moberly, Kennedy-Siding, Quintette and Narraway/Belcourt) within the Dawson Creek TSA and identify mineral licks and calving, rutting and matrix habitat that are regularly used by these populations. This summary reviews literature and current research being conducted on caribou populations within the Dawson Creek TSA, and suggests potential WHA areas.

Calving areas that have been identified as potential WHAs include Mt. Le Moray and Mt. Bickford (Moberly), Mt. Reynolds and Milburn Peak (Kennedy-Siding), Goat Mtn., Albright Ridge, alpine areas between and including Quintette Mtn. and Turning Mtn., Mt. Spieker, Mt. Collier, high elevation areas between the Murray River and the Wolverine River (Quintette), and Ochak Mtn., Muinok Mtn. and the ridge east of Mt. Hamelin (Narraway/Belcourt).

Regular use has not been documented for the majority of rutting areas within the Dawson Creek TSA; however, Mt. Reesor and Mt. Spieker have been used historically and currently by rutting caribou in the Quintette area.

Connectivity corridors that exhibit regular use are most apparent in the Narraway/Belcourt area and include the low elevation valleys of Belcourt Creek, the Narraway River and Red Deer Creek as well as over Ptarmigan Mtn.

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INTRODUCTION

Woodland caribou (*Rangifer tarandus caribou*) in British Columbia and Alberta have shown a steady decline over the past two decades. The species has been identified by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), and have been classified as threatened in British Columbia. Within northern BC, increasing resource expansion in the form of forest harvesting, oil and gas development and mining activities has increased the pressure on caribou populations and critical caribou habitat.

The British Columbia Ministry of Water, Land and Air Protection identified several species of risk to be incorporated into the Identified Wildlife Management Strategy (Province of British Columbia, 2004; Cichowski et al., 2004). The species at risk included on this list are affected by forest or range practices and are included on the Committee on the Status of Endangered Wildlife in Canada (COSEWIC, Schedule 1). All three ecotypes of caribou in British Columbia have been included on Schedule 1 of the Identified Wildlife Management Strategy.

As part of the IWMS, Wildlife Habitat Areas (WHAs) are to be identified for each species included in the IWMS. WHAs are meant to conserve habitats that are critical to the species of concern and reduce the impact of forest and range practices on the species. For caribou, WHAs include regularly used calving areas, rutting areas, mineral licks, and matrix/connectivity habitats.

The purpose of this summary is to determine the extent of information available for preparation and identification of WHAs for caribou within the Dawson Creek Timber Supply Area (TSA). Local biologists have identified five northern caribou herds of concern within the Dawson Creek TSA. These include the Graham herd, Moberly herd, Quintette herd, Kennedy/Siding herd, and the Narraway/Belcourt herd. The Graham herd will not be included within the scope of this report, as information pertaining to the herd has already been summarized by Diversified Environmental Services of Fort St. John, BC.

METHODS

To determine the extent of information available that could be used to identify WHAs for caribou, interviews were conducted with local biologists, foresters, residents, and guide outfitters/trappers that could be contacted. In addition, an intensive literature review of consultant reports, WLAP reports/inventories and current research projects were analyzed for data and information pertaining to the requirements of WHA allocation. Caribou locations and critical habitat areas were roughly plotted on a 1:250,000 map (Appendix I) and summarized in tabular format (Appendix II). Only information specific to the herds within the Dawson Creek TSA has been included in the following discussion. It should be noted that the purpose of this summary is to report the biological requirements of northern ecotype caribou, and has not taken into account policy constraints.

RESULTS

Calving and Rutting Areas

In general, caribou within the Dawson Creek TSA make west to east movements from summer to winter habitats. All herds within the study area exhibit this movement in some form. Generally, calving activities occur in the high elevation subalpine and alpine habitats, but summer and fall habitat use is quite varied between the different populations. In the following sections, habitat use and requirements, and specific calving/rutting areas will be discussed and identified based on the individual herds within the Dawson Creek TSA.

Moberly Herd

Within the Moberly herd, there are three subgroups of caribou that have different habitat selections and occupy different areas within the Moberly area (Jones, pers. comm.). These subgroups can be classified based on the geographic areas they inhabit: Mt. McAllister/Beattie Peaks, Mt. Bickford, and the Mt. Le Moray/Le Hudette. The Moberly herd primarily uses high elevation subalpine and alpine habitats at elevations greater than 1500 m during the spring, and varied use of the ESSF forests during the summer and fall (Table 1).

Table 1. Caribou habitat use during spring and summer/fall seasons in the Moberly Herd during 2003-2004. Seasons have been characterized as Spring = April 15 – May 31 and Summer/Fall = June 1 – October 15 (Jones et al., 2004).

SEASON	RANKING OF USE	HABITAT TYPE	BIOGEOCLIMATIC ZONE	ELEVATION	STAND TYPE	STAND AGE
Spring	Primary	Alpine	ATp	>1700 m		
	Secondary	Subalpine Forest	ESSFmv2	1500-1700 m	Subalpine fir dominated; spruce dominated	141-250 years
Summer/Fall	Primary	Subalpine forest and subalpine parkland	ESSFwk2/wc3	1301-1700 m	Pure subalpine to subalpine dominated; spruce dominated	141-250 years

The group occupying the Mt. Le Moray and Mt. Le Hudette area remains spatially segregated from the remainder of the Moberly herd, which resides on the north side of the highway (Jones, pers. comm.; Seip, pers. comm.). Caribou in the Mt. Le Hudette area remain in the high elevation, alpine areas throughout the year, making use of lower elevation subalpine forests during the summer and fall. Mt. Le Moray has been identified as an important area for calving, but fidelity to specific calving areas has not been identified by current telemetry work being conducted in the area (Jones, pers. comm.). Jones (pers. comm.) reports that consistent areas used during the rut have yet to be identified; however, Seip (pers. comm.) suggests that caribou in this herd are probably using lower elevation subalpine forests during the rut.

There is some overlap between the Mt. Bickford group and the Mt. McAllister/Beattie Peaks group. Caribou in the northern part of the region, Mt. McAllister/Beattie Peaks, make extensive use of the ESSF forests at lower elevations, especially during the winter and summer (Jones, pers. comm.; Seip, pers. comm.). The group makes use of high elevation subalpine forest habitat near Mt. McAllister and Mt. Frank Roy during the spring. The remainder of the year is spent foraging in the ESSF forests around Mt. McAllister. Seip (pers. comm.) describes the ESSF forest as having a large component of spruce and lodgepole pine, which is extensively used by caribou foraging for terrestrial lichens. For management purposes, lower elevation ESSF forests surrounding Mt. McAllister should be included within designation areas, to ensure protection of potential rutting areas and to provide a buffer around important calving habitat.

Caribou in the Mt. Bickford area remain on the Mt. Bickford mountain complex for the majority of the year. During the summer and fall, animals use the subalpine forests, but calving activity is in the high elevation alpine areas (Jones et al., 2004). Subalpine forests surrounding important alpine areas should be included in designation to incorporate subalpine habitats at elevations above 1300 m (Seip, pers. comm.; Jones et al., 2004).

Kennedy-Siding Herd

Unlike their distinct winter habitat selection, caribou within the Kennedy-Siding herd have variable use of habitat types during the spring, summer and fall seasons (Table 2) (Jones et al., 2004). Spring habitat use primarily consists of high elevation alpine areas in the headwaters of the Burnt River and the Misinchinka River. Specifically, calving observations have been recorded on Mt. Hunter, Mt. Reynolds and in alpine areas at the headwaters of the Burnt River, between 2002 and 2004 (Jones et al., 2004). Milburn Peak is used during the spring, as well as during the summer/fall season. During the spring, alpine tundra is the dominant habitat type selected, with varied use in the subalpine parkland and subalpine forests surrounding the high elevation, windswept alpine (Jones et al., 2004).

Table 2. Caribou habitat use during spring and summer/fall seasons in the Kennedy-Siding Herd during 2003-2004. Seasons have been characterized as Spring = April 15 - May 31 and Summer/Fall = June 1 - October 15 (Jones et al., 2004)

SEASON	RANKING OF USE	HABITAT TYPE	BIOGEOCLIMATIC ZONE	ELEVATION	STAND TYPE	STAND AGE
Spring	Primary	Alpine	ATp	>1500 m		
	Secondary	Subalpine parkland and subalpine forest	ESSFwk2/mc3	1301-1500 m	Pure subalpine fir stands	141-250 years
Summer/Fall	Primary	Subalpine forest	ESSFwk2/wc3	1301-1500 m	Subalpine fir dominated; pure subalpine fir forests	141-250 years

During the summer and fall, animals within the herd show variable, scattered use of different areas within the subalpine forest (Jones, pers. comm.). Unlike the Moberly herd, individuals

within the Kennedy-Siding herd will cross the highway, making use of ESSF forests on the north side of the highway (Lavitah Mtn.) during summer and fall. During the summer and fall, caribou primarily use the ESSF forests in an elevational range between 1300 and 1500 m, with some use of alpine areas during this time (Jones et al., 2004). There is concentrated use on Mt. Le Moray, Mt. Stephenson and north of Lavitah Mtn. during the summer/fall season. Specific rutting observations have not yet been recorded within the Kennedy-Siding herd.

Quintette Herd

There has been extensive caribou work completed in the Quintette area due to the large amount of industrial activity that has occurred in the area. This herd is threatened by forest harvesting, past and current mining exploration, and increasing oil and gas development. Studies conducted within the Quintette area include, but are not limited to, Sopuck (1985), Stevenson and Hatler (1985), Murray (1992), Westworth Associates Environmental (1998), and Jones et al. (2004).

Although seasonal habitat use within the Quintette herd can vary, the spring habitat selected is relatively constant (Table 3). Spring habitat is primarily characterized as high elevation, alpine tundra (Murray, 1992; Jones et al., 2004). However, females on spring and summer ranges will also use high elevation subalpine scrub forest at or near treeline (Sopuck, 1985). Sopuck (1985) reported a small sample size of animals that also used high elevation spruce-fir forest, on south-facing slopes, and near timberline for calving. For this reason, it is important that not only alpine areas, but also the subalpine forests adjacent to these alpine areas, be designated as calving/spring habitat. All calving and spring locations were above 1500 m.

Table 3. Caribou habitat use during spring and summer/fall seasons in the Quintette Herd during 2003-2004. Seasons have been characterized as Spring = April 15 – May 31 and Summer/Fall = June 1 – October 15 (Jones *et al.* 2004).¹

SEASON	RANKING OF USE	HABITAT TYPE	BIOGEOCLIMATIC ZONE	ELEVATION	STAND TYPE	STAND AGE
Spring	Primary	Alpine	ATp	1701-2100 m		
Summer/Fall	Primary	Subalpine forests	ESSFwk2/wc3	1301-1700 m	Subalpine fir dominated, pure subalpine fir	>140 years
	Secondary	Subalpine forests	ESSFmv2	1301-1700 m	Spruce dominated forests; pine dominated forests	60-120 years

¹ It is important to recognize that the number of caribou (3) monitored in the Quintette area by Jones et al. (2004) was small, and may not accurately represent the entire Quintette population.

Some individuals within the Quintette herd will make large-scale migrations to low elevation forests in the east for the winter season (Stevenson and Hatler, 1985; Murray, 1992). Although most animals move back up to high elevation mountainous areas to calve, there have been some reports of female caribou calving in the low elevation forests that are primarily used as winter range (Woods, pers. comm.). Calving activity in the low elevation forests, however, is not often documented because of the difficulty in visually locating animals (Woods, pers. comm.).

Specific calving areas have been identified within the Quintette area and include:

- Mt. Collier, Mt. Crum, Mt. Reesor, Mt. Spieker, Quintette Mtn. and Bullmoose Mtn. (Pate, pers. comm.; Seip, pers. comm.; Jones et al., 2004);
- Mt. Ralsson and the ridge northwest of Mt. Crum (Stevenson and Hatler, 1985);
- High elevation areas between the Wolverine River and the Murray River (Stevenson and Hatler, 1985; Jones et al., 2004); and
- High elevation areas between Quintette Mtn. and Turning Mtn. (Stevenson and Hatler, 1985; Sopuck, 1985);
- Goat Mtn. and Albright Ridge (Sopuck, 1985);
- Low elevation forests around Bearhole Lake (Sopuck, 1985; Stevenson and Hatler, 1985; Woods, pers. comm.).

Regular use of calving areas has been reported for the Quintette to Turning Mtn. area by Sopuck (1985) and Stevenson and Hatler (1985). However, it is unknown whether there is regular use of other identified calving areas and a small sample size of radio-collared caribou in the Quintette area (Jones et al., 2004) does not allow for accurate estimates of fidelity to calving areas. It should be noted that calving areas in the Quintette should not be limited to these specific areas. All alpine areas should be considered important because of the limited availability of high elevation windswept alpine (Jones et al., 2004).

During the summer and fall, caribou primarily use high elevation spruce or subalpine fir forests, or remain in the windswept alpine (Table 3) (Murray, 1992). Sopuck (1985) reported caribou remain in the alpine and open subalpine during pre-rut and rutting periods (September to November 15). Defining fall habitat use may be difficult, as animals tend to be in transition between summer and winter ranges, if they use separate ranges between the seasons. Some individuals within the Quintette herd will remain in the windswept alpine all year, while others move east into lower elevation forested habitats for the winter months. However, Sopuck (1985) suggests that rutting activities usually occur in the open alpine and subalpine habitats, and caribou may show fidelity to rutting areas across years, increasing the importance of traditional rutting areas.

Observations of rutting activity has been documented in the following areas:

- Southeast and east of Mt. Collier (Stevenson and Hatler, 1985);
- Mt. Reesor and Mt. Spieker (Stevenson and Hatler, 1985; Jones et al., 2004);
- High elevation areas between Quintette Mtn. and Turning Mtn. (Stevenson and Hatler, 1985);
- High elevation areas around Hook Lake and the headwaters of the Wolverine River (Stevenson and Hatler, 1985); and
- ESSF forests at the headwaters of Windfall Creek (Jones et al., 2004).

Historical rutting behaviour has been documented at the southern most extent of the Quintette area on Mt. Becker, Bertram Peak and surrounding Wapiti Lake (Stevenson and Hatler, 1985).

Narraway/Belcourt Herd

Much of the data existing for the Narraway/Belcourt herd is a result of work completed by researchers in Alberta. The herd's seasonal range occurs in both Alberta and British Columbia,

with summer ranges being primarily located within British Columbia (Saher and Schmiegelow, in prep). However, critical migration routes between summer and winter ranges are also located in British Columbia.

As documented for all other herds, caribou within the Narraway/Belcourt herd primarily make use of high elevation alpine areas for calving activities during the spring. Specifically, caribou have been located in open alpine meadows and semi-open subalpine forest during the calving period (Edmonds and Bloomfield, 1984). Calving activities occur in the high elevation, at a mean elevation of 1844 m (Edmonds and Bloomfield, 1984). However, calving animals will also make use of timberline areas adjacent to windswept alpine (Edmonds and Bloomfield, 1984). Fidelity to calving areas has yet to be defined within the Narraway/Belcourt area.

Recent studies completed on spring migration routes have suggested numerous high elevation areas in BC to be important calving grounds (Saher and Schmiegelow, in prep):

- Ptarmigan Mtn.;
- Secus Mtn.;
- High elevation areas north of lower Belcourt Creek (Pate, pers. comm.);
- High alpine areas at the headwaters of Belcourt Creek;
- High alpine areas at the headwaters of the Narraway River (Dimsdale Lake);
- High alpine areas at the headwaters of Herrick Creek; and
- High alpine areas east of Herrick Pass (Saher, pers. comm.).

During the summer and fall, caribou inhabit a variety of habitat types, including alpine meadows, creek meadows, subalpine meadows and krummholz habitat, at elevations greater than 1800 m (Edmonds and Bloomfield, 1984). This, however, may be a result of caribou in transition between summer and winter ranges.

Specific rutting behaviour has been described as occurring in open areas above timberline, near summer ranges, at treeline or in semi-closed to closed subalpine forest (Bloomfield et al., 1981; Edmonds and Bloomfield, 1984). Rutting generally takes place before the fall migration back to winter ranges and therefore the majority of rutting areas used by the Narraway/Belcourt caribou occur within British Columbia (Bloomfield et al., 1981). Fidelity to rutting areas may be apparent within the Narraway/Belcourt area; Edmonds and Bloomfield (1984) reported 60% of radio-collared caribou in Alberta returned to the same rutting area each year.

Historical observations of rutting activity have been recorded by Stevenson and Hatler (1985) within the Narraway/Belcourt herd and include:

- Bertram Peak;
- Low elevation areas around Wapiti Lake;
- Mt. Becker and high elevation areas to the southwest of Mt. Becker;
- Secus Mtn.;
- Muinok Mtn.;
- Ochak Mtn.;
- Menagin Mtn.; and
- Mid-elevation areas southwest of Belcourt Lake.

Mineral Licks

Within the Dawson Creek TSA, several mineral lick sites have been identified as significant for caribou (Table 4). It is believed that mineral licks are not obligatory to caribou as they are for other ungulate species, such as sheep and goats (Seip, pers. comm.). However, observations of caribou use at lick sites have been reported (Pate, pers. comm.; Woods, pers. comm.; Sopuck, 1985). All mineral lick locations (Appendix I) are located in low elevation, meadows and valley bottoms. For management purposes, I would suggest important, high use licks be included within WHA designation, especially if the lick is in close proximity to known caribou areas.

Table 4. Location of mineral licks within the Dawson Creek TSA.

MINERAL LICK LOCATION	COMMENTS	REFERENCES
Kearns Lake	Several licks located in valley bottom	Pate, pers. comm.
Little Boulder Creek	Most important caribou lick in the area	Pate, pers. comm.
Twidwell Creek	Complex of licks in the area	Pate, pers. comm.
Mt. Crum	Important because of its location in high caribou use area (only lick in the area); road in close proximity to the lick	Pate, pers. comm.
Flatbed Creek	Lick located adjacent to highway – possibly used by caribou spending all year in low elevation pine/black spruce	Pate, pers. comm.
Imperial Creek	Serves a large area – important for caribou, moose and elk	Pate, pers. comm.
Mt. Anderson	Mineral lick location – unknown use or importance	Pate, pers. comm.
Ptarmigan Mtn.	Two licks located in low elevation on north face of the mountain – periodic use by caribou	Pate, pers. comm.
Nekik Mtn.	Caribou lick located in valley between Nekik Mtn. and Meosin Mtn.	Stevenson and Hatler (1985)

The Little Boulder Creek Lick is the most important mineral lick complex within the Moberly herd area (Pate, pers. comm.). The lick is located in a low elevation meadow, and a second lick nearby has been formed from old salt blocks. During late August, 25 cow and calf caribou have been repeatedly observed on the lick. A second complex of mineral licks is located between McNairn Creek and the headwaters of Little Boulder Creek, which is also used by caribou in the Moberly herd (Pate, pers. comm.).

Within the Quintette area, an important mineral lick that is important for caribou, moose and elk populations is located upstream on Imperial Creek. Wildlife trails and paths lead into the lick for up to five miles surrounding the lick. Pate (pers. comm.) suggests animals make direct movements from the Monkman area to make use of the Imperial Creek mineral lick. Another mineral lick is located at the headwaters of Windfall Creek and is used by caribou in the Quintette herd (Pate, pers. comm.). Pate (pers. comm.) described this lick as important because of its relative location to caribou populations using the general area.

There are several small mineral lick locations in the Narraway/Belcourt area. Two licks are located on the north side of Mt. Ptarmigan and may be frequented by caribou in the area. These mineral licks are also located within identified spring migration routes of the Narraway/Belcourt caribou herd. However, it is not known to what extent caribou use these licks.

Connectivity Corridors

The use of spring migration routes within the Narraway/Belcourt herd has been recently documented by Saher and Schmiegelow (in prep). Individual caribou within the Narraway/Belcourt herd showed high fidelity to spring migration routes, moving from their winter range in Alberta to high elevation summer ranges in British Columbia. While conducting large-scale movements, caribou select for terrain that facilitates easy movement (Saher and Schmiegelow, in prep). This is usually characterized by low-sloped terrain that is close to edge habitats.

Caribou within the Narraway/Belcourt herd make use of several key migration corridors. These include the Red Deer Creek valley, movement over Ptarmigan Mt. and into the Narraway River, the Narraway River valley, and the Belcourt Creek valley. Over a two year study, individual caribou used the same routes to move from winter to summer ranges, showing high fidelity to migration routes. Because of this, migration routes are critical to maintaining the connectivity between seasonal ranges, and ensuring the animal's physiological condition is maintained through the migration period (Saher and Schmiegelow, in prep). Other movement corridors within the Narraway/Belcourt areas include all major drainages and ridges as well as lower elevation passes (Edmonds and Bloomfield, 1984).

With the increase in mining developments in the Quintette area, connectivity between Perry Creek and the north slopes of Mt. Spieker is critical to animals within the Quintette herd. Seip (pers. comm.) suspects the caribou using these areas may be moving around the peak of Mt. Spieker and using the alpine areas to the northwest as a movement corridor. Other consistently used corridors could not be identified from the literature or from current research projects.

DISCUSSION/RECOMMENDATIONS

Current research suggests that northern ecotype caribou primarily make use of alpine areas during the calving season. However, local biologists have stressed the importance of low cover, subalpine parkland areas, as well as subalpine forests as calving sites (Backmeyer, pers. comm.; Woods, pers. comm.). The use of subalpine habitat for calving has also been reported for caribou within the Graham herd in the north portion of the Dawson Creek TSA (Culling, pers. comm.). Animals calving in the subalpine may use habitats with low canopy cover and krummholz type habitats that provide more cover than the adjacent windswept alpine (Backmeyer, pers. comm.). Jones et al. (2004) have reported calving habitat to be primarily in the alpine tundra biogeoclimatic zone.

Rutting habitat is not as distinct and can vary based on the different herds and seasonal movements. All alpine areas within known caribou use areas and home ranges should be included within WHAs because of their importance to calving and their limited availability. In addition, the alpine areas should incorporate a band of subalpine forest adjacent to alpine areas to provide a buffer to the calving areas. This buffer can be determined using elevational data collected from collared caribou within each of the herds in the Dawson Creek TSA.

In order to determine rutting areas, each herd should be considered separately, as fall habitat use is largely dependent on the geographic location of each herd. Subalpine forests and alpine areas appear to be commonly used areas during the fall; however, some herds exhibit different use of forest types and elevational gradients within the subalpine forests. In addition, defining rutting areas may not be feasible, as caribou in some areas may not show high fidelity to or use specific rutting areas (Pate, pers. comm.).

This summary provides a brief overview of the literature reviewed pertaining to habitat use during the calving and rutting periods as well as locations of mineral licks and connectivity/migration corridors. Areas used for these activities have been roughly delineated (Appendix I) to provide an overview of potential WHA areas in the Dawson Creek TSA. It should be noted that additional anecdotal information should be pursued from guide outfitters, trappers and residents from the region in order to provide a comprehensive summary and confirm regular use of calving, rutting and matrix habitat, and the location of active mineral licks within the Dawson Creek TSA. Also, ongoing research by Jones et al. during 2004/2005 will be able to provide more information pertaining to habitat use during the fall and spring.

LITERATURE CITED

- Bloomfield, M., J. Edmonds and J. Steele. 1981. First annual report of the Berland – A La Peche caribou study. Alberta Energy and Natural Resources, Fish and Wildlife Division, Edson, AB.
- Dzus, E. 2001. Status of the Woodland Caribou (*Rangifer tarandus caribou*) in Alberta. Alberta Environment, Fisheries and Wildlife Management Division, and Alberta Conservation Association, Wildlife Status Report No. 30, Edmonton, AB. 47 pp.
- Edmonds, E.J. and M. Bloomfield. 1984. A study of woodland caribou (*Rangifer tarandus caribou*) in West Central Alberta, 1979 to 1983. Alberta Energy and Natural Resources, Fish and Wildlife Division, Edson, AB.
- Jones, E., D. Seip, and M. Gillingham. 2004. Ecological relationships between threatened caribou herds and their habitat in the central Rocky Mountains Ecoregion. Annual Report April 1, 2003 to March 31, 2004. Prince George, BC. 67 pp.
- Cichowski, D., T. Kinley and B. Churchill. 2004. *Accounts and measures for managing identified wildlife*. Identified Wildlife Management Strategy 2004, Ministry of Water, Land and Air Protection, Victoria, BC.
- Province of British Columbia. 2004. *Procedures for managing identified wildlife*. Identified Wildlife Management Strategy 2004, Ministry of Water, Land and Air Protection, Victoria, BC.
- Murray, L.J. 1992. Habitat use and seasonal movements of radio-collared caribou in the Peace Subregion, 1988-1990. BC Ministry of Environment, Fort St. John, BC.
- Saher, D.J. and F.K.A. Schmiegelow. In prep. Movement pathways and critical habitat: selection by mountain caribou during spring migration. Department of Renewable Resources, University of Alberta, Edmonton, AB.
- Seip, D.R. and E. Jones. 2004. Ecological relationships between threatened caribou herds and their habitat in the central Rocky Mountains Ecoregion. 2003-2004 Progress Report.
- Sopuck, L.G. 1985. Movements and distribution of caribou in relation to the Quintette Coal Development. Prepared by Renewable Resources Consulting Services Ltd., for Denison Mines Ltd., Sidney, BC. 50 pp.
- Stevenson, S.K. and D.F. Hatler. 1985. Woodland caribou and their habitat in Southern and Central British Columbia: Volume 2. BC Ministry of Forests, Victoria, BC, Land Management Report No. 23.
- Westworth Associates Environmental Ltd. 1998. Wildlife inventories in the Burnt River

Landscape Unit: Volume 2 – Terrestrial furbearers, carnivores, and ungulates. Prepared by Westworth Associates Environmental Ltd., Edmonton, AB., for Canadian Forest Products Ltd., Chetwynd Division, Chetwynd, BC.

PERSONAL COMMUNICATIONS

1. Backmeyer, Rod. 2004. Wildlife Biologist, Ministry of Water, Land and Air Protection, Fort St. John, BC.
2. Culling, Diane. 2004. Diversified Environmental Services, Fort St. John, BC.
3. Jones, Elena. 2004. MSc. Candidate, University of Northern British Columbia, Prince George, BC.
4. Pate, Brian. 2004. West Fraser Mills Ltd., Chetwynd, BC.
5. Seip, Dale. 2004. Research Biologist, Forest Service, Prince George, BC.
6. Woods, Rob. 2004. Wildlife Technician, Ministry of Water, Land and Air Protection, Fort St. John, BC.

Appendix 1. Map of reported caribou calving and rutting habitats, connectivity corridors and mineral licks within the Dawson Creek TSA, and potential WHAs.

Appendix 2. Summary of important areas for calving and rutting habitat, matrix habitat and mineral lick locations: Woodland Caribou in the Dawson Creek TSA.

IMPORTANT AREA	HERD	TYPE OF USE	HABITAT TYPE USED	BEC ZONE	ELEVATION	REFERENCES	COMMENTS
MOBERLY							
Mt. Bickford, mountain north and west of Little Boulder Creek	Moberly	Spring/Calving	Alpine tundra	AT		Jones (pers. comm.), Seip & Jones, 2004	
Mt. Bickford, mountain north and west of Little Boulder Creek	Moberly	Summer/Fall	Alpine tundra and subalpine forests	AT and ESSF		Jones (pers. comm.), Seip & Jones, 2004	Primarily alpine use, but use subalpine forests
Mt. Bickford	Moberly	Calving	Alpine tundra	AT		Seip & Jones, 2004	Calving use observed
Mountain south of Little Boulder Creek	Moberly	Summer/Fall	Subalpine forests	ESSF		Seip & Jones, 2004	
Mt. Monteith	Moberly	Spring & Summer/Fall	Alpine tundra	AT		Seip & Jones, 2004	
Mt. Frank Roy	Moberly	Summer/Fall	Alpine tundra	AT		Seip & Jones, 2004	
Mt. Le Moray	Moberly	Summer/Fall	Alpine tundra and subalpine forests	AT and ESSF		Seip & Jones, 2004	Important area identified by E. Jones
KENNEDY-SIDING							
Oguznasechi Mtn.	Kennedy-Siding	Summer/Fall	Alpine tundra and subalpine forests	AT and ESSF		Seip & Jones, 2004	
Area between Mt. West and Lavitah Mtn.	Kennedy-Siding	Summer/Fall	Subalpine forests	ESSF		Seip & Jones, 2004	Area at the headwaters of Mischinsinlika Creek
Peak west of Mt. Reynolds	Kennedy-Siding	Spring	Alpine tundra	AT		Seip & Jones, 2004	
Mt. Hunter and mountain northwest of Mt. Hunter	Kennedy-Siding	Spring	Alpine tundra	AT		Seip & Jones, 2004	
High elevation areas at headwaters of North Burnt River	Kennedy-Siding	Spring	Alpine tundra	AT		Seip & Jones, 2004	
High elevation areas of headwaters	Kennedy-Siding	Spring	Alpine tundra	AT		Seip & Jones, 2004	East side of Burnt

of the Burnt River	Siding					2004	River
Milburn Peak	Kennedy-Siding	Spring and Summer/Fall	Subalpine forests and alpine tundra	ESSF and AT		Seip & Jones, 2004	Animals have scattered use during the summer
QUINTETTE							
Windswept Alpine	Quintette	All Seasons	Alpine tundra	AT		Jones (pers. comm.)	All windswept alpine is important because of its availability
Mt. Collier	Quintette	Spring and Summer/Fall	Alpine tundra	AT		Seip & Jones, 2004	All windswept elevation is important (E. Jones)
Headwaters of Windfall Creek	Quintette	Summer/Fall	Subalpine forests	ESSF		Seip & Jones, 2004	
Bearhole Lake	Quintette	Spring and Late Winter	Lowland conifer forests			Sopuck, 1985; Stevenson and Hatler, 1985	
Quintette Mt. And surrounding alpine to the west	Quintette	Spring and Summer/Fall	Alpine tundra	AT		Sopuck, 1985	
Turning Mtn.	Quintette	Spring and Summer	Alpine tundra	AT		Sopuck, 1985	
Mountain west of Quintette Mtn., north of Kineseo Creek	Quintette	Calving & Rutting			5000 ft	Stevenson and Hatler, 1985	
Mountain west of Quintette Mtn.	Quintette	Calving & Rutting			>5500 ft	Stevenson and Hatler, 1985	
Mountain south of Mt. Babcock	Quintette	Rutting			~5000 ft	Stevenson and Hatler, 1985	
Mountain northwest of Quintette Mtn.	Quintette	Rutting & Calving			>5000 ft	Stevenson and Hatler, 1985	
Mountain complex between Wolverine River & Murray River	Quintette	Calving			5500 ft	Stevenson and Hatler, 1985	
Ridge north of Mt. Crum (along the Sukunka River)	Quintette	Calving			5000 ft	Stevenson and Hatler, 1985	
Mountain southeast of Mt. Collier	Quintette	Rutting			5000 ft	Stevenson and Hatler, 1985	
Mt. Spieker and peak south of Mt. Spieker	Quintette	Rutting areas				Stevenson and Hatler, 1985	Some lower elevation use (not

North of Chain Lakes	Quintette	Summer/Fall (October)			<3500 ft	Murray 1989	strictly alpine)
Ridge south of Mt. Crum (along Sukunka River)	Quintette	Summer/Fall (October)			5500-6000 ft	Murray 1989	
Mountain west of Quintette Mtn.	Quintette	Summer/Fall (October)			4500 ft	Murray 1989	
North of Albright Ridge	Quintette	Summer/Fall (October)			~5500 ft	Murray 1989	
NARRAWAY/BELCOURT							
Bertram Peak to Onion Lake	Belcourt-Narraway	Rutting area			>6000 ft	Stevenson and Hatler, 1985	Historical use
North of Menagin Mtn.	Belcourt-Narraway	Summer/Fall			~5000 ft	Murray 1989	
Wapiti Lake	Belcourt-Narraway	Rutting area			4000 ft	Stevenson and Hatler, 1985	Historical use
Mt. Becker and mountains northwest and southwest of Mt. Becker	Belcourt-Narraway	Rutting area			>5000 ft	Stevenson and Hatler, 1985	Historical use
Secus Mtn.	Belcourt-Narraway	Rutting area			5500 ft	Stevenson and Hatler, 1985	Historical use; B. Pate (pers. comm.) indicated importance of Secus Mtn.
Ochak Mtn.	Belcourt-Narraway	Rutting area			6000 ft	Stevenson and Hatler, 1985	Historical use
Muinok Mtn. and south of Muinok Mtn.	Belcourt-Narraway	Rutting area			5500 ft	Stevenson and Hatler, 1985	Historical use
West of Belcourt Lake	Belcourt-Narraway	Rutting area			4500 ft	Stevenson and Hatler, 1985	Historical use