

Mountain Caribou Ungulate Winter Range (UWR) Report (U-7-003) Omineca Region



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1.0 INTRODUCTION

The Environmental Stewardship Division of the Ministry of Water, Land and Air Protection, Omineca Region recommends the areas in the “High” and “Corridor” zones in the Prince George and Robson Valley Forest Districts be designated as Ungulate Winter Range because of the serious condition of Mountain Caribou populations in BC and in the Omineca Region. Currently, only areas in the Prince George and Robson Valley Forest Districts zoned as “Medium” for caribou have status as Ungulate Winter Range. The management strategies for "High", "Corridor" and "Medium" caribou zones have been fully incorporated into District policies since 1993, and have been calculated into the Allowable Annual Cut in the Timber Supply Reviews. To simplify and clarify the Mountain Caribou Ungulate Winter Range designation, we recommend that the existing Prince George and Robson Valley Mountain Caribou Ungulate Winter Ranges be incorporated into the Omineca Regional proposal.

In the Fort St. James Forest District, we recommend that the areas in the “High”, “Medium” and “Corridor” zones be designated as Ungulate Winter Range. These management strategies have been incorporated into District policies for three years, and have been calculated into the Allowable Annual Cut in the 2001 Timber Supply Review.

Ungulate Winter Range U-7-003 for Mountain Caribou was approved by the Deputy Minister of Water, Land and Air Protection on October 6, 2003. Details of the approved ungulate winter range can be obtained from the following website:
http://wlapwww.gov.bc.ca/wld/uwr/ungulate_app.html.

2.0 APPROVED MANAGEMENT OBJECTIVES

Warning

The following planning objectives are a unofficial consolidation of the management objectives established within the legal order pertaining to this Ungulate Winter Range. Official ungulate winter range orders may be accessed and downloaded from this Web Site http://wlapwww.gov.bc.ca/wld/uwr/ungulate_app.html .

While every attempt has been made to ensure accuracy and completeness, these management objectives cannot be guaranteed. Users should always refer to the official order, which maybe amended from time to time,

2.1 Caribou Corridor

UWR Units: PC-029, PC-030, PC-031, PC-032, PC-033, PC-034, PC-036, PC-037, PC-038, PC-040, PC-044, PC-046, PC-047, PC-048, PC-049, PC-051, PC-052, PC-056, PC-057, PC-061, PC-062, PC-063, PC-066, PC-072, PC-073, PC-078, PC-080, PC-082, PC-085, PC-002, RC-005, RC-006, RC-016, TC-005, TC-009, TC-010, TC-014.

In areas identified as Caribou Corridor, maintain a minimum of 20% of the forest in each corridor as 100+ years of age in a contiguous, windfirm corridor where no more than 20% of the area is in less than 3m green-up condition at any time by:

- 1) managing forest health to reduce conflicts between caribou and bark beetle management. In the event of a bark beetle outbreak, limit harvesting to forest health sanitation activities which maintain the habitat attributes of the Corridor UWR.
- 2) encouraging fire suppression within ungulate winter range units to maintain age class distribution and contiguity functions of the UWR, and reflect UWR objectives in appropriate Fire Management Plans.

2.2 Caribou High

UWR Units: PC-001, PC-002, PC-003, PC-004, PC-005, PC-006, PC-007, PC-008, PC-009, PC-010, PC-011, PC-012, PC-013, PC-014, PC-015, PC-016, PC-017, PC-018, PC-019, PC-020, PC-022, PC-023, PC-024, PC-025, PC-026, PC-027, PC-028, RC-001, RC-003, RC-008, RC-009, RC-013, RC-019, RC-020, RC-021, RC-022, TC-003, TC-006, TC-016, TC-018.

In areas identified as High, maintain old forests that provide arboreal lichens for forage by:

- 1) prohibiting forest harvesting, except Category A approved cut blocks and associated roads authorized at the time of ungulate winter range designation
- 2) maintaining contiguous, unfragmented forests that provide habitat types that minimize predation; human access and disturbances which can lead to mortality or displacement to less favourable habitats by following management practices to:
 - a) control access and human disturbance:
 - i) plan the location and design of major/secondary access routes to avoid the winter range units unless there are no other practicable alternatives for required access. No new roads will be approved without written consultation with the Environmental Stewardship Division of the Ministry of Water, Land and Air Protection;
 - ii) where road/trails are constructed within this winter range, reclaim or plant road/trails to limit access;
 - iii) within adjacent winter range, limit permanent road access within 2 km of this winter range by access restrictions or road deactivation (to reduce human disturbance and illegal caribou harvest);
 - b) practice forest health activities only where the District Manager determines that no action would result in a significant negative impact on adjacent timber values. The District Manager may use a similar evaluation to that used for harvesting in a Riparian Reserve.
 - c) limit fire suppression within ungulate winter range units which do not pose a significant risk to adjacent forest lands and reflect UWR objectives in appropriate Fire Management Plans.

2.3 Caribou Medium

UWR Units: PC-035, PC-039, PC-041, PC-043, PC-045, PC-050, PC-053, PC-054, PC-055, PC-058, PC-059, PC-060, PC-064, PC-065, PC-068, PC-069, PC-070, PC-071, PC-074, PC-075, PC-076, PC-077, PC-079, PC-081, PC-083, RC-004, RC-007, RC-010, RC-011, RC-012, RC-014, RC-015, RC-017, RC-018, TC-001, TC-002, TC-004, TC-007, TC-008, TC-011, TC-012, TC-013, TC-015, TC-017, TC-019.

In areas identified as Caribou Medium, maintain Mountain Caribou habitat values through partial cutting silvicultural practices by:

- 1) managing for $\leq 30\%$ volume removal on a cut block area every 80 years
- 2) limiting openings to a mean opening size ≤ 0.5 ha. (recommended range from 0.1 to 1.0 ha),
- 3) incorporating natural clumps of trees in the openings within the stand while allowing efficient skidding;
- 4) distributing openings throughout the block and keeping openings at least 2 tree lengths apart where practicable.
- 5) maintaining caribou winter range by managing access and human disturbance by:
 - a) planning the location and design of major/secondary access routes to minimize permanent roads in caribou habitat;
 - b) within adjacent winter range, limit permanent road access within 2 km of Caribou High;
- 6) managing forest health to reduce conflicts between caribou and bark beetle management. In the event of a bark beetle outbreak, limit harvesting to forest health sanitation activities which maintain the habitat attributes of the UWR.
- 7) encouraging fire suppression within ungulate winter range units to maintain age class distribution and contiguity functions of the UWR, and reflect UWR objectives in appropriate Fire Management Plans.

3.0 BACKGROUND

Mountain Caribou, an ecotype of woodland caribou (*Rangifer tarandus caribou*), live most of the year at high elevations and in winter feed primarily on arboreal lichens in old growth Engelmann Spruce Subalpine Fir (ESSF) or Interior Cedar-Hemlock (ICH) forests. Because of their association with old forests and their vulnerability to the effects of human activity in their range, Mountain Caribou are a species of concern to habitat managers.

The Omineca Region has the highest density of Mountain Caribou in the world (Stevenson *et al.* 2001). Currently, approximately 40% of the total remaining population of Mountain Caribou are within the Omineca Region, mostly in the Prince George Forest District (Hart Ranges, North Cariboo Mountains, Narrow Lake, and George Mountain subpopulations (Stevenson *et al.* 2001). The importance of Mountain Caribou has long been recognized, and in the mid 1970's, the United States government declared Mountain Caribou in the United States an endangered species. More recently, COSEWIC (Committee on the Status of Endangered Wildlife in Canada) listed the Southern

Mountain population of Woodland Caribou, which includes the Omineca Region's Mountain Caribou as threatened. In British Columbia, the Provincial Conservation Data Centre has upgraded Mountain Caribou to the Red Listed level, the highest level of management concern.

As a result of the international importance of Mountain Caribou, Stevenson and Hatler (1985) reviewed available information on the population and habitat of Mountain Caribou from south of Chetwynd to the US border. Recognising the impacts on the forest industry of protecting all Mountain Caribou habitat, the authors recommended the provincial government establish a management strategy of stratifying the habitat along a gradient from areas of critical importance where no timber harvesting is permitted to areas of low value caribou habitat where timber harvesting would be carried out with no restrictions or special management concerns.

The Fish and Wildlife Habitat Protection staff used this recommendation to develop an Omineca Region Mountain Caribou Management Zone Strategy that was implemented in 1990 in the Prince George and Robson Valley Forest Districts. By 1993 the zones were incorporated into the policies of both Forest Districts.

Caribou habitat was stratified in to "High", "Medium" and "Corridor" zones throughout both Districts based on radio-telemetry and survey information.

- Within the "High" zone, no timber harvesting is permitted and strict access management is practiced.
- In the "Medium" zone, partial cutting that maintains arboreal lichen biomass in the stand is permitted. Harvesting in the "Medium" zone follows the recommendations of Stevenson et al. (1994; 2001). Access management is required to strategically locate permanent roads and to rehabilitate all unnecessary roads.
- The "Corridor" zone is managed as a continuous corridor of timber greater than 100 years old, with old stand characteristics.

This information was incorporated into the 1994 Prince George Timber Supply Review (TSR) and the 2000 Robson Valley Timber Supply Review, which were signed by the Chief Forester of British Columbia. These reviews incorporated Allowable Annual Cut (AAC) reductions to accommodate special management for Mountain Caribou.

Subsequent to the 2000 TSR, some caribou areas have been re-evaluated in the Robson Valley. The Enhanced Forest Management Pilot Project supported an examination of all available radio telemetry and survey data for caribou in or adjacent to the Robson Valley and some additional survey work. Based on the new survey work, an area previously zoned as Caribou High in the Rausch River watershed was deemed too rugged to support wintering caribou. This area has been deleted from caribou management. The same survey work identified an area in the Camp-Canoe area as supporting caribou. This area has been designated caribou high and included in the caribou management strategy. The examination of all caribou data suggested that caribou use in the Morkill River watershed was restricted to summer and early fall. These animals winter to the east in Alberta. This area previously designated as Caribou High has a new designation of Caribou High

Summer. It will have an access management strategy, but very little impact on timber availability.

The new federal *Species at Risk Act* (SARA) stimulated the Ministry of Water, Land and Air Protection to develop and publish *A Strategy for the Recovery of Mountain Caribou in British Columbia (2002)*, as Mountain Caribou are currently Red-Listed under the provincial Conservation Data Centre (CDC), and listed as Threatened under the national Committee on the Status of Endangered Wildlife in Canada (COSEWIC)

Subsequently, a small area has been identified in the Fort St. James District that provides critical habitat for caribou that use habitat in the same manner as Mountain Caribou. For the purposes of management we are classifying this herd as Mountain Caribou. The importance of this habitat has been verified through research (Poole *et al* 2000). The critical areas for this Takla herd were incorporated into the 2001 Prince George TSR.

Currently, only areas in the Prince George and Robson Valley Forest Districts zoned as “Medium” for caribou have status as Ungulate Winter Range. Because of the serious condition of Mountain Caribou populations in BC and in the Omineca Region, we recommend that the areas in the “High” and “Corridor” zones in the Prince George and Robson Valley Forest Districts also be designated as Ungulate Winter Range. These management strategies have been incorporated into District policies since 1993, and have been calculated into the Allowable Annual Cut in the Timber Supply Reviews. In the Fort St. James Forest District, we recommend that the areas in the “High”, “Medium” and “Corridor” zones be designated as Ungulate Winter Range. These management strategies have been incorporated into District policies for three years, and have been calculated into the Allowable Annual Cut in the last Timber Supply Review.

3.1 Site Description

Figures 1 through 3 identify the current Ungulate Winter Range designation for each Forest District, illustrating the critical mid-to-late winter habitats for Mountain Caribou in the Omineca Region, and key winter movement corridors connecting those critical habitats.

The critical Mountain Caribou winter habitats in the Omineca Region are found in Engelmann Spruce-Subalpine Fir (ESSF) forests, mostly leading subalpine fir (*Abies lasiocarpa*). They are found generally above 1370 metres elevation in the Prince George Forest District (but lower in the more northerly Anzac/Table area), 1300 metres in the Fort St. James Forest District, and 1500 metres in the Robson Valley Forest District. The “High” zone in the Robson Valley Forest District also includes a small area of Interior Cedar-Hemlock (ICH) forest.

3.2 Mountain Caribou Use

Mountain Caribou populations, distribution, and habitat use are better understood in the Omineca Region than in some other parts of their range because of the substantial amount

of research that has taken place in the region. Information available up to the early 1980's was summarized by Stevenson and Hatler (1985). Subsequent radiotelemetry studies of Mountain Caribou in the Hart Ranges, North Cariboo Mountains, Narrow Lake, and George Mountain subpopulations provided additional information on habitat use at the landscape level (Terry 1993), and winter trailing studies resulted in a more detailed understanding of resource use at finer scales (Terry *et al* 2000). Radiotelemetry studies in the Fort St. James Forest District provided new information about habitat use by the Takla caribou (Poole *et al.* 2000).

As well, the Mountain Caribou in Managed Forests (MCMF) joint government-industry program, which developed strategies to maintain habitat for Mountain Caribou while economically harvesting timber, was based in Prince George, and many of the silvicultural systems trials that were established through the MCMF program are located in the Omineca Region. The MCMF program produced two publications for forest and habitat managers, Stevenson *et al.* (1994) and Stevenson *et al.* (2001), which have been used by Habitat Protection staff to develop management strategies for Mountain Caribou habitat in the Omineca Region. While a key component of managing Mountain Caribou in this province will be the designation of Ungulate Winter Range for Mountain Caribou in this region, the document *Mountain Caribou in Managed Forests: Recommendations for Managers* by Stevenson *et al* (2001) is invaluable, and its use is encouraged.

Mountain Caribou in the Omineca Region use the critical habitats proposed as Ungulate Winter Range throughout most of the year, typically using somewhat lower elevations within those habitats during spring and fall, and higher elevations during summer and winter. Most Mountain Caribou in the Omineca Region use the ICH Zone less than Mountain Caribou in other regions, although cedar-hemlock stands are important to Mountain Caribou in the Robson Valley Forest District. Omineca Mountain Caribou live mostly in the ESSF Zone, spending much of the winter on snowpacks exceeding two meters in depth and eating the arboreal lichens *Bryoria* spp. and *Alectoria sarmentosa*, which are most abundant on trees greater than 100 years old. This pattern of habitat use allows the caribou to exploit a forage resource unused by other local ungulates, and physically separates them from most predators during much of the year.

Radiotelemetry studies have consistently shown that Mountain Caribou strongly prefer old forests and avoid young stands (Stevenson *et al.* 2001). Forest harvesting may affect Mountain Caribou in many ways: by removing the winter forage resource, by replacing old-growth stand structures with densely vegetated young seral stands, by fragmenting areas of suitable habitat, by causing disturbance by creating road access, and by altering predator-prey relationships. The habitat management strategies developed by the MCMF program, and applied to the Caribou Medium zone by Habitat Protection staff of Ministry of Environment, Land and Parks, were designed to mitigate the adverse effects of forest harvesting on Mountain Caribou. However, the long-term effectiveness of these strategies is uncertain. Caribou High zones have been designated to provide refugia for Mountain Caribou in case MCMF strategies are unsuccessful, and to allow for a range of future management options.

Late-winter inventory flights conducted by regional wildlife staff have shown that Mountain Caribou are maintaining population levels in parts of the Robson Valley and Prince George Forest Districts, and experiencing significant losses in others. In the Hart Ranges, Narrow Lake area, George Mountain Area, and the North Cariboo area, there are an estimated 950 caribou, reduced from approximately 1000 caribou 10 years ago. The George Mountain herd has declined from about 20 animals to possibly 3 caribou in the last 15 years. The Narrow Lake area has also had a significant number reduction, but not as severe as George Mountain (Seip *et al.* 2002).

The Fort St. James Takla Mountain Caribou herd currently has approximately 100 animals (Poole *et al.* 2000).

4.0 LAND DESIGNATION

There are no known land title conflicts within the area covered by this proposed Mountain Caribou Ungulate Winter Range. Several proposed Caribou Ungulate Winter Range areas are under Parks status, which will have no impact on the Provincial Forest.

The Caribou High and Medium Management Zones are in unoccupied Crown Provincial Forest lands. The Caribou Corridor Management Zones connect the high elevation areas across the valley bottoms, and within the Prince George and Robson Valley Forest Districts, cross linear corridors including provincial highways, hydro power lines and both CN and BC Railway lines.

5.0 FORESTRY RESOURCE IMPACTS

The assessment completed by the regional timber supply analyst (see appendix 4) indicates the total area identified in the proposed Mountain Caribou Ungulate Winter Range is 976 644 hectares compared to the 920 908 hectares incorporated in the Timber Supply Review. Even though this represents an increase of 55 736 hectares in caribou habitat, the regional timber supply analyst suggests the proposal would result in an unquantified increase to the timber harvesting land base and a resulting unquantified increase in the supply of timber for harvest, relative to that incorporated in the Timber Supply Review.

Table 1 summarises currently approved cutblocks and roads within proposed Mountain Caribou UWR.

Table 1: Forest Licensee/Ungulate Winter Range Overlap

Forest Licensee	Forest District	Management Direction	Current Forest Development Plan conflicts
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Canadian Forest Products Ltd. (FL A40873)	Fort St. James	High	No blocks. 3-400 metres of road accessing MID 20 and MID 26.
		Medium	Blocks and associated roads for: MID20, MID26, BAP116, BAP217, SAM450, SAM451, SAM452, SAK286, CP 264 Blk SAK235, CP G04 BLK SAK210, CP 264 Blk. SAK288, CP 262 Blk. SAK347.
		Corridor	SAM SAK267
BC Timber Sales	Fort St. James	Medium	Blocks and associated roads for: A50767 Blk 1, SBAP 002, SBAP 003, SBAP 004, SBAP 005, SBAP 006, SBAP 008, SBAP 009
Slocan Forest Products (FL 15430)	Robson Valley	High	Blocks and associated roads for: C20, 22, 23, 24, 30,31, 32, 33, 42; A24, 25, 26, 28, 30, 32, 36, 38, 40. (2001 FDP)

6.0 OTHER RESOURCE IMPACTS

This proposal was referred to the Ministry of Energy and Mines. Concerns are noted in Appendix 3.

The Ministry of Sustainable Resource Management noted no conflicts or concerns with this proposal.

7.0 STRATEGIC LAND USE PLAN RECOMMENDATIONS

Habitat management objectives for caribou are in place within the Prince George, Fort St. James and Robson Valley LRMPs. In all instances, the sensitive nature of these animals is recognised, and recommendations are in place which emphasise their protection. Specific objectives and strategies for each LRMP are summarised in Appendix 2.

Protection of Mountain Caribou habitat was a significant part in the LRMP documents for all three Forest Districts.

By establishing this recommended Ungulate Winter Range, government will:

- Endorse existing forest management policy as it relates to Mountain Caribou habitat management,
- Follow LRMP recommendations, which have the agreement of the stakeholders in the three Forest Districts,
- Create no net impact on the AAC in the three Forest Districts, as the reductions have already taken place in the current Timber Supply Reviews for Robson Valley and the Prince George TSA's.
- Assist in re-establishing Mountain Caribou populations so that these animals are no longer listed by COSEWIC as threatened.

8.0 FIRST NATIONS

Following the government expectations for First Nations consultation, each band with an interest in the Mountain caribou UWR areas were contacted. The McLeod Lake Indian Band provided a positive response to both the Prince George and Fort St. James UWR proposals. The Tlazt'en First Nation and McLeod Lake Indian Band provided a positive response to the Fort St. James proposal. The Lheidli T'ennah Band provided a positive response to the Prince George proposal. We were unable to receive any feedback from the others.

9.0 REFERENCES

Armleder, H.M., S.K. Stevenson, and S.D. Walker. 1992. *Estimating the abundance of arboreal forage lichens*. BC Ministry of Forests, Land Management Handbook Field Guide Insert 7. Victoria BC.

Arthur, Bill, Ministry of Water, Land and Air Protection, Omineca Region, *personal communication*.

British Columbia Ministry of Water, Land and Air Protection. 2002. *A Strategy for the Recovery of Mountain Caribou in British Columbia*. Available from http://wlapwww.gov.bc.ca/wld/documents/mcaribou_revyrstrat02.pdf.

Poole, Kim G., Douglas C. Heard, and Garth Mowat, 2000. *Habitat use by woodland caribou near Takla Lake in central British Columbia*. Can. J. Zool. 78: 1552-1561.

Pousette, John and Beckett, Doug, Ministry of Forests, Prince George Forest Region, *personal communication*.

Seip, D., G. Watts, M. Wolowicz, and J. Young. 2002. *2002 Caribou survey of the North Cariboo Mountains, Narrow Lake, and George Mountain*, Ministry of Forests (Prince George Forest Region) and Ministry of Water, Land and Air Protection (Omineca Region), survey report. Unpublished data.

Stevenson, S.K., H.M. Armleder, M.J. Jull, D.G. King, E.L. Terry, G.S. Watts, B.N. McLellan, and K.N. Child. 1994. *Mountain Caribou in Managed Forests: Preliminary recommendations for managers*. B.C. Min. For. Res. Branch, Victoria, B.C.

Stevenson, S. K., H. M. Armleder, M.J. Jull, D. G. King, B.N. McLellan and D. Coxson, 2001. *Mountain Caribou in Managed Forests: recommendations for managers*. Second Edition, Ministry of Forests. 58 pp.

Stevenson, S.K. and D.H. Hatler. 1985. *Woodland caribou and their habitat in southern and central British Columbia*. 2 vol. B.C. Min. For. Land Manage. Rep. 23. Victoria, B.C.

Terry, E. 1993. *Habitat use and seasonal movements by woodland caribou in east-central British Columbia*. Unpublished report prepared for B.C. Min. Environ., Lands and Parks, Northern Interior Region, Prince George, B.C.

Terry, E.L., B.N. McLellan, and G. Watts. 2000. *Winter habitat ecology of Mountain Caribou in relation to forest management*. J. Appl. Ecol. 37:589-602.

APPENDIX 1 – SUMMARY OF LRMP RECOMMENDATIONS

1. FORT ST. JAMES LRMP

Species at Risk

Objective — Maintain (and enhance where appropriate) populations of species, plants and ecosystems at-risk.

- Inventory and map red-listed and blue-listed animals, plants and ecosystems within the plan area and provide periodic updates as new information becomes available.
- Develop management plans to maintain at-risk species and habitats

This LRMP provides the following General Management Direction for the management of caribou. This management strategy is dynamic, with strategies and map areas likely to change over time as information is gathered and research studies are completed.

Objective — Manage existing caribou habitat and populations in the Fort St. James planning area.

- Develop and implement a Caribou Management Strategy in co-ordination with adjacent planning areas.
- Within Caribou Management Areas, restrict the introduction of animals that pose proven health risks to caribou (i.e., domestic sheep).

Objective — Maintain current caribou populations and habitat by reducing risk through carefully controlled resource development.

Management STRATEGIES for Specific Caribou Management Areas:

- Mt. Blanchet — No resource development activities within this Caribou Management Area, where it overlaps the Blanchet Protected Area.

ALL OTHER CARIBOU MANAGEMENT AREAS

- Forest operational planning will continue, providing the general management direction given by this document is followed.
- Maintain the seral stage distribution close to the natural seral stage distribution where possible.

Forest Development Planning

- Utilise the most “up-to-date” caribou habitat mapping in operational resource development planning.
- Provide the following assessments for forest development planning for Caribou Management Areas, to make more informed decisions in development planning:
 - known baseline data on caribou populations to assess impacts of development
 - strategies to meet biodiversity objectives set in landscape unit planning
 - access management and control strategies
 - lichen assessments, in accordance with methodology acceptable to MELP.
 - known caribou movements
 - identify caribou habitats that are used for the following purposes: calving areas, ranges during specific seasons, connective and lowland migration corridors, mineral licks, and high elevation balsam forests adjacent to areas used for any of the above purposes.

- Focus on silvicultural and harvesting systems that perpetuate terrestrial and arboreal lichen retention and recovery. Consider partial cutting (i.e., small patch) of balsam stands to maintain arboreal lichens.
- Where necessary, encourage extended stand rotations and minimise forest fragmentation.
- Prioritise development planning to areas that caribou are not currently utilising.

General Forest Management

- Outline strategies to address caribou values in Fire, Fuel and Pest Management Plans, and co-ordinate these with adjacent planning areas.

All Resource Development

- Endeavour to schedule development activities and field work to minimise impacts at times of greatest caribou use.
- Co-ordinate resource development to limit activity in sensitive caribou use areas (i.e., calving areas, mineral licks).
- Utilise appropriate plant species and seeds for re-vegetation. When revegetating disturbed sites use species that will not out-compete native plant species.
- Utilise appropriate vegetation management in riparian habitat and areas being managed for caribou, with the intent of reducing conflicts between different habitat requirements of caribou and moose, and thereby not encouraging increased moose populations that may result in greater predation of caribou by wolves.

Objective — Integrate multiple access requirements of all resource users to minimise impacts to wildlife populations and habitat requirements.

- Identify and manage those areas that require special access management or rehabilitation.
- Minimise access (both amount and duration) to areas with sensitive wildlife populations and habitats.
- In areas with sensitive wildlife species and/or habitats, deactivate roads to an appropriate level once development operations and active needs have ceased.
- When locating roads, consider the management intent of the Forest Ecosystem Networks/movement corridors.
- Manage access within valuable ungulate winter range (i.e., restrict recreational vehicular access).

Objective — Manage access within Caribou Management Areas.

- Deactivate and establish access control points to limit access to identified sensitive caribou habitats (i.e., calving areas, mineral licks) in forest development planning.
- Prior to timber harvesting or mine exploration and development, establish signs to advertise future access management. Signs should detail caribou use and provide rationales for access management.
- Advertise any access management through user groups and the media.
- Educate the public and industrial users about impacts on caribou by snowmobile and ATV use, and promote responsible use of these vehicles.
- Limit recreational vehicle (including snowmobiles and ATV's) access or manage for seasonal recreational vehicle access closures to caribou winter ranges and caribou calving areas during years when caribou are present.
- Limit the amount and duration of road development, and minimise the distance and duration of time for which a road is ploughed, while facilitating industrial operations.
- Minimise road width and design road length to minimise line-of-sight without compromising driver safety.
- Implement a higher proportion of permanent and semi-permanent road deactivation (vs. temporary deactivation) for secondary roads, as soon as possible once development

operations and active needs have ceased.

4.18 Takla-Middle RMZ (page 133)

- **Wildlife** – “Takla Caribou Herd” caribou and goat winter on Mt. Sidney Williams, Pyramid Peak and Tsitsutl Mountain
- **Objective:** Manage valuable habitats for a variety of species. Consider the maintenance of habitat when integrating resource development plans with:
 - Caribou and goat habitat on Mt. Sidney Williams, Pyramid Peak and Tsitsutl Mountain.

4.21 Mitchell RMZ (page 143)

- **Wildlife** – “Takla Caribou Herd” habitat in the Mitchell Range
- **Objective:** Manage to maintain identified valuable habitats for a variety of species.
 - Implement strategies to manage for the caribou habitat in the Mitchell Range.

2. PRINCE GEORGE LRMP

2.2 General Management Direction (page 21)

- Rare and Uncommon
 - Objective: Maintain rare and uncommon habitats, plants and/or animal species

2.23 Resource Management Zones, Objectives and Strategies

All Resource Management Zones with caribou have the same objective: “Manage caribou habitat to provide opportunity for population levels to increase.”

Prince George LRMP Resource Management Zone Caribou Strategies

Resource Management Zones	No commercial timber harvesting in areas of high suitability caribou habitat until proven management strategies are developed in areas of medium caribou habitat, appropriate to the growth cycle of trees in the caribou habitat.	Implementation of alternate silvicultural systems is preferred in areas of medium suitability caribou habitat.	Maintain the integrity of caribou movement corridors.	In areas with medium suitability caribou habitat or movement corridors, winter logging must be planned to minimize the amount of plowed roads.
#1-Parsnip High Elevation(p35)	X			
#2-Parsnip Side Valleys (p39)			X	X
#3-Anzac River Valley (p43)			X	X
#25-George Mountain/Wendle Lake (p111)	X	X	X	X
#31-Tree Farm	X	X	X	X

Licence #30 (p129)				
#33-McGregor River (p135)			X	X
#35-McGregor/Dezaiko Ranges (p139)	X	X	X	X
#39-Herrick Creek Old Growth Reserves (p147)				
#40-Herrick Creek Old Growth Forest Management Areas (p151)\			X	X
#41-Herrick Creek Valley (p155)			X	X
#46-Bowron River Valley (p163)		X		X
#47-Haggen Creek (p167)	X	X	X	X
#52-Fraser Valley East (p155)			X	X
#53-Bearpaw Ridge/Pritchard Creek (p179)	X	X		X

3. ROBSON VALLEY LRMP

Deferral of Commercial Timber Harvesting in High Value Caribou Habitat (page 14)

The current practice of deferring commercial timber harvesting in areas identified as having high habitat value for Mountain Caribou is approved. This deferral will continue for 10 years from the date of approval (April 30, 1999). Forest harvesting in high value caribou habitats would then be allowed after 10 years unless research indicates unacceptable impacts on caribou. This deferral does not extend to incidental timber harvesting for the purpose of mineral, natural gas and petroleum exploration and development.

Overall Access Management Goal (page 19)

- To manage access in a manner to allow a balanced, environmentally sound, sustainable use of land and resources

Objective: Manage road access in a manner that minimizes disturbance to wildlife values, allows recreation opportunities and protects fragile alpine environments.

Strategy:

- Reduce predator access into critical wildlife habitat by minimizing or eliminating snow plowed roads and managing packed trails in cooperation with snowmobilers and other users
- Manage road access to reduce wildlife disturbance, displacement, habitat loss and increased mortality rates due to poaching and other human activities

Overall Biodiversity Goal (page 20)

- To ensure the abundance and natural diversity of native species and their natural habitats

- throughout the Robson Valley.
- To identify, protect and recover native, endangered, threatened and vulnerable species and ecosystems.

Caribou Objective: Protect critical high elevation winter range habitat (page 23)

Strategies:

- Incorporate sensitive timber extraction in areas designated as Caribou Medium and upon further research and local public input consider incorporation of such practices in Caribou High areas
- Encourage unfragmented spatial separation between caribou and other ungulates to reduce predation by wolves
- Promote public education and awareness of the need to avoid interaction with caribou

Robson Valley LRMP Resource Management Zone Caribou Strategies

All Resource Management Zones with caribou have the same objective: “Maintain an where necessary, enhance wildlife and habitat to ensure healthy populations, genetic variability and distribution.”

	Strategies							
Resource Management Zones	Any commercial recreation use will minimize conflicts with grizzly and caribou	Ensure mineral exploration and/or small mine development minimizes disturbance and is sensitive to grizzly, caribou and ungulate habitat	For proposed large mine developments, grizzly, caribou and ungulate habitat objectives will be addressed by the Environmental Assessment process	In Caribou Medium, 33% of the timber volume can be removed every 80 years. Therefore rotation could be as high as 240 years. Green-up is considered to be 3 meters which is reached in approximately 27 years	Caribou High Habitat areas will see limited (if any) commercial logging in future. Sensitive timber extraction in the future may be considered pending further research and review of management strategies in Caribou Medium Habitat with local public input	In areas identified as Caribou Corridor, maintain a minimum of 30% of the timber as 100+ years of age in a continuous, windfirm corridor. No more than 20% of the area may be in a non-green-up condition at any time. Timber extraction guidelines may be reconsidered in the future pending further research	Heli-ski operations will design flight lines and activities to minimize contact with caribou	Heli-hiking must be managed to avoid conflict with wildlife
Morkill RMZ D (p81-82)	X	X	X	X	X	X		
Cariboo RMZ K (p92)	X	X	X	X	X		X	
Goat River RMZ L (p99)	X	X	X	X	X		X	
Rocky Mountain Trench RMZ B (p117)		X	X		X	X	X	X
Boundary/Horsesey Creek RMZ F (p126)	X	X	X		X			
Upper Raush RMZ J (p130)	X	X	X	X	X		X	

APPENDIX 2 - SUMMARY OF CONSULTATION

Contact Name	Response / Comments
A. Takla Herd - Fort St. James Forest District	
Darwyn Koch, RPF. Apollo Forest Products Ltd. Dave Jewisson, RPF. La Pas Lumber Co. Ltd.	Joint email received Oct. 1, 2002. No concerns with the proposal. Pleased to see the west boundary along the Mitchell Range relocated higher in elevation.
Annette Constabel, RPF. Canadian Forest Products Ltd., Fort St. James Division	Email received Oct. 4, 2002. Overall support, but with a number of concerns: <ol style="list-style-type: none"> 1. Couldn't find TSR netdown for caribou medium. 2. Concern identified strategies are not flexible enough for forest mgmt. Not the same as strategies identified in their current FDP. 3. LRMP acknowledgement of mountain caribou habitat. Felt UWR words were misleading 4. Sakeniche/MacDougall caribou corridor. No specific data to suggest corridor will be used, therefore hesitant to see it included. 5. Glad to see UWR boundary linework more detailed. Would like to see further refinement of the High (No harvest) line. 6. What will happen to approved blocks and roads within the UWR? 7. Want to keep approved blocks under the same management strategy as outlined in their FDP, not the strategy identified in this UWR proposal.
Annette Constabel, RPF. Canadian Forest Products Ltd., Fort St. James Division	1. Email received Jan. 27, 2003. Supports extension of Sakeniche/MacDougall corridor north to Takla Lake.
Janine Elo, District Manager Fort St. James Forest District, MOF	<ul style="list-style-type: none"> • Letter of support received Nov. 15, 2003: "My support of this proposal is as follows: <ol style="list-style-type: none"> 1. I support the establishment of UWR's for the Takla Herd as long as the boundaries have been or will be accurately delineated to reflect necessary caribou habitat. However, I am concerned about the boundaries capturing a high volume of pine and spruce that is infested or susceptible to bark beetle infestations. I understand that your final proposal will include explicit strategies for managing forest health in stands of pine and spruce. I strongly suggest that these strategies be developed with Ministry of Forests and forest industry licensee staff for stands with low arboreal lichen content. 2. I support the establishment of the objectives outlined in Water Land and Air Protection's proposal for caribou management. 3. I support the strategies for meeting the objectives in Water Land and Air Protection's proposal as best management practices or guidance only, not as Higher Level Plans." <p><i>Note: All comments received were considered and document reworked. A forest health objective was developed in consultation with MOF staff. Strategies and objectives contained in the original referral document were reworked and combined into the objectives reflected in this document.</i></p>
Derek Hart, BC Timber Sales, Fort St. James Forest District, MOF	<ul style="list-style-type: none"> • Strategies too restrictive with respect to block size and % volume removal to allow for management of forest health concerns. • Skid trail widths operationally not feasible for selective

Contact Name	Response / Comments
	<p>harvest</p> <ul style="list-style-type: none"> • Did not know what a no-tail-swing feller buncher was. • UWR boundary linework refined using forest cover, elevation and caribou location info. BCTS felt forest cover info is inaccurate, and would severely restrict ability to harvest pine due to forest health concerns. Want an opportunity for exemption from proposed strategies.
Shannon Carson, Planner, MSRM, Prince George	Email received September 19,2002. Noted no public responses received regarding netdown for Takla herd caribou mgmt in TSR II.
Paul Inden, RPF, Ministry of Forests, Fort St. James	Email received September 18,2002. Noted no public responses received regarding netdown for Takla herd caribou mgmt in TSR II received in Fort St. James.
Larry Joseph, Smithers BC	The proposal does not include the adjacent forest districts. Has the Bulkley-Cassiar, Morice, Lakes, and Mackenzie districts adopted the same plan to establish UWR that harmonize with your plan to protect the same caribou herds mentioned in your proposal?
<p><u>Fort St. James caribou workshop participants. March 6, 2001.</u> Present - Eliot Terry (Keystone Wildlife Research), Art Lance (IFS), Bernie Tobin (Carrier Lumber), Dave Jewisson (La Pas Lumber), Annette Constable, Jamie Lee, Shane Smith, Greg Shea (Canfor), Lance Mitchell, Ed Hadikin, Mike Slivitzky, Russ MacDonald (Min. of Forests), Sandra Sulyma, Joanne Vinnedge, John Stadt (BC Environment)</p> <p>Project objective was to review the literature and develop timber harvesting prescriptions applicable to the Ft. St. James FD. Workshop goal to clarify information and get feedback.</p>	<ol style="list-style-type: none"> 1. Concern that partial cutting requirements will result in more open roads increasing access in caribou management areas. 2. Operational feasibility concern for partial cutting in low volume balsam stands or on steep slopes. Are these steep slopes still mountain caribou habitat? 3. Uncertainty regarding the suitability of mountain caribou habitat over a long cutting cycle (80 years) – i.e. will the stands maintain caribou habitat and timber values? 4. Mean opening size (0.5 ha) may be too small (operationally) – mountain caribou partial-cuts. 0.5-1.0 ha suggested as an alternative range (mean >0.5 ha) 5. Forest health concerns in caribou habitat. 6. Monitoring is crucial to increase our knowledge regarding timber harvesting in caribou habitat.
Darryl Bokvist, Slocan Forest Products	Referred Sept. 19, 2002. Discussed verbally by telephone. No serious concerns expressed. No formal response received.
Troy Larden, WLAP Ecosystem Section Head, Skeena Region	Referred Sept. 19, 2003. He referred it on to Jonah Keim. Discussed verbally with Jonah Keim. Skeena Region expressed interest to proceed with UWR designation on Skeena side of herd boundary. No formal response or further information received.
Gary Page, Takla Development Corporation	After original referral, email reminder sent September 30, 2002 by Sandra Sulyma. No response to date.
Nick Massey, Energy and Mines	No response received from Ed Beswick on this specific UWR proposal. Received a separate response from Nick Massey (November 27, 2002) on a different UWR proposal which noted many claim units with significant exploration and expenditures in the Mt. Sidney Williams area (within range of Takla herd UWR proposal). In that instance, Mines requests that restrictions will consider the impact on the mineral sector, with flexibility to accommodate mineral exploration and development activities.
Tl'azt'en Nation	"Tl'azt'en Nation supports any proposals that deals with wildlife within their traditional area as long as objectives with [which] restrict logging in the protected area for moose, deer, elk caribou and are managed to maintain habitat needed by those regulates

Contact Name	Response / Comments
	[ungulates?]"
McLeod Lake Indian Band	Chief Harley Chingee supports this proposal.
Middle River Band Yekooche First Nation Nak'azdli First Nation Nat'oot'en First Nation Takla Lake First Nation	No formal responses received. Final request for comment letter mailed May 12/03. No responses to date.
B. Prince George Forest District	
Lheidli T'annah Band	Chief Barry Seymour supports this proposal.
McLeod Lake Indian Band	Chief Harley Chingee supports this proposal.
Canadian Forest Products	Canfor supports this proposal
Carrier Lumber Ltd.	No response
The Pas Lumber Co.	The Pas supports this proposal
C. Robson Valley Forest District	
Robson Valley Licensee Liaison Group (Slocan, McBride Forest Industries, Hauer Bros., Bell Pole, SBFEP)	Email forwarded to MOF and licensees informing them of proposed changes to caribou line for UWR (September 30, 2003) requesting feedback. Presented information about the proposed change in caribou line in the UWR proposals and the proposed mule deer UWR packages (November 18, 2002). Requested feedback or comments. SBFEP responded they were not affected (October 31, 2002).
Slocan	Steve Day indicated there were Category A cut blocks in the Canoe caribou UWR polygon and some investment in planning some of the blocks in the Camp drainage. The polygon was adjusted to exclude several Cat A blocks on the periphery. A proposal to log the Cat A blocks in the side valley but taking access and silviculture measures to reduce impacts to caribou was presented to Slocan. Slocan (Grant Sime) suggests more study on patterns of caribou use is needed before designating UWR.
BC Timber Sales (Jim Reid)	No conflicts with caribou polygons. Well aware of management regime
North Thompson Indian Band	Send UWR package by email (March 6 2003), and surface mail (March 13, 2003). Attempted 2 follow-up telephone call (April 2 and May 2) (message not returned) and final letter sent (May 7, 2003). No response.

APPENDIX 3 - TIMBER SUPPLY ASSESSMENT

Timber Supply Assessment of the Mountain Caribou Ungulate Winter Range Proposal, Omineca Region, August 8, 2003

Doug Beckett, Regional Timber Supply Analyst
Ministry of Forests, Northern Interior Forest Region

This timber supply assessment is divided into 3 assessment sections, and a conclusion of the assessment section:

1. Comparison of caribou objectives;
2. Comparison of numeric data for areas to which caribou high, medium and corridor objectives are applied;
3. Visual comparison of mapped areas to which caribou high, medium and corridor objectives are applied;
4. Conclusion of the assessment.

This assessment considers whether or not the mountain caribou ungulate winter range proposal, Omineca Region exceeds the timber supply implications already accounted for in the Timber Supply Review II (TSRII).

Section 1: Comparison of Caribou Objectives

Comparison of Caribou Corridor and Caribou High Objectives:

Caribou corridor and caribou high objectives stated in the document are the same as those applied in TSRII for both the Robson Valley and Prince George TSAs.

Comparison of Caribou Medium Objectives:

The objectives stated in the document for caribou medium are different than those applied in TSRII for both the Robson Valley and Prince George TSAs as follows:

Caribou medium proposed objective:

- 1) TSRII objective has been removed; and
- 2) a maximum of 30% of the volume can be harvested from a stand in an entry, and subsequent re-entry is not permitted for 80 years.

Caribou medium applied in Prince George TSA TSRII:

- 1) a maximum of 33% of the forested area can be shorter than 3 metres; and
- 2) a maximum of 33% of the forest can be younger than 81 years.

Caribou medium applied in Robson Valley TSA TSRII:

- 1) a maximum of 33 % of the forested area can be shorter than 3 metres;
- and
- 2) a minimum of 67% of the forest must be greater than 80 years.

During this review, it has become apparent that the management intention for caribou medium was not adequately reflected in TSRII. The difference in caribou medium management is not the result of changing objectives, but rather the result of an error in modelling management of the day in the timber supply review process. Had this information come to light while the TSR II information package was being prepared, the TSRII analysis would have been set-up to reflect the caribou medium objectives as per the proposal. This correction will be made in subsequent analysis whether or not the Mountain Caribou Ungulate Winter Range, Omineca Region proposal is accepted.

Potential implications on timber supply of correcting the caribou medium objectives with in the Prince George TSA:

In TSRII, 44% of the Prince George Forest District medium forest is excluded from harvesting. Likewise, 35% of the Fort St. James Forest District medium forest is excluded from harvesting. Thus, the first Prince George TSA objective applied in TSRII can likely be met over the long-term from the excluded forest. Removing this objective as proposed, could improve the timber supply over the short- to mid-term with little likelihood of improving the long-term timber supply.

At first blush, the timber supply implications of the proposed caribou medium objective is likely to be similar to the implications of the second Prince George TSA objective that was applied in TSRII. The proposed caribou medium objective has an implied rotation of 267 years, which compares reasonably to the TSRII objective implied rotation of 242 years. We would expect this 10% increase in the implied rotation to possibly equate up to a 10% decrease in the timber harvesting land base with in the area designated as medium.

But, the TSRII medium implied rotation is somewhat mitigated if we assume the majority of the excluded forest will not be younger than 81 years of age. Depending on how much of the total area is forested, the TSRII implied rotation for this objective could actually be as short as 121 years. As such, the changes in the medium objectives could be equivalent to reducing the timber harvesting land base contained with in the medium zones by as much as 55%.

While the proposed medium objectives mean less volume per hectare can be obtained while harvesting, there is likely greater harvest flexibility as all of the timber harvesting land base may be accessed at one time. It is possible the size of the timber harvesting land base could also increase or decrease as a result of economic considerations.

Potential implications on timber supply of correcting the caribou medium objectives with in the Robson Valley TSA:

In TSRII, 62% of the Robson Valley TSA medium is excluded from timber harvesting. Thus, it is probable the first objective applied in TSRII can be met over the long-term from the excluded forest. Removing this objective as proposed could improve the harvest flow over the short- to mid-term with no expected improvement to the long-term harvest flow.

At first blush, the harvest flow implications of the proposed caribou medium objective is likely to be similar to the implications of the second Robson Valley TSA objective that was applied in TSRII. The proposed caribou medium objective has an implied rotation of 267 years, which compares reasonably to the TSRII objective implied rotation of 242 years. We would expect this 10% increase in the implied rotation to possibly equate up to a 10% decrease in the timber harvesting land base with in the area designated as medium.

But, the TSRII medium implied rotation is somewhat mitigated if we assume the majority of the excluded forest will not be younger than 81 years of age. Depending on how much of the total area is forested, the TSRII implied rotation for this objective could actually be as short as 121 years. As such, the changes in the medium objectives could be equivalent to reducing the timber harvesting land base contained with in the medium zones by as much as 55%.

While the proposed medium objectives mean less volume per hectare can be obtained while harvesting, there is likely greater harvest flexibility as all of the timber harvesting land base may be accessed at one time. It is possible the size of the timber harvesting land base could also increase or decrease as a result of economic considerations.

Section 2: Comparison Of Numeric Data For Areas To Which Caribou High, Medium

And Corridor Objectives Are Applied:

Please be advised:

- **The following area comparisons and impact assessments are complicated with the introduction of inventory file updates since TSRII. These updates result in a changing resultant timber harvesting land base. Thus, one has to be aware that differences in timber harvesting land base could be more a reflection of inventory updates than a reflection of the changes to the areas for which caribou objectives are to be applied;**
- **The way the numbers below were generated, any timber harvesting land base given back to the TSA's as a result of shifting of caribou high boundaries is unquantified. As such there is an inherent bias to overestimate the timber harvesting land base losses from the proposed ungulate area designations and objectives relative to TSRII;**
- **similarly, any shifting of caribou medium or corridor designated areas over areas designated as caribou high in TSRII would result in an**

underestimation of the timber harvesting land base implications - though the probability of this occurring is much less likely than the previous risk to overestimate the timber harvesting land base losses; and

- a visual comparison between the ungulate information used in TSR II and the proposed areas do not support all of the changes in land base as described in the section below.

The relative area for which these objectives are applied has changed somewhat:

Management Unit	Management Direction	TSR II Total Area (ha)	TSR II THLB (ha)	Proposed Total Area (ha)	Proposed THLB (ha)	Difference Total Area (ha)	Difference THLB (ha)
Prince George Forest District	H	596842.6	66333.5	609691.8	2100.6	12849.2	n/a
	M	52714.9	23297.4	51951.1	25541.9	-763.8	2244.5
	C	65544.1	26239.3	76063.7	40391.9	10519.6	14152.7
	Total	715101.6	115870.2	737706.6	68034.4	22605.0	16397.1
Fort St. James Forest District	H	58535.5	10100.2	38970.5	275.3	-19565.0	n/a
	M	41390.9	23468.1	21416.1	12522.1	-19974.8	-10946.0
	C	1593.6	997.1	4923.1	3596	3329.5	2598.9
	Total	101519.9	34565.3	65309.7	16393.4	-36210.2	-8347.0
Vanderhoof Forest District	H	0.0	0.0	0.0	0.0	0.0	0.0
	M	0.0	0.0	0.0	0.0	0.0	0.0
	C	0.0	0.0	0.0	0.0	0.0	0.0
	Total	0.0	0.0	0.0	0.0	0.0	0.0
Prince George TSA - Totals	H	655378.1	76433.7	648662.3	2375.9	-6715.8	n/a
	M	94105.8	46765.5	73367.2	38064.0	-20738.6	-8701.5
	C	67137.7	27236.3	80986.8	43987.9	13849.1	16751.6
	Total	816621.5	150435.5	803016.3	84427.8	-13605.2	8050.1
Robson Valley TSA	H	66610.0	20204.0	127277.5	7911.8	60667.5	n/a
	M	20250.0	7608.0	30196.7	5098.9	9946.7	-2509.1
	C	17427.0	8669.0	16153.7	6359.8	-1273.3	-2309.2
	Total	104287.0	36481.0	173627.9	19370.5	69340.9	-4818.3
Total Proposed Ungulate	H	721988.1	96637.7	775939.8	10287.7	53951.7	n/a
	M	114355.8	54373.5	103563.9	43162.9	-10791.9	-11210.6
	C	84564.7	35905.3	97140.5	50347.7	12575.8	14442.4
	Total	920908.5	186916.5	976644.2	103798.3	55735.7	3231.8

Note the proposed timber harvesting land base area for high is not comparable to the TSR II timber harvesting land base area. As such the difference between these areas do not reflect implications of any changes.

Section 3: Visual Comparison Of Mapped Areas To Which Caribou High, Medium And

Corridor Objectives Are Applied:

Prince George TSA:

Prince George Forest District:

- 100% of the proposed caribou high, medium and corridor is the same as what was incorporated into the TSRII. District staff may wish to do a similar visual comparison to ensure the TSRII ungulate objectives in the TSRII file is actually the information incorporated into TSRII. I do not understand why the area summaries indicate differences. I recommend assuming no changes to the area by management direction.

Fort St. James Forest District:

- The linework indicating the location of the caribou objectives was not included in the TSRII data file. An approach to approximate the location of the Land and Resource Management Plan (LRMP) caribou objectives was incorporated in TSRII - with the intent of fully incorporating the LRMP caribou objectives. For interest, the resultant timber harvesting land base used to assess the proposed caribou objectives had the LRMP caribou zones cut in to the file, and areas identified as high were removed from contributing to the timber harvesting land base.
- About 98% of the proposed caribou high-designated area were theoretically incorporated in to TSRII (in reality it was not, for the reason noted in the bullet above). Thus, about 2% of the proposed area designated as caribou high are new. This area has been changed from medium, corridor or no caribou designations to high in the proposal, resulting in a downward pressure to the timber harvesting land base. A larger sized area - though still relatively small - has changed from high designation (as actually intended) to medium, corridor or no caribou designation, resulting in a similar or slightly larger upward pressure to the timber harvesting land base as compared to the related downward pressure. Considering the relatively small area where management direction has shifted, and the counteracting implications of these changes, I recommend assuming no overall implications to the timber supply, and ignoring in the implications consideration.
- A very small area designated as medium in TSRII is designated as high in the proposal. This results in a possible very small downward pressure on the timber harvesting land base. A timber harvesting land base area so small that I recommend ignoring in the implications consideration.
- Some area designated as high in TSRII is designated as medium in the proposal. As there is no easy procedure to establish how much timber harvesting land base is now contained with in the medium designation that was formally high in TSRII, the increase to the timber harvesting land base is unreported.
- More area is designated as corridor in the proposal than was incorporated in TSRII. The proposal includes 100% of the area designated as corridor in TSRII. About 50% of the newly designated corridor were designated as medium in TSRII, while the other 50% had no caribou objectives in TSRII. I recommend assuming the relaxation of the constraint on harvest flow for one area is equivalent to the increased constraint on the harvest flow for the other area.

Robson Valley TSA:

- It appears that about 15% less total area is designated as high in the proposal than was incorporated in TSRII. About 65% of the area designated as High in the proposal were designated as high in TSRII. The remaining 35% have been shifted to cover new areas.
 - No timber harvesting land base credit has been accounted for the 15% reduction in total area designated as high;
 - No timber harvesting land base credit has been accounted for the 35% which no longer has high caribou designation as a result of shifting area of designation;
 - A 7 912 hectare debit has been accounted for the 35% which now has high caribou designation as a result of shifting area of designation.
- The visual inspection indicates that less area is designated as medium in the proposal than was incorporated in TSRII. 100% of the resultant proposed caribou medium was incorporated in TSRII. Thus, resulting in an unquantified increase to the timber harvesting land base.
- The visual inspection indicates that much less area is designated as Corridor in the proposal than was incorporated in TSRII. 100% of the resultant proposed Caribou Corridor was incorporated in TSRII. Thus, resulting in an unquantified increase to the timber harvesting land base.
- The visual assessment leads me to question the 'TSRII Total Area' numbers provided in the table above. I suspect the numbers actually reflect upon the forested area, not the total area by management direction, while the 'Proposed Total Area' is actually the total area by management direction.
- Chris Ritchie and Bill Arthur indicate the caribou corridor and medium timber harvesting land base reductions indicated in the table above are reflective of the area designation changes made.

Section 4: Conclusions Of The Assessment:

Prince George TSA:

Prince George Forest District:

- There are no visually obvious changes in the area designation between the LRMP caribou high, medium or corridor objectives. As such, I conclude most, if not all of the difference between the TSRII area summary and the proposed summary is the result of improved inventory information and the application of a more precise definition of the caribou high designation. Thus, I suggest it reasonable to assume no harvest flow implications should be considered as a result of the management area designations.

- The implications of having incorrectly incorporated caribou medium objectives in TSRII possibly results in a reduction to the harvest forecast. This reduction could be equivalent to as much as 55% of the area designated as medium. This would be equivalent to removing up to 12 814 hectares (23 297.4 hectares * .55) of timber harvesting land base assuming the TSRII area summary, or 14 048 hectares (25 541.9 hectares * .55) of timber harvesting land base assuming the proposed area summary. This impact assessment is likely further compounded when one attempts to incorporate adjustments to accommodate economic accessibility considerations. As the intent was to reflect current management in TSRII, the proposed management objectives were current at that time, and the correction will be made whether or not the Mountain Caribou Ungulate Winter Range, Omineca Region proposal is accepted, it is reasonable to conclude that none of the timber supply implications resulting from correcting the management objectives in the model should be considered as an impact of the caribou ungulate proposal. Thus, there are no timber supply implications as a result of the management objectives.

Fort St. James Forest District:

- Changes to caribou high are insignificant.
- Changes to the area designated as caribou medium is insignificant.
- The implications of incorrectly incorporating caribou medium objectives in TSRII possibly result in a reduction to the harvest forecast. This reduction could be equivalent to as much as 55% of the area designated as medium. This would be equivalent to removing up to 12 907 hectares (23 468.1 hectares * .55) of timber harvesting land base assuming TSRII area summary, or 6 887 hectares (12 522.1 hectares * .55) of timber harvesting land base assuming the proposed area summary. It is possible this impact would be further adjusted for economic accessibility considerations. As the intent was to reflect current management in TSRII, the proposed management objectives were current at that time, and the correction will be made whether or not the Mountain Caribou Ungulate Winter Range, Omineca Region proposal is accepted, it is reasonable to conclude that none of the timber supply implications resulting from correcting the management objectives in the model should be considered as an impact of the caribou ungulate proposal. Thus, there are no timber supply implications as a result of the management objectives.
- Area designated as high in TSRII is designated as medium in the proposal. This results in an unquantified increase to the timber harvesting land base.
- Changes in caribou corridor likely counteract themselves, thus changes are insignificant.

Robson Valley TSA:

- The proposed area designated as caribou high is about 15% smaller than in TSRII. The resultant increase to the timber harvesting land base is not reflected in the area summaries, providing an unquantified increase to the timber harvesting land base. It is reasonable to assume the reduction in total area designated as high would increase the timber harvesting land base by about 15% or 3 031 hectares ($20\,204.0 \text{ hectares} \times .15$) assuming TSRII area summary or 1 187 hectares ($7\,911.8 \text{ hectares} \times .15$) assuming the proposed area summary.
- The location of the caribou high has shifted somewhat. The area summary indicates the timber harvesting land base is about 7 912 hectares smaller as a result of area which is proposed as high which was not high in TSRII. The increase to the timber harvesting land base resulting from eliminating the high area designation from TSRII is not reflected in the area summaries, leaving an unquantified increase to the timber harvesting land base. As the area shifted is about the same, it is likely fair to consider no net impact to the timber harvesting land base as a result of these shifts in area designation.
- Less area is designated as caribou medium in the proposal. The area summary indicates the caribou medium objectives apply to 2 509 less hectares of timber harvesting land base. This relaxation of management constraints equates up to a 1 581 hectare increase to the timber harvesting land base.
- The implications of incorrectly incorporating caribou medium objectives in TSRII possibly results in a reduction to the harvest forecast. This reduction could be equivalent to as much as 55% of the area designated as medium. This would be equivalent to removing up to 4 184 hectares of timber harvesting land base assuming the TSRII area summary, or 2 804 hectares of timber harvesting land base assuming the proposed area summary. This impact assessment is likely further compounded when one attempts to incorporate adjustments to accommodate economic accessibility considerations. As the intent was to reflect current management in TSRII, the proposed management objectives were current at that time, and the correction will be made whether or not the Mountain Caribou Ungulate Winter Range, Omineca Region proposal is accepted, it is reasonable to conclude that none of the timber supply implications resulting from correcting the management objectives in the model should be considered as an impact of the caribou ungulate proposal. Thus, there are no timber supply implications as a result of the management objectives.
- Changes in area designated as caribou corridor is not likely to affect the harvest forecast as the average harvest age for the Robson Valley TSA is 150 years relative to the implied rotation of 135 years for the corridor.

In summary I conclude:

- Correcting the TSRII modelling error for the caribou medium management objectives will likely negatively impact the timber supply by an equivalency of up to 23 739 or 29 905 hectares ($14\,048 + 6\,887 + 2\,804$ to $12\,814 + 12\,907 + 4\,184$ hectares) of timber harvesting land base (with additional adjustment

to the timber supply impact as operational implications of the management objectives are also incorporated). As this correction will be made whether or not Mountain Caribou Ungulate Winter Range, Omineca Region proposal is accepted, the timber supply implications should not be considered in assessing the proposal;

- Numeric quantification of the changes resulting from the proposal is complicated:
 - with the introduction of inventory file updates since TSR II;
 - by a changing timber harvesting land base as a result of the inventory updates;
 - as the timber harvesting land base with in areas designated as high in TSR II are not numerically accounted for;
 - as timber harvesting land base gained through the removal of TSR II high designation is not accounted for numerically;
 - as some of the TSR II ungulate designation was approximated; and
 - as the visual comparison between the ungulate information used in TSR II and the proposed areas do not support all of the numeric comparisons.

Thus, the timber supply implications assessment described in “Section 4: Visual Comparison Of Mapped Areas To Which Caribou High, Medium and Corridor Objectives Are Applied” is most relied upon for these conclusions;

- The total area identified in the proposed Mountain Caribou Ungulate Winter Range is 976 644 hectares compared to the 920 908 hectares incorporated in the Timber Supply Review II. Even though this represents an increase of 55 736 hectares in caribou habitat, the proposal has no timber supply impact beyond what was intended to be incorporated in TSR II. Actually, the proposal would likely result in an unquantified increase to the timber supply relative to that intended in TSR II; and
- The 7 978 hectares of ungulate budget for the Fort Saint James Forest District, out of 1 277 341 hectares of timber harvesting land base; 3 034 hectares of ungulate budget for the Prince George Forest District, out of 1 326 164 hectares of timber harvesting land base; 3 549 hectares of ungulate budget for the Vanderhoof Forest District, out of 784 640 hectares of timber harvesting land base; and 237 hectares of ungulate budget for the Robson Valley TSA timber harvesting land base, out of 213 383 hectares is unaffected by this Mountain Caribou Ungulate Winter Range, Omineca Region proposal.

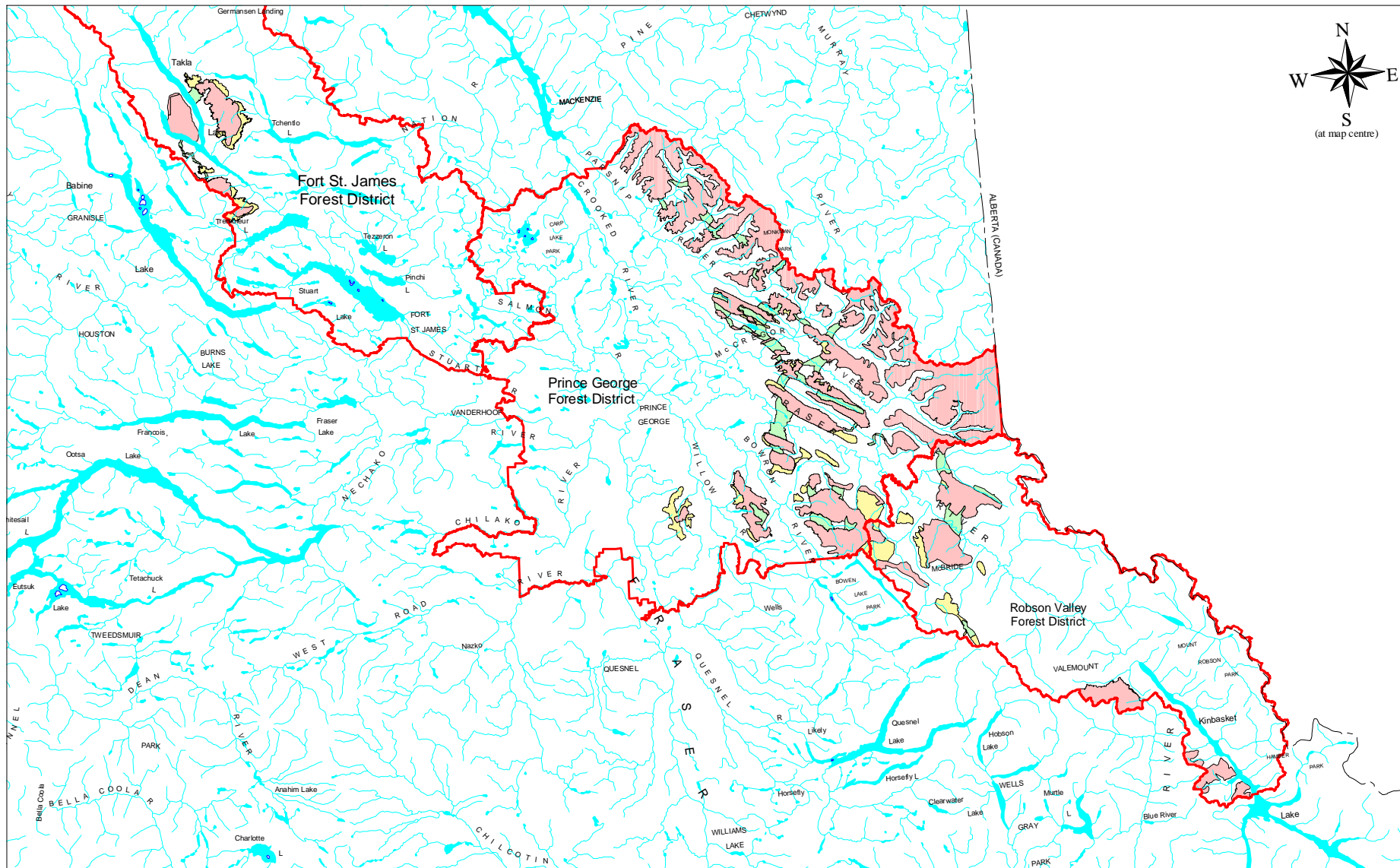
APPENDIX 4 – MOUNTAIN CARIBOU UWR MAPS

Ungulate Winter Range U-7-003 for Mountain Caribou was approved on October 6, 2003. These boundaries can be accessed from the following website:


http://wlapwww.gov.bc.ca/wld/ugwr/ungulate_app.html.

- Map 1 – Omineca Mountain Caribou UWR
- Figure 1 – Fort St. James District – Mountain Caribou UWR
- Figure 2 – Prince George District – Mountain Caribou UWR
- Figure 3 – Robson Valley – Mountain Caribou UWR




Map 1 - Omineca Mountain Caribou UWR



Ministry of Forest Districts -
1:20K

 Ministry of Forest Districts -
1:20K

Omineca Mountain Caribou UWR

-  Caribou High
-  Caribou Medium
-  Caribou Corridor

1:2,000,000

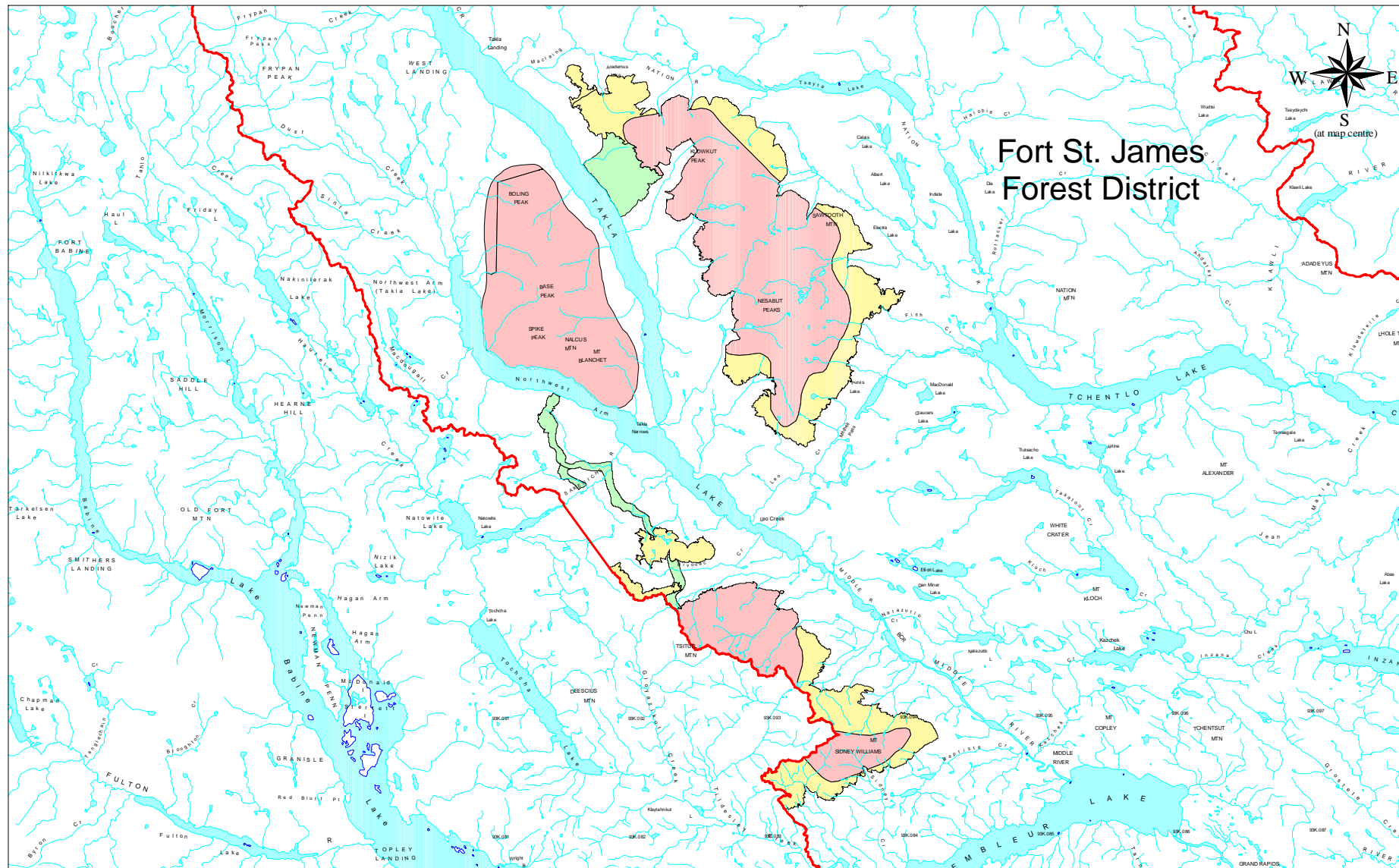
50 0 50 Kilometers



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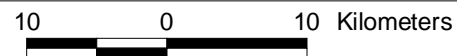


Figure 1 - Fort St. James District - Mountain Caribou UWR



- Ministry of Forest Districts - 1:20K
- Ministry of Forest Districts - 1:20K
- Omineca Mountain Caribou UWR
- Caribou High
- Caribou Medium
- Caribou Corridor

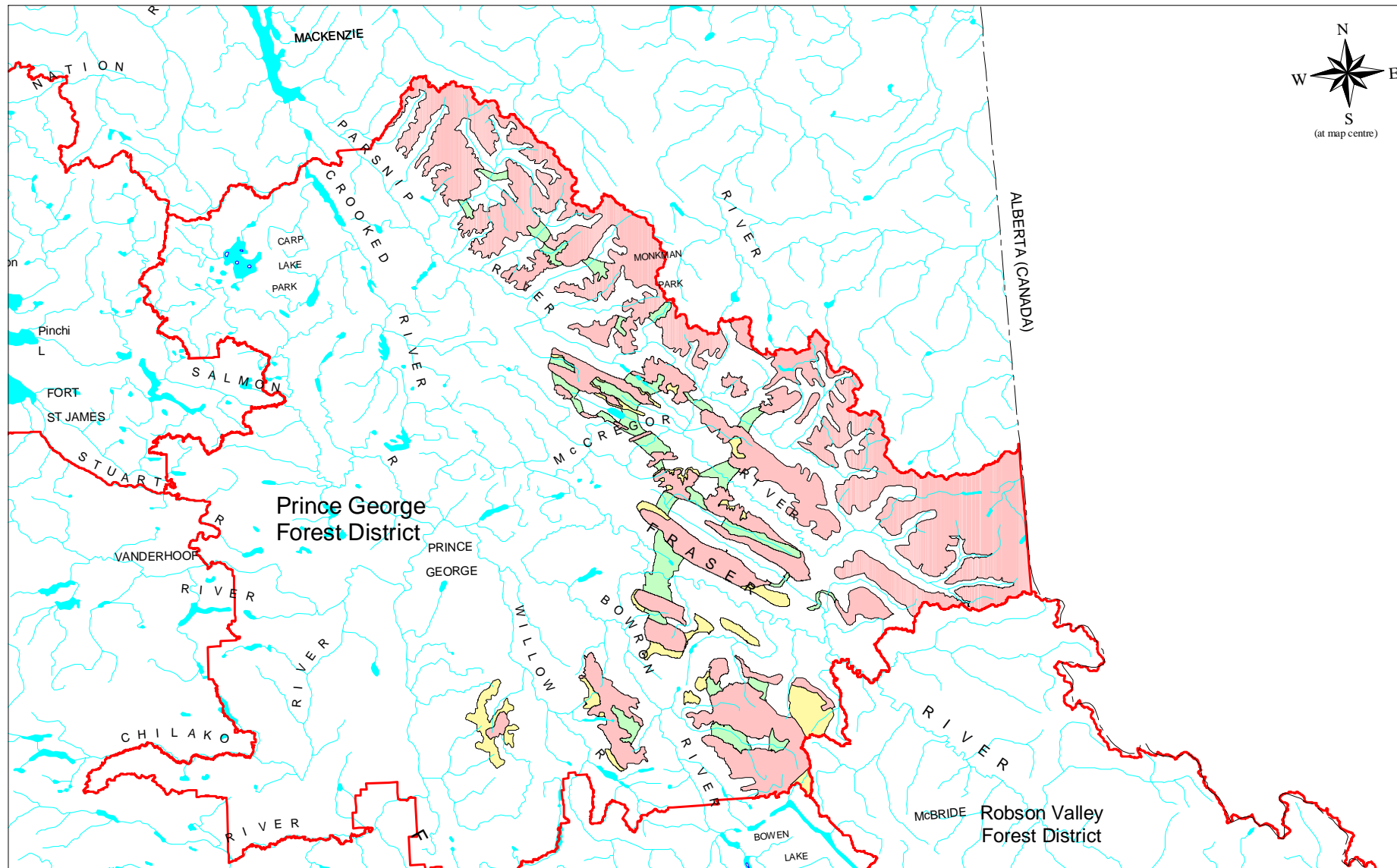
1:400,000



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Figure 2 - Prince George District - Mountain Caribou UWR



- Ministry of Forest Districts - 1:20K
- Ministry of Forest Districts - 1:20K
- Omineca Mountain Caribou UWR
- Caribou High
 - Caribou Medium
 - Caribou Corridor

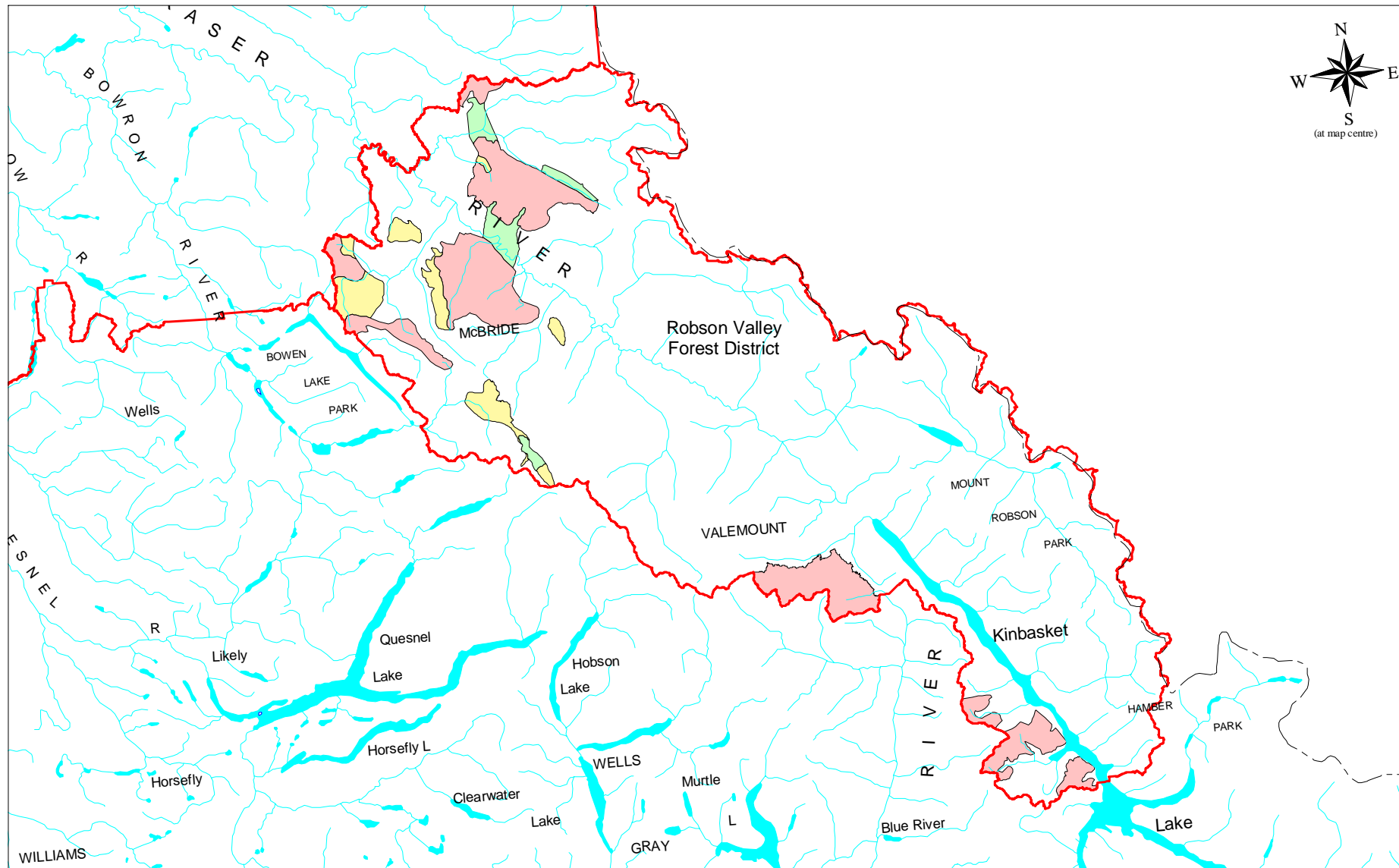
1:1,200,000

25 0 25 Kilometers

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Figure 3 - Robson Valley District - Mountain Caribou UWR



- Ministry of Forest Districts - 1:20K
- Ministry of Forest Districts - 1:20K
- Omineca Mountain Caribou UWR
- Caribou High
- Caribou Medium
- Caribou Corridor

1:1,000,000

20 0 20 Kilometers

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