The BC Species at Risk Coordination Office's Draft Mountain Caribou Recovery Strategy: Analysis of Habitat Options for Forest Industry Stakeholders

Prepared for the

BC Species at Risk Coordination Office

By

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FINAL VERSION

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Executive Summary

We conducted a multi-phased analysis to examine the implications of draft mountain caribou habitat management recommendations for forest industry stakeholders within the Mountain Caribou Recovery Area (MCRA). The analysis was strategic in nature and provided quantitative metrics, maps and descriptive analyses that were intended to inform SaRCO-led stakeholder discussions. The objective of the analysis was to express habitat impacts in terms of the timber harvesting land base (THLB) that would be affected by SaRCO's draft recovery strategy, over and above the area affected by current habitat management for mountain caribou. The incremental THLB changes by Management Unit (i.e., TSA and TFL) for selected draft options varied between 0 and 24.8%. The total incremental equivalent THLB affected over the MCRA was 191,665 ha. In addition, the draft habitat options affected 41,102 ha of private forest land. We also conducted a qualitative assessment of timber supply impacts based on estimated THLB changes and existing timber supply information. The assessments were peer reviewed by Ministry of Forests and Range, branch and regional timber supply analysts. The analysis suggested that the draft mountain caribou recovery strategy would affect short-term timber supply in some Management Units, but that mid-term impacts would be more widespread, particularly in those units with significant pine components.

Acknowledgements

Thanks are owed to many individuals for their support and exemplary contributions toward this endeavour. We received incredible GIS support from Kathleen McGuinness[4], whose insight and expertise was a great asset for this project. A special thanks to Rick Deegan who took on the role of lead cartographer for this venture. Contributions from members of the Mountain Caribou Science Team were crucial and much appreciated. We are extremely grateful to past and present MOFR branch and regional timber supply analysts for providing peer reviews. Acknowledgements are also in order for Susan Westmacott, Stephen Sutherland, Sasha Lees and Bruce Rea for lending their analytical and mapping knowledge.

We also thank the Species at Risk Coordination Office for their direction, feedback and support. Although release of draft working copies (read unfinished) was not an ideal roll out, the comments received from forest district and other forest stakeholder representatives was both productive and much appreciated. Thanks to Mike Geisler, Pat Field, Kurt Huettmeyer and Tavis McDonald for coordinating MOFR and BCTS feedback.

[4] Touchstone GIS Services, Inc.

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Foreword

This report is intended to present strategic-level impacts of the draft recovery strategy for mountain caribou developed by the Species at Risk Coordination Office (SaRCO). A number of issues regarding data currency and assumptions have been raised since earlier versions. In most cases this new information has not resulted in new analyses or results. Rather, the information is being collected and will be assessed as to its likely impact on the strategic-level results presented here.

The information presented and opinions expressed are the responsibility of the authors and do not necessarily represent the comments and opinions provided by reviewers.

List of Updates since Last Draft

- Executive summary
- Acknowledgements
- Analytical approach background
- Map of Mountain Caribou Recovery Area Planning Units, Protected Areas and Mountain Caribou Habitat
- Rationale behind status quo habitat management baselines used for this analysis
- Incremental equivalent THLB and CMAI impacts for planning unit 3A (Revelstoke – Shuswap)
- Caribou Habitat Management Gross Area comparisons between status quo and draft option amended in Phase 1 results
- Updates to equivalent THLB and CMAI impacts for planning units 5A (Upper Fraser) and 6 (Hart) resulting from status quo discrepancies with Ominica Ungulate Winter Range Order (U-7-003)
- Movement of November 2006 Phase 2 Results to Appendix 4
- Qualitative timber supply assessments or updates for Robson Valley, Revelstoke, Golden and Okanagan TSA's and TFL's 33, 55 and 56.
- March 14, 2007 edits:
    - Title fixes related to the Mt. Robson Planning Unit
    - Other minor grammatical edits.

Background

In British Columbia, the Species at Risk Coordination Office (SaRCO) has led the development and analysis of recovery options for threatened subpopulations of mountain caribou, an ecotype of woodland caribou *(Rangifer tarandus caribou).* Habitat management recommendations are a key facet of the recovery options developed by the SaRCO-led Mountain Caribou Science Team (MCST). The habitat management alternatives are spatial in nature and may have implications that vary for stakeholders.

A multi-phased analysis project was conducted over the Mountain Caribou Recovery Area (MCRA) (Figure 1) to examine the implications of the habitat management recommendations for forest industry stakeholders. The project provided quantitative metrics, maps and descriptive analyses that are intended to inform SaRCO-led stakeholder discussions. The analysis is considered broad in nature and is designed to illustrate the order of magnitude implications that may arise from the application of SaRCO's draft habitat management strategy. It is not intended to provide detailed metrics for negotiation amongst stakeholders.

The foundation of this analysis was to express impacts to forestry stakeholders in terms of the timber harvesting land base (THLB) that would be affected by the strategy, over and above the area affected by current habitat management for mountain caribou. THLB was used to approximate timber supply implications because of its demonstrated employment as a strategic indicator in impact assessments and because it was impractical to conduct timber supply analyses over the entire range of mountain caribou. THLB is a common metric considered within Annual Allowable Cut determinations and it has a strong relationship to timber supply. Generally, as THLB is reduced within a forest management unit, there is a risk that timber supply cannot be maintained in the long term.

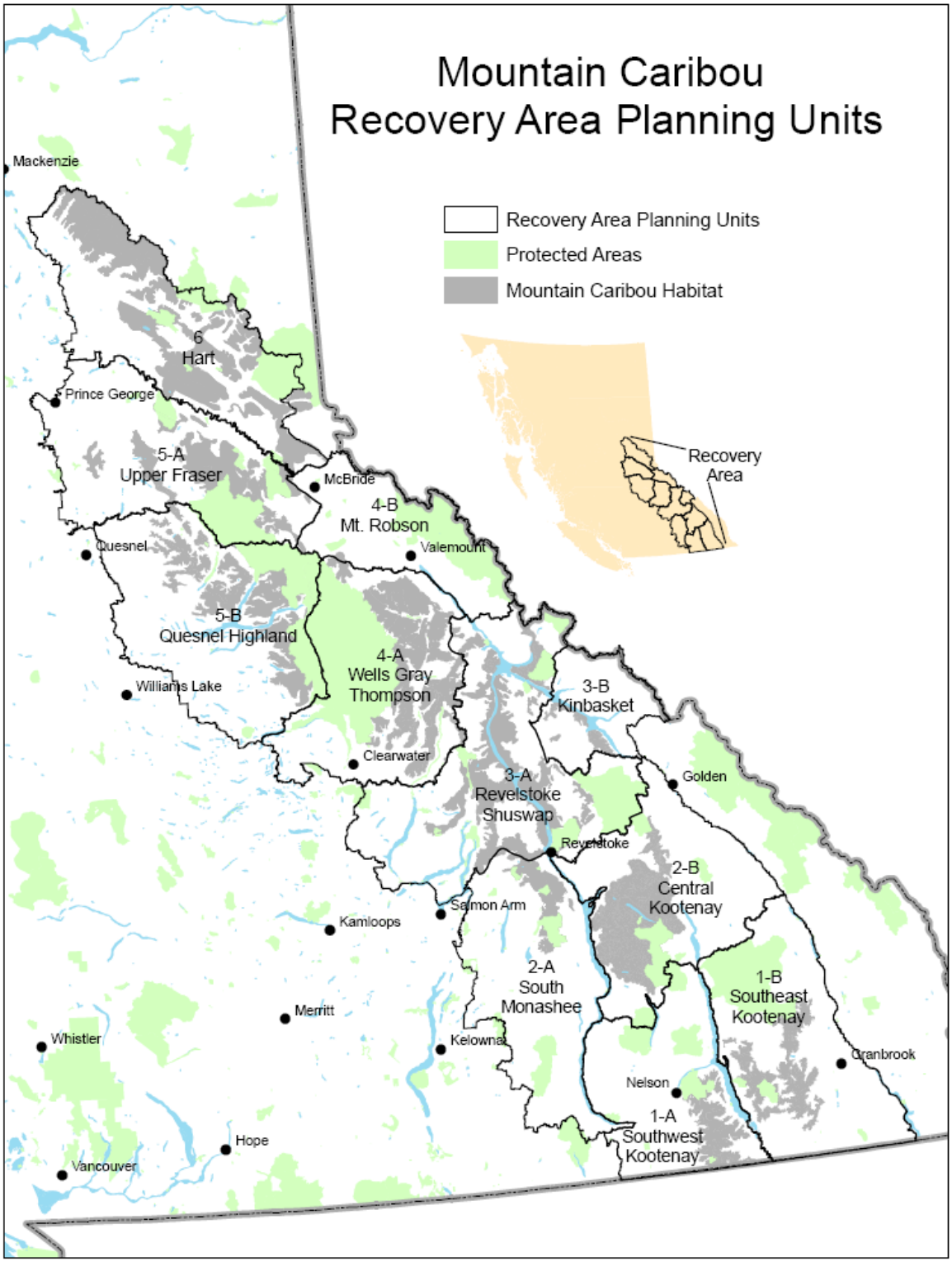

Figure 1 Mountain Caribou Recovery Area Planning Units, Protected Areas and Mountain Caribou Habitat. Mountain Caribou Habitat was illustrated with habitat management data from the Northern Mountain Caribou Recovery Implementation Group, Ominica Ungulate Winter Range Order U-7-003, Okanagan-Shuswap LRMP Caribou Resource Management Zones, Revelstoke Caribou Capability (2006), Revelstoke Caribou Management Zones (RMAC), Mountain Caribou Science Team Habitat Areas and the Kootenay-Boundary Land Use High Level Plan Caribou Habitat Management Zones.

This analysis was designed to calculate the implications of the proposed habitat management strategy in a conservative manner. Proposed incremental habitat areas may overlap with other timber management objectives (e.g. Visual Quality Objectives (VQO) and Biodiversity Emphasis Options (BEO)); however, non-caribou objectives, other than those explicitly identified, were not used to calculate incremental impacts. This might result in overstated impacts. This approach was selected in part because some timber management objectives are in a state of development or improvement throughout much of BC and capturing this in the analysis was beyond the scope and resources available to this project.

Purpose

The purpose of the analysis was to analyse the incremental implications of SaRCO's draft mountain caribou recovery strategy and to summarize the outcomes at the caribou recovery planning unit[2] and forest management unit (MU) scales.

Approach

A three-phased approach was designed to characterize the order of magnitude of the incremental implications of proposed caribou habitat management options. They included:

1. Summary statistics of incremental equivalent timber harvesting land base[3] (THLB) and forest culmination mean annual increment volumes (CMAI) by mountain caribou recovery area planning unit for status quo and SaRCO's selected option under the draft recovery strategy;
2. Summary statistics of incremental THLB and CMAI by Licensee Operator Area and Forestry Management Unit (i.e. TSA and TFL); and,

[2] Mountain caribou recovery area planning units are spatially defined zones that broadly adhere to mountain caribou sub-populations.
[3] Although 'equivalent THLB' is commonly used in impact assessments, it does not necessarily equate to the same number of physical hectares on the ground.

3. A qualitative assessment of the expected implications of the SaRCO selected option on timber supply in relation to existing timber supply.

The calculation of incremental impacts required the characterization of current management, which required interpretation for use in this analysis. Current caribou habitat management was reviewed with herd experts from the MCST to develop our status quo benchmark. Current habitat management policy, legal guidelines or 'accepted in principle' habitat management criteria were used to develop status quo standards.

In some regions within the mountain caribou recovery area, status quo caribou habitat management objectives are complex and may include aspatial, spatial and temporal dimensions. For ease of modeling land-use policy over the entire mountain caribou recovery area (i.e. approximately 14,000,000 ha), this project characterized current management guidelines using surrogate forest retention targets suitable for strategic analysis.

Scope

This project analysed SaRCO's selected habitat management option in relation to status quo management. Within-herd connectivity was included in the analysis because management objectives had been established for these zones in most regions.

Out of Scope

This project did not analyze proposed between-herd (landscape scale) connectivity in the south portion of the mountain caribou range, nor did it analyze the possible impacts associated with "matrix" habitat management[4] in the north portion of the range. Quantified management objectives had not been established for these proposed zones and were therefore infeasible to analyse.

[4] This includes limiting early seral habitat in UWR zones that are ecologically proximal to Caribou Habitat Management zones.

We did not conduct forest estate modelling to characterize timber supply and timber flow implications but leveraged these analyses where available to.

Methods

Data were assembled from the entire extent of the MCRA. Where necessary, data sharing agreements were established for proprietary information. Data included:

- MCRA planning units,
- Caribou habitat management data,
- Draft caribou habitat management spatialized targets data,
- MCST recovery habitat data,
- Forest cover data[5],
- Timber harvesting land base data (Appendix 3),
- MOFR timber operator areas,
- Biogeoclimatic zone data (BEC),
- Biodiversity Emphasis Option data (BEO),
- Natural Disturbance Type data (NDT),
- Forest landscape units,
- Moose and deer winter habitat,
- Protected areas,
- Designated and draft Old Growth Management Areas (OGMA),
- TSA and TFL boundaries.

A review of current management for caribou with MCST herd experts assisted with the definition of status quo management. When necessary, we defined surrogate retention targets to facilitate this analysis, in particular for status quo habitat management zones that had aspatial and temporal policy rules associated with them. In addition, herd experts provided the strategic logic and data for habitat-related recovery options. Except where noted, designated and draft OGMA data were used in the calculation of status quo baselines. Forest retention targets for SaRCO's selected habitat options were interpreted from publicly available MCST documents.

[5] Reference years for source forest cover data ranged from update years 2000 to 2005. Sources include the BC Land and Resource Data Warehouse, TFL 14, TFL 23, TFL 30, TFL 52, TFL 55, TFL 56.

Data were assembled using ArcGIS[6]. Mean Annual Increment (CMAI) information was derived by multiplying culmination MAI (Cul_MAI_1) by polygon area. GIS matrix data were used to generate summary statistics as guided by the caribou habitat management definitions (next section). Summary statistics of incremental equivalent THLB and CMAI impacts were produced to meet objectives for phase 1 and phase 2 reporting. The GIS data were also used to inform the phase 3 qualitative timber supply impact analysis for timber management units that were associated with an estimated equivalent THLB impact of >1% over status quo.

[6] ArcGIS 9.1, Environmental Systems Research Institute, Inc. 2005.

Caribou Habitat Management Definitions

The calculation of incremental impacts required the characterization of current caribou habitat management and draft habitat management options, which required interpretation for use in this analysis. This section lists the surrogate forest retention targets employed in this analysis. Tables include status quo and SaRCO's selected option under the draft recovery strategy. Only those options that result in incremental habitat beyond status quo are presented.

1-A Southwest Kootenay			**Retention Target Applied for each Caribou Habitat Management Option**	
KBLUP-HLP DATA Attribute: Car_zone	**MCST Core Habitat Augmentation Dataset**	**Current Land Use Habitat Management Definition**	**Status Quo**	**Maintain with Resilience**
1		100% retention	100%	100%
2		100% retention*	100%	100%
3		40% ge AC8 70% ge AC4	50%	100%
4		33% ge AC5	20%	20%
	Core		not applicable	100%
	Connectivity		not applicable	20%
* Variance 4 of the KBLUP-HLP was followed for Status Quo. E.g. Stands that are Pl, Fd or Lw leading have 0% retention				

Notes: Southwest Kootenay

Status quo habitat management

- Based on KBLUP-HLP caribou habitat management zones;
- 50% retention target for Zone 3 defined by Wilson and Valdal;
- 20% retention target for Zone 4 (Connectivity) based on definition by southern herd experts in the MCST. This retention target was an estimate of average stand level retention in these resource management zones.

Selected Option: Maintain with Resilience (MR)

- A combination of KBLUP-HLP caribou habitat data and additional core and connectivity habitat data (authored by the MCST) was used to define MR;

- KBLUP-HLP caribou habitat zones 2 and 3 become 100% retention;
- 20% retention target for connectivity (Zone 4 and new Connectivity Zone) recommended by MCST.

1-B Southeast Kootenay		**Retention Target Applied for each Caribou Habitat Management Option**	
KBLUP-HLP DATA Attribute: Car_zone	**Current Land Use Habitat Management Definition**	**Status Quo**	**Maintain with Resilience**
1	100% Retention	100%	100%
2	100% Retention*	100%	100%
3	40% ge AC8 70% ge AC4	50%	100%
4	33% ge AC5	20%	20%
* Variance 4 of the KBLUP-HLP was followed for Status Quo. E.g. Stands that are Pl, Fd or Lw leading have 0% retention			

Notes: Southeast Kootenay

Status quo habitat management

- Based on KBLUP-HLP caribou habitat management data;
- 50% retention target for Zone 3 defined by Wilson and Valdal;
- 20% retention target for Zone 4 (Connectivity) based on definition by southern herd experts in the MCST. This retention target was an estimate of average stand level retention in these resource management zones.

Selected Option: Maintain with Resilience (MR)

- 20% retention target for connectivity (Zone 4 and new Connectivity Zone) recommended by MCST;
- KBLUP-HLP caribou habitat zone 2 and 3 becomes 100% retention.

2-A South Monashee			**Retention Target Applied for each Caribou Habitat Management Option**
Ok-Shuswap LRMP Linework	**MCST Core Habitat Dataset**	**Current Land Use Habitat Management Definition**	**Status Quo**
Winter Range		Modified Retention	N\A
Corridor		30%over80yrs	N\A
	Core1		N\A
	Connect 1		N\A

Notes: South Monashee

Status quo habitat management

- Spatial definition utilized Okanagan-Shuswap LRMP caribou habitat data;
- 20% retention for connectivity corridor defined by MCST based on average stand level retention.

Selected Option: Status Quo

- No impact from selected draft habitat management option.

2-B Central Kootenay			**Retention Target Applied for each Caribou Habitat Management Option**	
KBLUP-HLP DATA Attribute car_priority	**Data: Habitat Capability (Hamilton and Wilson)**	**Current Land Use Habitat Management Definition**	**Status Quo**	**Assist to Long Term Sustaining**
1	N\A	100% Retention	100%	100%
1A	N\A	100% Retention	100%	100%
2	N\A	Retention Target Criteria for ESSF BEC Zone described in Notes Section	12% (Calculated based on land use definition	N\A
2	N\A	Retention Target Criteria for ICH BEC Zone described in Notes Section	31.3% (Calculated based on land use definition)	Not applicable
2	High and Medium Capability		N\A	Retention Target Criteria described in Notes Section

Notes: Central Kootenay

Status quo habitat management

- Based on KBLUP-HLP caribou habitat management data;
- ESSF target for Zone 2 calculated by Valdal, McGuinness and Wilson. A 40% ≥AC 8 target and 10% AC 9 target for caribou habitat in Zone 1, 1A and 2 was calculated. This target is preferentially found within Zones 1 and 1A then the remainder is found within Zone 2. The Zone 2 area target divided by the Zone 2 total area resulted in the 12% aspatial retention value. All targets were calculated within THLB based on current management review with Cam Leetch and Dennis Hamilton.
- ICH target for Zone 2 calculated by Valdal, McGuinness and Wilson. A 40% ≥AC 8 target and 10% AC 9 target for caribou habitat in Zone 1, 1A and 2 was calculated. This target is preferentially found within Zones 1 and 1A then the remainder is found within Zone 2. The Zone 2 area target divided by the Zone 2 total area resulted in the 31.3% aspatial retention value. All targets were limited to THLB based on current management review with Cam Leetch and Dennis Hamilton.

Selected Option: Assist to Long Term Sustaining (ALTS)

- Based on KBLUP-HLP caribou habitat dataset and a caribou habitat capability dataset (Hamilton and Wilson);

- ALTS habitat management option is 100% retention within Zones 1 and 1A and a 40% O+M retention to be achieved in high and medium capability areas within Zone 2;
- Seral targets within Zone 2 high and medium capability are to be met by Landscape Unit; however, this criterion was not analysed for expediency;
- Retention is applied to the THLB only in order to derive a conservative estimate of impacts.

3-A Revelstoke - Shuswap				
Revelstoke TSA, TFL 55 and 56		**Retention Target Applied for each Caribou Habitat Management Option**		
Draft Spatial Retention within RMAC Linework	**Old Forest Retention in 2006 Caribou Capability Linework**	**Current Land Use Habitat Management Definition**	**Status Quo**	**Assist to Long Term Sustaining**
Spatial Retention Areas		100% Retention	100% Retention	N\A
	Meet Habitat Mgmt Criteria (listed below)		N\A	Retention TBD
Golden TSA		**Retention Target Applied for each Caribou Habitat Management Option**		
Draft Spatial Retention of KBLUP Caribou Guidelines	**ALTS Option: Old Forest Retention within KBLUP Caribou Habitat Zones**	**Current Land Use Habitat Management Definition**	**Status Quo**	**Assist to Long Term Sustaining**
Spatial Retention Areas		100% Retention	100% Retention	N\A
	Meet Habitat Mgmt Criteria (listed below)		N\A	Retention TBD
Shuswap (Okanagan TSA - TFL 33)		**Retention Target Applied for each Caribou Habitat Management Option**		
Preferentially Deployed OGMA's in OK-Shu LRMP Caribou Habitat Zones	**ALTS Option: Old Forest Retention within 2006 Salmon Arm Caribou Capability Habitat Zones**	**Current Land Use Habitat Management Definition**	**Status Quo**	**Assist to Long Term Sustaining**
9900 ha AC 8 and 9 THLB retention		100% Retention	100% Retention	
	Meet Habitat Mgmt Criteria (listed below)			Retention TBD

Notes: PU 3-A Revelstoke - Shuswap

Status quo habitat management

Revelstoke TSA, TFL 55 and 56

- Revelstoke caribou habitat defined with draft spatialized retention targets for RMAC caribou habitat management data[7].

Golden TSA

- Caribou habitat areas defined by draft spatial deployment of aspatial KBLUP-HLP caribou habitat objective targets[8].

Shuswap (Okanagan TSA and TFL 33)

- Draft spatialized retention targets within Okanagan-Shuswap LRMP Caribou Habitat Management Zones[9]
- 20% retention for connectivity corridor defined by MCST based on average stand-level retention in these zones.

Robson Valley TSA

- Not affected by ALTS option in TSA overlap with PU 3A.

Kamloops TSA

- Refer to PU 4A section for status quo and ALTS criteria and notes.

Selected Option: Assist to Long Term Sustaining

Revelstoke TSA, TFL 55 and TFL 56

- Option criteria set by Rob Serrouya and Bruce McLellan,
- No harvesting in winter moose and deer habitat zone overlap with 2006 caribou habitat capability linework[10],
- No harvesting above “Caribou Line”,
- ESSF: Maintain 40% ≥AC 8 and 10% AC 9 by landscape unit in caribou capability areas not above the caribou line and not in moose and deer winter range overlap zones,
- ICH: Maintain 40% ≥AC 8 and 10% AC 9 by landscape unit in caribou capability areas not above the caribou line and not in moose and deer winter range overlap zones,
- Intermediate BEO “turned off” in ALTS option,
- Early seral areas are part of the seral budget calculation in ALTS option.

[7] Data authored by Rob Serrouya, caribou researcher, Mountain Caribou Science Team

[8] Data authored by Darcy Monchak, Planning Officer, Integrated Land Management Bureau, Ministry of Agriculture and Lands

[9] Serrouya, R., McLellan, B., Pavan, G.,Furk, K., and C. Apps, (2006). Implementation of Caribou Research within the Okanagan-Shuswap Forest District

[10] Data authored by Rob Serrouya and Bruce McLellan, Senior Wildlife Habitat Ecologist, Ministry of Forests and Range and Mountain Caribou Science Team.

Selected Option: Assist to Long Term Sustaining (cont)

Golden TSA

- Option criteria set by Rob Serrouya and Bruce McLellan,
- No harvesting in winter moose and deer habitat zone overlap with KBLUP Caribou Habitat Management Zones
- No harvesting above "caribou line",
- ESSF: Maintain 40% ≥AC 8 and 10% AC 9 by landscape unit in caribou capability areas not above the caribou line and not in moose and deer winter range overlap zones,
- ICH: Maintain 40% ≥AC 8 and 10% AC 9 by landscape unit in caribou capability areas not above the caribou line and not in moose and deer winter range overlap zones.

Shuswap (Okanagan TSA and TFL 33)

- Option criteria set by John Surgenor,
- Management criteria applied to 2006 caribou habitat management zones[11],
- No harvesting in 2006 Caribou Capability Zones above forestry operability line,
- Maintain 40% ≥AC 8 by landscape unit in ESSF and ICH BEC zones,
- Manage adjacent UWR to maximum of 15% between 5 and 35 years[12].

[11] Data authored by Rob Serrouya, caribou researcher, Mountain Caribou Science Team
[12] Not considered because it is not a caribou habitat objective and is subject to refinement

3-B Kinbasket			**Retention Target Applied for each Caribou Habitat Management Option**
KBLUP-HLP DATA Attribute: Car_zone	**Data: Spatial Deployment of KBLUP Caribou Habitat Objectives**	**Current Land Use Habitat Management Definition**	**Status Quo Habitat Management**
1		100% Retention	N\A
2		100% Retention	N\A
3		40% ge AC8 70% ge AC4	N\A
4		33% ge AC5	N\A
5		70% ge AC8	N\A
6		70% ge AC8	N\A
7		40% ge AC8 10%=AC9	N\A
8		30% ge AC8 10%=AC9 20% PC ge AC7	N\A
	Y		100%
	N		0%

Notes: Kinbasket

Status quo habitat management

- Caribou habitat areas defined by draft spatial deployment of aspatial targets[13].

Selected Option: Status Quo

- No impact from draft habitat management option.

[13] Data authored by Darcy Monchak, Planning Officer, Integrated Land Management Bureau, Ministry of Agriculture and Lands

4-A Wells Gray - Thompson			**Retention Target Applied for each Caribou Habitat Management Option**	
Spatial Deployment of 40% Old and Mature Dataset	**Capability Data within Core Habitat[1]**	**Current Land Use Habitat Management Definition**	**Status Quo**	**Assist to Long Term Sustaining**
Retention Areas		100% Retention	100%	N\A
Connectivity			20%	N\A
	All Capability		N\A	100%
[1]Core Winter or Core All Seasons Habitat				

Notes: Wells Gray-Thompson

Status quo habitat management

- Wells Gray–Thompson caribou habitat defined with draft spatialized retention targets[14],
- 20% retention for connectivity corridor defined by MCST based on average stand level retention in these zones.

Selected Option: Assist to Long Term Sustaining

- Based on Wells Gray–Thompson core habitat, connectivity corridors and caribou capability used,
- All high and moderate habitat capability within core winter, core all seasons and connectivity zones were set to 100% retention.

[14] Furk, K. and D. Lewis (2005). Kamloops LRMP Caribou Habitat Retention Selection

4-B Mt. Robson		**Retention Target Applied for each Caribou Habitat Management Option**
Ominica Ungulate Winter Range Order U-7-003	**Current Land Use Habitat Management Definition**	**Status Quo**
Caribou High	100% Retention	100% Retention
Caribou Medium	33% entry every 80yrs	66% Retention
Caribou Connectivity	20% ge 100 yrs and 20% not less than 3m.	20% Retention

Notes: Mt. Robson

Status quo habitat management

- Caribou habitat management zones defined by Ominica Ungulate Winter Range Order U-7-003.

Selected Option: Status Quo

- No impact from draft habitat management option.

5-B Quesnel Highland			**Retention Target Applied for each Caribou Habitat Management Option**	
CCLUP Caribou Hab Data	**Northern MC RIG Core Habitat Data**	**Current Land Use Habitat Management Definition**	**Status Quo**	**Assisted Long Term Sustaining**
no_ha		100% Retention	100% Retention	N\A
mod_ha		33%entry every 80yrs	66% Retention	N\A
	HIGH	N\A	N\A	100%
	MEDIUM	N\A	N\A	100%
	CONNECTIVITY	N\A	N\A	20%

Notes: Quesnel Highland

Status quo habitat management

- Based on CCLUP caribou habitat management dataset,
- 66% retention target defined by Armleder, Valdal and Wilson.

Selected Option: Assist to Long Term Sustaining

- Based on proposed Cariboo Mountains and Hart Ranges Mountain Caribou Recovery Implementation Group caribou habitat management zones,
- Connectivity retention target based on Omineca UWR order.

5-A Upper Fraser		**Retention Target Applied for each Caribou Habitat Management Option**	
Northern MC RIG Core Habitat Data	**Current Land Use Habitat Management Definition**	**Status Quo**	**Assist to Long Term Sustaining**
HIGH	100% Retention	100%	100%
MEDIUM	33% entry every 80yrs	66%	100%
CONNECTIVITY	20% ge 100 yrs and 20% not less than 3m.	20%	20%

Notes: Upper Fraser

Status quo habitat management

- Based on proposed Cariboo Mountains and Hart Ranges Mountain Caribou Recovery Implementation Group caribou habitat management zones. HIGH or CORRIDOR polygons that do not represent status quo include: Polygon ID's (FID) 426, 475, 513, 517, 518, 528, 539, 551, 557, 567, 590, 615, 633, 777, 821, 1074,
- 66% retention target defined Valdal and Wilson,
- 20% retention target defined Valdal and Wilson.

Selected Option: Assist to Long Term Sustaining

- Based on proposed Cariboo Mountains and Hart Ranges Mountain Caribou Recovery Implementation Group caribou habitat management zones,
- Connectivity retention target based on Omineca UWR order.

6 Hart		**Retention Target Applied for each Caribou Habitat Management Option**	
Northern MC RIG Core Habitat Data	**Current Land Use Habitat Management Definition**	**Status Quo**	**Assist to Long Term Sustaining**
HIGH	100% Retention	100%	100%
MEDIUM	33% entry every 80yrs	66%	100%
CONNECTIVITY	20% ge 100 yrs and 20% not less than 3m.	20%	20%

Notes: Hart

Status quo habitat management

- Based on proposed Cariboo Mountains and Hart Ranges Mountain Caribou Recovery Implementation Group caribou habitat management zones. HIGH or CORRIDOR polygons that do not represent status quo include: Polygon ID's (FID) 426, 475, 513, 517, 518, 528, 539, 551, 557, 567, 590, 615, 633, 777, 821, 1074,
- 66% retention target defined Valdal and Wilson,
- 20% retention target defined Valdal and Wilson.

Selected Option: Assist to Long Term Sustaining

- Based on proposed Cariboo Mountains and Hart Ranges Mountain Caribou Recovery Implementation Group caribou habitat management zones,
- Connectivity retention target based on Omineca UWR order.

Phase 1 Analysis Results: Incremental THLB and CMAI by Planning Unit

	PU 1A: SW Kootenays (Excl. Private Forestry Zone)				
	Gross Habitat Mgmt Area (ha)	**Increase in Gross Area over Status Quo (ha)**	**Increase in Gross Area over Status Quo (%)**	**THLB Incremental over Status Quo (ha)**	**CMAI - Incremental over Status Quo (m3/yr)**
Status Quo Habitat Management	55,170.5	N/A	N/A	N/A	N/A
Maintain with Resilience	66,176.9	11,006.4	19.9%	7,095.6	15,846

	PU 1A: SW Kootenays (Incl. Private)				
	Gross Habitat Mgmt Area (ha)	**Increase in Gross Area over Status Quo (ha)**	**Increase in Gross Area over Status Quo (%)**	**THLB Incremental over Status Quo (ha)**	**CMAI - Incremental over Status Quo (m3/yr)**
Status Quo Habitat Management	55,170.5	N/A	N/A	N/A	N/A
Maintain with Resilience	111,790.0	56,619.5	102%	7,095.6[15]	77,779.2[16]

The Maintain with Resilience habitat option is illustrated with the Southwest Kootenay map that can be found at http://ilmbwww.gov.bc.ca/sarco/mc/maps_shapefiles.html

	Planning Unit 1B: SE Kootenays				
	Gross Habitat Mgmt Area (ha)	**Increase in Gross Area over Status Quo (ha)**	**Increase in Gross Area over Status Quo (%)**	**THLB Incremental over Status Quo (ha)**	**CMAI - Incremental over Status Quo (m3/yr)**
Status Quo Habitat Management	154,892.0	N/A	N/A	N/A	N/A
Maintain with Resilience	154,892.0	0	0	10,493.2	23,855.8

The Maintain with Resilience habitat option is illustrated with the Southeast Kootenay map that can be found at http://ilmbwww.gov.bc.ca/sarco/mc/maps_shapefiles.html

[15] THLB is not defined on private land
[16] Incremental CMAI value includes private land

	Planning Unit 2A: South Monashee				
	Gross Habitat Mgmt Area (ha)	**Increase in Gross Area over Status Quo (ha)**	**Increase in Gross Area over Status Quo (%)**	**THLB - Incremental over Status Quo (ha)**	**CMAI - Incremental over Status Quo (m^3/yr)**
Status Quo Habitat Management	58,834.0	NA	NA	NA	NA

The Status Quo habitat option is illustrated with the South Monashee map that can be found at http://ilmbwww.gov.bc.ca/sarco/mc/maps_shapefiles.html

	Planning Unit 2B: Central Kootenay				
	Gross Habitat Mgmt Area (ha)	**Increase in Gross Area over Status Quo (ha)**	**Increase in Gross Area over Status Quo (%)**	**THLB Incremental over Status Quo (ha)**	**CMAI - Incremental over Status Quo (m3/yr)**
Status Quo Habitat Management	304,220.4	N/A	N/A	N/A	N/A
Assist to Long Term Sustaining	254,659.2	-49,561.2	-16.2%	19,762.6	53.875.8

The Assist to Long Term Sustaining habitat option is illustrated with the Central Kootenay map that can be found at http://ilmbwww.gov.bc.ca/sarco/mc/maps_shapefiles.html

	Planning Unit 3A: Revelstoke - Shuswap				
	Gross Habitat Mgmt Area (ha)	**Increase in Gross Area over Status Quo (ha)**	**Increase in Gross Area over Status Quo (%)**	**THLB Incremental over Status Quo (ha)**	**CMAI - Incremental over Status Quo (m3/yr)**
Status Quo Habitat Management	395,650.7	N/A	N/A	N/A	N/A
Assist to Long Term Sustaining	408,856.5	13,205.8	3.3%	34,096.1	91,047.3

The Assist to Long Term Sustaining habitat option is illustrated with the Revelstoke-Shuswap map that can be found at http://ilmbwww.gov.bc.ca/sarco/mc/maps_shapefiles.html

	Planning Unit 3B: Kinbasket				
	Gross Habitat Mgmt Area (ha)	**Increase in Gross Area over Status Quo (ha)**	**Increase in Gross Area over Status Quo (%)**	**THLB Incremental over Status Quo (ha)**	**CMAI - Incremental over Status Quo (m3/yr)**
Status Quo Habitat Management	30,761.1	N/A	N/A	N/A	N/A

The Status Quo habitat option is illustrated with the Kinbasket map that can be found at http://ilmbwww.gov.bc.ca/sarco/mc/maps_shapefiles.html

	Planning Unit 4A: Wells Gray - Thompson				
	Gross Habitat Mgmt Area (ha)	**Increase in Gross Area over Status Quo (ha)**	**Increase in Gross Area over Status Quo (%)**	**THLB Incremental over Status Quo (ha)**	**CMAI - Incremental over Status Quo (m3/yr)**
Status Quo Habitat Management	170,595.7	N/A	N/A	N/A	N/A
Assist to Long Term Sustaining	170,595.7	0	0	64,133.1	141,527.0

The Assist to Long Term Sustaining habitat option is illustrated with the Wells Gray-Thompson map that can be found at http://ilmbwww.gov.bc.ca/sarco/mc/maps_shapefiles.html

	Planning Unit 4B: Mt Robson				
	Gross Habitat Mgmt Area (ha)	**Increase in Gross Area over Status Quo (ha)**	**Increase in Gross Area over Status Quo (%)**	**THLB - Incremental over Status Quo (ha)**	**CMAI - Incremental over Status Quo (m^3/yr)**
Status Quo Habitat Management	3019.9	NA	NA	NA	NA

No map has been created for Mt. Robson PU; however, the Mt. Robson Status Quo habitat management zones can be seen on the Quesnel Highland and Upper Fraser maps.

	Planning Unit 5A: Upper Fraser				
	Gross Habitat Mgmt Area (ha)	**Increase in Gross Area over Status Quo (ha)**	**Increase in Gross Area over Status Quo (%)**	**THLB Incremental over Status Quo (ha)**	**CMAI - Incremental over Status Quo (m3/yr)**
Status Quo Habitat Management	169,315.0	N/A	N/A	N/A	N/A
Assist to Long Term Sustaining	204,455.3	35,140.3	20.7%	9,907.3	14685.4

The Assist to Long Term Sustaining habitat option is illustrated with the Upper Fraser map that can be found at http://ilmbwww.gov.bc.ca/sarco/mc/maps_shapefiles.html

	Planning Unit 5B: Quesnel Highland				
	Gross Habitat Mgmt Area (ha)	**Increase in Gross Area over Status Quo (ha)**	**Increase in Gross Area over Status Quo (%)**	**THLB Incremental over Status Quo (ha)**	**CMAI - Incremental over Status Quo (m3/yr)**
Status Quo Habitat Management	235,038.0	N/A	N/A	N/A	N/A
Assist to Long Term Sustaining	281,253.6	46,215.6	19.6%	44,499.3	87,421.4

The Assist to Long Term Sustaining habitat option is illustrated with the Quesnel Highland map that can be found at http://ilmbwww.gov.bc.ca/sarco/mc/maps_shapefiles.html

	Planning Unit 6: Hart				
	Gross Habitat Mgmt Area (ha)	**Increase in Gross Area over Status Quo (ha)**	**Increase in Gross Area over Status Quo (%)**	**THLB Incremental over Status Quo (ha)**	**CMAI - Incremental over Status Quo (m3/yr)**
Status Quo Habitat Management	399,261.6	N/A	N/A	N/A	N/A
Assist to Long Term Sustaining	400,100.6	840	0.2%	1,678.2	2,713.0

The Assist to Long Term Sustaining habitat option is illustrated with the Hart map that can be found at http://ilmbwww.gov.bc.ca/sarco/mc/maps_shapefiles.html

Phase 2 Analysis: Incremental Impacts by Timber Licensee Operator Area

The Phase 2 analysis was guided by the notion that the draft mountain caribou habitat management options are inherently spatial, which may have disproportional impacts on some timber industry operators. Timber licensee operator area (LOA) datasets (Appendix 1) are the responsibility of the Ministry of Forests and Range; however, the accuracy of LOA data used for this analysis varied widely between management units due to recent province wide chart area realignment. Following earlier drafts of this report many updated LOA datasets were submitted to SaRCO by MOFR District offices.

An updated Phase 2 analysis based on these new LOA datasets was not conducted because of the resources required to prepare the submitted LOA data for an analysis. In addition, a re-analysis seemed somewhat unnecessary due to parallel analyses being conducted by Districts and licensees aimed at meeting the intent of the Phase 2 analysis. In the interest of transparency, the Phase 2 results from earlier drafts of this report have been moved to Appendix 4.

Phase 3: Qualitative Timber Supply Impacts

Timber supply is a function of not simply the timber inventory on a land base but is the result of the complex spatial and temporal relationships of the land base, forest growth, and management objectives. Due to this complexity, the usual tool for understanding the timber supply on a management unit is a forest estate model. However, the use of forest estate modelling specifically for deriving implications of the draft mountain caribou recovery strategy would require resources beyond those available at this time for this strategic-level project.

This phase provides a qualitative assessment of the timber supply impacts of the changes in mountain caribou management based upon the identified changes and information existing on timber supply dynamics. This review consisted of (1) identifying the incremental changes on a management unit basis, (2) identifying key timber supply characteristics of each management unit, (3) assessing the timber supply implications of the changes for caribou management of each management unit and (4) having the assessments peer reviewed by MOFR branch and regional timber supply analysts.

Incremental Changes

The methods to calculate incremental changes of timber harvesting land base (THLB) and the maximum cumulative mean annual increment are described in previous sections of this report. It is important to note that these changes result from either boundary changes (i.e., actual on the ground differences) or from changes in management. Further, the estimates of the impact of specific management, as identified in Phase 1, are simplistic representations and will not fully capture the complex temporal and spatial dynamics of timber supply.

Changes in maximum cumulative mean annual increment should not be viewed as changes in timber supply but used as an indication of changes in productivity.

The incremental changes by Management Unit for the selected management option(s) are shown in Table Phase 3-1. The incremental THLB changes vary from 0 to 24.8%. As noted above, the changes are between the status quo and the selected recovery option given the best available description of THLB. The methodology did not consider other management objectives (e.g., landscape biodiversity), some of which may be more restrictive than caribou management. In those instances, the estimated impacts of the caribou recovery option on THLB will be overestimated.

Current Timber Supply Review and Allowable Annual Cut

The timber supply impacts of the draft mountain caribou recovery strategy are dependent not only on changes in mountain caribou habitat management but also upon the dynamics of timber supply within the Management Unit. Timber supply dynamics are reviewed regularly for all Management Units through the Chief Forester's timber supply review process that supports his allowable annual cut decisions (AAC) under Section 8 of the *Forest Act*. Similar reviews may also be conducted for other processes such as the regional manager's Section 59.1 Innovative Forestry Practices Agreement AAC determination or for land use planning needs.

Appendix 5 describes the current allowable annual cut status of each Management Unit and associated information from the timber supply review. In some Management Units the most recent timber supply review may have been focussed on the short-term harvest levels in consideration of the mountain pine

beetle infestation. In these cases, information may have been extracted from the previous timber supply review.

Management Unit Impacts

In this section, we provide a synthesis of the likely implication of the selected recovery option for each forest Management Unit in which mountain caribou planning units are located. This synthesis consists simply of assessing the level of impact on timber supply that the selected recovery option over the status quo is likely to have. This assessment considers current information available about the Management Unit. This information is typically the most recent timber supply analysis created for the Chief Forester's timber supply review. This synthesis cannot provide definitive answers on timber supply impacts. It is expected that for many Management Units, stakeholders will want to conduct a more detailed assessment of the land base differences between current management requirements and the selected draft recovery options.

Table Phase 3-2 provides an overview summary of the assessment of the likely timber supply impacts for the short, mid-, and long-terms of each Management Unit. This opinion of impacts is based upon the incremental THLB impacts identified and considerations for temporal dynamics identified in the most recent timber supply analysis. The implications of mountain pine beetle are also considered. Note that the time period represented by short, mid-, and long-terms differ among Management Units. The mid-term is considered the period of transition between the harvest flow relying on existing natural stands and relying on managed stands. Often this transition period is associated with the harvest flow being at its lowest point.

Arrow TSA

The selected recovery option will have an impact on the timber supply of the Arrow TSA. The incremental THLB impact is identified as 2.42%. The impact could be distributed throughout all planning horizons. Although the pine component is relatively small (15%), the shift in harvest focus or mortality loss in the short-term coupled with the low availability of timber supply at the end of the mid-term suggests a disproportionately greater impact in the mid-term.

A detailed forest estate modelling analysis is being considered by the Arrow Forest Licensee Group for an allowable annual cut increase application under their Innovative Forestry Practices Agreements. The analysis is likely to generate a more accurate assessment of timber supply impacts than the THLB impacts estimated here.

Cranbrook TSA

The selected recovery option will have impact on the timber supply of the Cranbrook TSA. The incremental THLB impact is identified as 1.54%. Analysis from the recent timber supply review (but not specific to the recovery option scenario) provides indications that the recovery option may reduce the length (1 decade) that the current AAC level can be maintained and deepen the mid-term harvest level. Given the high pine component in the TSA, timber supply impacts in the short-term may be avoided due to harvest flow directed to stands of high pine content. However, due to unrecovered mortality (or any increased short-term harvesting) the mid-term timber supply will be more sensitive (i.e., higher than 1.54%) to any increased in forest retention requirements.

Current analysis is probably sufficient to demonstrate the general range of likely timber supply impacts.

Golden TSA

The recommended recovery option for the Golden TSA within the mountain caribou planning unit 3B is consistent with current practice. For mountain caribou planning unit 3A, the assisted long term sustaining management option results in a 3.8% decrease in equivalent THLB over the status quo within the Golden TSA. Timber supply within the Golden TSA was demonstrated in the most recent timber supply review to be highly sensitive to increased constraint within the ESSF and ICH capability areas but also demonstrated for the general removals of mature land base the ability to transfer some short term timber supply impacts to the mid-term. As management change under the assisted long term sustaining management option is not increasing the forest cover constraints for the ICH and ESSF caribou capability areas (not in moose winter range and below caribou line), it is likely the timber supply impacts will be proportional to the decrease in equivalent THLB.

Nevertheless, given the sensitivity and difference in dynamics suggested by the 2003 analysis, further analysis would be useful to better characterize short-term impacts.

Invermere TSA

The selected recovery option will have minimal impact on the timber supply of the Invermere TSA. The incremental THLB impact is identified as 0.02%. Given the small size of this impact and the high pine component in the TSA, timber supply impacts in the short-term are unlikely. Further, while the mountain pine beetle infestation may accentuate the mid-term impact due to the recovery option, the mid-term timber supply impact will still be relatively small.

Given the low incremental change, more detailed modelling will not be sensitive to the recovery option.

Kamloops TSA

A forest estate analysis, completed for the Kamloops Land and Resource Management Monitoring Table investigated the timber supply impacts of proposed mountain caribou boundary and management options. An analysis which turned off harvesting from all capable areas (i.e., similar to the selected recovery option) resulted in a 6.6% mid- and long-term reduction in timber supply. The current analysis for incremental THLB impact has identified a 6.55% impact . Harvest and mortality losses due to mountain pine beetle infestation (about 28% of the TSA inventory is pine) will likely focus harvest away from mountain caribou zones in the short-term but will accentuate the impact of the recovery option in the mid-term. This accentuation and the impact of the mountain pine beetle itself on the mid-term will result in a significant drop in the mid-term from recent timber supply review forecasts.

The existing analysis appears to sufficiently identify the timber supply impact of the selected recovery option. A timber supply review is on-going within the Kamloops TSA.

Kootenay Lake TSA

The selected recovery option will affect the timber supply of the Kootenay Lake TSA. The incremental THLB impact is identified as 6.72% (Table Phase 3-1). There is some uncertainty around the applied retention targets in relation to landscape biodiversity requirements for the status quo option that could influence the identified impact. The 2001 timber supply analysis identified a fairly stable timber supply that relies on existing natural stands for 6 decades. 21% of the TSA inventory volume is pine. Due to the likely increase focus on pine harvest, the short-term timber supply should not be affected by the selected recovery option. However, this displacement of impacts will result in a disproportionately larger impact related to mountain caribou in the mid-term. The long-term impact should be consistent with the incremental THLB impact.

Additional analyses focussed on investigating harvest flow changes due to the recovery option, as well as other land management differences since the 2001 analysis, could further refine the estimation of impacts.

Okanagan TSA

The recommended recovery option for the portion of the Okanagan TSA within mountain caribou planning unit 2A is consistent with current practice. For mountain caribou planning unit 3A, the assisted long term sustaining management option results in a 0.22% decrease in equivalent THLB over the status quo in the Okanagan TSA. Timber supply analysis completed in 2002 suggests that the short-term timber supply is fairly robust for the Okanagan TSA. Increased mortality and harvest levels for the mountain pine beetle infestation could put some greater pressure on mid-term timber supply around decade 6 when modelled harvest flow switches from existing natural stands to managed stands. The impact due to the selected caribou management option should remain small.

Due to the relatively small incremental impact, detailed forest estate modelling at the TSA level is unlikely to produce refined impact assessments.

Prince George TSA

The selected recovery option will have an impact on the timber supply of the Prince George TSA, particularly within the Prince George Forest District where mountain caribou populations are present. The incremental THLB impact for the TSA is identified as 0.14%. This impact may be underestimated (may be at 0.5% level), because within the method to calculate incremental THLB, the equivalent retention target for status quo is likely overestimated. Harvest and mortality losses due to mountain pine beetle infestation (about 32% of the inventory volume is pine in the Prince George District portion of the TSA) will likely focus

harvest away from mountain caribou zones in the short-term but will result in the recovery option having a disproportionately higher impact in the mid-term.

Due to the relatively small incremental impact, detailed forest estate modelling at the TSA level is unlikely to produce refined impact assessments, although a more detailed assessment at the Prince George Forest District level may be found to be useful.

Quesnel TSA

The selected recovery option will have an impact on the timber supply of the Quesnel TSA and potentially greater impact in the mid-term. The incremental THLB impact is identified as 0.67%. The estimated impact is likely low because, within the calculation of incremental THLB, the equivalent retention target for status quo may be overestimated. Due to the severity of the mountain pine beetle infestation in the Quesnel TSA (Quesnel TSA has about 68% of inventory volume in pine), the short-term focus will be on harvesting pine with the recognition that the loss of mature pine will cause large mid-term timber supply deficiencies. As such, assuming under the status quo the mountain caribou zones were to be available in the mid-term, the recovery option will have a disproportionately higher impact in the mid-term.

A more detailed analysis would better characterize the impact of the recovery options on mid-term harvest levels within the Quesnel TSA.

Revelstoke TSA

For mountain caribou planning unit 3A, the assisted long term sustaining management option results in a 12.4% decrease in equivalent THLB over the status quo. Timber supply analysis completed in 2002 suggests that timber supply of the Revelstoke TSA is sensitive to increases in the area managed for caribou or the associated forest retention requirements. The current AAC is

forecasted to be maintained for less than 2 decades before stepping down for the next 5 decades to a 37% lower long-term level. The 2004 timber supply review analysis suggests increases in constraints related to mountain caribou could have large impacts on the timber supply of the TSA. Mountain pine beetle is not a significant factor within the Revelstoke TSA.

Given the sensitivity of the existing timber supply and the identified size of impact, further analysis would be useful to better characterize impacts.

Robson Valley TSA

The selected recovery option will affect the timber supply of the Robson Valley TSA. The incremental THLB impact is identified as 3.0%. The timber supply analysis supporting the 2006 AAC determination identifies a fairly robust timber supply that expects to have the majority of harvest from existing natural stands for the next 13 decades. However, the current forecasts are based upon stepping down the current AAC after 2 decades and reaching a 37% lower long-term harvest level after 5 decades. Pine is only a small component (12% of inventory volume) of the TSA and should not significantly alter the harvest flow dynamics. As such, the distribution (i.e., evenly or concentrated at a specific time period) of the recovery option impact during the step down will be dependent on harvest flow choices of the allowable annual cut. A 3.0% equivalent THLB reduction will likely reduce to 1 decade the ability to maintain the current AAC from the 2 decades projected and will have a long-term impact proportional or slightly less than the incremental THLB reduction.

More detailed modelling at the TSA level is unlikely to produce refined impact assessments given the dependence of the short-term timber supply on harvest flow objectives.

Williams Lake TSA

The selected recovery option will impact the timber supply of the Williams Lake TSA. The incremental THLB impact is identified as 1.26%. The impact is likely higher because the method to calculate incremental THLB appears to have overestimated the status quo retention target for modified harvest zones. Further, given the significance of the mountain pine beetle infestation (about 54% of inventory volume in TSA is pine) harvest will be focussed away from mountain caribou zones in the short-term but could result in a disproportionately higher impact in the mid-term. As mountain caribou management zones are located east of the Fraser River, this section of the TSA will have higher impacts.

Due to the size of the incremental impact, additional modelling at the TSA level is unlikely to provide a refined impact assessment, although it might characterize impacts specific to the eastern portion of the TSA.

100 Mile House TSA

The selected recovery option will have minimal impact on the timber supply of the 100 Mile House TSA. The incremental THLB impact is identified as 0.01%. The impact is likely slightly higher because the method to calculate incremental THLB may overestimate the status quo retention target for modified harvest zones. Harvest and mortality of pine due to the mountain pine beetle infestation in the short-term will change the harvest flow dynamics and place more emphasis on non-pine stands in the mid-term. Nevertheless the changes due to the selected recovery option will result in relatively small timber supply impacts at the TSA level.

Due to the small incremental impact, more detailed modelling at the TSA level is unlikely to produce a discernible harvest flow changes.

TFL 14

The selected recovery option has no impact on the timber supply in TFL 14. Priority zones with management requirements that restrict harvesting are not found on the timber harvesting land base of TFL 14 either in the status quo or the selected recover option. The most recent 2001 timber supply review suggested that short-term timber supply is robust.

More detailed modelling at the TSA level would not provide additional information.

TFL 23

The selected recovery option will have an impact on the timber supply of TFL 23. The incremental THLB impact is identified as 3.60%. While the impact likely could be distributed throughout all planning horizons, the amount of pine (about 24% of inventory volume) and current performance suggests in the short-term a lack of harvest from the caribou management zones in the short-term. These harvest dynamics will accentuate the already decreasing mid-term and suggest the recovery option will have a disproportionately higher impact in the mid-term.

Additional analyses to investigate harvest flow changes due to the recovery option and other land management differences since the last timber supply review analysis in 1998 would likely provide a more accurate estimate of impacts than the THLB analysis presented here.

TFL 30

The selected recovery option will have an impact on the timber supply of TFL 30.The incremental THLB impact is identified as 0.28%. The impact is likely slightly higher because the method to calculate incremental THLB appears to

have overestimated the status quo retention target for modified harvest zones. Timber supply analysis completed in 2002 identified a relatively stable timber supply for TFL 30 which, if desired, could absorb the impacts in the short-term.

Due to the relatively small incremental impact, more detailed modelling at the TSA level is unlikely to produce a discernible harvest flow impact.

TFL 33

For mountain caribou planning unit 3A, the assisted long term sustaining management option results in a 2.71% decrease in equivalent THLB over the status quo. Timber supply analysis completed in 1999 suggests that the timber supply is fairly sensitive to management changes, particularly around visual management. A 2005 postponement review, while recognizing most information has remained similar to 1999, noted new information identifying higher site productivity on the TFL.

Due to the sensitive nature seen in the current timber supply analysis, further analysis would better characterize the short-term harvest flow implications.

TFL 52

The selected recovery option will affect the timber supply of TFL 52. The incremental THLB impact is identified as 6.04%. The impact is likely slightly higher because the method to calculate incremental THLB appears to have overestimated the status quo retention target for modified harvest zones. The impact will also likely to be disproportionately higher in the mid-term due to the short-term harvest focus and mortality of pine. Analysis completed during the 2001 timber supply review suggests that timber supply availability hits a low in the mid-term. Mid-term impacts due to mountain caribou would accentuate the mid-term low.

West Fraser is conducting timber supply analysis to support a 2007 AAC determination by the chief forester. This analysis is likely to provide more a more accurate assessment of impacts than the THLB estimate presented here.

The assessment impact of 6.04% did not consider the consolidation of TFL 5 into TFL 52.

TFL 55

For mountain caribou planning unit 3A, the assisted long term sustaining management option results in a 16.6% decrease in equivalent THLB over the status quo. Timber supply analysis completed in 2006 suggests the current AAC can be maintained for 4 decades before stepping down to a 19% lower long-term level. At this time the transition from harvesting primarily existing natural stands to harvesting managed stands will have occurred. Sensitivity analysis indicated timber supply is highly sensitive to changes in the forest requirements of existing caribou management zones. As such, the selected management option will result in a much reduced timber supply through all periods.

Further analysis would better characterize the short-term harvest flow implications.

TFL 56

For mountain caribou planning unit 3A, the assisted long term sustaining management option results in a 24.8% decrease in equivalent THLB over the status quo. Timber supply analysis completed in 2000 suggests the current AAC can be maintained for 2 decades before stepping down to a 26% lower long-term level. Summaries of the status quo caribou retention targets in the 2000 analysis show some initial flexibility for mature seral goals but as harvesting progresses the age class distribution approaches the targeted mature forest retention

requirement. Regardless of this flexibility, the selected management option will result in a much reduced timber supply through all periods.

The chief forester's 2005 postponement order recognizes the potential for a timber supply impact due to the caribou recovery plan and requests that once such a plan is available the licensee commence a timber supply analysis. Further analysis will better characterize the short- and mid-term harvest flow implications.

Table Phase 3-1: *Incremental changes in timber harvesting land base and maximum cumulative mean annual increment between the selected mountain caribou recovery option and status quo management*

Timber Management Unit (MU)	MU THLB Area (ha)	THLB Reference	MC Planning Units that intersect with MU	Incremental max CMAI over Status Quo Mgmt (m3)	Incremental THLB over Status Quo Mgmt (ha)	THLB Reduction for affected MU (%)
Arrow TSA	210,275	TSR 2004	1A, 2A, 2B	13,313.60	5,098.10	2.42%
Cranbrook TSA	416,196	TSR 2004	1B	12,543.10	6,404.30	1.54%
Golden TSA	153,870	TSR 2003	3A, 3B	16,648.10	5,974.5	3.80%
Invermere TSA	233,873	TSR 2004	1B	456	56.4	0.02%
Kamloops TSA	1,040,860	TSR 2001	4A, 3A	150,266.40	68,194.80	6.55%[1]
Kootenay Lake TSA	257,850	TSR 2002	1A, 1B, 2B	41,334.80	17,324.20	6.72%
Okanagan TSA	1,022,342	TSR 2006	2A, 3A	6,461.40	2,780.50	0.22%
Prince George TSA	3,325,683	TSR 2002	5A, 6	8,319.90	4,712.70	0.14%
Quesnel TSA	1,010,888	TSR 2001	5A, 5B	12,305.50	6,788.00	0.67%
Revelstoke TSA	78,018	TSR 2002	2A, 3A	26,695.20	9,745.70	12.40%
Robson Valley TSA	210,691	TSR 2006	3A, 4B, 5A, 5B, 6	9,612.20	6,514.90	3.00%
Williams Lake TSA	2,096,251	TSR 2001	5B	56,858.9	26,437.3	1.26%
100 Mile House TSA	744,170	TSR 2006	5B	164.2	89.7	0.01%
TFL 14 (Tembec)	53,304	TSR 2001	2B	0	0	0.00%
TFL 23 (P&T)	224,702	TSR 1999	2A, 2B	24,197.2	8,262.5	3.60%
TFL 30 (Canfor)	118,725	TSR 2003	6	621.1	331.7	0.28%
TFL 33 (Federated)	6,979	TSR 2000	3A	496.6	189.3	2.71%
TFL 52 (West Fraser)	188,956	TSR 2003	5A, 5B	18,497.8	11,416.50	6.04%
TFL 55 (LP)	22,341	TSR 2006	3A, 3B	9,178.50	3,728.80	16.60%
TFL 56 (RCFC)	30,702	TSR 2001	3A, 3B	22,828.00	7,615.30	24.80%

[1] ALTS option for Kamloops TSA analysed with KLRMP Timber Supply Analysis (Foresite 2006)

Table Phase 3-2: Timber supply implications of selected recovery options as compared to status quo

		Analyst Opinion on the Impact of Recovery Option over Status Quo[2]		
Management Unit (MU)	**Selected Options within MU[1]**	**Short term**	**Mid-term**	**Long-term**
Arrow TSA	MR, SQ, ALTS	M	++	++
Cranbrook TSA	MR	M	++	++
Golden TSA	SQ, ALTS	++ to +++	++	++
Invermere TSA	MR	M	+	+
Kamloops TSA	ALTS	M to +	+++	+++
Kootenay Lake TSA	MR, ALTS	M to +	+++	+++
Okanagan TSA	SQ, ALTS	M	+	+
Prince George TSA	ALTS	M	+	+
Quesnel TSA	ALTS	M	++	+
Revelstoke TSA	ALTS	++++	++++	++++
Robson Valley TSA	SQ, ALTS	M to ++	++	++
Williams Lake TSA	ALTS	M	++	++
100 Mile House TSA	ALTS	M	+	+
TFL 14 (Tembec)	ALTS	0	0	0
TFL 23 (P&T)	ALTS	M to +	++	++
TFL 30 (Canfor)	ALTS	M	+	+
TFL 33 (Fed. Coop)	ALTS	++	++	++
TFL 52 (West Fraser)	ALTS	M to ++	+++	+++
TFL 55 (LP)	ALTS	++++	++++	++++
TFL 56 (RCFC)	ALTS	++++	++++	++++

[1] MR = maintain with resilience; SQ = Status quo; ALTS = assist to long term sustaining
[2] 0 = no impact; M = no change due to change in harvest dynamics; + = likely less than 1% decrease; ++ = likely 1-5% decrease; +++ = likely 5-10% decrease, ++++ = >10% decrease

Appendix 1 Timber Operator Area Data

District	Custodian	Data Aquired From:	Vintage
DAB - Arrow Boundary	MOF	Per Wallenius - ILMB	Updated version from MOF created Spring 2006
DWL - Williams Lake (DQU & DCC - Quesnel and Central Cariboo)	MOF	Mark McGirr - ILMB	DRAFT ONLY
DCO - Columbia	MOF	Per Wallenius - ILMB	Current to Dec 31, 2004 but database standardized Feb 2006. Metadata states that update is pending (Val Beard, MOF)….
DRV - Robson Valley	MOF	Steve Kachanoski - ILMB	Jan 2003
SIR - Southern Interior Region (DKA, DCW, DOS - Kamloops, Clearwater, Okanagan Shuswap)	MOF	Steve Kachanoski - ILMB	Covers SIR area - June 2005
DMH - 100 Mile House	MOF	Steve Kachanoski - ILMB	Kamloops Data Warehouse Metadata states - Year Unknown
DKL - Kootenay Lake	MOF	Per Wallenius - ILMB	Current to summer 2005 but database standardized Feb 2006. Metadata states that update is pending (Dale Anderson, MOF)….
DPG - Prince George	MOF	Deanna Leask - MOF	Oct 2005
DRM - Rocky Mountain	MOF	Per Wallenius - ILMB	MOF created Aug. 2005 (Interior Reforestation) - spring 2006 - added/updated Park, TFL, TSA boundaries within dataset

Appendix 2: Caribou Habitat Management Data Used for Status Quo Determination

One of the goals of this project is to broadly estimate the implications of mountain caribou recovery options on forest management unit timber supply. However, in some timber management units, the caribou habitat management data that was used as a management objective in the last timber supply review is disparate from what is used to direct contemporary current timber management. The following table identifies data used to define status quo caribou habitat management as well as data used in the last timber supply review.

Table 1. Summary of mountain caribou management by management unit.

Management Unit	**Forest District**	**HLP or LRMP[17]**	**UWR Order[18]**	**WHA[19]**	**Information Considered in Last Rationale[20]**	**MC Planning Units that intersect MU**	**Data Used to Define Status Quo**
Arrow TSA	Arrow-Boundary	KBHLPO-04 2005			Current	1A, 2A, 2B	KBLUP, RMAC, OSLRMP
Cranbrook TSA	Rocky Mountain	KBHLPO-04 2005			Current	1B	KBLUP(spatial and aspatial objectives)
Golden TSA	Columbia	KBHLPO-04 2005			Older	3B	Spatial Deployment of Old and Mature KBLUP objectives

[17] KHLPO-04 2005 Kootenay Boundary Higher Level Plan Order Variance 4 March 2005; OSLRMP 2000 Okanagan Shuswap Land Resource Management Plan as approved September 9, 2000; PGLRMP Prince George Land Resource Management Plan as approved January 1999; CCLUP HP 1996 Cariboo-Chilcotin Land-Use Plan Higher Level Plan as per government intent of January 23, 1996; RHLPO 2005Revelstoke Higher Level Plan Order dated March 25, 2005.; RVLRMP 1999 Robson Valley Land Resource Management Plan approved April 30, 1999; KHLPO Amend 2006 – Kamloops Higher Level Plan as amended January 23, 2006

[18] Ungulate Winter Range Orders: OS UWR 2006 = #U-8-004; PG UWR 2006 = #U-7-003; RV UWR 2006 = #U-7-003

[19] Wildlife Habitat Areas: CCLUP WHA 2005 – WHA #5-088 to 5-117.

[20] Information is considered to be "current" if the chief forester recognized the current mountain caribou management requirements or "consistent" if recognized management requirements that would from a timber supply perspective be similar with the current requirements. This assessment is based on the information available at time of latest rationale. The associated timber supply analysis may have used older information.

Invermere TSA	Rocky Mountain	KBHLPO-04 2005			Current	1B	KBLUP(spatial and aspatial objectives)
Kamloops TSA	Kamloops & Headwaters	KLRMPO 2006			Consistent	4A	Spatial Deployment of Old and Mature KLRMP objectives
Kootenay Lake TSA	Kootenay Lake	KBHLPO-04 2005			Older	1A,1B,2B	KBLUP(spatial and aspatial objectives)
Okanagan TSA	Okanagan Shuswap	OSLRMP 2000	OS UWR 2006		Consistent	2A,3A	Spatial Deployment of Old and Mature OSLRMP objectives
Prince George TSA	Prince George, Fort St. James, Vanderhoof	PGLRMP 1999	PG UWR 2006		Consistent	5A,6	UWR (caribou) Order
Quesnel TSA	Quesnel	CCLUP HP 1996		CCLUP WHA 2005	Consistent	5A,5B	UWR (caribou) Order
Revelstoke TSA	Columbia	RHLPO 2005			Consistent	3A	Spatial Deployment of Old and Mature RMAC objectives
Robson Valley TSA	Headwaters	RVLRMP 1999	RV UWR 2006		Current	4B,5A,5B,6	UWR (caribou) Order
Williams Lake TSA	Central Cariboo, Chilcotin	CCLUP HP 1996		CCLUP WHA 2005	Current	5B	CCLUP, UWR (caribou) Order
100 Mile House TSA	100 Mile House	CCLUP HP 1996		CCLUP WHA 2005	Current	5B	CCLUP, UWR (caribou) Order
TFL 14 (Tembec)	Rocky Mountain	KBHLPO-04 2005			Consistent	2B	KBLUP(spatial and aspatial objectives)
TFL 23 (P&T)	Arrow-Boundary	KBHLPO-04 2005			Older	2B	KBLUP(spatial and aspatial objectives)
TFL 30 (Canfor)	Prince George	PGLRMP 1999	PG UWR 2006		Consistent	6	UWR (caribou) Order
TFL 33 (Fed. Coop)	Okanagan Shuswap	OSLRMP 2000	OS UWR 2006		Older	3A	Spatial Deployment of Old and Mature OSLRMP objectives
TFL 52 (West Fraser)	Quesnel	CCLUP HP 1996		CCLUP WHA 2005	Current	5A,5B	UWR (caribou) Order
TFL 55 (LP)	Columbia	RHLPO 2005			Older	3A	Spatial Deployment of Old and Mature

							RMAC objectives
TFL 56(RCFC)21	Columbia	RHLPO 2005			Consistent	3A	Spatial Deployment of Old and Mature RMAC objectives

Appendix 3 Timber Harvesting Land Base (THLB) Datasets used for this Project

Timber Management Unit	MC Planning Units that intersect with MU	THLB Data Used
Arrow TSA	1A, 2A, 2B	2004 KBLUP Planning Datasets
Cranbrook TSA	1B	2005 KBLUP Planning Datasets
Kootenay Lake TSA	1A, 1B, 2B	2005 KBLUP Planning Datasets
Kamloops TSA	3A, 4A	2002 TSR2 Dissolved THLB dataset
Invermere TSA	1B	2005 KBLUP Planning Datasets
Revelstoke TSA	2A, 3A	2005 KBLUP Planning Datasets
Golden TSA	3A, 3B	2005 KBLUP Planning Datasets
Okanagan TSA	2A, 3A	June 2001 TSR2 dataset for the Okanagan
Robson Valley TSA	3A, 4B, 5A, 5B, 6	2002 TSR Dissolved THLB dataset
Williams Lake TSA	5B	2003 CCLUP Dissolved Dataset
Quesnel TSA	5A, 5B	2003 CCLUP Dissolved Dataset
Prince George TSA	5A, 6	2004 TSR Dissolved Dataset
100 Mile House TSA	5B	2003 CCLUP Dissolved Dataset
TFL 23 (P&T)	2A, 2B	2004 KBLUP Planning Datasets
TFL 55 (LP)	3A, 3B	2005 KBLUP Planning Datasets

TFL 56 (RCFC)	3A, 3B	THLB Surrogate - Forested Area below operability line minus OGMAs
TFL 52 (West Fraser)	5A, 5B	THLB used for 2005 MOFR Timber Reallocation Project
TFL 30 (Canfor)	6	THLB used for 2005 MOFR Timber Reallocation Project
TFL 33 (Canoe)	3A	June 2001 TSR2 dataset for the Okanagan
TFL 14 (Tembec)	2B	2002 KBLUP Planning Datasets

Appendix 4 Phase 2 Results from November 2006

Timber Management Unit	Timber Operator	Gross Status Quo Habitat Management Area (ha)	Gross Proposed Recovery Area (ha)	Increase in Gross Area with Recovery Option (ha)	Increase in Gross Area with Recovery Option (%)	Incremental THLB over Status Quo Management (ha)	Incremental MAI over Status Quo Management (m3/yr)	Proportion of MU Incremental THLB Impact
Prince George TSA	BCTS	65401.4	65759.1	357.7	0.5%	66.1	145.6	1.53%
	Canfor	236704.0	241722.7	5018.7	2.1%	2,496.5	4,324.7	57.93%
	Carrier Lumber Ltd.	38008.1	43470.7	5462.6	14.4%	1,649.5	2,906.5	38.28%
	Existing Volume	70838.7	70956.3	117.6	0.2%	33.5	51.0	0.78%
	Lakeland Mills Ltd.	5878.7	5878.7	0.0	0.0%	0.0	0.0	0.00%
	Native	8683.6	8683.6	0.0	0.0%	0.0	0.0	0.00%
	Winton Global	33600.5	33742.7	142.3	0.4%	63.6	91.0	1.48%
TFL 30	Unspecified Operator (Canfor)	10876.6	11586.8	710.2	6.5%	331.7	621.0	100.00%
TFL 30	Canfor	57.3	57.4	0.0	0.0%	0.0	0.0	

Timber Management Unit	Timber Operator	Gross Status Quo Habitat Management Area (ha)	Gross Proposed Recovery Area (ha)	Increase in Gross Area with Recovery Option (ha)	Increase in Gross Area with Recovery Option (%)	Incremental THLB over Status Quo Management (ha)	Incremental MAI over Status Quo Management (m3/yr)	Proportion of MU Incremental THLB Impact
Quesnel TSA	Unspecified Operator	24,835.4	32,192.9	7,357.5	29.6%	5,436.2	10,063.8	85.87%
	Big Valley	8.5	12.9	4.4	51.5%	2.7	3.6	0.04%
	Little Swift	19.5	1,079.5	1,060.0	5429.1%	891.8	1,501.5	14.09%
TFL 52	West Fraser	27569.2	36265.8	8696.6	31.5%	7209.9	11778.4	78.46%
TFL 52	Big Valley	1,682.5	3,902.2	2,219.7	131.9%	1,978.9	2,949.1	21.54%
TFL 52	Cariboo Lake	0.0	3.7	0.0	0.0%	0.0	0.0	0.00%
TFL 52	Little Swift	0.0	308.9	0.0	0.0%	0.0	0.0	0.00%
Williams Lake TSA	Unspecified Operator	128,136.8	171,552.5	43,415.7	33.9%	18,158.5	37,916.7	80.89%
	Cariboo Lake	648.1	3,530.4	2,882.3	444.7%	1,569.3	2,581.2	6.99%
	Little River	1.8	378.1	376.3	20575.8%	188.1	346.7	0.84%
	Quesnel Lake	1,044.7	4,377.0	3,332.3	319.0%	2,533.2	6,523.7	11.28%
	WELDWOOD	21.0	24.0	3.0	14.5%	0.1	0.1	0.00%
100 Mile House TSA	Unspecified Operator	84.9	98.9	14.1	16.6%	8.2	11.7	9.14%
	WELDWOOD	19,267.3	20,134.6	867.3	4.5%	81.5	152.5	90.86%
Robson Valley TSA								
Hart Herds	Community Forest	17724.4	17724.4	0.0	0.0%	0.0	0.0	0.00%
	McBride Forest Ind.	12147.7	12232.0	84.2	0.7%	4.2	4.4	0.28%
	Slocan	4016.2	4155.7	139.5	3.5%	0.8	0.9	0.05%

Timber Management Unit	Timber Operator	Gross Status Quo Habitat Management Area (ha)	Gross Proposed Recovery Area (ha)	Increase in Gross Area with Recovery Option (ha)	Increase in Gross Area with Recovery Option (%)	Incremental THLB over Status Quo Management (ha)	Incremental MAI over Status Quo Management (m3/yr)	Proportion of MU Incremental THLB Impact
Robson Valley TSA								
Upper Fraser Herds	BCTS	677.6	1,026.6	349.0	51.5%	45.2	52.2	2.96%
	Community Forest	9,716.0	10,503.3	787.3	8.1%	338.9	491.3	22.20%
	McBride Forest Ind.	51,951.0	59,340.9	7,390.0	14.2%	1,137.5	1,687.8	74.51%
Robson Valley TSA								
Quesnel Highland Herds	Unspecified Operator	10.8	10.8	0.0	0.0%	0.0	0.0	0
	McBride Forest Ind.	0.0	19.0	0.0	0.0%	0.0	0.0	0
Kamloops TSA	BCTS	6,446.63	27,030.51	20,583.88	319.30	8,389.32	16,217.92	13.40%
	CANFOR	10,849.15	42,482.44	31,633.29	291.57	15,983.95	32,384.30	25.53%
	Gilbert Smith Forest Products Ltd.	3,245.99	14,839.99	11,594.00	357.18	4,629.21	6,226.80	7.39%
	International Forest Products Ltd.	0.00	18.73	18.73	0.00	15.26	36.79	0.02%
	Weyerhaeuser Company Ltd.	23,189.17	85,945.05	62,755.88	270.63	33,583.02	71,286.96	53.65%

Timber Management Unit	Timber Operator	Gross Status Quo Habitat Management Area (ha)	Gross Proposed Recovery Area (ha)	Increase in Gross Area with Recovery Option (ha)	Increase in Gross Area with Recovery Option (%)	Incremental THLB over Status Quo Management (ha)	Incremental MAI over Status Quo Management (m3/yr)	Proportion of MU Incremental THLB Impact
Golden TSA	To be determined (ALTS Rev-Shu)							
Revelstoke TSA	To be determined (ALTS Rev-Shu)							
TFL 55	To be determined (ALTS Rev-Shu)							
TFL 56	To be determined (ALTS Rev-Shu)							
Okanagan TSA	To be determined (ALTS Rev-Shu)							
TFL 33	To be determined (ALTS Rev-Shu)							
TFL 23								
Central Sekirk Herds	**Incremental impact for ALTS option in Central Selkirk was proportionally distributed amongst timber operators**							
		Zone 2 H+M Area	**Zone 2 H+M Percentage**					
	BC Timber Sales	19,547.0	0.1357			2410.61	7059.60	29.18%
	Pope and Talbot Ltd. - TFL23	47,450.3	0.3294			5851.75	17137.19	70.82%
	Springer Creek Forest Products	1.1	0.0000			0.13	0.38	0.00%

Timber Management Unit	Timber Operator	Gross Status Quo Habitat Management Area (ha)	Gross Proposed Recovery Area (ha)	Increase in Gross Area with Recovery Option (ha)	Increase in Gross Area with Recovery Option (%)	Incremental THLB over Status Quo Management (ha)	Incremental MAI over Status Quo Management (m3/yr)	Proportion of MU Incremental THLB Impact
TFL 23								
South Monashee Herd	Status Quo Habitat Management with Draft Option							
Arrow TSA								
South Selkirk Herd	Atco Lumber Ltd.	0.6	243.2	242.6	40433.3%	111.2	190.0	0.77%
	BC Timber Sales	15,054.9	16,383.2	1,328.3	8.8%	388.1	1,126.3	2.70%
	Private	782.7	875.6	92.9	11.9%	0.0	0.0	n\a
	Unallocated	0.0	119.5	0.0	0.0%	0.0	0.0	0.00%
Arrow TSA								
Central Sekirk Herds	**Incremental impact for ALTS option in Central Selkirk was proportionally distributed amongst timber operators**							
		Zone 2 H+M Area	**Zone 2 H+M Percentage**					
	BC Timber Sales	5989.66678	0.04157421			645.71	1686.94	14.24%
	Private	82.7865	0.00057462			n\a	n\a	n\a
	Springer Creek Forest Products Ltd.	34103.12087	0.236709382			3676.46	9604.85	81.09%
	Unallocated	195.88361	0.001359626			21.12	55.17	0.00%
	Woodlot	502.39509	0.003487119			54.16	141.50	1.19%

Timber Management Unit	Timber Operator	Gross Status Quo Habitat Management Area (ha)	Gross Proposed Recovery Area (ha)	Increase in Gross Area with Recovery Option (ha)	Increase in Gross Area with Recovery Option (%)	Incremental THLB over Status Quo Management (ha)	Incremental MAI over Status Quo Management (m3/yr)	Proportion of MU Incremental THLB Impact
Kootenay Lake TSA								
South Selkirk Herd	Harrop-Proctor Community Forest License	3,080.5	4,402.8	1,322.3	42.9%	1,046.5	2,627.4	5.57%
	JH Huscroft Ltd.	25,863.4	31,398.9	5,535.5	21.4%	3,561.7	8,106.5	18.94%
	Kalesnikoff Lumber Co. Ltd.	1,640.5	1,993.6	353.1	21.5%	71.0	164.5	0.38%
	Park	26.8	208.5	181.7	678.5%	0.3	0.8	0.00%
	Private (Darkwoods)	186.6	42,551.3	42,364.7	22700.2%	15.2	45.1	N\A
Kootenay Lake TSA								
South Purcell Herd	BC Timber Sales	4,279.9	6,891.6	2,611.7	61.0%	184.0	323.4	0.98%
	Creston Valley Forest Corperation	1,092.8	1,195.6	102.8	9.4%	75.9	174.8	0.40%
	JH Huscroft Ltd.	4,655.8	5,166.3	510.5	11.0%	88.3	197.3	0.47%
	Park	13.8	16.8	3.0	22.0%	0.0	0.0	0.00%
	Tembec Industries Inc.	14,575.8	16,906.7	2,330.9	16.0%	899.7	1,951.6	4.79%
	Wynndel Box and Lumber Co.	9,486.1	10,450.2	964.1	10.2%	479.3	1,007.2	2.55%
Kootenay Lake TSA								
Central Sekirk Herds	Continued next page							

Timber Management Unit	Timber Operator	Gross Status Quo Habitat Management Area (ha)	Gross Proposed Recovery Area (ha)	Increase in Gross Area with Recovery Option (ha)	Increase in Gross Area with Recovery Option (%)	Incremental THLB over Status Quo Management (ha)	Incremental MAI over Status Quo Management (m3/yr)	Proportion of MU Incremental THLB Impact
Kootenay Lake TSA								
Central Sekirk Herds	**Incremental impact for ALTS option in Central Selkirk was proportionally distributed amongst timber operators**							
		Zone 2 H+M Area	**Zone 2 H+M Percentage**					
	BC Timber Sales	11,414.5	0.0792			2235.82	5728.89	20.79%
	Goose Creek Lumber Ltd.	1.8	0.0000			0.36	0.92	0.00%
	Meadow Creek Cedar Ltd.	19,699.5	0.1367			3858.66	9887.11	35.88%
	Unallocated	5,079.5	0.0353			994.95	2549.38	9.25%
Cranbrook TSA	Baribeau Redding	2,877.1	3,506.1	629.0	21.9%	13.3	25.6	1.37%
	Galloway Lumber Company Ltd.	3,600.7	3,600.7	0.0	0.0%	0.0	0.0	0.00%
	Lamb / Swansea / Lumberton	2,196.7	2,196.7	0.0	0.0%	0.0	0.0	0.00%
	Lamb Fire	810.3	971.3	160.9	19.9%	106.2	158.8	10.93%
	Lumberton	176.8	176.8	0.0	0.0%	0.0	0.0	0.00%
	Mark	2,943.9	2,943.9	0.0	0.0%	0.0	0.0	0.00%
	Moyie	6,339.1	6,728.3	389.2	6.1%	297.6	665.4	30.63%
	Perry	501.4	501.4	0.0	0.0%	0.0	0.0	0.00%
	Tembec Industries Inc.	45,074.7	48,862.3	3,787.6	8.4%	554.6	1,206.2	57.08%
	White	4,123.6	4,811.6	688.0	16.7%	0.0	0.0	0.00%

Timber Management Unit	Timber Operator	Gross Status Quo Habitat Management Area (ha)	Gross Proposed Recovery Area (ha)	Increase in Gross Area with Recovery Option (ha)	Increase in Gross Area with Recovery Option (%)	Incremental THLB over Status Quo Management (ha)	Incremental MAI over Status Quo Management (m3/yr)	Proportion of MU Incremental THLB Impact
Invermere TSA	BC Timber Sales 06	0.0	0.0	0.0	0.0%	0.0	0.0	0.00%
	None	0.0	0.0	0.0	0.0%	0.0	0.0	0.00%
	Tembec Industries Inc.	11,471.1	11,471.1	0.0	0.0%	0.0	0.0	0.00%

Appendix 5 AAC and Base Case Timber Supply Information within Mountain Caribou Recovery Area

Management Unit	Determination or Postponement Date	Current AAC	Harvest Flow Pattern[22]	% pine vol23	Decade Existing = Managed[24]	Comment Latest Rationale in relation to harvest flow[25]	Next Determination
Arrow TSA	01-Jul-05	550,000		15	7	2005: Slight difference from KBHLPO not considered significant	2010
Cranbrook TSA	01-Nov-05	974,000		46	6	2005: Decision upward on base to reflect KBHLPO-04.	2010
Golden TSA	01-Jun-04	485,000		13	7	2004 Rationale: AAC is 8% lower than modelled initial harvest level	2009
Invermere TSA	01-Nov-05	598,570		36	4	2005 Rationale: Accept KHLPO var 4 as current practi ce.	2010
Kamloops TSA	01-Jan-04	4,352,770		28	6	2004 Rationale: Fire and beetle uplift. This is above initial level shown in 2001 base case 2003 Rationale: Base case level upward and downward pressures balanced.	2007
Kootenay Lake TSA	01-Jan-02	681,300		21	8	2002: Identifies KBLUP considered except partial harvest	2007
Okanagan TSA	01-Jan-06	3,375,000		26	8	2006: Beetle uplift brought AAC level above initial level as such likely some mid-term lowering.	2011
Prince George TSA	01-Oct-04	14,944,000		32[26]	9	2004 Rationale: Increased AAC for MPB infestation. Base case reasonably reflects current knowledge.	2008

[22] harvest flow pattern of the "base case" management identified in the timber supply review. The base case is a harvest flow selected by the analyst to represent current practice and standard harvest flow objectives. The decision maker uses the base case for a reference but it is not the allowable cut determination.

[23] Based on % inventory pine volume summary produced about 2005.

[24] The decade where managed stands become equal or greater than 50% of the harvested volume. This value is dependent on short-term harvest levels.

[25] The chief forester's AAC decision identifies differences from assumptions modelled under the base case. This column provides some indication of significant differences from the base case and the chief forester's determination.

[26] Percent reported is for Prince George Forest District only.

Quesnel TSA	01-Oct-04	5,280,000		68	n/a	2004 Rationale: Beetle uplift. Concern about mid-term.	2008
Revelstoke TSA	01-Sep-05	230,000		1	7	TSR3 Rationale: AAC at base case initial level	2010
Robson Valley TSA	04-Aug-06	536,000		12	13	TSR3 2006: Reduced former AAC (which was modelled in base) about 3%	2011
Williams Lake TSA[27]	01-Jan-03	3,768,400		54	TSR3: n/a; TSR2: 8	2006 det meeting: Harvest expected to focus on pine first decade 2001 Rationale: AAC reflects initial base case level	2006
100 Mile House TSA[28]	06-Sep-06	2,000,000		53	TSR3 n/a: TSR2: 9	2006 Rationale: Harvest expected to focus on pine first decade.	2011
TFL 14 (Tembec)	15-Jul-05	160,000		69	n/a	2005 Postponement:Kept AAC at 160000. Rationale 2001: Revised base case analysis starts at 155000	2007
TFL 23 (P&T)	16-Oct-02	680,000		24	n/a	2002 Postponement: Felt slight changes since 1999 would not affect timber supply 1999 Rationale: Initial base case level same as AAC	2007
TFL 30 (Canfor)	01-Jul-03	330,000		9	n/a	2003 Rationale: Believed base case within initial harvest 285,000 (vs previous AAC of 350,000) more constrained due to patch size target modelling	2008
TFL 33 (Fed. Coop)	16-Dec-05	21,000		17	n/a	2000 Rationale: Used the:LRMP" run as base where visuals relaxed but still sensitive to changes in forest cover constraints.	2010
TFL 52 (West Fraser)	01-Jan-03	570,000		52	n/a	2003 Rationale: Did not accept initial harvest level of 596900 modelled. in base case. Recognized salvage opportunities within non harvest zones	2007
TFL 55 (LP)	18-Apr-01	90,000		1	6	2006 TSR analysis: Suggests base case in line	2006
TFL 56 (RCFC)	13-Dec-05	100,000		0	7	2005 Postponement: Noted little risk based on new information but will need to reconsider when mountain caribou planning work completed. 2001 Rationale: AAC remained same	2011

[27] TSR2 harvest flow shown
[28] TSR2 harvest flow shown