

Implementation Plan for the Ongoing Management of Boreal Caribou (*Rangifer tarandus caribou* pop. 14) in British Columbia



Prepared by Ministry of Environment



2011

About British Columbia Implementation Plans

The Province prepares implementation plans to meet its commitments to manage and/or recover species at risk under the *Accord for the Protection of Species at Risk in Canada*, and the *Canada - British Columbia Agreement on Species at Risk*. Species at risk management and/or recovery is the process by which the decline of an endangered, threatened, or extirpated species is reduced, arrested, or reversed, and threats are removed or reduced to improve the likelihood of a species' persistence in the wild.

What is an implementation plan?

An implementation plan outlines the response of the provincial government to the need to manage species at risk for which management and/or recovery in British Columbia may have significant socio-economic implications. Implementation plans guide and prioritize management actions that are required to meet objectives and goals identified through government decisions. Such government decisions are informed by science and technical information, but are also made with consideration of socio-economic factors.

What's next?

Directions set out in this implementation plan are intended to involve governments, communities, land users, and other interested parties in cost-effective implementation of conservation activities that build towards managing and/or recovering the species.

For more information

To learn more about species at risk recovery in British Columbia, please visit the Ministry of Environment Recovery Planning webpage at:

<<http://www.env.gov.bc.ca/wld/recoveryplans/rcvry1.htm>>

To learn more about the British Columbia Conservation Framework, please visit the Ministry of Environment Conservation Framework webpage at:

< <http://www.env.gov.bc.ca/conservationframework/>>

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<<http://www.env.gov.bc.ca/wld/recoveryplans/rcvry1.htm>>

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Preface

This implementation plan outlines the direction provided by the government of British Columbia to manage Boreal Caribou in British Columbia. This direction reflects the potentially significant socio-economic implications associated with management of this species. The Ministry of Environment, as the agency responsible for species at risk policy and planning in British Columbia, developed this plan with support from other British Columbia government agencies. The Ministry of Forests, Lands and Natural Resource Operations is charged with leading implementation activities to meet government's commitments for the management of Boreal Caribou. This plan identifies the responsible agencies and organizations involved in delivering government's management actions for Boreal Caribou in British Columbia.

This document identifies the management actions that are deemed necessary, based on the best available scientific and technical information and considering socio-economic values, to decrease the expected rate of decline in the Boreal Caribou population and significantly reduce the risk of Boreal Caribou extirpation in the Calendar, Chinchaga, Maxhamish, and Prophet ranges within 50 years. Implementation of the management actions to achieve the goals and objectives identified herein are subject to the priorities and budgetary constraints of participatory agencies and organizations. It may also be necessary to modify these actions while respecting their intent, to accommodate new science resulting from effectiveness monitoring of management actions and continuing research on habitat associations, to address socio-economic objectives in Boreal Caribou management, and/or to meet direction provided by the government of British Columbia.

Success in the management of this species depends on the commitment and cooperation of many different parties that may be involved in implementing the directions set out in this plan. The Province of British Columbia encourages all Canadians to participate in the conservation of Boreal Caribou.

ACKNOWLEDGEMENTS

The Ministry of Environment thanks staff from the Ministries of Environment; Energy and Mines; Forests, Lands and Natural Resource Operations; and the Oil and Gas Commission for constructive input in the development of earlier drafts of this implementation plan. Chris Pasztor and Leah Westereng (B.C. Ministry of Environment) prepared this document.

EXECUTIVE SUMMARY

Boreal Caribou (*Rangifer tarandus caribou* pop. 14) was designated as Threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in May 2002. As a result, the population was listed as Threatened in Canada on Schedule 1 of the *Species at Risk Act* (SARA). In British Columbia, Boreal Caribou is ranked S2 (imperiled) by the Conservation Data Centre and is on the provincial Red List. The British Columbia Conservation Framework ranks Boreal Caribou as a priority 1 under goal 3 (maintain the diversity of native species and ecosystems).

In British Columbia, approximately 1300¹ Boreal Caribou currently reside in the northeast of the province within 15 Core Habitat areas among six ranges: Calendar, Chinchaga, Maxhamish, Parker, Prophet, and Snake-Sahtaneh. Boreal Caribou in B.C. are contiguous with Boreal Caribou populations in Alberta and Northwest Territories, as individuals move across these jurisdictional boundaries.

Boreal Caribou require large areas of contiguous habitat to avoid predators. Indirect effects from habitat loss, fragmentation, and alteration primarily due to human activities, and direct effects from predation, have threatened the functionality of Boreal Caribou habitat and the population within B.C. The government of British Columbia has identified management actions to address these threats while recognizing the potentially significant socio-economic implications associated with management of Boreal Caribou. Management actions to address these threats are presented in this document.

The following population and distribution goals identified by the government of British Columbia will guide implementation efforts within the province:

1. to decrease the expected rate of decline in the Boreal Caribou population;
2. to significantly reduce the risk of Boreal Caribou extirpation in the Calendar, Chinchaga, Maxhamish, and Prophet ranges within 50 years;

The following implementation objectives provide measurable targets for action and evaluation:

1. protect sufficient Boreal Caribou habitat,² to provide the opportunities to recover populations in all six ranges within 50 years;
2. recruit capable Boreal Caribou habitat into a suitable condition by undertaking restoration activities in the Chinchaga, Parker, Prophet, and Snake-Sahtaneh ranges;
3. in all six ranges, manage the size of the industrial footprint by protecting habitat from industrial activities and require industry standard management practices that minimize surface footprint and preserves caribou habitat;
4. in all six ranges, mitigate the effects of the industrial footprint by reducing predators and managing habitat conditions through fire suppression; and

¹ The Boreal Caribou population estimate is 1290–1340 (Ministry of Environment 2010a).

² Protection can be achieved through various mechanisms including: voluntary stewardship agreements, conservation covenants, sale by willing vendors on private lands, land use designations, and protected areas.

5. monitor the effectiveness of management actions within all range areas and modify actions accordingly to ensure population and distribution goals are being achieved.

The goals and objectives of this implementation plan are intended to maximize conservation efforts to benefit Boreal Caribou and support future recovery efforts while providing resource development opportunities. This vision provides certainty in maintaining socio-economic and environmental values, which are important to the people of British Columbia and the global community as a whole.

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1 SCOPE OF THE IMPLEMENTATION PLAN

This implementation plan is limited to the Boreal Caribou that are found in British Columbia and represents direction provided by the Government of British Columbia to manage this population (see Section 3.2).

1.1 Associated Documents

This implementation plan was informed by the following technical information, and additional scientific information on the management of Boreal Caribou in British Columbia.

Goddard, A.D. 2009. Boreal Caribou in northeastern British Columbia. Biological rationale, data summary and literature review. B.C. Min. Environ., Fort St. John, BC. Peace Region Technical Report. 21 pp.

Ministry of Environment. 2010a. Science update for the Boreal Caribou (*Rangifer tarandus caribou* pop. 14) in British Columbia. Victoria, BC. 54 pp.

Thiessen, C. 2009. Peace Region Boreal Caribou monitoring: annual report 2008-09. B.C. Min. Environ., Fort St. John, BC. Peace Region Technical Report. 36 pp.

Wilson, S.F., C. Pasztor, and S. Dickinson. 2010. Projected Boreal Caribou habitat conditions and range populations for future management in British Columbia. Prepared for Ministry of Energy, Mines and Petroleum Resources and Ministry of Environment, Victoria, BC. 11 pp.

More information on Boreal Caribou and copies of these documents can be found at:

< <http://www.env.gov.bc.ca/wld/speciesconservation/bc/index.html> >

2 SUMMARY OF THE SCIENCE UPDATE

Only basic species assessment and status information are presented in this section. Please refer to Ministry of Environment (2010a) for more complete information about Boreal Caribou in British Columbia, including: estimated population size and distribution information within six range areas (Calendar, Chinchaga, Maxhamish, Parker, Prophet, Snake-Sahtaneh), habitat and biological needs, threats, existing management actions, and knowledge gaps regarding this species.

Note that Boreal Caribou is used as the naming convention throughout this document. This is synonymous with, but differs from, the English name, Caribou (boreal population), which is the provincial standard.

2.1 COSEWIC Species Assessment Information

* Common and scientific names reported in this document may be different from names reported by COSEWIC.

<p>Date of Assessment: May 2002</p> <p>*Common Name (population): Woodland Caribou (Boreal Population)</p> <p>*Scientific Name: <i>Rangifer tarandus caribou</i></p> <p>COSEWIC Status: Threatened (May 2002)</p> <p>Reason for Designation: A widespread population ranging across the boreal forests of northern Canada. Populations have decreased throughout most of the range. Threatened from habitat loss and increased predation, the latter possibly facilitated by human activities.</p> <p>Canadian Occurrence: BC, AB, SK, MB, ON, QC, NL, NT</p> <p>COSEWIC Status History: The Boreal population was designated Threatened in May 2000. This newly-defined population is comprised of a portion of the de-activated “Western population” and all of the de-activated “Labrador-Ungava population.” Status re-examined and confirmed in May 2002. The last assessment was based on an updated status report.</p>
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2.2 Species Status Information

Boreal Caribou ^a	
Legal Designation	
<u>Identified Wildlife:</u> ^b Yes (2004) <u>B.C. Wildlife Act:</u> ^c Schedule A <u>SARA Schedule:</u> 1 (2003)	
Conservation Status ^d	
B.C. List: Red B.C. Rank: S2 (2006) Global Rank: G5TNR	
<u>Subnational Ranks:</u> ^e AB: S2; Labrador: S2S3; MB: S4; NWT: SNR; ON: S3; QU: S2S3; SK: S3; YK: S1	
B.C. Conservation Framework (CF) ^f	
Goal 1: Contribute to global efforts for species and ecosystem conservation.	Priority: ^g 3 (2010)
Goal 2: Prevent species and ecosystems from becoming at risk.	Priority: 6 (2010)
Goal 3: Maintain the diversity of native species and ecosystems	Priority: 1 (2010)
<u>CF Action Groups:</u>	Planning; List under <i>Wildlife Act</i> ; Send to COSEWIC; Habitat Protection; Habitat Restoration; Species and Population Management; Review Resource Use

^a Data source: B.C. Conservation Data Centre (2010) unless otherwise noted.

^b Identified Wildlife under the *Forest and Range Practices Act*, which includes the categories of species at risk, ungulates, and regionally important wildlife (Province of British Columbia 2002).

^c Schedule A = Designated as wildlife under the B.C. *Wildlife Act* which offers it protection from direct persecution and mortality (Province of British Columbia 1982).

^d S = Subnational; N = National; G = Global; T = infraspecific taxa (subspecies or varieties); B = Breeding; X = presumed extirpated; H = possibly extirpated; 1 = critically imperiled; 2 = imperiled; 3 = special concern, vulnerable to extirpation or extinction; 4 = apparently secure; 5 = demonstrably widespread, abundant, and secure; NA = not applicable; NR = unranked; U = unrankable.

^e Data source: NatureServe (2009).

^f Data source: Ministry of Environment (2010b).

^g Six-level scale: Priority 1 (highest priority) through to Priority 6 (lowest priority).

2.3 Populations and Distribution

Boreal Caribou in Canada occur in all provinces and territories except New Brunswick, Nova Scotia, Prince Edward Island, and Nunavut (Thomas and Gray 2002). This national population is

estimated at approximately 31,000–39,000, with approximately 1300³ individuals residing in British Columbia (Ministry of Environment 2010a).

In British Columbia, Boreal Caribou reside in the northeast of the province within 15 Core Habitat areas among six ranges: Calendar, Chinchaga, Maxhamish, Parker, Prophet, and Snake-Sahtaneh (Figure 1). Core Habitat areas have general habitat requirements such as treed peatlands, and terrestrial and arboreal lichen forage base, and are known to be used by Boreal Caribou through documented occurrences. Range areas are much larger than Core Habitats and based on known historical or current use, and also have resources to support the Boreal Caribou population. Boreal Caribou in B.C. are contiguous with Boreal Caribou populations in Alberta and Northwest Territories, as individuals move across these jurisdictional boundaries.

³ The Boreal Caribou population estimate is 1290–1340 (Ministry of Environment 2010a).

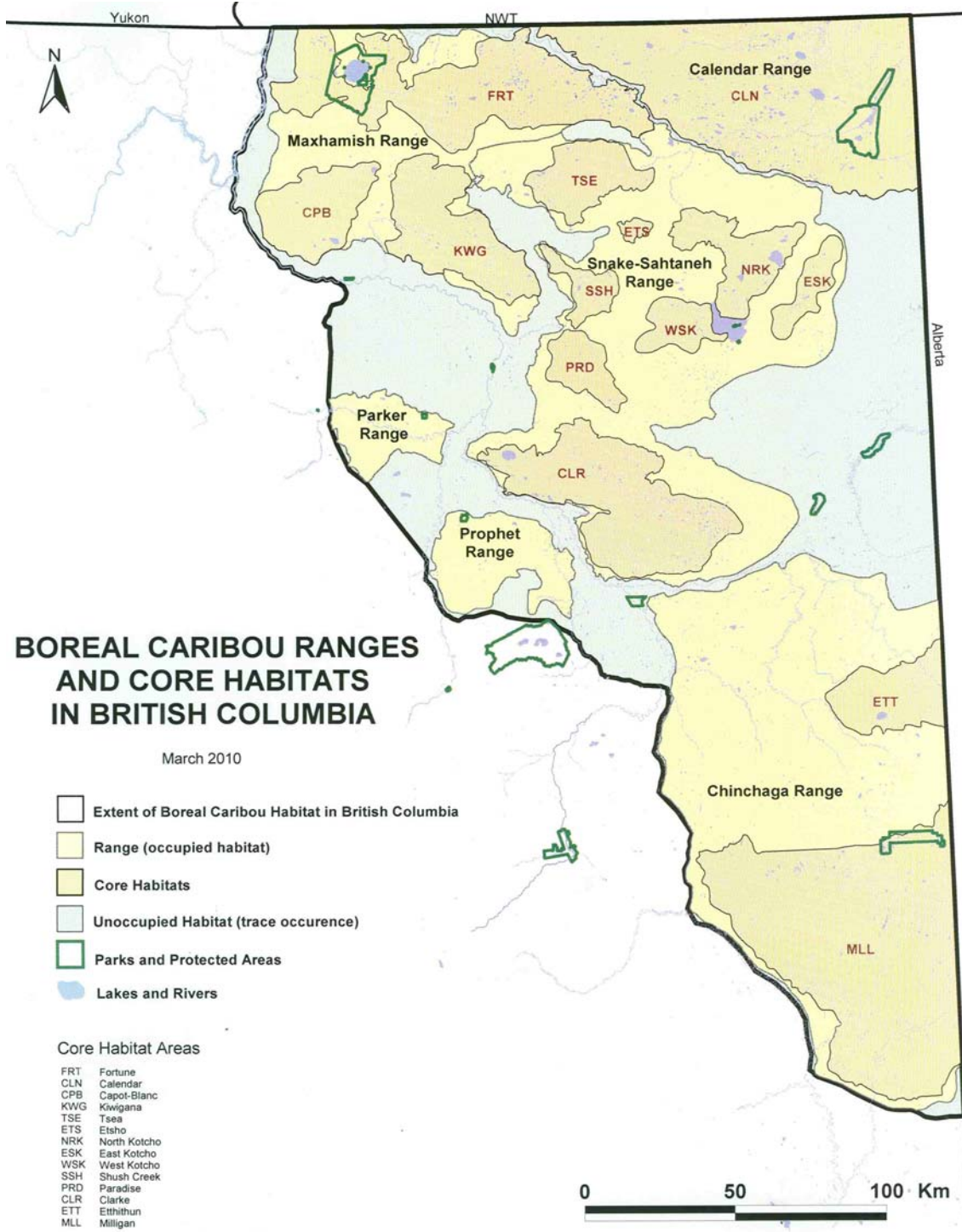


Figure 1. 2010 Boreal Caribou Ranges and Core Habitats in northeastern British Columbia (from Culling *et al.*, in prep.).

2.4 Threat Assessment

Threats for the Boreal Caribou were assessed for the entire province and are available in the *Science Update for the Boreal Caribou (Rangifer tarandus caribou pop. 14) in British Columbia* (Ministry of Environment 2010a).

3 IMPLEMENTATION ACTIONS

This implementation plan (e.g., population and distribution goals, habitat protection, threat mitigation, and other management actions) is influenced by past and current industrial activities, current resource development commitments, and future socio-economic considerations (e.g., future revenues from industrial development).

3.1 Population and Distribution Goals

The population and distribution goals of this implementation plan are:

1. to decrease the expected rate of decline in the Boreal Caribou population; and
2. to significantly reduce the risk of Boreal Caribou extirpation in the Calendar, Chinchaga, Maxhamish, and Prophet ranges within 50 years;

3.2 Rationale for the Population and Distribution Goals

It is believed that the population of Boreal Caribou in British Columbia is declining (Thiessen 2009; Ministry of Environment 2010a). This decline may be attributed to habitat loss, fragmentation and alteration, and increased predation, resulting in part from petroleum and natural gas activities, and to a lesser degree, previous forestry activities. The current level of forestry activity operating in Boreal Caribou ranges is low; however, > 75% of the Boreal Caribou range is tenured and being developed for petroleum and natural gas. Thiessen (2009) reported that this level of activity exceeds a disturbance threshold of 61% in 12 of 15 Core Habitat areas within the range of Boreal Caribou. The 61% disturbance threshold is a point where Boreal Caribou populations achieve negative population growth (*sensu* Sorensen *et al.* 2008). Given this, and not accounting for future petroleum and natural gas activities planned within the Boreal Caribou range, the population is likely to continue to decline.

To mitigate the continued decline and possible extirpation of Boreal Caribou in British Columbia, a provincial inter-agency technical team of biologists and land use analysts reviewed available data and research, and explore management options through a modeling exercise that estimated B.C.'s Boreal Caribou population within 50 years, or the expected development horizon of current petroleum and natural gas plays in the Boreal Caribou range (Wilson *et al.* 2010). The results of this analysis demonstrated that if no management actions were taken to protect Boreal Caribou and their habitat, the current population would decline and have a > 60% probability of becoming extirpated in all but one range within 50 years (Table 1). Conversely, if a full moratorium on petroleum and natural gas development was established over the range of Boreal Caribou, Boreal Caribou would still decline, but the probability of becoming extirpated was reduced to < 40% in

four of the six ranges (Table 1). A high probability (> 80%) of extirpation was estimated for two of the ranges (Parker and Snake-Sahtaneh), regardless of the modeled management scenario (Table 1; Wilson *et al.* 2010).

Table 1. Probability of Boreal Caribou extirpation by range within 50 years under certain management options.

Range area	Probability (%) of extirpation within 50 years		
	No management	Full moratorium on petroleum and natural gas	Provincial direction for management
Calendar	67.8	5.5	13.6
Chinchaga	83.5	2.8	24.5
Maxhamish	8.1	0	5.1
Parker	98.5	65.4	97.5
Prophet	99.1	35.9	27.5
Snake-Sahtaneh	95.0	42.6	83.6

In British Columbia, petroleum and natural gas development is an important and significant revenue stream to the provincial economy. In 2008/09, provincial royalty programs and natural gas stimulus packages generated \$2.3 billion in revenue, accounting for 60% of the total revenue generated by this resource sector, and approximately 6% of total government revenues. Additional royalty programs and natural gas stimulus packages introduced in 2009 are expected to increase tenure sales and subsequent investment in petroleum and natural gas development within northeast B.C. in 2010.

Given the potential impacts to provincial revenues from petroleum and natural gas development (e.g., forgone tenure sales and a delay of longer-term royalty streams) under defined management scenarios for Boreal Caribou, the B.C. government concluded that the most biological and economical feasible option in managing Boreal Caribou was to defer petroleum and gas tenure sales over a portion of the remaining untenured area in three (Calendar, Chinchaga, Prophet) of six ranges, and enable habitat restoration and other management actions across all Boreal Caribou ranges. This direction is expected to reduce the expected rate of decline in the Boreal Caribou population and significantly reduce the risk of Boreal Caribou extirpation in the Calendar, Chinchaga, Maxhamish, and Prophet ranges within 50 years compared to what would have been under a “no management” scenario (Table 1). Furthermore, this decision should ensure that Boreal Caribou are maintained within British Columbia to support future recovery efforts.

3.3 Implementation Objectives

The following implementation objectives provide measurable targets for action and evaluation:

1. protect sufficient Boreal Caribou habitat,⁴ to provide the opportunities to recover populations in all six range within 50 years;
2. recruit capable Boreal Caribou habitat into a suitable condition by undertaking restoration activities in the Chinchaga, Parker, Prophet, and Snake-Sahtaneh ranges;
3. in all six ranges, manage the size of the industrial footprint by protecting habitat from industrial activities and require industry standard management practices that minimize surface footprint and preserves caribou habitat;
4. in all six ranges, mitigate the effects of the industrial footprint by reducing predators and managing habitat conditions through fire suppression; and
5. monitor the effectiveness of management actions within all range areas and modify actions accordingly to ensure population and distribution goals are being achieved.

⁴ Protection can be achieved through various mechanisms including: voluntary stewardship agreements, conservation covenants, sale by willing vendors on private lands, land use designations, and protected areas.

3.4 Actions and Performance Measures

Table 2. Implementation actions for Boreal Caribou management. (See end of table for footnotes.) Note: Actions and timelines in this table may be modified based on the priorities and budgetary constraints of participatory agencies and organizations.

Threat ^a or concern addressed	Objective	Conservation Framework Action Group ^b	Priority ^c	Actions	Range	Performance measures ^d	Participating agencies ^e (lead agency is identified in bold)	Status ^f
All	1, 2, 3, 4	Planning	Beneficial	Develop cross-agency management teams, boards, and/or committees with associated roles and responsibilities to implement all aspects of management for Boreal Caribou.	All	Teams, boards, and/or committees with associated roles and responsibilities finalized by December 2010.	MFLNRO , MoE, MEM	In progress
All	1, 2, 3, 4	Planning	Beneficial	Develop a research and effectiveness monitoring board with associated roles and responsibilities to ensure government implementation goals and objectives are being achieved.	All	Board finalized by December 2010.	MFLNRO , MoE	In progress
Knowledge gap	4	Planning	Necessary	Determine Traditional Ecological Knowledge (TEK) related to historic and current distributions and populations of Boreal Caribou and other wildlife.	All	TBD ^g	MFLNRO	Not initiated

Threat ^a or concern addressed	Objective	Conservation Framework Action Group ^b	Priority ^c	Actions	Range	Performance measures ^d	Participating agencies ^e (lead agency is identified in bold)	Status ^f
All	4	Planning	Necessary	Develop an effectiveness monitoring strategy associated with management actions.	All	Strategy finalized by fall 2011.	MoE , MFLNRO	Not initiated
All	4	Planning	Necessary	Review Boreal Caribou population model to determine management action effectiveness.	All	Slower rate of predicted decline in the population of Boreal Caribou.	MoE	Not initiated
5.3	1	Habitat Protection	Essential	Establish ungulate winter ranges (UWR) and wildlife habitat areas (WHA) in the Fort Nelson Forest District under the <i>Forest and Range Practices Act</i> .	Calendar, Maxhamish, Parker, Prophet, and Snake-Sahtaneh	Approximately 1.5 million ha of UWR and approximately 275,000 ha WHAs.	MoE	Complete
5.3	1	Habitat Protection	Essential	Establish UWRs and WHAs in the Fort St. John Timber Supply Area under the <i>Forest and Range Practices Act</i> .	Chinchaga	Approximately 565,000 ha of UWRs and approximately 180,000 ha of WHAs.	MFLNRO	In progress
3.1, 3.2, 3.3	1	Habitat Protection	Essential	Establish UWRs and WHAs under the <i>Oil and Gas Activities Act</i> .	All	Approximately 2 million ha of UWRs and approximately 500,000 ha of WHAs.	MFLNRO	In progress

Threat ^a or concern addressed	Objective	Conservation Framework Action Group ^b	Priority ^c	Actions	Range	Performance measures ^d	Participating agencies ^e (lead agency is identified in bold)	Status ^f
3.1, 3.2, 3.3	1	Habitat Protection	Essential	Establish Resource Review Areas (RRAs).	Calendar	Approximately 211,000 ha of Core Habitat.	MEMPR , MoE	Completed June, 2010
					Chinchaga	Approximately 240,000 ha of Range Habitat.	MEMPR , MoE	Completed June, 2010
					Prophet	Approximately 100,000 ha of Core Habitat.	MEMPR , MoE	Completed June, 2010
3.1, 3.2, 3.3	1, 3	Habitat Protection	Essential	Develop an activity (e.g., pipeline, seismic, access) management strategy for RRAs.	Prophet, Chinchaga, and Calendar	Strategy approved by spring 2011.	MFLNRO , MoE, MEM, OGC	Not initiated
				Implement the activity management strategy for RRAs (see above).	Prophet, Chinchaga, and Calendar	TBD	MFLNRO	Not initiated
3.1, 3.2, 3.3	1, 3, 4	Habitat Protection	Necessary	Develop performance measures to determine the effectiveness of RRAs.	Prophet, Chinchaga, and Calendar	TBD	MoE , MFLNRO,	Not initiated
3.1, 3.2, 3.3, 5.3, Knowledge gap	1	Habitat Protection	Necessary	Develop a habitat suitability monitoring strategy to manage for future habitat conditions.	All	TBD	MFLNRO , MoE	Not initiated
				Implement a habitat suitability monitoring strategy to manage for future habitat conditions.	All	TBD	MFLNRO	Not initiated

Threat ^a or concern addressed	Objective	Conservation Framework Action Group ^b	Priority ^c	Actions	Range	Performance measures ^d	Participating agencies ^e (lead agency is identified in bold)	Status ^f
7.1	3	Habitat Protection	Necessary	Develop a fire response/suppression strategy to manage habitat conditions.	All	Strategy finalized by fall 2011.	MFLNRO	Not initiated
				Implement a fire response/suppression strategy to manage habitat conditions.	All	TBD	MFLNRO	Not initiated
3.1, 3.2, 3.3	3	Habitat Protection	Essential	Develop petroleum and natural gas industry standard operating and planning practices.	All	Practices finalized by December 2010.	MoE, MFLNRO, MEM, OGC	In progress
				Implement petroleum and natural gas industry standard operating and planning practices.	All	TBD	OGC	Not initiated
3.1, 3.2, 3.3, 5.3	2	Habitat Restoration	Essential	Develop a habitat restoration strategy.	Chinchaga, Parker, Prophet, and Snake-Sahtaneh	Finalized by fall 2011.	MFLNRO, MoE	Not initiated
				Implement a habitat restoration strategy.	Chinchaga, Parker, Prophet, and Snake-Sahtaneh	Increased amount of capable habitat recruited to suitable conditions.	MFLNRO	Not initiated

Threat ^a or concern addressed	Objective	Conservation Framework Action Group ^b	Priority ^c	Actions	Range	Performance measures ^d	Participating agencies ^e (lead agency is identified in bold)	Status ^f
Knowledge gap	4	Species and Population Management	Essential	Develop a Boreal Caribou population monitoring strategy.	All	Strategy complete by Jan. 2011.	MFLNRO , MoE	Not initiated
				Implement a Boreal Caribou population monitoring strategy.	All	Accurate Boreal Caribou population estimate.	MFLNRO	In Progress
8.2, Knowledge gap	3	Species and Population Management	Essential	Determine predation risk to Boreal Caribou.	All	TBD	MoE , University of Alberta	In Progress
				Determine the need and level of predator management.	All	TBD	MFLNRO , MoE	Not initiated
				Develop a predator management strategy if deemed necessary.	All	TBD	MFLNRO , MoE	Not initiated
				Implement a predator management strategy.	All	TBD	MFLNRO	Not initiated
8.2, Knowledge gap	3	Species and Population Management	Essential	Determine the need and level of alternate prey management.	All	TBD	MFLNRO , MoE	In Progress

Threat ^a or concern addressed	Objective	Conservation Framework Action Group ^b	Priority ^c	Actions	Range	Performance measures ^d	Participating agencies ^e (lead agency is identified in bold)	Status ^f
8.2, Knowledge gap	3	Species and Population Management	Essential	Develop alternate prey management strategy if deemed necessary.	All	TBD	MFLNRO , MoE	Not initiated
				Implement alternate prey management strategy.	All	TBD	MFLNRO	Not initiated

^a Threats are based on the [IUCN-CMP](#) unified threats classification system (see [CMP](#) 2010, Ministry of Environment 2010a).

^b This refers to the [B.C. Conservation Framework](#) action groups (Ministry of Environment 2010b). See Section 2.2 for action groups assigned to Boreal Caribou.

^c Essential (urgent and important); Necessary (important but not urgent); or Beneficial.

^d Performance measures for objectives and other implementation activities.

^e MoE = Ministry of Environment, MEMPR = Ministry of Energy, Mines, and Petroleum Resources (prior to 2011), MEM = Ministry of Energy and Mines, MFLNRO = Ministry of Forests, Lands and Natural Resource Operations, OGC = Oil and Gas Commission.

^f Status: Not initiated; In progress; Ongoing; Completed.

^g TBD = To be determined.

3.5 Narrative to Support Action and Performance Table

This section provides additional information to support the understanding of implementation actions identified in Table 2 for Boreal Caribou management.

Decreasing the expected rate of decline in the Boreal Caribou population and significantly reducing the probability of extirpation in the Calendar, Chinchaga, Maxhamish, and Prophet ranges in British Columbia may be achieved by protecting Boreal Caribou and their habitat from industrial activities, and managing the size and/or mitigating the effects of industrial footprint. Managing the size of the industrial footprint will include actions such as protecting habitat from industrial activities, changing practices associated with industrial activities, standardizing operating and planning practices associated with industrial activities, and restoring habitat disturbed by past industrial activities. Mitigating the effects of the industrial footprint may be achieved by reducing predators, managing habitat conditions through fire suppression, and requiring industry standard management practices that minimize surface footprint and preserves caribou habitat.

3.5.1 Habitat Protection

Protecting Boreal Caribou habitat from the impacts associated with petroleum and natural gas activities includes the deferral of petroleum and natural gas tenure sales over a portion of the remaining untenured area in the Calendar, Chinchaga, and Prophet ranges. The deferral areas will be in effect for five years and legally established as Resource Review Areas (RRAs) under the authority of the Ministry of Energy and Mines. The RRAs will be reviewed in five years to determine their effectiveness in supporting and achieving implementation plan goals for Boreal Caribou.

In addition to the establishment of RRAs, government will be implementing petroleum and natural gas standard operating and planning practices within identified Boreal Caribou habitat areas that are outside the RRA areas. The development of these practices is required to manage petroleum and natural gas activities to minimize the potential for disturbance and displacement of Boreal Caribou and to preserve Boreal Caribou habitat. Operating practices will be regulated under the *Oil and Gas Activities Act* and monitored to determine their effectiveness in protecting Boreal Caribou and the environment.

Protecting Boreal Caribou habitat from forestry activities associated with British Columbia *Forest Act* agreement holders includes establishing no harvest and no road building zones, and managing forestry lands that minimize impacts to Boreal Caribou and their habitat. Boreal Caribou habitat identified for forestry management will be established as Ungulate Winter Ranges (UWRs) and Wildlife Habitat Areas (WHAs) in all ranges under the authority of the Ministry of Environment.

3.5.2 Habitat Restoration

An essential component in mitigating the effects of past industrial activities on Boreal Caribou and their habitat is to restore capable habitat to more suitable habitat conditions. This action combined with areas deferred from tenure sale can have a considerable benefit in ensuring government goals are achieved. Habitat restoration activities are expected to be planned for specific areas within the Chinchaga, Parker, Prophet, and Snake-Sahtaneh ranges. Restoration activities may include treating contaminated areas (remediation), mounding to support tree seedling growth, tree planting with fertilizer bags, straight planting, fertilizer treatments, slash rollback, brush mat planting, and tree falling (physical blockage).

3.5.3 Species and Population Management

Given the various knowledge gaps associated with Boreal Caribou population dynamics, estimates, and trends, it is essential that species and population management occur across all ranges. Species and population management activities will include improving knowledge of Boreal Caribou population estimates and trends; improving knowledge of calving areas; improving knowledge of Boreal Caribou adult and calf survival; increasing calf survival, determining predation risk; and determining population distribution estimates, and trends of predators (e.g., wolves) and alternate prey of predators (e.g., moose).

3.5.4 Planning

A strategic and well-coordinated plan will be necessary to ensure management actions are coordinated and implemented efficiently across all ranges. This can be achieved by developing a formal governance structure where cross-agency representation oversees the delivery of implementation activities through specific teams, committees, and boards. The planning of implementation activities will be at the range level, governed and guided by associated Terms of References or Project Charters. The delivery of these activities, however, will be site specific or at local levels within associated ranges. The Ministry of Environment in collaboration with other provincial agencies will oversee the planning and implementation of Boreal Caribou management in B.C. However, this effort will only be successful with the support of other government agencies, First Nations, industry representatives, and the general public.

4 MONITORING

Monitoring associated with this plan will focus on the effectiveness of management actions in achieving population and distribution objectives and goals. This approach is expected to be structured through an adaptive management strategy to learn from the outcome of management actions.

5 EFFECTS ON OTHER SPECIES

Actions taken to protect and manage Boreal Caribou and their habitat from identified threats may have positive benefits for the protection of other species and their habitats within Boreal Caribou range. If it is determined that the actions taken to protect and manage Boreal Caribou are having adverse effects on other species and their habitats for which they may be a conservation concern (i.e., potential to be listed by the Conservation Data Centre as a conservation concern), these actions may be modified to address this concern.

6 REFERENCES

- B.C. Conservation Data Centre. 2010. BC Species and Ecosystems Explorer. B.C. Min. Environ., Victoria, BC. <<http://a100.gov.bc.ca/pub/eswp/>> [Accessed July 12, 2010]
- Conservation Measures Partnership. 2010. Threats taxonomy. <<http://www.conservationmeasures.org/initiatives/threats-actions-taxonomies/threats-taxonomy>> [Accessed July 12, 2010]
- Culling, D.E., B.A. Culling, C. Thiessen, M.R. Rowe, and R.J. Backmeyer. *In preparation*. Rationale for 2010 revised Boreal Caribou range and core habitat map. Prepared for B.C. Ministry of Environment, Fort St. John, BC.
- Goddard, A.D. 2009. Boreal Caribou in northeastern British Columbia. Biological rationale, data summary and literature review. B.C. Min. Environ., Fort St. John, BC. Peace Region Technical Report. 21 pp.
- Ministry of Environment. 2010a. Science update for the Boreal Caribou (*Rangifer tarandus caribou* pop.14) in British Columbia. Victoria, BC. 54 pp. <<http://www.env.gov.bc.ca/wld/recoveryplans/rcvry1.htm>> [Accessed September 2010]
- Ministry of Environment. 2010b. Conservation framework. B.C. Min. Environ., Victoria, BC. <<http://www.env.gov.bc.ca/conservationframework/index.html>> [Accessed July 12, 2010]
- NatureServe. 2009. NatureServe explorer: an online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, VA. <<http://www.natureserve.org/explorer>> [Accessed July 12, 2010]
- Province of British Columbia. 1982. Wildlife Act [RSBC 1996] c. 488. Queen's Printer, Victoria, BC. <http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_96488_01> [Accessed July 12, 2010]
- Province of British Columbia. 2002. Forest and Range Practices Act [RSBC 2002] c. 69. Queen's Printer, Victoria, BC. <http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_02069_01> [Accessed July 12, 2010]
- Sorensen, T., P.D. Mcloughlin, D. Hervieux, E. Dzus, J. Nolan, B. Wynes, and S. Boutin. 2008. Determining sustainable levels of cumulative effects for boreal caribou. *J. Wildl. Manage.* 72:900–905.
- Thiessen, C. 2009. Peace Region Boreal Caribou monitoring: annual report 2008–09. B.C. Min. Environ., Fort St. John, BC. Peace Region Technical Report. 36 pp.
- Thomas, D.C. and D.R. Gray. 2002. Update COSEWIC status report on the Woodland Caribou *Rangifer tarandus caribou* in Canada. Pages 41–42 in COSEWIC assessment and update status report on the Woodland Caribou *Rangifer tarandus caribou* in Canada. Committee on the Status of Endangered Wildlife in Canada, Ottawa, ON.
- Wilson, S.F., C. Pasztor, and S. Dickinson. 2010. Projected Boreal Caribou habitat conditions and range populations for future management in British Columbia. Prepared for Ministry of Energy, Mines and Petroleum Resources and Ministry of Environment, Victoria, BC. 11 pp.