

Uncertain Future



Woodland Caribou and Canada's Boreal Forest

Executive summary

Forest-dwelling woodland caribou thrive only in large, intact wilderness forests. Not only are they well-loved symbols of Canada's identity, they are key indicators of healthy, fully functioning boreal forest ecosystems. Woodland caribou are like canaries in a coal mine: where they are plentiful, our forests and wetlands are in good health, where they are threatened, in decline or extirpated (locally extinct), nature has been thrown out of balance.

Woodland caribou require large areas of undisturbed older forest both to avoid predators and to find the old-growth dependent lichens that are the mainstay of their winter diet.

Over the past century, Canada's woodland caribou have been extirpated from more than half of the range they occupied before European settlement in Canada. The steadily shrinking forest area occupied by caribou in Canada is largely due to habitat change caused by the expansion of resource extraction activities across the landscape — agriculture, forestry, oil and gas and mining exploration and development.

Today, the federal *Species at Risk Act* lists the Atlantic-Gaspésie population of woodland caribou as endangered, the Boreal and Southern Mountain Populations as threatened, and the Northern Mountain population as of special concern.

In the face of this crisis for Canada's woodland caribou, what are governments doing to respond? This report assesses government efforts — federal, provincial and territorial — to protect and restore woodland caribou populations across Canada. It examines government actions in four key areas that offer the best chance of saving Canada's woodland caribou from extinction, and in so

doing, helping to ensure the long-term health of our boreal forest ecosystems:

- Legal protection of caribou habitat;
- Policies regarding resource development;
- Ecosystem conservation as an element of land use planning; and
- Recovery plans for at-risk caribou populations.

Although government has the legal mandate for Canada's remaining woodland caribou populations, resource extraction industries also have a responsibility for the fate of woodland caribou. Companies — logging, mining, oil and gas — can choose to operate at a higher standard than is currently being set by government by voluntarily setting caribou habitat aside and advocating for legal protection and policies.

Our intention is to report back every two years on how governments are responding to the crisis of Canada's woodland caribou.

Major Findings

1. Legal protection of caribou habitat

In the long-term, woodland caribou will only survive if Canada establishes a formal network of large protected areas within their range. Otherwise, the species remains extremely vulnerable to industrial landscape pressures such as logging, mining and oil-and-gas exploration and development and the associated road networks. Scientists have determined that large areas need to remain off-limits to industrial development to maintain woodland caribou herds¹.

Unfortunately, the proportion of legally pro-

tected forest in caribou range remains in the single digits in most provinces and territories. The total protected area within caribou range is highest in British Columbia at nearly 18% and lowest in Newfoundland and Labrador at 1.5%. The extent of protected areas falls far short of recommendations from caribou scientists to protect large areas for caribou in the range of thousands of square kilometres. There are numerous opportunities to make progress over the next year. For example, the proposed expansion of the NWT's Nahanni National Park Reserve to include the entire South Nahanni watershed would protect nearly the entire range of the herd in that region.

2. Resource development policies

Given that approximately half of the boreal region is already allocated for forestry, as well as oil and gas and mining exploration or development, the way that these areas are managed is critical for caribou's health and survival². These notoriously shy creatures are affected by roads and seismic lines as well as actual resource extraction activities. Even low levels of industrial activity can threaten the health of a woodland caribou herd³.

There is an opportunity for governments and industry to lessen the impacts of industrial development on caribou, by such means as maintaining large, intact older forests used by caribou, keeping road-free areas, and reducing the cumulative impacts of multiple industrial and heavy impact recreational uses on caribou habitat.

On the industrialized landscape, where caribou are already in serious trouble from coast to coast, some experiments to address the impacts of industrial resource extraction on caribou are underway. For example, the Government of Ontario has developed guidelines for forest management that aim to maintain caribou habitat; however, it is too early to tell what impact these guidelines will have.

Across Canada, mechanisms to address and reduce the cumulative impacts of different industrial uses on caribou habitat have not been put in place. Alberta's forests — crisscrossed by thousands of kilometres of logging roads and oil and gas seismic lines, pipelines and access roads — are a prime example of this phenomenon and its

destructive impact on caribou.

One of the most disturbing trends, linked to demand to maintain high timber harvest levels, is the justification for logging large, old forests that support caribou on the premise of "habitat creation." This "cut now to create habitat later" approach is largely unproven in practice. It is based on the assumption that these areas will eventually regenerate to suitable caribou habitat and that the caribou populations will have intact forest elsewhere to inhabit in the meantime. Given that there is no evidence of caribou re-entering an area after industrial activity, this approach presents very significant risks to caribou survival, especially if it is not combined with equal or greater efforts to protect current caribou habitat⁴.

3. Land Use Planning

Canada's intact northern boreal forests are the last stronghold for woodland caribou — in many cases serving as the final frontier between the species and extirpation across Canada. As such, how we plan for their future is vital.

However, this report finds that in most provinces, the pace of industrial expansion into previously unexploited boreal forest areas is advancing faster than land use planning efforts to identify and protect significant caribou habitat. For example, a new diamond mine is being constructed in Ontario's intact boreal forest before land use planning has been conducted or protected areas established. In many regions, such as Ontario's northern boreal, the East Side of Lake Winnipeg in Manitoba and the NWT's Mackenzie Valley, there are significant opportunities to plan for conservation before industrial activities begin, but the window of opportunity is narrowing as pressures for new development projects mount.

4. Recovery planning

At the more reactive end of the scale, we must take bold actions to recover and restore the populations of caribou already in trouble (and too many are).

The listing of boreal and southern mountain woodland caribou populations as threatened under the Federal Species at Risk Act (SARA), as well as listing under some provincial species at risk

legislation, is a positive step. SARA mandates the development of recovery strategies, within set timelines, for species that are listed as threatened and endangered. Recovery strategies must identify the threats to the survival of the species, population objectives and management activities needed to meet the objectives, and, to the extent possible, critical habitat. However, the extent to which recovery plans will steer decision-making in favor of caribou remains untested in most jurisdictions.

Newfoundland and Labrador, Manitoba and Alberta have recently released plans or strategies for caribou recovery and the governments of B.C., Saskatchewan, Ontario and Quebec say they are close to releasing draft plans.

The draft recovery plan for Labrador is notable because it has taken the significant first step of developing a functional definition for Critical Habitat, centered on identifying core areas using current caribou occurrence. Critical Habitat identification can provide the basis for legal protection.

Population targets also play a role in the degree to which habitat will be protected for caribou recovery. The Alberta plan, for example, suggests planning targets for the recovery of only “the majority” of the province’s 18 caribou herds. This commitment sets a low success threshold for a province that has the ability to implement full recovery planning for all remaining populations. The Alberta government also rejected its Recovery Committee’s recommendation for a moratorium on future industrial allocations in the ranges of critically endangered herds.

This brings us to the crux of the issue for caribou survival — to what extent are we willing to curb or modify current or future industrial activities to ensure caribou survival? In answering this question, we must remember that caribou stand for much more than the survival of one species — they stand for the survival of Canada’s boreal wilderness, one the greatest intact forest ecosystems left on the planet.

Recommendations

To ensure the survival — or better yet, the recovery — of woodland caribou, governments need to take a number of immediate steps, including:

Legal Protection of Caribou Habitat

1. Provinces/territories must create networks of interconnected permanently protected areas within current caribou ranges that are large enough to support caribou populations and limit disturbance in herd ranges (areas at least 10,000 km² in size).

Resource Development Policy

1. Provinces/territories need to develop policies that require resource managers to maintain caribou habitat.
2. Provinces/territories need to develop criteria and monitoring mechanisms for measuring the success of resource development practices in achieving wildlife protection objectives.
3. Provinces/territories should set limits for linear disturbance (e.g., roads and seismic lines) within caribou herd ranges and support research to develop limits where the information is inadequate.
4. Provinces/territories should conduct comprehensive road planning to address caribou (and other wildlife) habitat requirements, including the maintenance of areas without roads, location of roads and decommissioning of roads after use.
5. Habitat creation strategies should be implemented only on a pilot basis with continuous assessment and must be paired with robust protection efforts — particularly the permanent protection of current habitat.

Land Use Planning

1. Land-use planning for unallocated boreal forests should set priorities for ecosystem protection with clearly identified conservation objectives and establish a network of protected areas prior to resource development.
2. Land-use planning initiatives should occur at a

scale that encompass entire caribou herd ranges (e.g., at least 9,000 km²).

3. Land-use planning needs to address the cumulative impacts and competing uses of woodland caribou's boreal forest habitat.

Caribou Recovery Planning

1. Governments should, at a minimum, plan to maintain current habitat for all caribou herds now considered at risk.
2. In forested areas that have not been converted for urban or agricultural use, potential/historical caribou habitat should be identified.
3. Provinces/territories should protect known caribou habitat in the interim as critical habitat is being determined, especially in instances where caribou populations are critically imperiled.
4. Recovery plans should develop strategies that adequately address key causes of decline.
5. Socio-economic concerns should not weaken science-based recovery strategies.

As a nation blessed with some of the largest intact forest areas remaining on the planet, Canada can and must act to fully protect one of our most emblematic forest species — woodland caribou. By doing so, we will safeguard the health of the surrounding forest and all of the other animal and plant species it contains. Canada's boreal ecosystem represents a globally important conservation opportunity and provides a range of invaluable ecosystem services — purifying water, storing carbon, supporting Aboriginal and northern communities — in addition to a home for wildlife such as woodland caribou⁶. We need to act now, before the window for conserving our natural heritage is closed for good.

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1. Introduction

Canada's boreal forest is one of the three largest intact forest areas remaining on the planet and represents North America's greatest conservation opportunity. Forest-dwelling woodland caribou, a nationally threatened species, are a living symbol of the importance of the boreal forest and its intact ecosystems. Our ability to sustain this species in the long term will reflect our success or failure in protecting the ecological health and integrity of Canada's boreal region.

Over the past century, woodland caribou have been extirpated (become locally extinct) from over more than half of their historic range (the range they occupied before European settlement began). The reasons for this range recession are complex, but one factor is clear: it has largely occurred in lockstep with the industrial exploitation of the landscape. It is well documented, for example,

that resource extraction activities, such as logging, mining, oil and gas seismic exploration and road construction degrade caribou habitat and introduce changes, such as increases in predator numbers and/or diseases, that woodland caribou simply cannot tolerate. Currently, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and the federal Species at Risk Act (SARA) list the Atlantic-Gaspésie population of caribou as endangered; the Boreal and Southern Mountain Populations as threatened; and the Northern Mountain population as of special concern.

If populations of forest-dwelling woodland caribou are to stabilize and, in the longer term, recover across Canada, four main actions will be required: protection of key habitat in permanent protected areas; true ecosystem-based forest

Woodland Caribou: An Overview

Woodland caribou (*Rangifer tarandus caribou*) are forest dwellers (although the northern mountain and the northern Ontario, Quebec and Labrador populations spend time in non-forested or sparsely forested high elevations). They inhabit Canada's boreal region from Yukon to Newfoundland at low population densities. This means that for herd of woodland caribou to be viable, they require large areas, with the median area occupied by a herd of 9000 km².⁷

Caribou are the only large mammal that can survive on a diet of lichens, which make up 60-70% of their diet. Lichens are one of the few readily available food sources in snow-blanketed boreal and mountain forests and are usually most abundant in older coniferous forests.

Unlike other members of the deer family to which they belong, woodland caribou reproduce slowly. Single calves are usually born in late May or early June on naturally protected calving areas like islands, lakeshores, peninsulas or alpine ridges that the caribou often return to year after year. Most predation occurs during the snow-free months, just prior to calving for females and within 6 weeks of birth⁸. Woodland caribou suffer high calf mortality rates, with only 30-50% of calves surviving their first year.

management in areas under industrial allocation within current and historic caribou range; land-use planning that addresses wildlife habitat needs; and the development and implementation of effective recovery and action plans for boreal and mountain woodland caribou, as mandated by SARA.

For a “listed” species under the federal act (as well as under various provincial species-at-risk acts), it is mandatory for governments to develop plans that lead to actions to stabilize and rebuild woodland caribou populations. This report looks at the current status of efforts to stop the decline

of woodland caribou populations as well as to restore and rebuild populations in each province and territory. It also examines what is being done through provincial policy to address the impacts of resource harvesting on caribou populations, the extent to which land-use planning initiatives address the need to maintain healthy ecosystems and to what extent remaining or potential caribou habitat has been officially protected.

Why focus on forest-dwelling caribou?

The status of caribou populations, while important in and of itself from many different perspectives – including the protection of biodiversity, our commitment to protect endangered species and our desire to leave a natural legacy to future generations – is also a useful proxy measure for the integrity of natural forest ecosystems.

Caribou need large tracts of undisturbed (usually coniferous) forest to avoid predators. Their survival pattern of highly dispersed populations is unsuited to small remnant forest areas or highly fragmented landscapes that increase access for predators and exposure for caribou. Caribou are the only mammal that can survive on a diet of lichens, which form the bulk of their winter food. Such lichens are only common in older forests – usually coniferous forests that are at least 60 years old or older.

Together, these factors mean that the presence of caribou is a good indicator of the presence of large areas of intact, older boreal forest, which have become increasingly scarce in the industrially developed portions of the Canadian boreal region, and will become even more uncommon as development spreads into previously undisturbed areas. Given their large habitat needs, maintaining and restoring habitat for woodland caribou means maintaining or restoring habitat for a wide range of other forest species as well.



Population numbers of woodland caribou are notoriously difficult to determine due to their highly dispersed and mobile populations. The following chart provides the most current estimates available:

Species	Population	Location	Approximate population	Designation under COSEWIC/SARA
Peary Caribou	-	Northern Arctic Archipelago	<2,000	Not listed under SARA.
Barren-ground Caribou	-	Alaska to Baffin Island	1.32 million	Not listed under SARA
Woodland	Tundra-dwelling woodland caribou	MB, SK, ON, PQ and Labrador	1.1 million	No status
	Atlantic- Gaspésie	Québec	Less than 200 adult animals	Endangered under SARA
	Boreal	From NWT-Newfoundland and Labrador	33,000	Threatened under SARA
	Southern Mountain population	British Columbia, Alberta	7,200	Threatened under SARA
	Northern Mountain population	Yukon, NWT, British Columbia	44,000	Special concern SARA
	Newfoundland population	Island of Newfoundland	100,000	No status
	Total forest-dwelling woodland caribou	From NWT-Newfoundland and Labrador	184,000	

Federal Commitments to Protect Canada's Biodiversity

- Internationally, Canada has committed to preserve species and ecosystem diversity through the ratification of the Convention on Biological Diversity in 1992.
- The federal government is committed to protecting threatened forested ecosystems through the National Forest Strategy (NFS), the first objective of which is to: 'Manage Canada's natural forest using an ecosystem-based approach that maintains forest health, structure, functions, composition and biodiversity, and includes: [...] conserving old-growth forests and threatened forest ecosystems.' Given that the primary cause of the decline of forest-dwelling woodland caribou is the decreasing availability of intact, older forests, national and provincial efforts to maintain this habitat for caribou recovery can be used as a measure against which we can assess progress toward this NFS objective.
- The federal Species at Risk Act (SARA) was brought into force in 2005. See the box on page 5 for recovery planning requirements under SARA.

Threatened Populations of Woodland Caribou in Canada

This report focuses on forest-dwelling woodland caribou. Woodland caribou have lost close to half of their historic range in Canada over the past 100 years. These disturbance-sensitive creatures were once found as far south as Georgian Bay and the Ottawa Valley in Ontario and ranged through southern Alberta and BC into Idaho. They were also inhabitants of the Maritime provinces up until the 1920s.

One scientific study estimated that only 51 % of woodland caribou's historic range was still inhabited by these elusive creatures in the 1980s. In Ontario, the same study found that woodland caribou have been losing an average of approximately 35,000 square kilometers of range every decade for the past 110 years.⁹

The factors behind this disappearance are complex, but there is little question that the main underlying factor is industrial development of the forest landscape. Computer models developed by

the University of Alberta, for example, found that human disturbance was “overwhelmingly” the cause of woodland caribou decline in northern Alberta. In fact, the models suggest that without human changes to the landscape, woodland caribou would be seven times more abundant in that area.¹⁰

Scientists have predicted that if development continues to push into the intact forest areas used by woodland caribou, these boreal icons could become extinct in Ontario and Alberta within this century.¹¹ As a result of these trends, scientists have characterized the decline of woodland caribou as a “hard to perceive, slow motion crisis.” That slow motion crisis, unfortunately, will lead to a dramatic ending – the extinction or loss of many (or most) populations of forest-dwelling woodland caribou in Canada – unless we take significant actions to reverse this crisis, which currently is only gathering momentum.

Threats to Woodland Caribou

Human development in forested ecosystems generally precipitates a cascading series of impacts that result in the disappearance of woodland caribou. In fact, today healthy woodland caribou populations are almost entirely restricted to areas of undeveloped boreal forest, such as north of the current logging limit in Ontario or in remote mountain areas of northeastern British Columbia. Across Canada, populations living within the managed forest where industrial activity occurs are steadily declining.

A prime factor in this decline is the woodland caribou's key survival method, which relies on the dispersion of individual animals through large areas of forest and distinct habitat separation from deer and moose and their predators (with caribou mainly using older forests away from the younger forests preferred by deer and moose).

The younger shrubbier growth in post-logging forests draws increased numbers of deer, moose and elk, which in turn sustain larger predator populations that prey upon caribou, particularly wolves. Deer also bring with them a brain parasite that increases caribou mortality.

It is well documented that resource extraction activities degrade caribou habitat, and that roads, in particular, allow for greater access to caribou for hunters and predators and can represent a barrier to woodland caribou movements.

With young post-logging forests lacking the lichens that are the mainstay of caribou winter food sources, predator populations on the upswing and their intact forest cover fragmented or threatened, caribou face an uphill battle for survival. Woodland caribou's low birth rate also makes the species particularly prone to a downward population spiral when populations come under pressure.



Recovery Planning – federal and provincial

- SARA mandates recovery plans for species that are threatened and endangered. For the first batch of listed species, recovery plans are due in June 2006 for endangered species and June 2007 for threatened species.
- Recovery strategies ultimately have to be approved by the federal Minister of Environment. For woodland caribou, which are listed nationally, provinces are working on draft recovery plans that will ultimately be rolled up into a national plan. The federal government has developed a recovery plan for woodland caribou in Jasper National Park, as these caribou fall within federal jurisdiction (see page 17)
- Recovery strategies must identify the species' Critical Habitat, to the extent possible, and provide examples of activities that are likely to result in its destruction. Where available information is inadequate, a schedule of studies to identify Critical Habitat must be included in the strategy.
- Once Critical Habitat (CH) is identified under SARA, its destruction is prohibited in areas within federal jurisdiction (e.g., national parks or other federal lands) and the federal government is mandated to protect CH if the federal Minister of Environment is of the opinion that a province is failing to adequately do so.

2. Organization of this report

This report examines the current state of government action to protect woodland caribou habitat across Canada. It focuses primarily on government policies and initiatives because of the significant role that both provincial and federal governments can play in the recovery of woodland caribou (as chief decision-makers of land use). Provincial governments, for example, are responsible for natural resource management and land-use planning, both of which have a profound impact on the state of woodland caribou habitat. The federal government, meanwhile, is responsible for the approval of recovery plans which are required to include the identification of Critical Habitat under SARA where possible. The federal government can also increase the amount of forested land protected through the establishment and management of national parks.

This report looks at the four key areas for each province and territory within existing woodland caribou range. How these four key areas are addressed will determine the future survival of woodland caribou in Canada. The four areas are: protected areas; resource management planning and policies; land-use planning processes and species-at-risk recovery planning.

Legal protection of forested habitats:

Both the federal and provincial governments have a number of ways in which they can permanently protect significant areas of current and potential woodland caribou habitat (e.g., provincial and national parks, nature reserves, land claim settlements, etc.). Large areas, at the scale of thousands of square kilometres, need to be set aside from industrial development in order to

maintain woodland caribou¹².

As our first measure of what is being done to protect woodland caribou and to create space for its recovery, the report looks at the percentage of current woodland caribou range (as defined by COSEWIC) in each province and territory that is protected on a permanent or interim basis. These protected areas may or may not be currently or traditionally occupied by woodland caribou, but they do provide a baseline measure of how much forested habitat in current caribou range remains off-limits to industrial development in each province and territory. In some provinces, however, there are activities within protected areas that threaten woodland caribou, including salvage logging of pine beetle kill in BC and motorized recreation in Gros Morne National Park.

Resource management policy:

Our second set of measures looks at various aspects of resource planning in each jurisdiction. Given that we know that resource extraction activities have been intrinsically linked to the disappearance of woodland caribou throughout their range, it is crucial to assess what policies and regulations have been developed to mitigate or avoid such impacts on caribou and their habitat.

An important element in this category is how governments have chosen to strike a “balance” between resource industry and caribou needs. Are they taking a precautionary approach that errs on the side of protecting current populations or are they betting on largely untested new harvesting approaches to “create” future caribou habitat with the hope of reducing any current impact on wood supplies?

Land use planning:

In areas that currently have little or no industrial activity, land use planning in advance of resource allocation can provide an opportunity to address the survival needs of caribou. This report looks at measures being taken in land use planning processes to incorporate caribou habitat requirements.

Recovery planning and implementation

The final section focuses on the steps being taken to recover at-risk populations of woodland caribou. This really represents the reactive end of the action scale for caribou, which comes into play once caribou populations are already in trouble – and far too many are.

Species recovery is a multi-faceted undertaking. This section therefore evaluates recovery population targets; interim protection of habitat while recovery plans are being developed and implemented; Critical Habitat identification; and how the factors that have caused (or are causing) the population decline are being addressed. To date, the extent to which these recovery plans will steer decision-making in favor of caribou remains untested in most jurisdictions.

Information for the recovery planning category for Alberta and Labrador was obtained through scientific reviews of recovery plans conducted for the Sierra Club of Canada.

3. Key findings

1. Legal protection of forested habitats:

Province/Territory	Percent of current caribou range protected
British Columbia	17.8
Alberta	14.1
Saskatchewan	5.2
Manitoba	4.9
Ontario	7.4
Quebec	4.8
Newfoundland and Labrador	1.5
Yukon	2.7
Northwest Territories	12.7

Discussion and Recommendations

This analysis presents a coarse measure of the amount of land protected within current range of woodland caribou and provides a benchmark against which to document progress toward increased protection. However, the areas included in these percentages may or may not support caribou now or in the future. To determine the actual amount of caribou habitat protected, a more detailed, site by site, examination would be required to determine which specific protected areas contained caribou or caribou habitat.

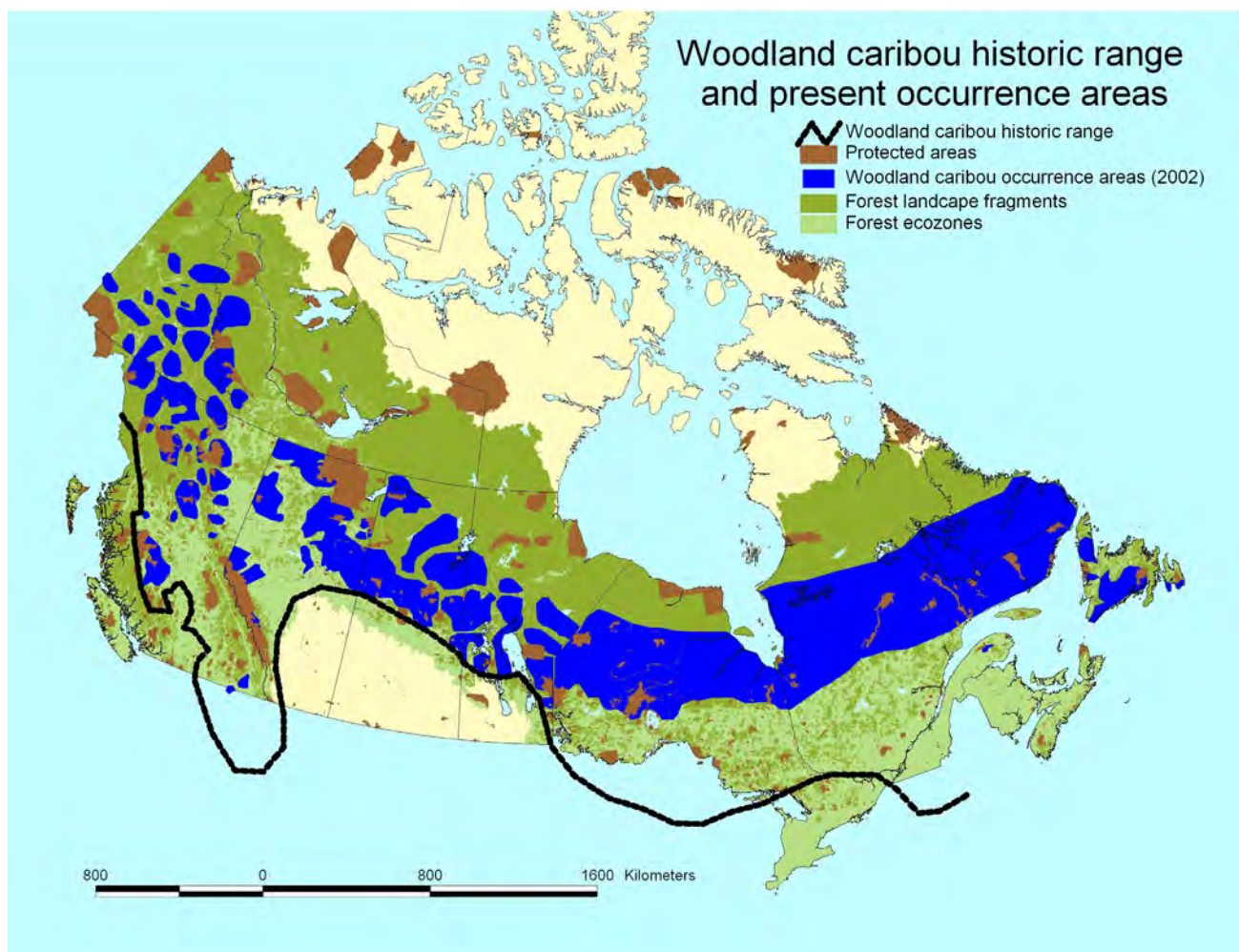
The most sure-fire way to maintain and recover woodland caribou is to keep the forests in which they live free from industrial activity. Legally protected areas are the most important tool to preserve intact forest ecosystems. Our report illustrates that the current coverage of protected areas is not sufficient to reverse the caribou's decline. Luckily, there is a tremendous opportunity to increase the amount of protected forest areas, as much of the northern boreal forest has not yet

Protected area calculations

Global Forest Watch Canada calculated the amount of forest-dwelling woodland caribou occurrence area that is protected. The 2002 COSEWIC report (2002 COSEWIC Assessment and Update Status Report on the Woodland Caribou /Rangifer tarandus caribou: /Atlantic-Gaspésie Population, Boreal Population, Southern Mountain Population, Northern Mountain Population, and Newfoundland Population in Canada) was used as the major reference for the woodland caribou area of occurrence (current ranges) (Page 12, Figure 5).

Data from the caribou maps was originally supplied to COSEWIC by provincial and territorial jurisdictions in 2000 and 2001 and were digitized by Global Forest Watch Canada. Protected areas of Canada was compiled by Global Forest Watch Canada from provincial, territorial and federal agencies; where data was not available, Global Forest Watch Canada digitized protected areas boundaries from paper and digital maps.

Using a GIS working environment (ESRI's ArcView GIS software), Global Forest Watch Canada intersected the caribou occurrence-area data with the protected areas data and subsequently calculated the area of caribou occurrence that is protected within each provincial and territorial jurisdiction. Note that some areas termed "protected" by government agencies and used in this analysis are subject to industrial activities. For a full metadata description, please contact Global Forest Watch Canada at info@globalforestwatch.ca.



been allocated. Scientists and conservationists (and even some forest companies) estimate that at least half of the boreal forest should be protected from industrial activity to ensure the maintenance of the boreal forest's ecological functioning, and to provide habitat for forest-dwelling species such as caribou.

Recommendation:

Provinces/territories must create networks of interconnected permanently protected areas within current caribou ranges that are large enough to support caribou populations and limit disturbance in herd ranges (areas at least 10,000 km² in size).



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2. Resource management policy

Province/Territory	Maintenance of large, older forests	Road planning and decommissioning
British Columbia	<p>No mandatory requirement to maintain large, older forests.</p> <p>Measures to conserve caribou vary between forest management plans.</p>	<p>No provincial access management strategy exists.</p> <p>Individual land-use plans may deal with maintenance of roadless areas.</p>
Alberta	<p>No mandatory requirement to maintain large, older forests.</p> <p>Strategic Plan recommended development of caribou habitat targets and thresholds for disturbance. This has not been implemented.</p> <p>No mandatory requirements for maintaining current caribou habitat.</p>	<p>Optional guidelines for road planning and decommissioning in forest management planning.</p> <p>No guidelines for other resource sectors (e.g. oil and gas).</p>
Saskatchewan	<p>No mandatory requirement to maintain large, older forests.</p> <p>Draft forest management planning manual requires thresholds for habitat of forest-dwelling species and regulations being developed may provide more specific guidelines for caribou habitat.</p>	<p>No requirements to maintain roadless areas for caribou.</p> <p>Draft manual requires plans to include an access management and road closure program.</p>
Manitoba	<p>No mandatory requirement to maintain large, older forests.</p> <p>Individual forest management plans select species for which habitat needs will be considered</p>	<p>No requirements to maintain roadless areas for caribou.</p> <p>Access plan, including decommissioning, required.</p> <p>Guidelines have a goal to minimize impacts of roads on habitat for species at risk.</p>
Ontario	<p>Caribou Guide sets an objective to maintain a continuous supply of suitable, mature, year-round habitat of 10,000 hectare or larger tracts of mature conifer forest.</p> <p>It also sets a priority to retain high quality habitat that is currently being used by caribou, particularly in the southern edge of caribou range.</p> <p>Pressure to maintain wood supply levels that are too high has lead to decisions to log areas that are a priority for caribou, thereby failing to implement the recommendations of the guide.</p>	<p>No mandatory requirements for maintaining roadless areas or decommissioning roads after use.</p> <p>Caribou Guide recommends regional-level road planning to avoid traditional winter habitat tracts and regenerating roads after clearcutting to provide for future roadless areas.</p> <p>It also recommends avoiding building roads near calving areas.</p>

Quebec	<p>No requirement in current plans to maintain large older forests for caribou.</p> <p>.By 2008, special plans for caribou will be required for maintenance of large habitat areas (100 km²) in regions with high caribou density.</p>	<p>No requirement for access planning to maintain roadless areas.</p> <p>All access roads become the property of the provincial government; there is no restriction on their use and it is illegal to close roads to motorized access or to destroy or alter them.</p> <p>A Commission on the Management of Public Forests stressed the need for a comprehensive provincial road-planning process and consideration of road closures.</p>
Newfoundland and Labrador	Commitment to retain 15-20% of the forest as old-growth when calculating the wood supply for Nfld.	No requirements to maintain roadless areas for caribou
Yukon	<p>There are currently no territorial-level forest policies in place. This is in process.</p> <p>There are three Forest Management Planning processes occurring throughout the southern Yukon in the Champagne and Aishihik, Teslin Tlingit and Kaska Traditional Territories intended to “maintain habitat for species of concern,” “protect or enhance habitats for species at risk,” and “ensure appropriate wildlife movement corridors between important habitats and key landscape features.” A fourth forest management plan has recently been initiated for the Whitehorse area.</p>	Requirements will be determined through forest management planning processes and a forest harvesting best management practices contract that are currently underway.
Northwest Territories	Requirements will be determined through land use plans. There is currently no regulatory framework for forestry as there is little commercial harvest.	

Discussion and Recommendations

Habitat policies

There is significant variation in the ways in which provincial and territorial resource policies address caribou. Some jurisdictions have caribou-specific policies as part of their resource management planning regimes (i.e. Ontario, Quebec), while others may rely on more general policies, such as policies for the retention of old-growth forests, to address the needs of caribou and other wildlife. A major challenge is that several jurisdictions have strategies or policies that provide guidance for forest managers but lack clear, mandatory requirements to maintain intact caribou habitat. Without mandatory requirements, the pressures to log caribou habitat to maintain wood supply seem

to override the needs of the species.

Ontario’s Forest Management Guidelines for the Conservation of Woodland Caribou: A Landscape Approach represents the most comprehensive approach of all the provinces and territories. It provides direction to help minimize the impacts of logging on caribou that is based on a sound set of scientific knowledge framed around how to do the least harm GIVEN that logging and road construction will take place. The challenge, however, is in its implementation, given the pressure during the forest management planning process to maintain wood supply levels that are too high. This leads to decisions to log areas that are a priority for caribou, thereby failing to implement the recommendations of the guide. For example, decisions were made to harvest

the last remaining caribou habitat in the Whisky Jack Forest Management Unit, and clearcuts are planned in areas of high caribou winter use in the Trout Lake Forest in the coming years.

Access management/road density

Many provinces/territories have inadequate policies to manage roads and access in caribou range and fail to make wildlife habitat needs an integral component of road planning. It is evident that caribou do poorly in areas fragmented by roads, yet efforts to limit or remove access and to avoid linear disturbances in core or critical habitat areas are scattered at best and, more often, completely missing.

Planning for future habitat

A number of provinces have adopted policies that are intended to lead to the future creation of caribou habitat (the ‘log now to create habitat later’ approach). These strategies represent a high-risk approach to the conservation of caribou because they are largely scientifically unproven. There is no evidence of caribou moving back into an area after industrial activity has occurred¹³. Furthermore, this approach does not address the immediate habitat needs of caribou, particularly in areas where resource management has already altered a significant portion of the landscape.

Recommendations:

- Provinces/territories need to develop policies that require resource managers to maintain caribou habitat.
- Provinces/territories need to develop criteria and monitoring mechanisms for measuring the success of resource development practices in achieving wildlife protection objectives.
- Provinces/territories should set limits for linear disturbance (e.g., roads and seismic lines) within caribou herd ranges and support research to develop limits where the information is inadequate.
- Provinces/territories should conduct comprehensive road planning to address caribou (and other wildlife) habitat requirements, including the maintenance of roadless areas, location of roads and decommissioning of roads after use.
- Habitat creation strategies should be implemented only on a pilot basis with continuous assessment and must be paired with robust protection efforts; particularly the permanent protection of current habitat.

The role of industry

Although the focus of this report is on government policy, resource companies are responsible for carrying out the industrial activities that are degrading caribou habitat. As such, they have a critical role to play in developing and implementing solutions.

Across North America, there is a growing consumer demand for forestry companies to adopt better environmental practices that incorporate the needs of wildlife such as woodland caribou. As the logging industry faces challenges on numerous fronts (i.e., mill closures caused by local timber supply shortages, global competition for fiber, high Canadian dollar), the transition underway represents an opportunity to move toward a more sustainable forest sector. Forest companies that are willing to invest in ecologically and socially sustainable forest management and become certified by the Forest Stewardship Council (FSC) are awarded by access to a green market (as stores such as IKEA, Lowes and Home Depot have purchasing policies that prioritize FSC certified products). Several companies, along with conservation groups and First Nations, have also demonstrated leadership by supporting the goals of the Boreal Forest Conservation Framework, a vision for Canada's boreal forest that includes protecting at least half of the boreal from industrial activities and practicing world-leading resource management on the remainder of the region.

In the absence of policies that work to protect caribou on the ground, some forestry companies have taken progressive actions. For example, Tembec has worked with a conservation group to secure temporary deferrals of core caribou winter habitat. Tembec has also worked with the conservation group and independent experts to improve the science and the Strategy for the Owl Lake herd. There is an opportunity for Tembec to continue working with conservation groups to defer and protect additional areas within its Forest Management License Area as part of the company's drive to achieve FSC certification.



3. Land-Use Planning

Province/Territory	Land Use Planning
British Columbia	Regional and sub-regional Land and Resource Management Plans can recommend caribou habitat retention.
Alberta	Alberta is developing an Integrated Land Management and a Land Use Framework. These are in the early stages of development and there is no indication yet of how they will address caribou habitat needs.
Saskatchewan	<p>Completed land use plans (Pasquia Porcupine and Amisk Atik) did not protect caribou habitat, but one did identify important caribou areas as special management areas.</p> <p>The first phase of the Athabasca Land Use Plan identified important caribou habitat as areas of concern.</p> <p>The draft North Central Land Use Plan's proposed protected areas do not address the habitat needs of caribou. Areas important for caribou are proposed to be allocated for logging.</p>
Manitoba	The activities of the Wabanong Nakaygum Okimawin, or East Side of Lake Winnipeg planning process have not been made public and it is difficult to assess at this point whether the land-use outcomes will provide adequate habitat for caribou or will allocate the majority of the region to industrial activities.
Ontario	The Northern Boreal Initiative (NBI) planning area covers a limited strip of land just north of the 51st parallel. Approximately eleven First Nations communities are located in the NBI planning area or associated with it but the process is narrowly focused on forestry. There is no planning process right now for communities north of the NBI area. The province lacks a comprehensive approach to planning for ecological values such as caribou habitat before development in this region.
Quebec	<p>In March 2005, Québec released a revised approach to land-use planning on public lands that will form the basis for future land-use plans. It allows for two designations specifically focused on the conservation of biodiversity: 1) protection (partial preservation of one component of natural heritage, e.g. wildlife habitats) and 2) strict protection (complete preservation of natural heritage, e.g. in national parks).</p> <p>There is no clear indication, however, that land-use plans will be required to incorporate caribou habitat requirements.</p>
Newfoundland and Labrador	There is no formal policy to deal with unallocated land such as the Northern Peninsula on the Island, or unallocated land in Labrador. Planning in Labrador occurs district by district.
Yukon	There is a planning process for the Peel Watershed, which is located in the north-central Yukon and has thriving caribou herds, including the Bonnet Plume herd – one of the most intact herds in the Yukon. The Peel Land Use Planning Commission is likely to consider the future health of woodland and barren ground caribou herd ranges.
Northwest Territories	<p>The Dehcho Land Use Planning Committee intends to manage the valley portion of their land claim area for caribou. The Revised Draft Dehcho Land Use Plan (November 2005) has quantitative cumulative effects thresholds for boreal woodland caribou.</p> <p>There is also interest by the Sahtu Renewable Resources Board in developing cumulative effects thresholds for woodland caribou as part of the Sahtu Land Use Plan. However, this direction has not yet been incorporated into the drafting of the land-use plan.</p> <p>There are currently National Energy Board and Joint Review Panel hearings underway pertaining to the proposed Mackenzie Valley Gas Project. These forums will influence whether or not an interconnected network of protected areas will receive permanent protection in the Mackenzie Valley before any industrial development, including the proposed pipeline, is permitted.</p>

Discussion and Recommendations

Over the next few years, decisions will be made about the future of intact boreal wilderness across Canada. These intact forests provide, at present, a safety net for woodland caribou populations—their last refuge.

In most instances, current land-use planning processes are inadequate to ensure caribou conservation because they fail to identify the maintenance of ecosystem functioning and wildlife habitat as primary objectives. Further, some of the planning processes (such as Ontario) fail to employ the appropriate scales needed to take into account intact forested ecosystems.

Moreover, existing land-use plans are seldom comprehensive in nature. In order for land-use planning to be effective, all land uses must be considered simultaneously, along with the assessment/forecast of cumulative effects. Out of the planning initiatives identified in this report, only one—the Dehcho land-use plan in the NWT—aimed at limiting the cumulative impacts of the many different resource and recreational

activities on caribou habitat. For other provinces and territories, this indicates a missed opportunity to plan comprehensively to address competing interests (and can lead to, for example, the continued spread of oil and gas seismic lines in areas where forest roads are being closed or mechanized backcountry recreation in areas deferred from logging.)

Recommendations:

- Land-use planning for unallocated boreal forests should set priorities for ecosystem protection with clearly identified conservation objectives and establish a network of protected areas prior to resource development.
- Land-use planning initiatives should occur at a scale that encompass entire caribou herd ranges (i.e. at least 9,000 km²).
- Land-use planning needs to address the cumulative impacts and competing uses of woodland caribou's boreal forest habitat.



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4. Recovery Planning

Province/ Territory	Status of recovery plan	Is Critical Habitat (CH) identified?	What are population targets?	Does plan mitigate key factors of decline?	Do socio-economic considerations serve as barriers to recovery?	If CH is not yet identified, is there a plan to protect habitat in interim?
British Columbia	Strategy for the Recovery of Mountain Caribou was released in 2002.	No.	The Strategy goals are for a metapopulation of 2,500-3,000 caribou; the improvement of identified local populations; and a down-listing of the species. The Species At Risk Coordination Office released a policy paper in October 2005 that included options to abandon either 3 or 5 caribou populations.	The strategy does not identify any concrete measures, with targets and/or thresholds, for addressing logging or heli-skiing.	The Strategy outlines general principles for recovery, one of which is: 'recovery will be based on financial capacity.'	No. There is continued logging and recreational activity in mountain caribou habitat.
Alberta	In June, 2005, Alberta's Minister of Environment approved the Alberta Woodland Caribou Recovery Plan.	No. It is deferred to the Caribou Landscape Planning Team to determine CH.	The Alberta plan aims to achieve positive population trajectories for 'the majority' of woodland caribou herds in the province. (Which could mean 10 out of 18 herds).	No. The recovery plan deferred the development of mitigative strategies to the Caribou Landscape Planning Team.	The recovery plan states that it operates in adherence to the concept of 'economic realism.'	No.
Saskatchewan	A technical report, the Status and Conservation management Framework for Woodland Caribou in Saskatchewan, was released in 2003. It is not a recovery plan.	Not applicable.	Not applicable.	Not applicable.	Not applicable.	No.
Manitoba	Manitoba's Conservation and Recovery Strategy for Boreal Woodland Caribou was released in 2006. This strategy is not compliant with SARA.	No.	The objectives of the strategy are to "Maintain current local populations that are self-sustaining, to address declining populations and to promote recovery of local populations that are currently not self-sustaining." Development of Action Plans for 3 'high-risk' ranges are scheduled to be completed in 4 years; the remaining ranges have no timelines for completion.	No- the plan defers any mitigative strategies to the future wherein integrated management and recovery action plans will be developed.	The strategy 'recognizes' that 'human activities will continue to occur on caribou ranges in Manitoba.'	No.

Ontario	Ontario's Woodland Caribou Recovery Team was established in 2000, but has not yet released a draft recovery plan.	No.	Not applicable.	Not applicable.	Not applicable.	No.
Quebec	Recovery plan for forest-dwelling woodland caribou populations is being developed and is expected in 2006. In 2002, a 10 year National Recovery Plan specifically for the small Gaspé Caribou population was released.	Forest-dwelling caribou: No details yet. Gaspé population: in the 2002-2012 plan, calving grounds, winter areas and summer areas are described but not mapped.	Forest-dwelling caribou: No details yet. Gaspé population: Plan targets 175 individuals by 2012.	Gaspé population: The Plan suggests mitigative measures for the effects of harvesting practices in areas surrounding the protected area and suggests predator control within the park.	Forest-dwelling woodland caribou: No details yet.	No.
Newfoundland and Labrador	The Recovery Strategy for Three Woodland Caribou Herds in Labrador was released in July 2004.	The Recovery Team developed a functional definition for CH; CH is likely to be roughly analogous to the current occupied range for at least 2 of the 3 herds. For the third, CH is likely to be an area larger than the current occupied territory.	The recovery strategy does refer to two historical herds, which were likely subgroups of the three larger herds.	The Sierra Club review of the recovery plan noted that Labrador addressed the primary threat to the three populations of woodland caribou (hunting), but failed to adequately identify mitigation strategies for future industrial impacts.	Proposed roads that could affect caribou were not addressed by mitigative strategies.	No.
Northwest Territories	No plan has yet been developed.	Not applicable.	Not applicable.	Not applicable.	Not applicable.	No.
Yukon	Recovery plans for the Carcross and Ibex woodland caribou herds were developed in the early 1990s.	Critical winter habitats of caribou were mapped based on movements of radio-collared animals. This map was given to the Yukon government's Environmental Protection and Agriculture Branches, and federal Forestry officials.	Not identified.	The Yukon Dept. of Renewable Resources developed interim guidelines for making decisions on the effects of development on caribou, and mitigative measures which could be taken.	Over-hunting was identified as a challenge to recovery in the 1992-1996 Progress Report.	No.

Discussion and Recommendations

Identification of critical habitat

The identification and potential ensuing protection of Critical Habitat is a key tool within recovery planning for stabilizing and recovering caribou populations because once CH is identified, there are legal tools that can be employed to protect it.

The Recovery Operating Manual identifies potential habitat as ‘historically occupied habitat that is still available for use or which could be restored to its historical state, or habitat not known to be historically occupied that would be or could be rendered suitable for the species.’ To date, none of the draft recovery plans have identified such habitat (although Manitoba expressed the desire to do so). As the decline of caribou populations is often delayed, the protection of current ranges in many jurisdictions might not be enough to ensure caribou recovery.

Although SARA mandates the identification of CH within recovery plans where feasible, Labrador is the only province to date that has initiated CH identification. In Alberta and Manitoba, the identification of CH was deferred to future planning teams.

The broad brush functional definition of CH in the Labrador recovery plan is a good first step, as it illustrates that CH identification can be done. Disconcertingly, there are signs that other provinces will follow Alberta’s and Manitoba’s lead and defer CH identification to post-recovery plan processes, for which there are no timelines under SARA. The longer it takes for CH to be identified, the more perilous the plight

of the caribou becomes—especially if status quo industrial operations continue to be allowed in caribou habitat as they are now.

However, it is important to note that even if CH has been identified, there will still be challenges in ensuring that it is protected. It will take significant political will to protect CH and will require a fundamental shift in the way we manage our public forests.

Population targets

Recovery is defined as a continuum from survival (maintaining current population size and distribution) to full recovery (restoring a species to a viable, self-sustaining population level, able to withstand random events).¹ Currently, interpretations of what recovery will actually mean for caribou are being determined in draft recovery plans across the country through population objectives. The importance of population targets is illustrated by the goal of the Alberta recovery plan, which is to recover “the majority” of Alberta’s herds. Under this scenario, 8 out of 18 existing herds could vanish from the Alberta under the province’s governance. Alberta’s population target condones extirpation and sets a low bar for species recovery.

Interim habitat protection measures

Alberta rejected its recovery team’s proposed moratorium for new industrial allocations in the habitat of populations facing imminent extirpation. Since the vast majority of these ranges are already allocated, this gives an indication of the resolve

Federal recovery plan for Woodland Caribou in Jasper National Park

“A Review of South Jasper National Park Caribou Action Plan for Caribou Recovery Phase 1, 2005” was released in September 2005. However, the plan does not identify Critical Habitat or recommend interim habitat protection measures.

Overall, the plan does not sufficiently address the two main threats that contribute to caribou mortality in Jasper: predation and collisions with vehicles, both of which are known to be exacerbated by roads and trails that dissect caribou range within the park.

The 12 person recovery committee was heavily weighted in favour of business interests, which likely resulted in reluctance to close roads identified as harmful to the caribou.

of the government to maintain caribou. (For now Alberta has opted for short-term management that includes intensive management, including cow penning, predator and alternative prey control).

As many provinces are stalling on CH identification, interim protection measures are not only prudent but are likely necessary to save some caribou populations from extirpation.

Mitigation of main factors in decline

Neither Manitoba's nor Alberta's draft recovery plans/strategies identify specific measures to mitigate the primary cause of caribou decline in the provinces — industrial resource extraction activities within the managed forest. Instead, they defer this task to future planning teams, which have no timeline for completion under SARA. The review of the draft Labrador recovery plan noted that while the plan adequately addressed the primary threat to the three threatened populations (hunting), its strategies for dealing with future industrial threats were inadequately articulated.

Socio-economic considerations

The recovery planning manual states that: 'knowledge-based, strategic thinking about what is needed for recovery of a species should not be influenced by socio-economic considerations.'² Under SARA, socio-economic considerations are already taken into account at the listing stage (although this is contested by scientists, conservation organizations and many parliamentarians involved in the creation of SARA) and in the action plan.

Resource management decisions cannot be made in a vacuum without consideration of socio-economic realities. However, at some stage in the planning process there needs to be an opportunity for a science-based assessment of what is absolutely needed for successful recovery to occur, and the most appropriate place for this is in the recovery plan.

Alberta, by openly stating in its introduction that its strategies were to be tempered by "economic realism," tips its "balance" in favour of economics. The reviewers of the Labrador recovery plan felt that socio-economic concerns

were barriers to the implementation of secondary strategies for recovery, and the review of the Jasper National Park recovery plan noted that the 12 person recovery committee was heavily weighted in favour of business interests, and that this likely resulted in a reluctance to close roads.

Recommendations:

- Governments should, at a minimum, plan to maintain current habitat for all caribou herds now considered at risk.
- In forested areas that have not been converted for urban or agricultural use, potential/historical caribou habitat should be identified.
- Provinces/territories should protect known caribou habitat in the interim as critical habitat is being determined, especially in instances where caribou populations are critically imperiled.
- Recovery plans should develop strategies that adequately address key causes of decline.
- Socio-economic concerns should not weaken science-based recovery strategies.

Conclusion

As a nation blessed with some of the largest intact forest areas remaining on the planet, Canada can and must act to fully protect all forest species, including woodland caribou. Canada's boreal ecosystem represents a globally important conservation opportunity and provides a range of ecosystem services – purifying water, storing carbon, supporting Aboriginal and northern communities - in addition to a home for wildlife such as woodland caribou¹⁴. We have the means and the opportunity – all we need is the will.

Endnotes

1. Canadian Boreal Initiative and Wildlife Conservation Society. CBI/WCS Woodland Caribou Expert Workshop Summary. 2006. Available at http://www.wcscanada.org/wcsc-whats_new.
2. Global Forest Watch Canada. "Canada's Forests at a Crossroads: An Assessment in the Year 2000." World Resources Institute. 2000.
3. Canadian Boreal Initiative and Wildlife Conservation Society. CBI/WCS Woodland Caribou Expert Workshop Summary. 2006. Available at http://www.wcscanada.org/wcsc-whats_new.
4. Canadian Boreal Initiative and Wildlife Conservation Society. CBI/WCS Woodland Caribou Expert Workshop Summary. 2006. Available at http://www.wcscanada.org/wcsc-whats_new.
5. Schaefer, James A. "Long-Term Range Recession and the Persistence of Caribou in the Taiga." *Conservation Biology*, Vol. 17, No. 5. P1435-1439. October 2003.
6. Canadian Boreal Initiative and The Pembina Institute. "Counting Canada's Natural Capital: Assessing the Real Value of Canada's Boreal Ecosystem." 2005.

Additional Sources:

Al. A. Arsenault, *Status and Conservation management Framework for Woodland Caribou in Saskatchewan*. Saskatchewan Environment. December 2003. Saskatchewan Environment, Fish and Wildlife Technical Report 2003-03.

Alberta Woodland Caribou Recovery Team. 2004. *Alberta woodland caribou plan 2004/05-2013/14*. Alberta Sustainable Resource Development, Fish and Wildlife Division, Alberta Species at Risk Recovery Plan No. X. Edmonton.

Manitoba's Conservation and Recovery Strategy for Boreal Woodland Caribou, 2005. http://www.gov.mb.ca/conservation/wildlife/managing/pdf/bw_caribou_strategy.pdf

Schmelzer et al. 2004. *Recovery strategy for three woodland caribou herds (Rangifer tarandus caribou; boreal population) in Labrador*. Department of Environment and Conservation, Government of Newfoundland and Labrador, Corner Brook.

Southern Lakes Caribou Recovery Program and Progress Report, 1992-1996, <http://www.yfwmb.yk.ca/comanagement/mgmtplans/slcrp/goals.html>.

The Mountain Caribou Technical Advisory Committee, *Strategy for the Recovery of Mountain Caribou*. Ministry of Air, Water and Land Protection, British Columbia, 2002. http://wlapwww.gov.bc.ca/wld/documents/mtcaribou_rcvrystrat02.pdf

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CPAWS is Canada's community-based, non-profit wilderness protection organization. With 13 chapters across Canada and 20,000 members, it has helped to conserve over 40 million hectares of Canada's most treasured wild places since 1963. It is a signatory to the Boreal Forest Conservation Framework, along with other leading conservation organizations, resource companies and First Nations.

Sierra Club of Canada has been working to protect the integrity of our global ecosystems since 1963. We are a national non-profit organization, made up of 10,000 members, supporters, and youth affiliate members all across Canada. We have five chapters across the country in addition to dozens of local groups in communities all across Canada from Cape Breton to Vancouver Island.



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