



THE EXCHANGE:

Sharing Knowledge, Inspiring Solutions



2026
EDITION 15



Alberta Regional Caribou Knowledge Partnership



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Connecting Alberta's forest sector and policy makers to accessible and relevant scientific information is key to advancing woodland caribou conservation efforts across the province. To facilitate this, the Alberta Regional Caribou Knowledge Partnership (ARCKP) provides regular knowledge exchange, keeping our partners and stakeholders up to date on the research and information they need to make important forest management and policy decisions.



Caribou-focused conservation benefits, gaps, and uncertainties for wolverine in Canada

As the impacts of development and climate change accumulate, more species are declining. Caribou are often considered an “umbrella” or “focal” species in conservation, meaning that

if the extensive habitat needs of caribou are met, many other species will also benefit. Caribou distribution overlaps with 90% of all boreal mammal and bird habitat, giving caribou conservation measures the potential to broadly benefit boreal biodiversity.

Wolverine are listed as Special Concern under the *Species at Risk Act*, a lower designation than most caribou populations. Although wolverine have been studied far less than caribou, they may benefit from caribou management strategies due to overlap in habitat and key threats.

Study Design

Two systematic literature searches into both woodland caribou (including boreal, northern mountain, central mountain, and southern mountain ecotypes) and wolverine management were conducted using:

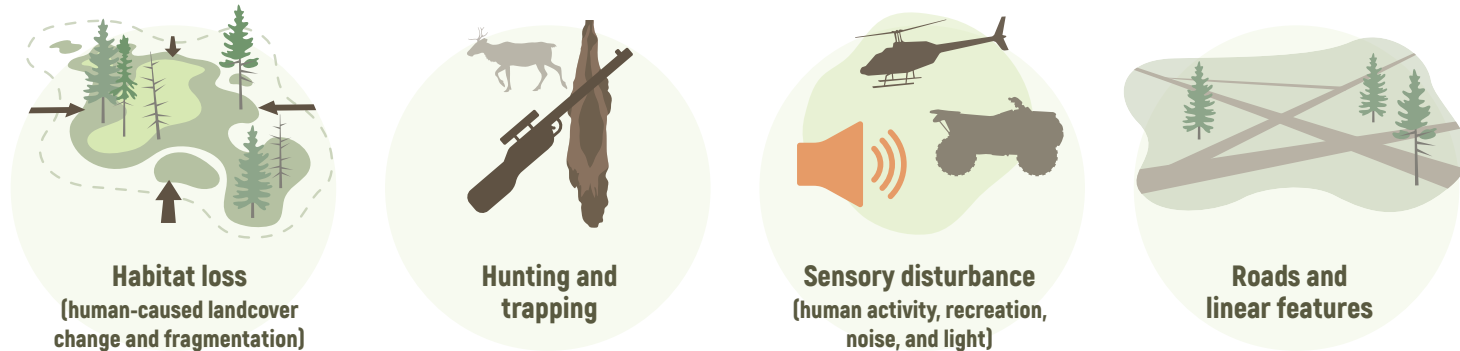
Peer-reviewed scientific literature published after 2000 using North America study sites

National and provincial/territorial conservation documents that are publicly available and published after 2000

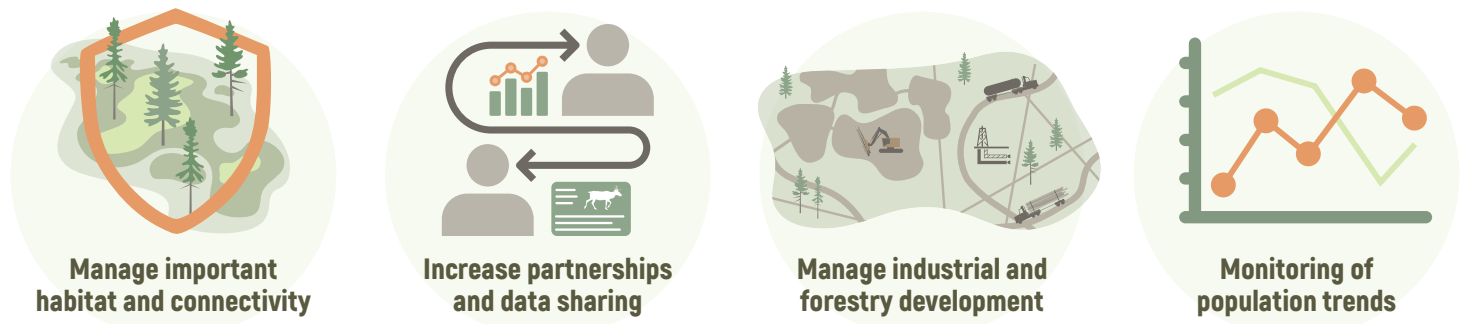


Some threats and suggested conservation actions overlap for caribou and wolverine

The top four most frequently listed threats for wolverine were among the top six most frequently listed for caribou. These include:

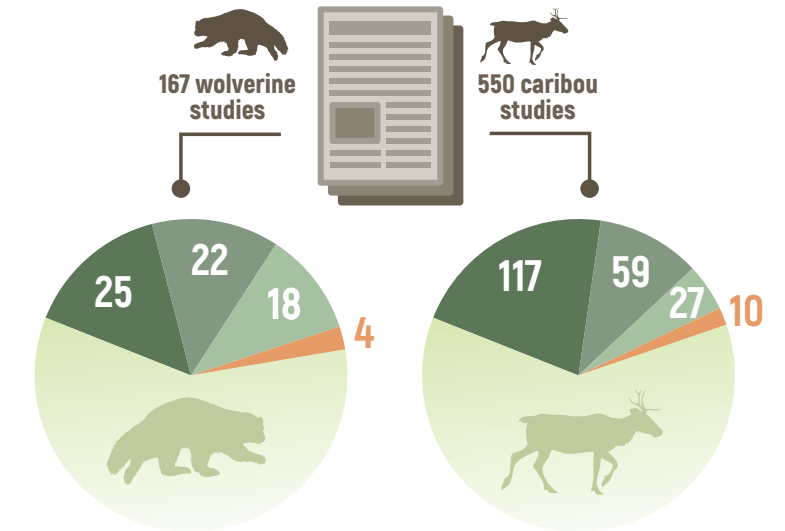


Conservation actions listed in more than 40% of both wolverine and caribou documents include:



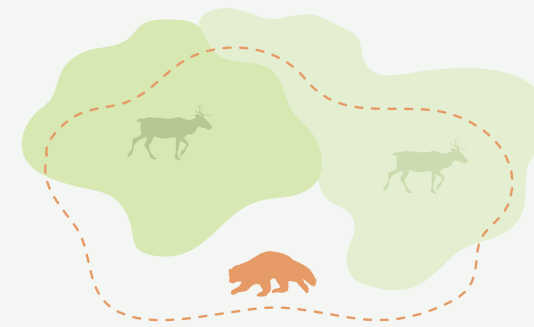
Within the peer-reviewed literature, the three most studied impacts with the highest overlap included:

1. Impact of habitat loss
 2. Impact of roads and linear features
 3. Impact of weather and climate
- The impact of sensory disturbance was not well studied for either species

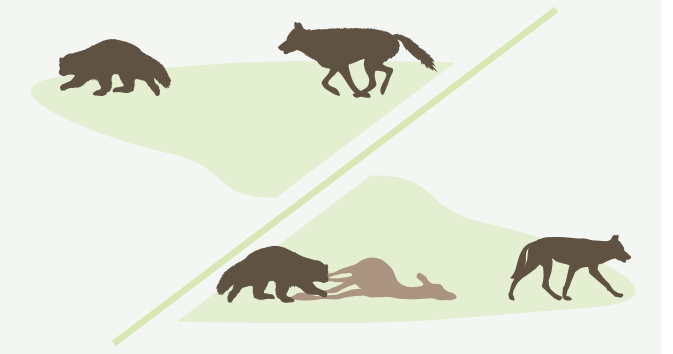


Range size and wolf control are key uncertainties

Wolverines occupy larger ranges than caribou and occur at much lower densities. This means caribou conservation across multiple adjacent ranges (i.e., a larger total area) will be most beneficial for wolverines.



Wolf kills of ungulates are a key food source for wolverines, but wolves are also known to kill wolverines. As a result, it is not clear how wolf control will impact wolverine populations.



Management Implications

Conservation planning that benefits multiple species at large scales can help increase the impact of management actions and increase the influence of limited resources. Since both caribou and wolverines prefer similar habitats, there is potential for management actions to benefit both species. Overall, management of the shared threats of sensory disturbance and industrial disturbance (forestry, mining, linear features) have the largest potential to benefit both species. Since wolverines are less represented in literature than caribou, they could also benefit from increasing partnerships and data sharing. In particular, multi-species monitoring via aerial or camera-based surveys.

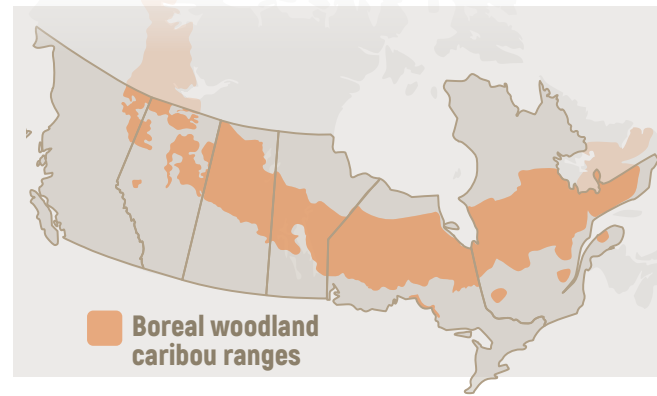
Forestry practices are complex and vary considerably across Canada. Examining management actions at different scales, such as spanning several caribou ranges or accounting for multiple species, could provide valuable insights into the efficacy of current habitat conservation efforts within the industry.

Hohnen, R., Stewart, F. E. C., & Scraftord, M. A. (2025). Wolverine in the slipstream: A systematic review of caribou-focused conservation benefits, gaps and uncertainties for wolverine in Canada. *Conservation Science and Practice*, 7(10), e70152. <https://doi.org/10.1111/csp2.70152>



Estimating climate and caribou protection impacts to Canada's timber supply

Finding balance between managed forests and habitat conservation is a complex trade-off. Managed forests are crucial contributors to the Canadian economy, providing jobs and filling demands for timber resources. In contrast, habitat fragmentation can negatively impact wildlife, particularly woodland caribou. Since the boreal population of the woodland caribou requires more undisturbed forest than most other species, caribou can be used as a conservation target with the understanding that many other boreal species will also benefit. Current conservation policies aim to retain at least 65% undisturbed habitat within caribou ranges, but it is not clear how achieving this level of protection will impact Canadian forestry. To ensure sustainable management of forest resources, a deeper understanding of these trade-offs is essential.



Study Design

This study looked at the distribution of boreal woodland caribou across Canada in combination with industrial forestry zones. The impacts of caribou range protections on timber supply were assessed under present and future climate conditions for the six largest provinces (British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, and Quebec).

Achieving caribou conservation targets required an average of 11% reduction in industrial forestry zones

Manitoba and Saskatchewan showed the largest proportional industrial forestry zone reductions, followed by Alberta and Quebec. However, modelling area reductions did not always result in reduced timber production. The landscape's ability to support supply demands is impacted by many factors including mill demand levels, forest age structure, disturbance histories, future disturbance rates, and annual allowable cut levels. **Under the 65% protection rule, timber supply shortages were only projected for Quebec, Alberta, and British Columbia.**

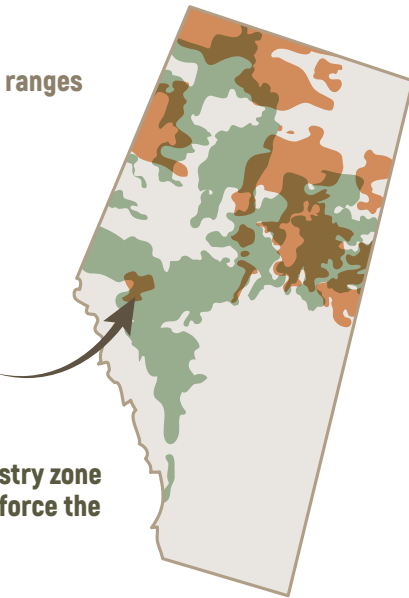
- Boreal woodland caribou ranges
- Industrial forestry zones



In Alberta, 13.2 M ha of caribou range overlap with industrial forestry zones by more than 35%.



18.6% (4.7 M ha) of industrial forestry zone would need to be protected to enforce the 65% protection rule

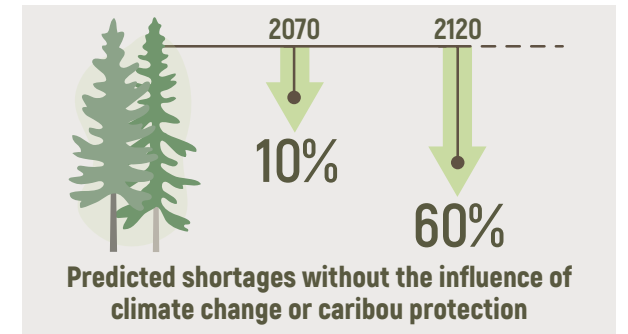


Alberta and Quebec were most vulnerable to modelled timber supply shortages. Dense caribou ranges and large climate change impacts from wildfire and insect outbreaks influenced Alberta's vulnerability. However, timber supply is projected to decline even without the impacts of caribou conservation or climate change, meaning these impacts are cumulative to other factors. Mill demand levels, timber production capacities, forest age structure, past and current forest disturbance rates (particularly from oil and gas activities), management plans that aim to keep harvest sustainable, and other complex factors and interactions can all play a role in declines. **Softwood supply shortages could reach 10% in 2070 and up to 60% in 2120 without the influence of climate change scenarios or caribou**

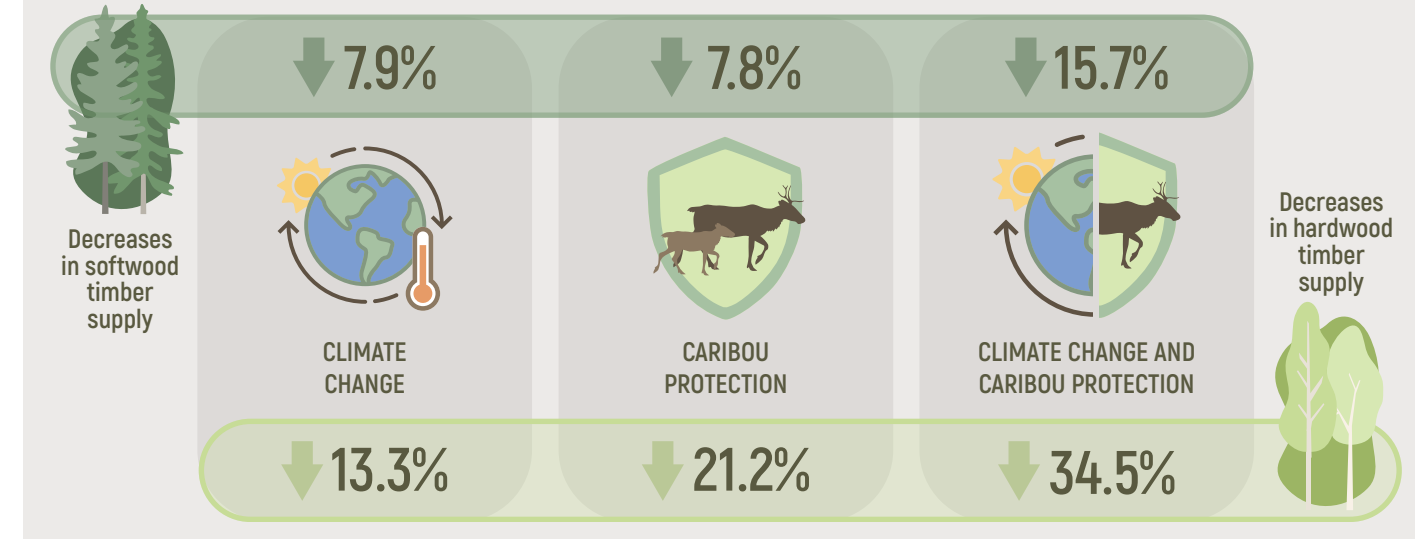
protection. However, this study did not account for southern mountain caribou ranges nor the finer scale 'dynamic' allocation of caribou range protection (more realistic than large static reserves), leading to conservative initial estimates.

Climate change is expected to increase the area burned and alter pest outbreaks, impacting forestry resources

The impacts of caribou conservation policies on timber supply were often equal to or smaller than impacts from climate change (from increasing area burned). Quebec, Alberta, and British Columbia all showed moderate timber supply shortages in the climate change scenarios even without changes to caribou protection.



Net impact of climate change and caribou protection policies on Alberta timber supply shortages predicted for the year 2120 under the RCP 8.5 climate scenario.



Management Implications

This preliminary, exploratory study found that the cumulative impact on timber supply due to climate change and increased caribou habitat protection will be larger in some provinces. Due to large climate change impacts, pursuing climate change adaptation strategies within the forestry industry could help partially mitigate impacts of caribou conservation measures. For example, lowering harvest targets in fire-prone regions could help buffer unexpected shortages caused by fires. Management strategies could prioritize a smaller but more stable timber supply.

This study reflects an exploratory first estimate. Since its release, there has been active scientific debate about whether the study underestimates potential timber supply impacts. The original authors have acknowledged that it was necessary to use coarser spatial data and simpler assumptions (e.g., static habitat reserves) because of the broad scale. Future research exploring finer-scale details may be needed to refine estimates.

Denys Yemshanov, Mackenzie Simpson, Sylvie Gauthier, Ning Liu, John Pedlar, Pierre Bernier, Yan Boulanger, Guillaume Cyr, and Anne-Helene Mathey. 2025. Climate change, caribou protection, and Canada's timber supply. Canadian Journal of Forest Research 2025 55, 1-24. <https://doi.org/10.1139/cjfr-2024-0181>

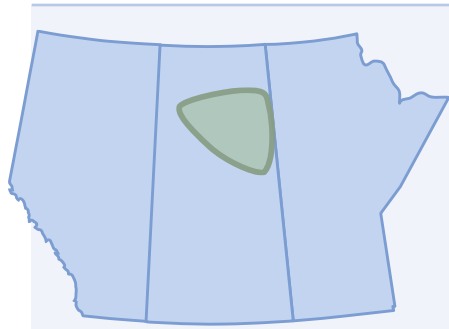
REPLIES Steven F. Wilson and Darren J. H. Sleep. 2026. Key omissions in caribou policy modelling: a reply to Yemshanov et al. (2025). Canadian Journal of Forest Research. 56: 1-2. <https://doi.org/10.1139/cjfr-2025-0251>

Denys Yemshanov, Mackenzie Simpson, Sylvie Gauthier, Ning Liu, John Pedlar, Pierre Bernier, Yan Boulanger, Guillaume Cyr, and Anne-Helene Mathey. 2026. Key omissions in caribou policy modelling—a reply to Wilson and Sleep (2025). Canadian Journal of Forest Research. 56: 1-2. <https://doi.org/10.1139/cjfr-2025-0331>

Habitat selection of black bears, wolves, and boreal caribou in an area of low anthropogenic disturbance

Landscape disturbances are known to have an important influence on animal behaviour and movement. For woodland caribou, these changes can increase predation risk by altering predator-prey dynamics, shifting habitat selection patterns, and making travel easier for wolves and bears. Research continues to uncover more about these processes, with most studies in heavily disturbed landscapes where caribou are at greatest risk of population declines. However, establishing a better understanding of these processes on a landscape with low anthropogenic disturbance may provide crucial insights for caribou conservation.

Predator avoidance through habitat selection is key to caribou survival, especially during the calving season when they are most vulnerable (May 1 to August 11). Caribou rely on mature conifer stands for refuge and access to forage. These habitats can take decades after fire disturbances to develop but are essential for helping caribou minimize encounters with predators. Understanding which habitats are selected by predators and how this selection changes as landscapes are disturbed is essential to understanding these dynamics.

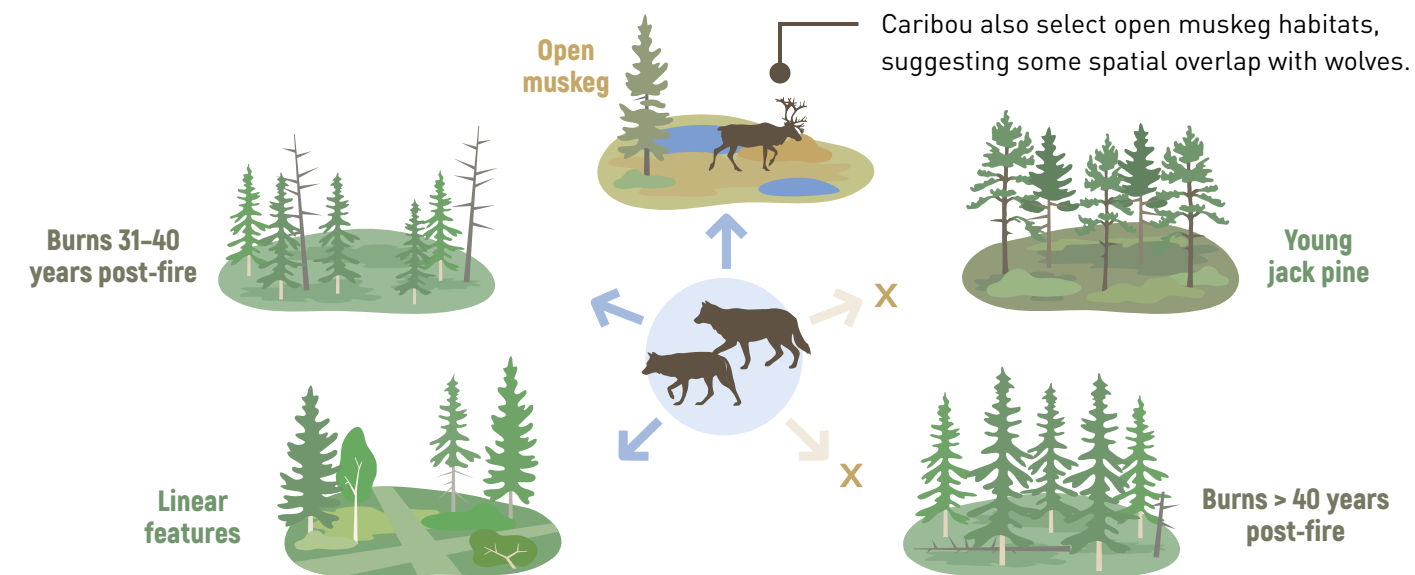


Study Design

This study took place in the boreal ecosystems of northern Saskatchewan. Anthropogenic disturbance in this region is low (0.13 km of linear features per km² or 0.4% of total area) but wildfire disturbance is high, with 58.2% of the area having burned within the last 40 years. This landscape provides a valuable opportunity to study predator-prey interactions under conditions that more closely resemble historical baselines. Bears, wolves, and caribou were collared with the goal of understanding how landscape disturbances influence habitat selection by predators, and what this means for caribou during calving seasons.

Wolves prioritized open habitats for easier movement

Wolves selected open muskeg, burns 31–40 years post-fire, and areas closer to linear features, likely to reduce energy expense. They avoided young jack pine and burns > 40 years post-fire.



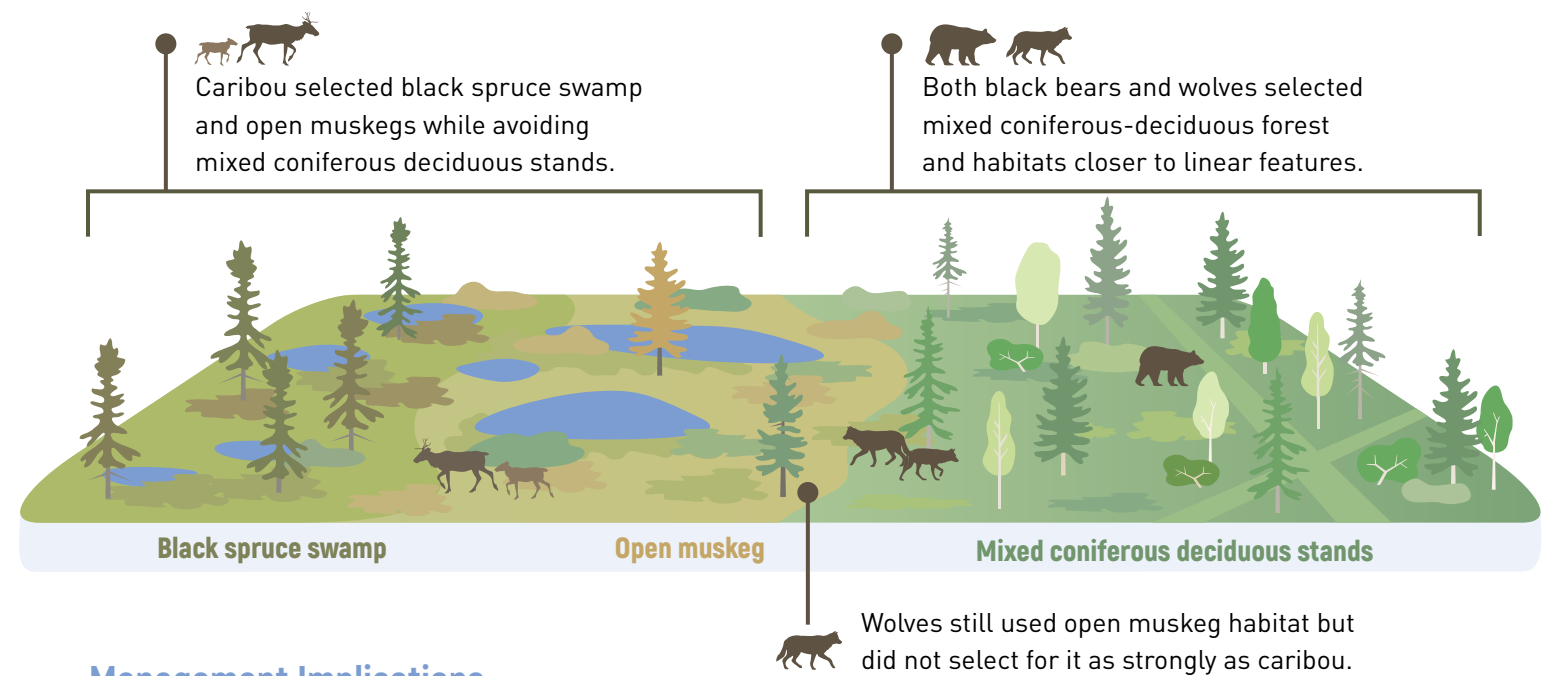
Black bears preferred early to mid-successional forest types and habitat selection varied seasonally

Spring and summer
Selected mixed coniferous-deciduous forest, likely due to higher forage availability.

Autumn
Selected young coniferous stands, including mature black spruce and young jack pine stands, which may reflect a change of diet to berries.

Year-round
Selected burns 0–20 years post-fire, and areas closer to linear features, while avoiding black spruce swamp and burns > 30 years.

Bears, wolves, and caribou generally selected different habitats during calving season



Management Implications

This research reveals clear patterns in how bears and wolves use successional forest stages and disturbances within a fire-driven boreal landscape. The patterns suggest that certain vegetation types provide key resources or structural features that are important across multiple levels of habitat use. Although linear features were sparse on this landscape, they were still exploited by bears and wolves. This highlights the disproportionately large influence linear features can have on predator behavior even at low densities.

As landscapes are disturbed, the natural spatial separation between caribou and predators is reduced, increasing predator-prey overlap during sensitive life stages for caribou. Management that protects certain habitat types like the open muskeg where wolves and caribou have the most overlap or the > 40 year post-fire forests that predators do not naturally select for could potentially help preserve the spatial separation that caribou rely on.

Patricia A. Tomchuk, Branden T. Neufeld, Ian N. Best, Clara Superbie, Charlotte Regan, Philip D. McLoughlin. 2026. Comparative habitat selection of black bears, wolves, and boreal caribou in an area of low anthropogenic disturbance. *Global Ecology and Conservation* Volume 65, January 2026, e04040. <https://doi.org/10.1016/j.gecco.2025.e04040>

WHAT IS THE ARCKP?

Who we are, and what we do

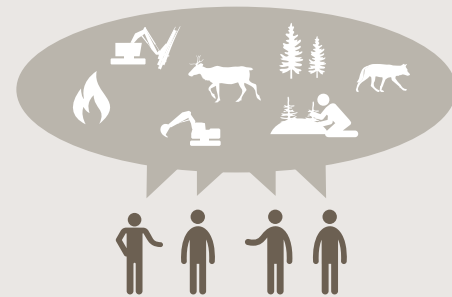
Woodland caribou are a cultural and ecological icon of Alberta's Boreal forests. However, they are also a threatened species, and represent a significant conservation challenge. In response to this challenge, and to the additional challenge of managing woodland caribou across different ecosystems, the Government of Alberta and the province's forest sector formed the Alberta Regional Caribou Knowledge Partnership (ARCKP). Together, we are committed to finding on-the-ground solutions that balance forestry activities with woodland caribou conservation.

Initiated in 2020, the ARCKP is an association of fRI Research and funded by the Forest Resource Improvement Association of Alberta (FRIAA) through the support of forestry companies in Alberta. Together, these partners have contributed over \$1 million per year to address region-specific knowledge gaps in woodland caribou ecology.



OUR VISION

A collaboration promoting self-sustaining caribou populations and a viable forest sector.



OUR MISSION

We support the development and sharing of innovative tools, techniques, strategies and understandable scientific knowledge to enhance sustainable forest management and caribou recovery efforts.

Have questions about the ARCKP?
Contact our network coordinator at ARCKP@fuseconsulting.ca or visit arckp.ca.

The ARCKP is funded by the Forest Resource Improvement Association of Alberta



Current ARCKP Partners



For more information or to contact the ARCKP, visit arckp.ca

