



# How Can We Protect Critical Caribou Habitat and Support Forestry Jobs in Ontario?

A BACKGROUND REPORT PREPARED BY ONTARIO NATURE  
JUNE 2019



# EXECUTIVE SUMMARY

Some residents of forestry-dependent communities and their elected municipal officials have expressed considerable opposition to caribou recovery planning, as they fear it will result in significant job losses or mill closures and a reduction in the industrial tax base. However, much of the planned wood supply in forest management units (FMUs) that significantly overlap boreal caribou ranges is not being logged. This raises important questions as to why critical caribou habitat cannot be protected without causing economic hardship.

If boreal woodland caribou populations are to survive and recover, their habitat must be maintained and restored to provide enough space for mating, rearing young and evading predators. Yet the Government of Ontario has allowed industrial expansion into unfragmented caribou habitat — including logging, mining, hydro corridors and roads — to continue, without range plans in place to guide (and potentially restrict) further industrial expansion and ensure strategic habitat restoration. The latest publicly available population data and range disturbance information indicate that boreal caribou critical habitat degradation has worsened over the past 10 years.

The purpose of this report is to explore opportunities to protect critical habitat and address concerns of forestry dependent communities. Four strategies are considered: 1) sharing the wood supply surplus, 2) improving socio-economic analysis to better reflect opportunities and trade-offs, 3) mobilizing the marketplace to both expect and reward critical habitat protection and 4) linking government subsidies, grants and guaranteed loan programs to critical habitat protection.

ISBN 978-1-988424-35-4

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# INTRODUCTION

The habitat needs of boreal (woodland) caribou have been considered in many forest management plans in Ontario since the early 1990s, including caribou “mosaics” and deferral blocks that aimed to create large, even-aged forest patches in an effort to better emulate disturbances created by wildfire.

Since the release of the Caribou Conservation Plan in 2009, planning focus has been on developing and implementing the Dynamic Caribou Habitat Schedule (DCHS), which is based on the premise “that harvested areas that provided suitable habitat can be regenerated using appropriate silviculture techniques to provide future caribou habitat.”<sup>1</sup> In practice, the DCHS consolidates logging activities over time and space (e.g., over 100 years, and an entire forest management unit, with consideration of adjacent FMUs) and supports decommissioning logging roads with the intention of establishing second-growth forests that are “suitable” for future caribou re-occupancy.<sup>2</sup> Determining the efficacy of this approach

remains limited because it has not been implemented for long enough to know whether or not caribou are maintaining stable populations as they re-occupy regenerating cutblocks. While caribou have been seen using previously logged areas (e.g., second-growth, conifer forests that are 40+ years old),<sup>3</sup> that use has yet to be linked to stable or increasing populations. In fact, the best available information suggests that these populations are declining.<sup>4</sup>

Ontario boreal caribou populations are listed as a threatened species under Ontario’s Endangered Species Act (ESA) and Canada’s Species at Risk Act (SARA). Ontario’s ESA requires that certain steps

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be taken to assist in the recovery of boreal caribou. The first step is preparation of a recovery strategy. The Ontario Ministry of Natural Resources' boreal caribou recovery strategy was published in July 2008. According to the strategy, the management goal is to:

"Maintain self-sustaining, genetically-connected local populations of forest-dwelling woodland

recommended a number of methods for achieving it, including landscape-level habitat management.<sup>6</sup> The recovery strategy was prepared as "advice to the responsible jurisdictions and the many different constituencies that may be involved in recovering the species."<sup>7</sup>

The Ministry of Natural Resources and Forestry also published a "response statement" for boreal

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caribou where they currently exist; ensure security for and (reproductive) connections among currently isolated mainland local populations; and re-establish caribou in strategically selected landscape units to achieve self-sustaining local populations and ensure connectivity."<sup>5</sup>

This strategy identified caribou habitat maintenance at the range level as a key objective and

caribou, as required by the ESA (Section 11). The response statement outlined a number of actions MNRF proposed to take in response to the recommendations made in the recovery strategy.<sup>8</sup> These included adopting a range management approach to boreal caribou recovery, carrying out regular population monitoring and cumulative-impact assessments, and developing policies to manage densities of roads and other linear fea-

tures in caribou ranges. While these approaches were consistent with the first critical habitat report published in 2008, they do not include the identification and protection of critical habitat included in the federal recovery strategy, which was published in 2012.<sup>9</sup>

Scientists have noted that “forest management planning for caribou tends to focus on one aspect of habitat for caribou: the amount and arrangement of forest stands of various types and ages. Typically, forest planning does not adequately consider how disturbance related to old, existing or new roads influences caribou sustainability, nor does it recognize cumulative habitat change incurred in forests as a result of other forms of human or natural disturbances coincidental with or stimulated by forest management activities.”<sup>10</sup> As such, they question how well forest management planning has been adapted to implement the requirements of the boreal caribou conservation plan or to provide effective critical habitat protection, a SARA requirement. In most cases, cumulative disturbance on boreal caribou ranges that overlap with the managed forest has continued to increase, while the forestry industry has had an almost uninterrupted exemption from the ESA’s recovery requirements (e.g., overall benefit). Critical caribou habitat in many ranges remains ineffectively protected (i.e., cumulative disturbance is over 35 per cent at the range level and increasing). For example, the Forest Management Guide for Boreal Landscapes does not include the requirements of the federal recovery strategy within the zone of continuous caribou range (i.e., to prevent damage or destruction of critical habitat) and is instead intended to “*minimize* the risk that forest management operations *might* incidentally kill, harm, or harass caribou, or damage or destroy

their habitat.”<sup>11</sup>

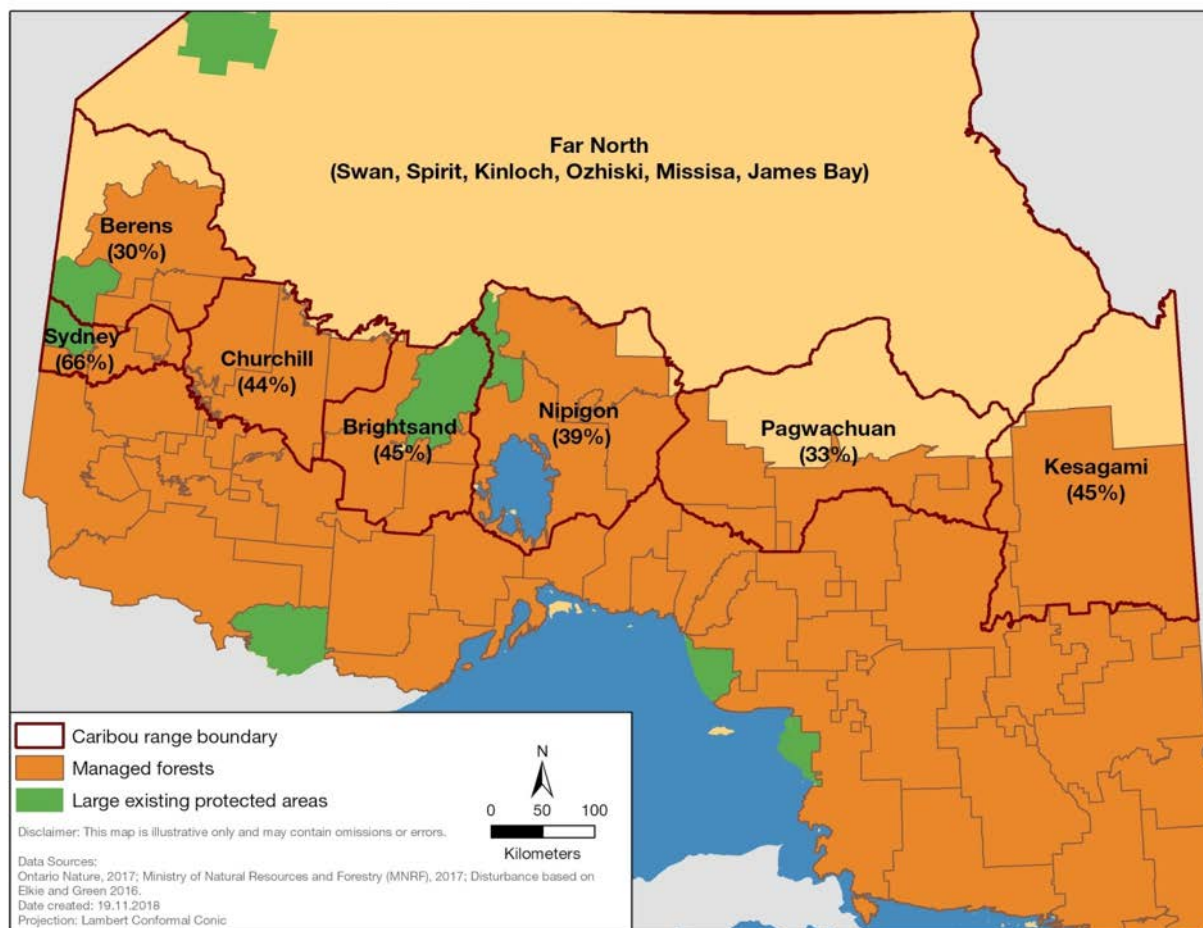
Despite evidence of decline across boreal caribou populations in Ontario, 2013 amendments to the ESA exempt a number of industries from the prohibition against damaging or destroying the habitat of listed threatened or endangered species. The exemptions apply to activities associated with forestry operations, hydroelectric generating stations, aggregate pits and quarries, drainage, early exploration mining, wind facilities and more. In June 2019, the Government of Ontario made many significant amendments to the ESA. These included allowing harmful activities approved under other pieces of legislation to be carried out without any additional authorizations under the ESA, as long as the proponent takes steps to minimize adverse effects. This contrasts with the original legislation, which focused on recovery of species at risk and allowed harmful activities approved under other legislation to occur only if an overall benefit to the species were provided. Mitigating impacts on species at risk is a significant policy shift away from species’ recovery.

Some residents of forestry-dependent communities and their elected municipal officials have expressed considerable opposition to caribou recovery planning, as they fear it will result in substantial job losses or mill closures and reduction in the industrial tax base.<sup>12</sup> However, much of the planned wood supply in forest management units (FMUs) that significantly overlap boreal caribou ranges is not being logged, particularly over the past decade. This raises important questions as to why critical caribou habitat cannot be protected without causing economic hardship.



Figure 1.

Caribou ranges, forest management units and most recently reported disturbance levels for ranges that overlap with the managed forest in Ontario.



Source: Ontario Nature, 2018.

# STATUS OF BOREAL CARIBOU IN ONTARIO

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recovery under that act, convened a team of experts, including leading caribou scientists, to conduct a meta-analysis of caribou population trends in relation to range-level disturbances.<sup>13</sup>

**Table 1.**

Habitat disturbance in caribou ranges in Ontario (from federal and provincial sources). The larger the total cumulative disturbance in a population range, the greater the probability of that caribou population not being self-sustaining.

Range		2011 (%)	2012 (%)	2013 (%)	2015 (%)	2017 (%)
Bright-sand	Federal <sup>21</sup>		42			41
	Provincial <sup>22</sup>	43.4	44.9	45.3	45.4	
Churchill	Federal		31			34
	Provincial	38.4	42.3	41.7	44.1	
Sydney	Federal		58			49
	Provincial	61.2	62.4	65.2	66	
Berens	Federal		39			37
	Provincial	27.4	28.8	29.1	30.4	
Nipigon	Federal		31			34
	Provincial	37.9	38.8	39.0	39.3	
Pagwachuan	Federal		27			27

The results of this analysis form the basis of the 2012 federal recovery strategy,<sup>14</sup> which sets a benchmark for the provinces: to maintain disturbance levels in every caribou range at 35 per cent or lower. Boreal caribou were also listed as threatened under Ontario's ESA when it took effect in 2008. Seven caribou ranges overlap the managed forest in Ontario: Berens, Brightsand, Churchill, Kesagami, Nipigon, Pagwachuan and Sydney (Figure 1).

The latest publicly available population condition data and range disturbance information for

boreal caribou ranges that overlap with the managed forest zone in Ontario are summarized in Tables 1 and 2. Available data indicate that the degradation of critical habitat for boreal caribou has worsened in most of the seven ranges overlapping Ontario's managed forest since 2011. For example, in the Churchill range, which has undergone the greatest increase in disturbance, the extent of anthropogenic disturbance has increased by about 100,000 hectares from 2011 to 2015.<sup>15</sup> While federal and provincial assessments of disturbance levels vary due to differences in methodology (e.g., the federal assessment used



## Table 2.

Available population size estimates and trends for caribou ranges that overlap the managed forest in Ontario.<sup>23</sup>

Range	Estimated Population Size (minimum annual count)	Population Trend (2011-2013)	Calf Recruitment Rate (calves per 100 adult females)
Berens	237 (2012)	Declining	23.9 (2013)
Brightsand	224 (2011)	Declining	25.5 (2013)
Churchill	262 (2012)	Declining	24.7 (2013)
Kesagami	178 (2010)	Declining	15.3 (2013)
Nipigon	172 (2010)	Declining	22.9 (2013)
Pagwachuan	164 (2011)	Stable	32.7 (2013)
Sydney	55 (2012)	Declining	13.6 (2013)

Note: MNRF regularly updates information on range condition (e.g., cumulative disturbance), whereas population surveys are not regularly updated.

Landsat data 1:50,000 scale to determine disturbance, while the provincial assessment used individual disturbances, such as mining claims, roads, fires, forestry blocks and so forth), both show overall increasing trends in cumulative disturbance. Increasing cumulative disturbance is linked to increasing risk of caribou extirpation.

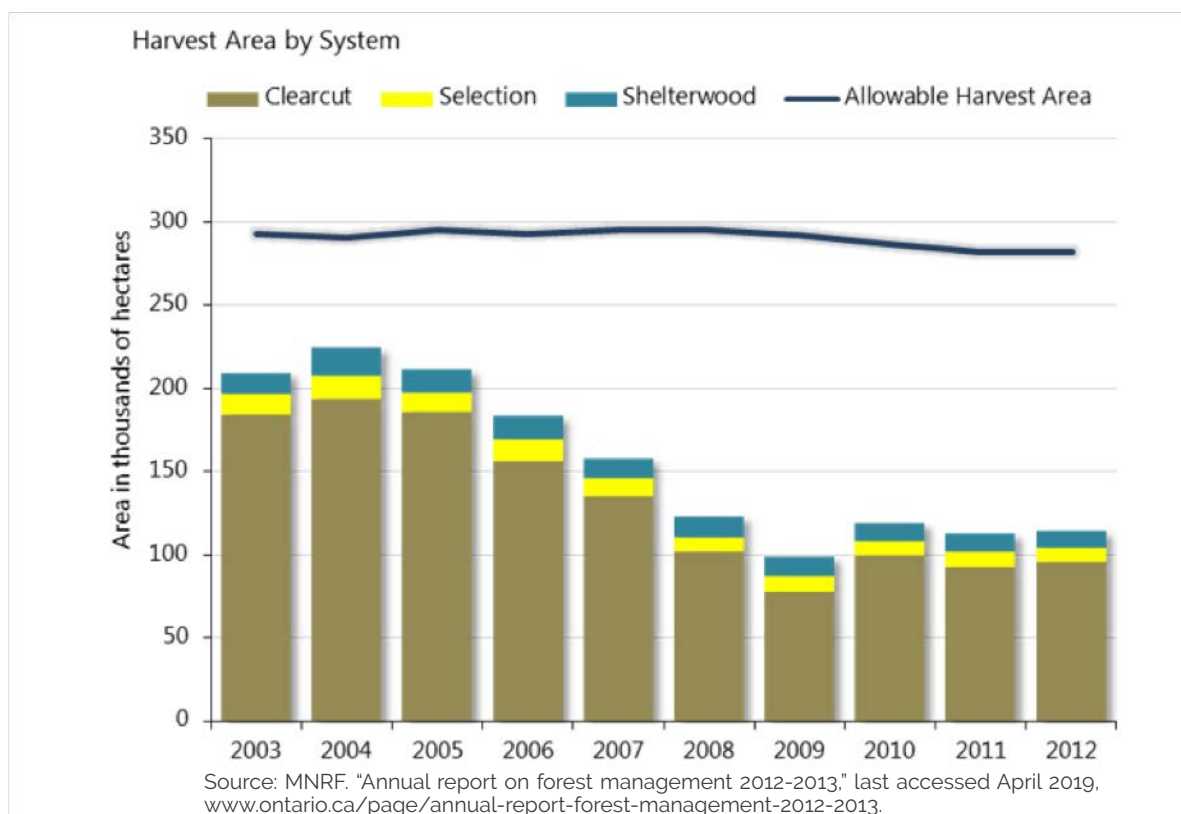
Risk of local extinction is high in populations with poor demographic conditions, such as low female survival and/or low calf recruitment (survival until adulthood). Adult female survival and calf recruitment are indicators of population trend (declining, stable or increasing). Environment Canada (2008) has demonstrated that the probability of extinction in boreal caribou populations decreases with increasing recruitment rates.<sup>16</sup> It notes that Bergerud (1992) reported that an approximately 28 calves/100 cows ratio indicates a stable population; however, this threshold can vary, depend-

ing on the survival rates of adult females. Available information on calf recruitment rates in Ontario shows declining population trends are generally consistent with increasing disturbance levels (Table 1 and 2). In Ontario, while cumulative disturbance at the range level is continually assessed, no populations have been monitored for six years or more.<sup>17</sup>

MNRF has allowed industrial expansion, including logging, mining and roads, into caribou habitat to continue for the past 10 years, without range plans in place to guide (and potentially limit) further industrial expansion and strategic restoration. This is despite evidence of population decline and, in some ranges, high-risk levels of cumulative disturbance.<sup>18</sup> MNRF has extended the regulatory exemption for the forestry industry to July 1, 2020,<sup>19</sup> and there are additional changes proposed to further minimize or eliminate the recovery require-

Figure 2.

Trends in harvest area compared to Allowable Harvest Area between 2003-2012.



ments of the ESA. For several years, MNRF has explored options to “harmonize” the ESA requirements with existing laws and policy that inform forest management.<sup>20</sup> This process has included

completion of a socio-economic analysis based largely using wood supply as a proxy to evaluate potential impacts on mills, jobs and tax revenue.

## HOW CAN CARIBOU RECOVERY AND INDUSTRIAL ACTIVITY CO-EXIST?

### I. Share the surplus

Geography plays an important role in how much wood harvesting occurs and where. Ontario’s forests and forest products industry are in a state of

change, as government and industry are transitioning from managing and harvesting mainly primary forests that were not previously logged to in-

**Table 3.**

Summary of harvested versus available wood volume in forests with greater than 50 per cent overlap with caribou ranges in Ontario. Surplus suggests volume is available for caribou recovery.

Forest Management Unit	Available to harvest (cubic metres per year)	Actual harvest (cubic metres per year)	Surplus 2016/17 (cubic metres)
Red Lake Forest (Plan 2008–18)	205,392	107,847 (2017/18)	97,545
Ogoki Forest (Plan 2008–18)	623,034	5,143.71 (2017/18)	617,890
Whitefeather Forest (2012–22)	624,594	0 (2016/17)	624,594
Caribou Forest (Plan 2008–18)	531,663	80,431 (2017/18)	451,232
Caribou Forest (Plan 2008–18)	531,663	80,431 (2017/18)	451,232
Trout Lake Forest (Plan 2009–19)	1,087,441	696,367 (2017/18)	391,074
Lac Seul Forest (Plan 2011–21)	616,851	347,931 (2017/18)	268,920
Abitibi River Forest (Plan 2012–22)	1,295,582	485,123 (2017/18)	810,459
Lake Nipigon Forest (Plan 2011–21)	895,174	513,922 (2016/17)	381,252

Note: Aroland, Eabametoong and Marten Falls First Nations (through Agoke Development Corporation) have the right to implement an interim forest management approach (harvest, silviculture, roads, etc.), and they are negotiating a long-term forest licence for the Ogoki Forest, 400 kilometres northeast of Thunder Bay, which sits within their traditional territories. Further, in 2013, Whitefeather Forest Community Resource Management Authority, a company guided by Pikangikum First Nation, was issued a Sustainable Forest Licence for the Whitefeather Forest. These extremely low harvest levels are, in part, a reflection of licensing transition and are likely to change.

vesting in and managing second-growth forests as previously logged forests regenerate. In some parts of the caribou range, the haul distances to mills are hundreds of kilometres. Forests in caribou range, on average, also tend to have lower yields and are less productive than more southern forests, due to tree species, climate and fire history.

## II. Improve socio-economic analysis

Accurate assessments of economic trade-offs are

an important part of decision-making about public lands. However, inappropriate model assumptions can lead to exaggerated or misleading projections of the socio-economic impacts of policy. Socio-economic analyses must be robust and transparent to ensure credibility of their outputs. In December 2017, MNRF's Forest Industry division made a presentation to industry stakeholders as a "first attempt" <sup>24</sup> to quantify the potential socio-economics of caribou prescriptions under consideration, which was intended as a "basis

for discussion.”<sup>25</sup> In 2018, the Ontario Forestry Industries Association began publicly claiming that 2,800 jobs (in May 2019, that claim is now 3,000 jobs) could be lost if implementation of the Forest Industry division’s scenarios moved forward,<sup>26</sup> citing the December 2017 presentation as an independent “study” conducted by MNRF. However, the analysis and presentation were not made available publicly (e.g., to be reviewed by economists or caribou biologists outside of government). MNRF stated that this was because they did not want the model outputs to be taken out of context. Nonetheless, the output of the most restrictive assessment with the greatest potential impacts is now used in public communications challenging implementation of federal and provincial recovery strategies, despite the fact that the modelled prescriptions are not what are required by law.

In August 2018, MNRF also presented the analysis to a small group of caribou scientists, economists and ENGOs via webinar.<sup>27</sup> They submitted a review to MNRF to summarize limitations of the analysis and suggest where improvements are needed to ensure MNRF does not overstate the potential economic impacts, underestimate the flexibility measures in implementing recovery strategies or impede thoughtful dialogue on trade-offs that may be associated with caribou recovery.

The key weaknesses identified during this webinar presentation included the lack of:

1. relative comparison with other factors affecting the sector;
2. involvement of caribou experts to inform caribou-related inputs;
3. reporting on the relative achievement of

- each scenario for caribou conservation;
4. comprehensive sensitivity analysis; and
5. consideration of non-market impacts.

1. Lack of relative comparison with other factors affecting the sector. MNRF did not report on how the estimated impact on jobs in this analysis compared to other factors affecting the sector.<sup>28</sup> The forestry industry faces many trade and economic challenges, including the boom-and-bust of commodities markets, high energy prices, an aging workforce, the fluctuating Canada–U.S. exchange rate and softwood lumber tariffs.<sup>29</sup> Further, increased technology means greater productivity using less labour, and therefore fewer workers can be employed even when mills are maintaining or increasing production and profits. In addition, the emergence of low-cost forest-products producers in the global market is an important factor that impacts the demand for Ontario’s forest products.<sup>30</sup>

The mill, job and tax projections should be compared, relatively, to other impacts, including trade tariffs, energy prices, technology increases and so on, that are known to be significant determinants of productivity and labour needs. For example, employment and hours worked fell at a greater rate than output in the period from 2000 to 2013, leading to labour productivity *growth* of one per cent per year in the forest-products sector compared to 0.6 per cent per year in the total economy, even while mills were closing.<sup>31</sup> Further, for the purposes of the initial socio-economic assessment (December 2017 presentation), the Forest Industry division made a baseline assumption of approximately 20 million cubic metres harvest (i.e., determined supply reductions based on this forecasted volume estimate), which is at least four-million cubic



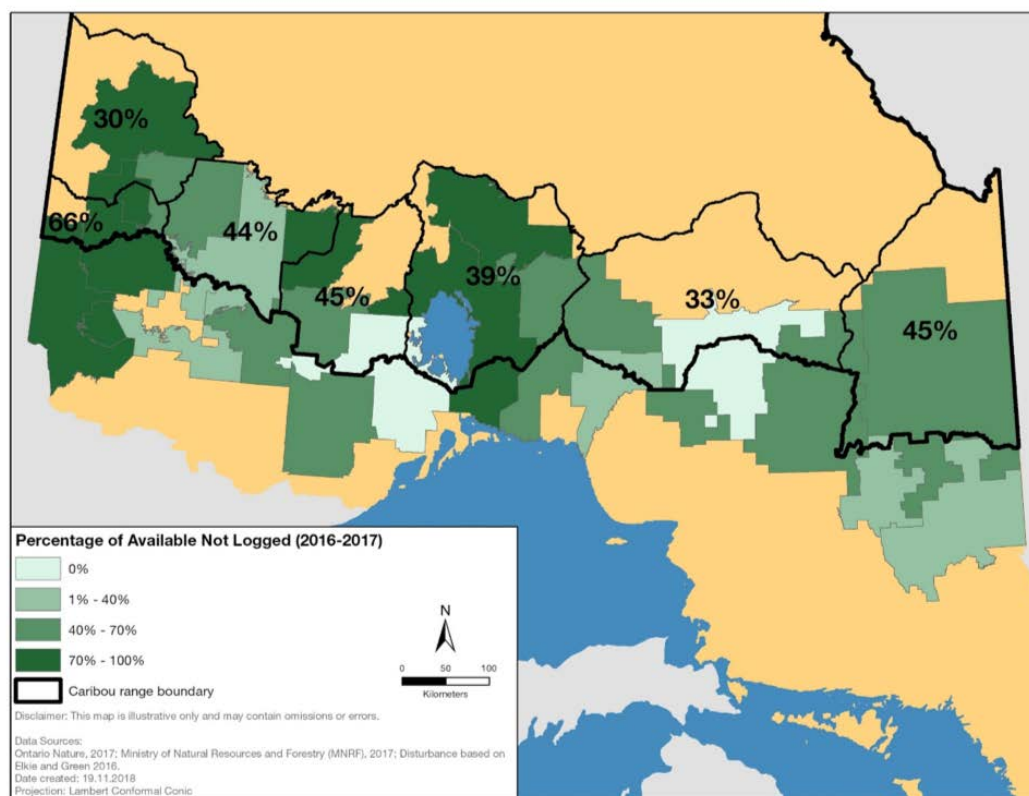
metres above current harvest (when compared to the harvest levels reported in the most recent annual reports).<sup>32</sup> To calculate this demand, the Forest Industry division included past usage, as well as installed capacity, business plans, provincial wood supply commitments and business-to-business arrangements, many of which were negotiated after the caribou recovery strategies were released. This further illuminates how the delay in critical habitat protection is and will continue to exacerbate potential impacts (e.g., when a long-term management direction ignores recovery strategy requirements, wood supply expectations are set higher than would be possible if critical habitat were protected). In addition,

whether the baseline trend assumption is one of growth, stability or decline informs whether the impacts of each option are foregone gains or reductions from the present value. This is an important distinction, as most people are more averse to losses than foregone gains, and the industry is likely to respond differently to each.

Further, MNRF did not identify how older data would impact results (i.e., sensitivity of the models to market assumptions). MNRF stated that its version of Socio-economic Impact Model (SEIM) used 2011 data and that it compared the provincial-scaled impacts with 2013 data from Ministry of Finance, with results being plus or minus five

Figure 3.

Current wood harvesting levels in FMUs in Ontario.



Note: FMUs that overlap with boreal caribou range (based on 2016/17 annual reports) are shown in gradients of green (dark green represents FMUs with the greatest gap between allowable cut and actual harvest). Percentages depict disturbance levels on each caribou population range (in black).

per cent.<sup>33</sup> Generally speaking, labour is continuously being replaced by automation in industrial processes, and the amount of labour per unit of finished product is likely lower than it was in 2011. In addition, a number of mills have (re) opened and major pulp mills have closed in Ontario since 2011,<sup>34</sup> so the SEIM baseline may be inaccurate for 2018 conditions. By way of comparison, labour force survey data from Statistics Canada show that employment in 2017 (38,813) was 5.3 per cent lower than in 2011 (40,104).<sup>35</sup> This suggests that MNRF's variance may not be appropriate or sufficient due to fluctuating economic factors.

2. Lack of involvement of caribou experts to inform caribou-related inputs and explore trade-offs. The scenarios MNRF considered included an assumption that "Category 1" areas would be permanently set aside. Category 1 habitat features or areas are identified by MNRF and include those "areas anticipated to have the lowest tolerance to alteration before their function, or usefulness, in supporting caribou is compromised."<sup>36</sup> They include winter areas, nursery areas and travel corridors. These were identified and set aside in addition to achieving the 35 per cent disturbance threshold recommended in the federal recovery strategy,<sup>37</sup> potentially increasing the impacts on wood supply unnecessarily. Also, the two scenarios MNRF considered assumed that the 35 per cent disturbance threshold must be achieved on each FMU (n = 20). This is one of many critical assumptions given that harvest levels vary significantly between units, FMUs likely differ in regard to their importance to caribou recovery and many caribou ranges extend beyond the managed forest (see Figure 3).

3. Lack of reporting on the relative achievement

of each scenario for caribou conservation. MNRF did not quantify the conservation outcomes of different options in terms of decreased risk of extirpation of boreal caribou. Without this information, any measure of conservation effectiveness cannot be ranked, which is presumably important evidence to inform a decision about competing trade-offs and risks. The disturbance threshold is a management approach based on risk. Scenarios can and should be assessed from a risk-based approach to convey these potential trade-offs.

4. Lack of comprehensive sensitivity analysis. MNRF did not adequately undertake sensitivity analysis (i.e., how much uncertainty there is in the model outputs, and how this can be associated with uncertainty in the model inputs) to the standard that would be expected in wildlife management. As a result, no information was provided on which input assumptions were having the greatest relative effect on the impacts reported. Assumptions associated with transportation costs, for example, would have been particularly sensitive to uncertainties. Even the relatively arbitrary scenarios developed (e.g., using 30 or 50 years to achieve protection goals was the only factor that appeared to be adjusted) showed that the job impacts reported doubled by restricting the time frame.<sup>38</sup> This suggests high sensitivity in the model and requires assessment of alternative scenarios (e.g., considering adjustments other than the time frame).

(e) Lack of consideration of non-market impacts. MNRF did not consider any non-market impacts in their economic analysis. The result was a lopsided analysis of only market (monetized) impacts. Research has shown that people are willing to dedicate economic resources for the

benefit of conserving biodiversity. In MNRF's Statement of Environmental Values, it notes, "natural resources should be properly valued to provide a fair return to Ontarians and to reflect their ecological, social and economic contribu-

tions." Even without Ontario-specific analysis, MNRF could have transferred passive-use values of caribou conservation from research done in Alberta or Saskatchewan.

### III. Support complementary, market-based solutions

Market-based incentives can complement regulatory frameworks and help provide financial or reputational incentives to achieve high standards of environmental performance (e.g., protection of critical caribou habitat).

For example, Forest Stewardship Council (FSC) certification has had substantial uptake in Ontario, with about half of the managed forest currently certified under FSC's forest management standards. FSC Canada has acknowledged that the impact of forest management practices on boreal caribou has emerged as an issue of significant debate in Canada, and an important metric of sustainability.<sup>39</sup>

FSC Canada's new standard confirms that development and implementation of boreal caribou range plans should be consistent with the federal recovery strategy. However, in recognition that SARA-compliant range plans may not be in place immediately, the standard provides flexibility through three options for achieving conformance with its standard:<sup>40</sup>

1. Implementation of a SARA-compliant range plan, where one exists;
2. Where a SARA-compliant range plan does not exist, management of caribou habitat consistent with alternative elements provided in the indicator that identify detailed requirements related to disturbance thresh-

olds based on the science presented in the federal recovery strategy; or

3. Management of caribou habitat using alternative methods provided they are comparable to the methods that form the basis of option 1.<sup>41</sup>

However, both regulatory and market-based approaches can suffer from the same issues of insufficient monitoring and enforcement. When using market-based approaches, it is essential to determine whether or not they are accomplishing their intended purpose, in this case, supporting critical habitat protection and boreal caribou recovery. While the success of FSC certification in supporting boreal caribou recovery remains to be seen in implementation, the system represents a science-based and collaborative approach to support implementation of regulatory requirements for critical caribou habitat protection.

### IV. Link taxpayer subsidies to the implementation of a caribou recovery strategy

There have been long-standing public concerns regarding how much taxpayers are subsidizing natural resource users,<sup>42</sup> including the forestry industry.<sup>43</sup> As most industrial logging occurs on public lands, the public expects that companies must provide a societal benefit in return for corporate profit. Put simply, this societal benefit is

most often framed within the context of jobs in the sector and payment of taxes. However, along with access to natural resources, subsidization programs are also a feature of the relationships between Ontario's public and forestry companies (both logging and forest-products manufacturers). There are potential opportunities to link societal expectations (including protection of species at risk) with publicly funded programs that already exist. A range of subsidies, grants and loan programs are available to the forestry sector (see some examples below), some of which are potentially detrimental to boreal caribou recovery. For the purposes of caribou recovery, there is potential to remove incentives that promote unsustainable logging (i.e., that result in the destruction of critical habitat), and increase incentives for critical habitat protection.

One of the most relevant programs is the Forest Roads Funding Program, which provides about \$60 million per year<sup>44</sup> to support building and maintaining roads the forestry sector requires. Roads eligible for funding have to be identified as primary or branch forest access roads that meet the following three conditions: 1) they are identified in approved forest-management plans and annual work schedules (100 per cent of primary road costs, 50 per cent of branch road costs), 2) they are located on Crown land and 3) their use is not limited to only the forest industry. Operational roads (i.e., temporary roads usually constructed within harvested areas) are not covered by this program. The provincial gov-

ernment boasts that the length of forest access roads maintained in Ontario is enough to drive across Canada and back, a seeming disconnect with the documented negative impact logging roads are having on boreal caribou populations and other species vulnerable to habitat fragmentation (Figure 4). Between 2005 and 2015, forest roads funding from the Ontario government equalled more than \$600 million; approximately 900 kilometres of forest roads were built each year,<sup>45</sup> and 21,000 kilometres maintained.

Through such expansion, Ontario taxpayers could be directly contributing to the destruction and degradation of critical caribou habitat. The expansion of access roads in Ontario has been shown to be a significant contributor to increased disturbance within caribou range that negatively affects caribou populations. Linear features, such as roads, pipelines and seismic lines, have been found to increase the speed at which wolves travel by two to three times relative to their travel speed in undisturbed forest.<sup>46</sup> The efficacy of regeneration approaches for operational roads in limiting predator access on a large scale is largely unknown, particularly at a landscape scale. Moreover, the wood and fibre sourced from caribou ranges tend to have relatively long-haul distances (for an example, see Figure 5).

## Figure 4.

Cumulative length of maintained forest access roads in Ontario.

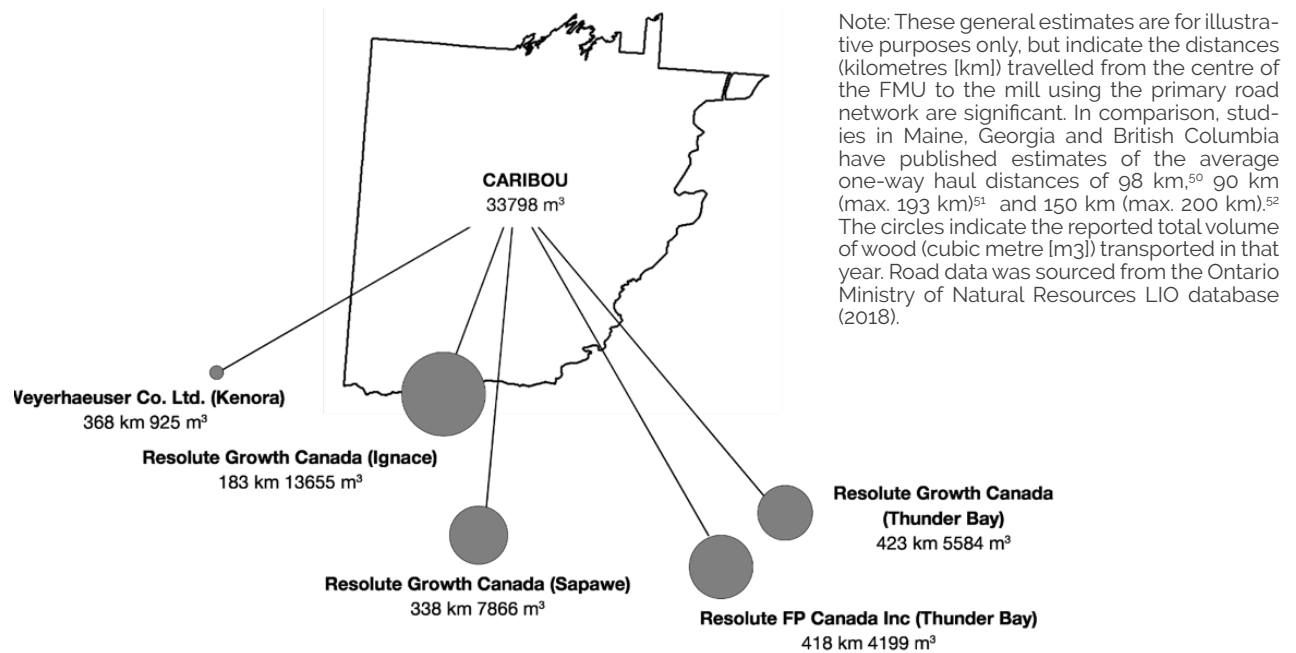
Source: Ministry of Natural Resources. "Ontario Investing \$60 Million in Forest Access Roads." Last updated April 2015, [news.ontario.ca/mnr/en/2015/04/ontario-investing-60-million-in-forest-access-roads.html](http://news.ontario.ca/mnr/en/2015/04/ontario-investing-60-million-in-forest-access-roads.html)





**Figure 5.**

As an example, broad estimates of one-way haul distances from the Caribou Forest Management Unit in northwestern Ontario as reported in the 2016/17 Annual Report of Wood Utilization by Mill ([www.efmp.lrc.gov.on.ca/eFMP](http://www.efmp.lrc.gov.on.ca/eFMP)) are shown.



Rethinking how this program is structured could enable taxpayers' dollars to be used in ways that provide forest access while also leading to incentives for development of caribou range plans that protect critical caribou habitat. This is not a significant leap, given that many such programs have been explicitly linked to reducing environmental impacts. For example, the Pulp and Paper Green Transformation Program, which in 2009 announced \$1 billion in funding to improve the environmental performance of Canada's pulp and paper mills,<sup>47</sup> offered the sector an opportunity to enhance environmental performance while at the same time renewing the industry's position in the global marketplace and paving the way to long-term gains for mills and mill communities. The program ended in 2012 but shows that such shared value is possible.

While the Forest Roads Funding Program has the most direct potential to either negatively or positively impact critical caribou habitat protection,<sup>48</sup> many funds and economic incentive programs could develop stronger links to environmental performance (e.g., protection of critical caribou habitat). For example, the Forestry Growth Fund supports continued productivity and innovation enhancements, increased competitiveness, access to new global markets and strengthened supply chains. In the 2018 provincial budget, \$30 million was allocated for this fund, to be spent over three years. In addition, the federal Expanding Market Opportunity (EMO) program provides funding to forest-product associations, provinces and wood-product research organizations to, in part, promote the use of Canadian wood, but also to promote the Canadian forest sector's environmental performance. An indi-

cator of performance based on the protection of critical caribou habitat could support expansion of markets based on environmental performance. Other programs, such as the Forest Industry Transformation (IFIT) program (from 2010

to 2016, applications to the IFIT program were valued at \$3.9 billion,<sup>49</sup> and in June 2017, the federal government committed another \$55 million in funding over three years) and others, could also be linked to such requirements.

# CONCLUSIONS

The provincial and federal governments can attract investment and create jobs successfully while meaningfully addressing the long-standing sustainability issue of caribou decline. Establishing a disturbance threshold target (e.g., less than 35 per cent at the range level) and a timeline to meet that threshold is a science-based approach that still allows forest managers to determine how best to achieve those goals (over time and space). In the absence of established targets for caribou recovery, companies face high uncertainty as they are exposed to the unpredictable risk of legal challenges, boycotts and loss of social licence.

## 1.

Transparently review gaps between what wood is harvested and what is available, and explore options for sharing the surplus of wood available within Ontario's caribou range. In Ontario, most forests that have more than 50 per cent overlap with caribou range are logging below the allowable harvest levels;

## 2.

The socio-economic analysis that was presented has several major flawed assumptions in it, and some questionable methodology. Undertaking a revision of the analysis under the guidance of an expert panel of caribou biologists, landscape ecologists and forest managers within and outside of provincial ministries will produce a more realistic assessment of the impacts of implementing the caribou recovery strategy, and have the advantage that it has been done transparently;

3.

Support market-based solutions and incentives, such as FSC certification, through which economic incentives exist to rationalize additional planning and, potentially, operational costs in exchange for increased social license and markets' access. These approaches can be complementary and support achievement of regulatory requirements; and,

4.

Link taxpayer subsidies to environmental performance, such as achievement of disturbance levels consistent with requirements under the federal SARA. For example, shifting to a more "results-based" regulatory regime (i.e., maintaining disturbance below the 35 per cent threshold) rather than a "process-oriented" regulatory regime may achieve desired habitat outcomes more efficiently and at a lower cost.

The industry faces a number of global pressures, many of which cannot be controlled by the Government of Ontario. Regardless, sustainable resource development means providing security for forestry-dependent families, real government investment to reduce northern and rural economies' dependence on internationally traded commodities, and halting the decline of boreal caribou. Mill closures are not generally the result of regional shortages of wood, but instead occur because manufacturing plants are no longer able to compete in increasingly competitive global markets.<sup>53</sup> Ignoring international commitments to protect biodiversity, disregarding (or fundamentally changing) federal and provincial laws that protect threatened and endangered species, and putting boreal caribou at high risk of extirpation are not responsible or necessary.



# REFERENCES

- 1 Ministry of Natural Resources and Forestry. (2014). State of the Woodland Caribou Resource Report. Species at Risk Branch, Thunder Bay, Ontario. + 156 pp. p.10.
- 2 Ministry of Natural Resources and Forestry. (2014). State of the Woodland Caribou Resource Report. Species at Risk Branch, Thunder Bay, Ontario. + 156 pp.
- 3 Ministry of Natural Resources and Forestry. (2014). Integrated Range Assessment for Woodland Caribou and their Habitat: Churchill Range 2012. Species at Risk Branch, Thunder Bay, Ontario. viii + 71 pp.
- 4 Johnson, C.J., Ehlers, L.P., and Seip, D.R. (2015). Witnessing extinction – Cumulative impacts across landscapes and the future loss of an evolutionarily significant unit of woodland caribou in Canada. *Biological Conservation*, 176-186.
- 5 Ontario Woodland Caribou Recovery Team. (2008). Woodland caribou (*Rangifer tarandus caribou*) (forest-dwelling, boreal population) in Ontario. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. p. vi.
- 6 Ontario Woodland Caribou Recovery Team. (2008). Woodland caribou (*Rangifer tarandus caribou*) (forest-dwelling, boreal population) in Ontario. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario.
- 7 Ontario Woodland Caribou Recovery Team. (2008). Woodland caribou (*Rangifer tarandus caribou*) (forest-dwelling, boreal population) in Ontario. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario, p.iii.
- 8 Ministry of Natural Resources. (2009). Ontario's Woodland Caribou Conservation Plan. Queen's Printer for Ontario, Toronto Ontario, Canada. 24 pp.
- 9 Environment and Climate Change Canada. (2012). Recovery Strategy for the Woodland Caribou (*Rangifer tarandus caribou*), Boreal population, in Canada." Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa, Canada, xi + 138.
- 10 Crichton, V., Fortin, D., Hebblewhite, M., St-Laurent, M.H., Johnson, C., McLoughlin, P., Racey, G., Ray, J., Schaefer, J., Schmiegelow, F., Sutherland, G., and Thompson, I. (September 22, 2017). Letter to Hon. Minister McKenna and Hon. Minister James Carr. Response from scientists to claims made by the Forest Products Association of Canada regarding the scientific underpinnings of the federal Boreal Caribou Recovery Strategy. Found at: [www.environmentnorth.ca/assets/files/scientists-letter-caribou.pdf](http://www.environmentnorth.ca/assets/files/scientists-letter-caribou.pdf)
- 11 Ministry of Natural Resources and Forestry. (2014). Forest Management Guide for Boreal Landscapes. Toronto, Ontario. [www.ontario.ca/page/forest-management-boreal-landscapes](http://www.ontario.ca/page/forest-management-boreal-landscapes)
- 12 Boan, J.J., Malcolm, J.R., Vanier, M.D., Euler, D.L., & Moola, F. M. (2018). From climate to caribou: How manufactured uncertainty is affecting wildlife management. *Wildlife Society Bulletin*, 42(2), 366-381. [wildlife.onlinelibrary.wiley.com/doi/pdf/10.1002/wsb.891](http://wildlife.onlinelibrary.wiley.com/doi/pdf/10.1002/wsb.891)
- 13 Environment Canada. (2008). Scientific Review for the Identification of Critical Habitat for Woodland Caribou (*Rangifer tarandus caribou*), Boreal Population, in Canada. Ottawa: Environment Canada. 72 pp. Chapter 14. [www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/publications/woodland-caribou-scientific-review/chapter-14.html](http://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/publications/woodland-caribou-scientific-review/chapter-14.html)
- 14 Environment Canada. 2012. Recovery Strategy for the Woodland Caribou (*Rangifer tarandus caribou*), Boreal population, in Canada. Species at Risk Act Recovery Strategy Series: Environment Canada, Ottawa, Canada. xi + 138 pp.
- 15 Elkie, P. & Green, K. (2016). Cumulative impacts monitoring 2016 estimates: disturbance models and simulated ranges of natural variation. Ontario Ministry of Natural Resources.
- 16 Environment Canada. (2008). Scientific Review for the Identification of Critical Habitat for Woodland Caribou (*Rangifer tarandus caribou*), Boreal Population, in Canada. Ottawa: Environment



Canada. 72 pp. plus 180 pp. Appendices. [www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/publications/woodland-caribou-scientific-review.html](http://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/publications/woodland-caribou-scientific-review.html)

17 Crichton, V., Fortin, D., Hebblewhite, M., St-Laurent, M.-H., Johnson, C., McLoughlin, P., Racey, G., Ray, J., Schaefer, J., Schmiegelow, F., Sutherland, G., and Thompson, I. (September 22, 2017). Letter to Hon. Minister McKenna and Hon. Minister James Carr.

18 Johnson, C.J., Ehlers, L.P., and Seip, D.R. (2015). Witnessing extinction – Cumulative impacts across landscapes and the future loss of an evolutionarily significant unit of woodland caribou in Canada. *Biological Conservation*, 176-186.

19 MNRF. April 2019. Amendments of Ontario Regulation 242/08 (General Regulation — Endangered Species Act, 2007) relating to forest operations in managed Crown forests, incorporating species recently listed to the Species at Risk in Ontario List, and safe harbour. [www.ebr.gov.on.ca/ERS-WEB-External/displaynoticecontent.do?noticeId=MTMzNzg&statusId=MjAzNDY3&language=en](http://www.ebr.gov.on.ca/ERS-WEB-External/displaynoticecontent.do?noticeId=MTMzNzg&statusId=MjAzNDY3&language=en)

20 Environmental Commissioner of Ontario. (2017). Good Choices, Bad Choices. Environmental Protection Report. Ch.7 Getting Approvals Wrong: The MNRFs Risk-Based Approach to Protecting Species at Risk. pp. 217-251.

21 Environment and Climate Change Canada. (2014). Report on the Progress of Recovery Strategy Implementation for the Woodland Caribou (*Rangifer tarandus caribou*), Boreal population in Canada for the Period 2012–2017.” (Species at Risk Act Recovery Strategy Series, Environment and Climate Change Canada, Ottawa).

22 MNRF. (2012). Integrated Range Assessment for Woodland Caribou and their Habitat [Brightsand, Churchill, Sydney, Berens, Nipigon, Pagwachuan, Kesagami].” (Species at Risk Branch, Thunder Bay, Ontario), 1-74.

23 MNRF. (2014). Integrated Range Assessment for Woodland Caribou and their Habitat. Species at Risk Branch. Thunder Bay, Ontario, 1-74. [Brightsand, Churchill, Sydney, Berens, Nipigon, Pagwachuan, Kesagami]; Environment and Climate Change Canada. “Report on the Progress of Recovery Strategy Implementation for the Woodland Caribou (*Rangifer tarandus caribou*), Boreal population in Canada for the Period 2012–2017. (Species at Risk Act Recovery Strategy Series, Environment and Climate Change Canada, Ottawa 2014).

24 MNRF. (August 15, 2018) “Wood supply and economic impact analysis: Assessment of caribou prescription options defined as part of the CFSA-ESA integration project.” Sault Ste Marie. Webinar presentation.

25 MNRF. (August 15, 2018) “Wood supply and economic impact analysis: Assessment of caribou prescription options defined as part of the CFSA-ESA integration project.” Sault Ste Marie. Webinar presentation.

26 Ian Dunn. (February 22, 2018). “Forestry industry also committed to protecting caribou” Toronto Star, Toronto Ontario; Jesse Synder. (April 26, 2018). “How federal caribou protection policies could wreak widespread economic carnage across Canada.” Financial Post, Toronto, Ontario.

27 MNRF. (August 15, 2018) “Wood supply and economic impact analysis: Assessment of caribou prescription options defined as part of the CFSA-ESA integration project.” Sault Ste Marie. Webinar presentation.

28 MNRF. (August 15, 2018). “Wood supply and economic impact analysis: Assessment of caribou prescription options defined as part of the CFSA-ESA integration project.” Sault Ste Marie. Webinar presentation.

29 Jessica Vomiero. (June 2018.) “Trump’s tariffs on Canadian lumber are pricing Americans out of the U.S. housing market.” Global News Toronto, Ontario; Samantha Masunaga. (May 2018) “Canadian newsprint tariffs starting to take toll on U.S. newspaper industry.” Toronto Star, Toronto, Ontario.

A Detailed Analysis of Productivity Trends in the Forest Products Sector in Ontario, 2000–2013: Sunset Industry or Industry in Transition?

- 30 Capeluck, E., & Thomas, J. (2015). A Detailed Analysis of Productivity Trends in the Forest Products Sector in Ontario, 2000-2013: Sunset Industry or Industry in Transition? (No. 2015-06). Centre for the Study of Living Standards.
- 31 Capeluck, E., & Thomas, J. (2015). A Detailed Analysis of Productivity Trends in the Forest Products Sector in Ontario, 2000-2013: Sunset Industry or Industry in Transition? (No. 2015-06). Centre for the Study of Living Standards.
- 32 MNRF. (August 15, 2018). "Wood supply and economic impact analysis: Assessment of caribou prescription options defined as part of the CFSA-ESA integration project." Sault Ste Marie. Webinar presentation.
- 33 MNRF. (August 15, 2018). "Wood supply and economic impact analysis: Assessment of caribou prescription options defined as part of the CFSA-ESA integration project." Sault Ste Marie. Webinar presentation.
- 34 CBC News. (Jan 18, 2015). Iroquois Falls latest casualty of changing northern Ontario economy. [www.cbc.ca/news/canada/iroquois-falls-latest-casualty-of-changing-northern-ontario-economy-1.2912506](http://www.cbc.ca/news/canada/iroquois-falls-latest-casualty-of-changing-northern-ontario-economy-1.2912506); CBC News (Dec 11, 2014). Ignace residents remain skeptical over Resolute sawmill restart. [www.cbc.ca/news/canada/thunder-bay/ignace-residents-remain-skeptical-over-resolute-sawmill-restart-1.2869808](http://www.cbc.ca/news/canada/thunder-bay/ignace-residents-remain-skeptical-over-resolute-sawmill-restart-1.2869808); [tbnewswatch.com](http://tbnewswatch.com) (Jul 3, 2018). Agreement signed for First Nations to supply lumber to reopen Nakina mill. [www.tbnewswatch.com/local-news/agreement-signed-for-first-nations-to-supply-lumber-to-reopen-nakina-mill-971412](http://www.tbnewswatch.com/local-news/agreement-signed-for-first-nations-to-supply-lumber-to-reopen-nakina-mill-971412); CBC News (Mar 18, 2019) Resolute rejects Repap Resources' bid for Fort Frances mill, says it will proceed with redevelopment. [www.cbc.ca/news/canada/thunder-bay/fort-frances-mill-repap-rejected-1.5061447](http://www.cbc.ca/news/canada/thunder-bay/fort-frances-mill-repap-rejected-1.5061447)
- 35 Statistics Canada. (2018). "Employment by industry, annual" Statistics Canada CANSIM 281-0024.
- 36 MNRF. "General Habitat Description for the Forest-dwelling Woodland Caribou (*Rangifer tarandus caribou*)". (Ministry of Natural Resources, 2013) p.3
- 37 MNRF. (August 15, 2018). "Wood supply and economic impact analysis: Assessment of caribou prescription options defined as part of the CFSA-ESA integration project." Sault Ste Marie. Webinar presentation.
- 38 MNRF. (August 15, 2018). "Wood supply and economic impact analysis: Assessment of caribou prescription options defined as part of the CFSA-ESA integration project." Sault Ste Marie. Webinar presentation.
- 39 Forest Stewardship Council (FSC) Canada. (2016). "Species at Risk: Woodland Caribou." [ca.fsc.org/en-ca/standards/forest-management-standard-revision-01/species-at-risk-woodland-caribou](http://ca.fsc.org/en-ca/standards/forest-management-standard-revision-01/species-at-risk-woodland-caribou)
- 40 FSC. (2016). "Species at Risk: Woodland Caribou." [ca.fsc.org/en-ca/standards/forest-management-standard-revision-01/species-at-risk-woodland-caribou](http://ca.fsc.org/en-ca/standards/forest-management-standard-revision-01/species-at-risk-woodland-caribou)
- 41 FSC. (2016). "Species at Risk: Woodland Caribou." [ca.fsc.org/en-ca/standards/forest-management-standard-revision-01/species-at-risk-woodland-caribou](http://ca.fsc.org/en-ca/standards/forest-management-standard-revision-01/species-at-risk-woodland-caribou)
- 42 Stephenson, A. (February 2019). "Alberta government subsidies to oil and gas sector growing: report." (Calgary Herald, Calgary, Alberta).
- 43 Eric Reguly. "Fell the subsidies, save the forest sector." (Globe and Mail, Toronto, Ontario, April 2008).
- 44 Ministry of Natural Resources and Forestry. (March 2019). "Forest Roads Funding Program." [www.ontario.ca/page/forest-roads-funding-program](http://www.ontario.ca/page/forest-roads-funding-program)
- 45 Ontario. IBI Group, Henson Consulting. (November 2016). Draft Technical Backgrounder Northern Ontario Multimodal Transportation Strategy, Highways and Roads. Ontario Ministry of Transportation and Ministry of Northern Development and Mines. p. 15.
- 46 Dickie, M., Serrouya, R., McNay, R. S., and Boutin, S. (2017). Faster and farther: wolf movement on linear features and implications for hunting behaviour. *Journal of Applied Ecology*, 54(1), 253-263.
- 47 Natural Resources Canada. "Investments in Forest Industry Transformation (IFIT)." Last updated August 2018.
- 48 Ministry of Natural Resources and Forestry. (March 2019). "Forest Roads Funding Program." [www.ontario.ca/page/forest-roads-funding-program](http://www.ontario.ca/page/forest-roads-funding-program)
- 49 Natural Resources Canada (NRCAN). (August 2018). Investments in Forest Industry Transforma-

tion (IFIT). [www.nrcan.gc.ca/forests/federal-programs/13139](http://www.nrcan.gc.ca/forests/federal-programs/13139)

50 Koirala, A., Kizha, A. R., and Roth, B. E. (2017). Perceiving major problems in forest products transportation by trucks and trailers: A cross-sectional survey. *Eur. J. For. Eng*, 3, 23-34.

51 Conrad, I. V. (2018). Costs and challenges of log truck transportation in Georgia, USA. *Forests*, 9(10), 650.

52 Canfor. Detailed Forest Management Plan 2001 (revised April 2003) [www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/formain15757/\\$file/Canfor\\_DFMP\\_F\\_Section\\_\(subsections\\_11\\_to\\_21\).pdf?OpenElement](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/formain15757/$file/Canfor_DFMP_F_Section_(subsections_11_to_21).pdf?OpenElement)

53 Haley, D., and Nelson, H. (2007). Has the time come to rethink Canada's Crown forest tenure systems? *The Forestry Chronicle*, 83(5), 630-641.

