

# Cumulative Effects, Caribou and National Energy Board Regulation

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Canada's National Energy Board (NEB) is a lifecycle regulator<sup>1</sup>, part of whose mandate is to promote safety, security and environmental protection of energy infrastructure in the Canadian public interest. The NEB has described the public interest as "*inclusive of all Canadians and refers to a balance of economic, environmental, and social considerations that changes as society's values and preferences evolve over time.*"<sup>2</sup> As an expert regulatory tribunal, the NEB maintains its own expertise on relevant topics, including environmental protection.

In order to construct and operate new facilities, NEB regulated companies are required to submit applications to the Board that enable the Board to: (i) evaluate the overall public good the request may create, as well as its potential negative aspects; (ii) weigh the various impacts; and, (iii) make an informed decision that balances the economic, environmental and social interests at that time. In reviewing these applications, the Board conducts an environmental assessment (EA) as part of its public interest determination. Filing requirements, including information to conduct a project EA, are set out in the NEB's Filing Manual<sup>3</sup>. In addition to a company's proposed mitigation, conditions of approval are attached to any recommendation or decision. Environmental protection conditions address whether sufficient baseline information is available and whether the mitigation measures will be appropriate, effective and sufficient.

The NEB also has responsibilities under Canada's *Species at Risk Act* (SARA). The SARA seeks to prevent wildlife species from becoming extinct and to secure actions for their recovery, by providing for the legal protection of wildlife species and the conservation of their biological diversity. The SARA sets out how to decide which species are a priority and how to protect them, through cooperation among government departments (provincial and federal), consultation and on-going review (EC 2003). The SARA also requires the NEB to identify likely adverse effects and ensure that all feasible measures will be taken to minimize the activity within critical habitat, among other obligations (Sections 77 and 79 of SARA). Separate from these SARA requirements, the NEB expects proponents to identify and mitigate project effects on any listed species, regardless of whether a species is listed under another jurisdiction, federal, provincial or territorial.

## **Regulatory Context for Woodland Caribou**

Under the SARA, species listed as extirpated, endangered, or threatened are afforded legal protection, and require the federal government to prepare a Recovery Strategy including the identification of critical habitat. One such listed species in Canada is woodland caribou, an iconic species long facing population declines; the boreal population of woodland caribou were listed in 2003, when the SARA first came into

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<sup>1</sup> The views, judgements, opinions and recommendations expressed in this paper do not necessarily reflect those of the National Energy Board, its Chair or Members, nor is the Board obliged to adopt any of them.

<sup>2</sup> National Energy Board Strategic Plan, NEB website: Home > About Us > Who we are > Governance (<https://www.neb-one.gc.ca/bts/whwr/gvrnnc/index-eng.html>)

<sup>3</sup> NEB's Filing Manual: <http://www.neb-one.gc.ca/bts/ctrg/gnnb/flngmnl/index-eng.html>

force. In 2012, Environment Canada (EC) released the final Recovery Strategy for the woodland caribou, boreal population, identifying critical habitat for the species (EC 2012a). EC's Recovery Strategy is based on a scientific review process, Traditional Knowledge study and broad consultation. It outlines strategies and approaches for population recovery, identifies long term strategic objectives for 'self-sustaining' populations, and classifies each local population according to its current self-sustainability.

Caribou is one of the boreal forest species most sensitive and vulnerable to land use change, and most scientists agree that much of the decline in caribou range is a result of human development (Festa-Bianchet et al. 2011). In its Recovery Strategy, EC reports that the amount of undisturbed habitat of suitable quality within a range is the primary indicator to predict how self-sustaining a local population may be. While there are several pathways by which caribou and their habitat may be affected by human activity, the linear disturbance created by a pipeline right-of-way (ROW) acts to alter both vegetation and habitat, and improve access for predators. Additionally, as caribou avoid cleared areas by up to 500m, the habitat effectively lost is greater than the area directly disturbed. Further indirect habitat loss may result from the fragmentation of formerly large patches of forest into smaller patches, reducing the availability of caribou forage and safe habitat. Cleared areas may also support forage for moose and deer, locally increasing their abundance and attracting predators such as wolves (EC 2012a).

### **NEB habitat conservation requirements**

Potential project effects on woodland caribou and their habitat have been considered in Board decisions and reports since 1977. In recent years, impacts of projects to caribou have become more prominent in part as a result of the growth of energy development in northern Alberta and BC, an increase in the number of applications the Board has received for large transmission pipelines traversing provincial and territorial boundaries, and increased concern from the public and Aboriginal communities. Figure 1 shows the NEB regulated pipelines in northern Alberta and BC, as well as pipelines that are approved but not yet constructed, and how those pipelines overlap caribou range.<sup>4</sup>

In order to address the concerns of critical habitat destruction, landscape fragmentation and growing cumulative effects in the boreal ecosystem, the Board has imposed conditions at three levels:

- Standard measures taken during and immediately following construction (presented through a project's Environmental Protection Plan (EPP));
- Measures to be taken on the ROW following construction to restore disturbed habitat (Caribou Habitat Restoration Plan (CHRP)); and,
- Compensation measures to be taken elsewhere to offset the residual effects of the linear disturbance on the landscape (Offset Measures Plan (OMP)).

In addition to the CHRP and OMP conditions, the final element in the suite of conditions is a project-specific Caribou Habitat Restoration and Offsets Measures Monitoring Program (CHROMMP) prescribing long term monitoring of the implemented restoration or offset measures to ensure effectiveness. To date only one NEB-regulated company, NOVA Gas Transmission Ltd. (NGTL), has submitted filings associated with all of the conditions for one project or another. All of NGTL's submissions (plans and programs) are available on the Board's public repository (NGTL 2014 is used as the example reference). The learnings presented below stem from the Board's experience overseeing these filings.

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<sup>4</sup> All NEB project reports are available on the NEB website; contact the NEB Library for any assistance in finding these.

## **Restoration and Habitat Offsets as mitigation options**

The objectives of NGTL's CHRP are threefold (regardless of project-specific implementation):

- To restore habitat along the project footprint, consistent over the long term with adjacent ecosystems;
- To effectively control access to the project footprint while the vegetation re-establishes; and,
- To reduce line-of-sight along a project footprint, thus decreasing the effects on predator/prey dynamics.

The best tool to support restoration post-construction is advance planning to minimize clearing and grading. Both EPP and CHRP filings include prevention measures, reducing the need for post-construction restoration measures. Identifying key locations to maintain existing vegetation along a proposed ROW greatly reduces the risks associated with slow revegetation rates in lowland habitats and limits alteration of line-of-sight distances and to ROW access. Techniques to preserve the existing vegetation include the use of snow ramps, minimal disturbance techniques (whereby the root stocks remain undisturbed), and manual bending of shrub vegetation. Advance planning can also identify crossing locations where directional drilling could protect the existing forest cover.

Restoring disturbed habitat is a key component of caribou conservation identified through EC's Recovery Strategy and in provincial caribou habitat planning. However, the preferred lowland habitat types have very slow rates of revegetation, making tree seedling establishment unpredictable (NGTL 2014), potentially reducing measure effectiveness. As the objective is to restore the footprint to the same function as the original or adjacent ecosystem, vegetation plots provide measurable criteria for comparing on- and off-ROW restoration success. Other measures to achieve the objectives include ground mounding, tree felling and applying rollback. Estimating the intensity at which to implement any particular measure, over what distance, and at what frequency, has been a challenge. NGTL has presented measurable targets for each of these design elements and long term monitoring will identify if, when and where remedial adaptive management actions are needed. Monitoring results will also shed light on the efficacy of the measures implemented, improving future restoration efforts and managing resultant residual effects.

After appropriate routing, onsite mitigation and restoration is applied, the long term clearing of a ROW leaves an unavoidable residual impact, interacting cumulatively on the landscape. The Board therefore requires regulated companies to compensate the residual effects through biodiversity offsets. In Canada a number of provinces have or are considering offsets, while federal experience has primarily been through the Fisheries Act and the Federal Policy on Wetland Conservation (EC 2012b, Poulton 2014). Through the Board's offset conditions, regulated companies are required to target "no net loss" when constructing facilities within woodland caribou critical habitat. Offset programs must be designed to meet accepted criteria such as additionality, permanence and equivalence (ACA 2011).

Following Board review, NGTL has been approved to use a restoration approach for its offsets, using many of the same measures (e.g. rollback, plantings) at offsite locations as on its ROWs. NGTL's calculations to quantify residual effects and required offsets account for a variety of mitigation- and habitat-related variables (e.g., rollback versus plantings, in upland areas versus lowlands). Its method

uses a range of multipliers (from 1.0 to 5.0) to account for key uncertainties associated with implementing different measures: a temporal risk multiplier to account for time delays in implementation; a spatial risk multiplier to account for the location of offsets and equivalence of habitat; and a delivery risk multiplier to account for the likely effectiveness of measures. An inherent effect multiplier also accounts for new ROW creation versus development paralleling existing RoW. Applying individual multipliers for each measure and circumstance along a ROW has led to overall offset ratios ranging from just over 1:1 up to 7.5:1, depending on unique project circumstances. In addition to confirming the effectiveness of the measures used, monitoring offsets also verifies the validity of the multipliers and improves their accuracy.

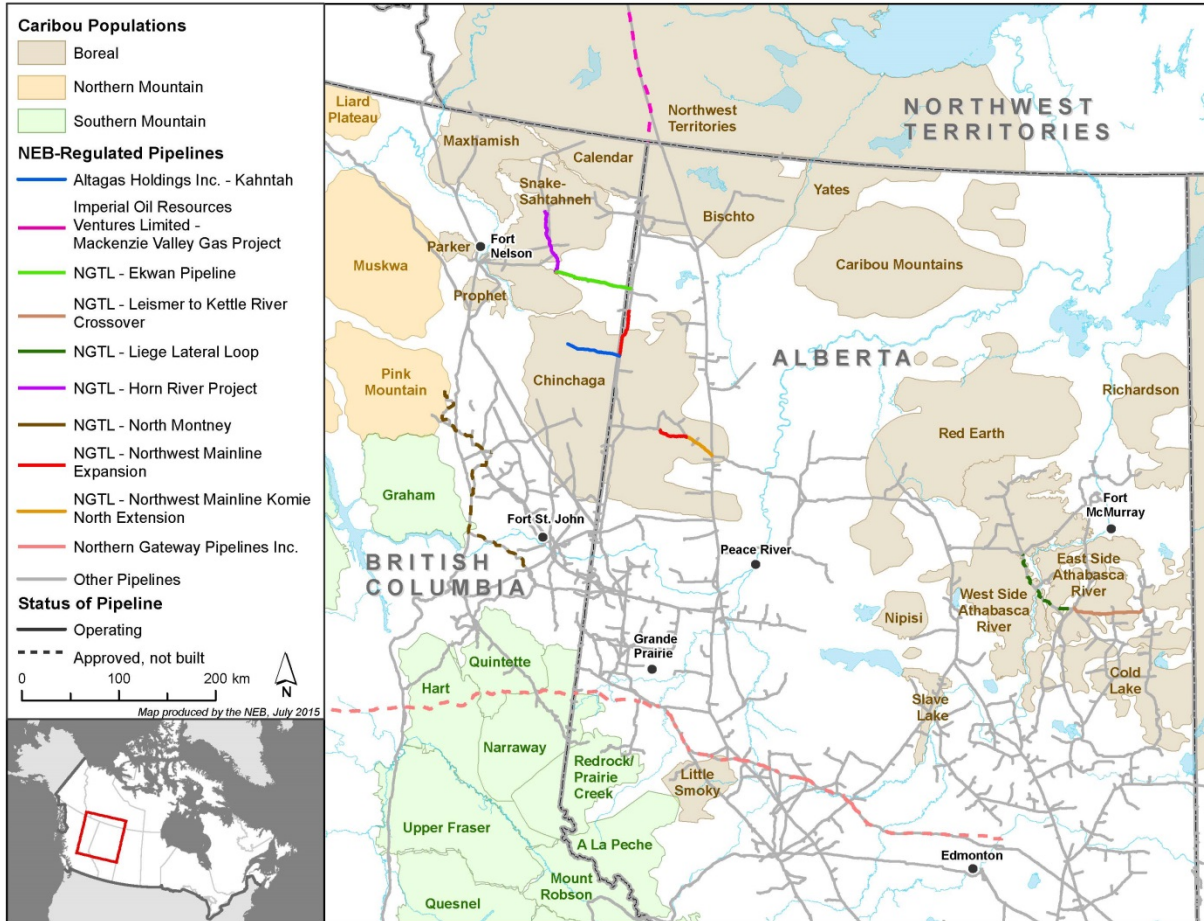
## **CONCLUSION**

In summary, there are a number of variables influencing how the Board may address project impacts on caribou habitat: Does the project pass through designated critical habitat? Are there federal or provincial objectives, zonings, or thresholds in place? How does the project affect the size and contiguity of habitat patches? The Board must weigh these and other variables to determine an appropriate level of mitigation. NEB habitat restoration and offset requirements continue to evolve due to different and often unique project circumstances. Experience to date suggests the following conclusions:

- Incentivizing restoration and prevention: Requiring offsets provides incentive for on-ROW restoration, which in turn provides incentive for avoidance or prevention of impacts during clearing and for careful implementation of effective mitigation during construction.
- Routing and Alignment: The extent of residual impacts a pipeline project may have on caribou habitat depends in large measure on the proponent's routing. Avoiding the creation of new ROW and following adjacent ROWs is key.
- No net loss: By providing for the potential of no net loss, a rigorous offsets program offers a useful option towards addressing either potentially significant impacts, or project contributions to already existing significant cumulative effects.

The Board's requirements for CHRP, OMP and CHROMMP plans have come about within the context of an evolving regulatory framework; there have been court challenges related to caribou, provincial range management plans remain mostly incomplete, and there is no regulatory framework around conservation offsets. Nonetheless, the Board as a regulatory tribunal must rely on its evidentiary record and offsets may offer potential flexibility as a regulatory tool in addressing residual and cumulative impacts. The development of these requirements has come from the Board's culture of innovation and creativity, striving to continually learn and improve our tools to manage energy infrastructure in the Canadian public interest.

**Figure 1: NEB-Regulated Pipelines within Caribou Ranges in Alberta and BC**



## **References**

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