

A Framework for Boreal Caribou Range Planning

Cadre de planification de l'aire de répartition du caribou boréal

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Purpose of this Document

This document outlines an approach to range planning for boreal woodland caribou (hereafter “boreal caribou”) in the Northwest Territories (NWT). It provides a common framework for how individual range plans, which manage habitat disturbance at a regional level, will be developed and updated over time. Section 3 of this Framework document describes a management approach that can be tailored to each region to support healthy and sustainable caribou populations, and Section 4 describes additional considerations that decision-makers will use in developing regional range plans.

This Framework addresses the recommendations to develop and implement range plans for boreal caribou habitat outlined in the *NWT Boreal Caribou Recovery Strategy*¹ (hereafter “*NWT Recovery Strategy*”) as well as obligations to protect critical habitat for boreal caribou identified in Environment and Climate Change Canada’s *National Recovery Strategy for Woodland Caribou, Boreal Population*² (hereafter “*National Recovery Strategy*”). Other approaches to conserve and recover boreal caribou,³ such as harvest management, research and monitoring, collaborative management and information sharing, are being addressed through additional implementation of the *NWT Recovery Strategy*, as described in the Conference of Management Authorities Implementation Agreement.⁴

¹ Conference of Management Authorities. 2017 Recovery Strategy for the Boreal Caribou (*Rangifer tarandus caribou*) in the NWT. *Species at Risk (NWT) Act* Management Plan and Recovery Strategy Series. ENR, GNWT. 57 + x pp.

http://www.nwt-species-at-risk.ca/sites/default/files/nwt_boreal_caribou_recovery_strategy_2017_final_0.pdf

² https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/plans/rs_caribou_boreal_caribou_0912_e1.pdf

³ In this document, unless explicitly stated otherwise, “caribou” will always refer to boreal caribou.

⁴ http://www.nwt-species-at-risk.ca/sites/default/files/consensus_agreement_boreal_caribou_implementation_nov2417_signed.pdf

Summary

Boreal caribou hold important cultural and spiritual significance for people in the NWT. On a spiritual level, many Indigenous people hold tremendous respect toward boreal caribou, and they are highly valued by harvesters. For many non-Indigenous people, boreal caribou are a part of northern biodiversity and play an important role in the boreal forest. For everyone, boreal caribou are an indicator of a healthy ecosystem and a symbol of the North.

In other parts of Canada, boreal caribou are in serious decline because of too much disturbance in their habitat. In the NWT, we are fortunate that there is still a great deal of intact habitat and a healthy boreal caribou population that can be harvested. However, careful land management will be needed to maintain enough habitat to support a healthy caribou population into the future. The NWT has an opportunity and a responsibility to be proactive in being responsible stewards of caribou and their habitat.

This document provides a coordinated and consistent approach to developing plans to manage habitat disturbance in boreal caribou habitat across the NWT. The approach sets limits on the acceptable amount of disturbance and defines levels of human disturbance designed to help stay below those limits. The process of developing regional range plans will use these thresholds, together with an understanding of important caribou habitats informed by traditional knowledge and western science, to identify areas where sets of more intensive management actions will be used to manage disturbance. This document also lays out a process for development, review and revision of the regional range plans, and monitoring and research to fill key knowledge gaps over time.

Wise range planning will help to ensure we maintain enough habitat in the NWT so that boreal caribou, and harvesting of boreal caribou, can continue now and for future generations.

Résumé

Le caribou boréal revêt une importance culturelle et spirituelle importante pour les résidents des Territoires du Nord-Ouest (TNO). Sur le plan spirituel, nombre d'Autochtones révèrent le caribou boréal. L'animal est également très prisé des chasseurs autochtones. Nombreux sont les non-Autochtones pour qui le caribou boréal constitue un acteur important de la forêt boréale et fait partie intégrante de la biodiversité nordique. Pour tous, le caribou boréal est un indicateur d'un écosystème en santé et un symbole du Nord.

Dans d'autres régions du Canada, les populations de caribou boréal connaissent un important déclin en raison des perturbations excessives qui affectent leur habitat. Les TNO peuvent compter sur un habitat largement intact et des populations de caribou boréal en bonne santé qu'il est permis de chasser. Toutefois, à l'avenir, une gestion minutieuse des terres sera nécessaire dans le but de maintenir un habitat suffisamment vaste afin que les populations de caribou boréal restent en bonne santé. Les Territoires du Nord-Ouest ont la possibilité et le devoir d'être des gardiens responsables et dynamiques du caribou et de son habitat.

Le présent document propose une approche coordonnée et cohérente pour la rédaction de plans de gestion des perturbations de l'habitat du caribou boréal aux TNO. L'approche fixe des limites sur le niveau de perturbations tolérables et définit les niveaux de perturbation humaine également tolérables afin de rester en dessous des limites de perturbations acceptables. Le processus d'élaboration des plans régionaux pour l'aire de répartition intégrera ces seuils, ainsi que les connaissances sur les habitats importants du caribou, fondées sur le savoir traditionnel et la science moderne, pour identifier les zones où un train de mesures de gestion plus intensives sera adopté pour faire face aux perturbations. Ce document présente également un processus d'élaboration, d'examen et de révision des plans régionaux pour l'aire de répartition, ainsi que de suivi et de recherche pour combler les principales lacunes en matière de connaissances au fil du temps.

La planification judicieuse appliquée à l'aire de répartition contribuera à garantir le maintien d'un habitat suffisant aux TNO, de sorte que les populations de caribou boréal puissent prospérer et que la chasse à ce cervidé puisse se poursuivre maintenant et pour les générations futures.

1. Context for Range Planning

1.1 Pressures on Boreal Caribou Populations

Boreal caribou (*Rangifer tarandus caribou*) are a distinct population of woodland caribou that live in the boreal forest of Canada, including the forests east of the mountains in the NWT (Figure 1). They tend to live in small groups, prefer to stay within the forest year-round, and do not migrate. Boreal caribou females space out for calving to reduce the risk of predation, and therefore these caribou need large areas of intact habitats.

Habitat disturbance, which affects boreal caribou populations by increasing predation risk, is thought to be the primary factor leading to boreal caribou declines across Canada.⁴ Cleared areas, especially roads and seismic lines, make it easier for wolves and bears to travel through the forest and locate prey.^{4,6} In addition, disturbances like wildfire and timber harvest result in younger forests that are attractive to other prey species like moose and deer. If there is enough young forest to increase the density of other prey, wolf density may also increase, leading to more predation on boreal caribou (Figure 2). Traditional and community knowledge summarized in the status assessment of boreal caribou in the NWT⁵ indicates that boreal caribou are very sensitive to most types of human disturbance and habitat change. Industrial development and wildfires can result in changes to the landscape that force boreal caribou to change their movements and can make them not use an area for many decades. Industrial development can also lead to stress and poor health. Although wildfires are natural, wildfires are thought to be increasing in many areas and are seen as a threat to boreal caribou. Climate change is also observed to be causing changes to habitat and food availability, snow and weather conditions, and may bring new predators that are expanding their range northward. Hunting pressure was identified as a moderate current threat to some boreal caribou populations in the NWT. There are concerns that it is increasing or will increase in the future.

As a result of these pressures, boreal caribou are listed as Threatened under both the *Species at Risk (NWT) Act* and the federal *Species at Risk Act (SARA)*. Declines observed in southern Canada are strongly linked to habitat disturbance;⁶ the more disturbances within a range, the more likely a local population will be declining. Disturbance can be natural (e.g. wildfire) or human-caused (e.g. timber harvest, and linear features like roads, seismic lines, and pipelines). Currently there is variation across the NWT in rates and direction of population change. There are documented population declines in parts of the southern NWT where the majority of boreal caribou occur, and where the amount of both human and natural disturbance is greatest.⁷

⁵ http://www.nwt-species-at-risk.ca/sites/default/files/boreal_caribou_nwt_status_report_dec_2012_3.pdf

⁶ https://wildlife-species.canada.ca/species-risk-registry/species/speciesDetails_e.cfm?sid=636

⁷ https://www.nwt-species-at-risk.ca/sites/default/files/ca_on_listing_boreal_caribou_as_threatened_2.pdf

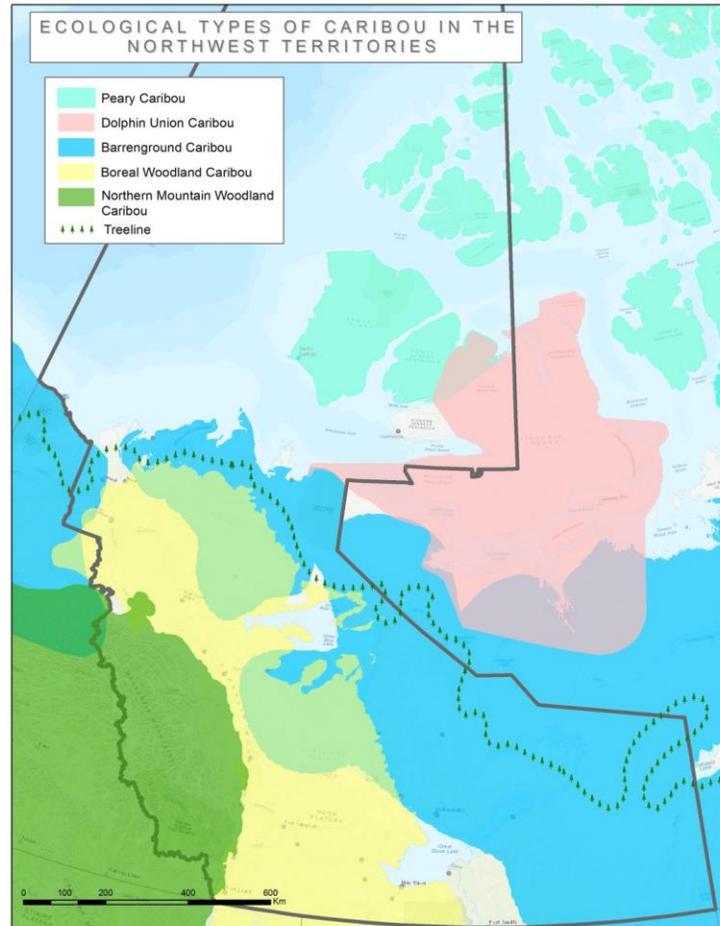


Figure 1. Distribution of different ecological types of caribou in the Northwest Territories. The yellow range north of the NWT border is called NT1 and represents the range of boreal caribou in the NWT and Yukon.

Recovery strategies have been developed under both Species at Risk Acts. The *NWT Recovery Strategy* calls for the development of regional range plans focused on managing human disturbance, while the *National Recovery Strategy* sets a target of maintaining at least 65% of the NT1 range in an undisturbed condition.

Range plans are focused on managing habitat disturbance as a means to decrease predation risk, but both the NWT status report⁸ and the *National Recovery Strategy* acknowledge that other factors such as climate change, harvest, and disease may be impacting boreal caribou in the NWT. Though these other threats are not addressed through range plans specifically, the NWT Conference of Management Authorities (CMA) has identified a number of actions to better understand these other threats.⁹

⁸ http://www.nwtspeciesatrisk.ca/sites/default/files/boreal_caribou_nwt_status_report_dec_2012_3.pdf

⁹ http://www.nwtspeciesatrisk.ca/sites/default/files/consensus_agreement_boreal_caribou_implementation_nov2417_signed.pdf

Potential impacts of habitat change on boreal caribou

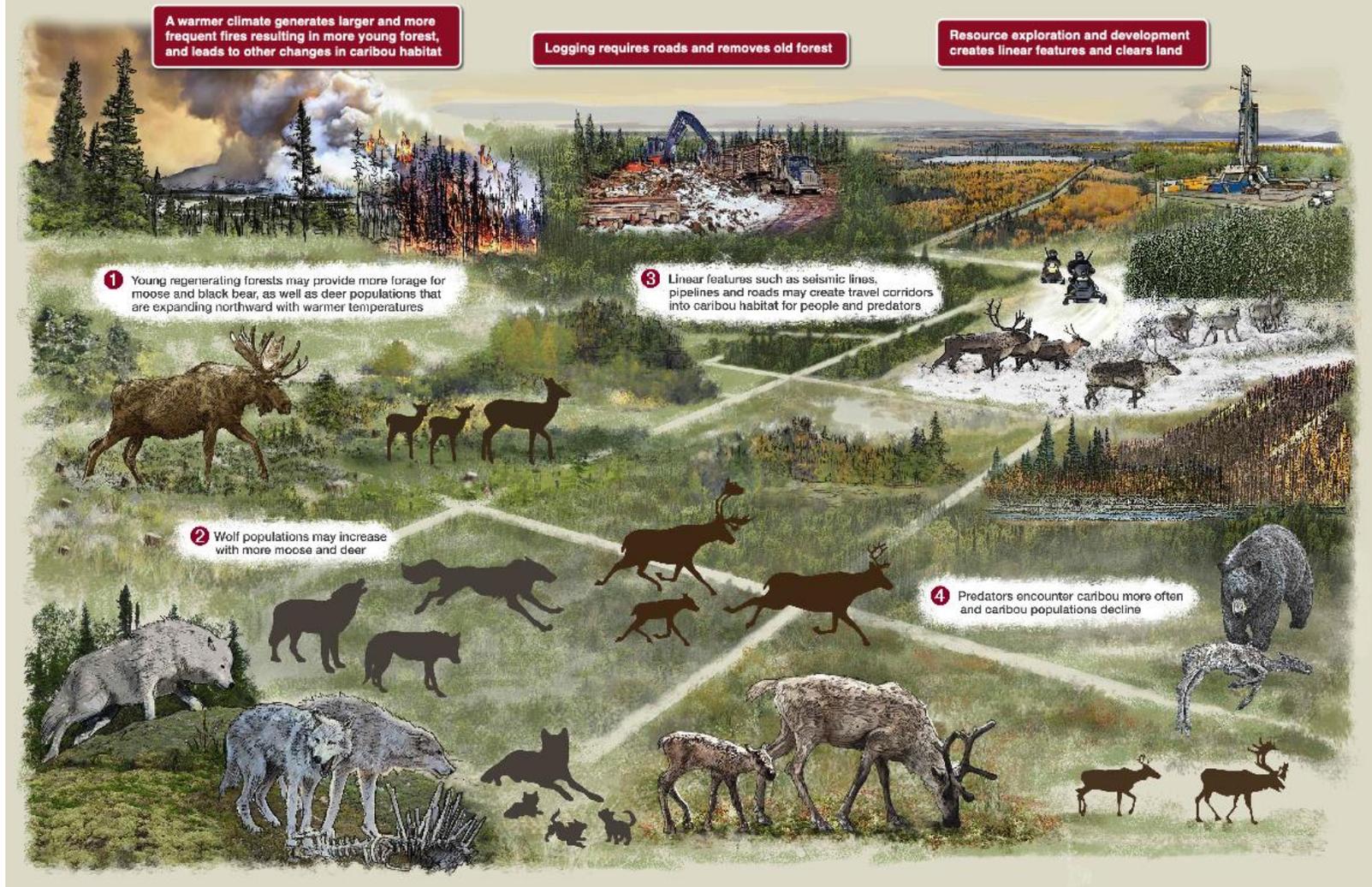


Figure 2. Potential impacts of habitat change on boreal caribou. The Framework and regional range plans attempt to manage the root cause of the effects described in this diagram by managing habitat disturbance. Illustration: Soren Heinrich; Design: Alaris Design; with thanks to the B.C. Oil and Gas Research and Innovation Society.

1.2 NWT Recovery Strategy

The *NWT Recovery Strategy* for boreal caribou was completed in 2017 by consensus agreement of the Conference of Management Authorities (CMA), the group of renewable resources boards and governments in the NWT that share management responsibility for the conservation and recovery of boreal caribou. The development of the strategy included engagement and consultation with Indigenous government and organizations (IGOs), NWT communities and the public. The *NWT Recovery Strategy* sets out a goal and objectives, two of which have guided the development of this Framework.

Goal, Objectives, and Approaches

The overall goal of the *NWT Recovery Strategy* is to “**ensure a healthy and sustainable boreal caribou population across their NWT range that offers harvesting opportunities for present and future generations.**” To help achieve that goal, six conservation and recovery objectives are identified in the Recovery Strategy, including two that are relevant to this range planning Framework. Each objective in turn has several recommended approaches for achieving that objective:

Objective 1: Ensure there is adequate habitat across the NWT range to maintain a healthy and sustainable population of boreal caribou;

Approach 1.1: Develop region-specific range plans and an overall NWT-Yukon range plan for habitat management.

Approach 1.2: Monitor landscape change annually.

Approach 1.3: Manage fire disturbance as a natural and necessary part of boreal caribou habitat.

Approach 1.4: Manage human-caused landscape disturbance.

Objective 6: Further to the *National Recovery Strategy*, ensure recovery obligations for protecting critical habitat and maintaining a self-sustaining population are met or exceeded in NWT.

Approach 6.1: Track and report on critical habitat indicators established in the *National Recovery Strategy*, to trigger adaptive management where necessary.

Approach 6.2: Track and report on self-sustaining population status indicators established in the *National Recovery Strategy*, to trigger adaptive management where necessary.

Approach 6.3: As new information becomes available, refine and improve indicators for critical habitat and population status.

This Framework directly supports the overall goal as well as objectives 1 and 6 of the *NWT Recovery Strategy*, by providing a consistent and coordinated approach to regional range plans that focus on managing human-caused landscape disturbance to maintain critical habitat for boreal caribou across the NWT.

1.3 National Recovery Strategy

The *National Recovery Strategy* was released in October 2012. Based on the population and distribution objectives identified in the *National Recovery Strategy*, each jurisdiction is expected to maintain or achieve self-sustaining status¹⁰ for each of its boreal caribou population(s) in order to maintain the current distribution of boreal caribou in Canada.¹¹ Based on the modeled relationship between habitat disturbance and the likelihood of observing self-sustaining boreal caribou populations, Environment and Climate Change Canada (ECCC) identified a management threshold of 65% undisturbed habitat that would provide a 60% chance of observing a self-sustaining population.

Using this threshold, the *National Recovery Strategy* defines *critical habitat* for boreal caribou as a minimum of 65% of the area within the boundary of each boreal caribou range maintained as undisturbed habitat, with biophysical attributes required by boreal caribou to carry out life processes within that area. *Undisturbed habitat* is defined as areas that have not burned within the past 40 years, and areas that are further than 500 m from human disturbance footprints (e.g. roads, seismic lines, and cut blocks) visible on 1:50,000 scale Landsat imagery.

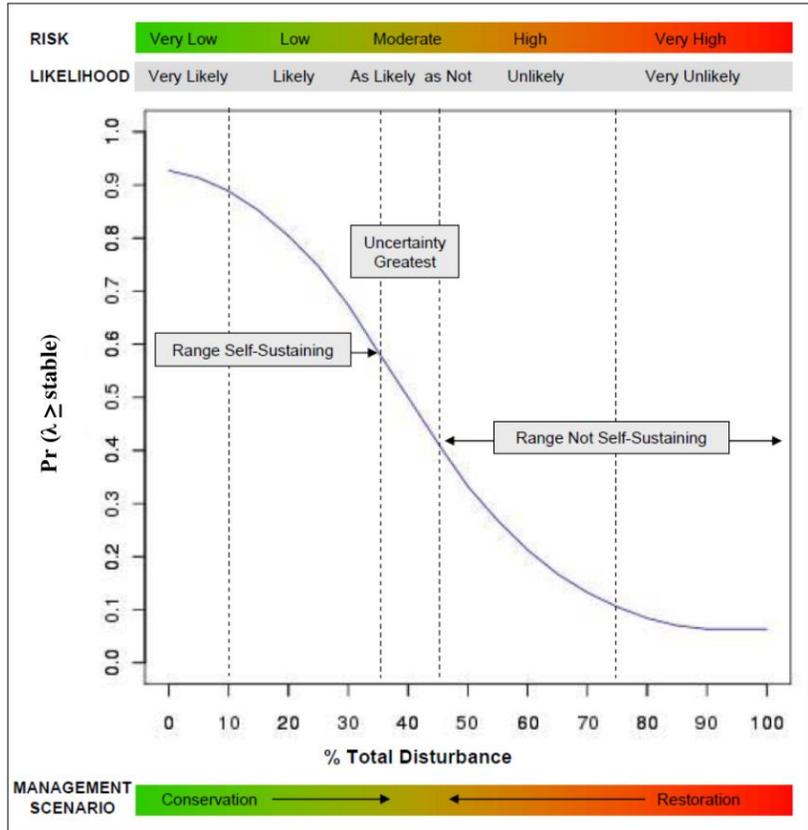


Figure 3. Disturbance-risk relationship from the *National Recovery Strategy* (Appendix E; Figure E-1). Pr($\lambda \geq$ stable) is the probability of observing stable or positive population growth.

¹⁰ A **self-sustaining population** is defined as “a population of boreal caribou that on average demonstrates stable or positive population growth over the short-term (≤ 20 years), and is large enough to withstand stochastic events and persist over the long-term (≥ 50 years), without the need for ongoing active management intervention.”

¹¹ Environment Canada. 2012. Recovery Strategy for the Woodland Caribou (*Rangifer tarandus caribou*), Boreal Population, in Canada. SARA Recovery Strategy Series. Environment Canada, Ottawa, ON. xi + 138pp. http://www.sararegistry.gc.ca/virtual_sara/files/plans/rs_caribou_boreal_caribou_0912_e1.pdf

Jurisdictions across Canada are expected to achieve or maintain this quantity of undisturbed habitat in each boreal caribou range as a means to ensure a self-sustaining population, based on the relationship between total disturbance and the likelihood that a caribou population will be self-sustaining (Figure 3).

When the *National Recovery Strategy* was released, the NT1 range was assessed as having a self-sustaining local population based on the fact that there was >65% undisturbed habitat. As of 2017, the NT1 range continues to have > 65% undisturbed habitat, though levels of undisturbed habitat are below that threshold in the southern part of the territory where the majority of NWT’s boreal caribou occur (Figure 4).

Further information on the status and trend of the NT1 population is summarized in Appendix A.

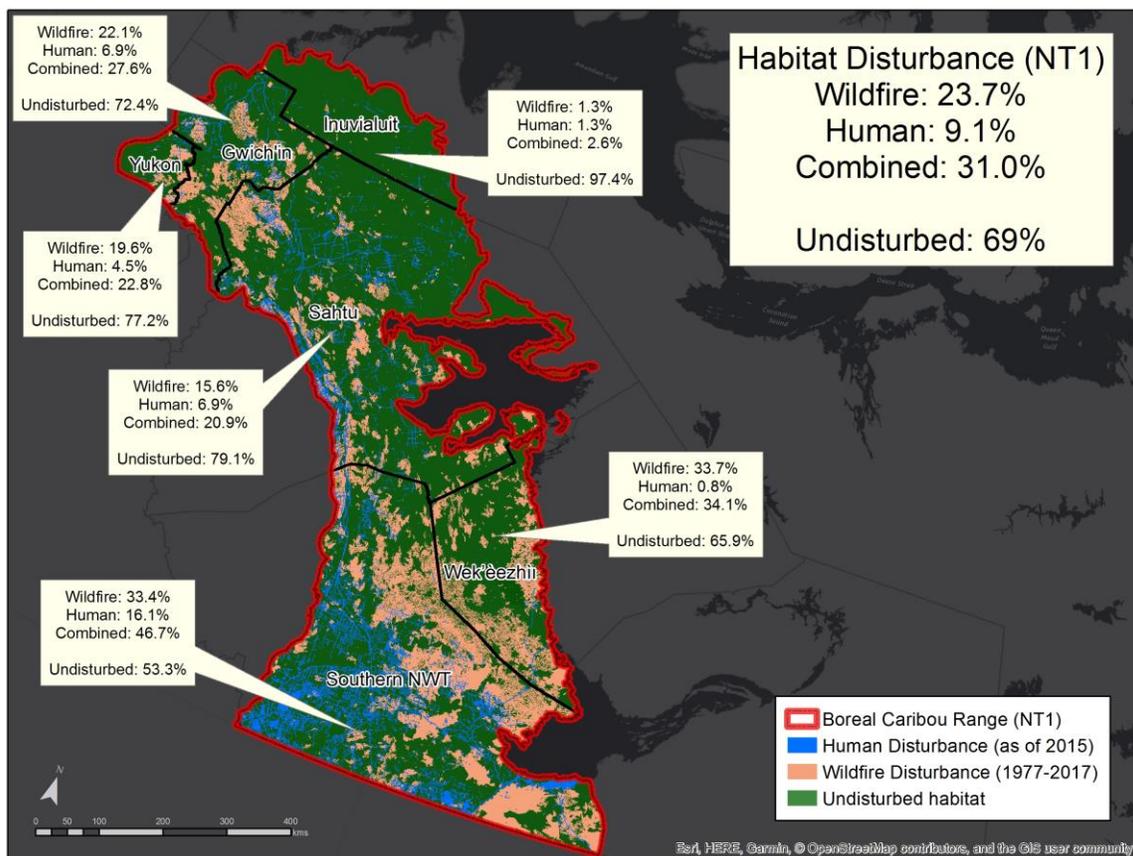


Figure 4. Disturbance by region as of fall 2017. Human disturbance is based on 2015 disturbance data published by Environment and Climate Change Canada. Wildfire disturbance is based on a combination of the National Burn Area Composite Data (1986-2017) and the Canadian National Fire Database (1977-1985). Current range boundaries and human disturbance maps are based on coarse-scale data and may be further refined during development of regional range plans.

2. Range Planning Framework

This Framework lays out a common approach to developing consistent regional range plans that together will achieve the objectives at the range-wide level and provides guidance for the process of developing individual regional range plans. The core of the Framework includes:

- **Regional range plans.** The NWT portion of the NT1 range is divided into five regional plans.
- **A tiered management framework.** Range plans must demonstrate where and how human and natural disturbance will be managed to maintain undisturbed habitat, maintain large habitat patches, and promote habitat connectivity across the range. The Framework lays out a tiered management approach, in which caribou habitat is assigned to different *management classes* (*Basic, Enhanced, and Intensive*) based on *importance of habitat* for caribou and range status relative to regional *human disturbance thresholds*. Though the Framework defines the tiers, specific areas assigned to each of the three management classes will be defined spatially when range plans are developed. Areas in enhanced and intensive management classes will be subject to stricter requirements and conditions with the intent of achieving no net loss (or increase) of undisturbed habitat due to human activity over time.
- **A menu of management actions.** Management actions proposed in each management class will address both development¹² activity and wildfire management. The Framework provides a menu of management actions that may be appropriate within each management class; actual decisions about which management actions to use in specific circumstances will occur during the development of regional range plans.
- **Implementation tools.** A suite of tools (i.e. legal instruments and conservation measures) that could be used to implement the management actions required in each management class are identified. Land use plans, powers under the *Wildlife Act*, the *Species at Risk (NWT) Act*, and existing environmental assessment and regulatory processes are some of the tools that will provide the legal means to implement most management actions. Region-specific tools available under Land Claim Agreements will also be included in Range Plans as possible and appropriate.
- **Considerations for monitoring, review and adaptive management.** Regional range plans will include a plan for monitoring population and habitat status and trend, as well as a program for addressing key learning objectives about the role of wildfire in shaping disturbance, the effectiveness of key management practices, and the effects of climate change. Traditional and local knowledge, new monitoring data, and ongoing research are likely to yield a better understanding of the relationship between habitat disturbance, caribou behaviour, and population status. To encourage range plans that are responsive to this and other new information, plans will be reviewed and updated every 10 years, with a five-year midterm review and with a set of pre-defined conditions that can trigger earlier review and revision of certain elements of the range plan.

These elements are further described in the following pages.

¹² Development is defined as any public, commercial or industrial undertaking or venture, including support and transportation facilities, related to the extraction of renewable or non-renewable resources, and any infrastructure related to transportation and utilities.

2.1 Framework Goal and Considerations

In accordance with the *NWT Recovery Strategy*, the **goal** of this range planning Framework is **to manage natural and human disturbance in order to provide adequate caribou habitat to ensure a healthy and sustainable boreal caribou population across their NWT range that offers harvesting opportunities for present and future generations**. Caribou conservation is therefore the primary driver of the design of the range planning Framework and the range plans themselves; they will ensure there is adequate habitat to support a self-sustaining caribou population throughout the NT1 range, and at smaller, sub-regional scales. When combined, regional range plans will strive to maintain 65% undisturbed habitat within the NWT portion of the NT1 range, to achieve or maintain a perpetual supply of large (>500 km²) patches of suitable habitat within each regional portion of the NT1 range, to maintain the presence of key biophysical habitat attributes (i.e. features of good habitat), and to maintain habitat and genetic connectivity throughout the range. Additionally, the range plan for the Southern NWT will strive to increase the amount of undisturbed habitat in that region over time.

Choices made about the management of caribou habitat have the potential to affect the interests of a range of governments and stakeholders. The diverse interests described below reflect the full set of interests held by organizations represented in the Working Groups (Appendix D) and were explicitly considered in the design of the Framework. Specifically, the Framework will:

- enable the GNWT to clearly demonstrate *compliance with the federal SARA* requirements to provide effective protection of critical habitat for boreal caribou
- ensure that adequate habitat is maintained to provide for maintenance of *harvesting opportunities* and Indigenous relationships with caribou at regional and sub-regional scales
- be interpreted in a manner consistent with the recognition and affirmation of existing *Aboriginal and treaty rights* as recognized in section 35 of the *Constitution Act, 1982*, and consistent with any applicable *land claims agreement*
- address the interest in maintaining flexibility¹³ and certainty¹⁴ for *development interests* in each region
- provide for *equity between regions* in terms of the responsibility for maintaining caribou populations while maintaining opportunity for development
- support *transparency in decision making* through clear and consistent guidance for stakeholders and decision makers reviewing development proposals
- minimize unnecessary administrative complexity by striving for *efficiency and compatibility* with the existing integrated resource management system and co-management arrangements

¹³ The term “flexibility” is intended to mean that range plans will strive not to result in the creation of additional protected areas that would be strictly off limits to development, beyond already existing/proposed protected areas, land use plan zones or land withdrawals, because the NT1 range currently has more than 65% undisturbed habitat. This provides flexibility for new development to occur in many areas of the NT1 range, but projects may be subject to additional management actions identified in the range plans.

¹⁴ The term “certainty” is intended to mean that the rules and expectations that apply to development within specific areas identified in a range plan are clear and will remain in effect until such time as range plans are reviewed and updated.

- make commitments with a high level of *achievability*
- facilitate *adaptability and learning* through the inclusion of explicit learning objectives and a schedule for periodic review of both the range plans and key elements of the Framework
- focus on improving *credibility* of the biological rationales used to guide choices about caribou habitat management

2.2 Regional Division of the Range Plans

The NT1 boreal caribou range extends from the southern border of the NWT into the Inuvialuit region and Yukon Territory. Given the sheer size of the NT1 range and its overlap with several settled and unsettled land claim regions, separate range plans will be developed for portions of the NT1 range. Currently, there is not sufficient information to inform the development of regional range plan boundaries that are based on biologically-relevant criteria, such as population substructure.

Instead, separate and complementary range plans will be developed for the Inuvialuit, Gwich'in, Sahtú, Wek'èezhì, and the Southern NWT portions of the range (Figure 5).¹⁵ When combined, these regional plans will help meet range-wide requirements for the NT1 range. This approach aims to achieve greater administrative simplicity by acknowledging that there are already established land use plans and regional decision making authorities (e.g. land and water boards and renewable resource boards) that guide land use and wildlife management decisions in settled land claim regions. It allows the range plans to be tailored to the needs and conditions in each region, and also promotes broad-scale connectivity across the range to avoid range recession.

Though range plans will address habitat management objectives at the regional scale, range plans should also strive to maintain adequate habitat at sub-regional scales, to provide for ongoing harvesting opportunities for Indigenous northerners at smaller scales.

Revisions to the regional range boundaries, the boundaries of the NT1 range, or both, may be made in the future as information becomes available during the development or regular update of regional range plans. See Section 3.6 and Table 4 on triggers for range plan review for further discussion.

¹⁵ Though a portion of the NT1 range overlaps with Yukon, this Framework does not apply to that portion of the range – instead, the Yukon Government will manage the YT portion of the range. The Yukon Government has indicated that the critical habitat of boreal caribou in the Yukon primarily overlaps with the draft Peel Land Use Plan, and the land use designations therein will maintain at least 65% undisturbed habitat in the NT1 Yukon range, if the Peel Land Use Plan does not substantially change during the consultation period.

Who Will Be Involved in Range Planning?

Boreal caribou and boreal caribou habitat fall under the management authority of multiple organizations. Wildlife management boards are the main instruments of wildlife management in regions with settled land claims. The NWT portion of the NT1 range contains a mix of public lands administered by the GNWT and by the federal government, as well as settlement lands owned by IGOs, private lands and reserve lands (Figure 8). Boreal caribou are known to move freely across administrative borders including adjacent jurisdictions (Yukon [YT], British Columbia [BC] and Alberta [AB]). Within the NWT, relevant Indigenous governments and organizations, community members, GNWT departments, regulatory boards, federal agencies and non-governmental organizations, as appropriate, will need work together to develop and implement the regional range plans. The GNWT has a lead role to play in coordinating the development of the regional range plans, and ensuring that when combined, the regional range plans achieve the overarching goals and objectives described in sections 2.2, 2.3 and 3.1 of the Framework. Further details on who will be involved in developing regional range plans are provided in section 4.1 of the Framework.

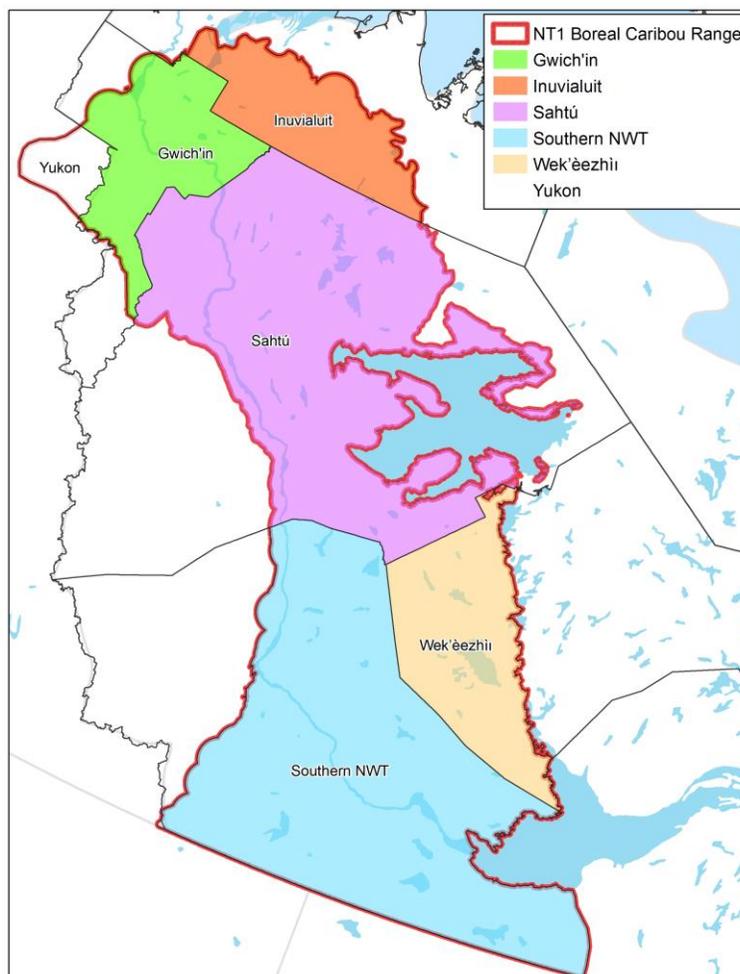


Figure 5. Range planning region boundaries

2.3 Tiered Management

Range plans must demonstrate where and how human and natural disturbance will be managed to maintain undisturbed habitat, large habitat patches, and habitat connectivity across the range.

The Framework lays out a tiered management approach, in which caribou habitat is assigned to one of three *management classes* (called Basic, Enhanced, or Intensive) based on *importance of habitat* for caribou and range status relative to regional *human disturbance thresholds*. Under this approach, human disturbance thresholds define the combination of management classes that should apply to a region. Maps of habitat importance then help to identify where those management classes should be placed on the ground. As a result, development in areas that are more important for caribou and in regions with high levels of existing human disturbance will be subject to additional requirements and conditions. The intent of the Enhanced and Intensive management classes is to manage human disturbance to achieve no net loss or an increase of undisturbed habitat over time and should generally be applied in areas of higher importance to caribou.

The processes of setting disturbance thresholds and mapping management classes are laid out below.

Important Habitat Areas

The relative importance of all areas in the range for boreal caribou (both disturbed and undisturbed) will be identified, described, and mapped as High, Medium or Low importance in each regional range plan. Local and traditional knowledge will play a central role in identifying and describing these areas and this information will be compiled through the range planning process. Where possible and available, monitoring data and other approaches to mapping habitat importance based on western science will also be used to complement local and traditional knowledge.

Higher importance areas should reflect those areas that currently provide for important life processes for caribou or will provide them in the future. For example, areas that currently provide or will provide preferred vegetation, travel corridors, large undisturbed habitat patches, areas that provide connectivity between large patches or between regions, and other areas that provide important habitat features may be considered High or Medium importance.

Consequently, low importance areas should reflect those areas where caribou are only seen infrequently, or which are unlikely to ever provide the functions as described above.

The process of mapping of important areas for boreal caribou will also provide an opportunity to refine the delineation of the NT1 range boundary and maps of habitat disturbance, including decisions about whether some large water bodies should be excluded from the range, and to refine the definition of biophysical attributes of critical habitat for the NT1 range.

Regional Disturbance Limits and Thresholds

Currently, there is more undisturbed habitat and larger contiguous patches of undisturbed habitat in the northern part of the range. However, caribou are thought to occur at higher densities in the southern part of the range where there are also higher levels of human and wildfire disturbance (Figure 4). This means a large proportion of the NWT boreal caribou population is found in areas where there is a lower likelihood that they can maintain their self-sustaining status due to habitat disturbance. A long-term objective of this Framework is to improve the condition of the southern portion of the NT1 range to increase the likelihood of observing stable or increasing population trends in that area.

The ECCC national risk model (Figure 3) represents the best available information linking habitat disturbance to the likelihood of self-sustaining caribou populations. The model describes the likelihood that the range (or regional portion of a range) will support a self-sustaining boreal caribou population, based on the total amount of disturbance, where low risk indicates a high likelihood that the population will be self-sustaining.

Based on the ECCC risk relationship, the Framework identifies for each region a minimum acceptable likelihood of supporting a self-sustaining caribou population, which is felt to be achievable based on the natural level of wildfire in each region. The Framework defines regional total disturbance limits based on these likelihoods, and then derives levels of human-caused disturbance that each region could accommodate while remaining below the limit after accounting for the expected variation in wildfire.

For regions with naturally lower levels of wildfire (Inuvialuit, Gwich'in, and Sahtú), the minimum acceptable likelihood of self-sustaining caribou populations is set at 67%, which corresponds to a maximum total disturbance level (human plus fire) of 30% (Figure 6). For regions with naturally high levels of wildfire (Southern NWT and Wek'èezhì), the minimum acceptable likelihood of self-sustaining population is set at 50%, which corresponds to a maximum total disturbance limit (human plus fire) of 40%. If actual disturbance levels in every region were at the maximum total disturbance limits, the amount of disturbance in NWT portion of the NT1 range would be 35%, thus respecting the threshold for critical habitat set out in the *National Recovery Strategy*. These total disturbance limits do not represent goals for disturbance in the NWT or in specific regions – instead, they represent management limits, beyond which the likelihood of maintaining self-sustaining caribou populations becomes unacceptably low.

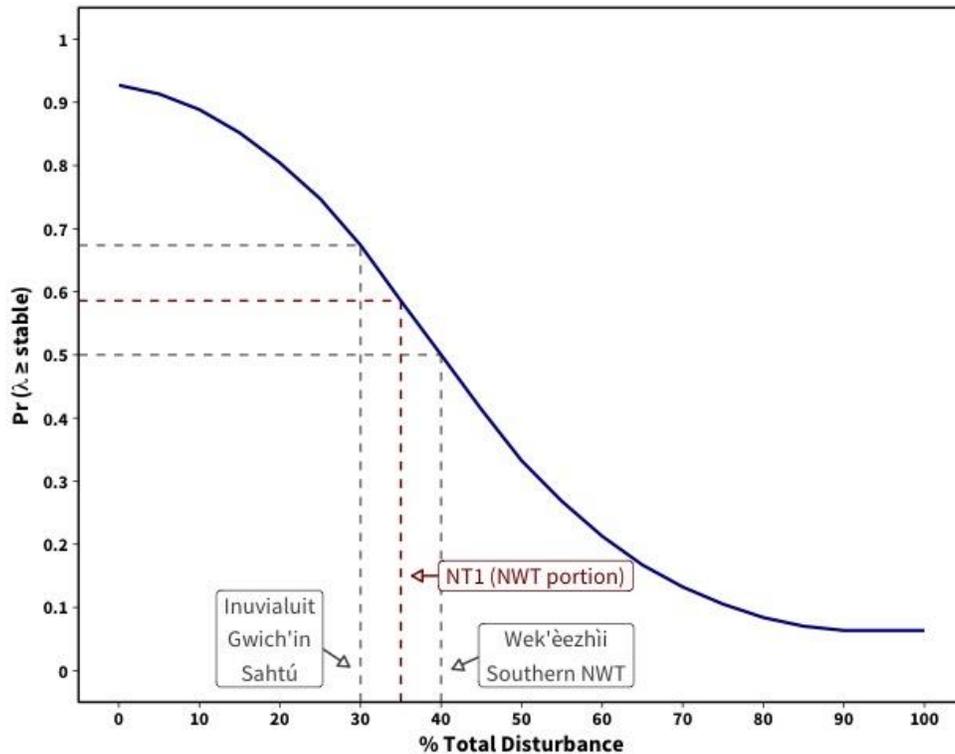


Figure 6. Minimum acceptable likelihoods of self-sustaining status and corresponding total disturbance limits for each region and the NT1 range

Using slightly higher total disturbance limits in the Southern NWT and Wek'èezhì is reasonable based on recent evidence from the SK1 range that suggests ranges with high levels of wildfire and low levels of human disturbance can support self-sustaining populations.¹⁶ The proposed definition of Critical Habitat for the SK1 range in Saskatchewan is a minimum of 40% undisturbed habitat (maximum of 60% total disturbance), which provides a 71% chance of self-sustaining.¹⁷ In the case of the SK1 range, however, small increases in human disturbance have a disproportionate effect on the likelihood of self-sustaining populations,¹⁸ reinforcing the need to manage human disturbance to relatively low levels in the Wek'èezhì and Southern NWT regions. As per the *National Recovery Strategy* (Section 7.1.1, page 34), if demographic data become available that indicate that boreal caribou are self-sustaining over a sufficiently long period at levels of total disturbance that are higher than 35%, a case can be made to amend the definition of critical habitat for the NT1 range.

¹⁶ <http://mcloughlinlab.ca/lab/wp-content/uploads/2016/11/2013-2016-SK-Boreal-Shield-Caribou-Project-Interim-Report-Nov-18-2016.pdf>

¹⁷ ECCC. 2019. Amended Recovery Strategy for the Woodland Caribou (*Rangifer tarandus caribou*), Boreal population, in Canada. http://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/plans/Rs-CaribouBorealeAmdMod-v00-2019Jun-Eng.pdf

¹⁸ ECCC. 2019. Boreal Caribou Science to Inform Recovery Science Summary Sheet #1. http://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/Ss-CaribouBorealCaribou-v00-2019June-Eng.pdf

Although the annual wildfire footprint¹⁹ is difficult to control and predict, it is possible to set thresholds for human disturbances that account for the expected range of variation in the 40-year fire disturbance footprints.²⁰ The Framework defines three levels (tiers) of human disturbance for each region, based on regional variation in wildfire disturbance, to help define the level of management intensity required in the regional range plan. Regional wildfire variability is used to define the upper and lower limits of the middle tier. The difference between the regional long-term disturbance limit and the median 40-year fire footprint for that region indicates the amount of human disturbance that region can accommodate given typical fire conditions. Similarly, the difference between the regional long-term disturbance limit and the maximum 40-year fire footprint for that region provides the amount of human disturbance that region can accommodate given more intensive fire conditions. The difference between these two values defines the upper and lower bounds of the middle tier of human disturbance (Tier 2 threshold, described below in section 4.3.3). Figure 7 shows the derivation of the human disturbance thresholds.

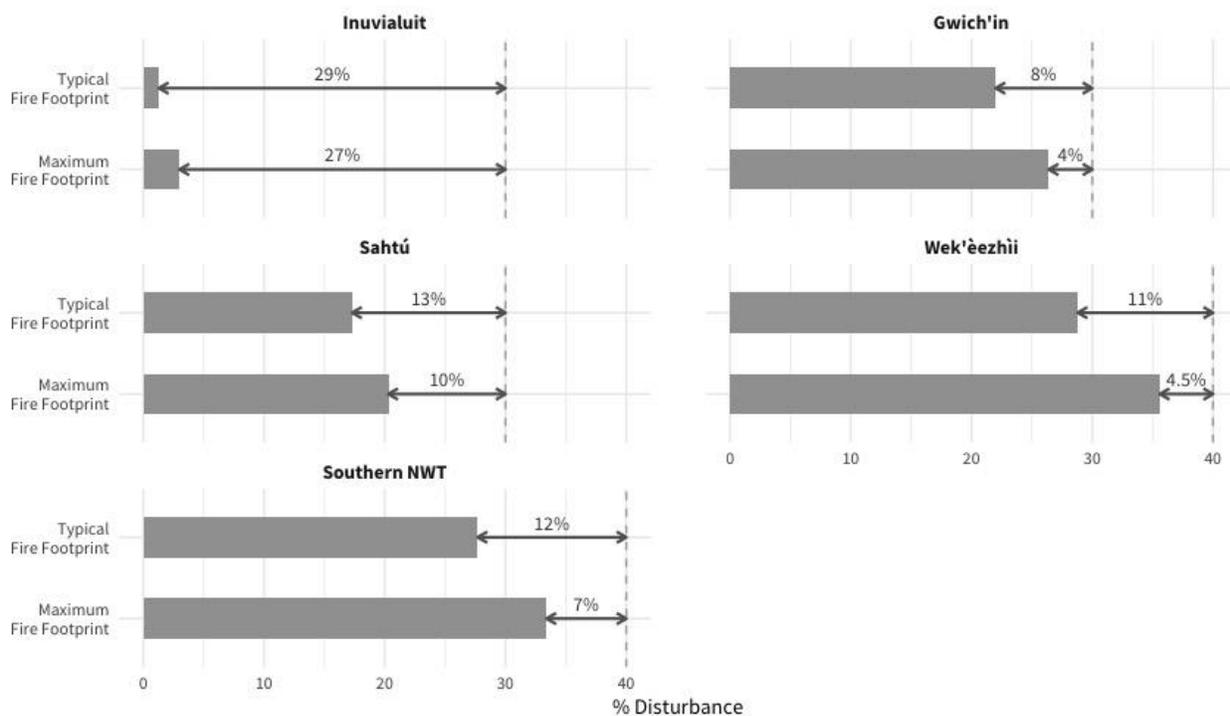


Figure 7. Regionally-specific human disturbance thresholds (horizontal arrows) are based on the difference between typical (median) and maximum 40-year fire footprints (bars) and the regional total disturbance limits (vertical dashed lines). These differences become the upper and lower bounds of Tier 2 (see Table 1).

¹⁹ Annual fire footprint is the total amount of area burned by fires in any given year.

²⁰ 40-year fire footprint is the total non-overlapping area burned by fires within a given forty year period. For example, the 40-year fire footprint for 2018 is the total non-overlapping area burned by fires between 1978 and 2018.

The tiered thresholds indicate the likelihood that various levels of human disturbance would threaten the region’s ability to keep total disturbance below the long-term disturbance limit, given observed fire footprints (Table 1). If human disturbance is kept within Tier 1, the likelihood of exceeding the long-term total disturbance limit is very low, and consequently the likelihood of a self-sustaining population will be higher than the level set in the Framework. If human disturbance falls within Tier 3, there is a high likelihood of exceeding the long-term total disturbance limit, and consequently the likelihood of a self-sustaining population will be lower than the level set in the Framework. Although the approach to setting human disturbance thresholds did not attempt to account for potential changes to fire regimes under climate change, there is additional conservatism built into the thresholds because they assume that wildfire and human disturbance are non-overlapping. In reality there will always be some overlap between wildfire and human disturbance, meaning that the total non-overlapping wildfire and human disturbance footprint will be less than the sum of its individual parts.

The current level of human disturbance in each region determines which human disturbance tier applies when the regional range plan is developed (Table 1), and in turn, which combinations of management classes apply.

Table 1. Human Disturbance Thresholds Tier assignments

Region	Total disturbance limit (%)	Human Disturbance Thresholds (%)			Current Human Disturbance	
		Tier 1	Tier 2	Tier 3	%	Tier
Inuvialuit	< 30	< 27	27 – 29	> 29	1.3	Tier 1
Gwich'in	< 30	< 4	4 – 8	> 8	6.9	Tier 2
Sahtú	< 30	< 10	10 – 13	> 13	6.9	Tier 1
Wek'èezhìì	< 40	< 4.5	4.5 – 11	> 11	0.8	Tier 1
Southern NWT	< 40	< 7	7 – 12	> 12	16.1	Tier 3

Tiered Management Classes

The Framework lays out a tiered management approach in which caribou habitat is assigned to one of three *management classes* (called Basic, Enhanced, or Intensive) based on *importance of habitat* for caribou and range status relative to regional *human disturbance thresholds*.

At a general level, the Basic management class identifies areas where development proceeds normally, while the Enhanced and Intensive areas indicate areas where more stringent management actions are required (described in greater detail below and [Appendix B](#)).

The current regional human disturbance status compared to regional disturbance thresholds determines which management classes are needed in a region (

Table 2). For example, when a region is in Tier 3 for human disturbance, a combination of the Basic (green), Enhanced (yellow) and Intensive (red) management classes should be used, while regions in Tier 1 and 2 need only include different proportions of Basic and Enhanced.

Where and in what proportions the management classes get delineated within a region is guided by maps of relative habitat importance for boreal caribou, and other factors such as development interests, existing land protection, etc. In general, the Enhanced and Intensive management classes should be applied to the areas that are of higher importance to caribou; however other factors may result in redistributing some important habitat into Basic management classes in consideration of regional opportunities, constraints, and values (see Section 4.2 for further discussion). At the regional scale, traditional and local knowledge will be a key input to helping to delineate management classes that recognize ecologically important areas in need of more stringent management to ensure the persistence of caribou.

In regions that fall into Tier 2 and Tier 3 for human disturbance, a greater proportion of the range planning area should be designated as Enhanced or Intensive management class areas than Basic, because there is a greater need to maintain or improve the amount of undisturbed habitat in that region over time. For example, in Tiers 2 and 3, an appropriate rule of thumb could be to assign no more than one-third of the range to the Basic class. It should be noted that in regions that fall within Tier 1 and 2, there may be existing protected areas, land use plan conservation zones, or community conservation plan land management categories that would correspond to the Intensive management class even though the Framework does not call for Intensive management classes.

Table 2. Distribution of Basic (green), Enhanced (yellow), and Intensive (red) management classes required in regional range plans according to tiered human disturbance thresholds and maps of relative habitat importance for boreal caribou.

Human disturbance thresholds	Relative importance of an area for Boreal Caribou		
	Low	Medium	High
Tier 3	Basic	Enhanced	Intensive
Tier 2	Basic	Enhanced	Enhanced
Tier 1	Basic	Basic	Enhanced

2.4 Management Actions

Management actions proposed in each management class can apply to both disturbed and undisturbed habitat, and will address both development activity and wildfire management. Table 3 provides a high-level summary of the management actions and approaches that are described in detail in [Appendix B](#). Though Table 3 and [Appendix B](#) provide a menu of management actions that may be appropriate within each management class, decisions about which actions will actually be applied in any particular location will be left until the development of specific regional range plans. [Appendix B](#) also describes circumstances where activities may be exempt from the requirements of a range plan; however, specific exemptions will be defined during the development of regional range plans based on exemptions already contained within approved or draft land use plans.

In general, the intent of the tiered management framework is to maintain or improve the condition of the range through the use of increasing proportions of Enhanced and Intensive management class areas in regions that fall in higher tiers of human disturbance. To achieve no net loss or net improvement in the amount of undisturbed habitat in Enhanced and Intensive class areas, range plans will require that certain conditions be met in order for new development to proceed in those areas. For example, developers must demonstrate that new disturbance (of undisturbed habitat) is minimized to the greatest extent feasible. The effects of unavoidable habitat disturbance will need to be offset²¹ by creating habitat-related benefits for caribou in other locations. This could be accomplished, for example, through off-site restoration of other currently disturbed areas at a greater than 1:1 ratio to compensate for uncertainty about the effectiveness of restoration treatments and time lags before restoration takes effect, and to ensure that in the long-run there is more habitat being restored than disturbed.

Lastly, once developments are complete, developers will be required to meet higher restoration standards to ensure functional and ecological restoration²² of areas disturbed on-site. These restoration standards are designed to reduce the risk to caribou of predation by making predator and human travel along linear features difficult in the near-term (functional restoration), and to encourage vegetation to re-establish and return the area to its condition before disturbance over the longer-term (ecological restoration).

²¹ Formally, offsets are defined as a “process of creating environmental benefits to compensate for the residual negative environmental impacts of development projects or programs (after all reasonable measures have been taken to avoid and minimize the losses).” (Poulton, D. 2018. <https://ablawg.ca/2018/04/26/alberta-energy-regulator-breaks-new-ground-on-offsetting-of-caribou-habitat/>)

²² “Functional restoration” is generally focused on reducing the ability of predators and humans to use linear features as travel corridors that increase the odds of encounters with caribou in the short-term, or to prevent repeated disturbances caused by vehicular traffic which may impede longer-term regeneration of vegetation. Functional restoration therefore addresses functional habitat loss for boreal caribou due to avoidance of these features but does not necessarily address the numerical response of predators to increased alternate prey levels associated with disturbed habitat.

“Ecological restoration” focuses on ensuring or accelerating the longer-term recovery of vegetation in disturbed areas that will provide biophysical attributes required by caribou (e.g. restoration of lichen ground cover, or conifer-dominated forest cover), and the return of an area to pre-disturbance composition and structure.

Table 3. High-level management actions

Management Class	Management Actions
Basic	<p>Development can proceed subject to normal conditions:</p> <ul style="list-style-type: none"> • Encourage use of best practices and minimum standards (including actions to manage sensory disturbance, and actions specific to seasonal use of habitats) • Wildfire management as per current GNWT Policy²³
Enhanced	<p>Ensure no net loss (or gain) of undisturbed habitat through:</p> <ul style="list-style-type: none"> • Required use of best practices and guidelines (including actions to manage sensory disturbance) • Avoiding disturbance of areas providing specific important habitat features (i.e., biophysical attributes of critical habitat) • Required re-use of existing disturbance to the extent feasible • Offsets for new long-term disturbance. Offset ratios will be set in recognition of the uncertainty in the effectiveness of proposed measures and the value of the area to boreal caribou. • The use of functional and ecological restoration treatments once disturbed areas are no longer in use • Designation of habitat patches as values at risk for wildfire management • Consideration of fuel management treatments where feasible and appropriate
Intensive	<p>Same as Enhanced, <u>plus</u>:</p> <ul style="list-style-type: none"> • Complete avoidance of creating new disturbance through re-use of existing disturbance, or, if creating new disturbance cannot be completely avoided, demonstrate that the disturbance footprint is minimized to the greatest extent possible • Restrict new disturbances to areas that do not provide important habitat features to the greatest extent possible • Higher-ratios for offsets for new long-term disturbance. Offset ratios will be set in recognition of the uncertainty in the effectiveness of proposed measures and the value of the area to boreal caribou, at higher ratios than those used in the <i>Enhanced</i> class • Stricter requirements for the use of functional and ecological restoration treatments once disturbed areas are no longer in use • Increased priority for habitat patches in wildfire management values at risk hierarchy • Consideration of treatments such as prescribed burns or fire breaks to reduce fuel loads and risk of fire spread where feasible and appropriate

²³ http://www.enr.gov.nt.ca/sites/enr/files/documents/53_04_forest_fire_management_policy.pdf

More specifically, within each management class, the following management actions may apply:

- In the *Basic* management class, highlighted in green, development can proceed subject to minimum standard conditions, and developers are encouraged to follow best practices to minimize impacts to caribou habitat. Examples of these kinds of practices may include the use of low impact seismic exploration techniques, avoiding certain disruptive activities during the late-winter or calving season or within habitat selected by caribou during these seasons, and sharing access with other proponents to minimize disturbance footprint. Basic minimum standards will be reviewed, updated, and improved, where necessary, to reflect current best management practices for boreal caribou, including actions to address sensory disturbance. Wildfire management in this class would follow the existing NWT Forest Fire Management Policy.
- In the *Enhanced* class, highlighted in yellow, development can proceed under specified conditions to ensure no net loss of undisturbed habitat over time, after accounting for areas recovering from disturbance. This could include requiring the use of currently disturbed areas, making implementation of best practices and guidelines for boreal caribou enforceable, stricter requirements for on-site habitat restoration, and in some cases, offsets for new long-term disturbance through off-site restoration or other means. Wildfire management will include identifying specific important habitat areas as values at risk, and consideration of fuel management treatments where feasible and appropriate.
- In the *Intensive* management class, highlighted in red, development can also proceed under specified conditions to encourage gains in undisturbed habitat. Development should only proceed if it can be demonstrated that (a) new disturbance has been minimized to the greatest extent feasible by minimizing footprint or re-using existing disturbances, (b) new on-site disturbance will be functionally restored (to impede predator and human travel along linear disturbance features) as soon as the development is concluded, (c) ecological restoration will be applied to return the area to pre-disturbance conditions, and (d) any new unavoidable long-term disturbance will be offset at a ratio reflective of the uncertainty in the effectiveness of proposed offsetting measures and the value of the habitat being disturbed. Wildfire management actions will include identifying specific areas as values at risk, and consideration of fuel management treatments where feasible and appropriate.

It is recognized that certainty about the ability of restoration offsets to provide habitat value in the near future is low at this time due a lack of research directly applicable to the Northern context and due to the unknown ways in which climate change will affect caribou habitat recovering from disturbance in the future. Consequently, there may be some areas of critical importance to caribou where it could be appropriate to limit development activities to areas that are currently disturbed or unlikely to ever provide important habitat features, to limit activities to those that have a neutral or positive effect on caribou and their habitat, or both. These decisions will be made during the regional range planning processes and revisited during the regular range planning cycle.

Given limited experience with implementing functional and ecological restoration of boreal caribou habitat in the NWT and the lack of current policy and guidance for requiring, implementing and monitoring offsets for disturbance, offsetting requirements will likely be phased in gradually over time. In the initial phase, developers could be required to contribute directly or indirectly to research and development of functional and ecological restoration practices for boreal caribou habitat. Additionally, developers could contribute to documenting the status of regeneration on existing human disturbance features where the actual current status as functional caribou habitat is unknown (for example on legacy seismic lines in the Southern NWT). Appropriate offsetting ratios will be determined through further research and the development of policies and guidelines related to offsetting, including approaches to funding, administering and monitoring success of offsetting programs.

2.5 Implementation

To ensure that the management actions identified in regional range plans actually get implemented on the ground, a variety of legislative and policy-based “tools” or “instruments” may need to be used. Any instruments proposed for the implementation of range plans will need to work within the existing land and resource co-management system established by land claim agreements and the *Mackenzie Valley Resource Management Act (MVRMA)*. In addition, the mix of land ownership and administration across the NWT (Figure 8) requires a multi-pronged approach that will rely on a suite of tools with various lead organizations. Regionally-specific tools and decision processes available under land claim agreements need to and will play a key role in implementing the regional range plans. Implementation tools led by ENR or by the GNWT more broadly, by the federal government, and by IGOs will all be important in implementing range plans. Specifically, a mix of land use plan zoning and conformity requirements, community conservation plans, regulations, conservation agreements (under territorial or federal SARA), rights issuance processes, environmental assessment (EA) processes, authorizations, permits and licences, broad policies and guardian programs may all be used to implement management actions in the range plans.

In general, identifying appropriate implementation tools will involve a multi-step process, where:

- Important areas and management classes are mapped out (as described above)
- Appropriate management actions are identified for each management class area
- Management class areas that are already in, or overlap with, protected areas, land use plan conservation zones, community conservation plans, or other types of habitat protection are identified
- Requirements already specified by Land Use Plan conformity requirements or community conservation plans are evaluated for applicability to caribou habitat
- Where gaps exist in protection or management actions already required for caribou in different management class areas, assess what development activities are likely to take place there to determine which implementation tools (e.g. amendments to land use plans or community conservation plans, legislative instruments, or other regionally-relevant approaches) might be most appropriate to require further management actions

An overview of potential implementation tools is documented separately (see Appendix B). The GNWT continues to work toward a better understanding of specific details of how these legal and policy instruments will be used to implement the management actions broadly outlined in Table 3 and Appendix B.

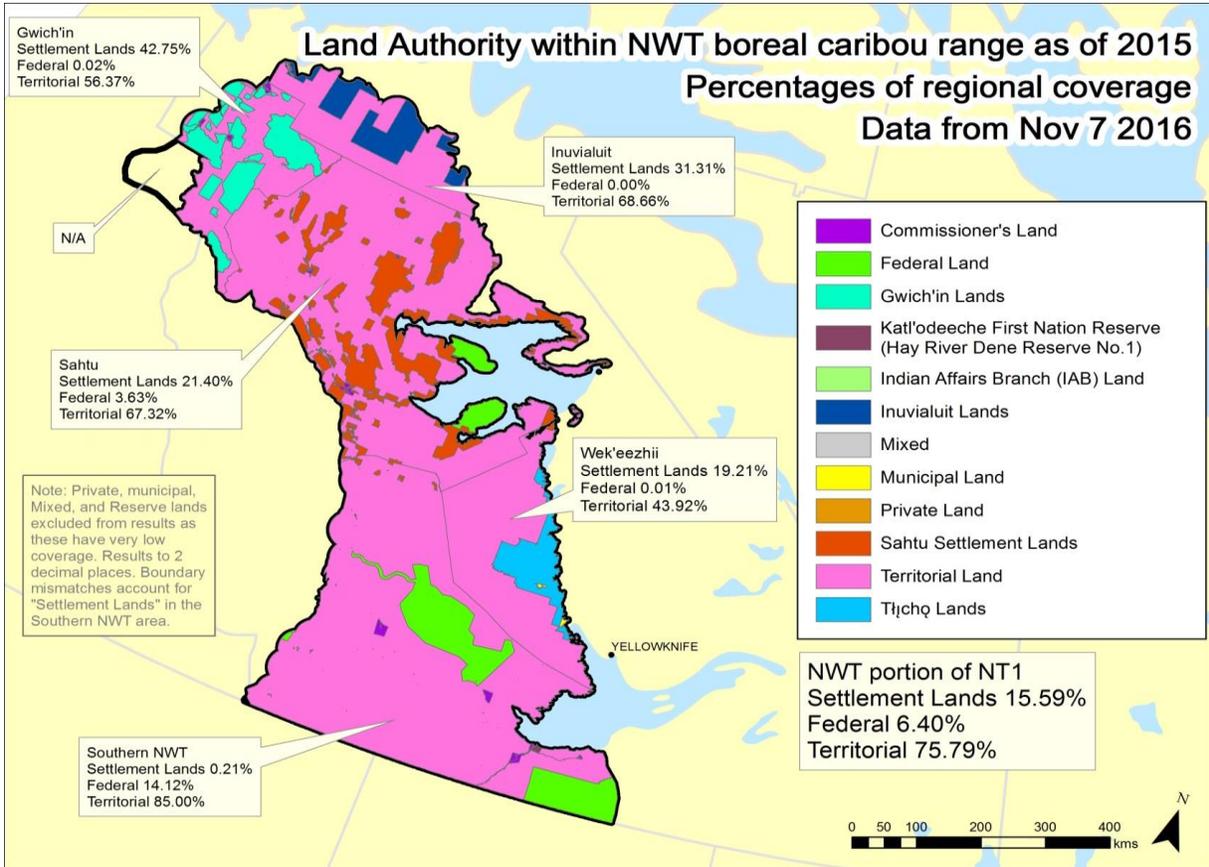


Figure 8. Land authority within NWT boreal caribou range as of 2015

2.6 Monitoring and Review

Each regional range plan will include a plan for monitoring population and habitat status and trend, as well as a program for addressing key learning objectives. This element is particularly important for the NWT, given the size of the range, the role of wildfire in shaping disturbance, the uncertainty of climate change, and the potential for growing trade-offs between development and conservation objectives over time. The GNWT and regional co-management partners will together be seeking to better understand the key factors driving caribou population trends in the NWT, with emphasis on the relationship between habitat disturbance and population status, with a view to being better informed and positioned to develop innovative ways to protect caribou in the future. This Framework, including approaches to setting thresholds, mapping habitat importance and defining tiered management classes may also need to be reviewed and adapted in the future as we gather this new information. Figure 9 describes a process for how range plans are updated over time, and where important information is used to facilitate those updates.

Every five years, the Conference of Management Authorities will review the *NWT Recovery Strategy* and report on actions taken to implement it and the progress made towards meeting its objectives. These reports are required under the *Species at Risk (NWT) Act* and will address progress on developing and implementing range plans. In addition, regional working groups (see Section 4.1) may wish to identify an annual review and reporting mechanism to track progress on the implementation of regional range plans and associated monitoring and research. Regular updates may also be provided to regions in the form of newsletters and/or digital materials.

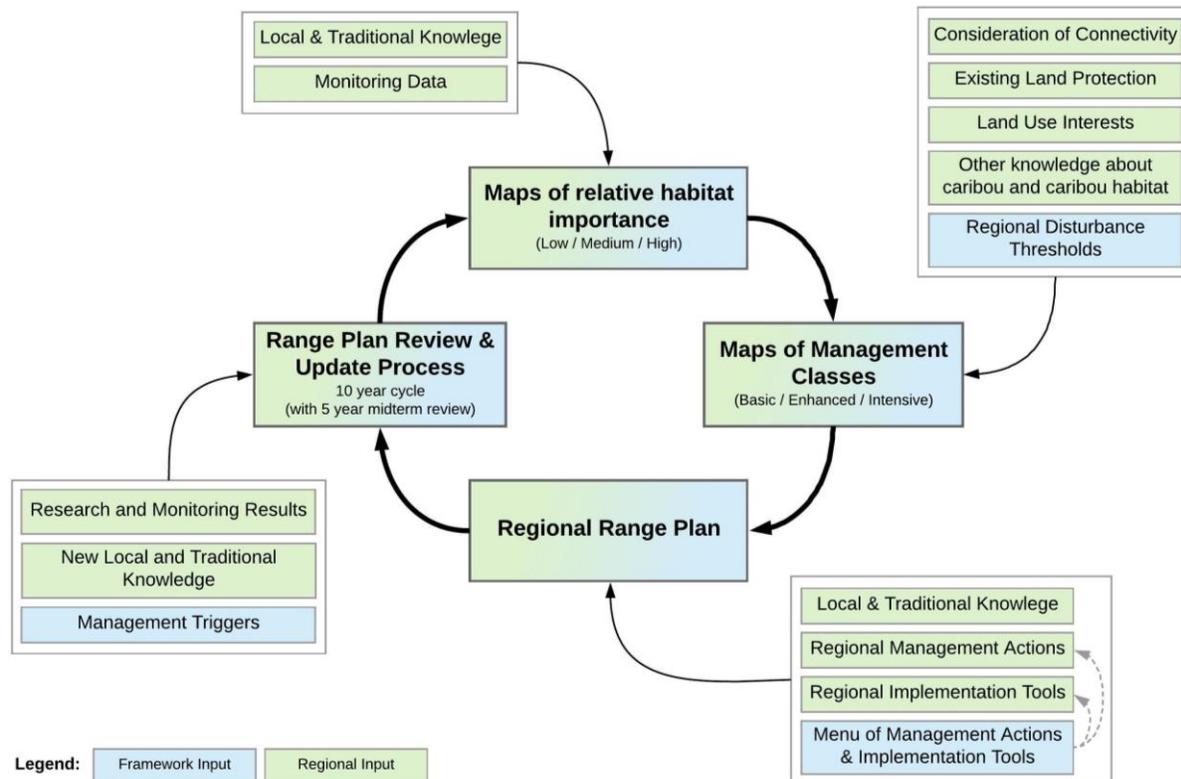


Figure 9. Range Plan review process

A broad list of research and monitoring needs for boreal caribou in the NWT have been articulated previously in the *NWT Recovery Strategy*. Building on these, through the development of this Framework, several high-level questions pertinent to the decisions embedded in this Framework were identified that merit inclusion as priorities for research and adaptive management. These knowledge gaps can be addressed using local or traditional knowledge, science, or a combination of these. Communities and regional organizations may identify other questions during the development of regional range plans. A sample of these questions, together with their relevance to the Framework is given in Appendix C.

Regional range plans will be reviewed and updated every 10 years, which will provide an opportunity to incorporate new information from research and monitoring.

The Framework and range plans are designed around a set of well supported assumptions that together, help describe the logic of the approach described in this Framework. These assumptions are that:

1. Management actions described in the range plans can maintain human and natural disturbance below specific levels
2. Keeping amounts of human and natural disturbance below specific levels will maintain total disturbance below predictable limits
3. Maintaining total disturbance levels below specific limits will provide adequate caribou habitat to ensure a self-sustaining population

4. Adequate habitat can ensure a healthy and sustainable boreal caribou population across their NWT range that offers harvesting opportunities for present and future generations (i.e. without the use of predator control programs, harvest restrictions, etc.)

To help validate these assumptions over time and to provide a safeguard for caribou in the event that one or more of these assumptions is not correct, the regional range plans will also identify specific management responses to changes in conditions (i.e. management triggers). Examples of these triggers are provided in Table 4.

Regional range plans may also identify specific circumstances under which exceptions to management actions required in each management class may be contemplated, or that might require amendments to the delineation of management classes in advance of the 10-year review cycle. To facilitate consideration of these triggers, a five-year mid-term review is included to allow for adjustment of the plan or management actions if any thresholds or triggers are exceeded.

Each regional range plan will include:

- Plans for monitoring the health of the caribou population and its habitat (this could include community-based monitoring programs, collaring or DNA-based monitoring programs, etc., to understand whether the population is growing, stable or shrinking). It should be noted that some regions do not currently have ongoing boreal caribou population monitoring programs
- A plan for monitoring the effectiveness of policy/management actions: Are management actions being implemented and are they effective? Are the thresholds triggering increased management oversight appropriately?
- Plans for addressing “big questions” that will be important for refining range plans over time (e.g. the relationship between disturbance and population trajectory) along with specific knowledge gaps (e.g. caribou use of burned areas)
- A process for periodic range plan review, and identification of events or conditions that would trigger earlier review

Table 4. Triggers for revising range plans at the 5-year mid-term review

Condition: <i>If...</i>	Response: <i>Then...</i>
Within the first 5 years of the plan, annual wildfire disturbance footprints persist outside the observed natural range of variation...	... Re-calculate human disturbance thresholds, update the Framework with the new values and re-evaluate the tier for that region. Adjust proportions of different management classes if required and update associated management actions (including revisiting wildfire management plans).
Within the first 5 years, the rate of new human disturbance is much higher than predicted in the regional plan	... Adjust the proportions of different management classes and update associated management actions
Undisturbed habitat within the NWT portion of the NT1 range falls below 65% despite implementation of the range plans...	... Re-evaluate management class assignments and update associated management actions.
Within the first 5 years the caribou population is showing a steep declining trend at the regional scale...	... Evaluate whether range planning objectives are being met. If not, re-evaluate management class assignments and update associated management actions. If yes, consider other non-habitat conservation measures at a regional scale.

3. Guidance for the Development of Regional Range Plans

Though the Framework provides a foundation for what regional range plans will consider, regional organizations and communities will play a critical role in filling these plans out and creating well-tailored regional range plans. This section provides high level guidance on the process of developing regional range plans.

The Framework establishes the scope of range plans by establishing acceptable likelihoods for the self-sustaining status of caribou populations, deriving levels of human disturbance to achieve those, and then identifies an approach (through the mix of management classes) to manage human disturbance into acceptable ranges.

All other input and decisions, for example, about how to map important areas, where to place management classes, which management actions to implement and how to implement them, and about learning priorities for the region, will be made at the regional range planning tables, taking into account existing habitat status, regional land protection, local values and other factors relevant at the time.

3.1 Working Groups

The development of range plans that can be implemented directly will require broad buy-in from a diverse set of governments, communities, and stakeholders. Therefore, given the range of interests involved and shared decision making authority, range plans should be developed collaboratively through regional working groups made up of representatives from relevant Indigenous governments and organizations, community members, GNWT departments (including Environment and Natural Resources; Lands; Industry, Tourism and Investment; Municipal and Community Affairs; and Infrastructure), regulatory boards, federal agencies, and non-governmental organizations, as appropriate. In addition to elders and harvesters, youth participation on the regional working groups is encouraged as they may be responsible for implementing and updating range plans in the future. Regional working groups will share the results of various steps in the development of regional plans with other regions to ensure that important habitat patches that cross range planning boundaries are treated and managed similarly across plans. This could be achieved by inviting representatives from adjacent regions to participate at regional working group meetings to review maps of important areas for boreal caribou and proposed management class delineations, or by creating an online spatial data viewer so that regional information can be shared among regions to assist with decision making (access to the site would be limited to regional working group members until the plans are finalized and information deemed confidential would not be displayed). This will help promote broader-scale connectivity across plans.

Currently, the range planning process is expected to take at least 2 years. Because planning processes like these are highly intensive time commitments, range planning effort will begin in the two regions with the highest risk to caribou populations and finish in the remaining three regions.

Table 5. Range Planning Sequencing

Timeline for Development	2018	2019	2020	2021	2022	2023
Range Planning Framework						
Southern NWT Range Plan						
Wek'èezhì Range Plan						
Sahtú Range Plan						
Gwich'in Range Plan						
Inuvialuit Range Plan						

Scope of Range Planning

The role of regional range plans is to maintain adequate habitat to ensure a healthy and sustainable population of boreal caribou. As described above, the range plans will detail habitat management actions and tie those to specific locations on maps. The range plans will not consider other conservation measures such as predator control or harvest restrictions at this time.

Suggested Principles

To help support consistency between the range plans, each range planning process should be guided by a set of similar principles. The following principles provide a starting point for guiding the range planning process, but the list is not intended to be complete or comprehensive. Instead each range planning working group will likely revisit these principles, and add others, subtract some, or clarify the existing principals as appropriate to the region. The range plans should:

- Be informed by good science and traditional knowledge
- Acknowledge and be guided by people’s relationship with caribou
- Help to promote the social, economic, and cultural well-being of people in the NWT
- Promote transparency in decisions made during the range planning process
- Respect Aboriginal land claims and rights, agreements and principles
- Respect the need for a collaborative process for co-management of resources
- Recognize the potential for and encourage local community engagement and involvement in implementing range plans
- Recognize the need to consider areas beyond each regional boundary to ensure habitat/genetic connectivity is maintained across the NT1 range

3.2 Content of the Range Plans

Range plans will rely on local context and local information to a large degree, particularly in identifying important habitat areas, developing maps of management classes, and identifying and implementing relevant management actions. Because of this fact, and to make the best use of the deep expertise held by community members and current and past land users, local and traditional knowledge will be a key source of information and will provide important perspective in the development of these plans. Existing work to document the status of caribou, to understand patterns of habitat selection and use, and to provide guidance on the management of caribou habitat will also be key inputs to the content of range plans.

To document this local context and provide a clear and transparent rationale for range plan decisions at the regional scale, each regional range plan will include the following sections, based on ECCC guidance for range plans:²⁴

- **Regional population trend:** Best available information (local, traditional and western science) will be used to identify the health, trend and condition of the regional population.
- **Current habitat condition:** Descriptions of the current habitat condition should include quantity of undisturbed habitat, quantity of current human disturbance, location of large undisturbed patches, descriptions of the location and quality of vegetative communities preferred by boreal caribou. Local and traditional knowledge will play a key role in these descriptions.
- **Mapping important areas:** Local and traditional knowledge will play a central role in identifying important habitat areas for boreal caribou around communities, and monitoring data and other sources of mapping habitat importance will complement that source of knowledge where possible and available.
- **Mapping existing land protections and development interests:** Descriptions and maps of current protected areas, interim measures agreements and land withdrawals, land use plan zoning, land and resource tenure, renewable and non-renewable resource development potential, planned infrastructure and development projects.
- **Management classes:** The Framework will identify which management classes are required given various levels of existing human disturbance. The range plans must map out where these management classes will be used on the ground, and in what proportion at a regional scale. This process will need to consider the maps of important areas, existing land protections in high value caribou habitat, existing resource development interest, maintenance of sub-regional harvesting rights, and other factors to be identified at the time. In addition, choices about which management class (and the associated management actions required), will require striking a balance between caribou conservation and development interests and their associated economic benefits.

²⁴ http://www.registrelep-sararegistry.gc.ca/virtual_sara/files/policies/Range%5FPlan%5FGuidance%5FEN%2Epdf

- **Specific management actions:** The range plans should choose management actions that are appropriate for each management class area and reflect the land use activities that are likely to affect caribou habitat in each area. For example, areas with heavy interest from mining should be sure to pick management actions that mitigate impacts caused by mining-related activities. Management actions listed in the appendix to this Framework are meant to be a starting point for discussion; other relevant actions identified during the range planning process may be considered for inclusion in the plans whether they are listed in the Framework or not.
- **Implementation instruments:** The mix of land administration in the NWT makes choosing implementation tools complex, and the range plans will need to make use of regionally-relevant tools and programs. For example, legislative tools may be appropriate for GNWT-administered lands, federal tools may be appropriate for federally-administered lands, and regionally-specific tools and programs may be appropriate for privately held lands resulting from Land Claim Agreements. Ultimately, range plans should identify a combination of tools and programs to implement the management actions.
- **Forecasts of future habitat:** The range plans should identify scenarios and projections of future habitat recovery, and likely sources and locations of future habitat disturbance from development and from wildfire. Range plans should also identify priority areas for restoration.
- **Monitoring, adaptive management and review:** The range plans should identify outstanding questions and uncertainties and develop time-bound learning plans to address key uncertainties faced in developing the range plans. These questions could touch on an array of topics including the effectiveness of management actions, the status of legacy human disturbance, the use of disturbed areas by caribou, etc. These questions should be developed with community and stakeholder input to ensure they reflect questions about caribou populations relevant to local interests. In addition, regional range planning processes should establish methods of ongoing communication within and among regions to ensure that advice, guidance, feedback, monitoring results, and implementation results can be shared easily and widely with communities and decision makers. The process for how best to facilitate this kind of communication may vary from region to region.

Glossary

Anthropogenic: caused by human activity.²⁵

Biophysical Attributes: habitat characteristics required by boreal caribou to carry out life processes necessary for survival and recovery.²⁵

Critical Habitat: means the habitat that is necessary for the survival and recovery of the species and that is identified as the species critical habitat in the *National Recovery Strategy*. For boreal caribou, critical habitat is: i) the area within the boundary of each boreal caribou range that provides an overall ecological condition that will allow for an ongoing recruitment and retirement cycle of habitat, which maintains a perpetual state of a minimum of 65% of the area as undisturbed habitat; and, ii) biophysical attributes required by boreal caribou to carry out life processes.²⁵

Development: any public, commercial or industrial undertaking or venture, including support and transportation facilities, related to the extraction of renewable or non-renewable resources, and any infrastructure related to transportation and utilities.

Ecological restoration: habitat restoration treatments that focus on ensuring or accelerating the longer-term recovery of vegetation in disturbed areas that will provide biophysical attributes required by caribou (e.g. restoration of lichen ground cover, or conifer-dominated forest cover), and the return of an area to pre-disturbance composition and structure.

Fire disturbance: The combined non-overlapping footprint of wildfires from the last 40 years.

Forty-year (40-yr) fire footprint: is the total non-overlapping area burned by wildfires within a given forty year period. For example, the 40-year fire footprint for 2018 is the total non-overlapping area burned by wildfires between 1978 and 2018.

Functional restoration: habitat restoration treatments that are generally focused on reducing the ability of predators and humans to use linear features as travel corridors that increase the odds of encounters with caribou in the short-term, or to prevent repeated disturbances caused by vehicular traffic which may impede longer-term regeneration of vegetation.

Habitat Importance: the relative importance of an area for boreal caribou based on local, traditional and/or scientific knowledge.

Human disturbance: anthropogenic disturbance visible on Landsat at a scale of 1:50,000, including habitat within a 500 m buffer of the anthropogenic disturbance.²⁵

Human disturbance threshold: management thresholds for human disturbance that indicate the likelihood that a region would be able to keep total disturbance below the long term disturbance limit, given variation in observed 40-yr fire footprints.

²⁵ Environment Canada. 2012. Recovery Strategy for the Woodland Caribou (*Rangifer tarandus caribou*), Boreal Population, in Canada. SARA Recovery Strategy Series. Environment Canada, Ottawa, ON. xi + 138pp.
http://www.sararegistry.gc.ca/virtual_sara/files/plans/rs_caribou_boreal_caribou_0912_e1.pdf

Likelihood of self-sustaining status: the probability that a boreal caribou population will experience stable or positive population growth over a 20-year period.²⁵

Long-term disturbances: habitat disturbances from human activity where the amount of time that the disturbed area is in use for a development project plus the predicted time for the feature to be functionally restored once no longer needed would be > 40 years. This includes permanent disturbance features which are expected to be used in perpetuity (e.g. public highways, communities).

Long-term Total Disturbance Limit: limit for the total amount of disturbance (human + fire), beyond which the likelihood of maintaining a self-sustaining population within a given range planning region would become unacceptably low.

Management Class: an area delineated in a regional range plan where specific management actions for managing disturbance to boreal caribou and their habitat will be required. Three categories of management classes may be identified in each range plan – Basic, Enhanced and Intensive - representing increasingly intensive management requirements.

NT1: the range of boreal caribou in the Northwest Territories and Yukon.

Offsets: the process of creating environmental benefits to compensate for the residual negative environmental impacts of development projects or programs (after all reasonable measures have been taken to avoid and minimize the losses).²⁶

Range: the geographic area occupied by a group of individuals that are subject to similar factors affecting their demography and used to satisfy their life history processes (e.g. calving, rutting, wintering) over a defined time frame.²⁵

Range plan: a plan describing how habitat disturbance from human development activity and wildfires will be managed to maintain adequate habitat to ensure a healthy and sustainable boreal caribou population that offers harvesting opportunities for present and future generations.

Self-sustaining population: a population of boreal caribou that on average demonstrates stable or positive population growth over the short-term (≤ 20 years), and is large enough to withstand stochastic events and persist over the long-term (≥ 50 years), without the need for ongoing active management intervention.¹

Sensory disturbance: disturbance to caribou caused by noise, light, vibration, or smell.

Short-term disturbances: habitat disturbances from human activity where the amount of time that the disturbed area is in use for a development project plus the predicted time for the feature to be functionally restored once no longer needed would be ≤ 40 years.

Total Disturbance: habitat showing: i) anthropogenic disturbance visible on Landsat at a scale of 1:50,000, including habitat within a 500 m buffer of the anthropogenic disturbance; and/or ii) fire disturbance in the last 40 years (without buffer).²⁵

²⁶ Poulton, D. 2018. <https://ablawg.ca/2018/04/26/alberta-energy-regulator-breaks-new-ground-on-offsetting-of-caribou-habitat>

Undisturbed habitat: habitat not showing any: i) anthropogenic disturbance visible on Landsat at a scale of 1:50,000, including habitat within a 500 m buffer of the anthropogenic disturbance; and/or ii) fire disturbance in the last 40 years (without buffer). Disturbance within the 500 m buffer would result in a reduction of the undisturbed habitat.²⁵

Appendices

Appendix A: Population Status and Trends of Boreal Woodland Caribou in the NWT

The following information is a summary of more detailed information provided in the 2012 status assessment of boreal caribou in the Northwest Territories (NWT) (Species at Risk Committee 2012), the 2017 *NWT Recovery Strategy* for boreal caribou (Conference of Management Authorities 2017), and new monitoring data that has become available since the status report and *NWT Recovery Strategy* were released.

In 2012, boreal caribou were assessed by the NWT Species at Risk Committee as Threatened²⁷ in the NWT (Species at Risk Committee 2012). Boreal caribou were subsequently listed as a Threatened species under the territorial *Species at Risk (NWT) Act* in 2014. This means boreal caribou are likely to become Endangered²⁸ in the NWT if nothing is done to reverse the factors leading to its extirpation or extinction.

Boreal caribou in the NWT inhabit an extensive area of boreal forest east of the Mackenzie Mountains as far north as Tuktoyaktuk. The range is continuous with northern Alberta (AB) and northern British Columbia (BC) to the south, although boreal caribou there are considered to be different populations for management purposes. The NWT's population (called NT1) also extends slightly into northeastern Yukon (YT). Boreal caribou are naturally found at low densities, either individually or in small groups. They do not form cohesive herds in the NWT; rather they are one continuous population of loosely distributed individuals. Major rivers and habitat fragmentation may affect movement.

A.1 Population Size

There are an estimated 6,000 to 7,000 boreal caribou in the NWT. This is a crude estimate based on the probable density of caribou in different regions (derived from community and scientific knowledge), multiplied by the size of the range in each region (Figure A1). The estimate is rough and it is recognized that better population estimates are needed. Boreal caribou are currently considered to be one continuous population across the NT1 range, however there are ongoing studies assessing whether evidence exists of sub-population structure based on genetic analyses, traditional knowledge (TK), and movements of collared individuals (Polfus et al. 2016, Manseau et al. 2017, Wilson et al. 2017).

²⁷ **Threatened in NWT:** A species that is likely to become an endangered species in the NWT if nothing is done to reverse the factors leading to its extirpation or extinction.

²⁸ **Endangered in NWT:** A species that is facing imminent extirpation from the NWT or extinction.

A.2 Population Trend

The NWT boreal caribou population was classified as '*likely self-sustaining*' by Environment Canada (EC) in 2012 based on habitat conditions at that time and the current understanding of a single NWT population with a continuous range (Environment Canada 2012). '*Likely self-sustaining*'²⁹ was determined based on EC's disturbance management threshold of 65% undisturbed habitat which provides a 60% probability for a population to be self-sustaining.

Determining an overall population trend for the NT1 range is difficult as trends vary among regions. Traditional and community knowledge compiled in 2012³⁰ suggests that boreal caribou population trends are stable or increasing in the Inuvialuit Settlement Region (ISR) and Sahtú Settlement Area (SSA), increasing in some parts of the Gwich'in Settlement Area (GSA), and declining in other parts of the GSA. In different areas of the Dehcho region, TK suggests that boreal caribou population trends are increasing, stable or declining depending on the area. There is concern that caribou may be declining in Wek'èezhì and the North Slave region overall. In some areas, boreal caribou group sizes have been smaller in recent years than in the past.

Boreal caribou are difficult to census based on their low population density and low detectability in areas with dense canopy cover, which limits the feasibility of measuring population trend based on repeated estimates of population size or density over time. Population trend is instead monitored based on a sample of collared adult females in different study areas. Population monitoring programs have been carried out in nine study areas to date in the NWT, and programs are ongoing in six study areas (Table A1; Figure A2). The Department of Environment and Natural Resources (ENR) attempts to maintain a sample size of roughly 30 individuals per study area, although numbers vary from year to year (note that for the Dehcho region, the ~30 collars are distributed across the Dehcho South and North study areas). Estimates of population growth are based on annual survival rates of collared adult females and spring composition surveys which are used to determine calf recruitment rates (calf:cow ratios). For each year, the finite rate of population increase is estimated from annual recruitment of females (assuming a 50:50 sex ratio in calf production and equal survival of sexes to time of census) and annual adult female survival using the formula outlined by Hatter and Bergerud (1991). The finite rate of population increase (λ ; Lambda) is determined using a stochastic version of Hatter and Bergerud's (1991) equation [$\lambda = \text{adult female survival} / (1 - \text{female calf recruitment})$] following Latham et al. (2011). Lambda values >1 indicate an increasing population, $\lambda=1$ indicates a stable population and λ values of <1 indicate a decreasing population. It should be noted that in most study areas adult female survival and calf recruitment can vary substantially from year to year, and the combination of these two measures can result in some years with λ values <1 and other years with $\lambda > 1$. Lambda values averaged over time provide an indication of whether caribou population trend in each study area is increasing, stable or decreasing.

²⁹ A self-sustaining population is one that on average demonstrates stable or positive population growth over the short-term (≤ 20 years), and is large enough to withstand stochastic events and persist over the long-term (≥ 50 years), without the need for ongoing active management intervention (Environment Canada 2012).

³⁰ Species at Risk Committee. 2012. Species Status Report for Boreal Caribou (*Rangifer tarandus caribou*) in the Northwest Territories. Species at Risk Committee, Yellowknife, NT.

To interpret how local growth rates may affect the NWT population as a whole, it is important to understand how estimated density and abundance of boreal caribou vary in different parts of the NWT current range (Figure A1). In general, there is evidence of slight population declines in the southern part of the territory, where it is believed that the majority of NWT's boreal caribou occur. It is estimated that roughly 53% of NWT boreal caribou are found in areas where caribou numbers have been stable or declining (Dehcho and South Slave ENR administrative regions) and roughly 8% of NWT boreal caribou are found in areas where caribou numbers were observed to be increasing (Gwich'in region). The remaining 39% are found in areas where the trend is currently unknown (Inuvialuit, Sahtú and North Slave regions).

Table A1. Boreal caribou population monitoring study areas in the NWT and average estimates of population trend (λ) over the duration of those studies. Lambda values are based on adult female survival and calf recruitment rates determined from collared female caribou.

Study Area	Start Year	End Year	Long-term Average ^b (range) λ	Average ^b λ - most recent 3 years (2016-2018)
Dehcho South ^e	2005	Ongoing	0.97 (0.72-1.28)	0.86
Dehcho North ^e	2005	Ongoing	0.94 (0.72-1.60)	1.03
Hay River Lowlands ^{f, g}	2005	Ongoing	0.97 ^c (0.72-1.14)	1.01
Cameron Hills ^{h, i}	2006	2010	0.87 (0.74-1.00)	
Pine Point/Buffalo Lakes ^g	2015	Ongoing	1.09 ^j	1.09 ^j
Mackenzie ^g	2015	Ongoing	1.04 ^j	1.04 ^j
Sahtú ^a	2003	2011	Not Available	
North Slave ^g	2017	Ongoing	1.04 ^k	1.04 ^k
GSA North ^{h, i}	2003	2007	1.08 ^d	
GSA ^{h, i} South	2005	2007	1.20 ^d	

^a Collar-based population monitoring program was initiated in the Sahtú Settlement Area in 2003, but no estimates of λ were produced. A total of 27 individuals were collared.

^b Average lambda (λ) values are based on the geometric means.

^c Lambda values were not available between 2011-2013 for the Hay River Lowlands study area.

^d The range of λ values for the Gwich'in North and South study areas were not provided in Nagy (2011) or Species at Risk Committee (2012).

^e Larter, N.C. and D.G. Allaire. 2018. Dehcho Boreal Caribou Study Progress Report, April 2018. ENR, GNWT, Dehcho Region, Fort Simpson, NT. 44pp.

^f Kelly, A. and K. Cox. 2013. Boreal caribou progress report: Hay River Lowlands Study Area, 1 April 2012 – 31 March 2013. ENR, GNWT, South Slave Region, Fort Smith, NT. 16pp.

^g ENR, GNWT. unpublished data.

^h Kelly, A. and K. Cox. 2011. Boreal Caribou Progress Report: Hay River Lowlands and Cameron Hills Study Areas, 1 April 2008 - 31 March 2010. Department of Environment and Natural Resources, Government of the Northwest Territories, South Slave Region, Fort Smith, Northwest Territories, Canada. 29 pp..

ⁱ Nagy, J.A.S. 2011. Use of space by caribou in northern Canada. Ph.D. dissertation, University of Alberta, Edmonton, AB. 184pp.

^j Lambda (λ) only estimated for 2018, due to low sample sizes in initial years of the program

^k Lambda (λ) only estimated for 2018, only one year of data available, and survival rate based on 20 females

^l The Alberta Government has been monitoring the Bistcho range, which essentially includes the Cameron Hills study area, from 2010 onwards. The 10-year mean lambda for 2007-2017 was 0.92, and for the most recent 3 years (2015-2017) was 1.05. (Alberta Government. 2018. DRAFT Provincial Woodland Caribou Range Plan – Appendix A.2)

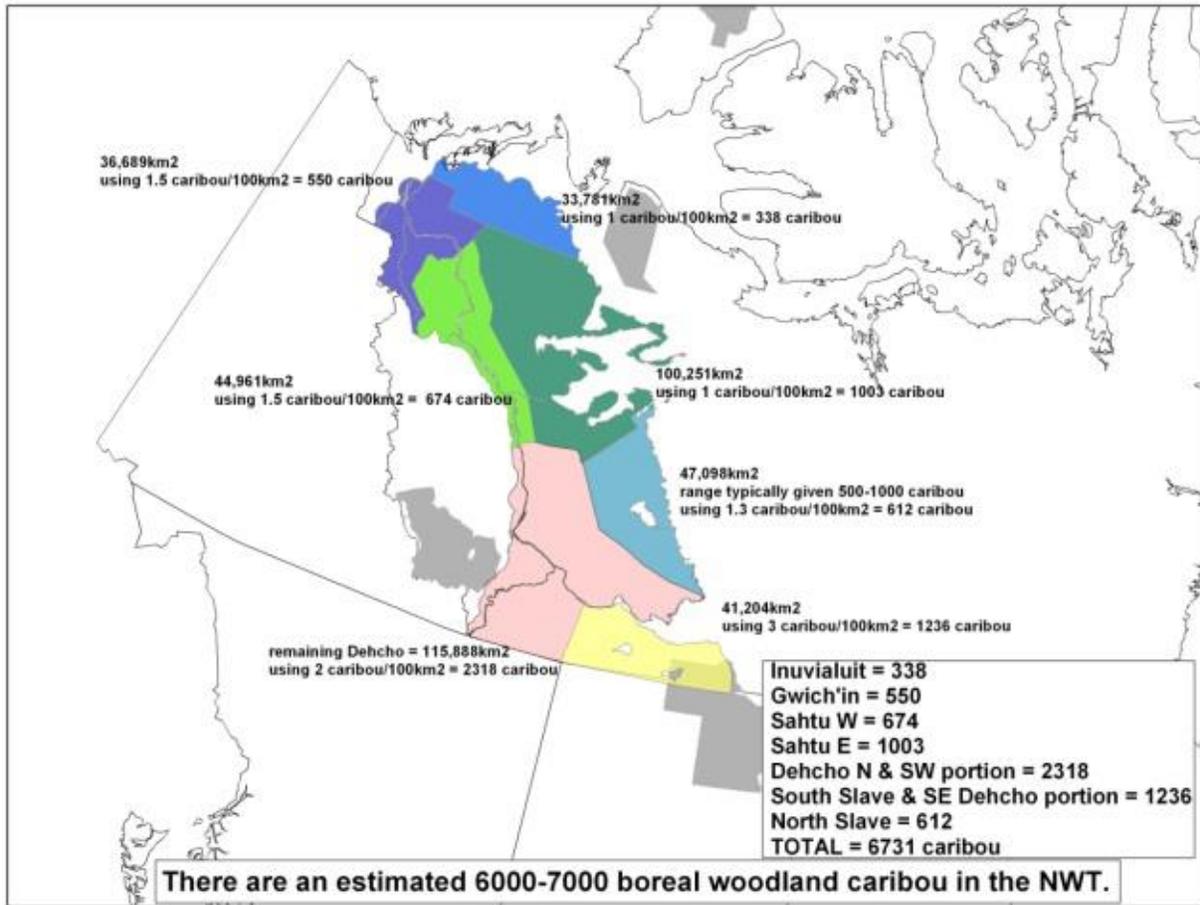


Figure A1. Population estimate of boreal caribou in the NWT based on regional density estimates; reproduced from ENR (2012)³¹

³¹ Environment and Natural Resources (ENR). 2012. Supplementary information to the Government of the Northwest Territories response on the proposed national boreal caribou recovery strategy. Memorandum, April 12, 2012. Environment and Natural Resources, Government of the Northwest Territories, Yellowknife, NT.

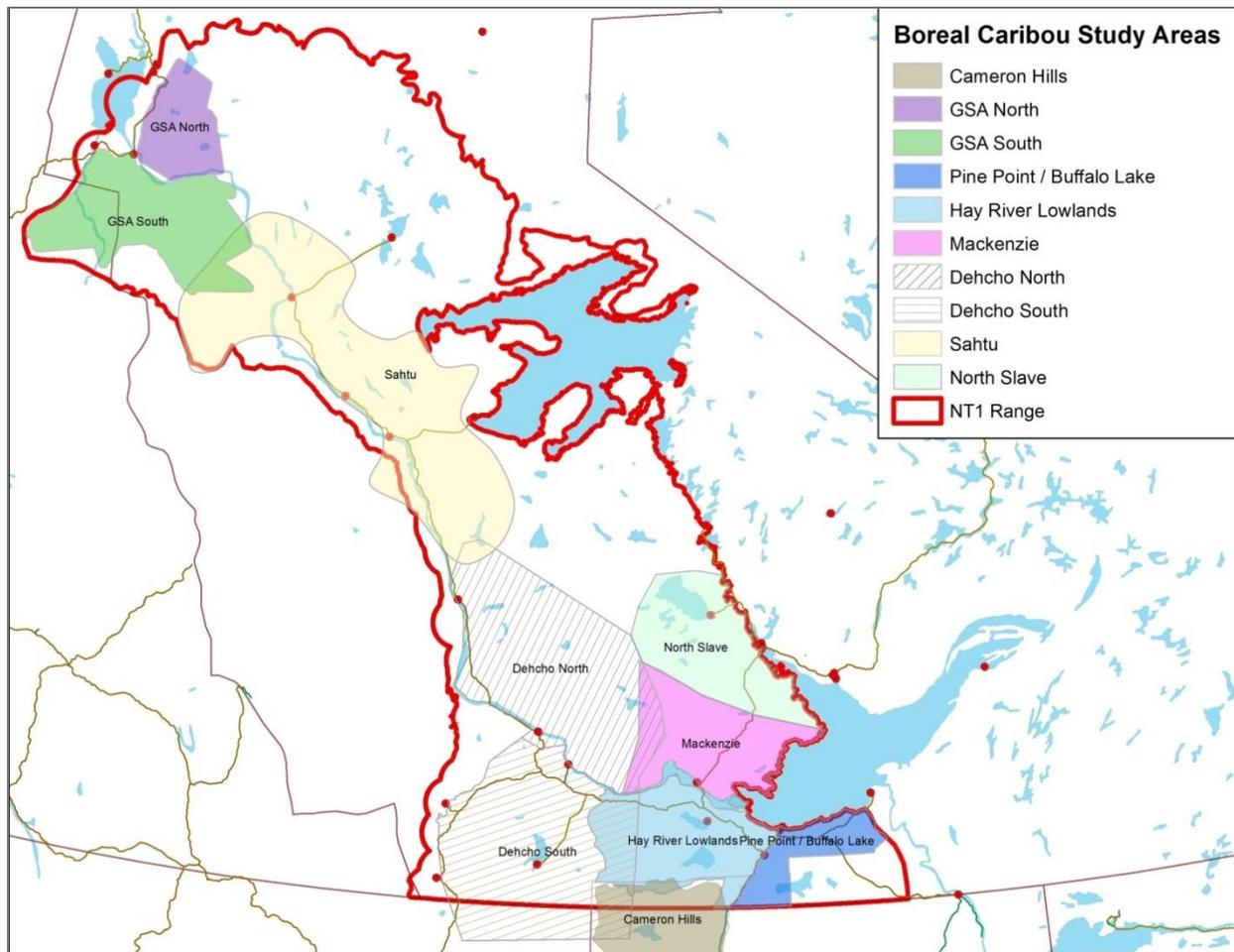


Figure A2. NWT study areas for boreal caribou population monitoring based on collared adult females. Study areas are delineated in part based on collared caribou movements, and some study areas overlap due to movements of collared boreal caribou between areas. Although a collaring program was carried out in the Sahtú from 2003-2011, no estimates of population trend were available from this program.

A.3 References

- Conference of Management Authorities. 2017. Recovery Strategy for the Boreal Caribou (*Rangifer tarandus caribou*) in the Northwest Territories. Species at Risk (NWT) Act Management Plan and Recovery Strategy Series. Environment and Natural Resources, Government of the Northwest Territories, Yellowknife, NT. 57 + x pp.
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- Manseau, M., P. Priadka, C.F.C. Klütsch and P.J. Wilson. 2017. Boreal caribou population genetic structure and diversity across the southern Northwest Territories. Report submitted to GNWT. 22pp.
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- Species at Risk Committee. 2012. Species Status Report for Boreal Caribou (*Rangifer tarandus caribou*) in the Northwest Territories. Species at Risk Committee, Yellowknife, NT.
- Wilson, S., G. Sutherland and T. Nudds. 2017. Sensitivity of estimates of range condition and integrated assessments of self-sustainability to variation in woodland caribou local population range delineation. Report prepared for Tolko Industries Ltd. 37pp.

Appendix B: Technical Details of Range Planning

This section provides additional technical detail for the approach to range planning described in the main body of the Framework document.

B.1 Wildfire Disturbance Calculations

Human disturbance thresholds in the Framework are set based on metrics characterizing the expected variation in annual wildfire footprints within each region. Figure B1 shows the range of footprints of wildfires 40 years old and younger by region, including the entire NT1 range. Each value is the size (percent of each regional area) of footprints in thirteen 40-year windows beginning in 1965 (1965-2005, 1966-2006, 1967-2007, and so on until 1977-2017). The 40-year fire footprints are based on wildfire disturbance records from the Canadian National Fire Database³² for the period from 1965 to 1985, and from the National Burn Area Composite³³ for the period from 1986-2017 which provides more precise wildfire polygons that exclude unburned areas within each wildfire perimeter. Fire polygons from wildfires up to for 40 years old are “dissolved together” (i.e. overlapping wildfires are not double counted) to produce the 40-year fire footprint for a given assessment period.

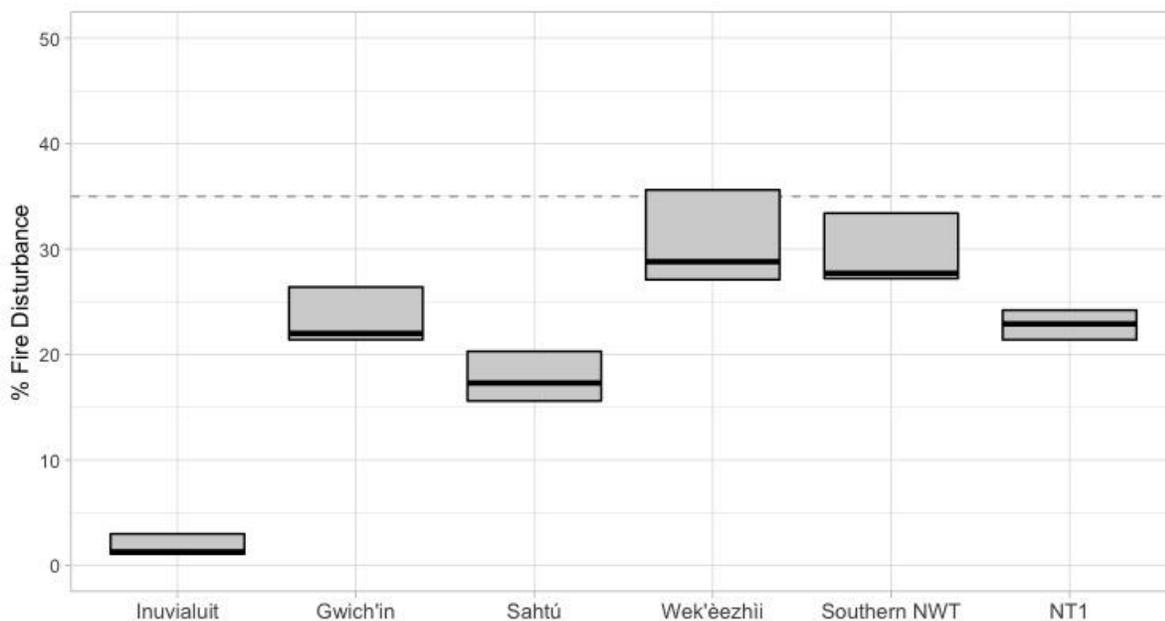


Figure B10. Regional natural variation in disturbance footprint of wildfires ≤ 40 years old based on wildfire history data from 1965-2017. Solid lines within boxes represent the median (the middle value). Upper and lower boundaries of the box represent maximum and minimum values, respectively. The dashed horizontal line represents the 35% disturbance threshold used to define critical habitat for boreal caribou under *SARA*.

³² <http://cwfis.cfs.nrcan.gc.ca/ha/nfdb>

³³ <http://cwfis.cfs.nrcan.gc.ca/datamart/datarequest/nbac>

B.2 Management Actions

This section describes a preliminary menu of caribou range management actions that are designed to avoid, minimize, restore or offset disturbance of boreal caribou habitat. Many of the management actions will be improved upon through reviews of existing standards and guidelines from other jurisdictions, better tailoring to northern conditions, and through explicit ties to impact pathways they are trying to mitigate.

Decisions about which actions are most relevant to any particular region will be made at the regional range planning stage. The list contained here represents a starting point for discussion, and it is expected that the proposed management actions will be further refined through the development of regional range plans. Some of the proposed actions are already required by land use regulations or land use plan (LUP) conformity requirements. Other proposed actions that are not currently required by existing legislation or LUP conformity requirements could be integrated by amending the existing *Northern Land Use Guidelines*, developing new sector-specific guidelines for operating in boreal caribou habitat, or through amendments to LUPs in the future.

It is recognized that managing both the human-caused and wildfire disturbance footprint will be important to achieving range plan objectives. Although management classes are defined by human disturbance thresholds, wildfire management options are considered an essential part of the tiered management approach and are discussed in [Section B.2.4](#).

Management classes are defined spatially, based on the condition of the range in each planning region relative to the human disturbance thresholds, and by using important areas maps to inform the selection of areas that fall within each class (as explained in Section 3.3). In the Framework, human disturbance thresholds define which management classes should apply to a region, as shown in Table B1 below.

Table B6. Illustration of how human disturbance thresholds and relative habitat importance are used to determine Basic (green), Enhanced (yellow) and Intensive (red) management classes that apply to a given region. Reproduced from Table 2 in this Framework.

Human disturbance thresholds	Relative importance of an area for Boreal Caribou		
	Low	Medium	High
Tier 3	Basic	Enhanced	Intensive
Tier 2	Basic	Enhanced	Enhanced
Tier 1	Basic	Basic	Enhanced

Management actions applied in the Enhanced and Intensive classes (yellow and orange boxes, respectively) are intended to help ensure no net loss, or a net gain, in the amount of undisturbed boreal caribou habitat within those areas due to anthropogenic activities for the duration of the range planning period (ten years). To achieve this, the management actions are designed to:

- require developers to demonstrate that any new habitat disturbance is avoided or minimized to the greatest extent possible through means such as re-use of existing disturbance features
- require that any unavoidable new long-term habitat disturbance proposed in Enhanced and Intensive class areas must be offset through actions such as off-site restoration or other means
- require more stringent standards for restoration of newly disturbed areas once projects are completed to help ensure that newly disturbed areas are put on a successional trajectory to return to pre-disturbance conditions as quickly as possible

It may take several decades to restore biophysical attributes of boreal caribou habitat on disturbed sites, and thus off-site restoration may not immediately compensate for new disturbance. However, by requiring that developers restore a larger area than they disturb through habitat offsets, over the long-term, the pace of habitat restoration should exceed that of new disturbance resulting in a net gain in undisturbed habitat.

The management actions are also designed so that restoration and offsetting requirements in the Intensive management class will be more stringent than in the Enhanced class. The actions proposed in these classes are intended to help regions that are currently within the Tier 3 human disturbance threshold to reduce their human disturbance footprint over time to within the Tier 2 threshold, and to help regions that are currently within the Tier 2 threshold to avoid increasing disturbance to within Tier 3. Regions that are currently below the Tier 1 threshold for human disturbance could add more human disturbance over time, but having a portion of those regions in Enhanced management classes helps to ensure that there are areas where boreal caribou conservation is the priority.

A combination of legislative and policy tools will be used to achieve these outcomes and ensure the specific management actions in each class are implemented; implementation tools are discussed in detail in Section B.3. For example, in Enhanced and Intensive management areas, integration of range plans into zoning and conformity requirements in Land Use Plans, or authority under the *Wildlife Act* and *Species at Risk (NWT) Act* to designate habitat and wildlife conservation areas and create regulations for these areas, could ensure that certain conditions on development are required that would achieve no net loss or an increase of undisturbed habitat. Other tools to make guidelines and best practices enforceable could include the requirement for developers to have approved Wildlife Management and Monitoring Plans (WMMP) under the *Wildlife Act*, and recommendations to include specific terms and conditions on permits and licences issued by Land and Water Boards (LWB) as part of input on screenings and environmental assessments (EA). Habitat designations under the *Species at Risk (NWT) Act* for Intensive management areas could also require that developers apply for permits for activities that would otherwise be considered to destroy designated habitat, and the issuance of such permits could be subject to similar conditions as are required under federal *SARA* to issue a permit to destroy critical habitat.

The management actions in Sections B.2.1 to B.2.4, and Tables B2 through B4 are grouped according to a standard mitigation hierarchy, which seeks to (a) avoid new disturbance, then (b) minimize necessary new disturbance as much as possible, and lastly (c) restore and/or offset any residual disturbance. Table B5 includes additional actions for managing wildfire disturbance.

For now, the tables are focused on the four primary development sectors that have the potential to affect the greatest area of the NT1 range – oil and gas (including geophysical exploration), forestry, linear infrastructure (roads, pipelines and utility corridors), and mineral exploration and mining. Other sectors that contribute less to the human disturbance footprint can be added to the table in the future.

Activities Exempt from Range Plans

Any land uses or activities that are permitted or licensed (i.e. existing land uses or land uses that are under construction), or for which permit or licence applications have been submitted at the time the range plans are formally approved will be exempt from the management actions identified in the Range Plans. However, activities that require new permits or approvals (e.g. new activities on the land), or activities that require permit renewals, where such activities will be substantially modified from those allowed under existing permits, will be required to comply with the range plans once they are approved.

Other types of exemptions will be contemplated during the development of the regional range plans, based on exemptions already specified in approved or draft (e.g. IDLUP) land use plans.

Other Types of Disturbance

Although the management actions outlined in the tables below focus on avoiding, minimizing, restoring and offsetting habitat disturbance, further sector-specific guidance will also be developed to address sensory disturbance to boreal caribou (e.g. noise, light, smell and vibration.). This could include measures such as seasonal restrictions on certain activities to minimize sensory disturbance during sensitive periods for boreal caribou (e.g. late winter, calving and post-calving), or avoiding key habitats during sensitive periods to prevent displacement of caribou from those areas. The GNWT has initiated a review of standards, best practices and guidelines for boreal caribou from across Canada with a view to updating current NWT guidelines and/or creating new boreal-caribou specific guidelines. These updated or new guidelines can be used to help identify relevant management actions for sensory disturbance that should be encouraged in the Basic management class and required in Enhanced and Intensive management class areas.

B.2.1 Avoiding new disturbance through land tenure, rights and resource allocation decisions

These management actions are related to decisions about whether to:

- Open areas to Calls for Nomination (also referred to as Expressions of Interest) and Calls for Bids for oil and gas exploration,³⁴ which could then lead to issuance of exploration licences and subsequent applications for permits to carry out exploration work (land use permits and water licences). However, if the Minister of Industry, Tourism and Investment receives a request to make a Call for Bids in relation to a particular area, section 13(2) of the *Petroleum Resources Act* requires the Minister to consider it in selecting lands to be specified in a Call for Bids.
- Enter into forest management agreements (FMAs) for commercial timber harvesting, and if so, how to define FMA boundaries and annual sustainable timber harvest volumes in consideration of disturbance thresholds and high importance caribou habitat.

Note that issuance of surface tenures on GNWT-administered lands for industrial and commercial development (e.g. licences of occupation for roads, easements for utility corridors, commercial leases) are not included in this category, as these types of tenure are usually not issued until other permits such as land use permits and/or water licences have been obtained. They are therefore not considered as an appropriate instrument to avoid disturbance.

Issuance of prospecting permits and mineral claims are also not included in this category because, under the NWT's current system for issuing sub-surface rights to minerals, gems and coal, the only lands that are not open for prospecting or staking are those set out in Section 5 of the Northwest Territories Mining Regulations.³⁵ It is also prohibited to prospect or stake a claim in areas where the surface rights to lands have been granted or leased by the Crown (including privately owned settlement lands), unless the surface rights holder has consented to it or a tribunal has authorized entry.

³⁴ For more information on oil and gas rights management go to <https://www.iti.gov.nt.ca/en/services/oil-and-gas-rights-management>

³⁵ For more information on administration of mineral rights see the following resources:

https://www.iti.gov.nt.ca/sites/iti/files/guide_to_the_new_mining_regulations.revised.may_9.2018.pdf

[https://www.iti.gov.nt.ca/sites/iti/files/2469 - iti - mining rights_180627_eng - final.pdf](https://www.iti.gov.nt.ca/sites/iti/files/2469_-_iti_-_mining_rights_180627_eng_-_final.pdf)

Mining Regulations: <https://laws-lois.justice.gc.ca/PDF/SOR-2014-68.pdf>

Territorial Lands Act: <https://laws-lois.justice.gc.ca/PDF/T-7.pdf>

Table B7. Management actions to avoid new disturbance through land tenure, rights and resource allocation decisions

Sector	Basic	Enhanced	Intensive
Oil and Gas Issuance of exploration rights (i.e. calls for nominations, calls for bids)	Areas can be opened up to calls for nominations and calls for bids.	Areas can be opened up to calls for nominations and calls for bids.	Advise not opening up new areas in this management class to calls for nominations or bids.
	Applicants are notified in calls for bids that conditions imposed on exploration activities within lease areas may be subject to change according to the condition of the range which may bump an area up to a higher management class. ³⁶	Applicants are notified in calls for bids that: (a) conditions imposed on exploration activities within lease areas will be more stringent, and (b) changes in the condition of the range may bump an area up to a higher management class in which even more restrictive conditions on development approval would apply. ³⁶	
	Exploration licences issued as per usual.	Exploration licences issued as per usual.	
Forestry (Issuance of long-term FMAs)	Issuance of long-term FMAs as per usual.	Issuance of long-term FMAs with condition that long-term forest management plans will be required to demonstrate ongoing supply of large undisturbed habitat patches within the management class area.	Only issue FMAs for salvage logging in recently disturbed habitat in this management class. Forest management plans for salvage logging must demonstrate avoidance of undisturbed habitat when accessing cut blocks.
Forestry (defining Allowable Sustainable Timber Harvest [ASTH] levels)	Encourage consideration of boreal caribou habitat in determination of ASTH.	Large patches of suitable caribou habitat within FMA planning areas should be removed from calculations of ASTH; or, Caribou habitat supply targets and caribou habitat patch size constraints should be included in ASTH analysis.	Areas with evidence of intensive use by boreal caribou should be removed from consideration in calculating ASTH volumes for salvage logging.

³⁶ This reclassification would occur only as range plans are revised.

B.2.2 Avoiding and minimizing new disturbance from developments during project design, project review and issuance of permits or licences

The actions proposed in this section focus on project design and location to minimize new habitat disturbance. These actions could include:

- The use of existing disturbances
- Limits on the dimensions/configuration of new disturbance (e.g. limits on linear feature width, well pad dimensions, aggregation of cut blocks)
- Locating new disturbance to be within close proximity or parallel to existing disturbance (to ensure overlapping buffered disturbance footprints and minimize the contribution of a project to the existing buffered disturbance footprint)
- Sharing access (multiple proponents using same access)
- Complete avoidance of undisturbed habitat and of disturbed habitat that will transition into undisturbed habitat in the next 10 years, especially those areas that currently or will soon provide biophysical attributes of critical habitat
- Avoidance/minimization of fragmentation of large patches of undisturbed or currently disturbed habitat that will transition into undisturbed habitat in the next ten years

Table B8. Management actions to avoid and minimize new disturbance from developments during project design, project review and issuance of permits or licences

Sector	Basic	Enhanced	Intensive
<p>Oil and Gas</p> <p>Issuance of land use permits and water licences to carry out exploration for or production of oil and gas (excluding geophysical/seismic surveys).</p> <p>Applies to well pads, camps, and other facilities required for oil and gas exploration or production except access roads and pipelines (addressed under linear developments).</p>	<p>Encourage developers to use areas of existing disturbed habitat to the greatest extent feasible to minimize new disturbance.</p> <p>Encourage avoidance of new disturbance in habitat types that provide biophysical attributes of critical habitat; locate new disturbance in habitat types that do not provide biophysical attributes, where feasible.</p>	<p>Require developers to demonstrate that they have minimized the amount of new habitat disturbance to the greatest extent possible by using areas of existing disturbance, and by minimizing the area of any unavoidable new disturbance.</p> <p>Where new disturbance is unavoidable, demonstrate that new disturbance will be located in habitat types that do not provide biophysical attributes of critical habitat to the greatest extent feasible.</p> <p>Camps and processing facilities: use areas of existing disturbance, located as close to associated linear developments as possible.</p>	<p>Require developers to demonstrate that they have minimized the amount of new habitat disturbance to the greatest extent possible by using areas of existing disturbance that will not transition into undisturbed habitat within the next 10 years.</p> <p>If complete avoidance of undisturbed habitat and/or disturbed habitat 30-40 years old is not feasible, require developers to demonstrate that all reasonable alternative means of undertaking the activity have been considered, and the alternative adopted will result in the smallest footprint in undisturbed and/or disturbed habitat 30-40 years old possible.</p> <p>Where new disturbance is unavoidable, demonstrate that new disturbance will be located in habitat types that do not provide biophysical attributes of critical habitat to the greatest extent feasible</p>

<p>Forestry</p> <p>Issuance of Timber Cutting Permits and Timber Cutting Licences³⁷</p>	<p>Issue Timber Cutting Permits and Licences as per usual.</p>	<p>Issue Timber Cutting Permits and Licences as per usual.</p>	<p>Do not issue new Timber Cutting Permits and Licences that would result in new disturbance footprint in undisturbed habitat</p>
<p><i>(Does not apply to Free Timber Cutting³⁷ Permits or long-term FMAs.)</i></p>	<p>Notify applicants that management class designation applied to an area may change in during future revisions of the regional range plan.</p>	<p>Require applicants for Timber Cutting Permits and Licences to demonstrate use of harvest patterns that emulate natural disturbance, spatial aggregation of cut blocks to reduce dispersion of forest harvesting areas and associated amount of road access, and creation of future large patches of undisturbed habitat.</p>	<p>Do not issue new Timber Cutting Permits and Licences that would result in new disturbance footprint in disturbed habitat that will be transitioning to undisturbed habitat in next 10 years.</p>
<p><i>Unless permit/licence applications are for salvage logging, it's assumed that they will affect undisturbed habitat.</i></p>		<p>Require use of existing linear features to access timber to greatest extent possible and avoid routing new access through undisturbed habitat patches that will not be harvested where possible. Require that access avoid large contiguous patches of undisturbed habitat that do not contain merchantable timber.</p>	<p>Timber Cutting Permits and Licences for salvage logging can be issued subject to avoidance of undisturbed habitat and disturbed habitat 30-40 years old.</p>

³⁷ A Timber Cutting Permit is a harvest allocation for a period not exceeding one year and for not more than 5,000 m³ of timber. A timber cutting permit may require the permit holder to submit an operating plan. A Timber Cutting Licence is a multi-year timber harvest allocation or a single year allocation that exceeds 5000 m³ and requires submission of a Long-term Development Plan and Annual Operating Plans (GNWT-ENR. 2005. Commercial Timber Harvest Planning and Operations Standard Operating Procedures Manual). Free Timber Cutting Permits are issued for a period not exceeding one year and for not more than 60 m³ of timber (Forest Management Regulations s.22).

<p>Linear Developments</p> <p>Issuance of land use permits and water licences for linear developments (roads, utility corridors, pipelines; excluding ground-based geophysical surveys [seismic]).</p> <p><i>Note that both linear and polygonal developments may be grouped under the same land use permit or water licence.</i></p>	<p>Encourage developers to minimize creation of new linear features and access by using existing linear features or sharing access.³⁸</p>	<p>Require developers to demonstrate that existing linear features and access will be used/shared to the greatest extent feasible.³⁸</p>	<p>Require developers to use existing linear features and access.³⁸</p>
	<p>Where new access is required, encourage the use of construction practices, seasonality of use, routing and road design that will minimize impacts to boreal caribou and their habitat.</p>	<p>Where new access is required, developers shall demonstrate that construction practices, seasonality of use, routing and road design will minimize impacts to boreal caribou and their habitat to the extent feasible for the project.</p>	<p>Where new access is required, developers shall demonstrate that construction practices, seasonality of use, routing and road design will minimize impacts to boreal caribou and their habitat to the extent feasible for the project.</p>
		<p>Where new disturbance is unavoidable, demonstrate that routing will favour habitat types that do not provide biophysical attributes of critical habitat to the greatest extent feasible.</p>	<p>Where new disturbance is unavoidable, demonstrate that routing will favour habitat types that do not provide biophysical attributes of critical habitat to the greatest extent feasible.</p>
		<p>Use narrowest class of access road required.</p>	<p>New access permitted adjacent to existing linear features only where the density/height/canopy closure of regeneration on the linear feature exceeds that of the surrounding habitat.</p>
		<p>Minimize sightlines by using doglegs or meandering route as much as safety permits.</p>	

³⁸ Note: S.10 of the Mackenzie Valley Land Use Regulations and S.13.1 of the NWT Land Use Regulations already prohibit, unless explicitly authorized by a permit, the clearing of a new line, clearing or right-of-way, where an existing line, trail or right-of-way can be used.

<p>Oil and gas</p> <p>Ground-based geophysical surveys (seismic), but could also apply to cut lines used in mineral prospecting).</p>	<p>Encourage use of low-impact seismic techniques.</p> <p>Encourage re-use of existing linear disturbances that are not in an advanced state of regeneration.</p>	<p>Require use of low-impact seismic techniques.</p> <p>Require developers to demonstrate re-use of existing linear disturbances that are not in an advanced state of regeneration to the greatest extent feasible.</p> <p>Where new disturbance is unavoidable, demonstrate that new disturbance will be located in habitat types that do not provide biophysical attributes of critical habitat to the greatest extent feasible.</p>	<p>Only seismic exploration using hand cut lines <3 m wide, meandering lines, and avoidance cutting techniques will be permitted. If helicopter assisted portable seismic techniques are proposed, they will only be permitted to take place outside of late-winter, calving and post-calving periods.</p> <p>Require developers to demonstrate re-use of existing linear disturbances that are not in an advanced state of regeneration to the greatest extent feasible.</p> <p>Where new disturbance is unavoidable, demonstrate that new disturbance will be located in habitat types that do not provide biophysical attributes of critical habitat to the greatest extent feasible.</p>
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<p>Mineral Exploration and Mining</p> <p>(excluding associated access roads)</p> <p>Issuance of land use permits and water licences to carry out exploration for or production of mineral resources.</p> <p>Includes activities such as line cutting, ground-based geophysical surveys, drilling, stripping, pitting, trenching, blasting, mining infrastructure including mills, surface building, camps, power lines, open pit mines, tailings impoundments that may require clearing land.</p>	<p>Encourage use of existing linear features to conduct geological mapping and sampling, claim staking and delineation, access drilling locations.</p> <p>Encourage avoidance of new disturbance in habitat types that provide biophysical attributes of critical habitat; locate new disturbance in habitat types that do not provide biophysical attributes, where feasible.</p>	<p>Require developers to demonstrate that they have minimized the amount of new habitat disturbance to the greatest extent possible by using areas of existing disturbance.</p> <p>Require developers to demonstrate that the length and width of new lines cleared to delineate or stake claims is minimized (e.g. by using lines <1.5 m wide), and to use hand cutting techniques that leave large trees standing. Leave vegetation breaks to limit predator travel and search efficiency.</p>	<p>Require developers to demonstrate that they have minimized the amount of new habitat disturbance to the greatest extent possible by using areas of existing disturbance that will not transition into undisturbed habitat within the next ten years.</p> <p>If complete avoidance of undisturbed habitat and/or disturbed habitat 30-40 years old is not feasible, require developers to demonstrate that all reasonable alternative means of undertaking the activity have been considered, and the alternative adopted will result in the smallest footprint in undisturbed and/or disturbed habitat 30-40 years old possible.</p>
	<p>Minimize the length and width of new lines cleared to delineate or stake claims</p>	<p>Require developers to demonstrate that mining infrastructure will be located within existing clearings to the greatest extent feasible, and as close to associated linear developments as possible.</p> <p>Where new disturbance is unavoidable, demonstrate that new disturbance will be located in habitat types that do not provide biophysical attributes of critical habitat to the greatest extent feasible.</p>	<p>Where new disturbance is unavoidable, demonstrate that new disturbance will be located in habitat types that do not provide biophysical attributes of critical habitat to the greatest extent feasible.</p>

Encourage the use of existing clearings and disturbed areas for camps, drilling locations, bulk sampling, mining facilities, waste rock piles, tailings facilities, etc.

Encourage avoidance of new disturbance in habitat types that provide biophysical attributes of critical habitat; locate new disturbance in habitat types that do not provide biophysical attributes, where feasible.

B.2.3 Balancing/offsetting new disturbance through habitat restoration

Reclamation requirements for development projects are often determined on a case-by-case basis, and there are currently no clear guidelines, standards or objectives in place in the NWT that outline expectations related to restoration of boreal caribou habitat. Closure objectives may involve reclamation, re-vegetation, rehabilitation or restoration but these are not equivalent concepts. For example, the guidelines for closure and reclamation of advanced mineral exploration and mine sites in the NWT³⁹ define reclamation as “the process of returning a disturbed site to its natural state or which prepares it for other productive uses that prevents or minimizes any adverse effects on the environment or threats to human health and safety.” Re-vegetation is usually limited to the establishment of plant cover at a disturbed site, but does not guarantee that the site will be set on a successional trajectory to pre-disturbance composition and structure. At the other end of the spectrum, restoration tends to focus on returning an area to pre-disturbance conditions.

The current requirements for restoration of lands following the completion of most development projects are to prepare disturbed sites in a manner that will facilitate natural re-vegetation, and to initiate active re-vegetation in areas where there is a threat of significant erosion, there is little to no organic matter left, the site is so large that the centre is too far from seed sources and colonizing plants to be revegetated, it is not acceptable to wait ten to 20 years for natural vegetation to develop, or there is a threat of invasive plants outcompeting native colonizers.⁴⁰ There are typically no requirements or standards in place to ensure that disturbed areas are set on a successional trajectory to recover to pre-disturbance vegetation composition or structure, or to restrict or impede the use of linear features by humans and predators once they are no longer needed to carry out a development project.

Although the *National Recovery Strategy* for boreal caribou provides criteria for when fire-disturbed habitat transitions back to undisturbed habitat (i.e., when wildfires turn 41 years old), no such criteria were provided for human disturbance. Ray (2014)⁴¹ provides a comprehensive review of habitat restoration concepts as they relate to boreal caribou habitat restoration, but stops short of providing measurable criteria to determine when disturbed areas can be considered restored. As such, criteria will need to be developed that are relevant to the NT1 range to determine when human-disturbed areas can be considered restored from a boreal caribou perspective. Restoration of boreal caribou habitat is often described in terms of “functional restoration” and “ecological restoration.”

³⁹ Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories
https://glwb.com/sites/default/files/documents/wg/WLWB_5363_Guidelines_Closure_Reclamation_WR.pdf

⁴⁰ MVLWB Standard Land Use Permit Template
https://mvlwb.com/sites/default/files/mvlwb/documents/MVLWB%20-%20Standard%20Land%20Use%20Permit%20Conditions%20Template%20-%20Public%20Version%20-%20Feb24_17.pdf

⁴¹ Ray, J. 2014. Defining habitat restoration for boreal caribou in the context of national recovery: A discussion paper. Report prepared for Environment Canada. 54pp.

https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/Boreal%20caribou%20habitat%20restoration%20discussion%20paper_dec2014.pdf

“Functional restoration” is generally focused on reducing the ability of predators and humans to use linear features as travel corridors that increase the odds of encounters with caribou and caribou mortality in the short-term, or to prevent repeated disturbances caused by vehicular traffic which may impede longer-term regeneration of vegetation. Functional restoration can be achieved by attaining a sufficient height and density of re-vegetation on linear features to impede movement of predators and people or by using line blocking treatments such as piling slash and debris, bending trees over the line or erecting barriers and fences. Functional restoration is therefore intended to address functional habitat loss for boreal caribou due to avoidance of these features, but does not necessarily address the numerical response of predators to increased alternate prey levels associated with disturbed habitat.

“Ecological restoration” focuses on ensuring or accelerating the longer-term recovery of vegetation in disturbed areas that will provide biophysical attributes required by caribou (e.g. restoration of lichen ground cover or conifer-dominated forest cover), and the return of an area to pre-disturbance composition and structure. This may also involve advancing recovery of disturbed areas to a point where they no longer provide early-seral vegetation that may contribute to increased densities of alternate prey species such as moose and deer. In practice, active ecological restoration may involve site preparation, creating favourable microsites using woody debris, and planting or seeding with native species that are characteristic of pre-disturbance conditions. As Ray (2014) points out “Re-establishing caribou habitat, if successful, will take several decades to achieve in a given area, and will not immediately compensate for the loss of habitat caused by the ongoing and future projects. This means that embarking on restoration now will not lead to immediate improvements in range condition.”

Management actions proposed for the Enhanced and Intensive management classes focus on functional and ecological restoration of new short-term disturbances created by development projects once those areas are no longer in use by a developer, and offsetting new long-term disturbance from development through offsite functional and ecological restoration of existing areas of disturbance. **Short-term disturbances** are defined as those where the combined operational lifetime and predicted time for the feature to be functionally restored once no longer needed would be <40 years. **Long-term disturbances** are defined as those where the operational lifetime of the footprint plus the predicted time for the disturbance to be functionally restored would be >40 years. These proposed definitions of short-term versus long-term disturbances are intended to recognize that even when development footprints are only in use for short periods, not all sites can be quickly or easily restored, or restored at all, which could result in a net increase in human disturbance footprint over time if they are not offset by habitat recovery elsewhere. It is also acknowledged that ecological restoration of both short-term and long-term disturbances may take longer than 40 years.

If, after demonstrating that all reasonable alternative means of undertaking development activities have been considered, the creation of new disturbance cannot be avoided, offsets could be required to compensate for new long-term disturbances in Enhanced and Intensive management class areas. In addition, on-site restoration activities could be required to accelerate recovery of disturbed areas once development activities have ceased. The intent of these management actions is to offset new long-term disturbance through functional and ecological restoration of existing/legacy disturbances elsewhere and to promote more rapid functional and ecological restoration of new short-term disturbance from development. These measures would help to ensure the pace of habitat recovery of existing disturbances equals or exceeds the pace of new human-caused disturbance.

Offsetting ratios for new long-term disturbance should be higher in Intensive management class areas than in Enhanced management class. This is intended to reflect the higher priority placed on boreal caribou habitat protection in Intensive class areas. Offsetting ratios are intended to address uncertainty about the positive benefits of habitat restoration for caribou, given that (a) the impacts of new habitat disturbance today are not immediately offset by restoration, and (b) restored habitat may not be of equivalent value to caribou as naturally intact habitat. For example, it could take at least 40 years for an area to be considered as “restored” caribou habitat, but it may still not be of the same value to caribou as an equivalent area of 80+ year old habitat that is disturbed today. Additionally, there is uncertainty that restored areas will meet ecological criteria within predicted timelines. These factors all contribute to the calculation of appropriate offset ratios. Appropriate offsetting ratios will need to be determined through further research.

Given limited experience with implementing functional and ecological restoration of boreal caribou habitat in the NWT, and the lack of current policy and guidance for requiring, implementing, and monitoring habitat disturbance offsets, these measures would be phased in gradually over time. Initially, developers could be required to contribute directly or indirectly to research and development of functional and ecological restoration practices for boreal caribou habitat. This could include initiatives such as identifying and prioritizing areas that require restoration, or on-the-ground restoration trials, that will help to inform the development of policy, guidelines and standards for restoration practices and the use of offsets.

Table B9. Management actions to balance/offset new disturbance through habitat restoration

Sector	Basic	Enhanced	Intensive
Functional Restoration	Current closure and reclamation requirements apply.	<i>For long-term linear disturbance footprints:</i>	<i>For long-term linear disturbance footprints:</i>
Oil and gas (except low impact seismic)		Unavoidable disturbance in undisturbed habitat will be offset using functional restoration methods to impede predator travel and human access. Offsets must be applied within Intensive or Enhanced management class areas.	Unavoidable disturbance in undisturbed habitat will be offset at a higher ratio than in the Enhanced category. Functional restoration methods will be applied to linear restoration offsets to impede predator travel and human access. Offsets must be applied within Intensive or Enhanced management class areas.
Linear developments			
Forestry (<i>applies only to logging roads</i>)		<i>For short-term disturbance footprints:</i>	<i>For short-term disturbance footprints:</i>
Mineral exploration and mining		Short-term linear features that are part of the project footprint will be functionally restored as soon as they are no longer in use. Linear features that will be in use intermittently for multiple years, will be functionally restored once no longer needed for the project.	Short-term linear features that are part of the project footprint will be functionally restored as soon as they are no longer in use. Linear features that will be in use intermittently for multiple years, will be functionally restored once no longer needed for the project.

<p>Ecological Restoration</p> <p>Oil and gas (except low impact seismic)</p> <p>Linear developments</p> <p>Mineral exploration and mining</p>	<p>Current closure and reclamation requirements apply.</p>	<p>For short-term linear and polygonal disturbance: if disturbance of undisturbed habitat is unavoidable, use of restoration treatments that will ensure more rapid return to pre-disturbance vegetation composition and structure will be required.</p>	<p>For short-term linear and polygonal disturbance: if disturbance of undisturbed habitat, and disturbed areas that are 30-40 yrs. old, is unavoidable, use of restoration treatments that ensure more rapid return to pre-disturbance vegetation composition and structure will be required.</p>
		<p>For long-term linear and polygonal disturbance footprints:</p> <p>Unavoidable long-term disturbance in undisturbed habitat will be offset.</p> <p>Require use of restoration treatments in offset areas that ensure more rapid return to pre-disturbance vegetation composition and structure.</p>	<p>For long-term linear and polygonal disturbance footprints:</p> <p>Unavoidable long-term disturbance in suitable boreal caribou habitat (presently disturbed or undisturbed) will be offset at a higher ratio than in the Enhanced category.</p> <p>Require use of restoration treatments in offset areas that ensure more rapid return to pre-disturbance vegetation composition and structure.</p>
<p>Forestry</p> <p><i>(applies only to cut blocks harvested under Timber Cutting Permits or Timber Cutting Licences)</i></p>	<p>As per current standard operating procedures.</p>	<p>For harvest of conifer-dominated stand types, where natural regeneration is unlikely to return a site to conifer-dominated tree cover within 40 yrs, use of reforestation treatments that ensure a more rapid return to pre-disturbance conifer dominated stand type will be required. This measure does not apply to salvage harvesting of burned stands.</p>	<p>For harvest of conifer-dominated stand types, where natural regeneration is unlikely to return a site to conifer-dominated tree cover within 40 yrs, use of reforestation treatments that ensures a more rapid return to pre-disturbance conifer dominated stand type will be required. This measure does not apply to salvage harvesting of burned stands.</p>

B.2.4 Managing Natural disturbance

Wildfire is inevitable across most of the territory, and is an important part of the natural boreal forest ecosystem. Resources (i.e. people, equipment, airplanes, etc.) are limited, and directing resources to fighting wildfires in caribou habitat mean that other resources are needed to protect communities and property. Many of the wildfires that would be most impactful to caribou habitat are very large and remote. These fires are nearly impossible to control. On the other hand, wildfire management actions taken to protect human life and property can sometimes indirectly protect caribou habitat in the surrounding area.

The primary mechanism for the GNWT to consider caribou habitat in responding to wildfire is through the “values at risk” (VAR) hierarchy, outlined in the NWT *Forest Fire Management Policy*.⁴² Human life and infrastructure/property are the top priorities that guide the GNWT’s decisions about wildfire response, but natural resource values (such as caribou habitat) can factor in as an additional priority. For this management tool to be effective, key habitat areas identified as VAR should be limited in number and comprise specific areas of high priority. The ability of the GNWT to protect these key habitat areas from wildfire will be limited by remaining resources in that wildfire season, and by distance to fire bases. In addition, these patches will not be protected indefinitely because doing so can lead to longer term fuel loading, which in turn leads to increased burn probability and other ecological problems. Caribou habitat areas managed as VAR should be reviewed every 5 years (at the mid-term range plan review) or more regularly as needed.

Treatments to reduce fuel loads such as prescribed burns and fire breaks can be used in some cases (and under the right conditions) to attempt to protect areas of interest. Approaches such as prescribed burns and re-vegetation of burned habitat have been used only rarely.⁴³ The GNWT does not have a well-developed prescribed burning program and currently only conducts burns to protect communities. The GNWT does not currently replant after wildfires because the burned areas are often too large to replant effectively, and because natural regeneration is often as successful, or more successful, than planted seedlings. The large-scale application of these types of treatments is limited by the large expanse of the taiga forest in the NWT and the costs associated with taking action in remote areas. Nonetheless, there may be opportunities to take action in some years recognizing the benefits of that action may be negated by wildfires in the future.

Feasibility studies into fuels treatments to protect older patches of forest and re-vegetation of burned areas would allow the assessment of the effectiveness, costs (both financial and human), logistics and the potential application of these approaches more broadly.

The management actions described below focus on reducing fuel loads to limit the spread or intensity of wildfires should they occur within specific areas, and whether and how to respond to wildfires that do ignite within different management class areas.

⁴² Northwest Territories Forest Fire Management Policy 53.04.

www.enr.gov.nt.ca/sites/enr/files/documents/53_04_forest_fire_management_policy.pdf

⁴³ It should be noted that prescribed burns are frequently used as an active fire management response (back burning) to limit the spread of fires.

Table B10. Wildfire management actions

Sector	Basic	Enhanced	Intensive
Wildfire - Reduction of fuel loads or creation of fuel breaks.	None	Feasibility studies of prescribed burns or timber harvesting to reduce fuels or create fuel breaks.	Feasibility studies of prescribed burns or timber harvesting to reduce fuels or create fuel breaks.
Wildfire - Active response to wildfires.	Follow current fire management policy	Identify high-priority undisturbed patches and disturbed patches 30-40 years old as VAR.	Identify high-priority undisturbed patches and disturbed patches 30-40 years old as VAR.
Wildfire - Regeneration of burned areas.	None	None	Feasibility studies and trial of re-seeding and/or replanting burned areas in strategic locations.

B.3 Implementation tools

B.3.1 Introduction

Any instruments proposed for the implementation of range plans will need to work within the existing NWT land and resource co-management system. Within this system, there are multiple governing bodies and regulatory organizations with different mandates and responsibilities (see Table B6 for more detail).

Effective implementation of range plans will require policies, guidelines and regulations that can influence Land Use Plans (LUPs), Community Conservation Plans (CCPs), the issuance of rights, EA processes, regulatory processes (issuance of permits and licences) as well as utilizing authority for wildlife and habitat management provided under the *Wildlife Act* and *Species at Risk (NWT) Act*. In this section the term “tool” is used broadly to mean any law, regulation, policy, plan or program that could be used to ensure that the management actions identified in a regional range plan are actually implemented.

Range plan implementation will occur through multiple decision-making pathways. The GNWT, Indigenous governments and organizations, land and wildlife management organizations established under land claim agreements, and other implementing parties will have roles to play in implementing aspects of range plans either as decision making authorities and/or by influencing land use decisions where they provide input (Table B6). In addition, decision making processes relevant to administration of lands that are not managed by the GNWT will play a key role. Federal tools may be used to protect critical habitat on federally-administered lands, and private land owners may wish to pursue the use of federal tools (e.g., Conservation Agreements under Section 11 of the federal *Species at Risk Act*) in addition to or in lieu of tools available under territorial legislation. Tools established under Land Claim Agreements may be available to manage habitat disturbance on private settlement lands. Community Guardianship programs may be an important tool for monitoring range plan implementation.

Some instruments and pathways will have more influence on land and resource decision-making than others and some will be easier to implement and/or more efficient, but no one instrument alone will be sufficient for full implementation. It is important to note that a multifaceted approach will be required for range plan implementation to ensure clarity, consistency and efficiency for government and industry.

Table B11. Authorities and decision-making roles in the NWT

Administrative Body and Authority	Role in Decision Making Process	Phase
<p>MVRMA LUP Boards</p> <p>Responsible for developing and monitoring implementation of a LUP for respective settlement areas established through land claim agreements. LUP boards are established in the Sahtú and Gwich'in regions.</p> <p>Tłjcho LUP is done by the Tłjcho Government's Land Protection Division, which manages implementation on Tłjcho Lands.</p> <p>Dehcho Land Use Planning Committee was established under the <i>Dehcho First Nations Interim Measures Agreement</i>.</p>	<ul style="list-style-type: none"> • Develop and monitor implementation of regional LUPs in areas with settled land claim agreements. • Can carry out conformity checks, grant exceptions or amend the LUP. • Develop plans that include legally binding zoning measures. • LUPs contain conformity requirements that guide the EA and regulatory processes. • Screen applications referred by the LWB for conformity with LUP. 	LUP
<p>Inuvialuit Hunters and Trappers Committees, Community Corporations, Elders Committees, Wildlife Management Advisory Council (NWT), Fisheries Joint Management Committee, Inuvialuit Game Council, Joint Secretariat, Environmental Impact Screening Committee, Environmental Impact Review Board</p>	<ul style="list-style-type: none"> • Develop, monitor implementation, review and amend Inuvialuit Community Conservation Plans (CCPs). • Involved in making land use decisions and managing cumulative impacts which will help protect community values and conserve the resources on which priority lifestyles depend. • Land is designated into five management categories (A-E) to recognize priority land uses and activities, as well as areas of special ecological and cultural importance. • CCPs are intended to provide guidance to all those with an interest in the planning area, but they are not legally binding documents. 	Planning / Screening / EA
<p>EA/Impact Review Boards</p> <p>The Mackenzie Valley Environmental Impact Review Board conducts EA and environmental impact reviews of developments in the Mackenzie Valley. The Environmental Impact</p>	<ul style="list-style-type: none"> • Conduct EAs and recommends approval (with or without mitigation measures) or rejection to responsible Ministers. • Orders environmental impact review if a more comprehensive assessment is required. • The independent panel conducts the environmental impact review and similarly recommends approval (with 	EA

Administrative Body and Authority	Role in Decision Making Process	Phase
<p>Screening Committee/ Environmental Impact Review Board carries out these functions in the ISR.</p>	<p>or without mitigation measures) or rejection.</p>	
<p>LWB/Inuvialuit Water Board</p> <p>Under the MVRMA (Mackenzie Valley, Sahtú, Gwich'in, and Wek'èezhìi LWB), and the Waters Act (Inuvialuit Water Board) regulate the use of land and water, and the deposit of waste, through the issuing of Land Use Permits and Water Licences.</p>	<ul style="list-style-type: none"> • Preliminary screener regardless of whether an EA is required. Conducts public review on a proposed development (potential for significant adverse impacts may be a cause for public concern). • Ensure conformity with LUP (refer to LUP Boards when necessary). • Issue Land Use Permits and Water Licences with terms and conditions. 	<p>Screening/ Regulatory</p>
<p>Regulators <i>other than</i> LWBs</p> <p>e.g. GNWT, DFO</p>	<ul style="list-style-type: none"> • Preliminary screener regardless of whether an EA is required. GNWT authorizations that require preliminary screening are listed in the <i>Preliminary Screening Requirement Regulations</i> (these regulations have not been amended to reflect authorizations issued by the GNWT post-devolution). Conducts public review on a proposed development (potential for significant adverse impacts may be a cause for public concern). • If issuing any authorization for the use of land, water, or deposit of waste, the authority must ensure conformity with applicable LUP (refer to LUP Board if necessary). • Write lease, licence or permit terms and conditions for land and resource management activity (including timber harvesting, oil and gas, and mineral development). Licences and permits include terms and conditions and other measures provided by the regulator/informed by EAs and Environmental Impact Reviews. • The responsible Ministers make consensus decisions on recommendations, often with associated mitigation measures, from the Review Board. For projects not on federal land, the GNWT Minister of Lands signs the decision on behalf of all the responsible Ministers. • ENR approves Type A Water Licences, or Licences where a public hearing has been held. 	<p>Screening/ Regulatory</p>

Administrative Body and Authority	Role in Decision Making Process	Phase
<p>Renewable Resource Boards (RRBs)</p> <p>Regional authority responsible for managing wildlife habitat (forests, plants and protected areas) and commercial activities related to wildlife in the settlement region. In the Mackenzie Valley, RRBs have been established through land claim agreements in the Gwich'in, Sahtú and Tłı̄chǫ regions. The Wildlife Management Advisory Council (NWT) serves a similar function for the Inuvialuit region.</p>	<ul style="list-style-type: none"> • Review proposals for wildlife management or wildlife management plans, consult with proposal submitting party and other managing bodies, and make final recommendations or determinations on the proposal. Each party can accept, reject or vary recommendations. • Contribute advice and information on renewable resource values to land use planning processes. • Contribute advice and information on renewable resource values to preliminary screenings and EAs as part of regulatory processes. 	<p>Wildlife Management Plans</p>
<p>*No RRBs in the Dehcho or Akaitcho regions.</p>		
<p>Land Administration: GNWT and respective Indigenous governments and organizations (IGOs).</p>	<ul style="list-style-type: none"> • IGOs are responsible for administering and managing tenure issuances on settlement lands. This can include both surface and subsurface rights. The GNWT consults with IGOs on all other settled and unsettled lands. • On public land, the GNWT Department of Industry, Tourism and Investment issues sub-surface mineral rights through the <i>Northwest Territories Lands Act</i> and its <i>Mining Regulations</i>, as well as sub-surface oil and gas rights through the <i>Petroleum Resources Act</i> and the <i>Oil and Gas Operations Act</i>. • On public land, the GNWT Department of Lands is responsible for the disposal of land through sales agreements or leased rights for occupying land (either exclusively or shared access), including: quarry permits and leases, recreational/cabin leases, licenses of occupation, easements, reserves (for other federal or territorial government departments that require tenure), commercial leases, etc. See: <i>Northwest Territories Devolution Act</i>, <i>Northwest Territories Lands Act and Regulations</i>, and <i>Commissioner's Lands Act and Regulations</i>. 	<p>Issuance of Land Rights and Tenures</p>

Administrative Body and Authority	Role in Decision Making Process	Phase
	<ul style="list-style-type: none"> • On public land, ENR issues FMAs, timber harvesting licences and timber harvesting permits. • On parcels of land where land administration was not transferred to the GNWT via the <i>Northwest Territories Devolution Act</i>, Indigenous and Northern Affairs Canada is responsible for the disposal of lease agreements or leased rights for occupying land (either exclusively or shared access) via the <i>Territorial Lands Act</i> and <i>Regulations</i>. Mineral rights are issued via the <i>NWT/NU Mining Regulations</i>. 	

B.3.2 Overview of implementation instruments

This section describes different legislative tools that could be used to implement the range plans, and how range plans and supporting policy or strategy instruments can influence decision-making at key entry points in the integrated land and resource management system. It focuses primarily on land use plans, community conservation plans and legislative tools for which ENR has a lead role in implementation, given the department’s mandate for management of wildlife and wildlife habitat. However, it is acknowledged that there are other legislative tools administered by other GNWT departments or the federal government, as well as regionally-specific tools available under land claim agreements that other regional range planning parties could use to implement aspects of the range plans. The full spectrum of available implementation tools will be considered for each regional range plan, but tools that provide mandatory and enforceable implementation of management actions identified in the range plans should be prioritized. The list of tools below reflects what is currently available, but it is acknowledged that new tools may become available with proposed amendments to existing legislation, and new proposed legislation.

Land Use Plans

Land use plans (LUPs) define where certain activities can take place and determine the effect of human impacts on the landscape. They are also used to assign special areas of spiritual, ecological or cultural importance for protection, and areas designated for development.

Land use plans are used to establish regional zones and broad criteria to help evaluate and screen project proposals as part of regulatory permitting processes.

Zoning provisions identify the following:

- Areas that are well suited for industrial development
- Areas that can support industrial development while respecting specific cultural or ecological values
- Areas where, for cultural or ecological reasons, development is prohibited

Implementing parties could ensure the guidance offered by range plans forms a part of their input into LUP processes (both new LUPs and LUP renewals). Range plans could offer specific guidance and examples to LUP processes regarding: 1) how cumulative disturbance thresholds can be set, and 2) where important habitat areas are that should be considered for protected area or conservation zone status. This approach could be strengthened through specific policy direction (see below, “GNWT Range Plan Implementation Policy”) prescribing that the GNWT will not approve future LUPs unless they adequately consider and reflect the guidance provided by caribou range plans. Implementing parties could also consider working together to jointly propose amendments to a LUP that reflect range plans.

While the GNWT considers regional land use plans to be the primary instrument to define where certain activities can take place,⁴⁴ it is important to highlight that land use planning is not a quick process. LUP development typically takes years and there are differences in coverage between areas. Approved LUPs are currently only in place in the Sahtú and Gwich’in regions, and on Tłı̨cho government lands. The dynamic nature of boreal caribou habitat would also make it challenging for LUPs to be responsive to changes in the location and configuration of boreal caribou habitat brought about by natural disturbance and succession, given that the amendment of land use plans is a lengthy process. Despite these challenges, approved land use plans are the first place for proponents of development projects to go to determine which land uses are acceptable or not, and how those land uses should proceed. It may thus make sense to integrate as much of the range plans into land use plans as possible.

While LUPs offer an important means of achieving range plan goals, they should be viewed as a medium to long-term opportunity, and other tools may need to be considered in the interim.

⁴⁴ <https://www.lands.gov.nt.ca/en/land-use-and-sustainability-framework>

Community Conservation Plans

Each of the six Inuvialuit communities in the ISR have developed a Community Conservation Plan (CCP) which reflects each community's values and strategies for achieving conservation and management of renewable resources within the community's planning area.⁴⁵ The goals of the CCPs are to 1) Identify and protect important habitat and harvesting areas, 2) direct land use decisions, 3) identify educational initiatives for the Inuvialuit and others interested in the area which will promote conservation, understanding and appreciation, 4) define species management, and 5) enhance the local economy.

Lands within each CCP are designated into one of five categories to reflect priority land uses and activities, as well as areas of special ecological and cultural importance. At one end of the spectrum, Category A lands and waters are those where there are no known significant and sensitive cultural or renewable resources, and lands shall be managed according to current regulatory practices. At the other end of the spectrum, Category E lands and waters where cultural or renewable resources are of extreme significance and sensitivity. There shall be no development on these areas, and these lands and waters shall be managed to eliminate, to the greatest extent possible, potential damage and disruption.

CCPs are reviewed, and potentially amended, every eight years, though they can be reviewed or amended earlier if needed.

Range plans could help to inform the review and amendment of CCPS by identifying where important habitat areas for boreal caribou occur within each CCP area, by recommending how those areas should be categorized (Category A-E), by recommending specific land use practices that should be followed in those areas to avoid, minimize, restore and/or offset impacts to boreal caribou habitat, by recommending general guidelines for operating in boreal caribou habitat, and by adding species conservation summaries for boreal caribou within each applicable CCP.

⁴⁵ Environmental Impact Screening Committee. 2014. Environmental Impact Screening Guidelines. 66 pp. Available at: http://www.screeningcommittee.ca/pdf/eisc_guidelines.pdf

Environmental assessment (EA) and regulatory processes

Range plans can be viewed as complementary to the project-specific assessment and EA processes in the NWT. Range plans would provide cumulative effects thresholds and mitigation options to inform EA processes to improve project screenings. Range plans will give EA review boards the ability to assess the significance of a project's contribution to overall cumulative effects on boreal caribou and boreal caribou habitat.

There is also the requirement under federal *Species at Risk Act* (S.79) for review boards to consider impacts on species at risk, including critical habitat. If the definition of critical habitat is tied to a cumulative disturbance threshold, review boards must consider it in their EA decisions.

However, it is important to highlight that project-specific EAs occur very late in the overall system of land and resource developments. If, for example, a review board would refer to a range plan and recommend mitigation, offset or monitoring measures due to an area being in an Enhanced or Intensive management class zone, then it would be better for all involved parties to know this was a likely outcome much earlier in the project development cycle.

Therefore, while EAs offer an important means of implementing range plans, they can only be viewed as a last step opportunity, and the other means must be considered in parallel.

Issuance of land and resource rights

The issuance of land and resource rights is the earliest point in the regulatory process where there may be an opportunity for range plans to influence decision-making. In fairness to development proponents, it is important to provide information regarding boreal caribou and habitat considerations within range plans that may influence later land use permitting or EA phases. Currently, opportunities for cumulative effects management at the rights issuance stage may be greater for oil and gas rights and surface leases than for sub-surface mineral rights acquired under the current Mining Regulations. This could include guidance in the range plans advising not to open up specific areas to Expressions of Interest (Calls for Nominations) or Calls for Bids for oil and gas exploration for defined periods of time.

The GNWT Lands Advisory Committee, which includes ENR, reviews and comments on land lease/tenure applications. This process provides a forum for the GNWT to promote compliance with range plans. For example, if a proposed project is in an Enhanced or Intensive management class, then ENR could request that Department of Lands include specific information directly to the proponent about the range plan recommendations for Enhanced mitigation, offset and monitoring measures that may be required for subsequent land use authorizations. The GNWT also conducts external consultation and engagement prior to issuing oil and gas and mineral rights. For example, for oil and gas Expressions of Interest (aka Calls for Nomination), the GNWT consults with those Indigenous governments and organizations in which the nominated parcels are located to ensure there are no reasons as to why these parcels cannot be made available for oil and gas exploration rights. This would provide an opportunity for regional organizations to highlight areas where the range plan may influence if and how oil and gas exploration could be carried out within those nominated parcels.

The different types of rights and tenure the GNWT issues include:

- Oil and Gas Rights Issuance
- Mineral Rights Issuance
- Quarrying Rights Issuance
- Other large-scale land tenures

Wildlife Act

Conservation Areas (S.89 and S.173(1)(z.60)) – *can be established by Executive Council through regulation*

Conservation Areas (CAs) are spatially delineated. CAs may describe the time period or periods during which the area is a CA and the circumstances under which the regulation applies. Regulations established for the CA may include: taking conservation actions; prohibiting activities that may adversely affect wildlife or habitat; imposing restrictions on harvesting and against damaging habitat, controlling, restricting or prohibiting any use of, access to, or activity in the CA; and respecting management plans for CAs.

Habitat Protection (S.93, and S.173(1)(z.61)) – *can be established by Minister*

This provision allows for protection of specific habitat features (e.g. salt licks), and can be identified spatially or described more generally and qualitatively (e.g. water crossings, land bridges). Regulations can include: requiring the taking of measures that may protect habitat; prohibiting activities that may adversely affect habitat; imposing prohibitions against damaging or destroying habitat; and controlling, restricting or prohibiting any use of, access to, or activity in habitat.

Wildlife Management and Monitoring Plans (WMMPs) (S.95, S.173(1)(z.64)) – *The Minister of ENR can require developers to develop and adhere to a WMMP that describes specific measures to mitigate and monitor impacts to wildlife and habitat. WMMPs are site and project specific, and the determination of whether a WMMP is required for a development project or activity is made on a case-by-case basis.*

Regulations regarding WMMPs may include: circumstances, developments or other activities that require a WMMP; reporting requirements, monitoring processes and inspections; and prohibitions and penalties in respect of WMMPs.

ENR's [WMMP guidelines](#) currently describe the types of development more likely to require WMMPs, and a system of three tiers for the contents of a WMMP, scaled to the size and type of development, level of certainty about efficacy of proposed mitigations, and the contribution of a project to cumulative effects.

Minister Submissions (S.97) – *to responsible body if a development may affect wildlife or its habitat*

The Minister may refer to the range plan to determine if there is likely to be an impact on boreal caribou. This provision gives the Minister the ability to use the range plan to influence land and resource management decisions, but does not require it. A GNWT-wide policy could create the expectation that the Minister would use the range plan, as one of multiple factors in preparing such submissions.

Species at Risk (NWT) Act

Note: The *Species at Risk (NWT) Act* has higher penalties than the *Wildlife Act*.

Habitat Designation (S.80, S.153-154) – *allows specific habitat to be designated for the conservation of the species or its habitat*

The Minister can establish regulations designating habitat or components of habitat, if the habitat is considered to be essential to the survival or recovery of the species and if the designation is necessary for the conservation of the species or its habitat (S.153). Once habitat is designated there is a prohibition against destroying it (S.80). The Minister can also establish regulations respecting the conservation of designated habitat (S.154). Possible regulations include but are not limited to: requiring conservation actions to be taken; prohibiting activities that may adversely affect the habitat; prohibiting damage of the habitat; and controlling, restricting or prohibiting access or use.

Habitat Conservation (S.152) – *allows for making of regulations respecting conservation of habitat*

The Minister can establish regulations respecting the conservation of habitat or the area in which the habitat is located, or surrounding area. Possible regulations include but are not limited to: requiring conservation actions to be taken; prohibiting activities; prohibiting damage or destruction of habitat/area; controlling, restricting or prohibiting access or use; and controlling, restricting or prohibiting release of substances.

Agreements Respecting Habitat Conservation (S.79) – *for private lands*

The Minister may enter into an agreement with an owner of private lands for the purpose of habitat conservation. Most private lands in the territory are on settled lands owned by Indigenous governments. Before making an agreement, the Minister may by order exempt activities that would contravene S.80. An order may restrict or specify the circumstances of authorized activities and establish terms and conditions to: *conserve the species and its habitat, minimize the impact of the authorized activity on the species and its habitat, or provide for the recovery of the species*. An order may also contain conditions requiring the owner to remedy the damage or destruction to habitat or to enhance another area.

Species at Risk Permitting (S.84, S.151-155) – *allows for exceptions to destruction of habitat prohibition in S.80, if the strict criteria set out in the Act are met*

The Minister may issue a permit authorizing the recipient to engage in an activity that, except for the permit, would contravene section 80 [destruction of habitat] or a regulation made under S.151, 152, 154 or 155. Permits allow for exemptions of protection measures established under the *Species at Risk (NWT) Act*. Regulations designating habitat would first be required.

Minister Submissions (S.76-78) – *to responsible body if a development may affect a listed species or its habitat*.

These sections state that the Minister shall make a submission to a responsible body if he or she considers that any of the following may affect a pre-listed species or a listed species or its habitat or the area in which the habitat is located of the surrounding area: if a development proposal undergoes a preliminary screening or a screening or is referred for EA of an environmental impact review (S.76); and application for a land use permit or water licence (S.77).

Forest Fire Management Policy (53.04)

The policy outlines principles and priorities for GNWT wildfire management services on forested areas. The primary mechanism for Forest Management Division (FMD) to consider caribou habitat in responding to wildfires is through their VAR hierarchy. Human life and infrastructure/property are always the top two priorities that guide FMD's decisions about which wildfires to respond to and how to respond, but natural resource values (such as caribou habitat) can factor in as the third priority. Section B.2.4 outlines different management actions that could be taken with respect to wildfire that are consistent with the forest fire management policy.

Forest Management Act, Forest Management Regulations, Commercial Timber Harvest Planning and Operations Standard Operating Procedures Manual

The *Forest Management Act*, Forest Management Regulations and standard operating procedures allow the Minister to issue Forest Management Agreements, timber cutting permits and licences, and attach conditions to these agreements and permits; determine annual sustainable harvest levels; define reforestation fees; and designate forest management areas, units and zones.

Section B.2 outlines different management actions that could be taken with respect to the management of timber harvesting and reforestation.

GNWT Range Plan Implementation Policy

Consideration may be given toward developing a broad GNWT boreal caribou and habitat management policy that describes how the GNWT will, as a whole, consider boreal caribou and these range plans when making decisions regarding land and resource use (e.g. input into preliminary screenings and EAs, input into LUPs, issuance of rights). This policy may discuss how GNWT departments will implement the range plan under various processes where the GNWT retains discretion in its decision making about land uses in boreal caribou habitat. Though a policy providing this kind of guidance may not be required to guide the GNWT in the use of legally binding tools (e.g., those available under the *Species at Risk (NWT) Act*), there will remain processes where legally-binding tools are not required. The following are examples of how such a policy could influence the GNWT's input into different land use planning and decision making processes where the GNWT retains discretion:

- **Land use plans (LUPs)** – The GNWT would use information on important areas, management classes, and recommended management actions in the range plans to inform the GNWT's input on LUP conformity requirements, zoning boundaries and designations, in its submissions to the development/renewal of LUPs. This could also lead to requests to amend LUPs.
- **Issuance of rights** – depending on the designation of an area (Basic/Enhanced/Intensive) within a regional range plan, the policy would provide guidance to relevant departments on where it may be unadvisable to issue rights (e.g. for oil and gas exploration), or the types of requirements that a right holder should be notified that they will need to meet (mitigations or offsets) as the project progresses through regulatory screenings.
- **Environmental assessment/regulatory** – The GNWT would provide comments and recommendations on development proposals undergoing preliminary screenings and environmental assessments (EAs) that are consistent with the proposed objectives and mitigation and management actions outlined in the range plans.

Appendix C: High priority knowledge gaps

A broad list of research and monitoring needs for Boreal Caribou in the NWT have been articulated previously in the *NWT Recovery Strategy*. Building on these, through the development of the Framework, several high-level questions pertinent to the decisions embedded in the Framework were identified that merit inclusion as priorities for research and adaptive management. These knowledge gaps can be addressed using local and traditional knowledge (LTK), science, or a combination of both. For example, information from community harvesters could be used to help determine the status of regeneration on legacy seismic lines. Communities and regional organizations may identify other questions during the development of regional range plans. A sample of these questions, together with their relevance to the Framework is given in Table C1.

Table C1. High priority questions for learning, and their relevance to the Framework

High Level Questions	Sub-components	Relevance to Framework
How does wildfire disturbance affect boreal caribou habitat use, alternate prey abundance and predation risk, and population trend habitat over time?	<ul style="list-style-type: none"> • Are human disturbance and wildfire disturbance used/avoided equally? • How long does it take for biophysical attributes of boreal caribou habitat to recover following wildfire? • Do boreal caribou use unburned residuals within wildfire perimeters? Do they use low-severity burns? • How does succession affect alternate prey abundance, predator abundance, and predation risk for boreal caribou in the NWT? • Evaluate the use of fuel treatments to reduce wildfire risk and severity. • Develop a more detailed understanding of wildfire regimes across the NT1 boreal caribou range. • Evaluate potential impact of climate change on future wildfire regimes, patterns of vegetation succession, and boreal caribou habitat suitability. 	<ul style="list-style-type: none"> • Setting of regional disturbance thresholds • How wildfire disturbance is mapped and measured • Management of wildfire disturbance

<p>How does human-caused habitat disturbance affect boreal caribou habitat use, predation risk and population trend?</p>	<ul style="list-style-type: none"> • Does the degree of use or avoidance of human-caused disturbance depend on the type of disturbance? • What factors determine the rate of vegetation regeneration on linear features, and what criteria should be used to determine when they are considered restored? • What is the status of regeneration on existing seismic lines within the NWT? • How does the height, density, and composition of vegetation on regenerating seismic lines affect predator movements, alternate prey abundance, predator abundance, and predation risk for boreal caribou in the NWT? • How long does it take for biophysical attributes of boreal caribou habitat to recover following other types of disturbance (i.e., from other types of activity than seismic exploration)? • What types of habitat restoration treatments could be applied in the north, how much do they cost, and how effective are they? • How should offsetting ratios be determined? What are the barriers to implementing offsets? • How will maps of human disturbance be tracked and updated? 	<ul style="list-style-type: none"> • Development of criteria to determine which types of development contribute to the human disturbance footprint • Development of criteria to determine when human disturbance can be considered functionally or ecologically restored • Development of an inventory of existing disturbance features that should be prioritized for restoration-based offsets • Development of management actions to achieve no net loss or improvement of caribou habitat • Development of an approach to tracking human disturbance within the boreal caribou range • How human disturbance is measured (e.g. different buffer zones for different disturbance types)
<p>What is the sub-population structure of boreal caribou within the NT1 range?</p>	<ul style="list-style-type: none"> • Should the NT1 range be considered as one continuous population or is there evidence of smaller relatively distinct location populations within the range? • What are the major barriers to dispersal and gene flow? 	<ul style="list-style-type: none"> • Adapting regional range planning boundaries based on sub-population structure
<p>How will climate change impact boreal caribou habitat?</p>	<ul style="list-style-type: none"> • How will permafrost degradation affect boreal caribou habitat and to what extent? • How will wildfire regimes (extent, severity and return interval) change under climate change, and how will this affect patterns of vegetation succession and boreal caribou habitat suitability? 	<ul style="list-style-type: none"> • Forecasting future disturbance levels • Setting regional disturbance thresholds and management triggers

Appendix D: Engagement working groups

Responsibility for management and stewardship of boreal caribou and their habitat is shared among wildlife and land management authorities across the NWT, including the GNWT, Indigenous governments, regulatory boards, land use planning boards and federal agencies. In addition, there are many stakeholders in decisions about land management across the NWT.

The GNWT convened two working groups to engage with regional Indigenous governments and organizations, renewable resource boards, land use planning boards, and regulatory boards, as well as relevant federal government departments, industry and environmental non-governmental organizations. One working group was formed for the northern NWT (North Slave (Wek'èezhì), Sahtú, Gwich'in and Inuvialuit Regions) and another for the southern NWT (Dehcho and South Slave administrative regions). Each working group met for three 2-day meetings to iteratively review and refine the draft Framework. Meetings were facilitated by Compass Resource Management Ltd. The list of organizations invited to each working group, and a record of which organizations attended each working group meeting is provided in tables D1 and D2.

Table D1. Northern NWT Working Group - North Slave (Wek'èezhì), Sahtú, Gwich'in and Inuvialuit Regions

Invited Organizations	Meeting #1 – July 24/25, 2018	Meeting #2 – October 10/11, 2018	Meeting #3 – March 07/08, 2019
Inuvialuit Regional Corporation	✓	✓	✓
Inuvialuit Game Council	✓	✓	
Wildlife Management Advisory Council (NWT)	✓	✓	
Environmental Impact Review Board	Declined	Declined	Declined
Environmental Impact Screening Committee	✓		
Gwich'in Tribal Council	✓	✓	✓ (by phone)
Gwich'in Renewable Resources Board	✓	✓	✓
Gwich'in Land and Water Board ^a	(WLWB on behalf of MVLWBs)	(WLWB on behalf of MVLWBs)	(WLWB on behalf of MVLWBs)
Gwich'in Land Use Planning Board			
Sahtú Secretariat Incorporated	✓	✓ (by phone)	
K'asho Got'Inę District Land Corporation ^b		✓	
Tulita District Land Corporation ^b			
Sahtú Renewable Resources Board	✓	✓	✓
Dél'Inę Got'Inę Government			✓

Sahtú Land and Water Board ^a	(WLWB on behalf of MVLWBs)	(WLWB on behalf of MVLWBs)	(WLWB on behalf of MVLWBs)
Sahtú Land Use Planning Board	✓	✓	✓
Tłjchq Government	✓	✓	✓
Wek'èezhìi Renewable Resources Board	✓	✓	✓
Wek'èezhìi Land and Water Board	✓	✓	
Government of the Northwest Territories ^c	✓	✓	✓
Environment and Climate Change Canada	✓	✓	✓
Indigenous and Northern Affairs Canada	✓		✓
Parks Canada Agency	✓		
Mackenzie Valley Review Board	✓	✓	✓
Mackenzie Valley Land and Water Board	(WLWB on behalf of MVLWBs)	(WLWB on behalf of MVLWBs)	✓
North Slave Métis Alliance	✓	✓	✓
Yellowknives Dene First Nation	✓ (by phone)	✓	✓
Mountain Island Métis			
Canadian Association of Petroleum Producers		✓	✓ (by phone)
NWT/NU Chamber of Mines ^d	✓	✓	
Canadian Parks and Wilderness Society (NWT Chapter)	✓	✓	✓

^a Representatives from the Wek'èezhìi Land and Water Board and Mackenzie Valley Land and Water Board participated on the two working groups on behalf of all the Mackenzie Valley Land and Water Boards.

^b At the first working group meeting, it was advised that the Sahtu district land corporations be invited to attend working group meetings as well. The K'asho Got'Inę District Land Corporation, Tulita District Land Corporation were invited to the second and third working group meetings.

^c Representatives from ENR's Wildlife Division participated at all workshops. The GNWT Department of Lands participated at the second meeting at the request of the working group. ENR Inuvik region's biologist attended the third working group meeting.

^d Pine Point Mining Ltd. also attended the first working group meeting by phone.

Table D2. Southern NWT Working Group – Dehcho and South Slave administrative regions

Invited Organizations	Meeting #1 – August 29/30, 2018	Meeting #2 – November 13/14, 2018	Meeting #3 – February 28/March 01, 2019
Dehcho First Nations	✓ (by phone)		✓
Deh Gáh Got'îę First Nation	✓	✓	✓
Jean Marie River First Nation	✓	✓	✓
Ka'a'gee Tu First Nation	✓	✓	✓
Pehdzeh Ki First Nation	✓	✓	✓
Sambaa K'e First Nation	✓	✓	
West Point First Nation		✓	✓
łídlíł Køç First Nation	✓	✓	(rep attended on behalf of DFN)
Fort Simpson Métis Local			
Fort Providence Métis Council		✓	✓
Fort Providence Resource Management Board			
Nahanni Butte Dene Band		✓	
Acho Dene Koe First Nation	✓ (by phone)	✓ (by phone)	✓ (by phone)
Dehcho Land Use Planning Committee	✓ (by phone)	✓	
K'at'odeeche First Nation	✓	✓	✓
Akaitcho First Nations			
Deninu K'ue First Nation	✓	✓	✓
Smith's Landing First Nation	✓		✓
Salt River First Nation			
Northwest Territories Métis Nation	✓	✓	✓
Fort Resolution Métis Council	✓		✓
Fort Smith Métis Council	✓	✓	✓

Hay River Métis Council		✓	
NWT Wildlife Federation			
Government of the Northwest Territories ^a	✓	✓	✓
Environment and Climate Change Canada	✓ (by phone)		✓
Parks Canada Agency	✓	✓	
Indigenous and Northern Affairs Canada			✓
Mackenzie Valley Environmental Impact Review Board	✓ (by phone)	✓ (by phone)	✓ (by phone)
Mackenzie Valley Land and Water Board		✓ (WLWB on behalf of MVLWB, by phone)	✓ (by phone)
NWT/NU Chamber of Mines			
Canadian Association of Petroleum Producers			
Canadian Parks and Wilderness Society (NWT Chapter)			

^aRepresentatives from ENR’s Wildlife Division participated at all workshops. ENR’s Forest Management Division participated at the second and third meetings, and Dehcho and South Slave ENR region biologists and Superintendents attended the third meeting at the request of the working group.