BOREAL CARIBOU RANGE PLAN: WEK'ÈEZHÌI REGION

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- North Slave Métis Alliance
- Yellowknives Dene First Nation
- Wek'èezhìı Renewable Resources Board
- Environment and Climate Change Canada
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Sommaire

Pourquoi était-il nécessaire de mettre en place un plan pour l'aire de répartition du caribou boréal?

Le caribou boréal a été classé comme espèce menacée en vertu de la *Loi sur les espèces en péril* (LEP) du Canada en 2003 et en vertu de la *Loi sur les espèces en péril* (TNO) en 2014, avant d'être réévalué comme étant menacé aux TNO en 2022. Aux TNO, une espèce en péril est une espèce susceptible de devenir une espèce en voie de disparition si les facteurs contribuant à sa diminution ne sont pas inversés.

L'habitat essentiel du caribou boréal, défini dans la LEP, correspond à au moins 65 % de l'aire de répartition du caribou boréal aux TNO (aussi appelé NT1 dans le plan fédéral), et il ne doit pas être perturbé pour garantir une probabilité de survie à long terme de 60 % à l'espèce. C'est pourquoi on doit protéger cet habitat.

En vertu de la *Loi sur les espèces en péril* (TNO), une stratégie de rétablissement du caribou boréal a été élaborée en 2017. L'un des objectifs de cette stratégie était que l'ensemble des autorités de gestion, y compris le gouvernement des Territoires du Nord-Ouest (GTNO), s'engagent à produire des plans régionaux pour l'aire de répartition du caribou boréal. Pour lancer le processus, le GTNO a mis en place en août 2019 un cadre de planification de l'aire de répartition du caribou boréal. Ce cadre propose une approche coordonnée et cohérente pour élaborer cinq plans régionaux pour l'aire de répartition aux TNO, dont le plan pour l'aire de répartition du caribou boréal de la région du Wek'èezhìı.

Ce plan a été établi en tenant compte des principes énoncés dans le cadre de planification, soit en faisant appel aux connaissances scientifiques et traditionnelles, en se laissant guider par le lien qui unit les gens et le caribou et en respectant un processus de collaboration.

Aux TNO, plusieurs autorités de gestion se partagent la responsabilité de protéger le caribou boréal et son habitat ainsi que de trouver un équilibre entre les besoins humains et les besoins de l'espèce. Pour favoriser la collaboration, un groupe de travail régional été formé à l'automne 2019 – le groupe de travail du Wek'èezhìı chargé du plan pour l'aire de répartition du caribou boréal –, composé de représentants de gouvernements autochtones (gouvernement tłı̨chǫ, Première Nation des Dénés Yellowknives, Alliance des Métis du Slave Nord), de l'Office des ressources renouvelables du Wek'èezhìi, d'organismes fédéraux (Environnement et Changement climatique Canada) et de ministères du GTNO.

En vertu de l'article 12.5.1 de l'Accord Tłı̨chǫ, le GTNO est tenu de soumettre toutes les propositions de gestion de la faune à l'approbation de l'Office des ressources renouvelables du Wek'èezhìi. Par conséquent, en 2021, un plan provisoire pour l'aire de répartition du caribou boréal a été élaboré, puis approuvé par l'Office des ressources renouvelables du Wek'èezhìi. À cette époque, il avait fallu rédiger un plan provisoire pour respecter les dispositions prévues à la mesure 6-1 de la partie 1 du rapport de l'Office d'examen des répercussions environnementales de la vallée du Mackenzie sur l'évaluation environnementale et les motifs de la décision concernant le projet de route toutes saisons de la région des Tłı̨chǫ. Pour cette raison, le plan provisoire pour l'aire de répartition du caribou boréal de la région du Wek'èezhìı devait être terminé et présenté à l'Office des ressources renouvelables du Wek'èezhìi 90 jours avant l'ouverture de la nouvelle route des Tłı̨chǫ, qui a eu lieu en novembre 2021. Le présent plan pour l'aire de répartition du caribou boréal de la région du Wek'èezhìı, dans sa version permanente, remplace dès lors le plan provisoire.

Limite de perturbation globale de l'habitat

La limite de perturbation globale de l'habitat du caribou boréal dans la région de planification de l'aire de répartition du Wek'èezhìı a été définie dans le cadre de planification. Parmi les perturbations possibles, notons

les perturbations naturelles (p. ex. les feux de forêt) et les perturbations humaines (p. ex. le développement industriel et la construction d'infrastructures). La limite de perturbation globale d'une région correspond aux perturbations combinées (naturelles et humaines) auxquelles peut s'adapter une région tout en maintenant une population autosuffisante de caribou boréal. Dans la région du Wek'èezhìı, la limite (y compris les feux de forêt et les activités humaines) est de 40 %.

Pour calculer la limite de perturbation humaine à laquelle peut s'adapter une région sans dépasser la limite de perturbation globale, on doit calculer la portée naturelle des perturbations causées par les feux de forêt, soit la différence entre les perturbations typiques et les perturbations maximales potentielles. C'est ce qu'on appelle le seuil de perturbation humaine. L'empreinte des feux de forêt dans la région de planification de l'aire de répartition du Wek'èezhìı permet une perturbation humaine de 4,5 % à 11 %.

Le cadre de planification définit également un système de gestion selon lequel le niveau de perturbation humaine dans lequel entre une région détermine quelle combinaison de catégories de gestion inclure dans le plan régional pour l'aire de répartition (élémentaire, importante ou intensive). Par exemple, une région dont les perturbations humaines demeurent sous les 4,5 % se situe au niveau 1; une région dont les perturbations humaines sont plus élevées, mais demeurent entre 4,5 % et 11 % se situe au niveau 2; et une région dont les perturbations humaines sont plus élevées que de 11 % se situe au niveau 3. À l'heure actuelle, les perturbations humaines dans la région de planification du Wek'èezhìı s'élèvent à 1,0 % (niveau 1).

Étant donné que la région de planification de l'aire de répartition du Wek'èezhìı est classée au niveau 1, un tiers de l'habitat doit être classé dans la catégorie de gestion « importante » (qui demande la mise en œuvre de mesures plus rigoureuses que la catégorie élémentaire) et pas plus des deux tiers classés pour gestion « élémentaire » (qui se caractérise par une mise en œuvre de mesures moins rigoureuses).

Cartes des régions importantes pour le caribou boréal et catégories de gestion

Le gouvernement tłı̨chǫ et l'Alliance des Métis du Slave Nord ont tenu des réunions communautaires et des entrevues avec les aînés, les chasseurs et les piégeurs pour recueillir des connaissances traditionnelles sur le caribou boréal et sur son habitat. Les données traditionnelles et scientifiques ont été utilisées pour élaborer les cartes des régions importantes pour le caribou boréal. On s'est ensuite servi de ces cartes pour cerner les zones d'application des différentes catégories de gestion. En outre, pour mieux définir ces zones, dans certains des scénarios élaborés, les perspectives de développement et les mesures de protection des terres en vigueur ont été prises en compte.

Lors des réunions tenues au printemps 2021, les représentants du groupe de travail du Wek'èezhìı ont conjointement décidé d'adopter une approche plus prudente concernant la carte des catégories de gestion, pour mieux protéger le caribou boréal. Ils ont également décidé qu'en raison de leur importance comme aire de mise bas, les zones longeant la côte du bras Nord du Grand lac des Esclaves chevauchant l'aire protégée proposée Dınàgà Wek'èhodì; une vaste zone à l'ouest du Lac La Martre, ainsi que la pointe Whitebeach et les zones juste au sud, devraient être classées dans la zone de gestion « intensive ».

En 2023, les catégories de gestion et les pourcentages correspondant respectivement aux zones de gestion intensives, importantes et élémentaires ont fait l'objet de discussions dans le sud des TNO et dans la région du Wek'èezhìı. Il a ainsi été décidé que les aires protégées devraient constituer une quatrième catégorie de gestion dans le cadre des plans pour les aires de répartition. Ainsi, les aires protégées seraient classées dans des zones de gestion semblables aux zones de gestion intensive, dans la mesure où toutes deux sont soumises à des règles similaires et plus strictes (interdiction d'effectuer toute activité d'exploitation à certains moments de l'année, par exemple) que pour les catégories de gestion « importante » et « élémentaire ».

À noter toutefois que les aires protégées au sein de l'aire de répartition du caribou boréal de la région du Wek'èezhìi ne le sont pas en vertu de la *Loi sur les aires protégées* des TNO et qu'elles ne sont pas non plus gérées par le GTNO. L'aire protégée Wehexlaxodiale, par exemple, est gérée comme une zone exclue du plan d'aménagement, en vertu du plan d'aménagement du territoire des Tłı̨chǫ. L'aire Ezǫdzìtì est quant à elle classée comme « aire patrimoniale tłı̨chǫ » et bénéficie, à ce titre, d'une protection permanente contre toute occasion d'utilisation que pourrait accorder le gouvernement.

Certaines zones où des perspectives de développement se dessinent et où le potentiel d'exploitation des ressources est élevé demeurent soumises aux exigences de la catégorie de gestion « élémentaire » et ne seront pas touchées par le plan pour l'aire de répartition. Mentionnons, entre autres, un corridor d'au moins 2 km de largeur englobant la route 3 et la route des Tłı̨chǫ pour permettre les travaux de construction et d'entretien routiers en cours.

Dans l'ensemble, dans le cadre de ce plan permanent, les représentants du groupe de travail ont finalement convenu que la région de planification de l'aire de répartition du Wek'èezhìı serait divisée ainsi : 55,02 % de l'habitat entrerait dans la catégorie de gestion « élémentaire », 28,07 %, dans la catégorie de gestion « importante » et 14 %, dans la catégorie de gestion « intensive ». Ensemble, les aires Ezǫdzìtì et Wehexlaxodiale constituent la catégorie de gestion propre aux aires protégées, qui représente 2,90 % de l'aire de répartition du caribou boréal du Wek'èezhìı.

Mesures de gestion

Les mesures de gestion ne s'appliquent pas aux aires protégées, lesquelles sont gérées par le gouvernement tłı̨chǫ, notamment en vertu du plan d'aménagement du territoire des Tłı̨chǫ. Les mesures de gestion prévues dans le plan pour l'aire de gestion varient selon les trois catégories de gestion définies dans le cadre :

- *Zones à catégorie de gestion élémentaire :* zones dans lesquelles les projets de développement devraient suivre les procédures d'atténuation habituelles déjà en vigueur. Les promoteurs sont encouragés à respecter les pratiques exemplaires et les lignes directrices concernant le caribou boréal.
- *Zones à catégories de gestion importante et intensive :* zones dans lesquelles les mesures deviennent graduellement plus rigoureuses. L'objectif est de réaliser un gain net ou, du moins, de ne pas subir de perte nette en habitat.
- *Zones à catégorie de gestion pour les aires protégées* La réglementation du gouvernement tłı̨chǫ ne permet aucun projet de développement industriel dans les aires protégées.

On a établi les mesures de gestion selon une hiérarchie d'atténuation conventionnelle qui tente, à la fois :

a) d'éviter le plus possible les nouvelles perturbations;
b) de minimiser le plus possible les nouvelles perturbations;
c) de réhabiliter l'habitat et de compenser sa perte.

Lors des réunions, les représentants du groupe de travail ont décidé que les mesures de gestion proposées dans le cadre seraient intégrées dans le plan pour l'aire de répartition, accompagnées de certains ajouts et changements.

Les aires de mise bas fréquemment utilisées (comme les îles et le littoral) à l'intérieur de zones classées « intensive » doivent être complètement évitées. Les mesures précises de gestion ont été ajoutées pour réduire ou pour empêcher les perturbations sensorielles au moment de l'année pendant lequel le caribou boréal est le plus vulnérable (mise bas, élevage et fin de l'hiver).

Des détails supplémentaires ont été ajoutés pour apporter des précisions :

- Le moment où il est conseillé de réaliser une réhabilitation fonctionnelle et écologique pour effacer l'empreinte des perturbations d'un projet de développement.
- Les critères à respecter pour déterminer si un site a été réhabilité convenablement.
- Le moment où la compensation pour la perte d'habitat doit commencer après une perturbation à long terme.

Dans les zones de gestion « importante » et « intensive », le plan de fermeture ou d'assainissement doit montrer comment seront effectuées les restaurations fonctionnelle et écologique d'un habitat après des perturbations causées par un projet de développement. S'il est impossible d'éviter de nouvelles perturbations à long terme, le promoteur devrait, en règle générale, élaborer un plan de compensation de perte d'habitat qui prouve que les zones perturbées sont réhabilitées. Toutefois, en raison du manque d'expérience pratique et d'orientation dans le domaine de la compensation de perte d'habitat aux TNO, le groupe de travail a recommandé que d'autres types de compensation soient envisagés, comme effectuer une contribution à la recherche sur la réhabilitation plutôt qu'effectuer personnellement une compensation à la perte d'habitat.

Instruments de mise en œuvre

Les instruments législatifs proposés qui permettraient de mettre en œuvre le plan pour l'aire de répartition du Wek'èezhìı sont, notamment, le plan d'aménagement du territoire tłı̨chǫ, la *Loi sur les espèces en péril*, la *Loi sur la faune* et la *Loi sur l'aménagement des forêts* des TNO, ainsi que la *Loi sur les espèces en péril* du Canada. La région définie dans le plan d'aménagement du territoire tłı̨chǫ et la région de planification de l'aire de répartition de la région du Wek'èezhìı se chevauchent à 19,2 %.

La majorité (80,4 %) de la région de planification de l'aire de répartition du caribou boréal du Wek'èezhìı fait partie des terres actuellement gérées par le GTNO. Bien que divers pouvoirs réglementaires et dispositions de la *Loi sur la faune* soient envisagés comme instruments de mise en œuvre du plan pour l'aire de répartition du caribou boréal sur les terres gérées par le gouvernement territorial, ce sont les deux articles ci-dessous que l'on privilégie.

L'article 93 de la *Loi sur la faune* porte principalement sur la protection des habitats pour la conservation d'espèces sauvages précises. Cet article permet de définir les habitats sur le plan géographique et qualitatif, et autorise la rédaction d'un règlement qui prévoit que les promoteurs respectent les mesures de gestion énoncées dans le plan autorisé pour l'aire de répartition.

En vertu de **l'article 95,** on peut obliger les promoteurs à rédiger et à respecter un plan de gestion et de surveillance de la faune (PGSF) qui sera approuvé par le ministre. Cette obligation s'applique au cas par cas, en fonction des éventuelles conséquences du projet de développement. Les renseignements figurant dans le présent plan pour l'aide de répartition pourraient par ailleurs servir à établir des stratégies d'atténuation mentionnées dans un PGSF. En ce qui concerne les mesures de gestion liées particulièrement à la récolte du bois, la *Loi sur l'aménagement des forêts* et ses règlements afférents constituent les principaux instruments de mise en œuvre.

Une petite partie de la région de planification du Wek'èezhìı de l'aire de répartition du caribou boréal, où un bail d'exploitation minière est toujours en vigueur, demeure sous administration fédérale. Cette zone, se trouvant dans l'aire de répartition NT1, fait l'objet d'une ordonnance en vertu de *la Loi sur les espèces en péril* qui protège l'habitat essentiel du caribou boréal. Pour mener des activités qui pourraient avoir une incidence sur cet habitat, les promoteurs doivent demander une autorisation en vertu de *Loi sur les espèces en péril* et respecter les exigences imposées.

Calendrier

Le présent plan pour l'aire de répartition du caribou boréal restera en vigueur jusqu'à ce que l'examen décennal suivi d'une mise à jour soit mené à bien, à moins qu'un examen quinquennal (examen à moyen terme) soit lancé, puis terminé. Les conditions pouvant déclencher un examen quinquennal suivi d'une mise à jour sont présentées dans le tableau 10.

Executive Summary

Why was a Boreal Caribou Range Plan needed?

Boreal caribou were listed as threatened under the federal *Species at Risk Act* (SARA) in 2003 and in the Northwest Territories (NWT) under the *Species at Risk (NWT) Act* in 2014; they were reassessed in NWT as threatened in 2022. When a species is listed as threatened, it means it is likely to become endangered in the NWT if nothing is done to reverse the factors leading to its decline.

Under the federal SARA legislation, critical habitat has been identified for boreal caribou and must be effectively protected within the NWT's boreal caribou range – referred to as NT1 in the federal plan. Critical habitat for boreal caribou is identified as maintaining at least 65% undisturbed habitat within the NWT's boreal caribou range to ensure a 60% probability of the population's long-term persistence.

Under the *Species at Risk (NWT) Act,* a boreal caribou recovery strategy was produced in 2017. As part of the NWT recovery strategy's objectives, all the management authorities, including the Government of the Northwest Territories (GNWT), committed to producing range plans for boreal caribou. To initiate the process, an NWT *Framework for Boreal Caribou Range Planning* (the Framework) was created in August 2019. The Framework provides a coordinated and consistent approach for five regional range plans to be produced in the NWT. The Range Plan for Boreal Caribou Range Plan: Wek'èezhìı Region (the Range Plan) is one of these five regional plans.

The Range Plan was prepared with the intention of following the Framework's principles, including - among others - being informed by science and traditional knowledge (TK), being guided by people's relationship with caribou, and respecting a collaborative process.

Responsibility for protecting boreal caribou and their habitat, and balancing these actions with human needs, is shared among many management authorities in NWT. As part of the collaborative process, a regional working group was formed in fall 2019. The Wek'èezhìı Boreal Caribou Range Plan Working Group (the Working Group) is made up of representatives from Indigenous governments (Tłı̨chǫ Government, Yellowknives Dene First Nation, North Slave Métis Alliance), the Wek'èezhìı Renewable Resources Board, federal government agencies (Environment and Climate Change Canada) and GNWT departments.

Under Section 12.5.1 of the Tłı̨chǫ Agreement, the GNWT is legally required to submit all wildlife management proposals to the Wek'èezhìı Renewable Resources Board (WRRB) for approval. As such, in 2021, an interim range plan was completed and approved by the Wek'èezhìı Renewable Resources Board. At the time, an interim range plan was necessary to fulfill Measure 6-1, Part 1 of the Mackenzie Valley Environmental Impact Review Board's Report of Environmental Assessment and Reasons for Decision for the Tłı̨chǫ All-Season Road (TASR; now known as Tłı̨chǫ Highway) project. This measure required that the Range Plan be completed and submitted to WRRB 90 days before the opening of the Tłı̨chǫ Highway. The Tłı̨chǫ Highway project was completed in November 2021. This full Range Plan replaces the interim range plan.

Total Habitat Disturbance Limits

The regional total habitat disturbance limit for the Wek'èezhìı range planning region was defined in the Framework. Habitat disturbance includes natural changes to caribou habitat (e.g., wildfire) and human activities such as industrial development and infrastructure. Regional total disturbance limits represent the combined amount of human and wildfire disturbance each region can accommodate while still maintaining a self-sustaining boreal caribou population. The total disturbance limit (including fire and human disturbance) in the Wek'èezhìı region is 40%.

A region's natural range of fire disturbance (i.e., the difference between typical fire disturbance and potential maximum fire disturbance) in turn defines the range of human disturbance that region can likely tolerate without exceeding the total disturbance limit. This is referred to as the human disturbance threshold. The fire footprint in the Wek'èezhìı range planning region allows for a human disturbance range of between 4.5% and 11%.

The Framework established a tiered management system in which the human disturbance tier that a region falls within, informs which combination of management classes are included in the regional range plan: Basic, Enhanced or Intensive. The Wek'èezhìı region would fall within Tier 1 if human disturbance remains below 4.5%, Tier 2 if disturbance increases but stays between 4.5% and 11%, and Tier 3 if disturbance were to exceed 11%. The current human disturbance is 1.0% of the Wek'èezhìı range planning region (Tier 1).

Since the Wek'èezhìı range planning region falls within Tier 1, it requires a minimum of one third of habitat in the Enhanced management class (which requires more stringent management actions than the Basic management class) and no more than two thirds of habitat in the Basic class (where management actions are not as strict).

Maps of Important Areas for Boreal Caribou and Management Classes

The Tłı̨chǫ Government and the North Slave Métis Alliance conducted community meetings and interviews with Elders and harvesters to gather TK about boreal caribou and their habitat. Together, TK and scientific information were used to develop maps of important areas for boreal caribou. These maps were then used to develop different scenarios for management class areas. Some of these scenarios considered economic development potential and existing land protections to help define potential management class areas.

At meetings in spring 2021, the Working Group collectively decided that a more conservative approach to the map of management classes would be best to protect boreal caribou. The Working Group agreed that areas along the shoreline of the North Arm of Great Slave Lake overlapping with the proposed Dınàgà Wek'èhodì protected area should be classified as intensive management areas because of their importance as calving sites. They also designated a large area to the west of Lac La Martre, as well as Whitebeach Point and areas just to the south, as intensive management areas for the same reason.

In 2023, in southern NWT and the Wek'èezhìı region, discussions took place about the management classes and corresponding percentages for Basic, Enhanced and Intensive classes. It was ultimately decided that protected areas should be made into a fourth management class for all the range plans. Protected areas would be similar to the Intensive management class since both have similar, more stringent rules, compared to Enhanced and Basic Management classes, including no development at certain times of year.

It should be noted that the protected areas within the Wek'èezhìı boreal caribou range are not protected under the *NWT Protected Areas Act* or managed by GNWT. Wehexlaxodiale Protected area is managed as a Land Use Exclusion Zone under the TLUP. Ezǫdzìtì is classified as a *Tłı̨chǫ Heritage Area* and has permanent protection from the granting of any interests by Government.

Some areas with development interests and higher resource development potential remained in the Basic management class and will not be affected by the Range Plan. This includes a 2 km minimum corridor width along Highway 3 and the Tłı̨chǫ Highway to allow for ongoing activities related to road maintenance.

Overall, for this full range plan, the Working Group agreed to a final division of management classes as follows: 55.02% of habitat was assigned as Basic management class, 28.07% was assigned as Enhanced management class, and 14.00% was assigned as Intensive management class in the Wek'èezhìı range planning region.

Combined, the Ezǫdzìtì and Wehexlaxodiale make up the Protected Areas management class, which constitutes 2.90% of the Wek'èezhìı boreal caribou range.

Management Actions

Management actions do not apply to the Protected Areas since Protected Areas are managed under the Tłı̨chǫ Government, including the Tłı̨chǫ Land Use Plan (TLUP). The management actions in the Range Plan vary according to the three management classes presented in the Framework.

- *Basic management class areas:* development should follow standard mitigation procedures that are currently in place. Proponents are encouraged to follow best practices and guidelines for boreal caribou.
- *Enhanced and Intensive management class areas:* actions become progressively more stringent. The goal is a net gain or, at the least, no net loss of undisturbed habitat in these areas.
- *Protected Areas management class:* There is no industrial development allowed in protected areas, under the Tłı̨chǫ Government legislation.

The management actions are grouped according to a standard mitigation hierarchy, which seeks to (a) avoid new disturbance, then (b) minimize necessary new disturbance as much as practicable and lastly, (c) restore and/or offset any residual disturbance. At the Working Group meetings, it was decided that the management actions proposed in the Framework would be included with some additions and changes for the Range Plan.

Areas repeatedly used for calving (such as islands and shorelines) within Intensive management class areas should be completely avoided. Specific management actions have been added to reduce or avoid sensory disturbances at the times of year when the caribou would be most sensitive (calving, post-calving and late winter).

Additional details have been added to clarify:

- When functional and ecological restoration is advised for a proposed development's direct disturbance footprint;
- What criteria can be used to determine that a site is adequately restored; and
- When are habitat offsets recommended to compensate for new long-term habitat disturbance.

In Enhanced and Intensive management areas, a developer's closure and reclamation plans should show how project disturbance will be functionally and ecologically restored. If a proposed project cannot avoid new long-term disturbance footprints, typically developers would be expected to create a habitat offset plan that describes restoration of other areas of disturbance. However, due to limited experience and guidance for habitat offsets within the NWT, the Working Group recommended that other forms of offsetting be considered, such as contributions toward research on restoration in lieu of restoration-based habitat offsets carried out by the developer.

Implementation Tools

The proposed legislative tools to implement the Wek'èezhìı range plan include the TLUP, the *Species at Risk (NWT) Act*, the NWT *Wildlife Act*, and the *NWT Forest Act* and the federal *Species at Risk Act*. The TLUP overlaps with 19.2% of the Wek'èezhìı boreal caribou range planning region.

The majority (80.4%) of the Wek'èezhìı boreal caribou range planning region falls within lands that are currently managed by the GNWT. Various sections and/or regulation making powers under the NWT *Wildlife*

Act are being considered but the two sections below are the preferred implementation instruments for the Range Plan on territorially managed lands.

Section 93 of the NWT *Wildlife Act* focuses on protection of habitat for the conservation of specified wildlife species. This section was chosen because habitat can be defined either geographically or qualitatively. This section can also include preparing regulations stipulating that a developer should follow the management actions outlined in the approved Range Plan.

Under **Section 95**, developers can be required to prepare and comply with a Minister-approved Wildlife Management and Monitoring Plan (WMMP). The requirement of a WMMP is done on a case-by-case basis depending on the potential impacts of a development project. The information contained within this range plan may be used to develop the mitigation strategies outlined in a WMMP. For management actions related specifically to timber harvesting, the current *Forest Act* and its associated regulations will be the primary implementation instrument.

There is a very small parcel of federally administered land in the Wek'èezhìı range planning region where an active mineral lease exists. Federally administered lands within the NT1 boreal caribou range are subject to a federal order under SARA that protects boreal caribou critical habitat. Proponents can apply for a federal SARA permit to carry out activities that might affect critical habitat if certain conditions are met.

Timeline

This Range Plan will remain in effect until the scheduled ten-year review and update is completed, unless a five-year mid-term Range Plan review is triggered and then completed. Triggers for a five-year review and update are provided in Table 10.

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Acronyms

ASTH	Allowable Sustainable Timber Harvest
BC	British Columbia
CIMP	Cumulative Impact Monitoring Program
CMA	Conference of Management Authorities
EA	Environmental Assessment
ECC	Environment and Climate Change (GNWT)
ECCC	Environment and Climate Change Canada
EIA	Department of Executive and Indigenous Affairs
ENR	Department of Environment and Natural Resources
FMA	Forest Management Agreement
FMD	ECC Forest Management Division
FVI	Forest Vegetation Inventory
GIS	Geographic Information System
GNWT	Government of the Northwest Territories
GPS	Global Positioning System
IGIOs	Indigenous Governments and Indigenous Organizations
ITI	Department of Industry, Tourism and Investment
MVEIRB	Mackenzie Valley Environmental Impact Review Board
MVLWB	Mackenzie Valley Land and Water Board
NSMA	North Slave Métis Alliance
NT1	“Northwest Territories” range of boreal caribou in Canada
NWT	Northwest Territories
RSF	Resource Selection Function
SARA	Federal Species at Risk Act
SARC	Species at Risk Committee
SK1	Saskatchewan’s “Boreal Shield” range of boreal caribou in Canada
SPARCS	Spatial Precipitation and Risk Calculation System
TG	Tłı̨chǫ Government
TK	Traditional Knowledge
TLUP	Tłı̨chǫ Land Use Plan
TRTI	Tłı̨chǫ Research and Training Institute
VAR	Value at Risk
WLWB	Wek’èezhìı Land and Water Board
WMMP	Wildlife Management and Monitoring Plan
WRRB	Wek’èezhìı Renewable Resources Board
YKDFN	Yellowknives Dene First Nation
ZOI	Zone of Influence

Glossary

Anthropogenic: caused by human activity.

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

Community Government: a corporation established under or continued by the Charter Communities Act, the Cities, Towns and Villages Act, the Hamlets Act, the Tłı̨chǫ Community Government Act, or any Designated First Nations Council.

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 in all ranges other than SK1, and a minimum of 40% undisturbed habitat in SK1; and, ii) biophysical attributes required by boreal caribou to carry out life processes.

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.

Direct disturbance: Direct disturbance that results from a project is calculated as the area of physical disturbance caused by that project (e.g., road surface).

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.

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 2024 is the total non-overlapping area burned by wildfires between 1985 and 2024.

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 western 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.

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.

Indigenous/traditional knowledge: knowledge and values, which have been acquired through experience, observation, from the land or from spiritual teachings, and handed down from one generation to another.

Large habitat patch: a patch of undisturbed habitat that is at least 100 km^2 in size.

Legacy disturbance: visible human disturbance footprints that persist on the landscape with little to no revegetation, or with a revegetated species that differs substantially from the surrounding undisturbed habitat; these human disturbance footprints have been abandoned and/or there is no proponent (company) currently responsible for their restoration.

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

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 that 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 are outlined. Three categories of management classes may be identified in each range plan – Basic, Enhanced and Intensive - representing increasingly intensive management actions.

Marxan: a spatial optimization program commonly used to support conservation planning, designed to achieve minimum targets for representation of conservation features for the smallest possible cost or within the smallest area possible.

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).

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.

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.

Resource selection function (RSF): analytical framework used to model and generate predictive maps of animal habitat selection, which typically compare resource units associated with locations "used" by individuals to resource units associated with a random sample of locations that are available to individuals within a certain spatial scale of interest.

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.

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.

SK1: Saskatchewan's "Boreal Shield" range of boreal caribou in Canada.

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).

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.

Zone of Influence: the area surrounding a development feature (e.g., road, mine site) or settlement, where its effects on caribou density, behaviour or movement can be observed; this *Zone of Influence* usually has a perimeter at a specified distance around the development project/settlement, beyond which caribou density, movement or behavioural responses return to previous levels.

1. RANGE PLANNING IN THE NORTHWEST TERRITORIES

Introduction

Boreal caribou play an important role in the lives of people in the Northwest Territories (NWT). They are highly valued from a spiritual, cultural, and harvesting perspective. On a spiritual level, Indigenous people hold tremendous respect toward boreal caribou, and for many non-Indigenous people, boreal caribou are an indicator of a healthy ecosystem and a symbol of the North.

In various parts of Canada, boreal caribou are in serious decline due to extensive disturbance of their habitat. In the NWT, and the Wek'èezhìı region more specifically, there is still a great deal of intact habitat and a relatively healthy population of boreal caribou. However, careful land management, guided by range plans, will be necessary to maintain enough habitat to support a healthy caribou population into the future. The Boreal Caribou Range Plan: Wek'èezhìı Region (hereafter the Range Plan) is one of five regional range plans that is being developed in the NWT (Figure 1).

The development of this Range Plan was guided by the NWT *Framework for Boreal Caribou Range Planning* (the Framework) and extensive input from the Wek'èezhìı Boreal Caribou Range Plan Working Group (the Working Group). In the creation of the Range Plan, the Working Group has done its best to follow the suggested principles from the Framework including being informed by good science and traditional knowledge (TK)[1], being guided by people's relationship with caribou, and helping promote the social, economic, and cultural well-being of people in the NWT. Other Framework principles to which this Range Plan has attempted to adhere include:

- Promoting transparency in decision-making during the range planning process;
- Respecting Indigenous land claim agreements and asserted or established Aboriginal and/or Treaty rights, agreements, and principles;
- Respecting a collaborative process;
- Encouraging community engagement and involvement in implementing the Range Plan; and
- Recognizing the need to consider areas beyond each regional boundary to ensure habitat/genetic connectivity is maintained across the NT1 range.

The Working Group will continue to strive toward meeting all these principles in all future iterations of the Range Plan.

[1] The term "traditional knowledge" has been used instead of "Indigenous knowledge" to be consistent with the terminology used in some of the literature cited in the interim range plan, the GNWT's Traditional Knowledge Policy, and the section of the plan written by Tłı̨chǫ Government. However, it is recognized that the term "Indigenous knowledge" is sometimes used interchangeably, and was the term used in the Terms of Reference for the Working Group.

This Range Plan was preceded by an interim range plan, finalized in December 2021. The interim plan was completed at a very accelerated pace to meet the timeline of Measure 6-1, Part 1 from the Report of Environmental Assessment and Reasons for Decision for the Tłı̨chǫ All-Season Road project (now Tłı̨chǫ Highway). This measure required that the Range Plan be completed and submitted to Wek'èezhìı Renewable Resources Board 90 days before the opening of the Tłı̨chǫ Highway. The Tłı̨chǫ Highway project was completed in November 2021.

This full Range Plan includes more comprehensive TK and addresses some uncertainties in the interim plan. It also replaces the interim plan and has been developed based on the best TK and western science available at the time.

Figure 1. NWT boreal caribou range planning regions.

1.1 Recovery Planning and Range Planning in the Northwest Territories

Recovery planning for species at risk takes place in the NWT under the *Species at Risk (NWT) Act* and under the federal *Species at Risk Act* (SARA). Management actions accompany this legislation to help species at risk recover, and local community governments have monitoring and management projects that also add to the recovery of species.

Under both the federal and territorial species at risk legislation, boreal caribou (*Rangifer tarandus caribou)* were listed as threatened in 2003 and 2014, respectively. The NWT Species at Risk Committee (SARC) reassessed boreal caribou as threatened under the *Species at Risk (NWT) Act* in 2022 (SARC 2022). According to the territorial legislation, being assessed as threatened indicates that a species is likely to become endangered in the NWT if nothing is done to reverse the factors leading to its extirpation or extinction.

If a species is listed as threatened under the federal SARA legislation, a recovery strategy identifying critical habitat must be produced within two years. Environment and Climate Change Canada (ECCC) completed a national recovery strategy for boreal caribou in 2012 (Environment Canada 2012), which was then amended in 2020 (ECCC 2020). In the amended recovery strategy, critical habitat is identified as: 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 in all ranges other than in Saskatchewan, and a minimum of 40% undisturbed habitat in SK1; and ii) biophysical attributes required by boreal caribou to carry out life processes (ECCC 2020).

For boreal caribou, critical habitat describes the habitat necessary to maintain or recover self-sustaining local populations throughout their distribution. In creating the national recovery strategy, 65% undisturbed habitat was established as the management threshold that would provide a 60% probability for a local population to remain or become self-sustaining (Environment Canada 2008; Environment Canada 2011). This threshold is considered a minimum threshold because at 65% undisturbed habitat, there still remains a significant risk (40%) that a local population will not be self-sustaining. The national recovery strategy released in 2012 directed the provinces and territories to each write range plans for their respective jurisdictions to demonstrate how habitat disturbance would be managed to achieve this target.

When a species is listed as threatened under the *Species at Risk (NWT) Act*, a recovery strategy must be prepared within two years of its listing. Recovery strategies are action-oriented planning tools that focus on activities for the protection and recovery of the species. They include an action framework that details specific actions to be undertaken by the management authorities responsible for boreal caribou.

The *NWT Recovery Strategy for Boreal Caribou* was completed in 2017 (and was accepted again as the recovery strategy in 2024 after the reassessment of boreal caribou as threatened in 2022). Its six main objectives consisted of the following: 1) Ensure there is adequate habitat across the NWT range to maintain a healthy and sustainable population of boreal caribou; 2) Ensure that harvest of boreal

caribou is sustainable; 3) Obtain information to inform sound management decisions, including boreal caribou ecology, key habitat and population indicators, and cumulative effects; 4) Manage boreal caribou collaboratively, using adaptive management practices and the best available information; 5) Exchange information with NWT people about boreal caribou in all regions; and 6) Ensure (federal) recovery obligations for protecting critical habitat and maintaining a self-sustaining population are met or exceeded in NWT (CMA 2017).

As part of the implementation agreement that follows all recovery strategies (legislated under the *Species at Risk (NWT) Act*), and specific to Objectives #1 and #6, all the management authorities - including the Government of the Northwest Territories (GNWT) - committed to preparing range plans for the NT1 range of boreal caribou.

The first step of the range planning process in the NWT was the creation of the *Framework for Boreal Caribou Range Planning* (GNWT 2019). The Framework provides a foundation and acts as a guide to producing five regional range plans in the territory: Southern NWT, Wek'èezhìı, Sahtú, Gwich'in and Inuvialuit. It provides a consistent management approach that can be tailored to each region, while focussing on maintaining at least 65% undisturbed habitat across the NT1 range. As boreal caribou are more likely to select patches of residual forest habitat greater than 100km^2 in size (Lesmerises et al. 2013), the Framework also aims to achieve or maintain a permanent supply of large patches (> 100 km^2) of suitable habitat within each region of the NT1 range. This will help conserve habitat connectivity throughout the range and sustain the features of high-quality caribou habitat. The main driver in the design of the Framework was caribou conservation, and this will be reflected in all the regional range plans, including the Wek'èezhìı region.

The completion of this Range Plan will not only help to fulfill the legal requirements under both federal and territorial species at risk legislation but also aims to reflect the main goal of the Framework: **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**.

1.2 Range Plan Development

Responsibility for management and stewardship of boreal caribou and their habitat is shared amongst wildlife and land management authorities across the NWT, including the GNWT, Indigenous Governments and Indigenous Organizations (IGIOs), renewable resources boards, regulatory boards, land use planning boards, and federal government agencies. In addition, many stakeholders take part in decisions about land management across the NWT. Therefore, successful development and implementation of boreal caribou range plans requires a collaborative approach.

The GNWT convened the Wek'èezhìı Boreal Caribou Range Planning Working Group to work collaboratively to develop a range plan for boreal caribou habitat in the Wek'èezhìı region. The

Working Group is intended to represent all key interests[2] and serves as the primary forum for developing the Range Plan. The mandate of the Working Group is to take a collaborative and interest-based approach where all participants are invested in developing a mutually beneficial Range Plan that will provide direction for management of boreal caribou habitat.

The Working Group convened in regular workshops between November 2019 and December 2024 to develop the Range Plan, following these high-level steps in the process:

1. Develop caribou habitat importance maps, based on TK and scientific information;
2. Gather relevant information on other land uses to inform planning, such as direction from land use plans, location of protected areas, infrastructure plans, resource tenures, and resource potential;
3. Co-develop a range of alternative management class maps that follow the guidance in the Framework and reflect a balance among the interests of affected parties, as represented by regional Working Group members, and seek consensus on a preferred map;
4. Identify management actions for each management class area and specific relevant implementation approaches; and
5. Recommend monitoring and adaptive management needs to fill important knowledge gaps.

The draft Range Plan was written by the GNWT Department of Environment and Climate Change (GNWT-ECC), Zoetica Environmental Consulting Services, the Tłı̨chǫ Government and North Slave Métis Alliance (NSMA), and was distributed to the Working Group for review. The Tłı̨chǫ Government and North Slave Métis Alliance (NSMA) indicated a preference for their Traditional Knowledge (TK) to be included in the range plan independently of western science, rather than being incorporated together. The Tłı̨chǫ Government and NSMA also wrote the sections of the Range Plan describing the process and results from their respective TK mapping workshops and interviews. The final draft Range Plan was circulated for public review. Following public review, it was submitted to the Wek'èezhìı Renewable Resources Board (WRRB) as a wildlife management proposal for WRRB's review and recommendation.

The interim range plan:
An interim boreal caribou range plan was finalized in fall 2021 at a very accelerated pace to meet the timeline of Measure 6-1, Part 1 from the *Report of Environmental Assessment and Reasons for Decision* for the Tłı̨chǫ Highway. This measure required that the Range Plan be completed and submitted to WRRB 90 days before the opening of the Tłı̨chǫ Highway. The Tłı̨chǫ Highway project was completed in November 2021. The interim plan development process followed the same collaborative approach and high-level steps described above, with the Working Group serving as the primary forum for its development. This full boreal caribou Range Plan has also been developed by the Working Group; it includes more comprehensive TK and addresses some uncertainties in the interim plan. This full Range Plan also replaces the interim range plan.

[2] Economic development interests were represented by the GNWT Department of Industry, Tourism and Investment. Private industry interests are represented on an External Stakeholders Advisory Working Group, which was provided with an opportunity to review the draft range plan once it was completed.

Who was involved in the range planning process?

The Working Group consists of representatives from a cross-section of affected parties, including Tłı̨chǫ Government, Yellowknives Dene First Nation (YKDFN), North Slave Métis Alliance (NSMA), The Wek'èezhìı Renewable Resources Board (WRRB), Environment and Climate Change (ECCC), and GNWT departments, including Executive and Indigenous Affairs; Industry, Tourism, and Investment; and the following GNWT-ECC divisions: Land Use and Sustainability, Wildlife Management, Forest Management, Conservation and Sustainable Livelihoods, and Wildlife and Forest Management - North Slave Region. GNWT-ECC is responsible for leading collaborative range planning across five regions of the NWT. GNWT-ECC is also responsible for ensuring that the GNWT meets its obligations to Canada's *Species at Risk Act* and the commitments under its Section 11 Agreement (2019). GNWT-ECC has, and will continue to, lead the GNWT's duty to consult with Indigenous peoples with respect to asserted or established Aboriginal and/or Treaty rights, through engaging Indigenous peoples throughout this planning process. An open public comment period on the final draft Range Plan collected input from the broader public and organizations that are not represented in the Working Group.

GNWT-ECC strives to align range planning, as much as possible, with concurrent NWT mandates and land interests by engaging broadly with GNWT department representatives through a Boreal Caribou Range Plan Outcomes Review Group and communicating to stakeholders through presentations, infographics and email updates.

Between August 2019 and March 2020, Compass Resource Management served as neutral third-party analysts and facilitators, and EcoBorealis Consulting provided independent technical support and caribou ecology expertise for the Wek'èezhìı boreal caribou range planning process. From September 2020 to December 2024, Zoetica Environmental Consulting Services took over these roles, and provided independent support for the use and interweaving of TK throughout the range planning process.

1.3 Wek'èezhìı Habitat Disturbance Limits

The national "Recovery Strategy for the Woodland Caribou (*Rangifer tarandus caribou*), Boreal population, in Canada" (Environment Canada 2012) and the amended recovery strategy (ECCC 2020) require maintaining at least 65% undisturbed habitat in the NT1 range as a whole to give boreal caribou a 60% chance of having a self-sustaining population. To achieve that goal, the Framework has identified a "minimum acceptable likelihood" that each range planning region should strive toward in order to support self-sustaining populations of boreal caribou in the NT1 range as a whole. This is partially informed by a "risk relationship" study conducted by ECCC in 2011. The regional minimum acceptable likelihood of maintaining self-sustaining populations in the Framework reflects differences in the natural levels of wildfire disturbance typical for each region (see Figure 6 in the Framework).

The Framework then defines “total disturbance limits” and tiered “human disturbance thresholds” based on those likelihoods. The regional total disturbance limit is the combined amount of human and wildfire disturbance each region can accommodate while still maintaining a self-sustaining boreal caribou population. The human disturbance thresholds were determined based on how much additional disturbance each region can accommodate (in order to stay within 65% undisturbed habitat). The thresholds are based on the difference between the typical fire disturbance and the maximum level of wildfire disturbance (see Figure 7 in the Framework and Figure 2 in this Range Plan.)

The Wek’èezhìı region has naturally high levels of wildfire, so the maximum total disturbance limit (human plus wildfire) is set at 40% (the equivalent to maintaining a minimum of 60% undisturbed habitat). This disturbance limit results in a 50% minimum acceptable likelihood of a self-sustaining population. If actual disturbance levels in every region were at their maximum total disturbance limits, the amount of disturbance in the NWT portion of the NT1 range would be 35%, thus respecting the threshold for critical habitat set out in the national recovery strategy (Environment Canada 2012; ECCC 2020). These total disturbance limits do not represent goals for disturbance in the NWT or in each region – instead, they represent management limits, beyond which the likelihood of maintaining self-sustaining caribou populations becomes unacceptably low.

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 outlined in the regional range plan.

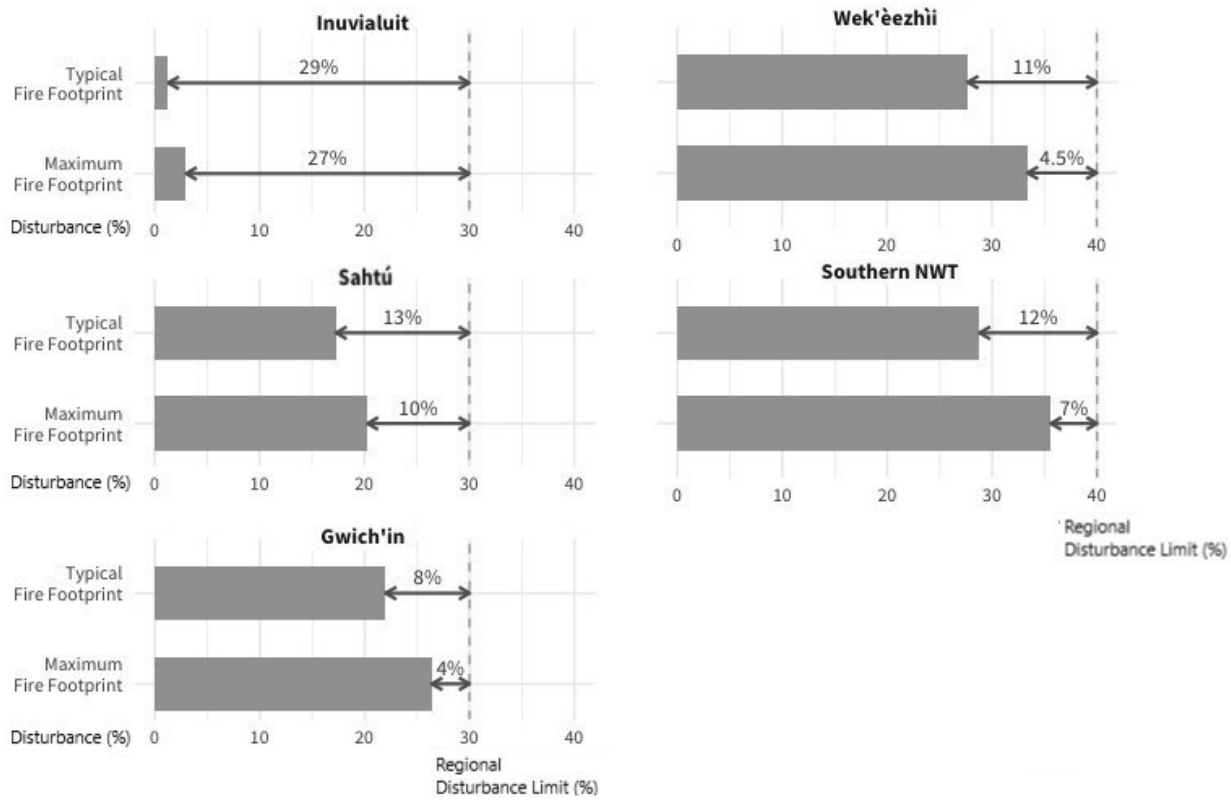


Figure 2. Regionally specific human disturbance thresholds (horizonal arrows) are based on the difference between typical (median) and maximum 40-year fire footprints (bars) and the regional total disturbance limits (vertical dashed lines). These differences become the upper and lower bounds of Tier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

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 (i.e., 40%), given observed fire footprints. Note that the Wek'èezhìı region is currently in Tier 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 2, there is a good chance that the region will stay below its long-term total disturbance limit. 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.

Table 1. Human disturbance thresholds tier assignments (reproduced from GNWT 2019).

Region	Total disturbance limit (%)	Human Disturbance Thresholds (%)			Current Human Disturbance		Mix of mgmt. classes required
		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'èezhìı	< 40	< 4.5	4.5 – 11	> 11	0.8	Tier 1	
Southern NWT	< 40	< 7	7 – 12	> 12	16.1	Tier 3	

2. CURRENT HABITAT CONDITION AND IMPORTANT AREAS FOR BOREAL CARIBOU

2.1. Habitat Condition and Disturbance levels

Within the Wek'èezhìı range planning region, there is currently 1.0% human disturbance (buffered by 500 m), 32.6% fire disturbance (fires up to 40 years old as of fall 2023) and 33.1% total disturbance (accounting for overlaps between human and fire disturbance footprints). These estimates include the alignment for the Tłı̨chǫ Highway project. This leaves a total of 66.9% undisturbed habitat in the Wek'èezhìı range planning region (including lakes).

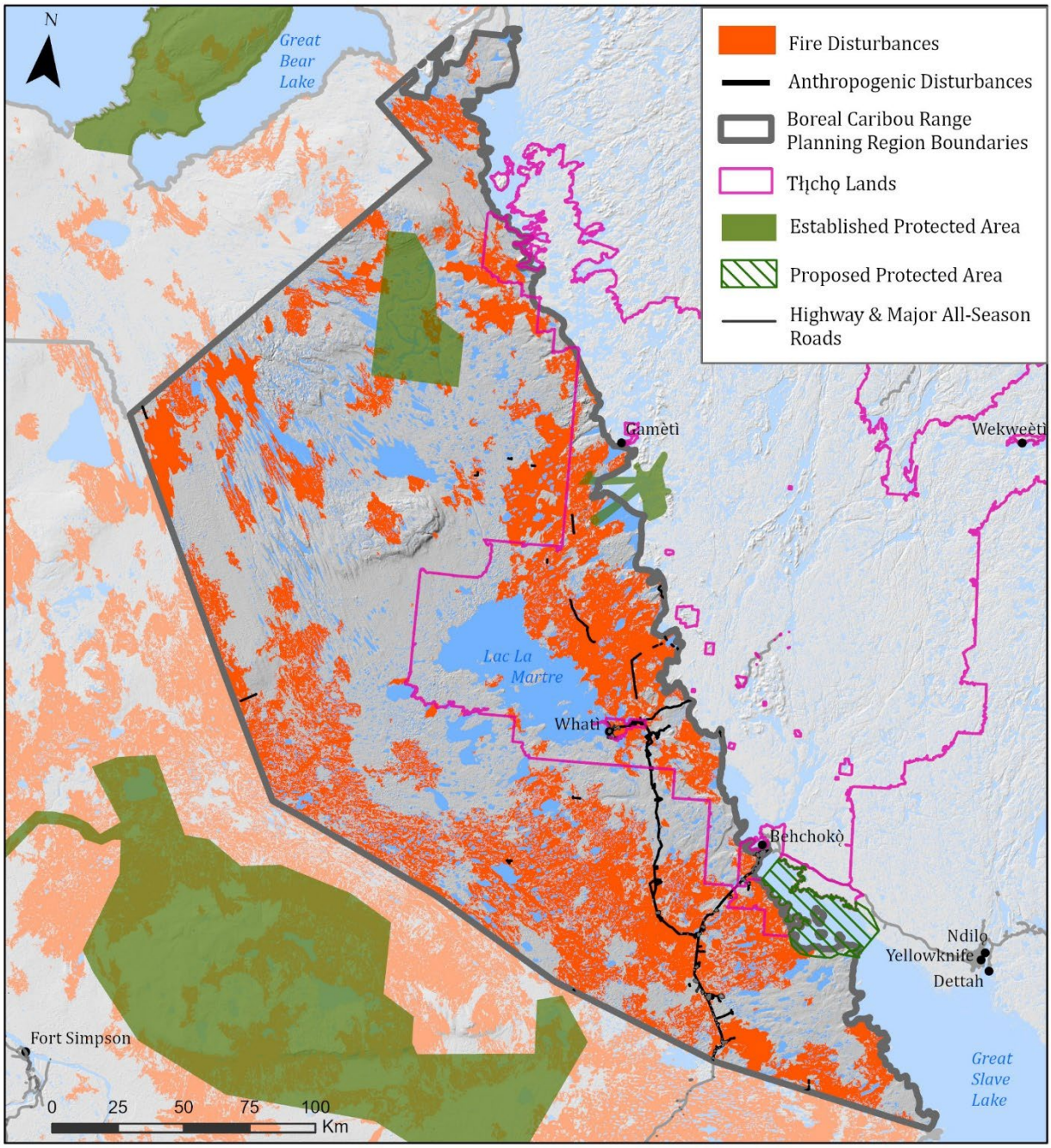


Figure 3. Current fire disturbance (up to 40 years old; 1984-2023 and anthropogenic disturbances (including 500 m buffer) which count towards the regional total disturbance limit. Fire disturbances are current to fall 2023, and anthropogenic disturbance is based on ECCC's 2020 buffered human disturbance layer, which includes the footprint for the Tłı̨chǫ Highway project.

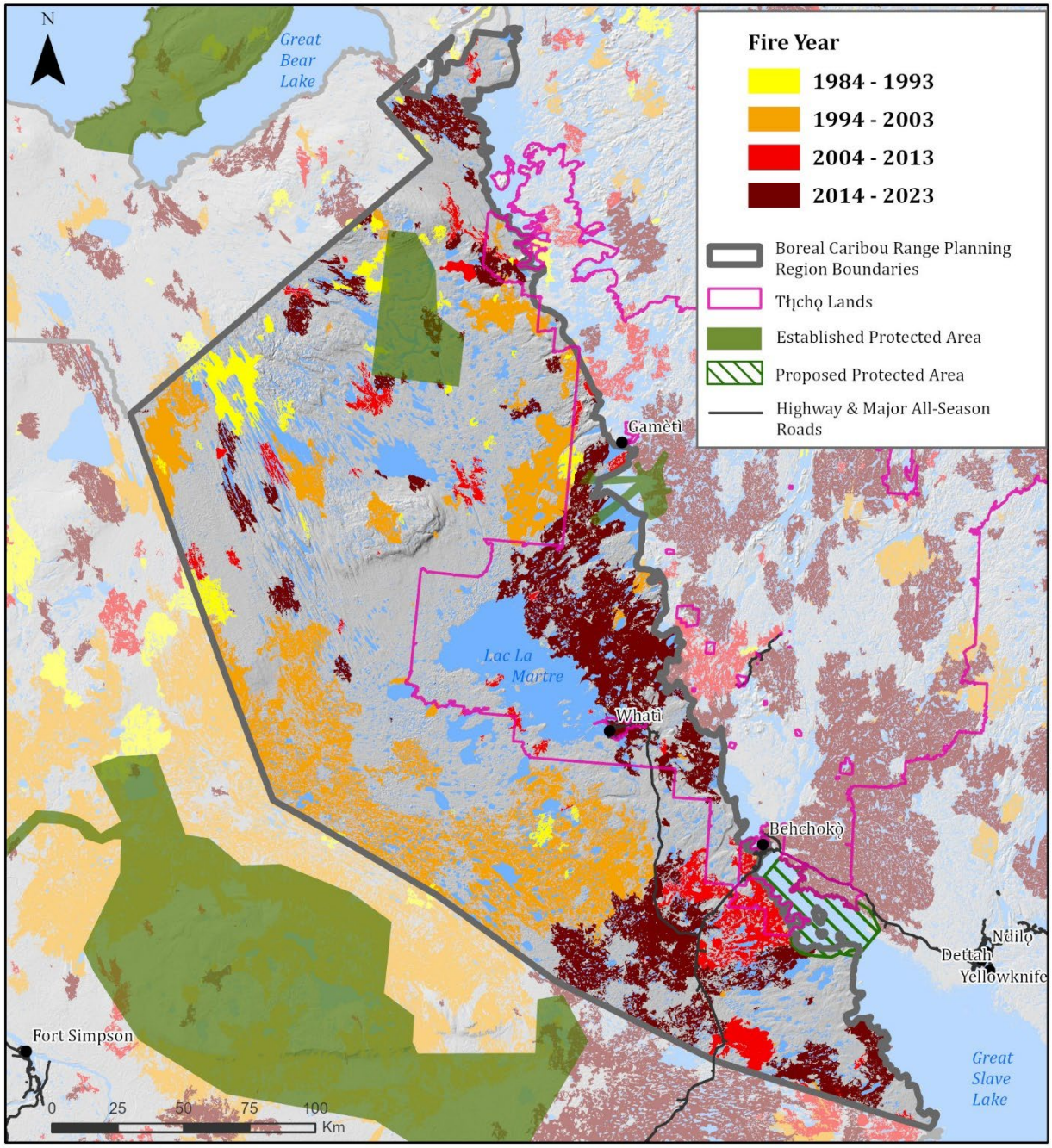


Figure 4. Fire disturbance history in Wek'èezhìı region: 1984 - 2023.

Table 2. Fire, anthropogenic, and combined disturbance within the Wek'èezhìı range planning region.

Area of Fire Disturbance[a] (ha)	Percent of Region
1,613,745.59	32.6%
Area of Human Disturbance[b] (ha)	**Percent of Region**
49,505.10	1.0%
Area of Fire and Human Disturbance[c] (ha)	**Percent of Region**
1,663,250.65	33.1%

[a] Fire disturbance is the combined 40-yr fire footprint from fires between 1984-2023.

[b] Human disturbance includes a 500 m buffer around it.

[c] This is the combined overlapping footprint of fire and human disturbance (i.e., "total disturbance").

Table 2 includes the size of the area (in hectares) and percentages of the Wek'èezhìı range planning region that are considered disturbed by either fire, human development, or a combination of both, based on the data displayed in Figure 3. Figure 4 shows the fire history for the region, beginning with fires ≤40 years old, broken down into different fire decades.

Table 3. Fire history by decade within the Wek'èezhìı range planning region, accounting for fire duplication between decades.

Year	Area (ha)	Percent of Region
1984 - 1993	103,122.1	2.08%
1994 - 2003	670,426.0	13.54%
2004 - 2013	195,128.6	3.94%
2014 - 2023	680,203.3	13.74%

Table 3 outlines the area (hectares) and percent of the region that has burned, broken down into different fire decades, based on the data displayed in Figure 4, (and accounting for fire duplication between decades). Figure 5 shows where there are other human disturbances (no buffer included) that have been mapped in other datasets that may not be captured in ECCC's 30 m resolution human disturbance data displayed in Figure 3. These datasets include footprints from the NWT Cumulative Impact Monitoring Program (NWT CIMP) – Inventory of Landscape Change project. The footprints are based on Land and Water Board (LWB) permit registry records, disturbance features that were mapped within 10 km of Highway 3 and the Tłı̨chǫ Highway for the *Tłı̨chǫ All-Season Road Caribou (tǫdzı) Habitat Offset Plan* (Associated Environmental 2021), and a 15 m resolution disturbance

dataset produced by ECCC in 2015. The disturbance features in these datasets were mapped using higher resolution satellite imagery than ECCC's 30 m resolution disturbance dataset, which is the one used to measure disturbance levels relative to the critical habitat threshold in the national recovery strategy. Because these other human disturbance features are too fine scale to be detectable in the ECCC's 30 m resolution dataset, they are not included in the calculations of percentage disturbance relative to the regional disturbance limits and thresholds set out in the Framework.

Figure 5 illustrates that most of the human disturbance in the region is concentrated along Highway 3 and the Tłı̨chǫ Highway alignment. Figure 6 shows a map of undisturbed terrestrial habitat (excluding water bodies greater than 1 km^2 in size, mapped at a scale of 1:50,000) within the Wek'èezhìı range planning region, which makes up 28,154 km^2 (56.8%) of the region. This map is essentially the inverse of Figure 3 (but with water bodies excluded) and illustrates that most of the currently undisturbed habitat is concentrated in the northern half of the region, with few large patches remaining south of Lac La Martre.

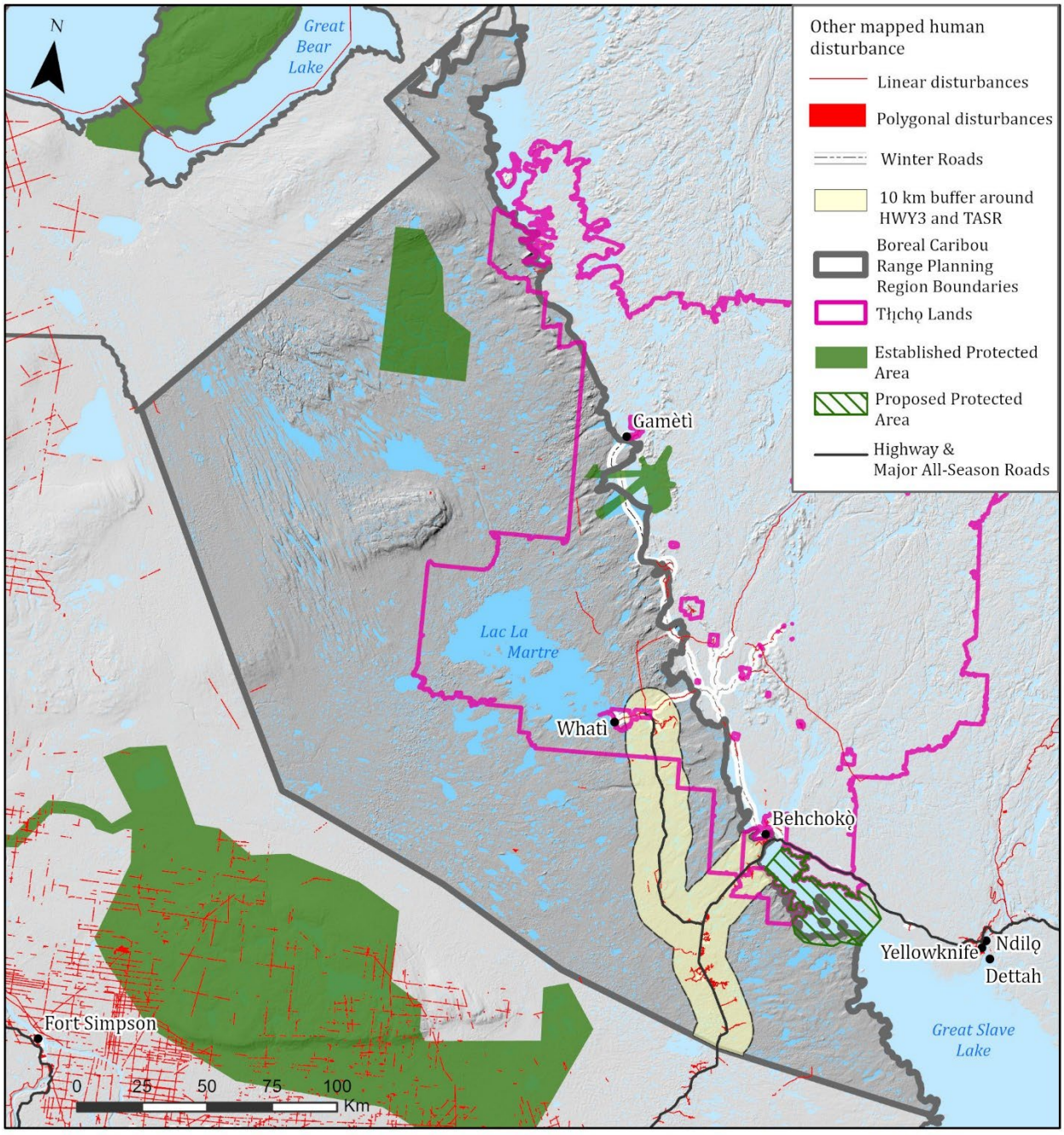


Figure 5. Other mapped anthropogenic disturbance.

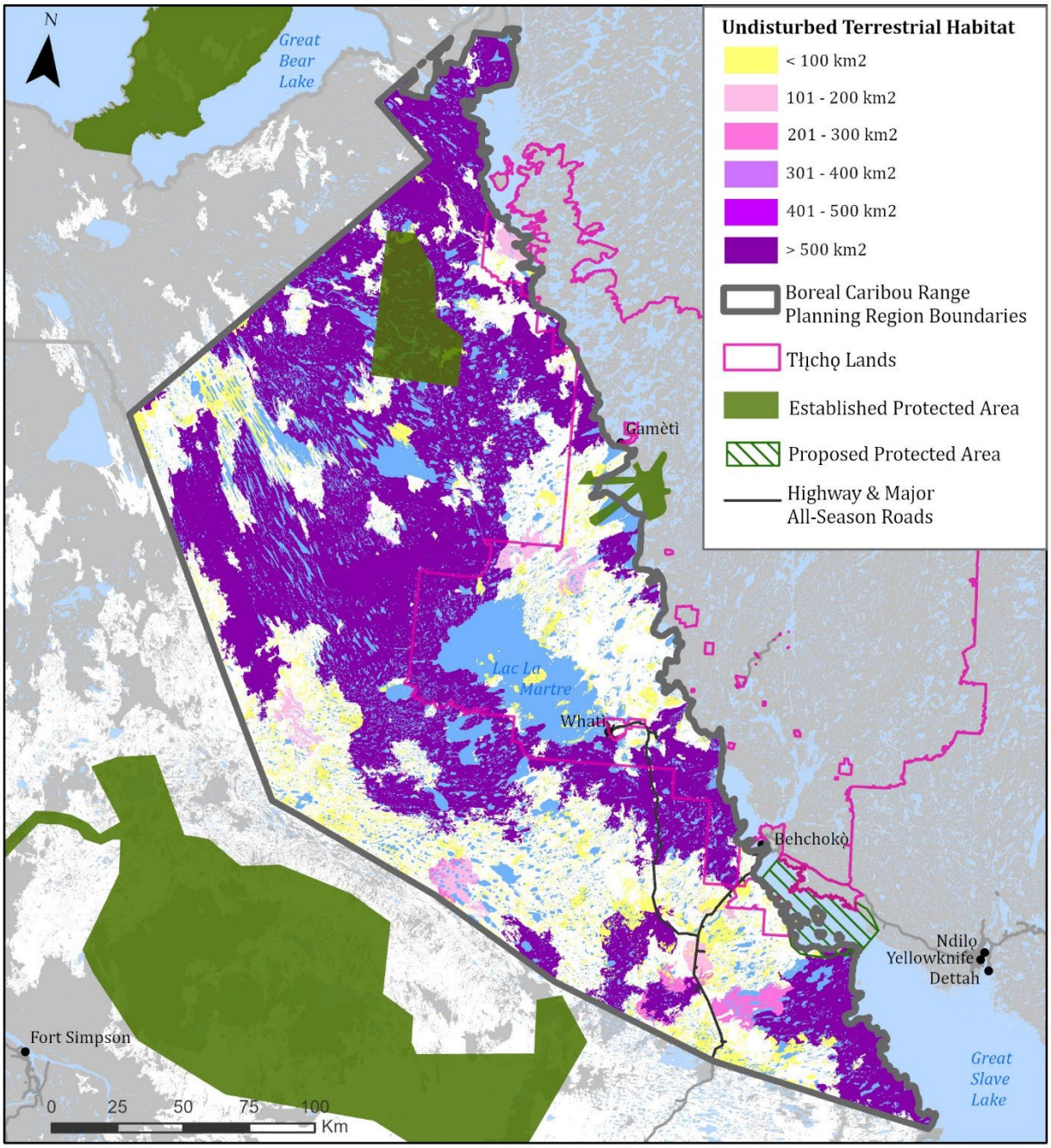


Figure 6. Undisturbed boreal caribou habitat (excludes lakes mapped at a 1:50,000 scale) within the Wek'èezhìı range planning region. Accounts for fire disturbance up to 2023 and human disturbance to 2020.

2.2. Review of Traditional Knowledge and Western Scientific Literature about Boreal caribou Habitat Selection and Use

There is information available from both western scientific studies and TK and local knowledge that supports a general understanding of seasonal habitat selection, and habitat avoidance, by boreal caribou. For the most part, both western scientific and TK information corroborate one another, and provide an enhanced understanding of boreal caribou habitat selection. Within this section, the state of knowledge about habitat selection gleaned from relevant western scientific studies, an RSF study conducted in support of this range planning process, and TK/local knowledge are highlighted.

Biophysical attributes (i.e., habitat types) recommended for consideration as critical habitat for boreal caribou within the Taiga Plains Ecozone have previously been described in Appendix H of the national boreal caribou recovery strategy (ECCC 2020). While this ecozone includes the Wek'èezhìı region, it spans a much wider area that includes the NWT, and portions of the eastern Yukon, northern Alberta, and northeastern BC. Habitat selection patterns are partially influenced by the relative availability of biophysical attributes available to boreal caribou and these will vary among planning units (ECCC 2020). The Wek'èezhìı range plan was developed with an emphasis on the biophysical selection patterns revealed in local studies, local knowledge and TK, and RSF products created using collared caribou data that overlap the Wek'èezhìı region. These more local sources of information will lead to a more accurate understanding of habitat selection patterns within the region, and they are still generally consistent with the biophysical attributes listed in Appendix H of ECCC (2020).

2.2.1 Caribou Habitat Selection – Western Science

Habitat selection by boreal caribou is generally understood to be based on the species' need to support the energetic and nutrient requirements of life-history activities associated with the season (e.g., gestation, lactation, movement, growth, insect avoidance), while avoiding mortality risks (e.g., areas with high predation). The balance of these primary drivers will vary through the seasons. The need to prioritize one over the other will also vary with habitat quality and availability, and the degree to which the species may face other pressures causing displacement from optimal habitat (ECCC 2020). Western scientific studies have generally shown that boreal caribou require large tracts of mature and old growth coniferous forests and muskeg (treed wetlands), particularly those that contain jack pine, black spruce, and tamarack forests with lichens, sedges and mosses for forage (SARC 2022; ESTR Secretariat 2013; Appendix H in ECCC 2020). Studies have generally supported the importance of habitat connectivity that permits boreal caribou movement between seasonally important habitats and among ranges, and that habitat selection and avoidance patterns differ among seasons (SARC 2022; ESTR Secretariat 2013; Appendix H *in* ECCC 2020.) See Appendix B for seasonal boreal caribou habitat selection maps.

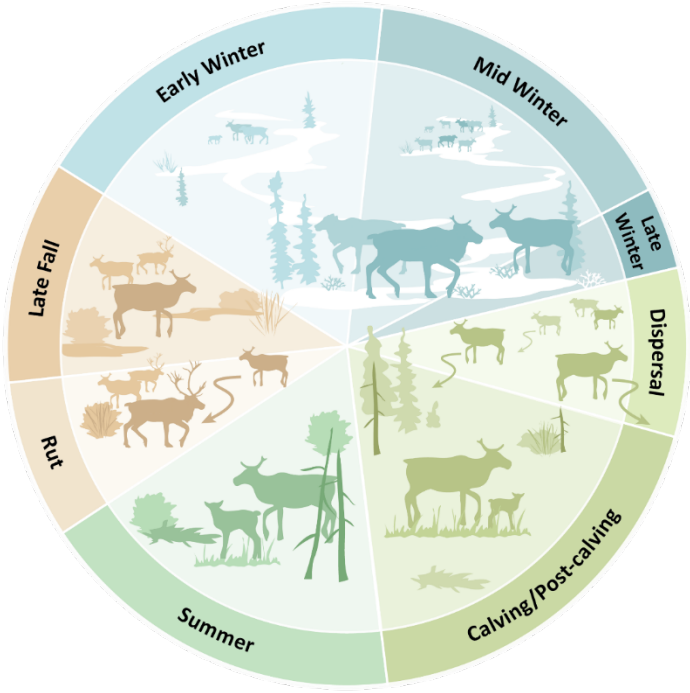
Western scientific studies have provided information on patterns of seasonally specific habitat selection in the NWT. Boreal caribou can be viewed as moving through four general seasons: 1) calving/post-calving (May to July), (2) summer (July to September), (3) rutting/fall (September to November), and (4) over-wintering (November to April), which are outlined in Figure 7. Within each of the general seasonal periods, boreal caribou behaviour has been further broken down into seasonal activity periods based on marked changes in daily movement rates.

During the calving/post calving period, boreal caribou females generally become more solitary as cows disperse to have their young (ECCC 2020). Many different types of habitats are potentially used during calving, with areas of high predator densities generally avoided (SARC 2012; ESTR Secretariat 2013; ECCC 2020). During the calving/post calving period, the selection of open coniferous forests, tussock tundra, low shrub, riparian habitat, recently burned areas, south and west aspects, and hills/higher locations have all been noted (ECCC 2020). Calving has also been noted to occur in muskegs, marshes, and other water sources (ECCC 2020). Boreal caribou have also been noted to use small islands of mature black spruce or mixed forest within peatlands in old burns at the edge of wetlands in alder thickets with abundant standing water on lake shores (ECCC 2020). During calving, boreal caribou have also been noted to use old burns and neighbouring remnant unburned forests surrounding burns (ECCC 2020).

As boreal caribou calves age, habitat selection may shift through the summer and into the fall rutting period, toward areas that allow for the building up of body fat and mass to carry animals through the winter months; this is especially important for adult females to meet the nutritional and energetic demand of lactation, gestation of young during the fall and winter, and calving the following spring (Denryter et al. 2020; Parker et al. 2009).

Western science provides information on general patterns of habitat avoidance in boreal caribou. Boreal caribou generally avoid areas with high levels of habitat fragmentation, such as seismic lines and other linear disturbances such as low use roads, as such features can benefit the hunting efficiency of predators like wolves (SARC 2022; ECCC 2020). However, the relationship between predators, prey, and roads is complex. Predictions regarding whether predators will use roads for hunting prey appear to be mediated by factors including overall development in an area and total road density, the main predator species' tolerance for traffic, and the predators' prior experience with human hunting (e.g., Dussault et al. 2012; Leblond et al. 2013). Boreal caribou have also been described as avoiding areas affected by forest fires and in some cases shifting their range to avoid fire disturbed areas (SARC 2012; ESTR Secretariat 2013; ECCC 2020); however, boreal caribou also select certain regenerating burns and adjacent habitat during some life-history phases (ECCC 2020). An RSF analysis of collar data in the NWT (DeMars et al. 2020) is described in more detail below and demonstrates the interaction between life-history phase and post-fire regeneration stage.

In the NWT, boreal caribou spend the longest period of their annual cycle over-wintering. Boreal caribou are adapted to feeding on lichens, and to travelling on and foraging in snow. They require habitat with arboreal lichen (tree lichen) and generally shallower snow (i.e., accomplished through snow interception of the canopy, wind and/or aspect and elevation) to enable efficient foraging for ground lichens (e.g., mature coniferous with closed canopies and upland or hilly areas exposed to wind). As snow depth increases, they remain in areas of dense pine or thick wooded black spruce with hanging lichen and access to open, mixed vegetation for ground forage. In late winter and early spring, they select habitat with both terrestrial and arboreal lichens.



Activity period	Habitat use and needs
Early Winter 1 Dec - 25 Jan	Caribou select sparse and open conifer forests, wetlands, or other areas providing accessible forage under shallow snow, especially lichens, grasses, sedges and shrubs. Movement is reduced likely due to snow accumulation and energy conservation.
Mid Winter 26 Jan - 15 Mar	Caribou use mainly conifer forests and wetlands that offer high lichen biomass, thermal protection, and reduced predation risk. Caribou continue to decrease their movements and increasingly group up.
Late Winter 16 Mar - 1 Apr	Caribou are condensed in larger groups with very low daily movement at this time of year. They are mainly using mature conifer forests, mixedwood forests and wetlands, aggregating where there are abundant lichens and conserving energy reserves.
Dispersal 2 Apr - 30 Apr	Females exhibit high mobility, seeking safe, isolated areas for calving. Habitat use is variable and exploratory. Diet shifts from primarily lichen-based to a variety of plants.
Calving/Post-calving 1 May - 30 Jun	Females space away from predators and other caribou and use primarily non-treed or sparsely treed landscapes and wetlands. Movement is reduced to avoid detection by predators and protect calves. Nutrient-rich foods are sought to replenish depleted previous year energy reserves.
Summer 1 Jul - 12 Sep	Female caribou seek nutrient-rich vegetation and low predator density in bogs, fens, and recent burns, to support lactation and protect calves. Open visibility of habitat may help detect predators. Females are spread out across the landscape. Daily movements increase somewhat as calves become more mobile.
Rut/ Early fall 13 Sep - 4 Oct	Habitat use becomes more variable and movement increases to support reproductive behaviors.
Late Fall 5 Oct - 30 Nov	Daily movements decline as caribou begin transitioning to winter diets and seeking out areas with abundant lichens, thermal cover and protection from predators. Caribou start to use older burn areas and dense forests.

Figure 7. Activity periods for boreal caribou within the Wek'èezhìı range. The date ranges are based on an analysis of movement rates conducted by Nagy 2011, which were updated and modified in an assessment of seasonal habitat selection patterns conducted by DeMars et al. 2020.

2.2.2 Boreal Caribou Habitat Selection in the Northwest Territories

A spatial representation of boreal caribou habitat selection and identification of areas important to boreal caribou was essential for the development of this Range Plan. Although ample information is available on this topic, additional work needed to be done with this information to build maps of important boreal caribou habitat to inform range planning. A study was therefore commissioned between 2002 and 2018 to examine this feature of caribou behaviour in the NWT. Between 194 and 350 adult females contributed data to the different seasonal and all-year RSF model. The study used their collar location data in the North Slave Tłı̨chǫ Highway area within the Wek'èezhìı range planning region (DeMars et al. 2020).

Analyses considered habitat selection during 7 different activity periods (calving, summer, early fall, late fall, early winter, mid winter, and late winter), and an all-year model. The habitat selection models (RSFs) considered land cover types broken down into different decadal post-fire age categories (<10 years up to >60 years), and proximity or density of human disturbances like roads, seismic lines, well pads, cut blocks and settlements.

The RSF models were used to generate predictive maps of seasonal and year-round boreal caribou habitat preferences, reflecting fire disturbance current to 2019 (Figure 8, and Appendix B). The seasonal predictive RSF maps were then used in analyses with Marxan software (Ball et al. 2009) to

identify important areas that would provide the best habitat for boreal caribou across the different seasons (see Section 2.3.2). The RSF analysis also showed a pattern of boreal caribou avoiding major roads, and polygonal (non-linear) disturbances such as well pads and cut blocks, year-round. However, the strength of the avoidance was higher in the snow-free seasons. Boreal caribou also avoided areas with higher densities of linear disturbances (like seismic lines), and similarly, the strength of avoidance was higher in the snow-free seasons. Analyses also showed that, during the calving and summer seasons, recent burns (<10 years old) in several land cover types were among the top habitat selected. The preference for recent burns during calving and summer may reflect a greater abundance of nutritional forage in these areas at that time of year when it is important for lactating females raising calves (Denryter et al. 2020; Parker et al. 2009).

While boreal caribou showed higher selection for younger (<10 years) and older burns (>30 years), they avoided middle-aged burns (11-30 years). The strength of these avoidance and use patterns varied among seasons. From early fall to late winter, which collectively represent the longest seasonal period in the NWT, boreal caribou habitat preferences shifted towards greater use of coniferous, mixed wood, wetland and non-treed land cover types (e.g., bryoids and shrubs) that had not burned in at least 60 years, and to a lesser extent areas that had burned in the last 41-60 years. The switch to areas that had not burned in more than 60 years during winter likely reflects a reliance of boreal caribou on terrestrial and arboreal lichens as their main winter food, which are generally more abundant in older forests (Greuel et al. 2021). This RSF analysis also showed that, throughout the year, boreal caribou tended to strongly avoid older deciduous land cover types. Appendix H in ECCC (2020) corroborates this general pattern and suggests that caribou generally prefer forests that are >100 years old within the Taiga Plains.

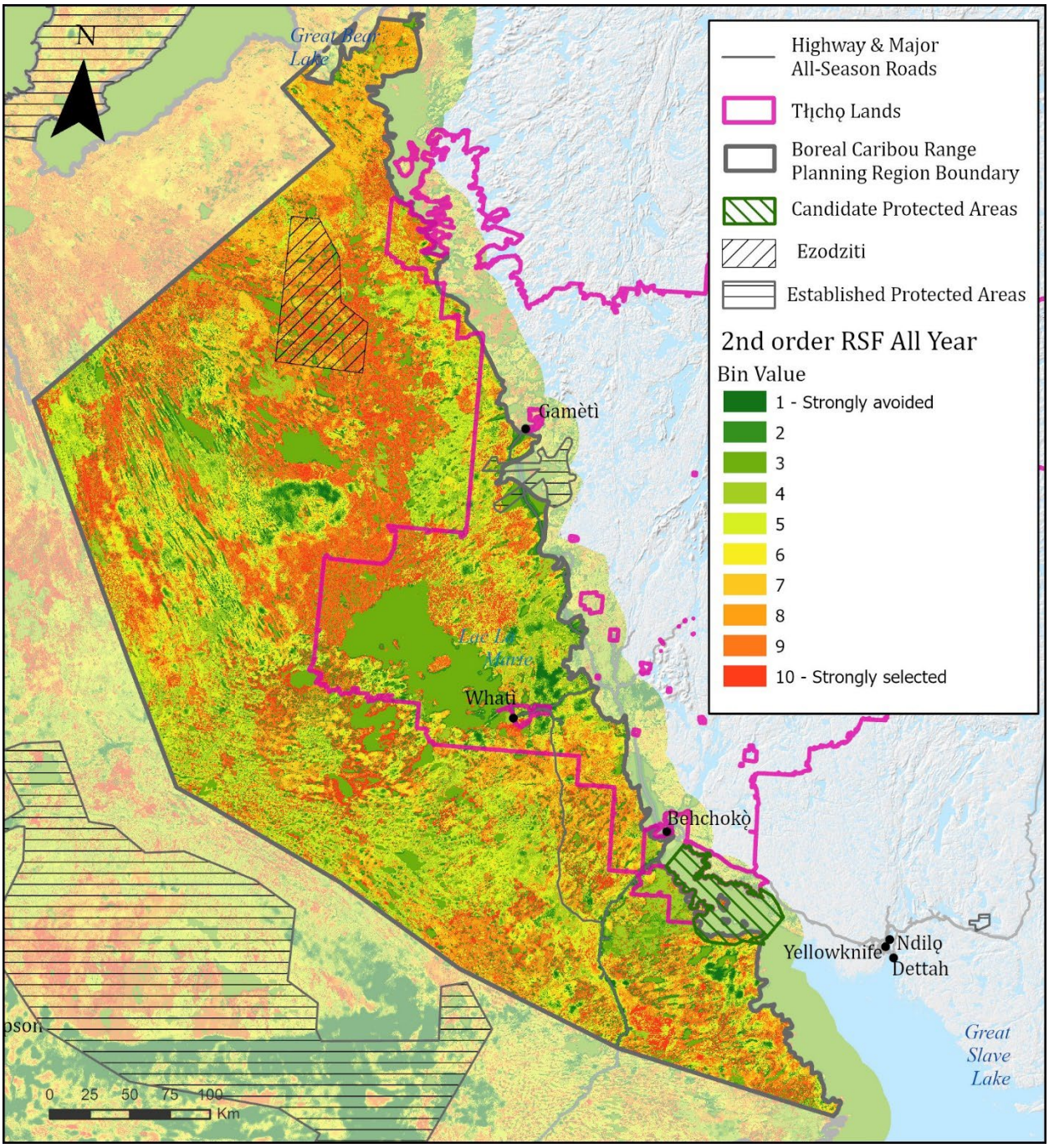


Figure 8. Relative likelihood of boreal caribou habitat selection predicted from the all-year RSF model. Predicted RSF values were binned into 10 categories. Bin 1 RSF values (green) represent areas most likely to be avoided, and Bin 10 (red) represents areas with the highest relative likelihood of being selected by boreal caribou. For Boreal Caribou Habitat Selection (RSF) Maps, see Appendix B.

2.2.2. Caribou Habitat Selection – Traditional Knowledge

Members of the Tłı̨chǫ Government, YKDFN (Tetsǫ́t'ıné) and NSMA hold TK and local knowledge of boreal caribou in the Wek'èezhìı region. Boreal caribou are named tǫdzı in Tłı̨chǫ and by YKDFN. Tłı̨chǫ, Tetsǫ́t'ıné and Métis have always been dependent on boreal caribou, especially when barren-ground caribou are unavailable. Table B-2 (Appendix B) documents the specific habitat elements needed for boreal caribou life requisites as identified by TK.

The WRRB initiated TK studies specific to boreal caribou and collaborated with the Tłı̨chǫ Government to carry out these studies (Legat and Chocolate 2012; Legat et al. 2019; Legat and Wetrade 2013; Legat and McCreadie 2015). Additionally, boreal caribou were discussed in a TK study for proposed mineral development (TRTI 2015) and during consultation for development of the offset plan for the Tłı̨chǫ Highway (Associated Environmental 2021).

The YKDFN discussed their knowledge of boreal caribou in a workshop for the Tłı̨chǫ Highway (YKDFN 2018). Tetsǫ́t'ıné have an extensive TK database, but information is not readily accessible and was not available for this range plan. Knowledge of boreal caribou includes seasonal movements, preferred habitats, Highway 3 crossing location, calving grounds, hunting camp locations, and interactions between barren-ground caribou (ekwǫ) and boreal caribou (YKDFN 2018).

The NSMA have trapped and harvested wildlife in boreal caribou range since at least the early 1800s (NSMA 2018) and their work on documenting TK about boreal caribou remains ongoing. The Lands and Culture Department at NSMA has been working on a Traditional Knowledge database for several years with the goal of documenting members' past and contemporary use of the land and the changes they have seen. Part of this work involves documenting members' knowledge about boreal caribou in the North Slave Region (NSMA pers. comm. 2025). The results presented here represent only a portion of NSMA knowledge of boreal caribou. Their respective TK collected during their most recent community mapping workshops are presented in Section *2.3.1 Important Areas based on Traditional Knowledge.*

For this range plan, most available TK information to date comes from the Tłı̨chǫ. Tłı̨chǫ Knowledge stresses the importance of understanding the "character" of boreal caribou when considering their habitat needs (Legat and Chocolate 2012; Legat et al. 2019). Boreal caribou are shy, intelligent, and hard to track; they are known to be fast, often too fast to secure a successful hunt (TRTI 2015). They are difficult to spot because they hide, stand still, and remain quiet, rarely standing out in the open to avoid predators (Legat and Chocolate 2012; Legat et al. 2019). For these reasons, hunters in the past used dogs to find them, and hunters learned to track their circular movements, and to spot them through small cracks in thick bushes (Legat and Chocolate 2012; Legat et al. 2019).

Tłı̨chǫ have mapped habitats from a TK perspective and then evaluated their importance to tǫdzı. Most boreal caribou are found on plateaus, with fewer in the lowlands (Legat and Chocolate 2012). Eight regional scale ecoregions with importance to boreal caribou were identified (Legat et al. 2019). Boreal caribou like islands, and large islands are important for calving. They prefer high ground, but they rut and calve throughout the bush. Important unique habitats are comprised of esker tops,

muddy areas (that are dry and cracking), river oxbows, points of land, lake peninsulas, river/lake shores, sandy beaches, sandy hills and islands (Legat and Chocolate 2012; Legat et al. 2019). Boreal caribou will sometimes wander outside of their typical areas and may be found on the barren grounds (Legat and Chocolate 2012; Legat et al. 2019, SARC 2022). Their diet varies with the season; grazing on various types of lichens in the late fall and winter and foraging on various plants such as sedges, grasses, leaves, berries, and mushrooms in the spring, summer, and early fall (Legat and Chocolate 2012; Legat and Wetrade 2013; SARC 2022).

Women play an important role with respect to boreal caribou, although their focus is somewhat different. They are familiar with different aspects of boreal caribou as they work on the hides, the meat, and prepare fat and bone grease, as described in Legat et al (2019). Boreal caribou are butchered in the same manner as other caribou, but the hide is much larger and more difficult to tan (Legat and Chocolate 2012). Most women prefer boreal caribou hides because they are large and good for clothing but working with boreal caribou can prove to be challenging (Legat and Chocolate 2012).

Although most of the TK information currently available for the range plan is from the Tłı̨chǫ, all three Indigenous groups have raised concerns about habitat changes due to climate change and the resulting impacts on boreal caribou. These impacts include warmer and drier weather, changes in wind patterns, and changes to snow and ice conditions (Legat and McCreadie 2015; Legat et al. 2019; Tłı̨chǫ Research and Monitoring Program 2013). Fire is the major factor that has caused habitat disturbance, changing boreal caribou numbers and traditional use of Wek'èezhìı land (Associated Environmental 2021). Habitat changes have favoured moose and bison over boreal caribou, and predators such as wolves and bears (Associated Environmental 2021). A more detailed discussion of climate change in the context of boreal caribou habitat can be found in section 6.3.

2.3. Important Areas for Boreal Caribou

2.3.1 Important Areas based on Traditional Knowledge

Mapping Tǫdzı Habitat using Tłı̨chǫ trails:

This section summarizes and describes the process of traditional knowledge (TK) research completed by the Tłı̨chǫ Government from 2020 to 2025. The research is integral to ensuring that the range plan accurately represents tǫdzı habitat through the traditional knowledge of Elders and harvesters. The Tłı̨chǫ Government focused on making sure that the maps are grounded in Tłı̨chǫ knowledge and perspectives and accurately reflects how the land is used and understood by the people who know it best.

The Tłı̨chǫ Government held a TK workshop on mapping tǫdzı habitat on December 8th and 9th, 2020. The two-day workshop involved 14 community members from the four Tłı̨chǫ communities: Behchokǫ̀, Gamètì, Whatì, and Wekweètì. The workshop was conducted with Elders and harvesters who have knowledge and personal experience of the study area, having hunted and trapped on that land throughout their lives. The Elders place high value on the method of seeing and personally experiencing a place in their evaluation of what is true. In TK research, Elders specify that the

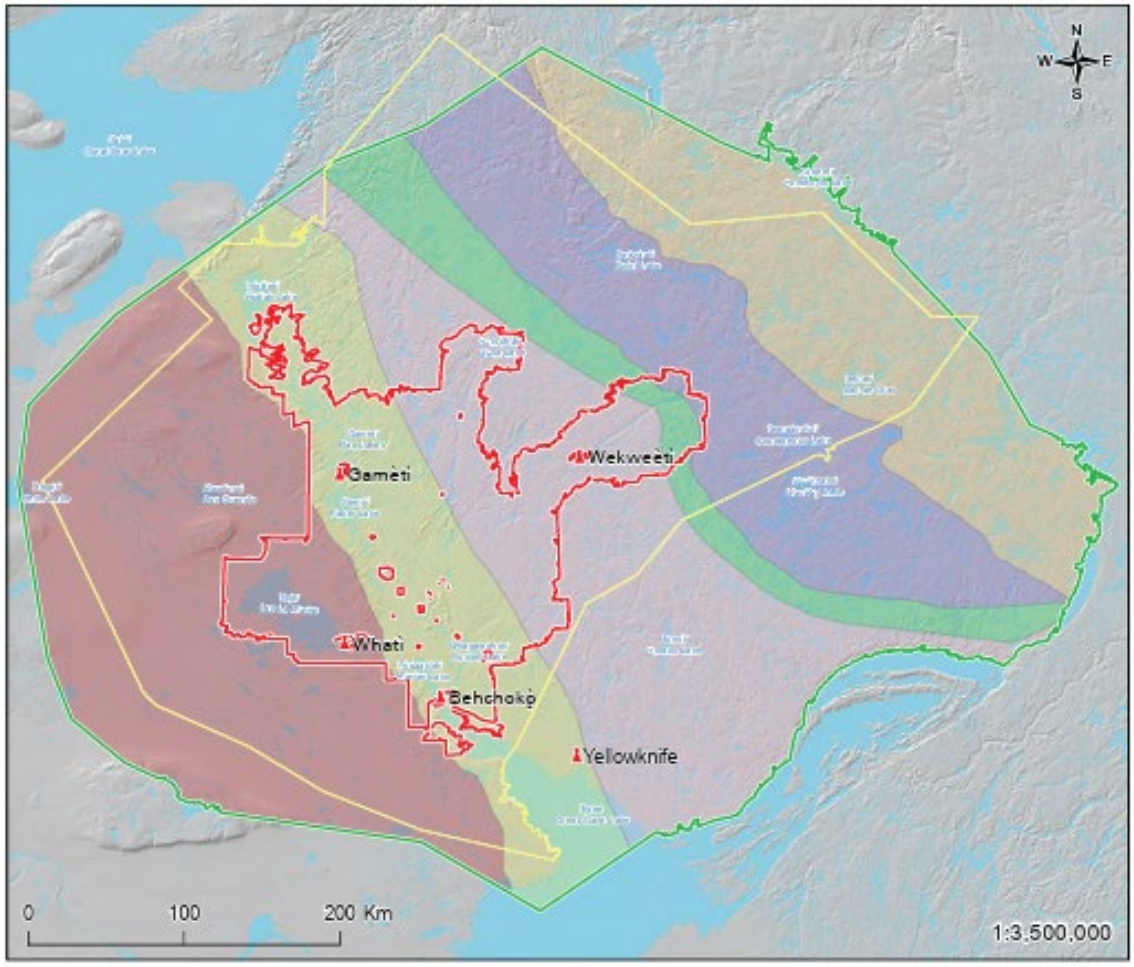
knowledge shared in studies is not hearsay, or heard or read somewhere, but is true, because they have seen it with their own eyes and experienced it personally (Legat 2012; Legat and Wetrade 2013).

In discussing important habitat areas with the Tłı̨chǫ knowledge holders, the term "essential habitat" was used because "critical habitat" has legal implications under the federal Species at Risk Act (S.C. 2002, c. 29)[3]. Using the terminology of essential habitat reflected a parallel way of knowing and describing the habitat that tǫdzı need for their long-term health and survival from a Tłı̨chǫ perspective and helped steer discussions away from any legal definitions.

Study Area

The study area was the Wek'èezhìı section of NT1. Tłı̨chǫ Elders often refer to this ecozone as nǫdıı (see Figure 9), translated as *the plateau*, since most of the land rises to a higher elevation from the lower elevation to the east called Į̨dàà and į̨kwę̀. Legat and Wetrade (2013) described that within Wek'èezhìı, "the place where tǫdzı belong" is called nǫdıı due to the number of plateaus in the area. These plateaus are ʔedèezhìì, Shìıgǫǫ̀làala, Gokw'ahshìì, Gohdlı̨ı̨shìì, Kwechoozhìì, and the mountain ridge is Whojıhchıì (Legat and Wetrade 2013: 8). As the Wek'èezhìı boundary does not follow natural landscape features, it was important during the workshop to focus on areas outside the boundary to understand tǫdzı movement and habitat use throughout the region. See Table 4 for more information on the traditional Tłı̨chǫ Ecoregions.

[3] *Critical habitat means the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species' critical habitat in the recovery strategy or in an action plan for the species (habitat essentiel).*



Map 8 Traditional Tłı̨chǫ Ecoregions

Community
Tłı̨chǫ Boundary
Wek'èezhìi Boundary
Mǫwhì Gogha Dè Nıı̨tèè

Hoziideè
Hozìı
Dechı̨̀llaa
ʔı̨kwę̀
ʔı̨daà
Nǫdìı

Figure 9. Traditional Tłı̨chǫ Ecoregions (Tłı̨chǫ Wenek'e, updated 2023).

Table 4. Cultural characterization of Tłı̨chǫ Landscape Units (adapted from Andrews 2011 and Tłı̨chǫ Government 2023).

Unit Name	Cultural Characterization
Hozìıdeè (meaning "vast/big barrens") *Ho-zee-day*	Glosses as 'big barrens', and refers to the region devoid of trees and characterized by only low shrubby vegetation; barren-ground caribou are hunted during late summer and fall; historically musk ox and white fox were important economic species; typically known only by Tłı̨chǫ men who travel on logistical forays to hunt or trap. Contact with Inuit expected and was relatively frequent in historic times. Wood must be carried from treeline.
Hozìı (meaning "barrens") *Ho-zee*	Glosses as 'barrens', referring to that area just beyond the tree line, well within Tłı̨chǫ traditional use area, and characterized by low growing dwarf shrubs and herbaceous plants and rare patches of stunted trees; barren-ground caribou are common in late summer and fall; historically musk ox and white fox were important economic species and were taken in spring and winter respectively; most frequented by men who travel on logistical forays, though groups sometimes included women on fall caribou hunts. Occasional contact with Inuit expected in some seasons and occurred relatively frequently in historic times. Wood must be carried from treeline.
Dechı̨laa (meaning "the edge of the trees") *Day-cheen-laa*	Glosses as 'the edge of the trees' and is characterized by a patchwork of trees growing in low Arctic vegetation dominated by dwarf birch. Barren-ground caribou are numerous during spring and fall migration; widely and thinly distributed in winter. Lakes are rich with fish, especially whitefish and lake trout. Migratory waterfowl common in season. Moose are rare. Considered home range of the Dechı̨laat'ı̨ì, ('Edge of the Woods People').
ı̨kwè *(towards the barrens)* *Eye-Kway*	Glosses as 'towards the barrens'; a broad band of open boreal forest and corresponds to the Canadian Shield, with large expanses of exposed bedrock, numerous clear lakes abundant with lake trout and whitefish. Considered part of the caribou winter grounds, and barren-ground caribou are common in winter. Moose are also an important species.
ʔı̨daà *(the way ahead; also known as "trails of our ancestors")* *Eye-Dah*	Glosses as 'the way ahead' or as 'up this way' and refers to the central corridor of access to the Tłı̨chǫ homeland. A single trail, referred to as *ʔı̨daàtı̨lı*, marks the region. Many tributary trails are accessed by it. The ecosystem is similar to ı̨kwè, though vegetation becomes denser toward southern end. Considered home range of the Sahtì got'ı̨ì ('Bear Lake People') and Et'aat'ı̨ì ('People next to another People') Tłı̨chǫ regional bands.
Nǫdìı (meaning "plateau or upland") *No-dee*	Glosses as 'plateau' or 'upland' and is characterized by greater soil deposition, fewer lakes and meandering rivers. Boreal species dominate and vegetation is denser. Woodland caribou and moose are important subsistence species, as are whitefish and lake trout. Included important trapping areas in historic times. Considered home range of the Tsǫ̀tìt'ı̨ì (Lac la Martre People).

The Tłı̨chǫ Elders are familiar with mapping Tłı̨chǫ land use and caribou habitat from numerous other mapping exercises and travels along the Tłı̨chǫ trail network (Andrews et al. 1998; Zoe 2007). An approach developed with Tłı̨chǫ Elders from previous mapping workshops was applied for mapping tǫdzı habitat. The Tłı̨chǫ Government named this the "Tłı̨chǫ trails" approach to mapping wildlife habitat. The essential part of the approach is to let the story of travel initiate the mapping. The Elders describe their trails and travel routes used from their communities into the tǫdzı harvesting area. The story of travel transforms the mapping exercise into an 'on the ground' approach, that lets the listener visualize the trails from being on the ground. After describing travel routes, the

Tłı̨chǫ Government identified camps and cabins used for hunting and trapping along the trails. During the second part of the "Tłı̨chǫ trails" approach, the harvesters describe where they usually see tǫdzı tracks and activity, where they had success in hunting tǫdzı, and where they anticipate one can most likely be successful when hunting tǫdzı. Once tǫdzı habitat was identified, harvesters described essential tǫdzı habitat, by describing locations tǫdzı are observed throughout the seasons and certain landscape features, such as islands, peninsulas, lakes, or habitat structures, that tǫdzı use at specific times of the year. Some of these features were identified as essential habitat.

Legat and Wetrade (2013) identified specific habitat features using Tłı̨chǫ names such as whagweè described as "sandy soil mixed with black dirt and covered with sparse vegetation", and tsoo described as "waterlogged soil, bogs, thick vegetation. Translated as muskeg" (Legat and Wetrade 2013: 10). Additionally, the Tłı̨chǫ Government focused on identifying Tłı̨chǫ placenames associated with harvesters' land use and tǫdzı habitat. The placenames describe the relationship between specific habitat, land features, and harvesting activities. Subsequently, placenames are essential to understanding the relationship between Tłı̨chǫ and wildlife habitat use throughout the study area (Legat 2012).

The workshop set-up included a large table for each community's participants. Each table had a printed map (size 1:250 000) of the study area. Harvesters used permanent markers to draw lines and polygons describing their land use and tǫdzı habitat. A pre-determined set of colour coding was applied to distinguish different land use activities and tǫdzı habitat. The digitized map of the tǫdzı habitat was submitted by the Tłı̨chǫ Government for the interim Boreal Caribou Range Plan (Figure 10).

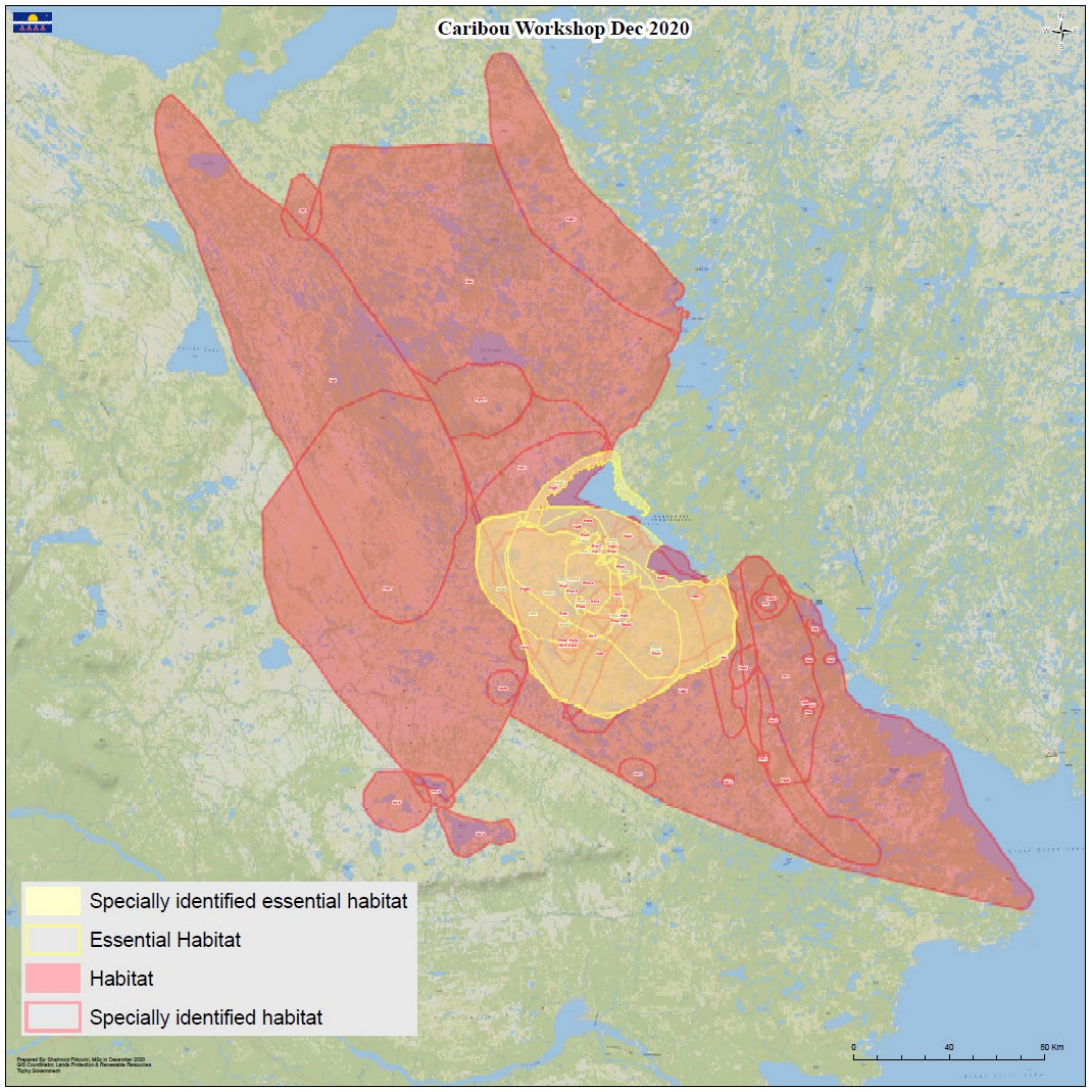


Figure 10. Tǫdzı habitat polygons identified by Tłı̨chǫ harvesters and Elders at a workshop held on December 8-9, 2020.

TK Verification Workshop

The Tłı̨chǫ Government held a two-day verification workshop in May 2022. The two-day workshop involved the same Elders and harvesters from the four Tłı̨chǫ communities: Behchokǫ̀, Gamètì, Whatì and Wekweètì who participated in the first TK mapping workshop. Following Tłı̨chǫ TK research protocols, it is essential to bring the digitized maps back to the Elders to review, discuss, and verify the TK maps to ensure the final maps are accurate and truthful based on the knowledge and perspectives of the Tłı̨chǫ Elders and harvesters. The Elders place high value on the method of seeing and personally experiencing a place in their evaluation of what is true, thus, we need to ensure that the TK maps of tǫdzı habitat reflect that.

At the verification workshop, knowledge holders suggested that the habitat south of the Tahga (North Arm), around K'ıts'ı Ehda (Whitebeach Point), was not well represented in the range plan map. The knowledge holders provided valuable TK about that area and identified essential caribou habitat that was added to the updated map (shown in the updated map, Figure 11). The Elders and harvesters considered it very important to ensure connectivity of the habitat valuable to tǫdzı from K'ıts'ı Ehda through Whatì (Lac la Martre) up to Kwet'ootì (Grandin Lake), thus creating a corridor of protection for tǫdzı.

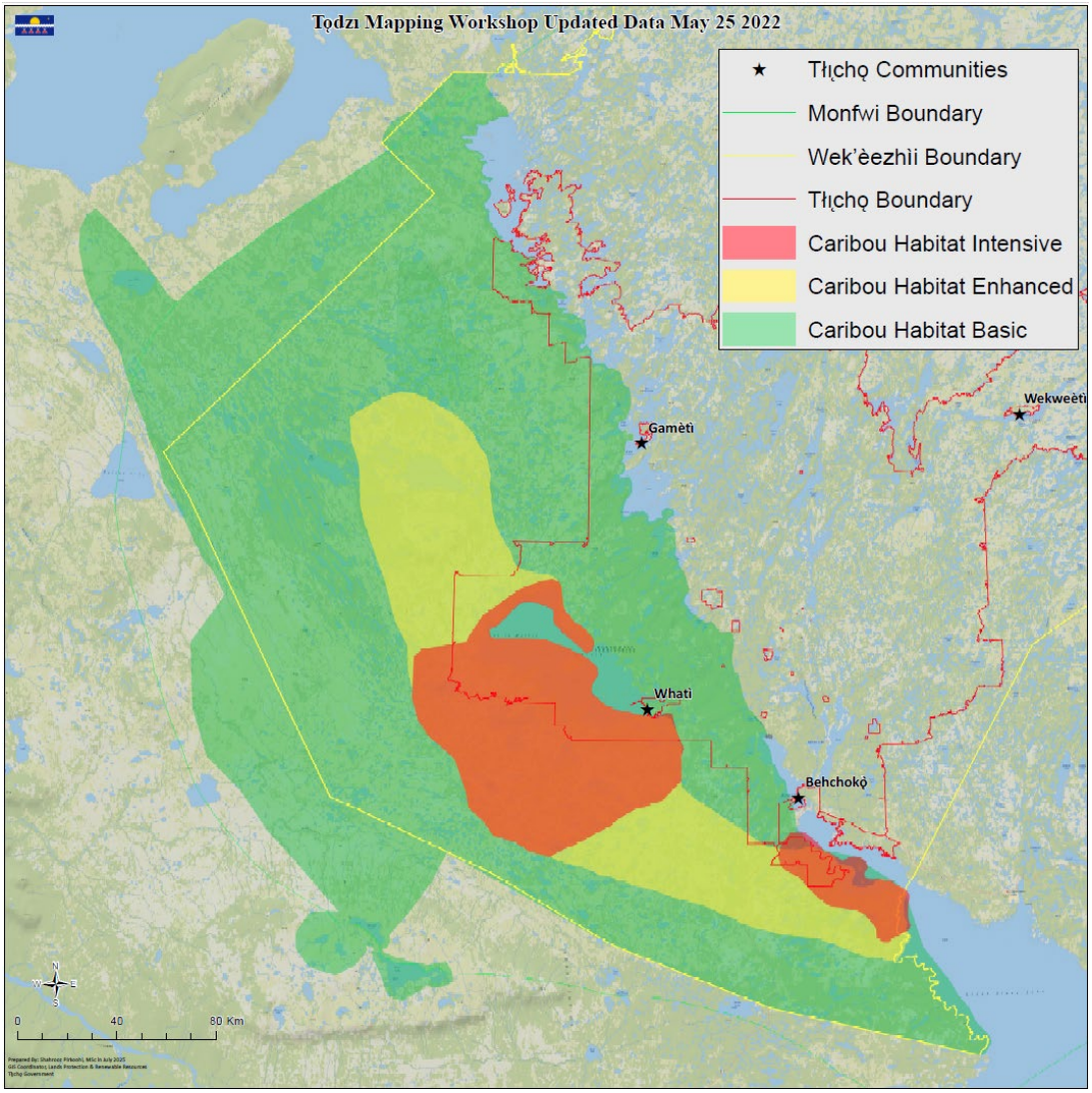


Figure 11. Map used at verification workshop in May 2022 based on Tłı̨chǫ TK gathered at initial meeting in December 2020 overlaying the GNWT-ECC Marxan analysis layers.

Emphasis on Habitat Connectivity

The Tłı̨chǫ Elders emphasized the concept of habitat connectivity throughout the research process. Initially, Elders focused on specific essential habitat, centered around calving locations such as islands and peninsulas. Most of the known locations were located around Whatì and the smaller lakes to the southwest. They subsequently identified and selected the larger area southwest of Whatì that is now

classified as an Intensive Management class. In the second and third TK workshops, the Elders discussed the importance of tǫdzı movement and the need for habitat connectivity across the landscape. They spoke of the necessity for continuous intact landscape to allow for tǫdzı movement between seasonal needs. As large parts of tǫdzı range has burned, and will likely burn in the future, the Elders emphasised the need for connectivity within the larger range. The habitat they selected both for the Intensive and Enhanced management classes, acts as a movement corridor for tǫdzı throughout the Wek'èezhìı portion of their range.

Incorporation of Protected Areas

GNWT-ECC noted that protected areas needed to be included in the range plan as an Intensive management class; therefore, the management classes needed to be revised to maintain the allowable percentage in each class. Therefore, Tłı̨chǫ Government held a third TK mapping workshop in October 2024 with key Elders who had been involved with the entire process of developing the range plan. The objective of the workshop was to adjust the maps to include Ezôdzìtì and to include areas that were identified through tǫdzı collar data that were shown to be important habitat for tǫdzı and the spatial continuity with the Southern NWT Range plan. The Elders agreed that areas previously identified and selected as essential habitat, are important in order to maintain habitat connectivity in the range plan. Additional areas were identified as essential habitat by the Elders and have been included in the updated map (Figure 12). The Elders considered it acceptable to remove areas in the management class from the northwest part of the Wek'èezhìı portion of their range as long as the habitat connectivity and levels of protection remained for the tǫdzı habitat selected in the southern part of the Wek'èezhìı range.

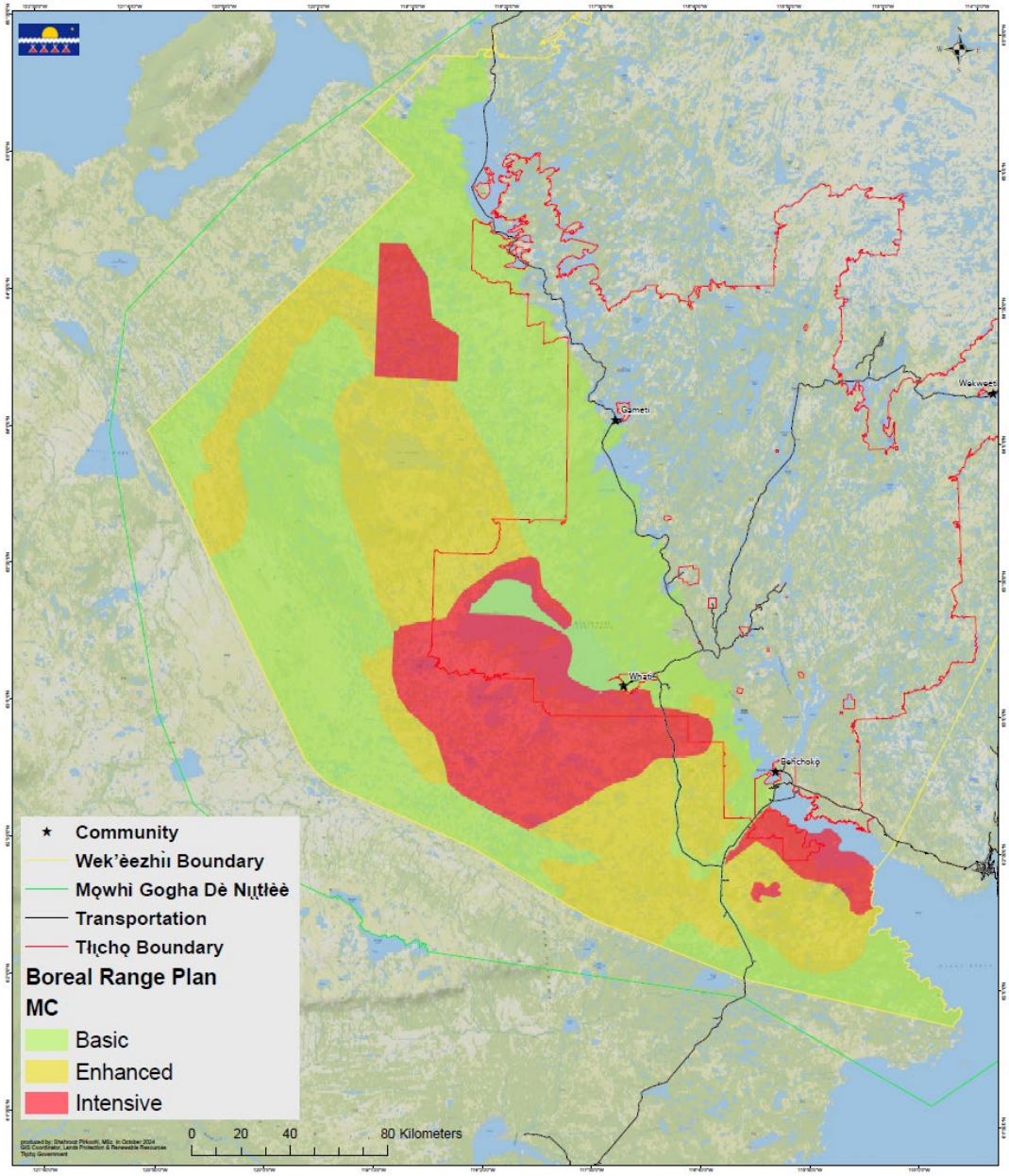


Figure 12. Map based on Tłı̨chǫ TK, including Ezôdzìtì protected area, and additional habitat identified at the October 2024 TK verification workshop.

NSMA knowledge gathering

Between February and March 2021, the NSMA held eighteen interviews with NSMA knowledge-holders to compile and document information about boreal caribou and their habitat.

Due to the COVID-19 pandemic, all surveys were done virtually through the Trailmark software, which allows users to drop points or draw polygons on a map following prompts or questions. Eighteen members aged 16 to 70 participated in this survey; most members completed the survey independently, though two Elders came to the NSMA office for assistance with using mapping software on their devices.

NSMA members identified twenty points of interest where caribou have been repeatedly seen or could expect to be seen (Figures 13 and 14). Ten of these locations were identified as being common road crossings for boreal caribou, while the other ten were grazing or calving areas. Twelve were in the North Slave or Wek'èezhìı region, while eight were in the South Slave or Dehcho region. Members indicated that these points of interest were of conservation value, though the survey didn't quantify conservation priorities as high, medium or low. NSMA recommended that it should be assumed all identified points of interest are of high conservation priority.

NSMA members also identified twenty patches of habitat that should be prioritized for conservation; four of these regions were in the South Slave or Dehcho region, and sixteen were in the North Slave or Wek'èezhìı region. Eight of these patches indicated important forest habitat, and members specified several of these as being important spring/calving habitat. Interestingly, one of these patches of forest habitat was within Yellowknife city limits, within Fred Henne Territorial Park. Members also identified twelve patches of non-forest (rock, lichen, low shrub and/or open marsh) habitat; members specified that many of these regions were important for calving (islands), insect avoidance and forage in late winter and early spring.

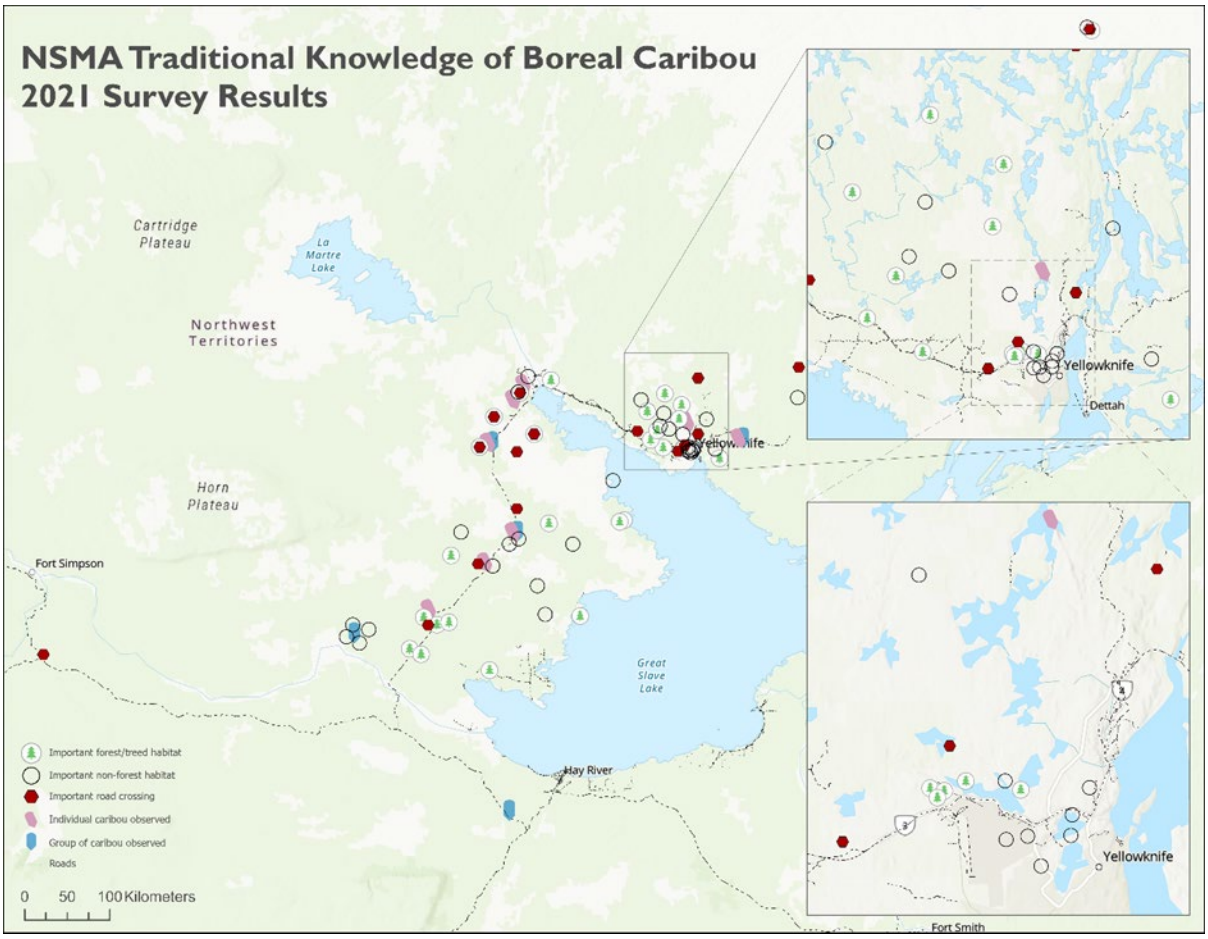


Figure 13. Locations where NSMA members have observed or expect to observe caribou.

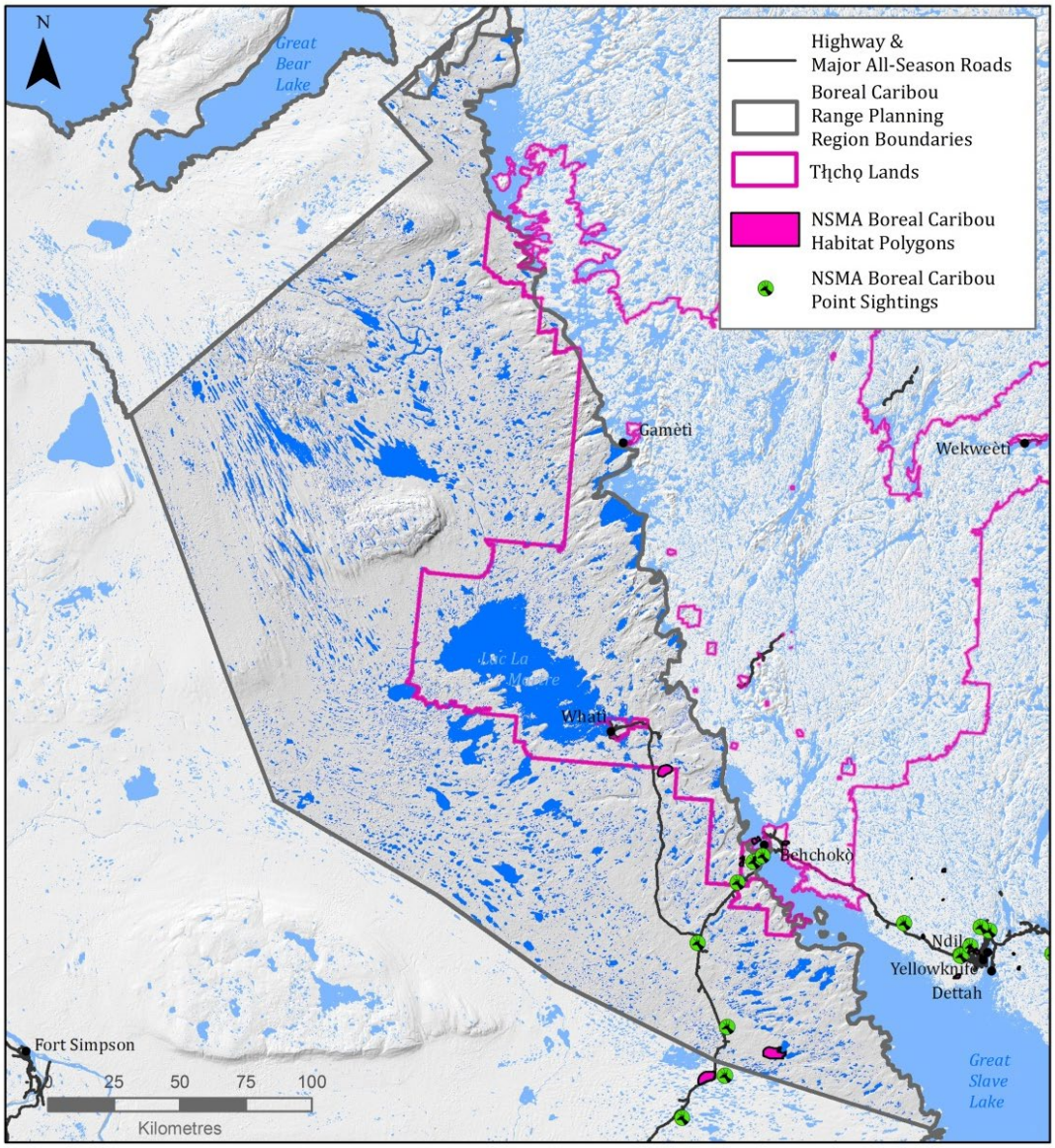


Figure 14. Boreal caribou habitat polygons and points of interest identified by NSMA members during surveys conducted between February-March 2021 (data provided by the NSMA, map created by GNWT-ECC).

2.3.2. Important Areas – Western Science

Seasonal maps of predicted boreal caribou habitat selection based on the resource selection function (RSF) models developed by DeMars et al. (2020) and known areas of high use by boreal caribou based on GPS collar locations, were used as the two main sources of information to develop western science-based maps of important areas for boreal caribou.

Marxan software is a spatial optimization program commonly used to support conservation planning (Ball et al. 2009). Since the predictive seasonal RSF maps are very fine-grained (30 m pixel resolution), Marxan was used to combine and simplify the seven seasonal RSF predictive maps into more generalized areas of important habitat. This was done by summing predicted seasonal RSF values within 5 km^2 planning units (hexagonal grid cells) and then using Marxan to select aggregations of planning units that provide high suitability habitat for boreal caribou across the different seasons. This size of planning units (5 km^2) was chosen to balance computational demands[4] of running Marxan analyses at the broad scale of the NT1 range with planning units that were small enough to capture fine-scale variation in habitat suitability. The Marxan analyses were run using predictive RSF maps at the scale of the whole NT1 range, with specific targets for representation of seasonal RSF value that had to be met in each individual range planning region.

One of the principles highlighted in the Framework (GNWT 2019) is the need to consider areas beyond each regional boundary to ensure habitat/genetic connectivity is maintained across the NT1 range. Conducting the Marxan analyses at the NT1 scale helped to ensure that areas of high suitability habitat that spanned regional boundaries were maintained as contiguous patches. The Marxan analysis was further refined by locking in planning units with above average known use by boreal caribou based on collar location data into the final solution.

Individual planning units were then assigned a High, Medium, or Low importance ranking based on how often they were selected out of 600 separate Marxan model runs (Figure 15). It was assumed that planning units that were selected more frequently represent areas that are likely more important for boreal caribou because they provide higher suitability habitat in most seasons. A Low importance category (red) was assigned to planning units that were never selected in any of the model 600 runs, Medium importance (yellow) was assigned to planning units that were selected less than half the time, and High importance (blue) was assigned to planning units selected more than half the time. Further details on the Marxan methodology and analyses are described in **Appendices C** and **D**. High importance areas accounted for 39.3% of the range planning region, Medium importance areas accounted for 21.4%, and Low importance areas accounted for 39.3%.

[4] There were a total of 88,478 – 5 km^2 planning units in the NT1 range, which means that there are 88,478! (factorial) possible solutions for Marxan to choose from. For each Marxan scenario or representation target considered, Marxan was run 100 times. Each set of 100 runs would take several hours of computing time.

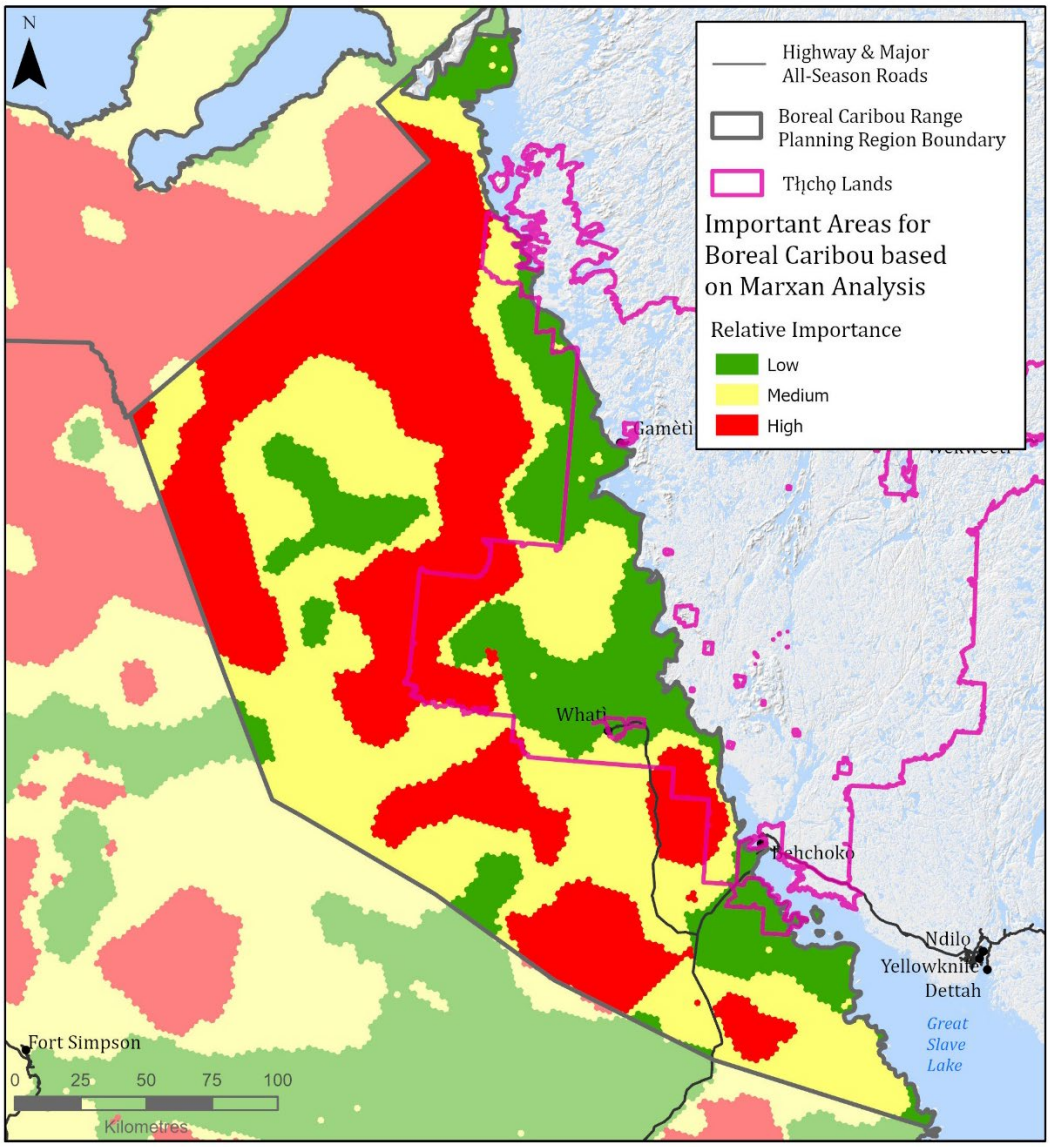


Figure 15. Important areas for boreal caribou in the Wek'èezhìı region, based on Marxan analyses using seven seasonal predictive RSF maps and areas of high known use by boreal caribou based on GPS collar data. This base map was used to start the process of establishing management class areas.

3. MANAGEMENT CLASSES (BASIC, ENHANCED, AND INTENSIVE)

As presented previously, the level of human disturbance in a range planning region determines which Tier (ranging from 1-3) that region falls within (Table 1). This in turn informs which combinations of management classes (Basic, Enhanced and Intensive) should apply to that region (Table 5). For a region falling into Tier 1 – such as Wek'èezhìı – the Framework recommends that that range plan needs at least one third of the area in the more robust Enhanced class and up to two thirds of the area in the Basic management class. If habitat is designated in the Basic management class, development activities in that area would typically be subject to the standard requirements already in place. For habitat assigned to the Enhanced or Intensive classes, more stringent management actions in these areas are advised. The management classes assigned to a region are established by comparing the current human disturbance relative to regional human disturbance thresholds (in other words, the Tier in which the region falls).

Table 5. 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 the Framework (GNWT 2019).

Human disturbance thresholds	**Relative importance of an area for boreal caribou**		
	Low	**Medium**	**High**
Tier 1	*Basic*	*Basic*	*Enhanced*
Tier 2	*Basic*	*Enhanced*	*Enhanced*
Tier 3	*Basic*	*Enhanced*	*Intensive*

Maps displaying areas considered important for boreal caribou, combined with other factors such as development interests, protected areas, etc., are used to guide where and how the management classes are delineated within a region. Typically, Enhanced and Intensive areas should be applied to areas that are of higher importance to caribou. As part of this process, TK and local knowledge have played an integral role in determining management classes within the Wek'èezhìı range planning region.

In regions that fall within Tier 1, it should be noted that the assignment of only one third of habitat in the Enhanced management class is a minimum requirement, but a more protective range plan (e.g. two thirds in the Enhanced management class) could be proposed based on consensus of the regional working group. Existing land use management zones (e.g., cultural heritage zones or habitat management zones on Tłı̨chǫ land), and protected areas, which prohibit many types of land use, could correspond to or exceed the requirements of an Intensive management class area. As such, for Tier 1 regions like Wek'èezhìı, it is possible that more than the minimum one third of habitat may be assigned to the Enhanced class and/or there may be areas assigned to the Intensive class even though Tier 1 regions do not require it.

To delineate management class areas for the *interim* Range Plan, various scenarios were considered, using Marxan (Ball et al. 2009). (For more detail on Marxan, see **Appendices C and D**.) The Working Group explored scenarios that considered habitat importance for boreal caribou, habitat connectivity, existing protected areas and other areas offering protection through the TLUP. Development potential (minerals, oil and gas, and forestry), regulatory access (i.e., where there is active resource tenure or areas that permit exploration and development), and proximity to key infrastructure were also considered. The scenarios and methods for their development are detailed in Appendix D. The different scenarios, informed by TK and Western science, were compared by the Working Group to assess which scenario might provide the best balance between caribou habitat protection and economic development opportunity. These scenarios are provided in Appendix D, Figure D-21.

When establishing the management classes for the interim plan, the Working Group agreed that areas along the shoreline of the North Arm of Great Slave Lake, that overlap with the NWT candidate protected area Dınàgà Wek'èhodì, should be classified as intensive management areas due to their importance as calving sites. The Working Group also designated a large area to the west of Lac La Martre, and Whitebeach Point and areas to the south, as intensive management areas for the same reason.

The final map of management class areas from the *interim* plan is presented in Figure 16. In the interim Range Plan, Enhanced and Intensive management areas accounted for 45% of the region.

The management class areas were adjusted for the full range plan. (Marxan was not used to make these adjustments). For details regarding the process of adjusting the management class areas using TK, for the full range plan, see section *2.2.2, Caribou Habitat Selection – Traditional Knowledge*.

Once the Interim Plan had been published in March 2022, the Working Group continued meeting to discuss preparation of the full Wek'èezhìı Boreal Caribou Range Plan.

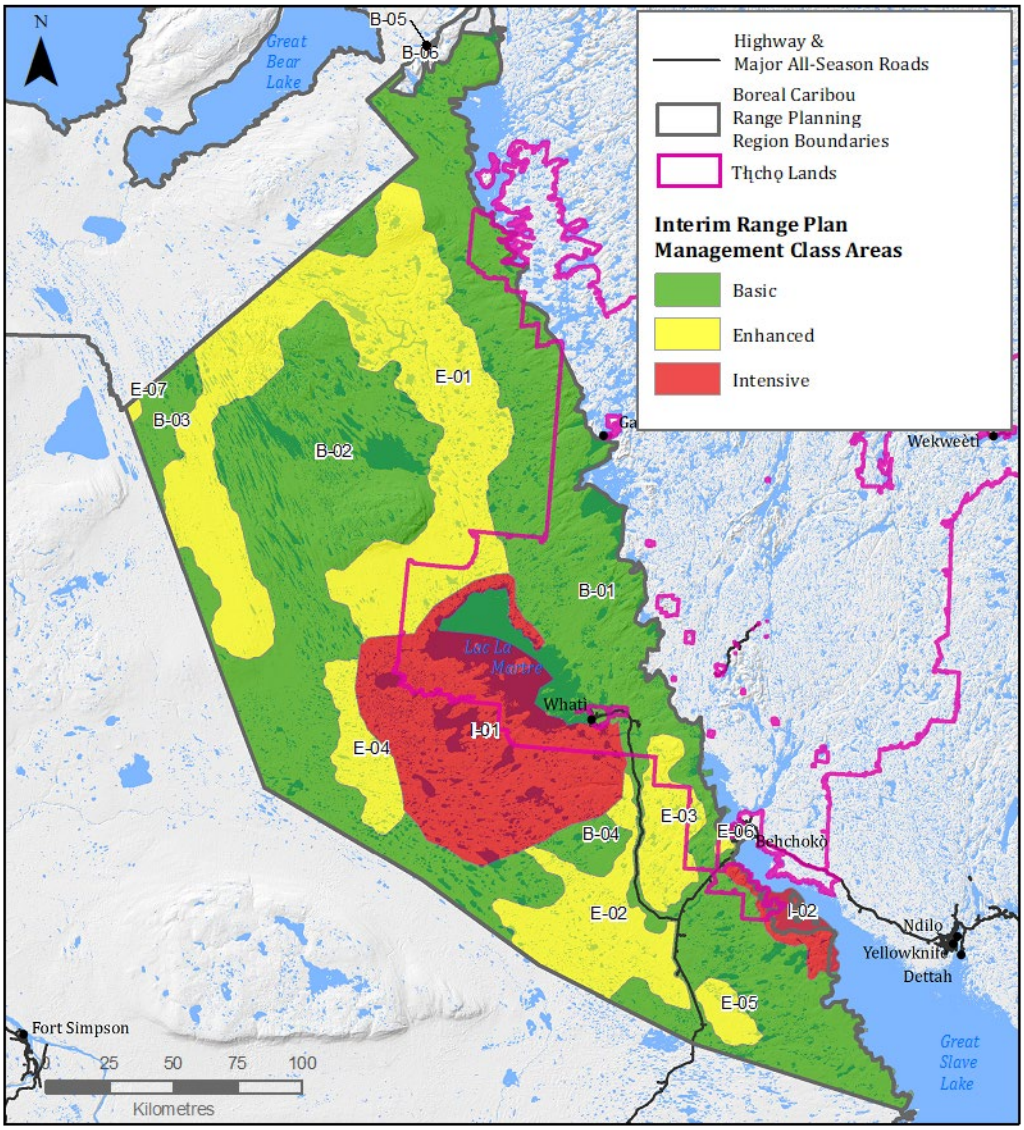


Figure 16. Final map of management class areas for the ***interim*** Range Plan. Management class areas are labeled by the type of area (B = Basic, E = Enhanced and I = Intensive) and a number.

In 2023, in southern NWT (SNWT) and the Wek'èezhìı region, discussions took place about the management classes and the corresponding percentages for Basic, Enhanced and Intensive classes. It was ultimately decided that protected areas should be made into a fourth management class for all the range plans, to ensure consistency. Protected areas would be similar to the Intensive management classes within a region since both have similar, more stringent rules. The Intensive Management Class represents the strictest level of management (compared to Enhanced and Basic management classes). This includes no development at certain times of year. Similarly, within protected areas, there are also prohibitions on development.

It should be noted that the protected areas within the Wek'èezhìı boreal caribou range are not protected under the *NWT Protected Areas Act* or managed by GNWT. Wehexlaxodiale Protected area, on the east side of the Wek'èezhìı boreal caribou range, is managed as a Land Use Exclusion Zone under the TLUP. Ezǫdzìtì, located entirely within the Wek'èezhìı boreal caribou range, is in the northern central section of the range. Being of great cultural and historical importance to the Tłı̨chǫ people, it is classified as a "Tłı̨chǫ Heritage Area" and has permanent protection from the granting of any interests by Government.

There is only one NWT candidate protected area: Dınàgà Wek'èhodì, which is on the northern section of the North Arm of Great Slave Lake. Its northwest and southeast boundaries are adjacent to Tłı̨chǫ lands. This area is very culturally and ecologically significant to the Tłı̨chǫ, due to its historical, traditional and cultural value (ENR 2021). Since Dınàgà Wek'èhodì is an NWT *candidate* protected area, it was not included in the new Protected Areas management class.

Starting with the management class map from the interim plan, the WG held several discussions focussing on the need to balance caribou habitat protection with development potential. They ultimately reinforced the need to make calving zones in the Intensive or at the very least Enhanced Management Class and also emphasized connectivity between regions. In particular, they highlighted the area between southwest Wek'èezhìı and the Horn Plateau in the SNWT, where calving sites have been identified, based on collar data. The WG chose to reduce some of the Enhanced Management Class area from northwest Wek'èezhìı and move it to the southwest border to ensure connectivity between these two areas, despite administrative boundaries.

Overall, the Wek'èezhìı working group agreed to a final division of four management classes as follows: 55.02% of habitat was assigned as Basic management class, 28.07%: Enhanced management class, and 14.00% was assigned Intensive management class in the Wek'èezhìı range planning region. Combined, the Ezǫdzìtì (Tłı̨chǫ Heritage Area), and the Wehexlaxodiale Land Use Exclusion Zone make up the Protected Areas Management class, which makes up 2.90% of the Wek'èezhìı boreal caribou range.

The final map of management class areas for this *full* Wek'èezhìı range plan is presented in **Figure 17.** Enhanced and Intensive management areas, combined with Protected Areas account for 45% of the region (Table 6).

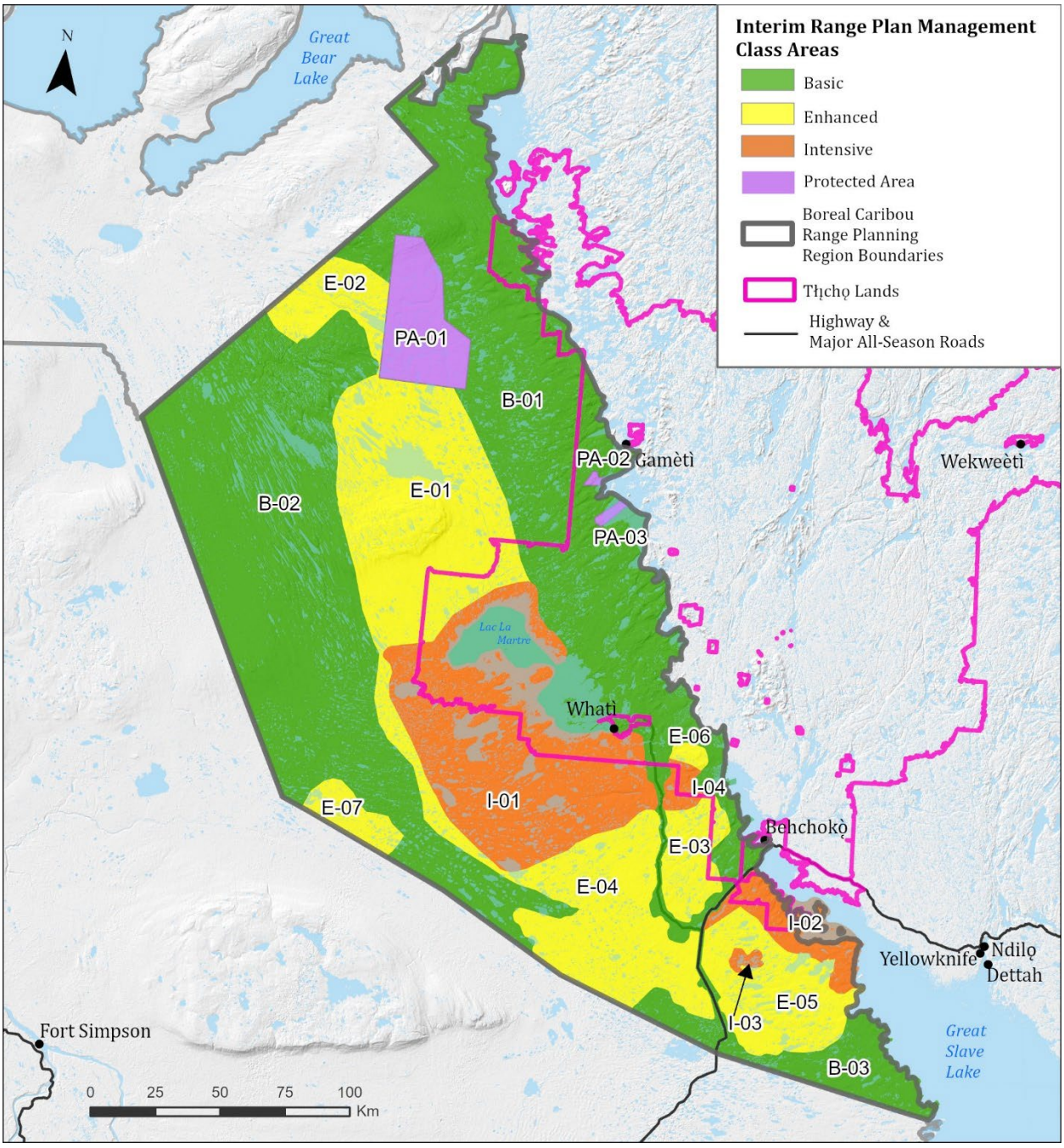


Figure 17. Final map of management class areas for the ***full*** Wek'èezhìı Boreal Caribou Range Plan. Management class areas are labeled by the type of area (B = Basic, E = Enhanced, I = Intensive, and PA = Protected Area) and a number.

Table 6. Spatial summary of final management class area delineation for the ***full*** Wek'èezhìı Boreal Caribou Range Plan.

Management Class	Number of Areas	% of Wek'èezhìı Range Planning Region	Minimum Patch Size (km^2)	Average Patch Size (km^2)	Maximum Patch Size (km^2)	Total Area km2
Basic	6	55	0.19	6,873.29	15,254.78	27,493.15
Enhanced	7	28	108.44	2,330.59	6,507.76	13,983.55
Intensive	4	14	66.89	1,399.81	5,769.71	6,999.07
Protected Areas	3	3	28.17	484.64	1,375.09	1,453.93
Grand Total	**15**	**100**				

3.1 How Management Classes Impact Development Interests

The following section describes how current development interests, planned development projects and areas of higher resource development potential overlap with Basic, Enhanced and Intensive management areas. It is important to note that development is not prohibited within Enhanced or Intensive management areas but should employ more stringent management actions to limit habitat and sensory disturbance to boreal caribou.

Active Land Uses/Leases

Within the boreal caribou range of the Wek'èezhìı region, only one group of active mineral leases overlap with an Intensive management class area (area I-02). These active mineral leases are held by Whispering Hills Resources Ltd. The intensive area around the mineral leases is the Whitebeach Point area, which has been designated as an Intensive management area due to the boreal caribou calving habitat along the shoreline and on the adjacent islands. Further TK about this area will be documented through future work with the NSMA, Tłı̨chǫ Government, and YKDFN.

Mineral Potential

There are some areas of higher mineral development potential that overlap with Enhanced and Intensive management class areas (Figure 18), but much of the area of higher mineral potential along the eastern edge of the range boundary is captured within a Basic management area. Some of the "site specific elevated potential" areas to the west of Whatì, west of Highway 3, and along the North Arm of Great Slave Lake fall within Enhanced and Intensive management class areas. In addition, there is a "regional data elevated potential" area along the North Arm of Great Slave Lake that overlaps with the Intensive management class around the Whitebeach Point area.

Management actions applied in the Enhanced and Intensive classes 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 over the long term – they are not intended to strictly prohibit development.

Refer to the *Management Actions* section for a summary of management actions that may be applicable to mineral extraction activities within Enhanced and Intensive management classes.

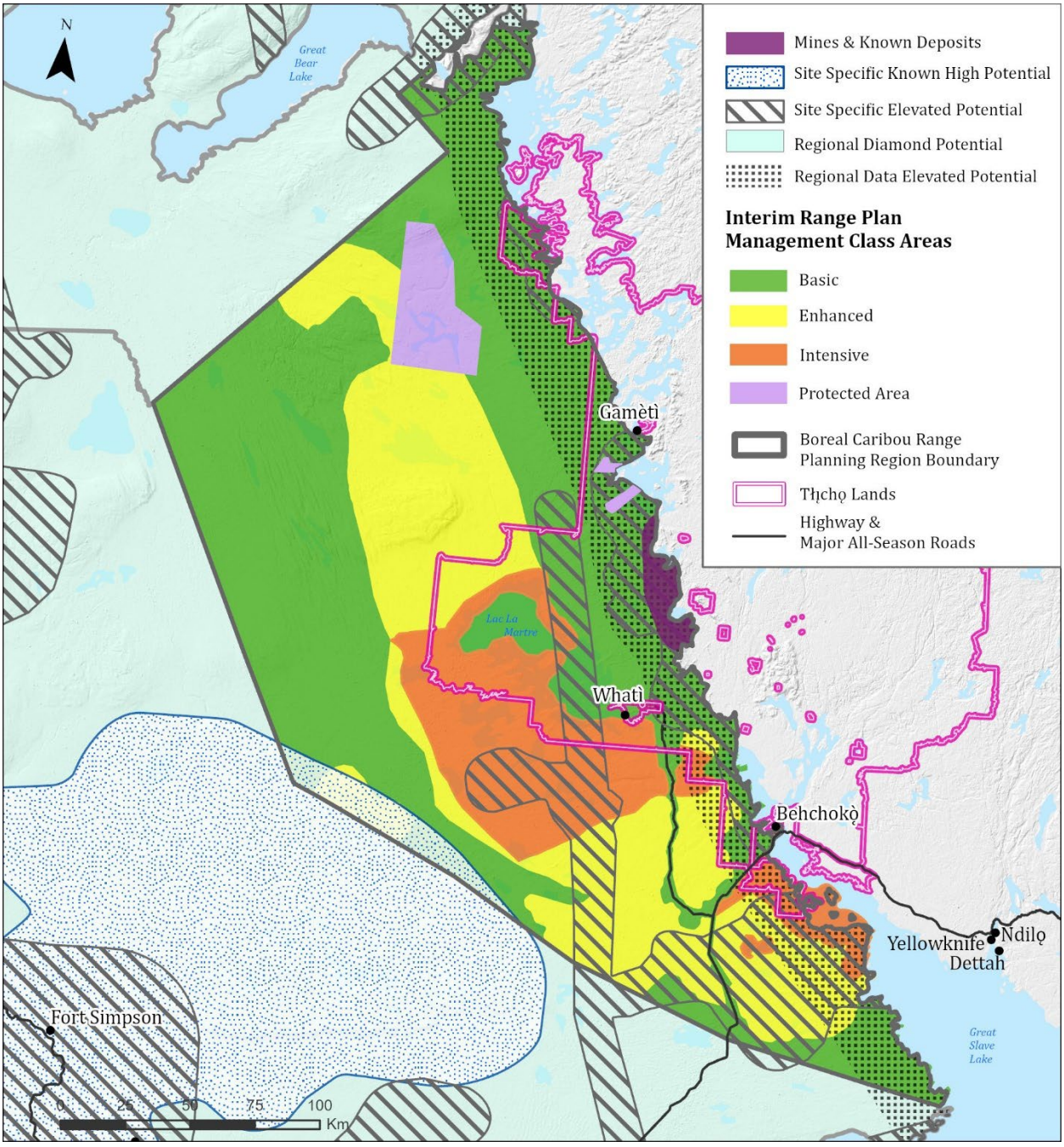


Figure 18. Overlap of mineral prospectivity map with Basic, Enhanced and Intensive management areas in the Range Plan.

Forestry Potential

Much of the "productive forest" is located within Enhanced management class areas and a smaller portion is in Intensive management areas (Figure 19). The Enhanced areas to the east and west of the Tłı̨chǫ Highway alignment capture both areas of high habitat suitability and connectivity corridors between those patches based on collared caribou movement paths. Subject to the management actions outlined in this Range Plan (see *Management Actions* section), commercial timber harvesting is possible within Enhanced management areas, and salvage logging is possible within Intensive management areas. Areas of productive forest also remain with the Basic management class area along Highway 3 and the Tłı̨chǫ Highway, the west side of Marian Lake and around the communities of Whatì and Behchokǫ̀.

Planned Infrastructure

Potential hydroelectric projects and the NICO Mine Access Road are all located within Basic management class areas in the Wek'èezhìı range planning area (See Figure 20).

Remediation Projects

All remediation projects currently underway or scheduled within the Wek'èezhìı range planning area fall within Basic management class areas.

Geothermal Potential

Areas of high geothermal potential fall within Enhanced and Intensive management class areas within the Wek'èezhìı range planning area. However, there are no geothermal energy projects currently being investigated for the region.

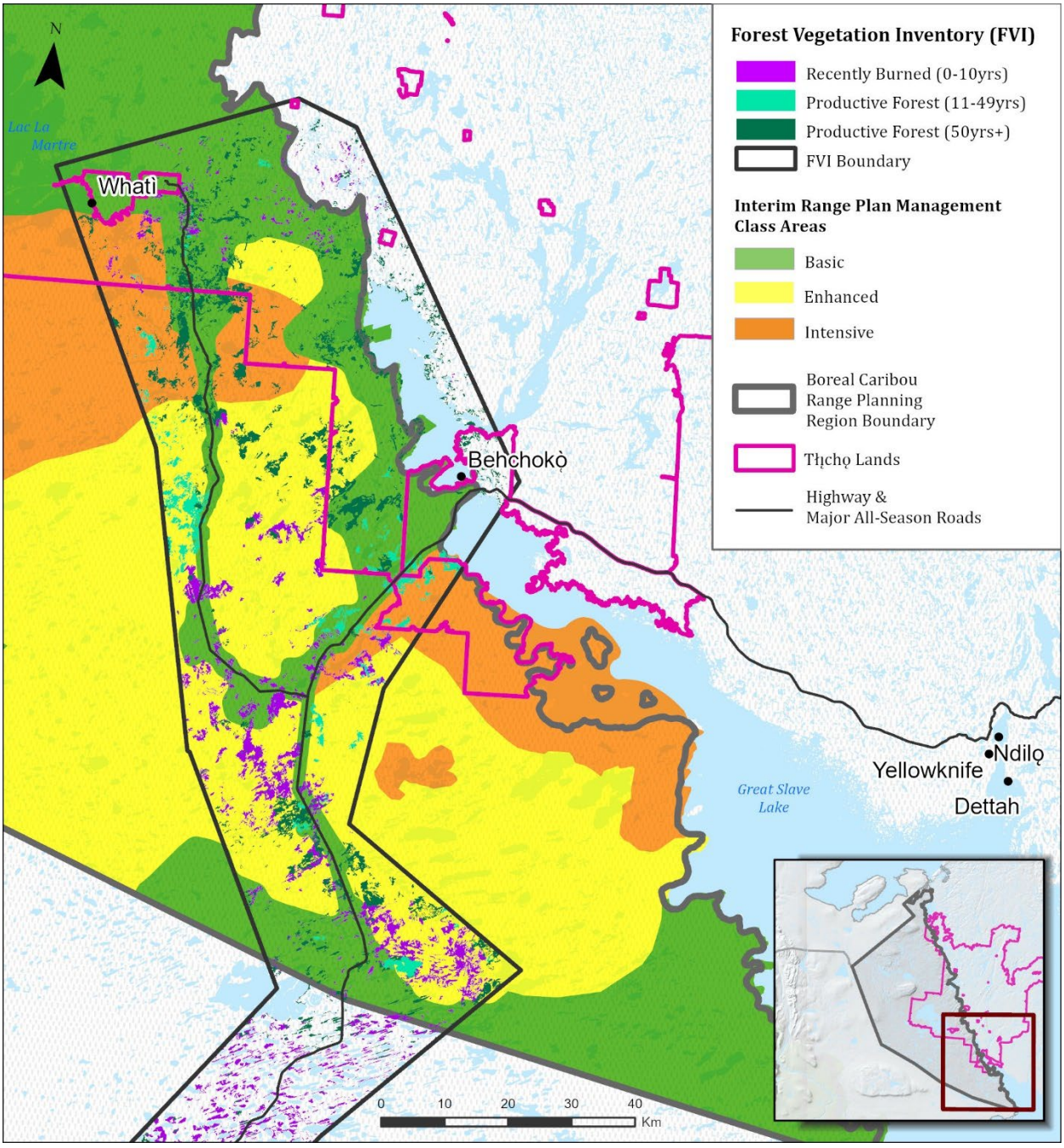


Figure 19. Overlap of areas with higher forestry potential with Basic, Enhanced and Intensive management areas in the Range Plan.

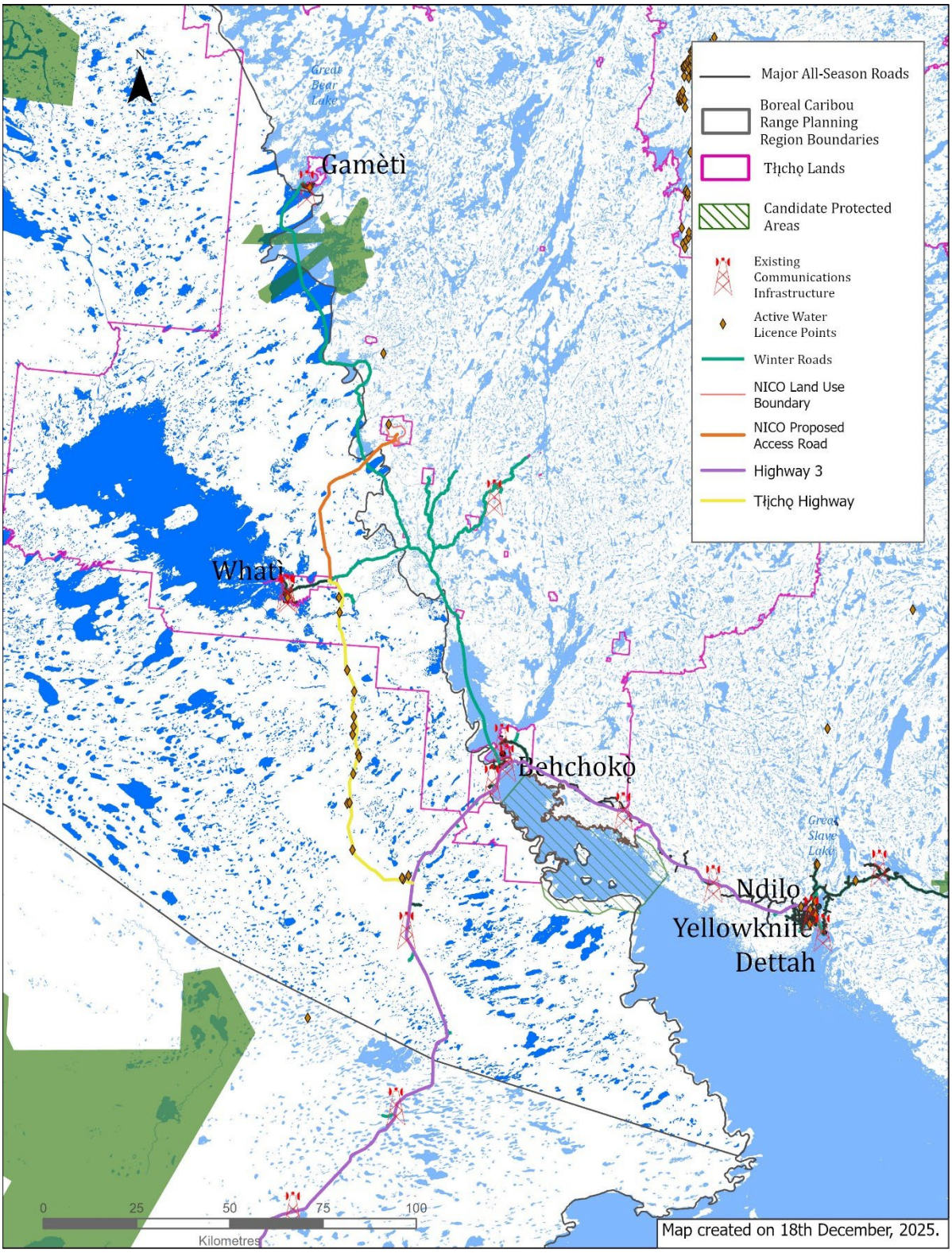


Figure 20. Active land use permits, water licences and other infrastructure (including NICO proposed Access Road) in the boreal caribou range of the Wek'eezhii region.

4. MANAGEMENT ACTIONS

4.1 Management Actions

The management classes described in Section 3 (Basic, Enhanced, and Intensive) are associated with a series of management actions listed in Table 8. These actions are designed to avoid, minimize, restore or offset disturbance of boreal caribou habitat. Some actions are specific to a single management class while others should be applied across management classes.

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 over the long term. To achieve this, the management actions are designed to:

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

Several management actions (e.g., Calls for Nomination, Calls for Bids, decisions to enter into Forest Management Agreements, wildfire management) are intended to inform decisions by Management Authorities in the NWT, particularly the GNWT, and are not intended for developers to directly implement. Parties responsible for implementation of each action are noted.

The management actions 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. Appendix E: *Identifying Habitat Patches as Values at Risk for Boreal Caribou* includes additional actions for managing wildfire disturbance.

Actions are described for four primary development sectors that have the potential to affect the greatest area of the NT1 range – oil and gas (including geophysical exploration), mineral exploration and mining, linear infrastructure (roads, pipelines and utility corridors, including associated borrow sources and quarries), and forestry. Management actions related to sensory disturbance are intended to apply to all development sectors. Other sectors that contribute less to the human disturbance footprint can be added to future versions of the Range Plan if needed.

4.2 Management of Sensory Disturbance

Although the management actions outlined in Table 8 primarily focus on avoiding, minimizing, restoring and offsetting habitat disturbance, additional actions have been included to address sensory disturbance to boreal caribou during the most sensitive seasons. The GNWT is in the process of developing guidelines for development projects in boreal caribou habitat that will contain further specific guidance for mitigating sensory disturbance. Developers are encouraged to consult the guidelines, once they become available, prior to applying for licences or permits.

The calving, post-calving, and late winter activity periods are considered the times when boreal caribou have the highest sensitivity to sensory disturbance. Exploration and development activities should be avoided to the greatest extent feasible during these periods when caribou are most sensitive (i.e. at highest risk periods) (Table 7).

Table 7. Sensitivity of boreal caribou to sensory disturbance during different activity periods.

Season	Activity Period	Date Range[1]	Sensitivity	Caribou Ecology / Rationale
Winter	Early Winter	1 Dec - 25 Jan	Lowest	Boreal caribou are beginning to shift towards greater use of older forest/wetland habitats but have relatively high daily movement rates.
	Mid Winter	26 Jan - 15 Mar	Medium	Movement rates are decreasing, and habitat use focused mostly in conifer forests/wetlands that haven't burned in >40 yrs.
	Late Winter	16 Mar - 1 Apr	**Highest**	Lowest daily movement rates; caribou in largest groups at this time of year; narrow range of habitat types selected (conifer forests/wetlands that haven't burned in >60 yrs); increased energetic costs of moving through deep snow.
	Dispersal	2 Apr - 30 Apr	Medium	Females spread out to find suitable calving sites; vulnerability during late gestation, period of higher adult female mortality; wider range of habitat types used during dispersal.
Calving / Post-calving	Calving / Post-calving	1 May - 30 Jun	**Highest**	Calves most susceptible to mortality during this period.
Summer	Summer	1 Jul - 12 Sept	Medium	Period of higher susceptibility to mortality for adult females; critical period for females to regain body condition; wider range of habitat types used during summer than winter.
Fall	Rut	13 Sept - 4 Oct	Medium	Disturbance during peak rut could result in lower pregnancy rates. More individuals susceptible to disturbance since they are in larger groups at this time of year.
	Late Fall	5 Oct – 30 Nov	Lowest	Boreal caribou are still using a wide variety of habitat types at this time of year; relatively high daily movement rates.

4.4 Management actions in the Wek'èezhìı Boreal Caribou Range Plan region

Management actions are organized by industrial sector and grouped according to a 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. With respect to Basic management actions, it is considered that existing and best practices apply to all management class areas. Enhanced management actions are intended to be *in addition to* Basic; and Intensive management actions are intended to be *in addition to* Enhanced management class areas.

Management actions are applicable to all stages of a project: design, review, and implementation. See section 5 for resources to assist in implementing management actions.

Table 8. Management actions applicable to Basic, Enhanced, and Intensive management classes (Figure 17) within the Wek'èezhìı region of NT1.

MITIGATION	BASIC MANAGEMENT ACTIONS
Avoid new habitat disturbance	**All Sectors** • Avoid new habitat disturbance by using areas of existing disturbance.[5] • Use existing disturbances that are not in an advanced state of regeneration, to the greatest extent feasible. • Avoid new habitat disturbance by sharing existing linear access,[6] where feasible. • Locate camps and processing facilities in areas of existing disturbance. • Applicants for land use permits and water licences are encouraged to demonstrate that new habitat disturbance is minimized to the greatest extent practicable by using areas of existing disturbance. • Minimize creation of new linear features and access by using existing linear features or sharing access.[6]

[5] Current boreal caribou habitat disturbance maps, showing fire and anthropogenic footprints, are available online via the NWT Species and Habitat Viewer.

[6] Note: S.10 of the *Mackenzie Valley 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.

MITIGATION	BASIC MANAGEMENT ACTIONS
Minimize impacts of unavoidable new habitat disturbance	**All Sectors** • Where new disturbance is unavoidable, use habitat types that are not preferred by boreal caribou.[7] • Avoid fragmenting large, contiguous patches of undisturbed habitat. • Locate facilities, camps, and activity sites as close as practicable to associated linear access features. • Minimize the length and width of new lines cleared. • Use routing that will favour habitat types that are not preferred by boreal caribou to the greatest extent feasible. • Use narrowest class of access roads practicable. • Design project footprints to reduce dispersion of project areas and associated access roads. **Oil and Gas Use** • Implement low-impact seismic techniques.[8] **Linear Developments** • Use of construction practices, seasonality of use, routing and road design that will minimize impacts to boreal caribou and their habitat (e.g., accessing areas over frozen ground). • Minimize sightlines by using doglegs or meandering route as much as safety permits.

[7] Current boreal caribou habitat selection maps, by all-year and seasons, are available online via the NWT Species and Habitat Viewer. Selection bins 7 and higher are preferred boreal caribou habitat.

[8] Low-impact seismic: the objective of low-impact seismic exploration is to create a narrow, continuously meandering line. The low-impact seismic method ensures that the maximum width of a low-impact seismic line will not exceed 5.0 m unless specifically approved, includes hand- or mechanically cut lines, ensures a maximum 200 m line-of-sight on any line, avoids larger standing trees by meandering, and generally does not disturb the soil and ground cover (GNWT 2015).

MITIGATION	BASIC MANAGEMENT ACTIONS
Avoid and minimize sensory disturbance	• **Schedule project activities** to occur outside of the highest risk periods for boreal caribou[9] to the greatest extent feasible. • Implement a project-specific **program to monitor boreal caribou sightings** within 500 m of project activities. • **Delay starting project activities** until the caribou have moved at least 500 m away from the site. If caribou approach active project activities within 500 m, monitor and document their behaviour and suspend activities if there is an imminent threat of injury or mortality to the caribou. • **Do not approach boreal caribou** closer than 250 m if they are encountered when traveling by snowmobile. • **Do not take off or land and avoid flying over habitat types that are preferred[7] by boreal caribou** during the highest risk periods[9], except where absolutely required for operational or safety purposes. • **Do not fly below 300 m** (1,000 feet) when over preferred boreal caribou habitat.[7] • **Do not directly fly towards, follow, chase, harass, hover over, or circle boreal caribou** important caribou habitat features (e.g., mineral licks, calving areas). • **Ascend to a higher flight path** or veer away if running, panic, or other startle responses are observed in caribou below.
Functional habitat restoration[10] and offsetting	• Follow current closure and reclamation requirements and guidelines.[11]
Ecological habitat restoration[12] and offsetting	• Follow current closure and reclamation requirements and guidelines.[11]

[9] See Table 7 for risk periods for boreal caribou.
[10] *Functional restoration* is discussed in more detail in Section 4.7.
[11] Follow the Northern Land Use Guidelines series for seismic, camps, pits and quarries,and roads and trails, the Mackenzie Valley Land and Water Board (MVLWB) Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories and the Commercial Timber Harvest Planning and Operations Standard Operating Procedures Manual as applicable.
[12] *Ecological restoration* is discussed in more detail in Section 4.7.

ACTIVITY	ENHANCED MANAGEMENT ACTIONS
Minimize impacts of unavoidable new habitat disturbance	• Hand cutting techniques that leave large trees standing is encouraged. • Minimize sightlines on linear features by using doglegs or meandering route as much as safety permits. • Leave vegetation breaks along linear features to limit predator travel.
Functional habitat restoration and offsetting	• Short-term disturbance[13] features that are part of the project footprint should be functionally restored as soon as they are no longer in use. Features that will be in use intermittently for multiple years will be functionally restored once no longer needed for the project.
	• Unavoidable long-term disturbance[14] in undisturbed habitat should be offset using functional restoration methods[10] to impede predator travel and human access. Selection of offset locations will follow the hierarchy described in section 6.4.
Ecological habitat restoration and offsetting	• If short-term disturbance of undisturbed habitat is unavoidable, use restoration treatments that will ensure more rapid return to pre-disturbance vegetation composition and structure.
	• Unavoidable long-term disturbance in undisturbed habitat should be offset.[15]

[13] Short-term disturbance is defined 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.
[14] Long-term disturbance is defined as habitat disturbance 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).
[15] Offsetting may be deemed necessary on a project-by-project basis as measures of Wildlife Management and Monitoring Plans under authority of the Minister of Environment and Climate Change, under the NWT Wildlife Act, or as part of the environmental assessment process under the Mackenzie Valley Resource Management Act integrated management system.

ACTIVITY	INTENSIVE MANAGEMENT ACTIONS
Avoid new habitat disturbance	• Avoid new habitat disturbance by using areas of existing disturbance,[5] that will not be transitioning to undisturbed designation within 10 years.[16]
Minimize impacts of unavoidable new habitat disturbance	• Where new disturbance is unavoidable, all reasonable alternative means of undertaking the activity should be considered; the alternative adopted should result in the smallest footprint in both undisturbed habitat, and in disturbed habitat that will be categorized as undisturbed within 10 years.[5]
Functional habitat restoration and offsetting	• Unavoidable long-term disturbance[14] in both undisturbed habitat, and habitat to be recategorized as undisturbed within 10 years[5], should be offset[15] at a higher ratio than in the Enhanced class. Functional restoration methods[10] will be applied to offsets to impede predator travel and human access. Selection of offset locations will follow the hierarchy described in section 4.6.
Ecological habitat restoration and offsetting	• If short-term disturbance[13] of undisturbed habitat, and habitat to be recategorized as undisturbed within 10 years[5] is unavoidable, use restoration treatments that ensure more rapid return to pre-disturbance vegetation composition and structure.
	• Unavoidable long-term disturbance in undisturbed habitat, or in habitat to be recategorized as undisturbed within the next 10 years[2] should be offset[15] at a higher ratio than in the Enhanced category.

[16] Current fire history maps are available online via the NWT Species and Habitat Viewer.

4.5 Balancing/Offsetting New Habitat Disturbance – Habitat Restoration

Within Basic management class areas, developers are expected to follow existing NWT closure and reclamation guidelines.

Within Enhanced and Intensive management class areas, developers are advised to develop closure, and reclamation plans for their project that will demonstrate how new **short-term** disturbances will be functionally[17] restored in the near term and ecologically[18] restored in the long term.

It is not always possible to quickly or easily restore all disturbed sites; in fact, there is sometimes no potential for restoration. Therefore, where rapid on-site restoration is not possible, offsetting by habitat recovery in other locations is necessary to avoid a net increase in human disturbance footprint.

Short term disturbance:
Typically, short-term disturbances are sites where there is minimal disturbance to the soil organic layer or root mat, and the feature could be used by the developer to fulfill their project objectives. The operational lifetime refers to the period of time in which the disturbance footprint is being actively used by the developer to fulfill these objectives. The area could be restored once no longer needed, typically in less than 40 years (e.g., timber harvest).

Long term disturbance:
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. Typically, long-term disturbances will be sites where the soil organic layer, root mat and aboveground vegetation are completely removed or covered over. Examples include mines, pits, quarries, borrow sources, tailings ponds, waste rock piles, all-season roads, etc.

If, after demonstrating that all reasonable alternative means of undertaking development activities have been considered, and that a proposed development will create a new **long-term** disturbance footprint within Enhanced and Intensive management class areas, developers are advised to develop a **habitat offset plan.** This plan should describe functional and ecological restoration of other existing areas of legacy disturbance to compensate for the new **long-term** disturbance. The intent of the habitat offsets for new **long-term** disturbances is to promote more rapid functional and ecological restoration of existing legacy disturbances. This will help ensure that the pace of habitat recovery from human-caused disturbance in the region equals or exceeds the pace of new human-caused disturbance. In addition to offsetting, developers should functionally and ecologically restore the project's direct **long-term** disturbance footprint once project activities on those sites have concluded.

[17] *Functional restoration* is discussed in more detail in Section 4.7.
[18] *Ecological restoration* is discussed in more detail in Section 4.7.

It is understood that it may take several decades to restore suitable boreal caribou habitat on disturbed sites, and thus off-site restoration may not immediately compensate for new disturbance. To accommodate for the length of time it takes for habitat to recover, a greater area of habitat should be offset, compared to the area of new disturbance. In this way, the pace of habitat restoration would exceed that of disturbance, resulting in a net gain in undisturbed habitat.

4.6 Hierarchy for Selection of Offset Locations

Selection of appropriate offset locations will prioritize legacy disturbances in other Enhanced or Intensive management areas within the Wek'èezhìı region, followed by existing disturbances in Basic management areas in Wek'èezhìı. If insufficient areas are available for offsets within the Wek'èezhìı region, existing disturbances in Enhanced or Intensive management areas in other boreal caribou range plan regions may be considered.

Given the lack of GNWT policy or guidance regarding habitat disturbance offsets, offset ratios (i.e., the amount of legacy disturbance that must be restored to compensate for a project's disturbance footprint) have not been defined in this Range Plan. Therefore, habitat offset plans will be reviewed and approved on a case-by-case basis. Offsetting in the form of direct or indirect contributions towards research and best practices for restoration may be considered in lieu of habitat offsets.

4.7 Functional restoration versus Ecological restoration

"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[19] and density[20] of re-vegetation on linear features to impede movement of predators and people; it can also be accomplished 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 the functional response of predators to these linear features but does not necessarily address the numerical response of predators to increased alternate prey levels associated with early-seral vegetation in recently disturbed habitat.

Criteria for functional restoration of linear features have not yet been defined in the NWT; however, lessons learned from work in other jurisdictions is providing interim guidance. Recent studies in Alberta have found that vegetation heights of 0.50-0.70 m were sufficient to reduce wolf selection for linear features and movement speeds on linear features (Dickie et al. 2017, Finnegan et al. 2018). For wolf movement speeds to be reduced to those equivalent to surrounding undisturbed forest, at least

[19] A minimum 4.5 m in approximately one third of non-woody and shrub vegetation in the disturbance; 60-80 cm coniferous saplings; 120 cm deciduous saplings.
[20] 800 tree stems/ha on dry uplands and lowland low density treed sites; 1,000 tree stems/ha on upland, transitional, and lowland treed sites.

33% of the vegetation on seismic lines had to exceed 4.86 m (Dickie et al. 2017). Vegetation heights exceeding 2.4-4.3 m also seem to be effective at deterring off-road vehicle use (Pigeon et al. 2016).

Vegetation regrowth on linear disturbances also needs to meet certain density criteria to impede predator movements. Draft guidelines from Alberta recommend tree regeneration densities of 800 stems/ha on dry uplands and lowland low density treed (e.g., open fens) sites, and 1,000 stems/ha on upland, transitional and lowland treed (e.g., black spruce bog) sites (Government of Alberta 2017). To meet these vegetation density targets, coniferous saplings need to be between 60-80 cm high and deciduous saplings need to be at least 120 cm high (Government of Alberta 2017). Shrub species do not contribute toward meeting the vegetation height and density targets, because the longer-term goal is for re-establishment of vegetation that can reach a minimum height of 5.0 m (Pyper and Broadley 2019, Government of Alberta 2017). To limit predator and human use of linear features in the short term (i.e., before vegetation reaches the minimum height and density targets), other line blocking treatments such as those mentioned in Section 3.8 may be needed in addition to site preparation and reforestation treatments.

"Ecological restoration" focuses on ensuring or accelerating the longer-term recovery of vegetation in disturbed areas to pre-disturbance composition and structure of biophysical attributes required by caribou (e.g., restoration of lichen ground cover, conifer-dominated forest cover). 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. These treatments may be implemented at the same time as functional restoration treatments and may help to achieve both functional and ecological restoration objectives.

Site-specific ecological restoration objectives will have to be developed for each project on a case-by-case basis taking into account the type of vegetation community, vegetation structure (height/density) and successional stage of specific sites prior to disturbance. Developers are responsible for adequately documenting pre-disturbance conditions at their project locations to inform the development of their ecological restoration objectives in their closure and reclamation plans.

4.8 Activities Exempt from Restoration

In the table of management actions (Table 8), low impact seismic exploration, and mineral prospecting activities with similar characteristics to low impact seismic operations will be exempt from functional and ecological restoration recommended in Enhanced and Intensive management areas. The rationale for this is that low impact seismic exploration techniques seek to mitigate improved access and facilitated travel for people and predators and to facilitate natural regeneration by design (GNWT 2015). This is accomplished by using narrow, meandering lines with a line of sight <200 m, leaving vegetation breaks or using doglegs at intersections with other linear features, avoiding clearing large trees, avoiding disturbance to the duff layer and vegetative root mat, and re-

use of existing linear features. Low intensity mineral prospecting activities can also employ many of the same strategies as low impact seismic exploration where it is necessary to use cut lines to explore or delimit a claim. For example, lines can be cut to a width of less than 1.5 m using hand tools only, and vegetation breaks can be left to limit line of sight (Government of Ontario 2020). Where seismic exploration or mineral prospecting activities do not meet the criteria for equivalence with low impact seismic exploration techniques, they should follow the functional and ecological restoration recommendations.

4.9 Managing Natural Disturbance

Wildfire is inevitable across most of the territory and is an important part of the natural boreal forest ecosystem. Fire management resources (e.g., people, equipment, airplanes, etc.) are limited, and directing resources to fighting wildfires in caribou habitat means 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, which 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.

"Values at Risk" (VAR) designation under the NWT *Forest Fire Management Policy* (GNWT 2005) defines how resources are directed and prioritized during forest fire response. 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 where resources and capacity allow. For this management tool to be effective, key habitat areas identified as VAR should be limited in number and should represent areas of high priority for boreal caribou. 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. It's also critical to note that important ecological areas designated as VAR will not be protected indefinitely because doing so can actually increase burn risk (i.e., burnable materials building up over time) and can lead to other ecological problems (e.g., disturbance regimes disrupted). Caribou habitat areas managed as VARs should be reviewed every five 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. However, prescribed burns are rarely used in the NWT[21] since the GNWT does not have a well-developed prescribed burning program and currently only conducts burns to protect communities. The GNWT also does not replant after wildfires because the burned areas are often too large to replant effectively, and because natural regeneration is frequently as, or more, successful than planted seedlings. These kinds of management interventions are also limited by the costs associated with operating in remote areas. There may be

[21] It should be noted that back burning is frequently used as an active fire management response to limit the spread of fires and is considered separately from prescribed burning which is not conducted as an active fire response.

opportunities to take management actions in some years, but with the caveat that the benefits of any action may be negated by wildfires in the future.

Feasibility studies into fuel 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.

Any management actions focused on wildfire are focused 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.

4.10 Resources to Assist Developers

GNWT-ECC has created an online tool called the *NWT Species and Habitat Viewer*. This viewer contains a boreal caribou tab that allows users to view current spatial data related to boreal caribou in the NWT and includes spatial data layers that can assist in following management actions laid out in this Range Plan. For example, maps of the management class areas, undisturbed habitat, fire disturbance, human disturbance, and seasonal habitat selection maps are included. Interested individuals can also contact GNWT-ECC at wmisteam@gov.nt.ca to request copies of these spatial data layers through a Data Release Agreement.

For more information, visit: https://www.enr.gov.nt.ca/en/services/research-and-data-nwt/wildlife-management-information-system.

5. IMPLEMENTATION INSTRUMENTS

As noted previously, this Range Plan provides guidance to developers and regulators operating within Wek'èezhìı range planning region. It is not legally binding itself and requires implementation via other instruments. Implementation may be pursued through the Tłı̨chǫ Land Use Plan, the NWT *Wildlife Act*, the territorial *Species at Risk (NWT) Act*, the federal *Species at Risk Act*, the *Forest Act* and the *Petroleum Resources Act*.

5.1 Tłı̨chǫ Land Use Plan

The TLUP overlaps with 19.2% of the Wek'èezhìı boreal caribou range planning region. Figure 21 shows where Candidate and Established Protected Areas, Ezǫdzìtì, and the TLUP zones overlap with the management classes; a detailed breakdown is provided in Table 9.

The TLUP already excludes many types of land use activity from consideration within Cultural Heritage, Habitat Management, Land Use Exclusion and Traditional Use zones. Therefore, it may already provide a higher level of habitat protection than the management actions require for Enhanced and Intensive management areas outlined in Section 4. For the area in the Enhanced

management class, 8.18% is captured within Cultural Heritage and Traditional Use zones, as well as Ezǫdzìtì; while 2.54% is captured within the Enhanced Management Zone. For the area in the Intensive management class, 30.01% is captured within Cultural Heritage and Habitat Management zones; while 2.66% is captured within the Enhanced Management Zone. Amendments to the TLUP may be necessary to implement the management actions outlined in the Enhanced and Intensive management class areas in the range plan where they overlap with areas of TLUP Enhanced Management Zone. For the area in the Basic management class, 13.28% is captured within Cultural Heritage, Habitat Management, Land Use Exclusion, and Traditional Use zones. The restrictions of these TLUP zones likely exceed the management actions recommended for Basic management class areas, because most types of development are not considered in these TLUP zones.

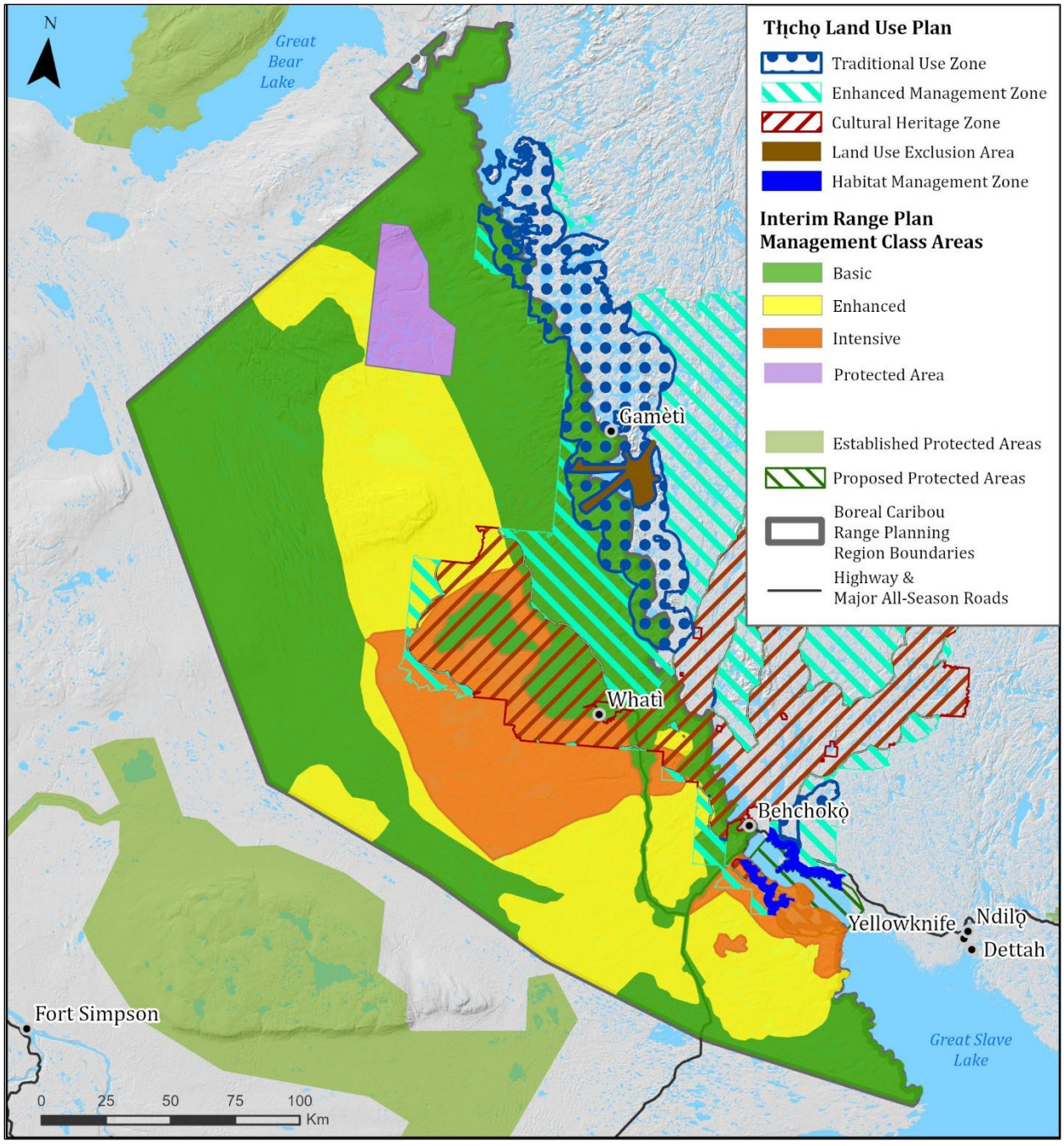


Figure 21. Overlap of Tłı̨chǫ Land Use Plan zones, Ezǫ dzìtì, established protected areas, and NWT candidate protected areas with Basic, Enhanced and Intensive management class areas in the range plan.

Table 9. Breakdown of Tłı̨chǫ Land Use Plan zones and established/candidate protected areas that overlap with Basic, Enhanced and Intensive management class areas. Areas labeled "No designation" are those occurring outside of the approved Tłı̨chǫ Land Use Plan and established/candidate protected areas, (including Ezǫdzìtì).

Management Class Type	Land Designation	km²	Percentage (%) of total area of Management Class Type
Basic	Cultural Heritage Zone	1994.26	7.24%
	Enhanced Management Zone	2532.41	9.20%
	Habitat Management Zone	<0.01	<0.01%
	Land Use Exclusion Zone	78.94	0.29%
	Traditional Use Zone	1581.76	5.74%
	Ezǫdzìtì	803.08	2.84%
	No designation	20502.8	74.57%
	Basic Total:	*6187.38*	*~100.00%*
Enhanced	Cultural Heritage Zone	592.66	4.24%
	Enhanced Management Zone	380.38	2.54%
	Traditional Use Zone	0.09	<0.01%
	Ezǫdzìtì	572.01	3.93%
	No designation	12438.41	88.95%
	Enhanced Total:	*2278.16*	*~100.00%*
Intensive	Cultural Heritage Zone	2104.77	28.44%
	Enhanced Management Zone	196.65	2.66%
	Habitat Management Zone	115.83	1.57%
	Candidate Protected Area - Dınàgà Wek'èhodì	330.14	4.46%
	No designation	4652.56	62.87%
	Intensive Total:	*2747.39*	*100.00%*

5.2 Implementation Instruments on Territorially administered Lands

Roughly 81% of the Wek'èezhìı range planning region falls within currently territorially administered lands. As such, territorial legislation including various sections of the *Species at Risk (NWT) Act* and the NWT *Wildlife Act* apply to these areas. Additionally, the *Wildlife* Act would apply to both

territorially managed lands and Tłı̨chǫ lands. This would allow both the *Wildlife Act* and TLUP to work in tandem on Tłı̨chǫ lands and be informed by the range plan. For management actions related specifically to timber harvesting, the *Forest Act* and its associated regulations will be the primary implementation instrument. This would involve decisions about whether to issue Timber Cutting Permits and Timber Cutting Licences, and the specific conditions included in these permits and licences. Decisions about whether to open up areas to Calls for Bids for oil and gas exploration are made under the *Petroleum Resources Act*.

Preferred implementation instruments under the Wildlife Act:

Section 93 of the *Wildlife Act* states that "No person shall substantially alter, damage or destroy

Wildlife Management and Monitoring Plans (WMMPs) (s.95, z.64)

Developers may be required to prepare and adhere to a Minister-approved Wildlife Management and Monitoring Plan (WMMP), if the proposed activities satisfy any of the conditions outlined in s.95(1) of the *Wildlife Act*. WMMPs were chosen as an implementation tool since there are already regulations in place enabling the Minister to require and approve a WMMP, and to enforce compliance with it. The preparation of a WMMP, as it pertains to boreal caribou, would be informed by the range plan

Under s.95, z.64(ii), a regulation could be created requiring WMMPs for projects that occur in speci ic range plan management class areas. Until new regulations are in place under s.93/z.61 (Habitat Protection) or s.95/z.64(ii), as a general policy, GNWT-ECC will require a Minister-approved WMMP for any new project that is proposed in an Enhanced or Intensive management area identified in the range plan. GNWT-ECC would require developers to demonstrate through the WMMP how the applicable management actions outlined in the range plan will be implemented in these areas.

5.3 Implementation Instruments on Federally administered Lands

Within the southeastern area of the Wek'èezhìı region of the NT1 boreal caribou range, there is a small federally administered parcel of land (see Figure 22). There is an active mineral lease held by Whispering Hills Resources Ltd. that encompasses the entirety of this federal land.

Some federally administered lands have been designated as critical habitat for boreal caribou. On June 7, 2019, the Government of Canada issued an order to protect critical habitat of boreal caribou on federal lands in Canada[22] under subsection 58(2) of the federal *Species at Risk Act* (SARA). This protection order excludes *Indian Act* lands, properties administered by the Parks Canada Agency that are not federal protected areas, and devolved lands in the Yukon and NWT.

Although land can be designated as critical habitat, a person or organization may still indicate interest in conducting an activity in that designated habitat. In such a case, the federal Minister of Environment and Climate Change may issue a permit or enter into an agreement with that person/organization allowing them to engage in the activity which could potentially affect a listed wildlife species, and/or any part of its critical habitat. The permit is difficult to obtain and may only be issued (or an agreement entered into), if one or more of the following criteria are met: (a) the activity is scientific research relating to the conservation of the species and conducted by qualified persons; (b) the activity benefits the species or is required to enhance its chance of survival; or (c) affecting the species is incidental to carrying out the activity. The applicant must also demonstrate that all reasonable alternatives to the activity that would reduce the impact on the species have been considered and the best solution has been adopted. Those issuing the permit (or entering into an agreement) must also be satisfied that the applicant has taken all feasible measures to minimize the impact of the activity on the species or its critical habitat and that the activity will not jeopardize the survival or recovery of the species. It is important to note that activities outside federally

[22] See Canada Gazette Part II, Vol. 153, No. 13, Registration SOR/2019-188, available at: http://gazette.gc.ca/rp-pr/p2/2019/2019-06-26/pdf/g2-15313.pdf

administered lands where the 500 m buffer around a project footprint extends onto federally-administered land may also require a permit under the federal SARA.

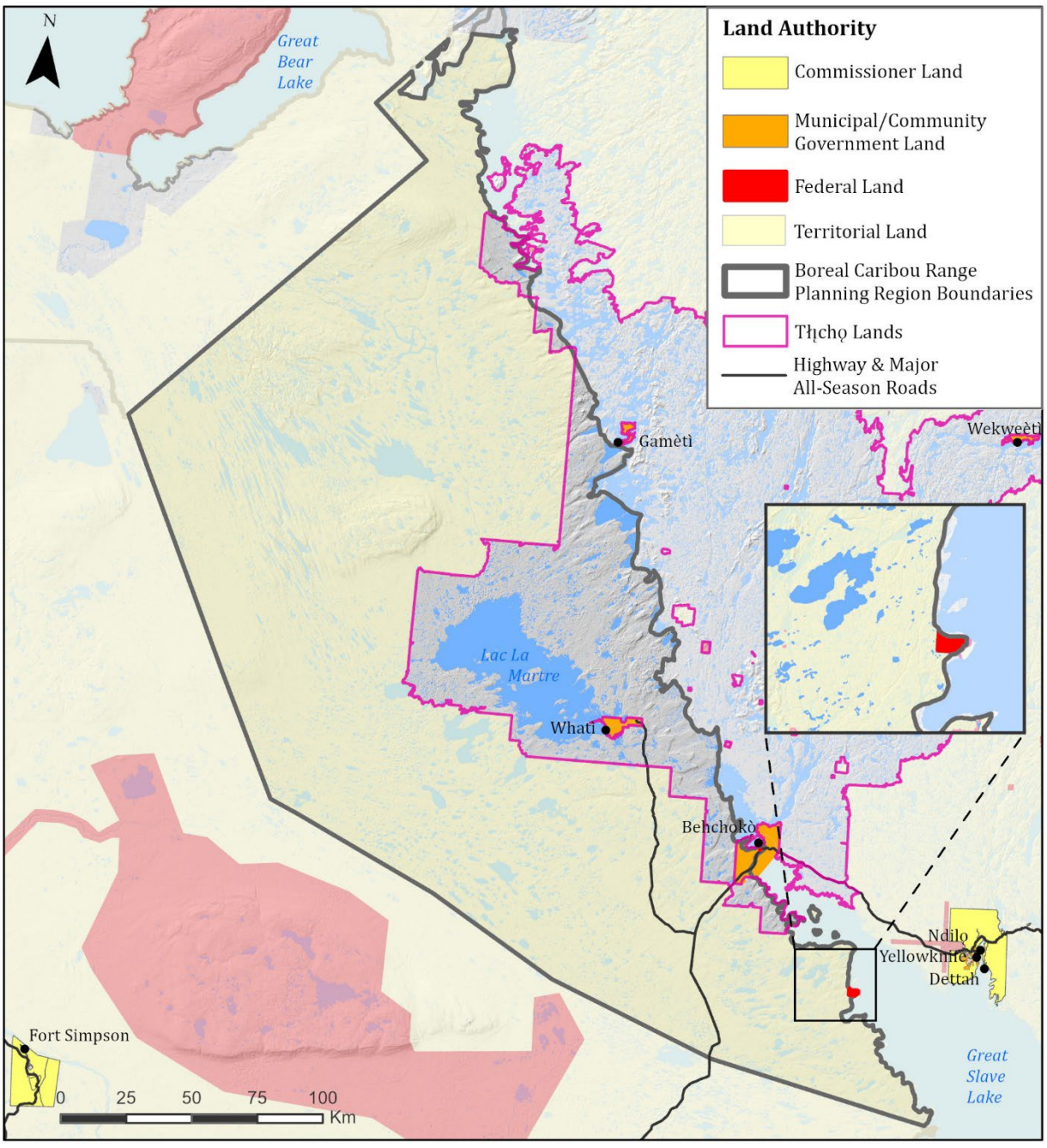


Figure 22. Land management authority in the boreal caribou range of the Wek'èezhìı region.

6. DISTURBANCE RECOVERY AND CLIMATE CHANGE

6.1 Projected Recovery of Disturbance

Between 2020 and 2024, an area of 1,049 km2 (2.1% of the region) transitioned back to undisturbed habitat. Between 2025 and 2029, another 591 km 2 (1.2%) will transition back to undisturbed habitat, moreso in the northwest of the Wek'èezhìı range, and west of Ezǫdzìtì Protected Area (Figure 23).

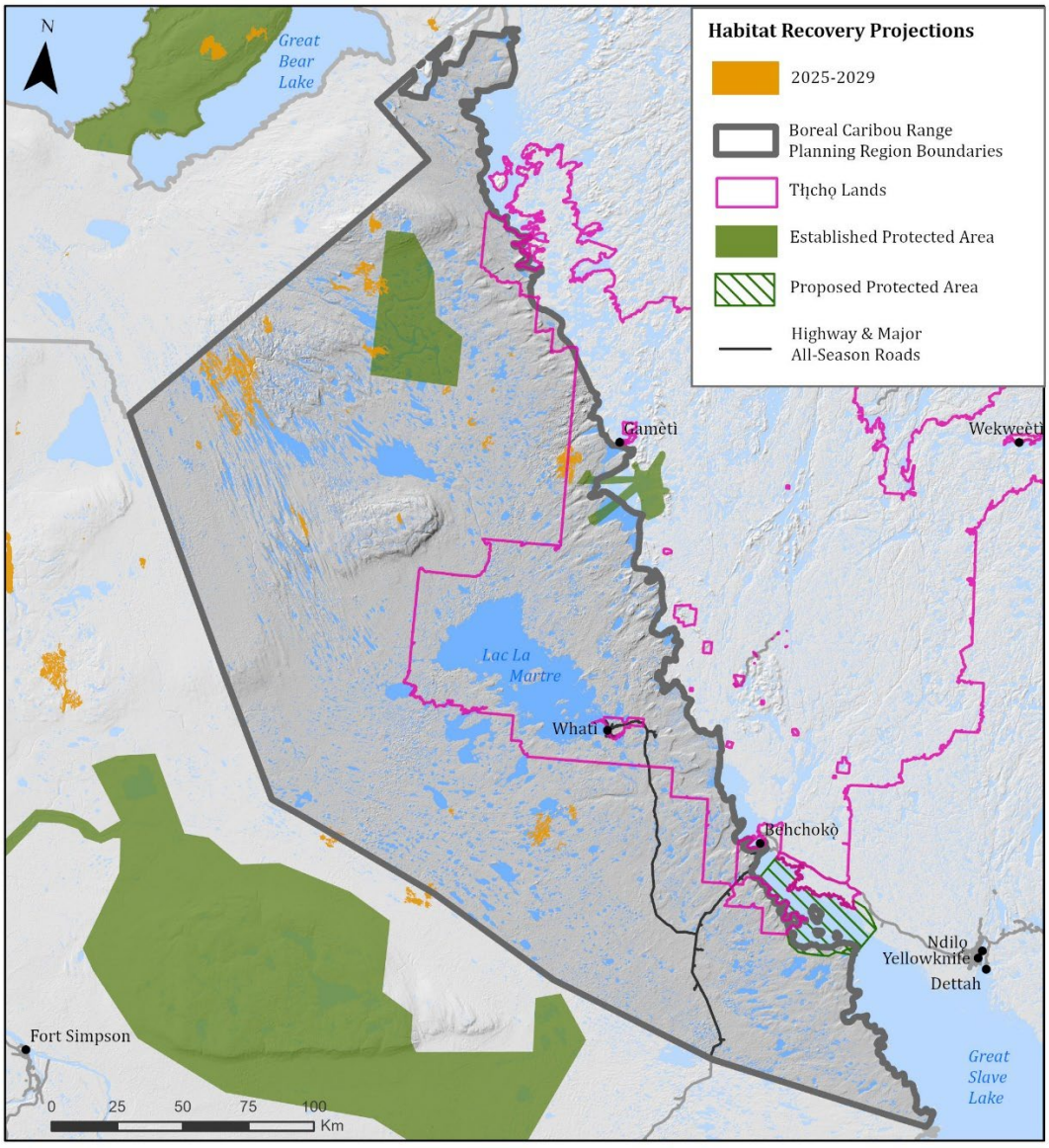


Figure 23. Projected habitat recovery from fires in the Wek'èezhìı region.

6.2 Projections of Future Disturbance

Ecological forecasting can help quantify important climate-induced changes to boreal caribou habitat over the next century. One study demonstrates that by 2100 boreal caribou habitat suitability may increase in portions of the NT1 but decrease in others due to changing wildfire regimes resulting in conversion of coniferous to deciduous forests (Stewart et al. 2023).

In the Wek'èezhìı region, the northeastern part of the range was predicted to contain an average small increase in caribou habitat suitability (Stewart et al. 2023). Projections for future human disturbance in the Wek'èezhìı region were not calculated due to high uncertainty of the nature, number and scale of future developments.

6.3 Climate Change

Climate change and its associated impacts are increasing and are expected to intensify over the course of the 21st century (IPCC 2023). Impacts from climate change are extensive and varied, depending on many factors. Impacts can include an overall increase in extreme weather events such as droughts, wildfires, and flooding. Other impacts include sea level rise, coastal erosion, increased precipitation, and ongoing permafrost thaw to name a few (IPCC 2023).

Canada is experiencing approximately double the global average warming rate (Bush and Lemmen 2019) and warming in the Northwest Territories is up to four times the global rate (GNWT 2022). Climate change impacts are expected to be particularly pronounced in polar regions like the NWT (Shukla et al 2019, GNWT 2022, IPCC 2023). In NWT, temperatures appear to be increasing at a higher rate both in the winter and in the northern part of the NWT (GNWT 2022).

Climate change driven increases in temperatures and changing precipitation patterns in the north are altering environmental conditions, including boreal caribou habitat (Brotton and Wall 1997, Severson et al. 2021). In northern regions, climate change is projected to cause many changes to ecosystem structure, composition, and functioning, including changes to forest composition, establishment of new species, increased insect and parasite outbreaks, a longer growing season, increased wildfire and continuing permafrost thaw. These impacts may affect the availability and quality of boreal caribou habitat and will play a role in the resiliency of the boreal caribou population over time (Shukla et al 2019).

Observations from the land show firsthand evidence of the impacts of climate change to boreal caribou. Indigenous communities throughout NWT suggest a range of impacts resulting from climate change. These include changing snow conditions, warmer summers and winters, changes in the distribution and abundance of caribou and predators, and changes in habitat due to melting permafrost (Species at Risk Committee 2022, GNWT 2024). In the past, rain was infrequent but now appears to be increasing in both the fall and winter. As knowledge holders point out, rain on snow events can cause a crust of ice to build up on the snow, covering vegetation. This makes foraging difficult as caribou's hooves are designed to dig through snow, as opposed to ice. Ice can also cause injury to their legs (Species at Risk Committee 2022). Elders and knowledge holders in the Tłı̨chǫ

region have expressed concern over changing fire behaviour due to climate change. They are observing larger, more intense fires and point out that it will take much longer for boreal caribou to return to the areas affected by these larger, more intense fires (Legat *et al*. 2019).

The impacts of climate change on boreal caribou, from changes in population range and habitat availability, to shifts in energy expenditure and interspecies dynamics, play a role in how well this species can successfully use habitats and remain resilient over time (Shukla et al. 2019). These impacts are complex and are likely to vary with spatial and temporal scales. At a continental scale, there is evidence that the boreal zone is experiencing larger and more frequent fires (Kasischke & Turetsky 2006; Hanes et al. 2019), and more frequent extreme fire weather conditions (Wang et al., 2015). Warmer temperatures and increased fire frequency are favoring alternate successional pathways of regeneration by shifting coniferous and mixed wood forests into deciduous forests, and in more extreme cases, to shrublands or grasslands (Johnstone et al., 2010, 2020). This phenomenon has already been detected in approximately 13.6% of the boreal forest of western North America between 1984 and 2014 (Wang et al 2020). Recent simulation studies suggest that climate change will further accelerate this vegetation shift in western Canada (Stralberg et al, 2018). At the scale of the NT1 boreal caribou range, future climate model predictions suggest the fire regime will intensify and could cause habitat suitability to increase in some areas and decrease in others over several decades (Figure 24) (Stewart et al., 2023).

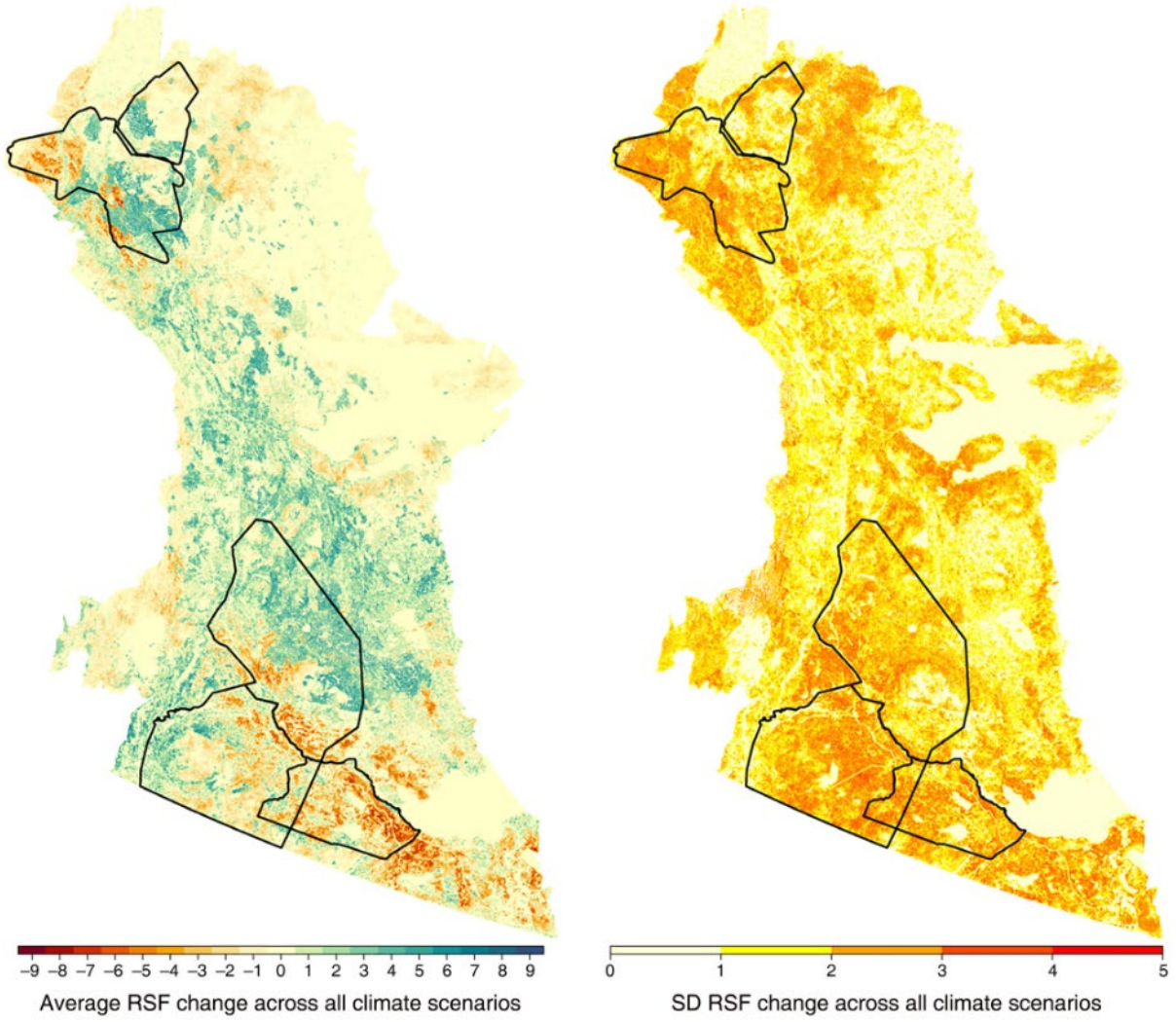


Figure 24. A comparison was made of important areas chosen by caribou (RSF values) from end and start dates (RSF value for year 2100 – RSF value for year 2011). Blue areas represent a net increase in areas chosen (the average RSF value), whereas orange-red areas (on the left map) represent a net decrease in areas chosen (average RSF value). In the map on the right, orange and red areas represent a net increase in the standard deviation (SD) of RSF values.

Habitat-related aspects of climate change, at all temporal and spatial scales, and the trajectory and changes due to climate change will need to be considered during each iteration of range plan updates. Additionally, there is growing demand by environmental regulators to evaluate potential climate-induced changes. For example, the Mackenzie Valley Environmental Impact Review Board has asked for climate change projections of boreal caribou habitat along the proposed Mackenzie Valley Highway to better understand long-term sustainability of the proposed project (K'alo-Stantec 2021).

Boreal caribou have been assessed to have moderate to poor capacity for adaptation to threats (Singer and Lee 2021, ENR 2021). The primary adaptive trait of boreal caribou is to travel long distances in pursuit of environmental conditions to suit their requirements; as such, maintenance of

adequate and connected habitat will be of primary importance in helping caribou adapt to a changing climate.

Considerations of climate change will enable the GNWT to produce regional range plans that acknowledge the potential adaptation and resiliency of boreal caribou within the NT1 range in the following ways:

1. Connectivity within and among regions within the NT1 range is emphasized as much as possible, such that boreal caribou can disperse among habitats over time as an adaptation in response to climate change and climate change related stressors.
2. Climate change-induced projections for the loss of habitat to wildfires are being investigated with the potential application of ensuring that redundancy is built into conserved boreal caribou range, where possible, to buffer against future, increased losses of boreal caribou habitat to wildfires, while still enabling the plan to meet framework objective thresholds for undisturbed habitat.
3. Future climate change models and projections will be examined during iterative range plan updates, and adjustments will be made, where possible, to better align the range plan with shifts in suitable habitat due to climate change.
4. Boreal caribou vulnerability assessments to climate change will be considered, to ensure that all climate change risks to caribou have been identified and, where appropriate, are mitigated to the full extent possible in the range plan.

Current areas of research that will support ongoing NWT boreal caribou recovery and adaptation to climate change impacts include:

Developing high resolution, broad-extent, spatial climate change refugia metrics for use in climate-informed range planning and adaptation within the NWT.

This is a collaborative effort between GNWT-ECC and the Canadian Forest Service. A key strategy for adapting to and mitigating the impacts of climate change is to incorporate nature-based sources of climate change adaptation and mitigation into landscape planning processes. This includes identifying areas that are more resistant to climate change impacts (i.e., refugia) along with the landscape features that promote climate buffering effects and factoring them into decisions regarding land use planning. These products will be available to incorporate into future decision-making analysis to inform range planning processes.

Fine-tuning and updating climate change modelling and forecasting of cascading effects on boreal caribou habitat as more information becomes available.

This is an active area of research with its foundation based within SpaDES (Spatial Discrete Event Simulation) – an open source simulation platform that facilitates a modular and integrated framework (Barros et al., 2023; Micheletti et al., 2021, 2023). This will continuously improve climate change projections to be used in future decision-making analyses.

6.4 Priority Areas for Habitat Restoration

The Tłı̨chǫ All-Season Road Habitat Offset Plan represents the first habitat offset plan in the Wek'èezhìı range planning region and more broadly, in the NWT as a whole. Habitat offsets are intended to offset, or compensate for, residual adverse impacts to boreal caribou that result from the development project in question - i.e., adverse impacts that remain following mitigation. (One of the main mitigations to the project was designing the road to overlap with the existing Old Airport Road to avoid new disturbance.) The residual adverse impacts will affect boreal caribou both *directly*, as a result of the physical footprint (e.g., habitat availability and connectivity), and *indirectly* (e.g., noise, light, vibration) in the Zone of Influence (ZOI) where such sensory disturbance may affect habitat use by boreal caribou. Offsets in this case apply to the footprint and ZOI (500 m) of the Tłı̨chǫ All-Season Road project (estimated to cover 1,130 hectares) and will total approximately 2,800 hectares (see section 5.2 of the Habitat Offset Plan for additional details).

Priority areas for habitat restoration include: (1) restoration of existing linear features, (2) restoration of existing polygonal features, and (3) reforestation of fire-disturbed areas. Although human-caused habitat disturbance is typically the focus of habitat offset restoration efforts, fire-disturbed areas are being considered for restoration given the role of fire as the primary disturbance force affecting boreal caribou and low levels of human-caused disturbance in the Wek'èezhìı range planning area. Objectives of restoration will include managing human access, recovery of native vegetation, reducing predator movement efficiency, and restoring habitat connectivity. All priority areas will be located within the Wek'èezhìı range planning region. Effectiveness monitoring and research will underpin these offsetting priorities, reflecting uncertainties of restoration interventions in this environment. Fire suppression, the establishment of new protected areas, expansion of existing protected areas, and habitat restoration outside of the Wek'èezhìı range planning region were also considered during habitat offset prioritization but, given feedback during consultation and engagement, were ultimately not pursued.

The habitat offset plan will be complemented by the development and finalization of an implementation plan prior, which will define focal sites for habitat restoration, quantify the area that needs restoration, methods, data management, procurement, schedule, costs, performance measures, and adaptive management provisions. Engagement and consultation will continue throughout this process as will existing monitoring programs. This implementation plan is expected to be complete in 2026 and will be subject to annual budgetary decisions of the GNWT Executive Council and Premier.

7. MONITORING, ADAPTIVE MANAGEMENT, AND RANGE PLAN REVIEW

This Range Plan will be fully renewed 10 years after its completion, with a five-year interim review allowing for adjustments mid-way through implementation. The Working Group will take the lead in directing these renewals and reviews. Certain conditions will trigger an early review of the range plan (GNWT 2019). These conditions are listed in Table 10, which is replicated from the NWT Framework for Boreal Caribou Range Planning (2019). The chart has been slightly modified, based on feedback from the Wek'eezhii Boreal Caribou Range Plan Working Group Meeting in February 2023.

Table 10. Triggers for earlier Range Plan review and update

Condition: *If…*	**Response: *Then…***
Within the first 5 years of the plan, annual wildfire disturbance footprints persist outside the observed natural range of variation (the variation in Wek'eezhii region being 29% typical disturbance and 35.5% maximum disturbance)	… 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 amount of human disturbance exceeds the upper limit of the current Tier that the region is in.	… Adjust the proportions of different management classes or change the location of polygons and update associated management actions, if necessary.
Undisturbed habitat within the NWT portion of the NT1 range falls below 65% despite implementation of the range plans	… Re-evaluate management class assignments or change the location of polygons and update associated management actions, if necessary.
Within the first 5 years the caribou population is showing a steep declining trend at the regional scale; the working group will decide collaboratively	… 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.

As part of the five-year review and the ten-year renewal, the **success of the Range Plan implementation between 2025-2035 will be assessed. The success will be defined first by maintenance of adequate habitat to enable a stable or growing boreal caribou population trend in this region**. The monitoring program for tracking the population status of boreal caribou in their Wek'èezhìı range is currently designed to enable GNWT-ECC to track calf recruitment and adult female survival rates in order to calculate an annual index of population trend (Appendix A). It occurs within two study areas: the North Slave Tłı̨chǫ Highway and Mackenzie. The monitoring program used to support the Range Plan will be built from existing programs and will be re-examined during

the Range Plan reviews for its ability to track population changes. Results of monitoring to date indicate that boreal caribou populations are increasing in both study areas.

Additional current monitoring focuses on measuring wildfire and human habitat disturbance. At this point, there is a lack of precedent, experience or infrastructure (e.g., local nurseries with local native species) in the north with respect to habitat restoration. There is also no inventory of candidate restoration sites. As such, research focused on habitat restoration will be encouraged through this Range Plan.

Annual reports of progress will be presented to the Conference of Management Authorities on Species at Risk (CMA). Presentation to the CMA, which addresses the conservation and recovery needs of species at risk across the territory, will also permit information sharing across range planning regions. Annual reports of progress will also be submitted to the Mackenzie Valley Environmental Impact Review Board as part of Tłı̨chǫ Highway environmental assessment requirements and to the Wek'èezhìı Land and Water Board to meet water license conditions for the Tłı̨chǫ Highway.

Annual meetings of the Working Group will also continue, allowing sharing of new information as it is made available and adjustments to be made to the Range Plan as needed. This is particularly important in the face of climate change, which has altered, and will continue to alter, environmental conditions and boreal caribou habitat in the NWT.

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