Wildlife Management and Monitoring Plan

LAND USE PERMIT MV2022W0006

Digaa Enterprises Ltd. (Digaa)

Version 2.0

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Prepared for:

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Acronyms and Definitions

ASHL	Annual Sustainable Harvest Level
ATA	Annual Timber Allocation
FMA	Forest Management Agreement
GNWT	Government of the Northwest Territories
MVLWB	Mackenzie Valley Land and Water Board
THP	Timber Harvest Plan
WMMP	Wildlife Management and Monitoring Plan

1 Project Description

1.1 BACKGROUND

On October 24, 2014, Digaa Enterprises Ltd. (Digaa), a business partnership between the Deh Gah Got'ie First Nation and the Fort Providence Métis Council, established a 25-year Forest Management Agreement with the Government of the Northwest Territories.

"*The GNWT wants communities to benefit from the forests, create economic investment opportunities for the forest industry and increase environmental stewardship and sustainability of forests in the NWT."*

In accordance with the Mackenzie Valley Resource Management Act and subject to regulations, terms and conditions, a second Land Use Permit (LUP) MV2022W0006 was granted to Digaa by the Mackenzie Valley Land and Water Board (MVLWB) on June 23, 2022, for a period of five years.

Digaa has prepared this Tier 1 Wildlife Management and Monitoring Plan, in order to satisfy the determination made in a letter from the Deputy Minister of the Environment and Natural Resources (now referred to as Environment and Climate Change), GNWT (July 13, 2022).

1.2 OBJECTIVES

The objectives for the Wildlife Management and Monitoring Plan (WMMP) are to:

a) reduce or prevent the potential for interaction between people and wildlife to ensure wildlife and human safety;

b) mitigate or prevent any direct impacts to wildlife and/or wildlife habitat; and

c) revise practises and procedures to reflect changing site conditions, activity levels or lessons learned to mitigate potential impacts on wildlife and wildlife habitat (i.e., adaptive approach).

1.3 PROPOSED ACTIVITIES

On October 24, 2014, Digaa Enterprises Ltd. (Digaa), established a 25-year Forest Management Agreement with the Government of the Northwest Territories to enable development of a forest biomass industry in the region.

The Minister of Environment and Climate Change (ECCC) sets an Annual Sustainable Harvest Level (ASHL) for the FMA area by considering social, biological and economic aspects of the area and overall objectives for the NWT. In support of this ASHL, the 25-Year Strategic Forest Management Plan for the Fort Providence FMA area (GNWT 2015) provides summaries of analyses conducted to examine timber harvest rates with various non-timber constraints applied over a 300-year planning horizon.

The ASHL for the Fort Providence FMA is currently set at 102,680 m^3/yr. Section 8.1 of the FMA sets Digaa's annual timber allocation (ATA) at 85% of the ASHL, or 87,200 m^3/year; apportioned 64,900 m^3/year (74%) coniferous and 22,300 (26%) deciduous timber.

1.4 PROJECT LOCATION

The Land Use Permit allows Digaa to access timber stands and harvest logs under their FMA. The FMA timber harvest area generally borders upon the Redknife River to the west, Great Slave Lake to the east, Kakisa Lake to the south and just beyond Mills Lake to the north (see Figure 1-1). Digaa's operations may include a temporary camp near 204 km along the Mackenzie Highway (117°46'15"W; 61°8'31"N).

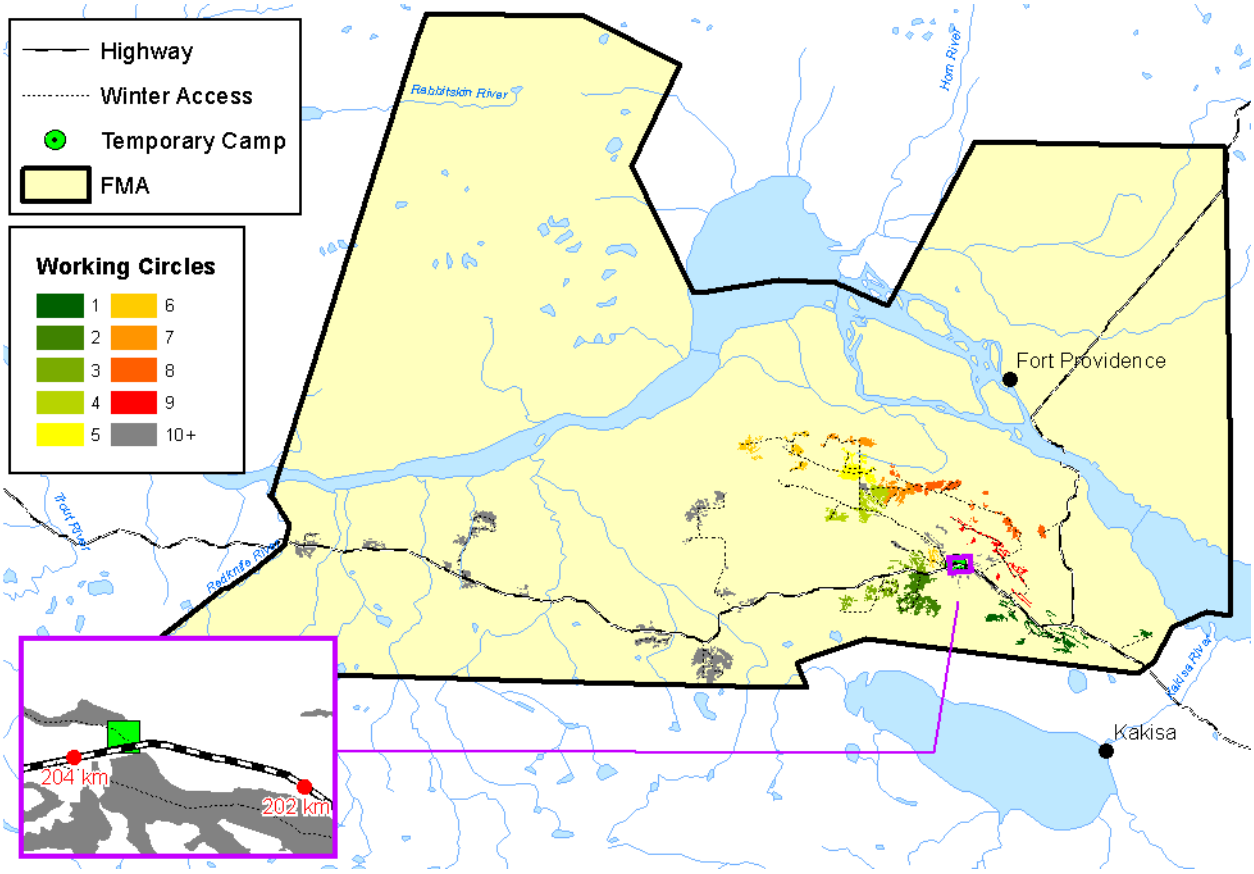

Figure 1-1 Overview map of operations

1.5 HARVEST TIMELINES

Guided by the Timber Harvest Plan, an Annual Operating Plan (AOP) is required to describe the operations for the next harvest season within the FMA area. An AOP details how, where and when the operator will develop roads, harvest timber, integrate operations with other users and mitigate the impact of logging including reclaiming disturbed sites.

The AOP is approved with terms and conditions by the ECC's Forest Management Division.

The anticipated sequence of annual operations is presented in Table 1-1 below. There have been no operations to date, and the commencement year of harvesting is unknown. The first three years of harvesting are expected to take place along the Hwy 1 corridor; however, the Dept of Infrastructure has logged a significant volume from the Year 1 area for a large gravel pit at Km 188. Access and control points are illustrated in Map 1 (Appendix 1).

Table 1-1 Digaa Harvesting Sequence

Year	Working Circle
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13

1.6 ENGAGEMENT ON THE WMMP

Specific agreements or other non-legislated requirements regarding the protection of wildlife and wildlife habitat do not exist within the project area. However, the Bison Control Area governs actions regarding bison that may occur in the project area.

Digaa will consult this WMMP with the Affected Parties identified in the Engagement Plan (described in LUP MV2022W0006_2_Digaa_Engagement_Plan).

The ECC Wildlife Division provided comments and information to Digaa regarding its LUP and for the preparation of this WMMP, which were considered and incorporated into the following subsections. Digaa will continue to work with the ECC Wildlife Division on a long-term access development plan that mitigates potential impacts to the wildlife species of concern.

1.7 LEGISLATED REQUIREMENTS

Various federal and territorial acts and regulations are pertinent to protecting wildlife and wildlife habitat in relation to this WMMP. These are briefly described in Table 1-2.

Table 1-2 Legislated requirements that protect wildlife and wildlife habitat

Legislation	***Specific Requirement***
Wildlife Act (Canada)	The Canada Wildlife Act outlines the controls of the Federal Government, in collaboration with the territories, to protect wildlife in Canada. The Act enables EC/CWS to take required measures to protect endangered wildlife and to acquire lands for wildlife research, conservation, and interpretation. This Act outlines the powers that wildlife officers have to manage wildlife offences and associated punishments.
Wildlife Act (NWT)	The NWT Wildlife Act pertains to all wildlife harvesting and management within the NWT. It acknowledges that the Renewable Resource Boards and Renewable Resource Councils will provide advice related to wildlife management.
	Unless you have an Aboriginal or treaty right or a permit, you cannot disturb bird eggs or nests that are being used. You cannot disturb the nest of any bird listed in the regulations even if the nest is not being used (section 51 [1]).
	Unless you have an Aboriginal or treaty right or a permit, you cannot break into, destroy or damage a den, beaver dam or lodge, muskrat push-up or hibernaculum (section 51 [2]).
	Unless you have an Aboriginal or treaty right or a permit, you can't do anything that will cause a significant disturbance to big game and you can't harass game or other animals listed in the regulations (section 52).
	You can chase wildlife away to protect a person from being injured or killed or to prevent property damage (section 55).
	If you kill big game or other wildlife listed in the regulations because you are starving or to prevent injury or property damage, you must report it to an officer as soon as you can (section 57).
	If you wound or kill big game or other wildlife listed in the regulations with your vehicle, you must report it to an officer. The regulations will include time limits for reporting (section 58).
	You can't leave food or waste somewhere that will likely attract big game and could put a person, wildlife, or domestic animals in danger. This does not prevent you from properly storing food in your house or camp (section 66).
	A developer or other person or body may be required, in accordance with the regulations, to prepare a wildlife management and monitoring plan for approval by the Minister, and to adhere to the approved plan, if the Minister is satisfied that a development, proposed development, or other activity is likely to: (a) result in a significant disturbance to big game or other prescribed wildlife; (b) substantially alter, damage or destroy habitat; (c) pose a threat of serious harm to wildlife or habitat; or (d) significantly contribute to cumulative impacts on a large number of big game or other prescribed wildlife, or on habitat (section 95 [1]).
	A wildlife management and monitoring plan must include: (a) a description of potential disturbance to big game and other prescribed wildlife, potential harm to wildlife and potential impacts on habitat; (b) a description of measures to be implemented for the mitigation of potential impacts; (c) the process for monitoring impacts and assessing whether mitigative measures are effective; and (d) other prescribed requirements (Section 95 [2]).
Species at Risk Act (Canada)	Under the Species at Risk Act, it is forbidden to kill, injure, harass, destroy the residence of, critical habitat of, capture or take and individual designated as extirpated, endangered, or threatened on federally-regulated lands (Sections 32 and 33), or territorial lands (Section 34 [1]). An order by the Governor in Council may, based on the recommendation of the Minister of Environment and Natural Resources, apply Sections 32 and/or 33 on territorial lands if the territorial laws do not effectively protect the species or its residences in question (Section 34 [2] and [3]).
Species at Risk Act (NWT)	The Species at Risk (NWT) Act applies to both public and private lands throughout the NWT and includes private lands owned under land claims agreements. The Act applies to any wild animal, plant, or other species managed by the GNWT. The Act is intended to be complementary to the federal Species at Risk Act and addresses concerns at the territorial level.
Migratory Birds Convention Act, Migratory Bird Regulations	The Migratory Birds Convention Act protects migratory birds and their nests throughout Canada. Migratory birds covered under the act include: waterfowl, cranes, shorebirds, and songbirds (a full list of species is at https://www.canada.ca/en/environment-climate-change/services/migratory-birds-legal-protection/convention-act.html). The MBCA is the enabling statute for the Migratory Birds Regulations, 1994. These regulations state that without authorization of a permit, the disturbance or destruction of a nest or egg of a migratory bird is prohibited.
Fisheries Act	The Fisheries Act states that unless authorized by federal regulation, no person shall deposit or permit the deposit of deleterious substances of any kind in water frequented by fish (Section 36 [3]). This protection of water can contribute to protection of wildlife and wildlife habitat.

1.8 CONTACT INFORMATION

Questions regarding the WMMP can be directed to:

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Digaa is a business partnership between the Deh Gah Got'ie First Nation and the Fort Providence Métis Council.

2 Wildlife Species and/or Habitat Features of Concern

While a host of wildlife species exist within the Deh Cho region, this WMMP is focused on the following species of concern to the general public:

a) Species at risk identified for the Deh Cho Region (section 2.1);

b) Fish such as walleye, whitefish, lake trout, northern pike, suckers, grayling, stickleback;

c) Big game species such as woodland caribou, bison (per Bison Control Area requirements), moose;

d) Furbearing species such as fisher, marten, mink, fox, coyote, beaver, otter; and

e) Predators such as black bear, grey wolf, lynx, cougar, wolverine.

Species of concern were referenced when considering potential impacts and mitigation strategies.

2.1 SPECIES AT RISK

The Committee on the Status of Endangered Species in Canada (COSEWIC) assesses the status of species at risk in Canada. The Species at Risk Committee (SARC) assesses the status of species at risk in the NWT. Table 2-1 provides a list of the species at risk within the South Slave Region (for Species at Risk).

Harvesting operations could adversely affect species at risk and their habitat. If species at risk are encountered during planning and harvesting operations, the primary mitigation measure is to avoid disturbing them and their habitat. In these cases, the supervisor will immediately halt operations and notify the Digaa Manager who, in turn, will report the finding to ECC, and collaborate with them on an appropriate action plan (e.g., no-harvest buffers; implement species-specific timing windows).

Table 2-1 Species at Risk

Species	Status in NWT		Status in Canada	
	SARC Assessment	Legal List	COSEWIC Assessment	Legal List
MAMALS				
Woodland Caribou (Boreal population)	Threatened	Threatened	Threatened	Threatened
Grizzly Bear	Special Concern	No status	Special Concern	Special Concern
Little Brown Myotis	Special Concern	Special Concern	Endangered	Endangered
Northern Myotis	Special Concern	Special Concern	Endangered	Endangered
Wolverine	Not at Risk	No status	Special concern	Special Concern
Wood Bison	Threatened	Threatened	Special concern	Threatened
BIRDS				
Bank Swallow	Not applicable	Not applicable	Threatened	Threatened
Barn Swallow	Not applicable	Not applicable	Special concern	Threatened
Common Nighthawk	Not applicable	Not applicable	Special concern	Threatened
Horned Grebe	Not applicable	Not applicable	Special concern	Threatened
Evening Grosbeak	Not applicable	Not applicable	Special Concern	Special Concern
Harris's Sparrow	Not applicable	Not applicable	Special Concern	Under Consideration
Horned Grebe	Not applicable	Not applicable	Special Concern	Special Concern
Lesser Yellowlegs	Not applicable	Not applicable	Threatened	Under Consideration
Olive-Sided Flycatcher	Not applicable	Not applicable	Special Concern	Threatened
Peregrine Falcon (anatum-tundrius complex)	Not assessed	No status	Not at risk	Special Concern
Red-necked Phalarope	Not applicable	Not applicable	Special Concern	Special Concern
Rusty Blackbird	Not assessed	No status	Special Concern	Special Concern
Short-eared Owl	Not assessed	No status	Threatened	Special Concern
Whooping Crane	Not applicable	Not applicable	Endangered	Endangered
Yellow Rail	Not applicable	Not applicable	Special Concern	Special Concern
FISHES				
Bull Trout	Not applicable	Not applicable	Special Concern	Special Concern
Shortjaw Cisco	Not applicable	Not applicable	Threatened	No status
AMPHIBIANS				
Northern Leopard Frog	Threatened	Threatened	Special Concern	Special Concern
INSECTS				
Gypsy Cuckoo Bumble Bee	Data Deficient	No status	Endangered	Endangered
Suckley's Cuckoo Bumble Bee	Not assessed	No status	Threatened	Under Consideration
Transverse Lady Beetle	Not assessed	No status	Special Concern	Special Concern
Yellow-banded Bumble Bee	Not At Risk	No status	Special Concern	Special Concern

Source of Species At Risk status: NWT Environment and Natural Resources 2022

(http://www.nwtspeciesatrisk.ca/SpeciesAtRisk?title=&field_area_tid=50&field_species_tid=All)

2.2 BOREAL WOODLAND CARIBOU HABITAT

A portion of the boreal woodland caribou (*Rangifer tarandus caribou)* range currently exists within the FMA area (Figure 2-1b). While there are no specific legislated requirements that prevent development within this range, Digaa will endeavour to work with ECC to implement plans that mitigate potential impacts to the valuable caribou habitat within this range.

Potential long-term effects of road and block patterns across the landscape while maintaining at least 65% undisturbed habitat for boreal woodland caribou habitat were examined in the 25-year Forest Management Plan (ENR 2015) that the Minister of ENR (now ECCC) used as a basis for setting an appropriate annual sustainable harvest level. To address general guidelines for maintaining caribou habitat (Environment Canada 2012; NWT ENR 2014), the accompanying THP aimed to concentrate harvest openings within contiguous areas ("Working Circles", see Maps – Appendix 1) that create patches larger than 2,000 hectares in size, that are expected to provide habitat after 40 years.

We evaluated potential contribution of the permit area (plus a conservative 1 km buffer around the permit area) to the disturbance regime within the NT1 Range and/or the Southern NWT Range Planning Region in two ways:

1) overlaying the spatial extent on an annual 2nd order (within the population range) resource selection function (RSF) (DeMars et al. 2020; RSF model data provided by ENR under a data-sharing agreement), and

2) uploading the spatial extent of the project to the NWT Species and Habitat Viewer (https://www.maps.geomatics.gov.nt.ca/Html5Viewer/index.html?viewer=NWT_SHV).

2.2.1 RESOURCE SELECTION FUNCTIONS

Resource Selection Functions (RSFs) integrate location data obtained from caribou with various factors thought to influence habitat use and distribution, including land cover, topography, productivity, and various disturbance types. As a result, RSFs represent the relative likelihood that caribou may be encountered in particular habitat types or regions, and indirectly provide an index of habitat suitability across seasons. A couple of notes to consider regarding the RSFs developed by DeMars et al (2020):

1) The annual (or global) models performed better (i.e.; had higher predictive power) than the seasonal models. Our assessment utilized the annual RSF. At writing, the seasonal RSF spatial data have not been provided, but given the lower predictive performance of the seasonal models, an assessment of the permit area on caribou habitat availability, based on the annual models, is likely sufficient;

2) Visual inspection of the seasonal RSFs in DeMars et al. (2020) suggest that the permit area is generally avoided during summer and calving, and functions primarily as fall and winter habitat;

3) RSFs represent relative probabilities. Even though an RSF may indicate high selection value in a particular area (i.e.; higher habitat suitability) relative to other habitat types, the actual probability of encountering caribou may still be quite low given the low density of caribou (6,000 animals in the NT1 Range).

4) The RSF values are typically standardized and 'binned' by deciles. We combined the 10 bins into 5 habitat classes according to the following combinations (which roughly correspond to a standard Habitat Suitability Index (HSI)) scale:

    a) Very Low Habitat Suitability: RSF bins 1+2
    b) Low Habitat Suitability: RSF bins 3+4
    c) Moderate Habitat Suitability: RSF bins 5+6
    d) High Value Habitat Suitability: RSF bins 7+8
    e) Very High Habitat Suitability: RSF bins 9+10

5) Much of the FMA appears to be generally avoided by caribou, likely due to the extent of < 40-year old fires in the FMA. These burned areas will be aging back into the habitat supply in the coming years.

Overall, the buffered (1km) permit area totals 28,051 ha. The permit area contains approximately 9% of available High and Very High habitat value for caribou (as indexed by habitat selection) within the FMA (Table 2-2). Much of this area appears to be fall and winter habitat (from DeMars et al 2020). The amount of High and Very High habitat combined that would be removed represents approximately 0.22% of similar value habitat that is currently available throughout the Southern NWT Range Planning Region (Table 2-2).

Table 2-2 Summary of Relative Habitat Selection Strength by Area (ha) in the permit area, the Fort Providence Forest Management Area, and the Southern NWT Range Planning Region.

	Relative Habitat Value				
	Very Low	**Low**	**Medium**	**High**	**Very High**
Permit Area (PA) (ha)	3,676	2,997	8,852	4,432	8,093
FMA (ha)	310,641	142,129	168,347	67,046	69,922
% PA/FMA	1.18	2.11	5.26	6.61	11.57
South NWT Range Planning Area (ha)	3,742,995	2,826,406	3,659,572	2,604,191	3,178,955
% PA/Range	0.10	0.11	0.24	0.17	0.25

2.2.2 PROJECT CONTRIBUTIONS TO DISTURBANCE REGIME

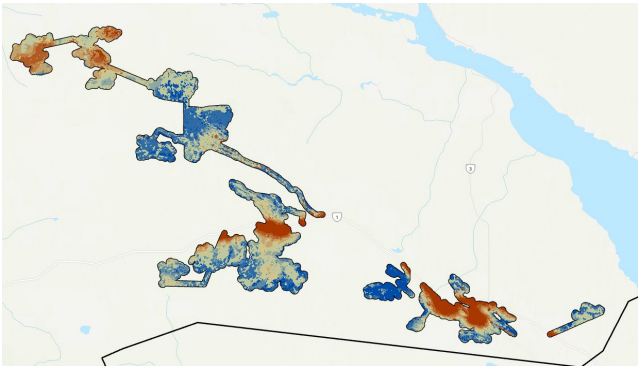
The FMA is a disturbed landscape, largely contributing to the general avoidance patterns observed in the annul RSF model. The boreal caribou habitat disturbance report for the FMA is provided in Appendix 2. Overall, approximately 14% of the FMA is disturbed by fire and another 20% is marked by human disturbance. After accounting for overlaps, the combination of human disturbance and fire covers approximately 32% of the FMA. The burned areas will likely return to the habitat supply in the coming years, much of it likely functioning as higher value habitat.

The boreal caribou project screening report summarizes the permit area contribution to the disturbance regime in the Southern NWT Range Planning Region and the NT1 Range as a whole. For reference, the summary is provided in Appendix 3.

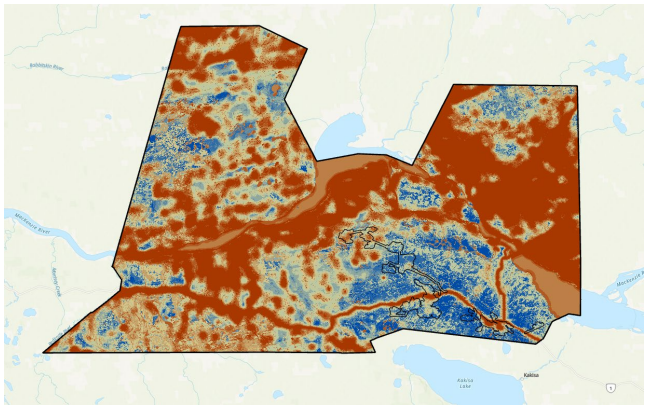
New total disturbance added by the project is 18,825ha, after accounting for overlaps with pre-existing disturbance. The new total disturbance added by the project increases the total disturbance area percentage in the Southern NWT Range Planning Region from 39.25% to 39.36% (+0.11%). The new total disturbance added by the project increases the total disturbance area percentage in the NT1 Range from 27.95% to 27.99% (+0.04%).

2.2.3 EVALUATION OF POTENTIAL IMPACTS TO BOREAL CARIBOU

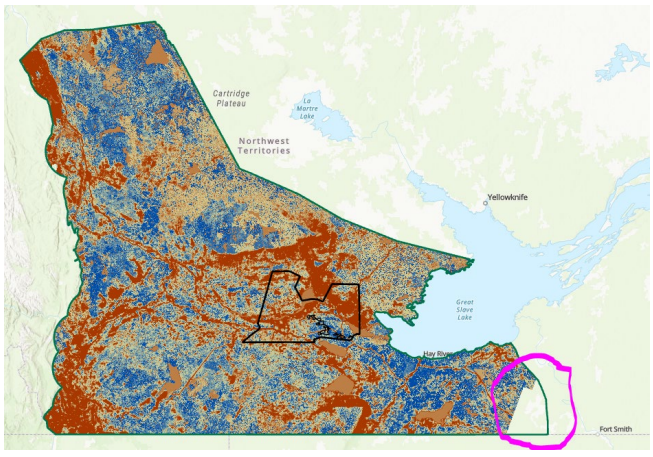
The negligible (-0.22%) removal of higher value habitat (as indexed by relative habitat selection) compared to what is available in the Southern NWT Range Planning Region, combined with the negligible contribution to the pre-existing disturbance in the Planning Region (+0.11%) and the NT1 Range as a whole (+0.04%), is indicative that the permit area is not likely to impact caribou or their habitat to any significant degree. Mitigation measures (see Section 3), in addition to commitments for reclamation and access management, will further reduce the potential of the permit area to impact caribou and caribou habitat, at the individual, sub-population, and population scales.



a) Habitat selection values in the permit area, including a 500m buffer around access roads and blocks



b) Habitat selection values across the FMA



c) Habitat selection values across the Southern NWT Boreal Caribou Range Planning Area

Figure 2-1 Year-round predicted habitat selection by boreal caribou in the a) project area, b) across the FMA, and c) across the southern NWT Range Planning Region. Dark red represents strong avoidance. Dark blue represents strong selection. Data sourced from DeMars et al. 2020.

3 Potential Impacts and Mitigation Measures

Most of the potential impacts to wildlife discussed below were identified in the 25-year Forest Management Plan (ENR 2015) and summarized in the Five-Year Timber Harvest Plan (March 31, 2022). Many of these will likely be mitigated by limiting harvesting activities throughout the winter months when most wildlife species are not engaged in particularly sensitive activities, such as breeding, and enhanced harvest practices, such as tree patch retention within cutblocks, access management, and reclamation activities. Potential impacts to wildlife and wildlife impacts are summarized in Table 3.1.

Table 3-1 Characterization of potential impacts to wildlife and wildlife habitat and overview of mitigations.

Wildlife and Wildlife Habitat			
Impact	**Species**	**Pathway**	**Mitigations**
Direct loss or removal of habitat, dens, or nests	General	Direct habitat loss or disruption refers to the physical disturbance and immediate loss of wildlife habitat (e.g., upland and riparian vegetation, wetlands and water) resulting from access management or timber harvesting operations. This disturbance can occur when trees are removed, debris is manipulated, water is diverted or hazardous materials are spilled. Road works and timber harvesting could cause temporary changes in habitat and ecosystem composition. Potential to indirectly cause habitat change. Potential that construction and use of linear routes will fragment habitat to some degree and increase predation.	Assess forest-level impacts through strategic planning initiatives and implement localized, transient, and temporary operations. Retain up to 5% timber volume within harvest blocks, including trees where available along riparian areas. If field crews observe wildlife features (e.g., bear dens, bat hibernacula, mineral licks) or species of concern, the supervisor will immediately halt operations and notify the Digaa Manager who, in turn, will report the finding to ECC and collaborate with them on an appropriate action plan (e.g., no-harvest buffers; operational timing windows). Access restrictions (Section 3.1), Reclamation (Section 3.2), Reforestation (Section 3.3)
	Predators, Northern Myotis	Road works and timber harvesting could directly or indirectly impact protected areas and buffer zones.	Establish appropriate retention buffers around known wildlife habitat features. When these are identified, the Digaa Manager will contact and work with the ECC Wildlife Division to develop site-specific setbacks. Design block patches and boundaries that are wind firm.
	Fish	The release of hazardous materials (e.g., fuel, waste and sewage) to the environment could damage fish habitat.	Use proper handling, storage and disposal techniques for hazardous materials. The spill contingency procedures described in Digaa's Spill Contingency Plan provide spill prevention and response methods to minimize potential effects on health and safety and the environment.
	Species at Risk	Forestry operations near waterbodies could damage habitat for identified bird, amphibian and fish species.	Retain protection buffers adjacent to waterbodies according to the Commercial Timber Harvest Planning and Operations Standard Operating Procedures Manual (ENR 2005).
Loss or removal of keystone species and/or Species at Risk habitat	Species at Risk	Potential of impacting rare, threatened or endangered species.	Mitigated in approved AOPs through sound block design that aims to identify these species and their habitat and by properly responding to instances where they are observed. Access restrictions (Section 3.1), Reclamation (Section 3.2), Reforestation (Section 3.3)

Fragmentation of wildlife corridor	General	Potential to impact buffer zones through blow-down.	Mitigated through sound block design that aims to retain wind firm patches and block boundaries. Access restrictions (Section 3.1), Reclamation (Section 3.2), Reforestation (Section 3.3)
Direct injury or mortality	General	Timber harvesting operations can contribute to the mortality or injury of wildlife: a) Accidentally, through incidents like vehicle collisions with wildlife or the release of hazardous substances, or Deliberately, through the destruction of problem wildlife to protect worker safety.	Not anticipated to occur with the application of appropriate mitigations. See below.
	Waterfowl	Timber harvesting near wetlands could negatively affect waterfowl populations	Plan harvesting operations to avoid known waterfowl nesting and staging areas and ensure activities take place outside timing windows for breeding (e.g., during winter months).
	Fish	The release of hazardous materials (e.g., fuel, waste and sewage) to the environment could decrease fish populations.	Use proper handling, storage and disposal techniques for hazardous materials. The spill contingency procedures provide spill prevention and response methods to minimize potential effects on health and safety and the environment.
	Bison, caribou, game and predator species	Improved access and use of linear features could influence population changes through increased predation, hunting, fishing or trapping.	Maximize the use of existing roads and trails, minimize the development of new permanent winter road access and deactivate or reclaim structures when access is no longer needed. Where practicable, apply appropriate reclamation measures to discourage access. To facilitate wildlife movement, incorporate gaps (1m high and 10m wide) into roadside snow-berms at every 500m (approximately) and at identified game or trapping trails.
	Bison, caribou, game species	Increased access could result in higher road mortality through collisions with vehicles.	Maintain safe speed limits along roads and highways and establish that wildlife have the right-of way. Communicate sightings and hazards along access roads and highways through radio transmissions. The Contractor will report wildlife-vehicle collisions to the Digaa Manager who will, within 24 hours, report it to the ECC wildlife emergency line (3-2) and collaborate with them on an appropriate action plan.
	General	Noise associated with road building and timber harvesting activities could affect wildlife behaviour.	Restrict machine-related operations to winter months. Where required, the Digaa Manager will work with ECC to develop action plans to address specific noise impacts to wildlife before operations commence.
	Predators, game species, wolverine, birds	Sensory disturbance from camps could attract wildlife and increase wildlife-human encounters.	Ensure all food and waste is properly handled and stored. Routinely haul waste to a designated disposal site (see Waste Management Plan). The procedures outlined in Digaa's Camp Plan and Waste Management Plan provide some methods to minimize these interactions. Encounters between animals and people are inherently dangerous for people and animals. Start with least intrusive deterrent actions and increase intensity as

			needed. If these are unsuccessful, the Contractor will report nuisance wildlife to the Digaa Manager who will, in turn, report it to the ECC wildlife emergency line (Table 3-2) and collaborate with them on an appropriate action plan.
Disturbances to key lifecycle stages: breeding, feeding, nesting, staging	General	Potential of disturbing breeding patterns (activities and season vary by species) due to localized, transient, and temporary operations.	Mitigated by harvesting during winter months. Pre-clearing surveys to confirm the absence of bear dens. Access restrictions (Section 3.1), Reclamation (Section 3.2), Reforestation (Section 3.3)
Effects on population abundance	General	Potential to indirectly causing influence population changes through improved access that might increase predation, hunting, fishing or trapping. Potential for road mortality through collisions with vehicles.	Apply appropriate reclamation and access management measures to discourage access where required. Monitoring of reclamation and access management measures, and adaptive management if corrective actions are required. Maintain safe speed limits along roads and highways.
Change in species diversity	General	Potential that some wildlife species may temporarily avoid a harvest area.	Tree retention patches (5%+) within harvest areas and ensuring reforestation. Access restrictions (Section 3.1), Reclamation (Section 3.2), Reforestation (Section 3.3)
Changes to migratory movement patterns	Birds, caribou, bison, game species	Potential that some wildlife species may temporarily avoid a harvest area. Potential that some wildlife species may adjust their movement patterns and incur energetic costs to access alternate habitat areas.	Not anticipated to occur with the application of appropriate mitigations. Access restrictions (Section 3.1), Reclamation (Section 3.2), Reforestation (Section 3.3)
Changes to predator-prey relationships	General	Potential that predation and predatory success rates may increase as a result of disturbed areas and facilitating access for predators.	Mitigated through long-term landscape-level strategic planning. Access restrictions (Section 3.1), Reclamation (Section 3.2), Reforestation (Section 3.3)
Human-wildlife conflicts	Bears, caribou, bison, game	Potential for wildlife to be encountered during winter operations.	Work with ECC to develop action plans to address identified wildlife before harvesting commences. Worker training. Waste management. Wildlife sightings and incidents log. Any bison sighting is to be immediately reported to ECC. Adaptive management.
Other - Behavioural changes	General	Potential that wildlife will be affected by operations due to noise. Potential that wildlife may alter their behaviour due to increased predation activities. Potential to attract wildlife to camps.	Mitigated as operations are localized, transient, and temporary and by harvesting during winter months and where required, working with ECC to develop action plans to address identified wildlife before harvesting commences. Mitigated by examining forest-level impacts through strategic planning. Mitigated by ensuring all food and waste is properly handled and stored.

	General	Progressive landscape change could lead to long-term changes in wildlife patterns that may not manifest themselves in the short-term.	Encourage adaptive management approaches to assess forest-level impacts through strategic planning initiatives (see 25-year forest management plan).
	Species at Risk	Road building and timber harvesting operations could indirectly affect habitat for species at risk.	Design harvest blocks to minimize or avoid impacting the habitat for these species and quickly respond to any new instances where they are observed. Report all observations of species at risk to ECC staff.
	Big-game species, Caribou, Bison	New road systems and harvesting in dispersed patterns across the landbase could fragment habitat to the benefit of some wildlife species (predators) and detriment of others.	Maximize the use of existing roads and trails, minimize the development of new permanent winter road access and deactivate or reclaim structures when access is no longer needed. Concentrate activities in limited areas each year and plan blocks in a way that the overall distribution of habitat within the timber harvest planning area is considered. Digaa worked with ECC to concentrate blocks into contiguous areas (larger than 2,000 hectares). Map 2 (Appendix 1) shows harvesting activities concentrated these compartments. Following harvest, these areas will regenerate as even-aged forests arranged so the remaining habitat within the FMA area is not isolated. This also maintains natural forest structure to provide for other wildlife habitat.
	Predators, Northern Myotis	Timber harvesting operations could disturb breeding patterns (note: activities and season vary by species).	Road management and harvesting operations should avoid known waterfowl nesting seasons by taking place outside timing windows for breeding (e.g., during winter months). Establish appropriate retention buffers around known wildlife habitat features (e.g., dens, hibernacula, mineral licks).
	Big-game species, Caribou, Bison	Displacement of big game species in late winter could result in high energetic costs or force them to move to sub-optimal habitat.	Assess each new harvest opening on the ground to determine if these species are actively utilizing the area. Temporarily suspend operations to allow wildlife to pass by; notify other operators where wildlife are located and report the event to the Digaa Manager who will maintain a log of wildlife interactions.

3.1 ACCESS RESTRICTIONS

While breeding periods may vary from year to year due to climatic conditions and some species may nest outside the dates provided if conditions are favourable, the Digaa Manager will employ the following access restrictions during sensitive periods to reduce disturbance to wildlife.

Aircraft used in support of operations will be scheduled to fly at times when few birds are present (i.e., early spring, late fall, winter). If avoidance is not possible, then the pilot, subject to his/her discretion regarding safety, will fly according to the restrictions described in Table 3-2. In addition, pilots will avoid landing and excessive hovering or circling over these areas where wildlife and wildlife features are observed. Pilots will be informed of these flight requirements during pre-flight meetings.

Table 3-2 Aircraft restrictions during sensitive periods for wildlife

Species	***Purpose/Habitat Type***	***Period***	***Minimum Altitude (agl)***
Birds, wildlife, general	When flying point to point in the vicinity of caribou and other wildlife species	Year round	650 m (2100 ft)
Wildlife, general	Over large mammals during ferry flights	Year round	300 m (975 ft)
Birds, general	Areas where birds are known to concentrate (sanctuaries, colonies, moulting areas)	Year round	1,100 m (3500 ft)
Raptors	Nest sites	Year round	650 m (2100 ft)
Migratory Birds	Nest sites (Zone B7)	May 1 to Aug 15	650 m (2100 ft)
Migratory Birds	Staging areas	May 10 to Sep 30	650 m (2100 ft)
Bear and wolverine	Dens	Oct 15 to May 15	300 m

During non-winter months, helicopters will be used to transport crew for timber reconnaissance and layout of roads, boundaries and pre-harvest evaluations required by ECC. Flights will generally require short durations for limited times during the year and will attempt to avoid known areas and times that are particularly sensitive (i.e., breeding, calving, staging). Pilots will avoid landing and excessive hovering or circling over areas at low levels (below 1,000 ft) where wildlife are observed.

3.2 MONITORING

The Digaa Manager will maintain a record of all incidents where wildlife species of concern are observed and where specific measures were taken to mitigate impacts to wildlife and wildlife habitat or feature. These observations and incidents will be used to support annual reporting for monitoring and, together with additional input from ECC's Wildlife Division, identifying trends over time. At least annually, Digaa will check with the ECC Wildlife Division for known locations of wildlife features to consider in its development planning.

3.3 TRAINING

Logging Contractors are responsible for providing qualified supervisors to train and educate site workers on measures for mitigating the wildlife and wildlife habitat impacts identified above. Contractors ensure that training sessions are scheduled to ensure employees:

a) understand the pertinent requirements of this WMMP,

b) are aware of commitments related to storing, handling and transporting petroleum products and other hazardous substances and take all necessary precautions to prevent spills,

c) know the steps to be undertaken when encountering wildlife species of concern (i.e., monitoring and reporting observations and incidents),

d) are able to identify wildlife values and be familiar with procedures to mitigate impacts and protect these values, and

e) are familiar with safe practices for working within Grizzly and Black Bear Country - for any work conducted when bears are not hibernating.

The Digaa Manager will provide evidence of training records with annual reports to ECC.

3.4 REPORTING PROTOCOLS

Reporting protocols describe the procedure, format, and frequency for reporting on implementation of the Wildlife Management and Monitoring Plan.

Observations of wildlife (i.e., species of concern) and wildlife features (e.g., dens, nests, mineral licks, and bat hibernacula) will be documented on the Wildlife Sightings Form (Appendix 3).

The Contractor will document all incidents of wildlife interactions (e.g., accidents, injuries or mortalities) on the Wildlife Incidents Form (Appendix 3). These will be immediately provided to the Digaa Manager who will, in turn, report it to the ECC and collaborate with them on an appropriate action plan. Where the situation is dangerous, the Contractor will call the ECC wildlife emergency line directly. In any cases involving species protected under the Migratory Birds Convention Act and its regulations, the Digaa Manager will also contact Environment Canada and collaborate with them on an appropriate action plan. In special circumstances, the Digaa Manager may also contact the Mackenzie Valley Land and Water Board.

Table 3-3 Contact List for a Wildlife Incident

Organization	Role/Contact Person	Contact Number	Location
Digaa	Manager, Bob Head	867-699-3411	Fort Providence, NT
Contractor (TBD)	On-Site Supervisors	TBD	TBD
ECC Wildlife Emergency Line		867-875-7640	Hay River
		867-872-0400	Fort Smith
Environment Canada - Canadian Wildlife Service	Jean-François Dufour	867-669-4766	Yellowknife, NT
Mackenzie Valley Land and Water Board		867-669-0506	Yellowknife, NT

Each year, by the anniversary of the approved LUP and where operations were actually conducted, Digaa will prepare and submit to the ECC Wildlife Division, an annual report that includes a copy of all sighting and incident forms and a summary of:

a) Incidents of human-wildlife interactions (e.g., accidents, injuries or mortalities involving wildlife),

b) Measures taken to mitigate impacts to wildlife and wildlife habitat, and

c) Unexpected disturbances to wildlife habitat.

A copy of this report will also be shared with holders of leases and claims located within the vicinity of Digaa operations. In exchange, Digaa expects that ECC Wildlife Division will keep Digaa informed on how this information was used and on general trends that will aid in the development of future wildlife management strategies and holders of leases and claims will reciprocate by sharing their annual reports.

4 Post-Harvest Activities

4.1 RECLAMATION

Road reclamation will follow Northern Land Use Guidelines, Access: Roads and Trails (GNWT 2016), with the objective of minimizing environmental disturbance. In the cases where access roads will be used again in the future, reclamation efforts will focus on seasonal reclamation that maintains natural drainage by pulling out snow-fills and installing cross ditches where required.

Sedimentation and erosion is typically controlled by good road design; such as maintaining lower road grades, incorporating vegetated buffer strips between roads and watercourses, proper scheduling of road construction and

using brush to trap sediment. As a last resort, grass-seeding – using only seed from local sources – may be applied in ditches.

Typically, in-block roads and landings will be reclaimed to a stable condition. However, some roads may be required as future access (as approved in the AOP or as required by the ENR) for silviculture, research, or fire suppression activities. Appropriate reclamation measures may also be required to discourage access. Specific situations, locations and timing are prescribed in collaboration with ECC staff and identified in AOPs.

Logging debris (i.e., broken tree tops, branches, dead and down trees) will occur throughout the harvested areas. Larger concentrations of debris from roadside processing will be piled and burned (i.e., slashing) – under appropriate weather conditions – to abate fire hazard and increase reforestation opportunities. This activity is based on site-specific prescriptions in collaboration with ECC staff.

4.2 REFORESTATION

With the AOPs and as a condition of harvest under the Commercial Timber Harvest Planning and Operations Standard Operating Procedures (ENR 2005), Digaa must include a Pre-harvest Ecological Assessment (PHEA) for each harvest block. ECC may use this to establish a Pre-Harvest Silviculture Prescriptions (PHSP) that specifies the silviculture system and reforestation plan.

Under the *Forest Management Regulations*, Digaa is assessed a reforestation charge which transfers the reforestation obligation onto the ECC. While reforestation approaches vary by site, specific methods may include some combination of site preparation, leave for naturals and/or planting trees. ECC monitors regenerating stands to ensure that future stands meet or exceed anticipated growth performance levels with appropriate tree species.

5 Adaptive Management

Adaptive management identifies how the monitoring results may be incorporated into improving monitoring protocols, mitigation measures taken or other management responses. As this THP is the first of its kind at this scale, the probability or significance of the potential impacts (section 3) is yet unknown – including any potential impacts that may be missing.

5.1 COLLABORATING WITH THE ECC'S WILDLIFE DIVISION

Over this term of this LUP, the Digaa Manager will work closely with the ECC Wildlife Division to identify specific information gaps and improvements to practices and procedures that might mitigate potential impacts on wildlife and wildlife habitat - - particularly boreal caribou. Accordingly, Digaa has committed to:

a) Modify the proposed timber harvest sequence by ending the "Loop Road" access by eliminating the connection between Blocks 3611 and 3613.

b) Prepare a Deactivation Plan (for submission to MVLWB), that would complement Digaa's Annual Operating Plan (for submission to ECC Forest Resources).

c) Prepare and submit a Wildlife Management and Monitoring Plan, that demonstrates how impacts to boreal caribou and their habitat are being managed within the FMA area.

6 References

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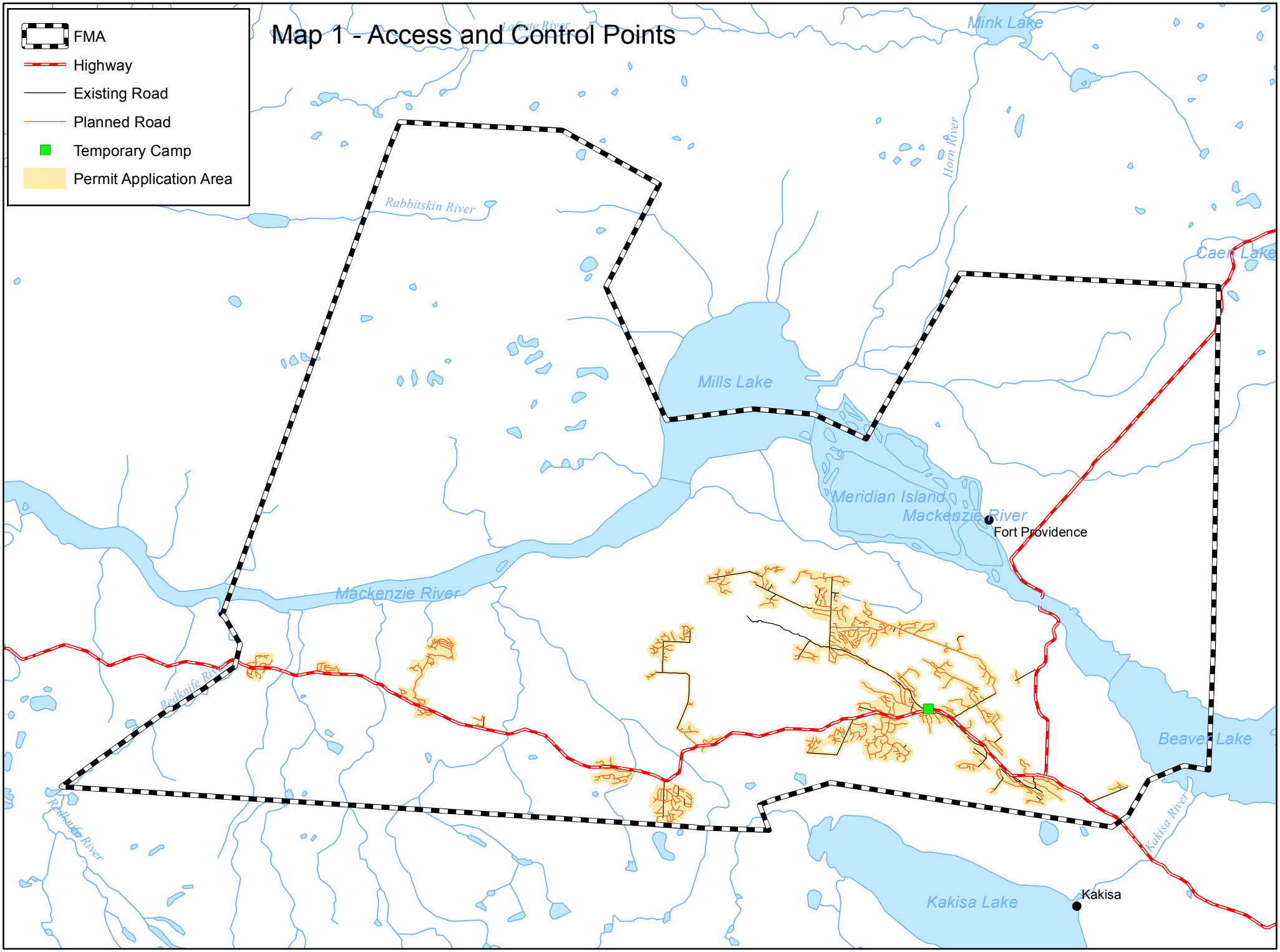
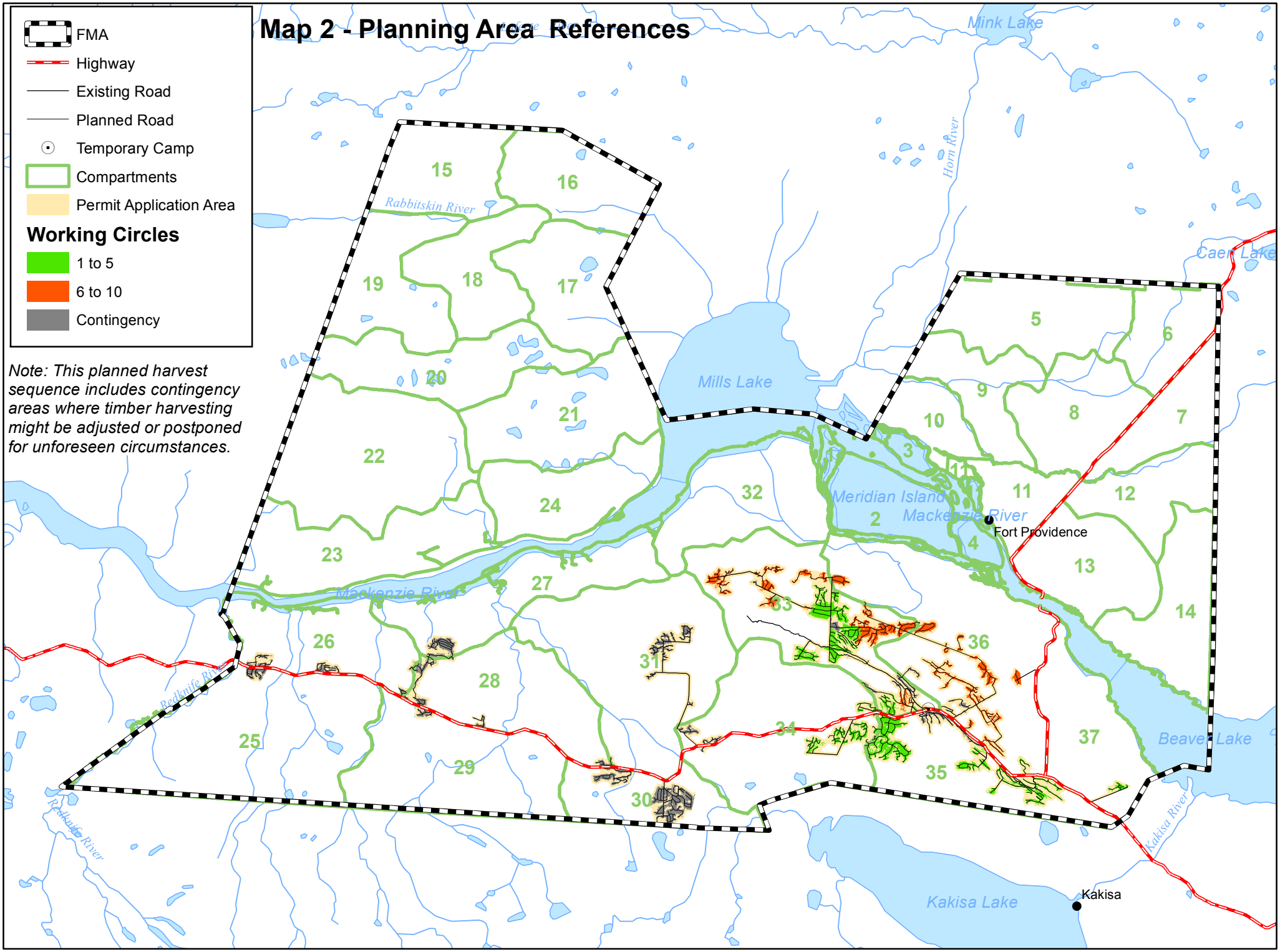
Appendix 1 Supporting Maps

The following overview maps support this plan:

- Map 1 – Access and Control Points
- Map 2 – Planning Area References


Map 1 - Access and Control Points
FMA
Highway
Existing Road
Planned Road
Temporary Camp
Permit Application Area
Mink Lake
Horn River
Rabbitskin River
Caen Lake
Mills Lake
Meridian Island
Mackenzie River
Fort Providence
Mackenzie River
Redknife River
Beaver Lake
Kakisa River
Kakisa Lake
Kakisa


Map 2 - Planning Area References
FMA
Highway
Existing Road
Planned Road
Temporary Camp
Compartments
Permit Application Area
Working Circles
1 to 5
6 to 10
Contingency
Note: This planned harvest sequence includes contingency areas where timber harvesting might be adjusted or postponed for unforeseen circumstances.
Mink Lake
Horn River
Rabbitskin River
Caen Lake
Mills Lake
Meridian Island
Mackenzie River
Fort Providence
Beaver Lake
Kakisa River
Kakisa Lake
Kakisa
Redknife River
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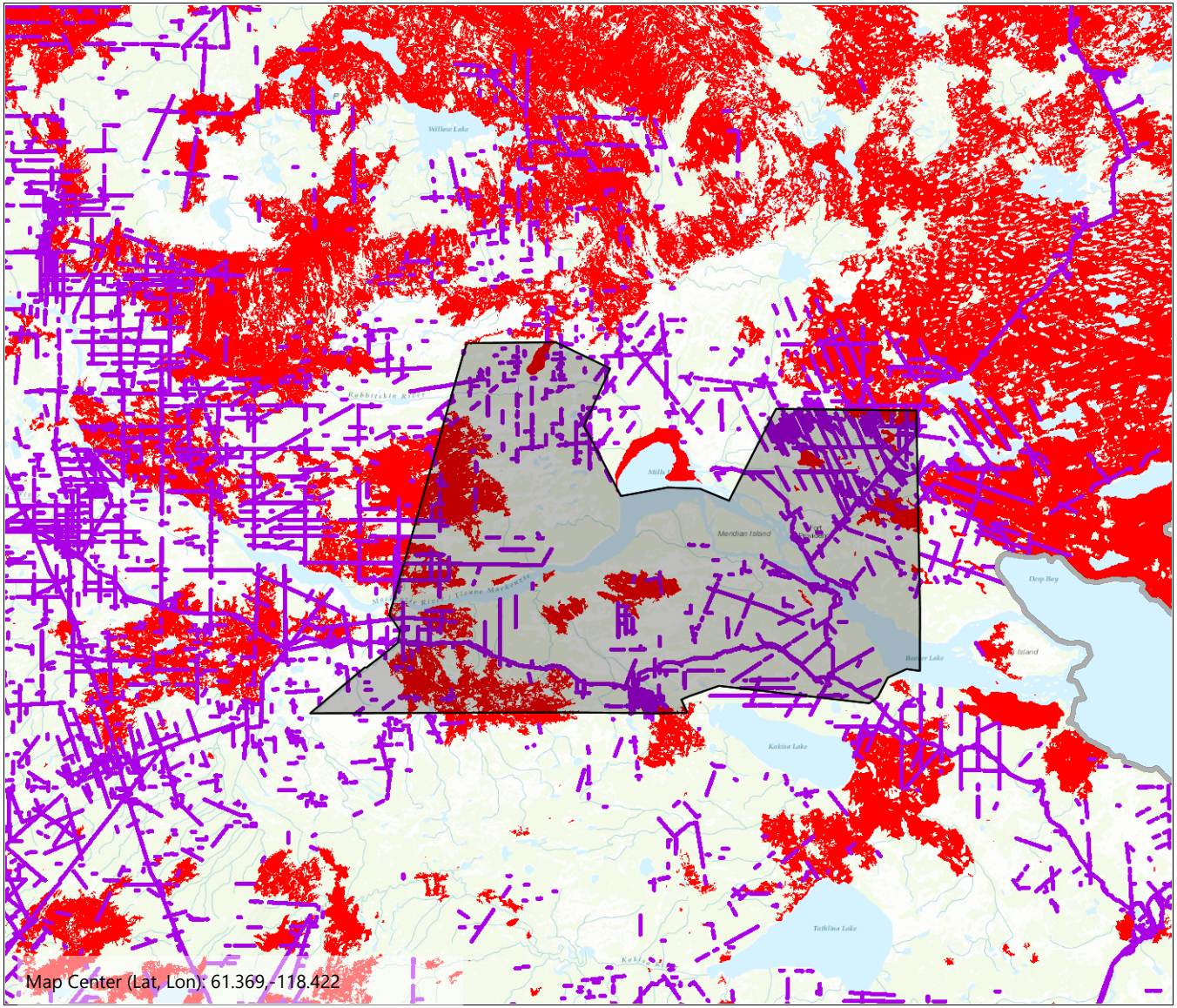
Appendix 2 Disturbance Reports

Reports in this appendix include:

- Boreal Caribou Habitat Disturbance Report for the FMA
- Boreal Caribou Project Screening Report

NWT Species and Habitat Viewer

Boreal Caribou Habitat Disturbance Report for the FMA



Legend

- Area of Interest
- NT1 Boreal Caribou Range
- Forty-year Fire Footprint
- Buffered Human Disturbance

Overview

Table 1. Disturbance Summary for the Area of Interest within the NT1 Boreal Caribou Range

Layer	Area (Ha)	Percent (%) of Clipped Area of Interest
Original Study Area	758377.3	
Study Area Clipped to Boreal Caribou NT1 Range	758377.3	
40 Year Fire	108002.59	14.2
Human Disturbance	148979.98	19.6
Human + Fire	241171.92	31.8

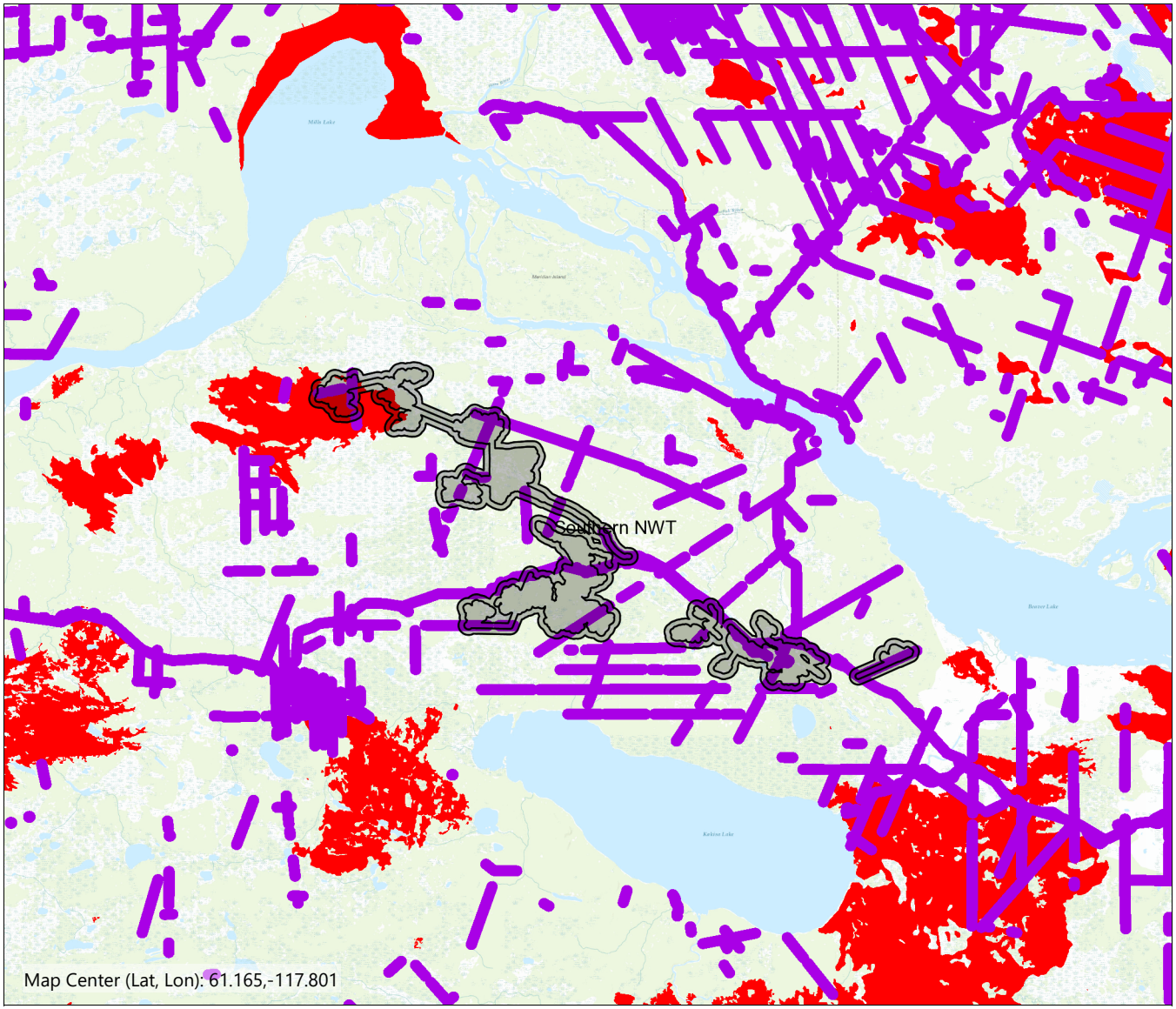
ABOUT: The Boreal Caribou Habitat Disturbance Report provides statistics for the current amount (%) of human, fire, and total (human + fire) disturbance within a user-defined area of interest within the NT1 Boreal Caribou Range. Statistics are based on the Buffered Human Disturbance (ECCC), Forty-year Fire Footprint, and Total Disturbance (Human + Fire) layers within the Landscape Disturbances layer group. All areas are expressed in hectares and are based on the Canada Albers Equal Area Conic Projection. DISCLAIMER: (1) The results of queries for areas of interest that are smaller than the NT1 range should not be relied upon to make inferences about whether boreal caribou populations are self-sustaining or not in the specific area of interest; (2) There may be human disturbance present within an area of interest that is not captured in ECCC's data, either because it occurred after the vintage of that data or was not detectable at a 1:50,000 scale on Landsat imagery.

Fire footprint 40-year period: 1982-2021
Human disturbance version: 2015

NWT Species and Habitat Viewer

Boreal Caribou Project Screening Report

Disturbance Calculations for the Project Footprint



Legend

- Project Footprint
- Project Footprint (+ 1 km Buffer)
- Boreal Caribou Range Planning Region
- Forty-year Fire Footprint
- Buffered Human Disturbance

Overview

About

Current disturbance is calculated based on the footprint of fires from the last 40 years ("Forty-year Fire Footprint"), human disturbance buffered by 500 m ("Buffered Human Disturbance (ECCC)") and the total non-overlapping footprint of fire and human disturbances combined (referred to as "Total Disturbance").

Table 2 provides statistics for the contribution of a user-defined development Project Footprint to the current human and total disturbance footprints within the NT1 boreal caribou range and range planning regions. To create the Project Footprint, inputs depicting a proposed development project were buffered by 500 m.

The area of new disturbance has been calculated to account for overlap with existing disturbances. All areas are expressed in hectares and are based on the Canada Albers Equal Area Conic Projection. DISCLAIMER: There may be human disturbance present within an area of interest that is not captured in ECCC's data, either because it occurred after the vintage of that data or was not detectable at a 1:50,000 scale on Landsat imagery.

Fire footprint 40-year period: 1982-2021
Human disturbance version: 2015

Table 1. Project Footprint Summary

Description	Area (Ha)
Footprint with 1km buffer	28029.38
Footprint in Range Planning Area	28029.38

Table 2. Comparative Disturbance Summary for the Project Footprint

		New Disturbance Added by the Project		Before Project				After Project			
Boundary Name	**Boundary Area (ha)**	**New Human Disturbance Area (ha) [1]**	**New Total Disturbance Area (ha) [2]**	**Human Disturbance Area (ha)**	**Human Disturbance Area as Percentage (%)**	**Total Disturbance Area (ha) [3]**	**Total Disturbance Area as Percentage (%)**	**Human Disturbance Area (ha)**	**Human Disturbance Area as Percentage (%)**	**Total Disturbance Area (ha)**	**Total Disturbance Area as Percentage (%)**
NT1 Range	44292048.98	20092.94	18824.83	4047137.44	9.14 %	12380071.21	27.95 %	4067230.38	9.18 %	12398896.04	27.99 %
Range Planning Region: Gwichin	3866210.02			268415.72	6.94 %	1152737.37	29.82 %	268415.72	6.94 %	1152737.37	29.82 %
Range Planning Region: Inuvialuit	3439298.31			46004.21	1.34 %	90749.42	2.64 %	46004.21	1.34 %	90749.42	2.64 %
Range Planning Region: Sahtu	14901479.33			1035136.83	6.95 %	3014899.15	20.23 %	1035136.83	6.95 %	3014899.15	20.23 %
Range Planning Region: Southern NWT	16241765.22	20092.94	18824.83	2618134.54	16.12 %	6374525.37	39.25 %	2638227.48	16.24 %	6393350.2	39.36 %
Range Planning Region: Wekeezhii	4950506.34			39708.55	0.8 %	1536858.27	31.04 %	39708.55	.8 %	1536858.27	31.04 %
Range Planning Region: Yukon	892789.86			39737.59	4.45 %	210301.62	23.56 %	39737.59	4.45 %	210301.62	23.56 %

For more information, completed regional range plans are available on the GNWT Boreal caribou in the NWT webpage: https://www.ecc.gov.nt.ca/en/services/boreal-caribou

1 This number represents the area of new buffered disturbance contributed by the project footprint, after accounting for any overlaps with the existing Buffered Human Disturbance Footprint (ECCC) layer depicted in the map on page 1.

2 This number represents the area of new buffered disturbance contributed by the project footprint, after accounting for any overlaps with the combined Buffered Human Disturbance Footprint (ECCC) and Forty-year Fire Footprint layers depicted on page 1.

3 Total Disturbance represents the combined (dissolved) footprint of Buffered Human Disturbance Footprint (ECCC) and the Forty-year Fire Footprint depicted on page 1.

Appendix 3 Forms

Forms in this appendix include:

- Wildlife Sighting Form
- Wildlife Incident Form

Wildlife Sighting Form

Year _____ Sheet # _____

DIGAA ENTERPRISES LTD.
P.O. Box 269,
Fort Providence, NT, X0E 0L0
PH: (867) 699-3411, FAX: (867) 699-4314
Email: bobhead@northwestel.net

#	Date	Time	Observer	Company	Species	Number	Activity	Location		
								Description	Coordinates	
E	Nov 12	14:15	John Doe	Rowse	Caribou	7 cows 2 bulls	Moving southeast	PP002; SE branch	114 17' 4"W	60 51' 11" N
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										

Additional Notes

Species of concern:

Mammals: Wood Bison, Woodland Caribou , Moose, White-tailed deer, Northern Myotis, Little Brown Myotis, Wolverine, Fisher, Marten, Mink, Fox, Coyote, Beaver, Otter, Black Bear, Grey Wolf, Lynx, Cougar

Birds: Bank Swallow, Barn Swallow, Common Nighthawk, Horned Grebe, Olive-Sided Flycatcher, Peregrine Falcon, Rusty Blackbird, Red-necked Phalarope, Short-eared Owl, Whooping Crane, Yellow Rail,

Other: Northern Leopard Frog, Gypsy Cockoo Bumble Bee, Walleye, Whitefish, Lake Trout, Grayling, Stickleback, Shortjaw Cisco

Wildlife Incident Form

Incidents must be reported to the appropriate government agency within 24 hours

DIGAA ENTERPRISES LTD.
P.O. Box 269,
Fort Providence, NT, X0E 0L0
PH: (867) 699-3411, FAX: (867) 699-4314
Email: bobhead@northwestel.net

Incident Date:	Incident Time:
Incident Location (Coordinates; Kilometre Post; Local Name):	
Wildlife species and Quantity Involved:	
Person(s) Involved:	
Incident Description:	
Deterrent Used:	
Reporting: ___ Called in the incident to the Contract supervisor ___ Called in the incident to Digaa's Manager ___ Sent a copy of this form to ENR Wildlife Division ___ Sent a copy of this form to Environment Canada - Canadian Wildlife Services	

Last revised on November 13, 2015