Wildlife Management and Monitoring Plan

LAND USE PERMIT MV2022W0006

Digaa Enterprises Ltd. (Digaa)

Version 6.0

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Acronyms and Definitions

AOL	Annual Operating Plan
ASHL	Annual Sustainable Harvest Level
ATA	Annual Timber Allocation
ECC	Environment and Climate Change
FMA	Forest Management Agreement
GNWT	Government of the Northwest Territories
MVLWB	Mackenzie Valley Land and Water Board
Permit Area	Defined as Working Circles 1-10, illustrated in Figure 1-1.
PHEA	Pre-Harvest Ecological Assessment
THP	Timber Harvest Plan (contains the Permit Area)
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).

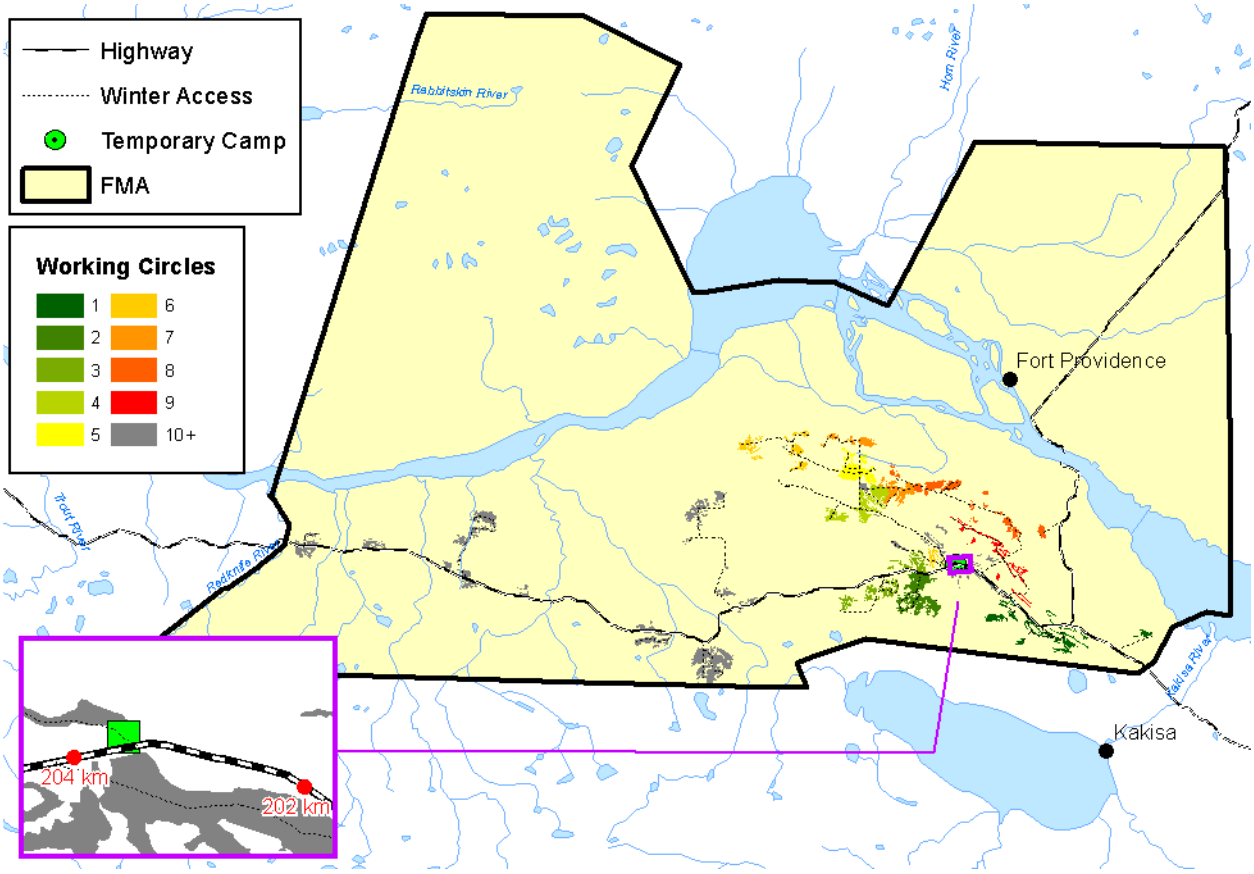

Figure 1-1 Overview map of operations

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 Permit Area (PA) contains the approved Working Circles in their anticipated sequence of annual operation (Figure 1-1 and Table 1-1). 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 Department 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.
	Section 51(1) Subject to section 17, no person shall, unless authorized by a licence or permit to do so *(or you have an Aboriginal or treaty right)*, destroy, disturb, or take a) an egg of a bird, b) the nest of a bird when the nest is occupied by a bird or its egg; or c) the nest of a prescribed bird, which are birds of prey (raptors) as set out in Schedule B of the Wildlife General Regulations.
	Section 51(2) Subject to section 17, no person shall, unless authorized by a licence or permit to do so, *or have an Aboriginal right to do so*, break into, destroy or damage a den, beaver dam or lodge, muskrat push-up or hibernaculum. Subject to sub-section 5.3.(1) of the Wildlife General Regulations, no person shall damage, destroy, disturb, or otherwise adversely affect the summer abode of a bat (also referred to as a summer maternity roost), unless authorized by a licence or permit to do so.
	Section 52. Subject to section 17, no person shall, unless authorized by a licence or permit to do so, (a) engage in an activity that is likely to result in a significant disturbance to big game or other prescribed wildlife; or (b) unnecessarily chase, fatigue, disturb, torment or otherwise harass game or other prescribed wildlife. Prescribed birds for the purpose of paragraph 51(1) (c) and 52 of the Wildlife Act are birds of prey (raptors) as set out in Schedule B of the Wildlife General Regulations. Schedule A – Part 1 of the Wildlife General Regulations lists the species prescribed as “big game.”
	Section 55. Notwithstanding any other provision of this Act or the regulations, a person may chase wildlife away from a dwelling place, camp, work site, municipality or unincorporated community, or its immediate vicinity, if doing so is necessary to prevent injury or death to a person or damage to property. "wildlife" means (a) all species of vertebrates and invertebrates found wild in nature in the Northwest Territories, and individuals of those species, except (i) fish as defined in section 2 of the Fisheries Act (Canada), and (ii) other prescribed species and subspecies, (b) species of wildlife referred to in paragraph (a) that are domesticated or held in captivity, and individuals of those species, and (c) prescribed species or subspecies of vertebrates and invertebrates, and individuals of those species or subspecies.
	Section 56. (1) Notwithstanding any other provision of this Act or the regulations but subject to subsection (4), a person may harvest and consume wildlife or take and consume the eggs of birds if it is necessary to prevent starvation of a person. (2) Notwithstanding any other provision of Statutory Requirements for Wildlife in the NWT September 2020 this Act or the regulations but subject to subsection (4), a person may kill wildlife if it is necessary to prevent injury or death to a person. (3) Notwithstanding any other provision of this Act or the regulations but subject to subsection (4) and any regulations specified as applying in respect of this section, a person may kill wildlife if it is necessary to prevent damage to property. (4) Subsections (1), (2) and (3) do not provide a defence to a contravention of this Act or the regulations for a person who resorts to harvesting or killing wildlife as a result of his or her mismanagement.
	Section 57. Subject to the regulations, a person shall, as soon as is practicable, report the harvest or kill of big game or other prescribed wildlife to an officer, if (a) under section 56, the person harvested big game or other prescribed wildlife to prevent starvation, or killed big game or other prescribed wildlife to prevent injury or death to a person or damage to property; and (b) the harvest or kill would, but for subsection 56(1), (2) or (3), be a contravention of this Act or the regulations. Section 7 of the Wildlife General Regulations describes what information must be included in the report.
	Section 58. A person who, with a motorized vehicle, accidentally kills or seriously wounds big game or other prescribed wildlife on a highway as defined in section 1 of the Motor Vehicles Act, shall report the event to an officer within the time fixed in the regulations. Sub-section 8(1) of the Wildlife General Regulations specifies that any person who accidentally kills or seriously wounds big game or other prescribed wildlife with a motorized vehicle on a highway must report the event to an officer within 24 hours after the incident. Sub-section 8(2) of the Wildlife General Regulations indicates the information that must be included in the report.
	Section 65. (1) Subject to subsection (2), no person shall intentionally feed big game, furbearers or other prescribed wildlife.

	Section 66. (1) No person shall deposit, place or leave in, on or about land or premises food, food waste or another substance if there is a reasonable likelihood that it could attract big game or other prescribed wildlife to the land or premises and endanger a person, a domestic animal or wildlife.
	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 ECC) 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 four ways:

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

2) uploading the spatial extent of the project to the NWT Species and Habitat Viewer to calculate project contributions to overall disturbance in the NT1 range using the screening tool. (https://www.maps.geomatics.gov.nt.ca/Html5Viewer/index.html?viewer=NWT_SHV).

3) uploading the spatial extent of the project to the NWT Species and Habitat Viewer to visually evaluate project overlap with the seasonal 2nd order resource selection function (from DeMars et al. 2020). (https://www.maps.geomatics.gov.nt.ca/Html5Viewer/index.html?viewer=NWT_SHV).

4) Visual evaluation of the spatial extent of the project with seasonal 3rd order (within the home range) resource selection functions found in the DeMars et al. (2020) report (Appendix I therein, Figures 9 – 15).

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 spatial layers for the seasonal 2nd (home range selection) and 3rd (within home range selection) order RSF spatial data have not been provided;

2) Visual inspection of the 3rd order seasonal RSFs (ie., functional response) in DeMars et al. (2020) suggest that the Permit Area is less likely to be utilized as calving and summer habitat, and may function 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 consists of < 40-year-old fires. These burned areas will be aging back into the habitat supply in the coming years. Results in DeMars et al (2020) indicate bi-modal selection for burns <10 years and >30 years, with corresponding avoidance of burns 10-30 years old.

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 2.

Per the expanded Permit Area with a 1 km buffer, the 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

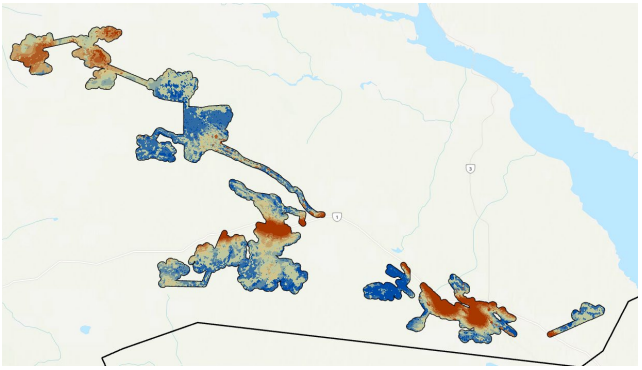
The negligible (-0.22%) removal of higher value habitat (as indexed by relative habitat selection) compared to what is available in the Southern NWT Range Planning Region, combined with the negligible contribution to the pre-existing

disturbance in the Planning Region (+0.11%) and the NT1 Range as a whole (+0.04%), is indicative that the Permit Areais 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 Areato impact caribou and caribou habitat, at the individual, sub-population, and population scales.

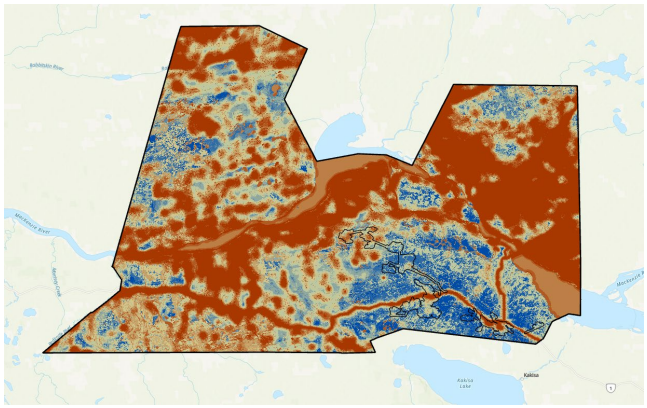
Digaa has also reviewed the seasonal boreal RSF maps on the NWT Species Viewer as well as the original modeling outputs in DeMars et al. (2020). Only 2nd order selection has been made available on the NWT viewer platform. Second order selection refers to the selection of a home range, which is often driven by limiting habitat. It is apparent in the modeling outputs that calving and summer habitat are not limiting in the southern NT range planning area. Inferences based solely on 2nd order selection may be misleading in the absence of the context provided by the functional response often captured by 3rd order selection processes. While it is not incorrect to suggest that calving and summer habitat may be present in the project area relative to the types of habitat used for these purposes across the range, 3rd order selection patterns indicate that caribou are not using or selecting this area for those purposes. Generally, RSF bins during calving and summer fall in the 4-7 range, indicative of no definitive selection pattern. RSF bins increase to 6-9 during the winter seasons. It is this pattern that contributed to our conclusion that the area likely functions more as winter habitat. This conclusion is also supported by discussions with a local trapper, who has a cabin at Km214 along Hwy 1, and operates along seismic lines both north and south of Highway 1. This trapper informed Digaa that he only sees caribou during the winter months, and only on his south line (towards Kakisa Lake). During the summer, caribou have not been observed along Hwy 1 by DOT crews between Hwy 1 and 3 junction to Redknife Rd in the western portion of the FMA. A few observations have been recorded at Junction 375 and Jean Marie R access road and further west at the Enbridge pipeline.

Not discounting the possibility for calving, the presence of a major road, other linear features such as seismic lines, and the prevalence of open and sparse coniferous cover types likely makes the project area less suitable for calving and summer range as these features are typically inconsistent with predator avoidance strategies.

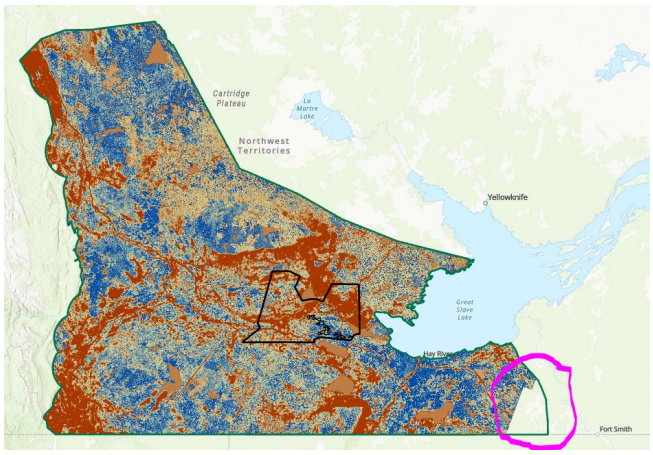
While not ignoring 2nd order results, seasonal 3rd order selection processes may be more informative for project mitigation planning as they indicate when animals are more likely to be encountered. Given Digaa's plans for winter harvest, Digaa has committed to increased vigilance and project stoppages when caribou are encountered to mitigate the risk to caribou during an energetically stressful season for these animals. As the project area is previously disturbed and less likely to be used during calving and summer even without the project, it is not anticipated that the project will result in a significant reduction in this habitat type relative to the southern NT planning range. Given the low density of NT boreal caribou, the overall likelihood of encountering caribou is also generally very low.



a) Habitat selection values in the Permit Area, including a 1000m 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 be mitigated by limiting harvesting activities throughout the winter months when most wildlife species are not engaged in particularly sensitive activities (e.g., breeding), and enhanced harvest practices, such as tree patch retention within cutblocks, access management, and reclamation activities. Risk timing windows for sensitive species are summarized in Table 3-1. Potential pathways for impacts to wildlife and wildlife habitat are summarized in Table 3.2. Proposed mitigations and monitoring are summarized in Table 3-3. A monitoring and response plan specific to boreal caribou is provided in Appendix A.

Table 3-1 Risk Timing Windows for NT Wildlife

Species	Activity Period	Southern NWT	Risk Category
Boreal Caribou	Early Winter	1 Dec – 25 Jan	Lowest
	Mid Winter	26 Jan – 15 Mar	Medium
	Late Winter	16 Mar – 1 Apr	Highest
	Dispersal	2 Apr – 30 Apr	Medium
	Calving / Post Calving	1 May – 30 Jun	Highest
	Summer	1 Jul – 12 Sept	Medium
	Rut	13 Sept – 4 Oct	Medium
	Late Fall	5 Oct – 30 Nov	Lowest
Mammals	Denning	1 Oct – 30 Apr	Sensitive
Bats	Hibernaculum	1 Oct – 30 Apr	Sensitive
Birds (passerine and waterfowl)	Breeding and Nesting	1 May – 31 Aug	Sensitive
Birds (raptors)	Breeding and Nesting	15 May – 31 Aug	Sensitive
Amphibians	Breeding and Emergence	1 Apr – 15 Aug	Sensitive

Table 3-2 Pathways for potential impacts to wildlife and wildlife habitat.

Wildlife and Wildlife Habitat		
Potential Impact	**Species**	**Pathway**
Direct or indirect habitat loss	General, including species at risk	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. Displacement of big game species in late winter could result in high energetic costs or force them to move to sub-optimal habitat. The release of hazardous materials (e.g., fuel, waste and sewage) to the environment could damage fish habitat. Forestry operations near waterbodies could damage habitat for identified bird, amphibian and fish species. Potential of disturbing breeding patterns (activities and season vary by species) due to localized, transient, and temporary operations. Progressive landscape change could lead to long-term changes in wildlife patterns that may not manifest themselves in the short-term.
Habitat Fragmentation Changes in movement patterns	General	Potential that construction and use of linear routes will fragment habitat to some degree and increase predation. 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. 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.
Direct injury or mortality Changes to predator-prey patterns	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 b) Deliberately, through the destruction of problem wildlife to protect worker safety. Potential to indirectly causing population changes through improved access that might increase predation, hunting, fishing or trapping. Potential for road mortality through collisions with vehicles.
	Waterfowl	Timber harvesting near wetlands could negatively affect waterfowl populations
	Fish	The release of hazardous materials (e.g., fuel, waste and sewage) to the environment could decrease fish populations.
	Bison, caribou, game and predator species	Potential that predation and predatory success rates may increase as a result of disturbed areas and facilitating access for predators. Improved access and use of linear features could influence population changes through increased predation, hunting, fishing or trapping.
	Bison, caribou	Increased access could result in higher road mortality through collisions with vehicles.

Indirect habitat loss – sensory disturbance	General	Noise associated with road building and timber harvesting activities could affect wildlife behaviour. Sensory disturbance from camps could attract wildlife and increase wildlife-human encounters. Potential to indirectly cause habitat loss due sensory disturbance and avoidance.
Human-wildlife conflicts	Bears, caribou, bison, game	Potential for wildlife to be encountered during winter operations. Potential to attract wildlife to camps.

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 3-4. 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 3-3 Proposed Mitigations and Monitoring

Potential Impact (Species)	Objective	Mitigation Measures	Metric	Monitoring Approach	Frequency and Duration	Supporting Documentation
Direct and indirect habitat loss; (General, including species at risk)	Minimize habitat loss in the short and long term	Assess forest-level impacts through strategic planning initiatives and implement localized, transient, and temporary operations. 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	Up to 5% timber volume retention. Performance levels established by ECC Forest Resources Establishment of appropriate tree species	Post-harvest reclamation and reforestation assessments	Post-harvest to evaluate 5% retention. ECC monitors regenerating stands to ensure that future stands meet or exceed anticipated growth performance levels with appropriate tree species.	Annual Operating Plan (AOP) Pre-Harvest Ecological Assessment (PHEA) 25-year forest management plan

		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. Retain up to 5% timber volume within harvest blocks, including trees where available along riparian areas. Reclamation (Section 4.1) Reforestation (Section 4.2)				
Direct and indirect habitat loss - disturbance to wildlife features, including dens or nests (General, including species at risk)	Avoid disturbance to dens or nests	Harvest during winter months Setbacks - If wildlife features are discovered ECC will be consulted for appropriate mitigation (e.g., no-harvest buffers; operational timing windows) prior to commencing operations	Number of wildlife features	Pre-harvest surveys (e.g. transects) for wildlife features, including potential den sites and raptor nests.	Surveys to occur once prior to harvest.	Annual Operating Plan (AOP) Pre-Harvest Ecological Assessment (PHEA)
Direct habitat loss (Fish, Birds, Amphibians)	Avoid release of hazardous materials	Use proper handling, storage and disposal techniques for hazardous materials.	Zero discharge to waterbodies (and/or within the cutblock,	Storage and equipment inspections	Daily / weekly	AOP

	(e.g., fuel waste, sewage) to waterbodies.		particularly adjacent to waterbodies)			Spill Contingency Plan
Direct or indirect habitat loss (Fish, Birds, Amphibians)	Minimize disturbance to areas adjacent to waterbodies.	Retain protection buffers adjacent to waterbodies.	I. The following no-harvest buffers will be maintained adjacent to water bodies excepting those with explicit permitted terms: a. Lakes larger than 16 ha: 100 m buffer. -15- b. Lakes 1 ha to 16 ha area: 30 m buffer. c. Ponds less than 1 ha in area: 10 m buffer. d. Large permanent rivers: 100 m buffer. e. Medium permanent rivers: 60 m buffer. f. Small permanent rivers and streams: 10 m buffer. II. Buffers are measured as the slope distance from the top of the ordinary high water mark on either side of a waterbody. III. A 10m “machine free” zone will be maintained adjacent to intermittent and	Ensure buffer areas are clearly marked and delineated for operations personnel	During cutting operations near waterbodies.	AOP PHEA Commercial Timber Harvest Planning and Operations Standard Operating Procedures Manual (ENR 2005).

			ephemeral streams, draws, and water source areas. IV. Equipment is to cross water bodies only at approved locations. V. Buffers may be enhanced with an additional machine free zone to protect a specific resource. The Supervisor will specify width of an enhanced buffer.			
Habitat Fragmentation, including disturbance to wildlife corridors. (General) Changes in movement patterns (General)	Minimize habitat fragmentation	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. Retain protection buffers adjacent to waterbodies. To facilitate wildlife movement, incorporate gaps (1m high and 10m wide) into roadside snow-berms at every	See relevant metrics above.	See relevant monitoring approaches above	As above. Report all observations of species at risk to ECC staff. All personnel will be responsible for reporting wildlife sightings and or identified wildlife features to the Digaa Environmental Supervisor (DES). The DES will compile all sightings and submit to ECC at the end of each annual harvest period. It should be noted, wildlife conflicts or incidents will be reported to ECC within 24 hours to develop appropriate mitigation actions	AOP PHEA Commercial Timber Harvest Planning and Operations Standard Operating Procedures Manual (ENR 2005). Watershed and Wildlife Timber Harvest Planning Manual.

		500m (approximately) and at identified game or trapping trails. 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. Access Restrictions (Section 3.1) Reclamation (Section 4.1) Reforestation (Section 4.2)				
Direct injury or mortality (Waterfowl)	Avoid injury or mortality	Plan harvesting operations to avoid known waterfowl nesting and staging areas and ensure activities take place outside timing windows	Adhere to timing windows (Table 3.1).	No specific monitoring proposed.	Not applicable.	AOP PHEA

		for breeding (e.g., during winter months).				
Direct injury or mortality (Fish, Birds, Amphibians)	Avoid injury or mortality	Use proper handling, storage and disposal techniques for hazardous materials.	Zero discharge to waterbodies (and/or within the cutblock, particularly adjacent to waterbodies)	Storage and equipment inspections	Daily / weekly	AOP Spill Contingency Plan
Direct injury or mortality (Bison, caribou, other game, and predator species) Changes in predator-prey patterns (General)	Avoid injury or mortality of wildlife	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. Access Restrictions (Section 3.1) Reclamation (Section 4.1) Reforestation (Section 4.2) 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.	Up to 5% timber volume retention. Performance levels established by ECC Forest Resources Establishment of appropriate tree species The planned roads are low end, Class 5, winter roads, with speeds up to 50 kph. The main access road into the Axe Point area may have sections of road that may safely allow speeds up to 60 kph.	Pre-harvest surveys for potential den sites and raptor nests. If discovered ECC will be consulted for appropriate mitigation (e.g., no-harvest buffers; operational timing windows) prior to commencing operations. Post-harvest reclamation and reforestation assessments Wildlife reporting	Daily; Injuries and mortalities reported to ECCC within 24 hours Den and nest surveys to occur once prior to harvest. Post-harvest to evaluate 5% retention. ECC monitors regenerating stands to ensure that future stands meet or exceed anticipated growth performance levels with appropriate tree species.	Annual Operating Plan (AOP) Pre-Harvest Ecological Assessment (PHEA)

		Maintain safe speed limits along roads and highways. Wildlife have the right-of-way				
Indirect habitat loss – Sensory disturbance (General)	Minimize sensory disturbance and associated habitat avoidance	Restrict machine-related operations to winter months. 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.	Adhere to timing windows (Table 3.1).	No specific monitoring proposed.	Not applicable.	AOP PHEA
Human-wildlife conflicts	Avoid human-wildlife conflicts	Worker training, including bear aware. Waste management. Wildlife sightings and incidents log. Ensure all food and waste is properly handled and stored. Routinely haul waste to a designated disposal site. Encounters between animals and people are inherently dangerous for people and animals.	Number of wildlife-human encounters	Wildlife reporting Waste containment inspections	Daily / weekly Any bison sighting is to be immediately reported to ECC.	AOP Camp Plan Waste Management Plan

		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 3-4) and collaborate with them on an appropriate action plan.				

Table 3-4 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 OPERATIONS AND MONITORING

Commercial Timber Harvest Planning and Operations Standard Operating Procedures Manual (The Manual) requires an approved Annual Operating Plan prior to the commencement of harvesting operations (i.e.; road construction, harvesting, deactivation). The long-term development plan (LTDP) …"must be in a form approved by the Supervisor and must include the following, where applicable" [FMR s. 13(2)]:

a. A map of the areas to be logged;

b. An outline of proposed roads and buildings to be constructed, and materials and equipment to be placed within the licence area;

c. Timing and sequence of logging operations;

d. Mill sites;

e. A fire control plan, as per the Government of the NWT Forest Fire Prevention and Suppression Guidelines for Industrial Activities;

f. A reforestation plan;

g. A restoration plan;

h. An environmental protection plan; and,

i. Other details required by the Supervisor.

As part of the LTDP, there will be a survey process that includes wildlife features. The Commercial Timber Harvesting Planning and Operations Standard Operating Procedures Manual includes provisions for the identification of wildlife features as part of the "Pre-Harvest Ecological Assessment" (PHEA). A PHEA is required for proposed cutblocks [FMR para. 36.1(j)]. A PHEA is a detailed report of site factors that may affect the operability and regeneration of a block. Position of a block in the landscape, local

topography and site-specific conditions are assessed. Details of the plant community, soil and moisture characteristics of the site are collected. Evidence of use by people or wildlife is also noted.

Harvest blocks must be inspected and assessed for sensitive features prior to harvest. Consistent with the definition of "wildlife tree" as speci ed in section 5.7.2 of the GNWT's Commercial Timber Harvesting Planning and Operations Standard Operating Procedures Manual, Digaa will assess the for the presence of large, dead or decaying trees during PHEAs, and if such features are found, they will be incorporated within the 5% retention areas within cutblocks where it is safe to do so. Specific wildlife features identified during the PHEA at field level and requirements for implementation of landscape objectives for wildlife management at the operating level must be coordinated with the Manager of Forest Resources and the Manager of Wildlife at the regional office. The PHEA will be part of the harvesting field layout that is conducted to establish road and landing locations, water bodies and riparian areas, wildlife tree patches, setbacks, and harvesting boundaries. Wildlife features include: dens, hibernacula, beaver dams or lodges, muskrat push-ups, and occupied and unoccupied raptor nests. Digaa shall submit its PHEAs to ECC Wildlife Management Division annually for review at least 60 days prior to the start-up of each winter's timber harvest operations (i.e, by September 1 of each year of operations).

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. WMMP Reports will be submitted annually to ECC, and will include:

- Sightings of wildlife or wildlife features (dens, nests, hibernacula, etc.) recorded during PHEAs and timber harvest operations.
- Records of training provided to staff and contractors related to the WMMP
- A summary of adaptive management Metrics, any Action Level exceedances, and adaptive Management Responses implemented as per Table 5-1 of the WMMP.

The Contractor will document all incidents of wildlife interactions (e.g., accidents, injuries or mortalities) on a Wildlife Incidents Form. Sample wildlife observation forms are provided in Appendix 4. 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 3-5 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

Digaa shall submit annual WMMP reports by June 30 of each year to the following ECC contacts:

- Heather Sayine-Crawford (Heather_Sayine-Crawford@gov.nt.ca)
- Ashley McLaren (Ashley_McLaren@gov.nt.ca)
- Kathleen Groenewegen (kathleen_groenewegen@gov.nt.ca)
- Angela Marie (angela_marie@gov.nt.ca)
- WMMP@gov.nt.ca

A copy of this report will also be shared with holders of leases and claims located within the vicinity of Digaa's operations. Digaa anticipates that ECC Wildlife Division will inform Digaa how this information was used to aide the development of additional wildlife management strategies. Digaa would also like to be provided copies of the annual reports from other lease and claims holders to build on regional wildlife management efforts.

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 ECC) 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. Adaptive management approaches are summarized in Table 5-1.

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 this Wildlife Management and Monitoring Plan, that demonstrates how impacts to boreal caribou and their habitat are being managed within the FMA area.

Table 5-1 Adaptive management approaches

Objective	Mitigation Strategies/Monitoring Approach	Metrics	Action Levels	Management Responses
Minimize habitat loss in the short and long term	Post-harvest reclamation and reforestation assessments	Post-harvest to evaluate 5% retention.	Level 1: <5% retention	Reforestation as per ECC mandate. Discussions led by ECC to revisit site preparation plan and revise as necessary to achieve goal in subsequent harvest blocks
		ECC monitors regenerating stands to ensure that future stands meet or exceed anticipated growth performance levels with appropriate tree species.	Level 1: Pending ECC performance level and composition criteria	Reforestation as per ECC mandate. Discussions led by ECC to review additional site preparation for reclamation and reforestation that is consistent with the performance level and composition criteria
Avoid disturbance to dens or nests	Pre-harvest surveys	Number of wildlife features disturbed	Level 1a: 1 wildlife feature disturbed that was not detected during pre-harvest surveys or subsequent operations	Improve site level supervision.
			Level 1b: Disturbance within setbacks established for identified wildlife features	Improve site level supervision and ensure marking of buffer retention areas is suitable.

				Reclamation in buffer retention area
			Level 2: >1 wildlife feature disturbed that were not detected during pre-harvest surveys or subsequent operations	In collaboration with ECC, revisit PHEA and survey protocols Revisit personnel training
Avoid release of hazardous materials to waterbodies	Storage and vehicle inspections	Zero discharge to waterbodies	Level 1: <5L	Site clean-up and remediation
			Level 2: 5-20L	Site clean-up and remediation. Halt operations for storage and equipment inspections and repairs
			Level 3: >20L	Site clean-up and remediation. Halt operations for storage and equipment inspections and repair Revisit Spill Contingency Plan and implementation Work with ECC on improving spill prevention protocols
Minimize disturbance to areas adjacent to waterbodies	Retain protection buffers adjacent to waterbodies	Identified setback distances (Table 3-3)	Level 1: Disturbance within setback buffer	Improve site level supervision and ensure marking of buffer retention areas is suitable Restoration works
*Minimize habitat fragmentation	5% forest retention Assess each new harvest opening on the ground to determine if these	Post-harvest to evaluate 5% retention.	Level 1: <5% retention	In collaboration with ECC, revisit site preparation plan and revise as necessary to achieve goal in

(species at risk, caribou, bison, big game, predators)	species are actively utilizing the area. Suspend operations to allow wildlife to pass by Reclamation and reforestation			subsequent harvest blocks
		ECC monitors regenerating stands to ensure that future stands meet or exceed anticipated growth performance levels with appropriate tree species.	Level 1: Pending ECC performance level and composition criteria	In collaboration with ECC, additional site preparation for reclamation and reforestation that is consistent with the performance level and composition criteria. Note: reforestation is ECC mandate.
		Identified setback distances around waterbodies (Table 3-3)	Level 1b: Disturbance within setbacks established for identified wildlife features	Improve site level supervision and ensure marking of buffer retention areas is suitable Reclamation in buffer retention area
		Observations of wildlife and/or wildlife sign	Level 1: Wildlife observed for 2 consecutive days and/or evidence of wildlife activity (e.g., recent tracks, bedding, cratering)	Increase frequency of surveillance or change method of monitoring (e.g. remote cameras)
			Level 2: Wildlife observed for >2 consecutive days	Suspend operations Increase frequency of surveillance or change method of monitoring (e.g. remote cameras)
Avoid injury or mortality (species at risk, big game, predators)	Daily operations monitoring and wildlife reporting	Maintain safe speed limits	Level 1a: 1 speed related wildlife injury Level 1b: 1 report of driving in excess speed	Education of individual personnel
			Level 2: >1 speed related wildlife injury or mortality	Revisit broader personnel training regarding speed limits Improved signage Investigation of road width and alignment standards and associated sightlines

		Maintain snow breaks in road-side berms	Level 1: 1 observation of wildlife "trapped" along the road	Site inspection and additional preparation
			Level 2: >1 observation of wildlife "trapped" along the road	In collaboration with ECC, revisit Access Management Plan and implementation procedures
		Wildlife have the right-of-way	Level 1: 1 report of harassed wildlife	Education of individual personnel
			Level 2: >1 report of harassed wildlife	Revisit personnel training regarding objective of the WMMP and protection of wildlife during operations
Minimize sensory disturbance	Adhere to operations timing windows	No specific metrics	No action levels currently proposed	No management response currently proposed
Avoid human-wildlife conflict	Worker training Waste management Wildlife sightings logs Wildlife deterrents	Number of human-wildlife encounters	Level 1: 1 encounter	Incident investigation report
			Level 2: 1-3 encounters	Incident investigation report Investigate all sources of attractants Review waste management protocols Secure waste management structures/areas Survey area for potential denning sites Revisit personnel training, including bear aware
			Level 3: >3 encounters	Incident investigation report Investigate all sources of attractants Review waste management protocols

				Secure waste management structures/areas Survey area for potential denning sites Revisit personnel training, including bear aware Contact ECC to discuss options to address the issue, including possible relocation options.

6 References

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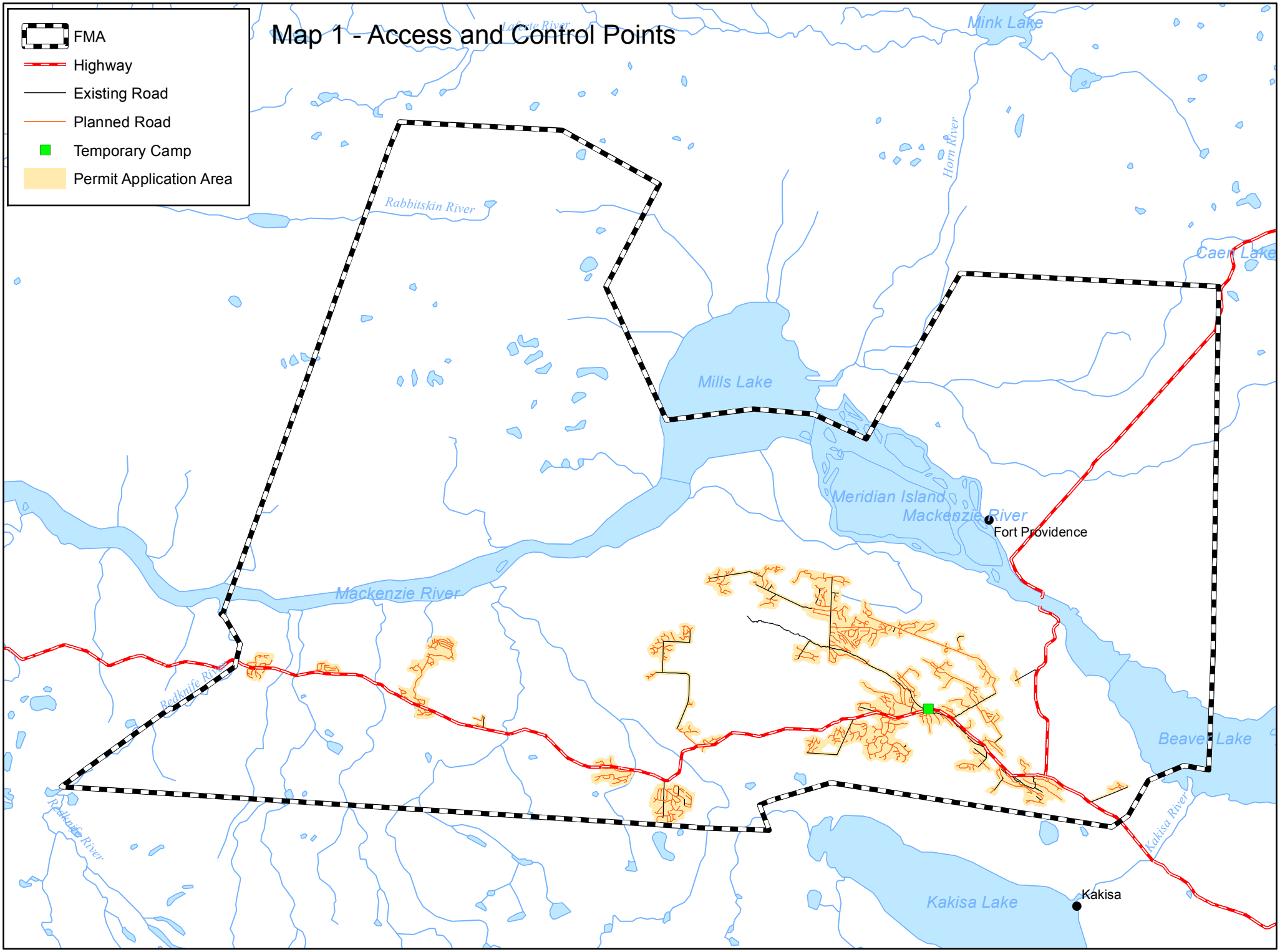
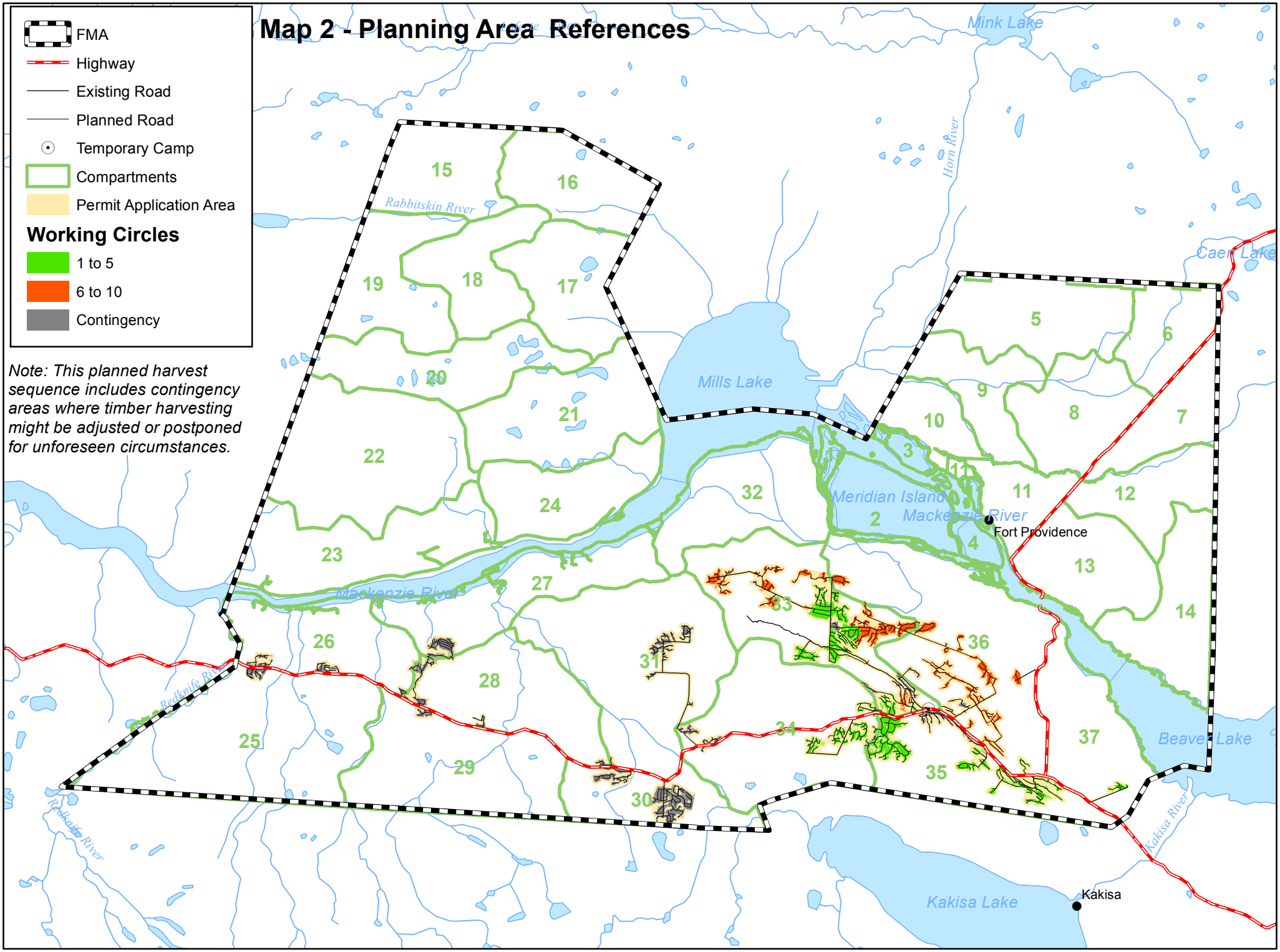
Appendix 1 Supporting Maps

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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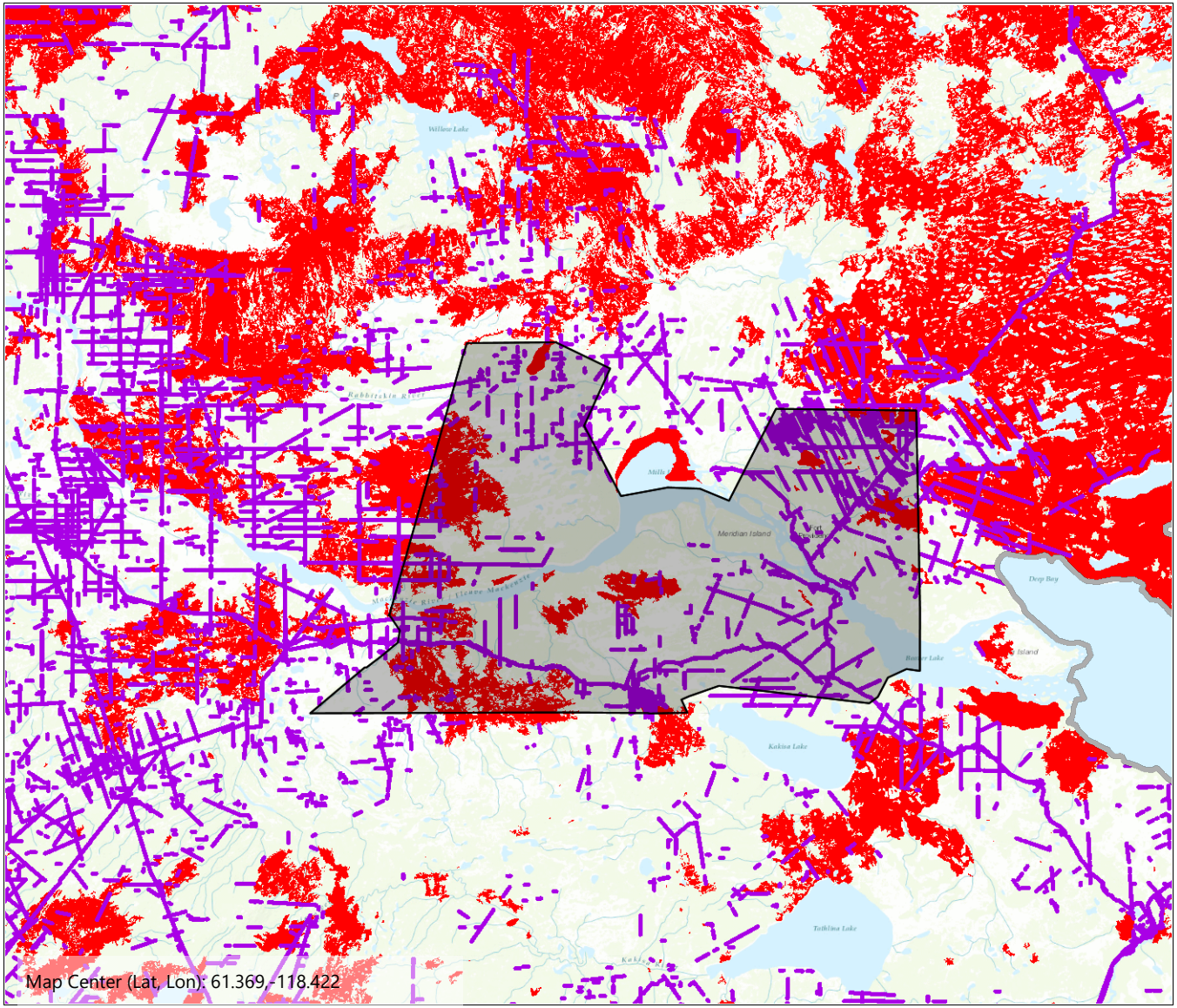
Appendix 2 Disturbance Reports

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

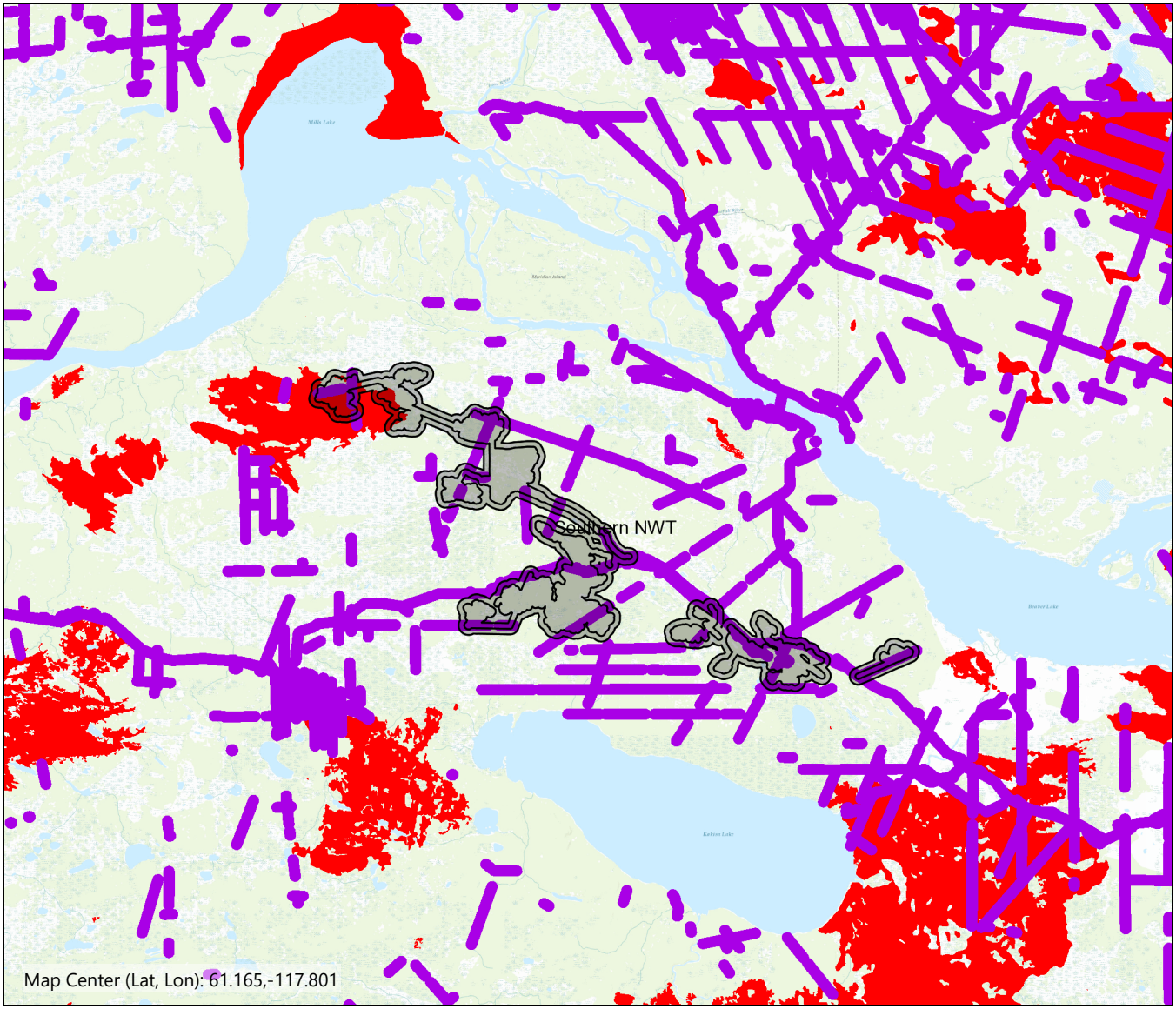
ABOUT: The Boreal Caribou Habitat Disturbance Report provides statistics for the current amount (%) of human, fire, and total (human + fire) disturbance within a user-defined area of interest within the NT1 Boreal Caribou Range. Statistics are based on the Buffered Human Disturbance (ECCC), Forty-year 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 - CARIBOU MONITORING PROCEDURE

PURPOSE

The purpose of this procedure is to describe when and what monitoring and mitigation will be implemented to limit effects on caribou.

RESPONSIBILITY

Digaa staff (or designated qualified professional) are responsible for completing the pre-clearing surveys and entering them into a database. Surveys will be overseen by the environmental manager. Surveys will be led by a qualified biologist or by a trained local community environmental field technician.

PROCEDURE

Although there may be occasional operations during snow free months, such as those that are immediately adjacent to existing Highway 1 or 3 infrastructure, Digaa Enterprises Ltd (Digaa) intends to conduct annual operations between November 1 and April 15 of each year to correspond with the less sensitive periods for caribou. The majority of operations are expected to be completed prior to April 04; however, some phases may extend to April 15. Operations that occur within the late winter and pre-calving sensitive periods will require enhanced mitigations as outlined below. Digaa has requested that the Government of the Northwest Territories - Environment and Climate Change (GNWT-ECC) provide caribou satellite collar location data every two (2) days during the late winter (16 March to 4 April) and pre-calving (April 5 – 15) periods. Digaa will inform ECC whether operations will extend into the pre-calving period.

Caribou Seasonal Periods

Digaa plans to conduct its operations during winter when ground conditions are frozen, enabling easier access with less ground disturbance. Typically, operations occur between November 1 and April 15 of each year. Early November consists of falling during road construction followed by falling on the first timber harvest area. Log skidding on harvesting areas will typically commence about two (2) weeks after falling starts, roughly December 01. Log processing, loading, and hauling may be underway on the right-of way wood; however, they will begin in earnest after the log skidding in the harvest block commences.

Falling and log skidding should be completed by the end of the late-winter period (April 01). Log processing, loading, and hauling operations should also be completed by April 01, but there is the possibility these may extend beyond this date. Deactivation of the harvested areas and roads will be well underway and is the last phase to complete, after the final loading and hauling is completed (deactivation may extend to April 15).

There are two key periods of medium risk that overlap Digaa operations when boreal caribou should receive additional protection from sensory disturbance to increase the likelihood of successful calving and thus recruitment of new individuals into the population (*Status Report for Boreal Caribou in the NWT* (Species at Risk Committee 2012):

1. Late-winter (16 March – 01 April): Boreal caribou are exhibiting their shortest daily movements at this time of year, reflecting the increased energetic costs of travelling through deep snow or limited areas that provide easier access for foraging on ground lichens (e.g., wind-swept areas and closed canopy forests with shallow snow). Disturbance during this time of year could have negative impacts on female body condition and, subsequently,

calf survival.

2. Dispersal (02 April – 30 April): Female boreal caribou spread out during this period and increase daily movements to find suitable calving locations.

Boreal caribou are generally considered less sensitive to sensory disturbance at other times of the year. For example, sensory disturbance may not always deter caribou as Digaa pesonnel have observed caribou in fresh harvested blocks and during harvesting operations in general. In the event this scenario occurs, discussions will be held with ECC biologists to enable harvesting operations and protect the caribou, especially from the potential for traffic collisions.

Caribou Collar Location Maps to Guide Activity

During the late winter sensitive period, most of the falling will have been completed, and it should be coming to completion. Digaa will consider commencing felling activities if satellite collar data indicates that there are no collared caribou within pre-defined "Cautionary Zones" around the cut block (Table 1). Caribou collar data will be supported by ground-based pre-clearing surveys that may include the use of drones fitted with infrared cameras and flown at a height appropriate to minimize disturbance to wildlife. Cautionary Zones are pre-defined spatial buffer areas around cut blocks that will:

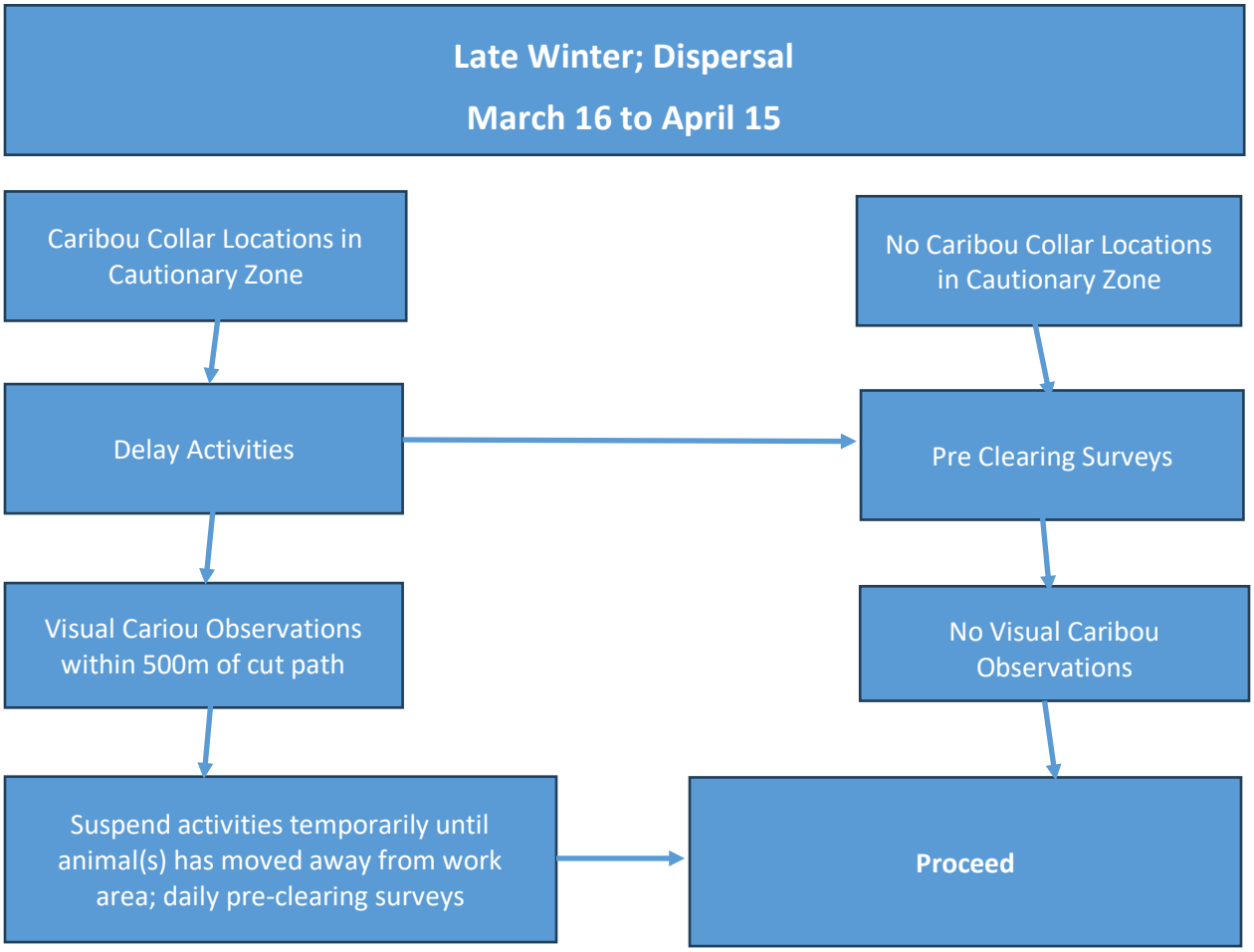
- Reduce sensory disturbance and unnecessary energy expenditure by caribou during the most sensitive periods (i.e., late-winter); and,
- Avoid injury or mortality of caribou.

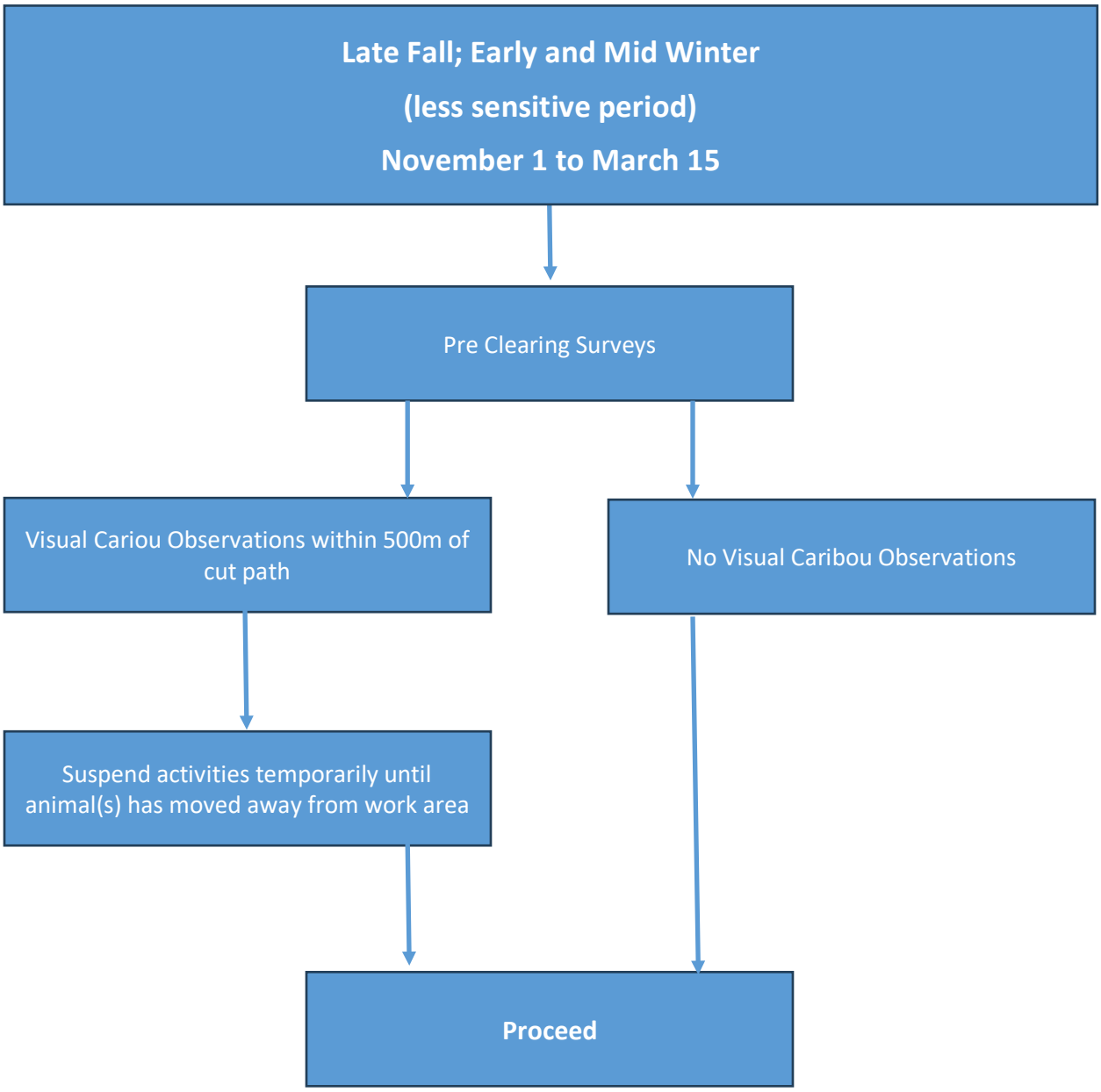
Table 1: Cautionary Zones and Search Zones Around Work Areas and Resulting Mitigation During Boreal Caribou Seasons

Boreal Caribou Period[1]	Cautionary Zone[2]	Search Zone[2]	Mitigation
Late fall; Early to Mid Winter (Nov 1 to 15 March)	500 m	500 m	Once a week during early to mid-winter operations, Digaa will initiate a pre-clearing survey within 500 m of the planned harvest area falling (i.e.; excluding the road rights-of-way) for that week to verify the absence of boreal caribou. Pre-clearing surveys will be conducted by foot and/or the with the support of a drone fitted with an infrared camera. If caribou are observed during the pre-clearing survey, or visually observed during felling activities, falling operations will be temporarily suspended in the immediate vicinity to allow wildlife to move away from the area of their own accord. If a caribou is reluctant to leave the immediate harvesting area, falling activities will be suspended and the regional GNWT-ECC biologist will be contacted for advice.

Late Winter; Dispersal (16 March to 15 April)	2 km	500 m	If collared caribou are within the Cautionary Zone, felling will be delayed until there are no more collared caribou locations within the Cautionary Zone or, a pre-clearing survey search for caribou within 500 m of the site is conducted to confirm absence prior to clearing new work sites. Felling activities may be temporarily delayed in the area concerned if fresh caribou sign or individuals are observed within 500 m of the work area. Pre-clearing surveys to look for caribou and caribou sign may be completed daily until no new caribou sign or individuals are observed within 500 m and collar data indicates that there are no collared individuals in the Cautionary Zone. Pre-clearing surveys will be conducted every 3 days within 500 m of the work area even if no caribou collar locations occur in the Cautionary Zone, to confirm absence prior to falling activities. If a caribou is reluctant to leave the immediate harvesting area, felling activities will be suspended and the regional GNWT-ECC biologist will be contacted for advice.

DECISION TREE




Late Fall; Early and Mid Winter
(less sensitive period)
November 1 to March 15
Pre Clearing Surveys
Visual Cariou Observations within 500m of cut path
No Visual Caribou Observations
Suspend activities temporarily until animal(s) has moved away from work area
Proceed

APPENDIX 4 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										
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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