Coffee Gold Mine
YESAB Project Proposal
Appendix 31-F Wildlife Protection Plan

VOLUME V

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ACRONYMS AND ABBREVIATIONS

Acronym	Definition
CDC	Conservation Data Centre
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
GPS	global positioning system
LAA	Local Assessment Area (as defined for the Wildlife and Wildlife Habitat Valued Component Assessment Report)
LSA	Local Study Area (as defined for baseline studies)
NAR	Northern Access Route
NMP	Northern Mountain Population (of Woodland Caribou)
Project	proposed Coffee Gold Mine
Proponent	Goldcorp Inc.
RAA	Regional Assessment Area (as defined for the Wildlife and Wildlife Habitat Valued Component Assessment Report)
RSA	Regional Study Area (as defined for baseline studies)
SARA	*Species at Risk Act*
TBD	to be determined
TH	Tr'ondëk Hwëch'in
TWG	Technical Working Group
VC	Valued Component
YESAB	Yukon Environment and Socio-economic Assessment Board

UNITS AND MEASURES

Symbol, Unit of Measure	Definition
ha	hectare
km	kilometre
km/hr	kilometres per hour
m	metre

INFORMATION REQUIREMENTS FOR QUARTZ MINE LICENSE AND WATER LICENSE

Information Requirement	Location in this Plan
Table of Concordance	*Will be included once YESAB process is complete.*
Revision Log	*Will be included once YESAB process is complete.*
Provide a brief overview of the project description, describe how wildlife use the area, indicate if there are any areas of concern within the project footprint, and describe the key areas where the project has potential to affect wildlife in the area.	Section 1.1 Project Summary
If First Nations were consulted during the development of this plan a summary of their key issues and concerns should be outlined along with how these issues are addressed in the Wildlife Protection Plan.	Section 1.2 Scope and Objectives Section 6.4 Wildlife Indicator Monitoring: Caribou Section 6.5 Wildlife Indicator Monitoring: Moose Section 6.9 Collaboration on Regional and Industry Research
Provide a summary of the wildlife that is supported by the habitats in the vicinity of the project, identify any wildlife corridors or migration routes that are used, and describe any wildlife features (e.g., breeding grounds, mineral licks, dens, nests, etc.) that are within the project area. Provide a description of any Valued Ecological and Cultural Components ("VECC") that were identified during the environmental assessment and the rationale for why each species was identified as a VECC. Include a summary of the seasonal periods, occurrence, and available habitat for all wildlife VECCs in the vicinity of the project. An overview of the habitat availability and classification for each VECC must also be provided in this section.	Section 4.0 Wildlife Resources
Provide an overview of the management and mitigation strategies and actions that will be implemented to minimize the impacts to wildlife and their habitat. A summary of the training available to employees and visitors on wildlife protection procedures is also required in this section. Describe how the site will be designed and constructed to reduce wildlife interaction. Include the procedures that will be carried out to minimize conflicts between wildlife and employees or visitors. Provide details of what animal attractants are on site, how the attractants are stored, and the procedures that are in place to reduce wildlife-human conflicts due to attractants. Include an outline of the procedures that will be put in place to minimize impacts to traditional land users and guide outfitters. Describe how impacts to wildlife from the mine operations will be minimized. Activities that should be described include, but are not limited to, operating procedures for transportation routes, on-road and off-road vehicles, heavy equipment, and aircraft and controls or deterrents used restrict wildlife access to tailings storage facilities or other high risk mine facilities. Identify the procedures that are in place to manage potential impacts to wildlife from direct and indirect habitat loss.	Section 5.0 Wildlife Protection Measures Framework

Information Requirement	Location in this Plan
Describe the recording program that is in place to document all wildlife observations and incidents and how this data will be used to identify existing or potential issues and areas of concern between wildlife and project components. Include a description of how rare species will be documented and reported. This program should include waterfowl and shorebird occurrence and distribution on all tailings ponds or other large storage ponds. Include a description of the program and methodology to monitor the occurrence, distribution and movement of wildlife on and near the mine site. If monitoring programs differ between seasons indicate the seasonal-specific monitoring programs that are in place. Include a description of how the data will be used to assess the effects to wildlife occurring from mine activities. Describe the program and methodology to monitor the baseline metal concentration in wildlife forage plants and small mammals and how the data will be used to assess the effects that the mining operation is having on these levels.	Section 6.0 Wildlife Effects Monitoring Framework
Present or summarize all proposed or required for wildlife monitoring. Include description of sample locations and frequency, proposed numeric objectives, standards and/or thresholds where applicable, adaptive management, data analysis and reporting. Append methods and QA/QC programs.	Section 6.0 Wildlife Effects Monitoring Framework *Additional details (e.g., thresholds) will be provided at a later date*
Describe the adaptive management actions that will be employed should negative effects on wildlife be observed.	Section 8.0 Adaptive Management

1.0 INTRODUCTION

1.1 PROJECT SUMMARY

The Coffee Gold Mine (Project) is a proposed gold mine fully owned by Goldcorp Inc. (Proponent) and located in the White Gold District of west-central Yukon, approximately 130 kilometres (km) south of the City of Dawson. The Project contains a substantial oxide resource that will be mined by open pit mining methods and recovered with heap leach processing.

Four Open Pits (called Latte, Double Double, Supremo, and Kona) will be developed using standard drill and blast methods, and mined using conventional shovel and truck methods. The ore will be crushed and placed onto a Heap Leach Facility. Gold extraction will utilize sodium cyanide heap leaching technology. A diluted solution of alkaline cyanide will be applied to the stacked ore on the heap leach pad using drip irrigation. As the solution percolates through the heap leach, gold will react with the cyanide and dissolve into the solution. This gold-bearing solution will be collected at the base of the heap leach pad and will be transported by pipe to the process facility where it will be processed via conventional gold recovery methods at an on-site adsorption, desorption, and recovery carbon plant to produce a final gold doré product. In addition to the Open Pits, the Heap Leach Facility and processing facilities, the overall Mine Site footprint will include two Waste Rock Storage Facilities (Alpha and Beta WRSF), a water treatment plant, water management structures, haul and service roads, a Camp Site and other ancillary buildings and facilities. Electricity will be generated on-site by diesel-powered generators.

The Mine Site will be accessed by road from Dawson via a 214-km, all-weather access road with river barge crossings, referred to as the Northern Access Route (NAR). The NAR includes upgrades to existing road and construction of approximately 37 km of new single-lane road with pullouts, with a design speed of 50 km per hour (km/hr). The NAR includes seasonal barge crossings on both the Stewart and Yukon rivers, with ice bridges in the winter months. Road activities will likely be suspended for approximately six weeks in November/December for fall freeze-up (Suspension Period), and approximately four weeks in April/May for spring thaw. Air transportation and the use of airstrips at the Mine Site will provide year-round access, and will be utilized to transport most mine personnel to and from site by charter aircraft from Whitehorse and other communities, as well as some freight.

1.2 SCOPE AND OBJECTIVES

The Project occurs in an area of Yukon's boreal forest region used by numerous bird and mammal species (hereafter referred to as wildlife), and may affect wildlife populations within the Project area along several pathways. There are distinct interactions between clearing required for the Project footprint and loss of wildlife habitat, as well as Project activities that create sensory disturbances that may affect wildlife use of adjacent habitat. The Project may also result in effects to wildlife movement through the Project area, increased mortality due to collisions with Project equipment and infrastructure, increased mortality due to

increased hunter access to the area or increased predator abundance, and increased mortality or effects to health resulting from contamination of the surrounding environments (through dust deposition or other contamination within the environment).

The purposes of the Wildlife Protection Plan are to minimize the effects of the Project's Construction and Operation-phase activities on wildlife and wildlife habitat, monitor the results of mitigation to ensure effectiveness, and adaptively manage for any unanticipated effects resulting from the Project. The Wildlife Protection Plan is intended to ensure that wildlife continue to use habitat in areas adjacent to the Project footprint and within the broader Project area while reducing the potential for Project-related injury or mortality to wildlife and accommodating operational and human health and safety requirements. Wildlife management, monitoring, and protection plans from similar mining projects in Yukon and northern Canada were reviewed during the preparation of this Plan to provide details on mitigations and monitoring that have been implemented in Yukon and similar jurisdictions. The Wildlife Protection Plan provides guidance to protect and limit disturbances to wildlife and wildlife habitat from Project activities, including both the Mine Site and NAR. It is anticipated that further details will be developed in continued discussion with management agencies, First Nations, other interested stakeholders, and any working groups established to monitor Project-related effects.

1.3 SYNERGIES WITH OTHER PROJECT DOCUMENTS

The strategies and actions identified in the Wildlife Protection Plan should be considered in association with the following Project-specific environmental management plans:

- Access Route Construction Management Plan — provides details on mitigation and monitoring for wildlife associated with the Construction phase of the NAR (Project Proposal, **Appendix 31-A**).
- Access Route Operational Management Plan — provides details about road management, access controls, and monitoring of use, including speed limits that will reduce the potential for wildlife collisions (Project Proposal, **Appendix 31-B**).
- Conceptual Reclamation and Closure Plan — provides the proposed approach to decommission mine features, reclaim landforms, and re-establish vegetated cover; the plan also outlines a monitoring program (including wildlife monitoring) to be conducted until mitigation measures have achieved closure objectives (Project Proposal, **Appendix 31-C**).
- A Water Management Plan provides details on the measures that will be used to prevent process solution (contact water) from affecting habitats retained within the Project footprint including a redundant system of liners, drainage layers, leak detection, and monitoring systems (Project Proposal, **Appendix 31-E**).

Several other environmental management plans will be developed for the Project licensing stages including:

- A dust management plan will provide information on fugitive dust dispersal as well as management and mitigation measures; limiting dust dispersal will minimize effects to wildlife and wildlife habitats within and adjacent to the Project footprint.
- A hazardous materials management plan will provide guidance on the storage and use of fuel and other hazardous substances on-site to prevent leaks and spills that could have adverse effects on wildlife and wildlife habitat.
- A noise management plan will provide guidance related to reducing noise; limiting noise will mitigate disturbance to wildlife in the Project area.
- A spill contingency plan will provide background planning and operational procedures for spill response to minimize exposure of wildlife to deleterious substances.
- A vegetation management plan will provide mitigation of potential effects to vegetation and vegetation monitoring protocols; vegetation protection measures identified in the plan are indirectly related to the protection of wildlife habitat.
- A waste management plan will provide details on handling Project waste, which, if mishandled, can attract problem wildlife to the site.

2.0 REGULATORY AND MANAGEMENT CONTEXT

The following legislation and regulations are relevant to the management and conservation of wildlife in the Project area. This section is provided as a general overview of relevant legislation and regional plans.

2.1 FEDERAL GOVERNMENT

2.1.1 *CANADA WILDLIFE ACT*

The *Canada Wildlife Act*, RSC 1985, c. W-9, allows for the creation, management, and protection of wildlife areas to preserve habitats, and to permit wildlife research and interpretive activities. There are no such protected areas in the Project area.

2.1.2 *MIGRATORY BIRDS CONVENTION ACT*

The *Migratory Birds Convention Act 1994*, SC 1994, c. 22, and its regulations provide protection for migratory birds (i.e., most species of birds in Canada) and their nests, and regulate the hunting of migratory game birds. The Act and its regulations prohibit the incidental take of migratory birds, their eggs, or active nests.

2.1.3 *SPECIES AT RISK ACT*

The *Species at Risk Act*, SC 2002, c. 29 (SARA), provides for the recovery of wildlife species that are extirpated, endangered, or threatened as a result of human activity, and manages species of special concern to prevent them from becoming endangered or threatened. Within the Act, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), an independent body of experts, is responsible for assessing wildlife species to determine whether they may qualify for legal protection and recovery under SARA. Once listed under SARA, species plans are legal requirements to secure the necessary actions for species recovery and management. Baseline surveys for the Project have documented several species listed under SARA or COSEWIC within the Project area (**Section 4.0**). The only species at risk in the Project area with an existing management plan is the Northern Mountain population of Caribou (i.e., the Klaza Caribou herd).

2.1.4 *YUKON ACT*

The *Yukon Act*, SC 2002, c. 7, gives authority to the Yukon Legislature to make laws in relation to the conservation of wildlife and its habitat within Yukon Territory, other than in a federal conservation area. This Act prohibits the Yukon government from making laws that limit subsistence hunting by Aboriginal people on lands where Final Agreements are not in effect. Where Final Agreements are in effect, such as the Project area, the Yukon government has the legislative authority to regulate all hunting, and must conform to the provisions of First Nation Final Agreements when addressing subsistence harvesting.

2.1.5 *YUKON ENVIRONMENTAL AND SOCIO-ECONOMIC ASSESSMENT ACT*

The *Yukon Environmental and Socio-economic Assessment Act*, SC 2003, C.7 gives authority and rules to the Yukon Environmental and Socio-economic Assessment Board (YESAB) to administer the assessment process that applies to all lands within Yukon. The YESAB information requirements and evaluation process guidelines include statements on documenting abundance and distribution characteristics of major wildlife species within the Project area and vicinity, including key habitat features. Also listed in these guidelines is the inclusion of all proposed environmental protection, contingency, and monitoring plans including wildlife protection and monitoring.

2.2 TERRITORIAL GOVERNMENT

2.2.1 *ENVIRONMENT ACT*

Yukon's *Environment Act*, RSY 2002, c.50, and regulations provide protection of land, water, and air. It applies on lands throughout Yukon, including private property, Crown lands, lands within municipal boundaries, and First Nation settlement lands where the First Nation has not developed equivalent laws. This Act is primarily used for regulations related to air quality, waste, recycling, spills and contaminated sites, and not wildlife. In addition, the Act provides for natural resource planning and management, including identifying conservation easements for conserving and enhancing wildlife habitats. There are currently no regulations for the protection of wildlife and habitats under this Act.

2.2.2 *WILDLIFE ACT*

The Yukon *Wildlife Act*, RSY 2002, c.229, provides rules for hunting and trapping, outfitting and guiding, licensing, enforcement, and habitat protection. It also gives authority to make regulations including prescribing specially protected wildlife and protected areas. Harvest management in the region is ultimately the responsibility of the Yukon Government under the *Wildlife Act*. The Peregrine Falcon (*Falco peregrinus*) and Gyrfalcon (*Falco rusticolus*), both of which could be found in the Project area, are protected under the Yukon *Wildlife Act*. The Project area does not overlap any Habitat Protection Areas administered under this *Act*.

2.2.3 YUKON CONSERVATION DATA CENTRE

The Yukon Conservation Data Centre (CDC) was established to provide information on species and ecosystems at risk. The CDC maintains a list of all animals known to occur in Yukon with their corresponding conservation ranks at the global, national, and territorial levels. The CDC has two types of lists: Track List and Watch List. The Track List is a list of all species of conservation concern with conservation status ranks. The Watch List is a list of species for which there is not enough information to determine whether they are of conservation concern.

2.3 First Nation Governments

The Project (including the NAR) is located on Crown Land and overlaps the established traditional territories of Tr'ondëk Hwëch'in (TH), Selkirk First Nation, and First Nation of Na-cho Nyäk Dun and the asserted traditional territory of the White River First Nation. Tr'ondëk Hwëch'in, Selkirk First Nation and the First Nation of Na-cho Nyäk Dun are self-governing, and have land management rights on settlement lands and land-use rights within the Project area as defined in their Final Agreements and the Umbrella Final Agreement; White River First Nation has not yet established legislation for the management and administration of settlement lands and wildlife.

2.4 Management Plans or Recovery Plans

2.4.1 Fortymile Caribou Herd Management Plan

The Fortymile Caribou Herd Management Plan was developed in 1995 through collaboration between the Alaska and Yukon governments, the Tr'ondëk Hwëch'in, Alaska Native organizations, and various environmental, hunting, and other interest groups. The recovery plan focused on promoting herd growth to facilitate the reoccupation of historic range in both Alaska and Yukon through the management of habitat, harvest and predation, as well as increased public involvement and awareness. The Plan was developed for a five-year period from 1996 to 2001.

Since 2001, there is no comprehensive management plan for the Fortymile Caribou; however, harvest management plans for the herd are developed by the Harvest Management Coalition consisting of members from the Alaska Department of Fish and Game, Bureau of Land Management and various regional advisory committees in cooperation with the Yukon Fish and Wildlife Management Board, Yukon Department of Environment, and Yukon First Nations (Harvest Management Coalition 2012). Under the current Harvest Plan, Yukon hunters are allocated 35% of the annual allowable harvest, which is set at 3% when the herd is below 70,000 Caribou and increases to 4% when the herd exceeds 70,000 Caribou. However, in support of the 1995 Fortymile Caribou Herd Management Plan, the Yukon licensed harvest was closed and the Tr'ondëk Hwëch'in began a voluntary no-harvest program to aid in herd recovery. Since then, the Yukon harvest has remained closed, and the harvest by Tr'ondëk Hwëch'in has remained very low to support further growth of the herd.

2.4.2 MANAGEMENT PLAN FOR THE NORTHERN MOUNTAIN POPULATION OF WOODLAND CARIBOU (RANGIFER TARANDUS CARIBOU) IN CANADA

The Northern Mountain Population (NMP) of Woodland Caribou, which includes the Klaza Caribou herd, was assessed by COSEWIC in 2002 and listed under SARA as a species of "special concern" in 2005. In 2012, Environment Canada released a management plan for the NMP. The goal of the Plan is to prevent the NMP from becoming threatened or endangered by engaging responsible agencies to carefully manage the NMP and their habitat (Environment Canada 2012). The Plan is focused on achieving the following goals that are re-evaluated on a five-year basis:

- Herds of the NMP are maintained or recovered, and populations operate within the natural range of variability
- The ecological integrity of key habitats and ecosystems required by the NMP are maintained
- First Nations, local communities, government agencies, and other interested parties are meaningfully involved in the stewardship of the NMP and its habitats.

To meet these goals, the Plan includes a series of management objectives for monitoring herd status and trends over time, including:

- Managing harvest for sustainable use
- Assessing health risks and maintaining Caribou health
- Increasing understanding of predator-prey dynamics and potential competition with other herbivores
- Identifying, assessing, managing, and conserving important habitats
- Promoting conservation of the NMP through environmental and cumulative effects assessments
- Fostering opportunities to share knowledge and information and develop education and stewardship programs (Environment Canada 2012).

2.4.3 OTHER RELEVANT GUIDELINES/BEST MANAGEMENT PRACTICES

- *Environmental Code of Practice for Metal Mines (Environment Canada 2009)*
- *Flying in Caribou Country: How to Minimize Disturbance from Aircraft (Environment Yukon 2010)*
- *Flying in Sheep Country: How to Minimize Disturbance from Aircraft (Environment Yukon 2006)*
- *Guidelines for Industrial Activity in Bear Country: For the Mineral Exploration, Placer Mining and Oil & Gas Industries (Environment Yukon 2008)*
- *Proponent's Guide: Assessing and Mitigating the Risk of Human-Bear Encounters (Yukon Government 2012).*

3.0 RESPONSIBILITIES

The Proponent is committed to providing necessary human, material, and financial resources to implement and maintain the Wildlife Protection Plan.

The Mine General Manager is responsible for ensuring that the site is managed in a way that ensures compliance will all regulatory requirements and internal sustainability objectives.

Environment Department staff will be responsible for ensuring compliance with the detailed requirements outlined in this plan. During the Construction and Operation Phases, the Environment Department will advise the contractors or site departments responsible for particular areas and monitoring the effectiveness of the Wildlife Protection Plan. The Environment Department will work with external parties including the Proponent's technical advisors, relevant authorities, First Nations, and other stakeholders on communicating the findings of the Wildlife Protection Plan and making appropriate adjustments to the Plan.

3.1 CONSTRUCTION PHASE

During the Construction Phase of the Project, it will be the primary contractor's responsibility to develop and implement site-specific construction plans that meets the objectives outlined in the Wildlife Protection Plan and incorporates the relevant mitigation measures for wildlife.

The Environment Department will be responsible for monitoring and assessing the effectiveness of the contractor's execution of wildlife protection measures. If maintenance or corrective actions are required, the contractor's site manager or delegate will be informed. The contractor will be responsible for conducting the corrective actions or maintenance activities in a timely manner.

3.2 OPERATION PHASE

During the Operation Phase of the Project, each department will be responsible for undertaking wildlife management in each respective area (referred to as the owning department). The Environment Department will be responsible for monitoring and assessing the effectiveness of wildlife management within the site and along the NAR. If maintenance or corrective actions are required, the owning department manager or delegate will be informed and will be responsible for carrying out the corrective actions or maintenance activities

4.0 WILDLIFE RESOURCES

Wildlife and Wildlife Habitat (i.e., mammals) and Birds and Bird Habitat were identified as Valued Components (VC) for environmental assessment for the Coffee Gold Mine Project Proposal submission to YESAB because of potential Project-related effects to individuals, populations, and habitats. Mammals and birds are important because of their value to First Nations and other local people who may in part rely on certain species as a subsistence and economic resource, and for their intrinsic value as a symbol of wilderness and as a part of healthy ecosystems. Additionally, some species have been identified as at-risk and must be assessed where potential Project-related effects can occur (SARA, subsection 79). For more information on VC selection refer to the Project Proposal, **Appendix 16-B** and **Appendix 17-B,** Section 1.2. The information below summarizes information on wildlife found within the Project area. For more information on baseline conditions refer to the Wildlife Baseline Report (Project Proposal, **Appendix 16-A**) and the Bird Baseline Report (Project Proposal, **Appendix 17-A**).

4.1 MAMMALS

Baseline information for mammals within the Project area was collected from 2013 through 2016, and involved a variety of studies including: aerial surveys for ungulates, bear den surveys, sheep surveys, snow tracking surveys, remote camera studies, ground-based investigations of wildlife trails and habitat features, pellet removal plots, and targeted surveys for Collared Pika (*Ochotona collaris*), bats, and small mammals. Baseline surveys were conducted at several spatial scales depending on the species being studied; however, discussion of baseline results generally focused on two spatial scales:

- The Wildlife Local Study Area (LSA) was delineated based on height of land and a minimum buffer of 1 km around the Mine Site footprint, as well as a 1-km buffer on either side of the proposed NAR.
- The Wildlife Regional Study Area (RSA) was designed to include any game management subzone that intersects or is in close proximity to the Project footprint (**Figure 4.2-1**).

The assessment of Project-related effects on Wildlife and Wildlife Habitats (Project Proposal, **Appendix 16-B**) generally used the same study areas as the baseline studies, but referred to them as assessment areas (e.g., the Wildlife Local Assessment Area was equivalent to the Wildlife LSA, the Wildlife Regional Assessment Area was equivalent to the Wildlife RSA). Additionally, several specific assessment areas were delineated for the assessment of certain species (i.e., Fortymile Caribou, Klaza Caribou, Thinhorn Sheep).

Of the mammal species potentially found within the Wildlife RSA, six are listed under SARA, COSEWIC, or the Yukon *Wildlife Act* (**Table 4.1-1**).

Table 4.1-1 Mammal Species at Risk Listed by the Committee on the Status of Endangered Wildlife in Canada, *Species at Risk Act*, and *Yukon Wildlife Act*

Common Name	Latin Name	SARA	COSEWIC	Yukon *Wildlife Act*	Confirmed in the Wildlife RSA
Woodland Caribou, Northern Mountain Population	*Rangifer tarandus caribou*	Special Concern (Schedule 1)	Special Concern (2014)	-	√
Grizzly Bear	*Ursus arctos*	No Status	Special Concern (2012)	-	√
Wolverine	*Gulo gulo*	No Status	Special Concern (2014)	-	√
Cougar	*Puma concolour*	Not at Risk	Not at Risk	Specially Protected	
Collared Pika	*Ochonona collaris*	No Status	Special Concern (2011)	-	√
Little Brown Myotis	*Myotis lucifugus*	Endangered (Schedule 1)	Endangered (2013)	-	√

The Project is located within the current range of two Caribou herds, the Klaza and the Fortymile. The Klaza Caribou herd is a resident herd of Woodland Caribou in the Dawson Range mountains estimated at 1,179 Caribou (Hegel 2013). The Mine Site is within the defined annual range of the Klaza Caribou herd; however, it is located outside of the herd's late-winter range (Hegel and O'Donoghue 2015). Wildlife observations made by Project staff and contractors since 2010 have documented Klaza Caribou within the southern sections of the RSA during the spring, summer, and fall seasons. For most of the year, the Klaza Caribou tend to be found in alpine and subalpine habitats above the treeline, although they will use lower-elevation habitats during the winter.

The Fortymile Caribou herd is a migratory herd that historically ranged over large parts of both Alaska and Yukon. Following a population decline in the 1970s, the herd abandoned nearly all of its range in Yukon. Following recovery efforts in the 1990s, the herd began returning to Yukon in 2002, but until 2013 the Fortymile Caribou herd range remained largely limited to habitats west of Dawson (Kienzler and Suitor 2015). In the fall of 2013, the herd expanded its current range in Yukon further east, re-inhabiting portions of its former Yukon range including parts of the RSA. Based on the observed use of the RSA from 2013 to 2016, Fortymile Caribou may be present seasonally in the Project area, during the fall and winter months; however, the number of Caribou present and the distribution of Caribou within the RSA is expected to vary between years. The Fortymile Caribou herd is currently estimated at approximately 52,000 animals (Harvest Management Coalition 2012).

Other ungulates in the Project area include Moose (*Alces alces*), Mule Deer (*Odocoileus hemionus*) and Thinhorn Sheep (*Ovis dalli dalli*). Moose are wide-spread in the region year-round, and are heavily harvested in parts of the Wildlife RSA. During the post-rut/early winter season, moose congregate in

subalpine shrub communities within the RSA; several key areas for post-rut/early winter congregations are known in the RSA including areas along the NAR. In the late winter, moose are more restricted in their habitat use than in other seasons, although baseline studies found that the RSA contains abundant and widespread high quality late winter moose habitat. Mule Deer are sparse in this part of Yukon but are occasionally observed in the RSA, usually associated with open grassy slopes. Thinhorn Sheep are known to occur in small numbers on the cliffs and rocky outcrops along the northern bank of the Yukon River.

Large predators found in the RSA include Grizzly Bear (*Ursus arctos*), Black Bear (*Ursus americanus*) and Grey Wolf (*Canis lupus*). Baseline studies suggested that while Grizzly Bear are present at relatively low densities, Black Bear are much more abundant within the RSA. Both species may den in the RSA and outside of the denning season, may overlap with the Project footprint from April to October. Grey Wolves are found throughout the Project area and baseline studies documented several wolf packs present within the RSA. Other furbearers that were documented in the RSA include Wolverine (*Gulo gulo*), Red Fox (*Vulpes vulpes*), Canadian Lynx (*Lynx canadensis*), American marten (*Martes americana)*, American Mink (*Neovison vison)*, American Beaver (*Castor canadensis*), Least Weasel (*Mustela nivalis*), and Ermine (*Mustela ermine*) among others.

A number of smaller mammals are present in the Project area including Snowshoe Hare (*Lepus americanus*), Red Squirrel (*Tamiascurus hudsonicus*), Northern Flying Squirrel (*Glaucomys sabrinus*) and various species of voles, mice, and shrews (*Sorex* sp.). Collared Pika (*Ochotona collaris*) were observed within the Wildlife RSA during wildlife baseline studies, but are not known from the Wildlife LSA — both the Mine Site and the NAR areas lack the talus slopes and other habitat requirements of Collared Pika. Little Brown Myotis were documented within the Wildlife LSA, but appear to be limited to the lower elevations along the NAR. Surveys for Little Brown Myotis conducted in Yukon have confirmed occurrence of this species up to 1,000 m elevation within its range (Slough and Jung 2008).

4.2 BIRDS

Baseline studies for birds and bird habitats within the Project area were conducted from 2013 to 2016 and consisted of point count surveys for upland birds, cliff-nesting raptor surveys, Common Nighthawk (*Chordeiles minor*) and Short-eared Owl *(Asio flammeus*) stand-watch surveys, Sharp-tailed Grouse (*Tympanchus phasianellus*) lek surveys, and incidental observations (Project Proposal, **Appendix 17-A**). Baseline studies for birds were conducted at two different spatial scales depending on the species being studied:

- The Bird LSA was delineated based on height of land and a minimum buffer of 1-km around the Mine Site footprint, as well as a 1-km buffer on either side of proposed road alignments.
- The Bird RSA was defined based on the watershed drainages overlapping the Project footprint and a 10 km buffer around the various road alignment options through the Dawson Goldfields (**Figure 4.2-1**).

Similarly, the assessment of Project effects on birds and bird habitats (Project Proposal, **Appendix 17-B**) defined two assessment areas:

- The Bird Local Assessment Area was based on the Bird LSA, but was limited to just those sections of the Bird LSA along the final Project alignment (i.e., the Bird LSA includes several previously considered alternate road alignments, the Bird LAA includes only the final alignment).
- The Bird Regional Assessment Area was equivalent to the Bird RSA as defined for baseline studies.

The Project area contains a wide variety of habitats ranging from dense lowland riparian forest to sparsely vegetated alpine areas, which provide breeding habitat for a variety of bird species including raptors, waterbirds, waterfowl, shorebirds, and upland birds. The diversity of birds within the Project area is generally representative of the avian community within the central Yukon; however, the lack of lakes and large waterbodies is reflected by the absence of species associated with those habitats. Additionally, alpine habitats are absent from the Project footprint and are limited within the Bird RSA, resulting in very few observations of alpine-obligate species. A total of 119 bird species have the potential to occur in the Project area, of which 88 have been documented to date, including seven species of conservation concern listed under COSEWIC or SARA (**Table 4.2-1**). The Project species list also includes 13 species which are on the Yukon Conservation Data Centre Track List and 14 species on the Watch List.

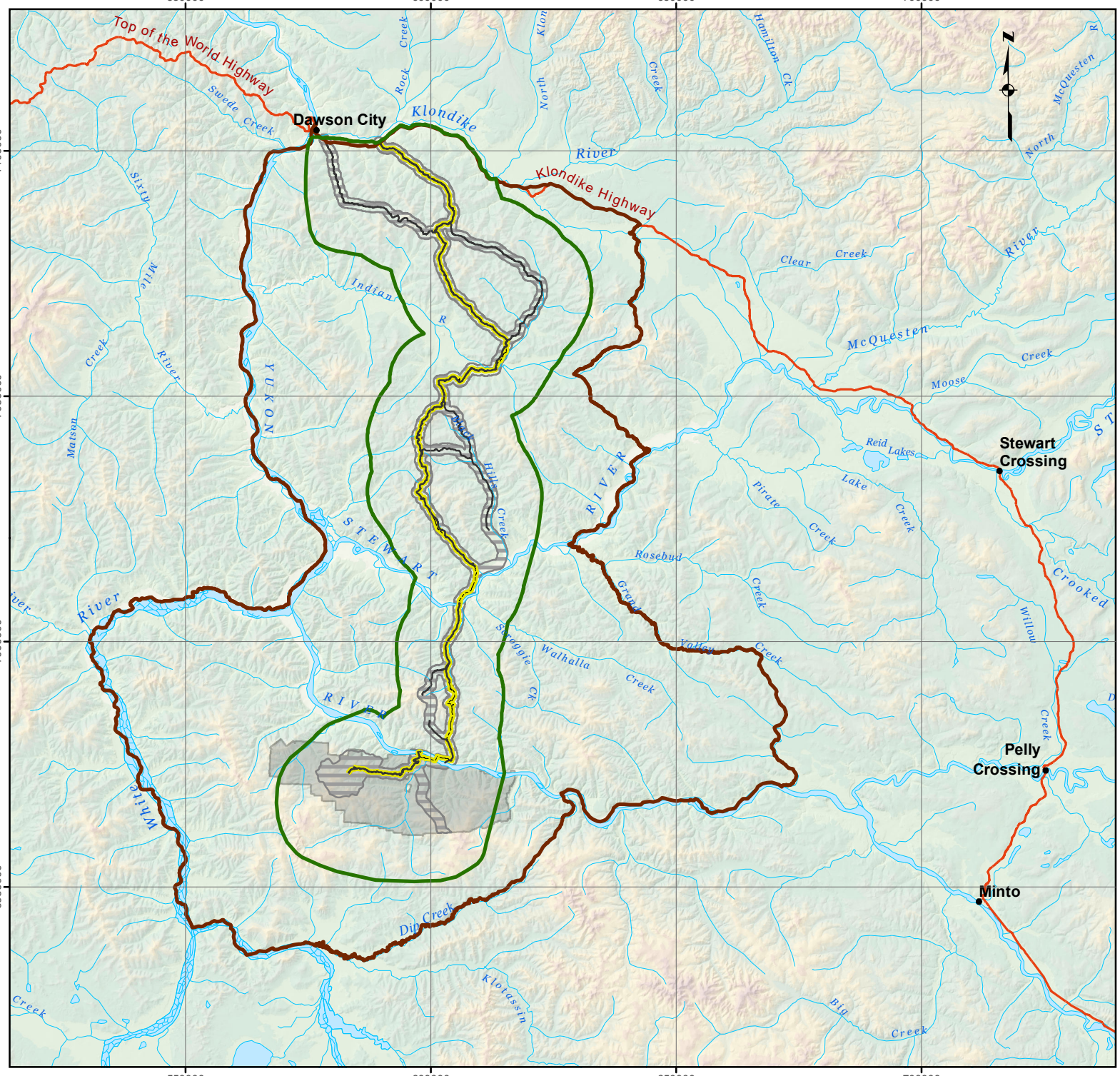
Table 4.2-1 Summary of Bird Species at Risk That May Occur within the Project Area

Common Name	Latin Name	COSEWIC Status (Year)	SARA Status	Confirmed in the Bird RSA
Horned Grebe	*Podiceps auratus*	Special Concern (2009)	Not listed	√
Peregrine Falcon	*Falco peregrinus*	Special Concern (2007)1	Schedule 1	√
Red-necked Phalarope	*Phalaropus lobatus*	Special Concern (2014)	Not listed	
Short-eared Owl	*Asio flammeus*	Special Concern (2008)	Schedule 1	√
Common Nighthawk	*Chordeiles minor*	Threatened (2007)	Schedule 1	√
Olive-sided Flycatcher	*Contopus cooperi*	Threatened (2007)	Schedule 1	√
Bank Swallow	*Riparia riparia*	Threatened (2013)	Not listed	√
Barn Swallow	*Hirundo rustica*	Threatened (2011)	Not listed	
Rusty Blackbird	Euphagus carolinus	Special Concern (2006)	Schedule 1	√

Important raptor habitats within the Bird RSA include the cliff faces along the Yukon and Stewart rivers and rock outcroppings (tors) in high-elevation areas that provide nesting sites for cliff-nesting raptors. Baseline surveys documented several active and inactive raptor nests along the Yukon and Stewart River cliffs (including active nests of Golden Eagles (*Aquila chrysaetos*), Peregrine Falcon and Common Ravens (*Corvus corax*)); however, no raptor nest sites were found in the Mine Site area. Raptor species at risk in the Project area include both Peregrine Falcon and Short-eared Owl. Suitable nesting habitat for Short-eared Owls can be found in several parts of the Bird RSA; however, Short-eared Owl observations during baseline studies were limited to a single observation of a foraging adult. Additionally, Gyrfalcon, while considered a potential species within the Bird RSA, was not detected in Project area during baseline studies. Gyrfalcon is protected under the Yukon *Wildlife Act*, although not listed under SARA or COSEWIC.

Waterfowl (i.e., ducks, swans, and geese) and other waterbirds (e.g., loons, grebes, gulls) are relatively uncommon in the Bird RSA due to the lack of lakes and large wetlands. Shorebirds in the Project area occupy a variety of habitats including stream margins, wetlands, and alpine areas. Horned Grebes (*Podiceps auratus)*, a species at risk, were confirmed nesting within the Bird RSA, but were only detected in the Dominion Creek area which is outside of the Project footprint.

Upland bird species within the Project area include game birds (grouse, ptarmigan), Common Nighthawks, Belted Kingfishers (*Ceryle alcyon*), woodpeckers and passerines (songbirds); passerine species include Flycatchers, Shrikes and Vireos, Jays and Crows, Larks, Swallows, Chickadees, Kinglets, Thrushes, Waxwings, Warblers, Longspurs and Sparrows, Blackbirds, and Finches. Upland bird species at risk detected in the Project Area include Common Nighthawk, Olive-sided Flycatcher, Bank Swallow, and Rusty Blackbird. Baseline studies documented Common Nighthawk along several sections of the NAR, with observations concentrated in areas with old burns or disturbance from placer mining. Olive-sided Flycatchers were found in several locations within the Bird RSA associated with old burns or coniferous forest habitats. Bank Swallows were observed in several areas along the NAR, with active nesting colonies located along river banks and embankments created from roads and placer mining activity. Rusty Blackbirds were documented in natural wetlands habitats and reclaimed placer mining ponds along the NAR. Additionally, although not listed under SARA or COSEWIC, Sharp-tailed Grouse were selected as a focal species for baseline studies and the Project effects assessment due to concerns about potential interactions with the NAR. Sharp-tailed Grouse surveys located several Sharp-tailed Grouse leks in the Project RSA; however, all documented leks were more than 3 km from the Project footprint.



Legend

- Highway
- Existing Access
- Proposed Route
- Bird Local Study Area
- Bird Regional Study Area
- Wildlife Regional Study Area
- Coffee Property

FIGURE: 4.2-1

Wildlife and Bird Study Areas for the Coffee

Data Sources
Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Models (30 m and 90 m) provided by Geomatics Yukon - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

Project data displayed is site specific. Survey data collected by EDI Environmental Dynamics Inc. (2015).

Disclaimer
This document is not an official land survey and the spatial data presented is subject to change.

0 10 20 30 40
KM

Map Reference Scale: 1:1,000,000 (Printed at 8.5 x 11)
Coordinate System: NAD 1983 UTM Zone 7N

Drawn: MP/HG	Checked: AM/MAS	Date: 3/27/2017

GOLDCORP EDI

Path: O:\2017\Y\003\2_Goldcorp_Coffee\GIS\ManagementPlanMaps\Fig_4_2_1_WildlifeRSABirdLSA.mxd

5.0 WILDLIFE PROTECTION MEASURES FRAMEWORK

To reduce or eliminate potential Project effects on wildlife and wildlife habitat, the Proponent has committed to a number of mitigation measures. Some of the mitigation actions are expected to be modified through the life of the Project as part of the adaptive management approach integrated into this plan (refer to **Section 8.0**). To inform the Proponent, Project regulators, First Nations, and stakeholders about mitigation effectiveness and Project effects, the wildlife protection measures are supported by a Project effects monitoring framework described in **Section 6.0**. The Project's wildlife monitoring program will be used to confirm compliance with mitigation practices, discern Project-related effects from natural variability, identify unanticipated Project-related effects so that mitigation actions can be implemented to reduce further harm, and provide information to support adaptive management of the Wildlife Protection Plan.

As referenced in **Section 1.3**, there are a number of other Project-specific management plans that will be implemented in conjunction with the Wildlife Protection Plan, and will contribute to the protection of wildlife and wildlife habitats through the management of effects to vegetation, air quality, and surface water quality, noise and waste management, among others. Refer to the relevant management plans for specific mitigation measures relating to these areas. Note that the Wildlife Protection Plan identifies mitigation actions and monitoring studies for both the Mine Site area and NAR during the Construction and Operation phases of the Project. Wildlife mitigation and monitoring programs for the Reclamation and Closure and Post-closure phases of the Project are included in the Conceptual Reclamation and Closure Plan (Project Proposal, **Appendix 31-C**).

5.1 PROJECT DESIGN

The Project design considered several elements that will help to mitigate effects on wildlife as described below:

Project Siting

- To minimize habitat loss, the Project footprint at the Mine Site was designed to be as small as possible; examples of considerations made to minimize the footprint include the backfill of pits and waste rock storage facility design.
- The location of the Mine Site and associated infrastructure avoids many of the sensitive habitats (e.g., riparian areas, wetlands, mature or old-growth forests, steep south-facing slopes, etc.) within the region; in particular:
- The location of the new airstrip on the subalpine ridge near the mine, as opposed to the location of the exploration airstrip in the Yukon River valley, minimizes disturbance to high-value wildlife habitats in the Yukon River valley and to the cliff-nesting raptor and sheep habitat on the north side of the Yukon River valley.
- To minimize disturbance to wildlife and wildlife habitats, where Project design allows, Project infrastructure and laydown areas will be constructed outside of identified environmentally sensitive areas (e.g., wetlands) and will avoid important wildlife habitat features.

Progressive Reclamation

- Phased mine development and progressive reclamation of disturbed areas, where practicable, will limit the length of Project effects. Progressive reclamation of Project infrastructure areas will be initiated as early as Year 2 and continue throughout the mine life. An early and progressive approach to reclamation will reduce the duration of direct habitat loss and sensory disturbance to wildlife.

- Natural vegetation will be maintained where possible to minimize direct habitat loss and limit erosion and sedimentation. Retained vegetation also decreases the amount of reclamation required at closure.

Road Design and Traffic

- By designing the NAR to follow existing roads wherever possible, the Proponent will minimize the amount of wildlife habitat lost to the Project and limit the increase in road access through the area.
- Project-related traffic on the NAR will be relatively low (average eight trucks/day) which will limit the potential for wildlife collisions and potential disturbance to wildlife along the road.
- The NAR will be designed for speeds of 50 km/hr. These speeds will increase the chance of vehicles being able to stop before colliding with wildlife.
- New sections of road will be designed to avoid important wildlife habitat features and sensitive habitats, where possible.
- Where possible, roads will be designed with clear lines of sight to increase the ability of drivers to see wildlife or other hazards.
- The road embankments will be lower profile (i.e., shorter and shallower), where possible, to minimize the potential for the road to filter or act as a barrier to wildlife movements.
- Where road embankments may pose a barrier to wildlife movement (e.g., steep banks >2 m high and extends for >500 m or is located in an area of known wildlife movement), construct wildlife crossings, including trails that traverse the cuts and fills to reduce the grade that animals must climb or descend. The exact design of wildlife crossings will be site-specific, but will incorporate the following guidelines where feasible:
    - Wildlife crossings will be designed to have a gradual grade (e.g., a 5:1 slope).
    - Crossing surface will be smooth and compacted to allow for solid footing, and constructed of finer fill materials.
- The selection of borrow sources for road material will target existing borrow sites or areas in existing disturbance (e.g., placer tailings). Where new borrow sources must be established, to the extent possible, borrow sources will be developed outside of areas known to be important to wildlife (e.g., known movement corridors, cliff nest sites).
- Operations along the NAR will shut down for the fall freeze-up Suspension Period (approximately 6-week closure, November to December) and the spring thaw Suspension Period (approximately 4-week closure, April to May). These closures will help minimize effects to wildlife during the spring and fall seasons.

5.2 GENERAL WILDLIFE PROTECTION MEASURES

The following general wildlife protection measures will help to minimize effects on wildlife and wildlife habitat, and will apply to all aspects of the Project:

- Hunting of wildlife will be prohibited at all times for all site personnel while working in the Project area (both on and off-shift).
- Feeding of wildlife will be prohibited.
- Harassing or approaching wildlife will be prohibited.
- A wildlife sighting log will be maintained by on-site personnel through all Project phases. Employees will be required to report all wildlife sightings along the road and near Project facilities; the Environment Department will be responsible for tracking all wildlife observations.

5.2.1 PROJECT PERSONNEL WILDLIFE AWARENESS ORIENTATION

The Proponent will implement a wildlife awareness program as a part of the Project orientation for both Project employees and contractors to increase awareness of the Proponent's commitment to protecting wildlife and wildlife habitat in the Project area. Personnel will receive an introduction to basic wildlife-related information relevant to the Project and an overview of relevant wildlife mitigation measures, as well as an awareness of the consequences of a failure to follow wildlife mitigation measures. The objectives of the wildlife awareness orientation will be as follows:

- Provide workers with knowledge of why interactions with wildlife are important to manage.
- Provide workers with an understanding of the course of action to be taken in a variety of circumstances involving wildlife encounters.
- Emphasize the role of adaptive management in realizing effective mitigation for wildlife and the workers' role in recording their observations on the wildlife sighting log, or as part of the monitoring programs described in this document.

5.2.2 REDUCE HUMAN-WILDLIFE ENCOUNTER RISKS

The Proponent will implement a wildlife management protocol to reduce the potential for wildlife-human interactions in the Project footprint, and help ensure employee safety while minimizing potential mortality of wildlife due to threats to life or property. Elements of the wildlife management protocol are presented as follows:

- Where practical, buildings will be designed to discourage use by wildlife and prevent human-wildlife conflicts:
    - All buildings and stair landings will be skirted to the ground to discourage wildlife access under buildings.
    - Windows will be installed on all exits to allow personnel to look for wildlife before exiting the building.

- Waste management will be strictly enforced. A waste management plan will be developed and will include detailed information on waste management, including:
    - Bear-proof garbage cans will be located outside buildings in high traffic areas for the collection of general waste.
    - Items disposed of in the onsite landfill will be restricted to materials which should not act as wildlife attractants (non-hazardous, non-leaching, inorganic garbage); however, the landfill will be monitored for wildlife and if wildlife are found to frequent the landfill, an electric fence will be place around the landfill.
    - Food waste will be incinerated daily or composted in a fashion that does not attract wildlife.
    - Domestic wastewater and sewage will be treated by a membrane bioreactor (MBR) plant and disposed of in a fashion that does not attract wildlife.
    - Periodic audits will be conducted to assess the effectiveness of waste management practices and regular surveillance of Project facilities and waste disposal sites will ensure that wildlife control measures are effective.
- Warning signs will be posted in areas of frequent wildlife encounters on a seasonal basis or as otherwise required.
- Any observation of bears or other wildlife acting defensively, showing signs of human habituation, or acting aggressively will be immediately followed up by designated personnel who have received appropriate training in monitoring, managing, and evaluating human-wildlife conflicts. If specific wildlife becomes a concern, Yukon Conservation Officer Services will be contacted for advice on appropriate actions.
- In the event of bear encounters, several types of bear deterrents will be employed including bear spray, air horns and if warranted, projectile deterrents (bangers, rubber bullets or bean bags). Firearms will only be used as a last resort in the event of a bear encounter when all other methods of bear deterrents have failed. If animals are killed in defense of life or property, Yukon Conservation Services will be consulted regarding disposal.
- Upon approval of Yukon Conservation Officer Services, any wildlife fatalities will have carcasses collected; salvageable meat may be offered to local First Nations, damaged meat/body parts will be made available to local trappers or disposed of.

5.2.3 MINIMIZE HABITAT LOSS

Habitat loss can result from both the direct loss of habitat due to vegetation clearing within the Project footprint and indirect loss of habitat due to sensory disturbance adjacent to the Project footprint. Project activities will limit habitat loss through the following mitigation measures:

- Project activities will minimize clearing and ground disturbance as much as reasonably practicable within the Project footprint.
- Construction activities will be managed to maintain key habitat features and observe least risk timing windows (refer to Section 5.4).

- Project activities will minimize noise where possible to, in part, avoid unnecessary disturbance to wildlife; a noise management plan will be developed for the Project licensing stage.
- Project activities will manage dust emissions to reduce fugitive dust generation and potential effects to wildlife and wildlife forage; a dust management plan will be developed for the Project licensing stage.

5.2.4 MANAGE ROAD OPERATIONS

Operations along both the NAR and Mine Site access roads will be managed to limit the potential effects to wildlife including disturbance to wildlife along roads, barrier or filter effects to movement, and mortality resulting from vehicles collisions or other indirect effects of road use. Additional to the reduced effects associated with low traffic volume and low speed limits that are part of the Project design, mitigation measures that will be implemented to minimize the effect of road operations on wildlife include:

- Wildlife will have the right-of-way along all Project roads:
  - Vehicle operators will be vigilant to watch for wildlife near roads, and will take all reasonable actions to avoid collisions with wildlife.
  - If wildlife are observed on the road, traffic must stop as far back as safely possible. If after five minutes the animals have not moved off the road, the vehicle may proceed slowly and cautiously. An operational decision tree matrix for drivers dealing with wildlife along Project roads is provided in **Figure 5.6-1**.
- Road signage, both permanent and temporary, will be erected to inform users regarding seasonal wildlife issues along Project roads as necessary.
- Speed limits will be posted along Project roads, including additional speed restrictions for the protection of wildlife along specific sections of road and/or during seasons when wildlife are expected to regularly interact with the road.
- No-stopping areas will be designated in sensitive wildlife areas as determined by project monitoring and project biologists; no-stopping areas will have signs posted.
- Temporary road closures and/or traffic restrictions for Project vehicles may be implemented as determined to be required to mitigate adverse effects to wildlife (e.g., during caribou migration, refer to Section 5.3.1).
- All incidents between vehicles and wildlife must be reported to the Proponent's Safety and Environment Department whether they are Near-miss, Collision with injury, or Collision causing accidental death.
  - Each incident will be investigated by the appropriate Supervisor and the Environment Department, and if applicable measures to avoid recurrence will be implemented. Disciplinary measures will be taken against any employee or contractor if the investigation concludes that the accident is the result of negligence.
- Where safe to do so and allowed by other design considerations, snow banks will be managed, and maintained to less than 1 m high over long continuous sections or will include periodic breaks to ensure escape opportunities to minimize potential barrier effects on wildlife movements.

- All trucks will be equipped with a wildlife sighting log to record species observations. Drivers will be required to document all wildlife observations.
- Wildlife observations along the road will be communicated to nearby drivers via radio communications (e.g., “three Moose north of km 45”) to ensure drivers are informed of potential hazards; communication of wildlife locations may be suspended if the communication presents a larger risk to wildlife (e.g., Moose locations during hunting season).
- The Proponent will have personnel that are responsible for monitoring conditions of the NAR and advising Proponent road users of potential hazards and wildlife issues along the route.

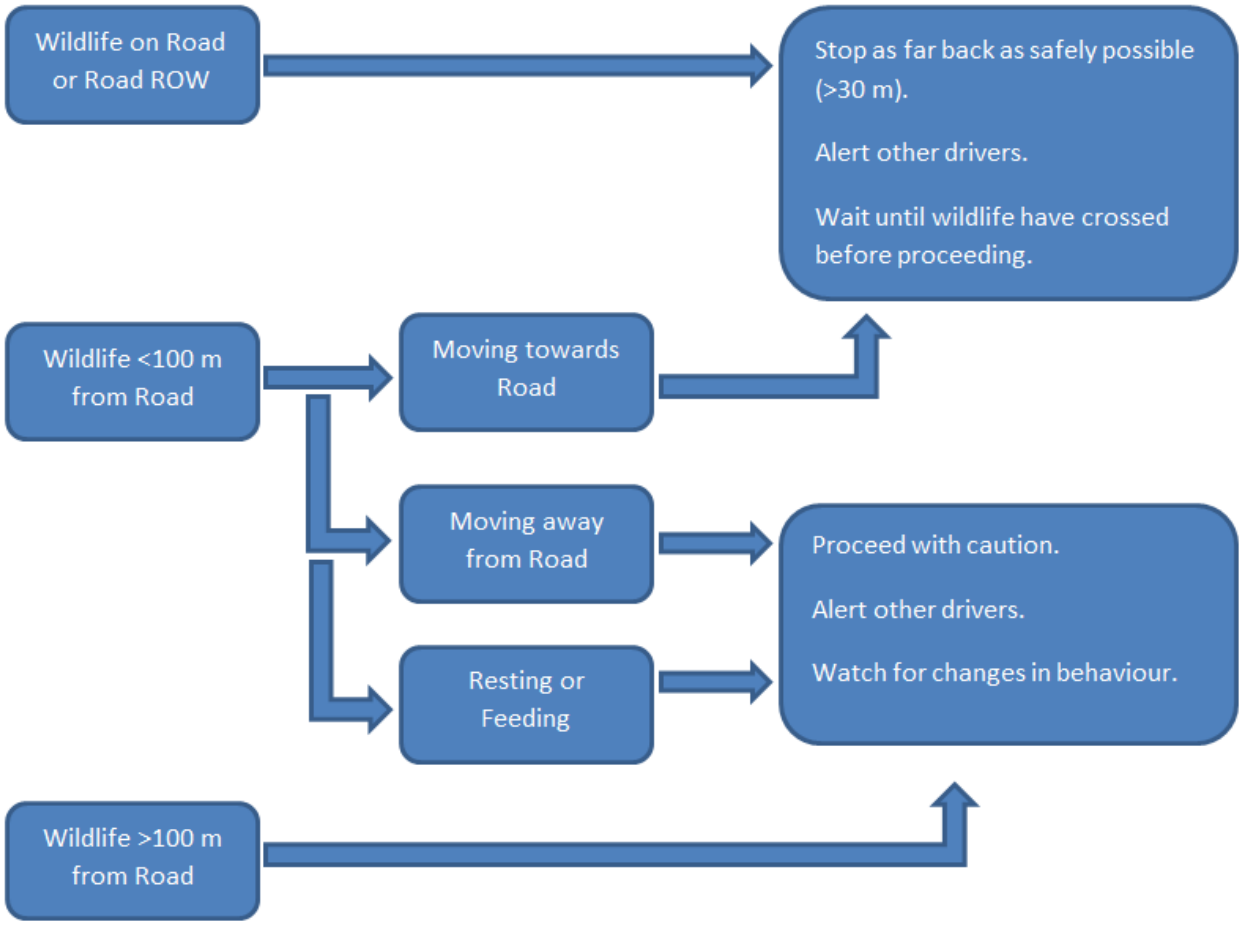


Figure 5.6-1 Project Wildlife and Road Operations Decision Matrix

5.2.4.1 Access Management

The Proponent has heard many concerns regarding potential effects to wildlife from public access of the NAR, particularly relating to the potential for increased harvest and wildlife collisions. To help address these concerns, the Proponent will continue engagement with representatives from First Nations, government regulators, and current road users. Many of the mitigation measures outlined above for Project operations along the NAR will also contribute to limiting effects from public use (e.g., road signage). Additionally, the following measures will be implemented to limit public access:

- Access control will be implemented at the north entrances of each of the Stewart and Yukon River crossing areas.
- Only authorized, mine-related vehicles will be permitted on Proponent-operated barges and ice bridges on the Stewart and Yukon rivers.

5.2.5 MANAGE AIRCRAFT OPERATIONS

Aircraft operations, including both fixed-wing aircraft and helicopters, will be managed to limit the potential effects to wildlife. Where possible, the Proponent will follow the guidance outlined in *Flying in Caribou Country: How to Minimize Disturbance from Aircraft* (Environment Yukon 2010) and *Flying in Sheep Country: How to Minimize Disturbance from Aircraft* (Environment Yukon 2006). Subject to Safety Considerations and Pilot discretion:

- The Proponent requires all Project-related aircraft to maintain a minimum cruising altitude of 300 m above ground level at all times of the year; between May 1 and June 31 the minimum cruising altitude will be increased to 600 m above ground level when Caribou have been identified in the area (for the protection of calving Caribou).
- Hovering or circling over wildlife may greatly increase disturbances and will be avoided.
- The south-facing slopes above the Yukon River are known to support nesting raptors during the nesting season and Thinhorn Sheep year-round. To the extent operationally feasible, aircraft will maintain a cruising altitude of 500 m above ground when flying over the south-facing slopes above the Yukon River, or maintain a horizontal distance of at least 1,000 m from these slopes to minimize potential sensory disturbances associated with aircraft.

The Proponent will follow these measures whenever possible, when guidelines do not conflict with Canadian Aviation Regulations. Weather conditions or other safety considerations may require deviation from flight paths or preferred elevation (e.g., aircraft may be required to adjust flight altitude to avoid conflicts with other planes). Exceptions will also be permitted for low-level flights and/or flights along the Yukon River during wildlife surveys, as directed by Project biologists in accordance with wildlife research permits.

5.2.6 PREVENT WILDLIFE ENTRAPMENT

The risk of wildlife mortality resulting from interactions with Mine Site infrastructure was considered during Project design. To limit the potential for wildlife entrapment in Mine Site infrastructure, several design elements and mitigation measures were developed.

- Heap Leach Facility events ponds will be fenced during Operation to prevent access by wildlife.
- Where Open Pits could present a hazard to wildlife that is not readily visible to approaching wildlife, where safe to do so, efforts will be made to limit the risk by placing boulders or creating berms to prevent access to the edges of the pit such that any approaching wildlife would be forced to slow down and recognize the risk.

5.3 SPECIES-SPECIFIC MITIGATION

5.3.1 CARIBOU

5.3.1.1 Fortymile Caribou

As discussed in **Section** 4.1, the Project overlaps the current range of the Fortymile Caribou herd. Fortymile Caribou could be present in the Project area October through April. During the fall migration period (October to November) and the spring migration (February to April), the Project could interact with large groups of caribou moving through the area. Additionally, during the winter months, groups of Fortymile Caribou may be found inhabiting suitable habitats throughout the region. To address potential effects to the Fortymile Caribou, a phased approach to mitigation will be followed, which will be triggered by increasing proximity of collared Caribou[1] or the observations of large groups of Caribou (i.e., more than 500 Caribou). During the Fortymile Caribou migration season, the Environment Department will be in regular contact with Environment Yukon to get updates on the location of collared Fortymile Caribou; information from Environment Yukon will help estimate Caribou numbers and direction of travel.

- **Response Level 1:** Triggered by one or more collared Caribou crossing the White River (west of the Mine Site) or the Yukon River (west of the NAR), the Donjek or Klotassin Rivers (south of the Project), and/or the Klondike Highway (north of the Project):
  - General mitigation measures apply.
  - Heightened alert by site personnel. The Environment Department will be in regular communication with Environment Yukon to track the location of Fortymile Caribou. All site personnel will be notified that Caribou are in the area and personnel must be alert to the presence of Caribou. Any observations of Caribou will be reported immediately to Environment Department.

[1] The use of collared Caribou as a trigger assumes that collared caribou are representative of large numbers of caribou; if observations indicate that is not the case, mitigation may be scaled back.

- **Response Level 2**: Triggered by one or more collared Caribou within 6 km of Project activities OR observations of several hundred Caribou within 6 km[2]:
  - General mitigation measures and Response Level 1 Caribou mitigation measures apply.
  - The Environment Department will inspect Project infrastructure in the relevant area to ensure that Caribou are not blocked from moving through the area and that Caribou will not get caught in infrastructure (e.g., fencing).
  - If Caribou are within 6 km of the NAR:
    - Monitoring will be conducted on the relevant section of road for Caribou presence.
    - Site personnel will direct traffic through the area accordingly; if indicated, additional signage and/or speed restrictions may be implemented.
  - Non-essential helicopter flights in the relevant area will be restricted to reduce disturbance.
  - If there are indications that a large group of Caribou may be moving towards the Mine Site, staff may be flown to adjacent ridges to monitor for Caribou with binoculars or spotting scopes.
- **Response Level 3** (applies to migratory movements only; does not apply to overwintering groups of Caribou): Triggered by one or more collared Caribou within 1 km of Project activities OR observations of large numbers of Caribou (i.e., more than 500 Caribou) within 1 km:
  - General mitigation measures and Response Level 2 Caribou mitigation measures apply.
  - If Caribou are within 1 km of the NAR:
    - The Proponent will temporarily stop all Project-related traffic along the NAR
    - If Caribou are moving through the area for longer than 24 hours, the Environment Department will work with Yukon Government to determine project activity.
  - If Caribou are within 1 km of a blast site:
    - Blasting may be temporarily suspended (up to 24 hrs.). If Caribou are moving through the area for longer than 24 hours, the Environment Department will work with Mine Operations to time blasting to have the least disturbance on Caribou.
  - The Environment Department will monitor the movement of Caribou through the area.
  - Environment Department will contact the Environment Yukon regional biologist to discuss Project activity if the Caribou remain in the area for more than 1 week.

5.3.1.2 Klaza Caribou

The Mine Site also overlaps with the annual range of the Klaza Caribou herd — small numbers of Klaza Caribou may be observed occasionally during the spring, summer, or fall seasons. Project design and General Wildlife Protection Measures outlined above are expected to limit effects to Klaza Caribou. Additionally, to minimize potential disturbance to pregnant females or cows with young calves, during the calving and post-calving season (May 1 to July 31), helicopters will be required to maintain a flight altitude of 600 m when Caribou have been identified in an area (see **Section 5.2.5**).

[2] A 6-km zone of influence is based on the results of Johnson and Russell 2014 for the Porcupine Caribou Herd.

5.3.2 MOOSE

The Project effects assessment included evaluation of several potential Project-related effects to Moose including effects to habitat, mortality, and Moose congregations during the post-rut/early winter period. The majority of these potential interactions will be mitigated through the Project Design and General Wildlife Protection Measures, in particular, several of the mitigation measures developed for the NAR design (**Section 5.1**) and operations (**Section 5.2.4**). Additionally, construction activities will be timed to avoid sensitive habitats for Moose during sensitive times, wherever possible (**Section 5.4**), including:

- Moose congregation areas during the post-rut (late-October to December)
- Late winter Moose habitat (February to April).

To reduce the potential for vehicle-wildlife collisions and disturbance to moose in post-rut areas, additional signage and/or traffic restrictions may be implemented as determined to be required.

5.3.3 THINHORN SHEEP

The cliffs on the north side of the Yukon River are known to support small numbers of Thinhorn Sheep. While the Project will not directly affect sheep habitats, the NAR may intersect sheep movement along the Yukon River, and Project activities (including both road traffic and aircraft) may result in sensory disturbance to sheep in this area. Mitigation measures for Aircraft Operations (**Section 5.2.5**) will help mitigate potential effects to sheep from Project aircraft. Additionally:

- To the extent feasible, road construction will be timed to avoid activity near the Yukon River cliffs during the lambing season (see **Section 5.4**)
- Where the NAR passes between the Yukon River cliffs along lower Ballarat Creek, a reduced speed zone or additional signage may be implemented to limit potential risks to Sheep moving through this area where crossings have been documented to occur.
- Special care will be taken so that road Construction and Operation activities do not create a barrier to Sheep movement through this area. Specifically:
    - Avoidance of tall, steep road banks.
    - Snow clearing and piling in a way that will minimize hindrance to Sheep crossing the road.

5.3.4 CARNIVORES

Project-related effects to large carnivores will be mitigated through the application of the Project Design and General Wildlife Protection Measures. In particular, management of Project waste and other potential attractants is critical to minimizing potential effects to bears and other carnivores, as such, waste management protocols will be included as part of the employee orientation for all employees and contractors. Waste management protocols for the Project will be strictly enforced (see **Section 5.2.2**).

Carnivore dens are considered important wildlife features, particularly for those species that regularly re-use den sites. Typically, bears re-use dens only occasionally, although they often re-use denning areas. Wolves are known to re-use dens and denning areas for generations. Wolverine natal dens may get used during subsequent years, or may occur in similar areas. Consequently, construction activities will include efforts to leave any identified dens structurally intact wherever possible. The Proponent will establish a no-disturbance buffer around active dens during the denning period (refer to **Section 5.4**).

5.3.5 BATS

The Project effects assessment evaluated potential Project-related effects to Little Brown Myotis, particularly regarding effects to active bat roosts. To minimize potential effects:

- Pre-clearing surveys for bat roosts will be conducted prior to the commencement of construction activities within 100 m of the Project footprint in areas with a high potential to support bat roosts (i.e., habitats below 1,000 m in elevation with suitable rock faces/cliffs or old forest with large trees (average dbh >25 cm)).
- Any identified bat roosts will be left structurally intact and a no-disturbance buffer will be established around active roosts (see **Section 5.4**).

5.3.6 BIRDS AND BIRD NESTS

The Project area contains a wide variety of habitats that provide breeding habitat for multiple bird species including raptors, waterbirds, waterfowl, shorebirds and upland birds, including several species at risk (**Section 4.2**). To protect birds nesting within the Project area, several mitigation measures have been developed in addition to the Project Design and General Mitigation Measures identified above:

- Nest-specific management plants will be developed for all known raptor nests within 1 km of the Project footprint; where possible, plans will include a site-specific no-disturbance for Project personnel and equipment around active nests during the breeding window.
- Although no Sharp-tailed Grouse lek sites have been located that interact with the NAR, should leks be identified in the future, project-related travel through lek sites may be restricted during certain times of day over sensitive periods.
- During construction, vegetation clearing will be conducted outside of the migratory bird nesting period (May 1 to August 15), wherever possible. If clearing outside of the bird nesting period is not possible, bird nest surveys will be conducted prior to clearing and any active nests identified will be protected within a no-disturbance buffer (**Section 5.4**).

5.4 PROCEDURES DURING CONSTRUCTION PHASE

Many of the predicted effects on wildlife will occur during the Construction Phase of the Project. Wildlife habitat will be removed during Project Construction, both through direct removal of habitat and functional loss of habitat due to sensory disturbance. Wildlife will also experience increased risk of mortality from Project infrastructure and activity. These Project-related effects will be managed through the implementation of the Project Design (**Section 5.1**), General Wildlife Protection Measures (**Section 5.2**) and Species Mitigation (**Section 5.3**). Additionally, several specific mitigation procedures will be implemented during Construction to reduce or remove potential effects to wildlife and wildlife habitat during this phase:

- Where practical, and not a risk to human safety, a Stop Work policy will be implemented when wildlife in the area may be endangered (i.e., risk of physical injury or death) by the work being conducted.
- Prior to site preparation or construction works, Project footprint boundaries and known wildlife habitat features or sensitive areas will be clearly marked on site plans and in the field by a qualified environmental professional.
- Construction activities will be timed to avoid sensitive habitats during sensitive times. If construction activities must occur during sensitive periods, additional monitoring and/or mitigation will be implemented. Sensitive habitats/time periods include:
    - Fortymile Caribou movement areas during migration (October to November, February to April) when Fortymile Caribou are present
    - Moose congregation areas during the post-rut (late-October to December)
    - Late winter Moose and Caribou habitat (February to April)
    - Sheep habitat during the lambing season (mid-May to mid-June)
- No-disturbance buffers will be established around identified wildlife habitat features (e.g., mineral licks, dens, and bat roosts) during sensitive periods, as per the setback distances identified in **Table 5.4-1** and **Table 5.4-2**.
- Outside of sensitive periods, wildlife habitat features will be kept structurally intact wherever practical.
- Prior to Construction, pre-clearing surveys for bat roosts will be carried out in habitats with high potential to support roosts (i.e., habitats below 1,000 m in elevation with suitable rock faces/cliffs or old forest with large trees (average dbh >25 cm)) within 100 m of the Project footprint. A no-disturbance buffer will be established around any identified roosts as per **Table 5.4-1.**
- Vegetation clearing will be conducted outside of the migratory bird nesting period (May 1 to August 15) wherever possible. If clearing outside of the bird nesting period is not possible, pre-clearing bird nest surveys will be conducted prior to clearing. Survey methods will follow best management practices, and will include the following:
    - Surveys will be conducted by qualified individuals who are experienced in performing pre-clearing surveys and have knowledge of regional bird species.

- Surveys will extend beyond the Project footprint to the distance of the appropriate no-disturbance setbacks (see **Table 5.4-2**) based on the habitat.
- Survey information including date, time, survey effort, and details on any nests located (e.g., location, species, nest status, photos etc.) will be documented on standardized forms.
- A no-disturbance setback around active nests will be established until chicks have fledged or the nest is determined to have been predated or abandoned. Recommended no-disturbance setbacks are listed in **Table 5.4-2**.
- Once the survey is completed, clearing activities will be completed within a seven-day window (in areas where no nests have been found).
- Survey results will be communicated with the on-site Construction Supervisor.

Table 5.4-1 Recommended No-disturbance Buffers for Important Wildlife Habitat Features

Wildlife Habitat Feature	No-disturbance Buffer[1,2]	Sensitive Period	Comments
Mineral lick	200 m	April – November	In addition to the no-disturbance setback, the integrity of wildlife trails leading to the lick must be maintained.
Sharp-tailed Grouse lek sites	500 m	April – mid-May	When leks are inactive, Project activities may occur up to 100 m from the lek site; however, development that removes suitable foraging habitat should be avoided.
Active Bear dens	1 km for blasting 300 m for other activities	October – early May	Outside of the denning season, Project activities may proceed but the den site must be kept intact
Active Wolverine dens	1 km	January – June	Outside of the denning season, Project activities may proceed but the site must be kept intact including any rock piles, downed trees, or other debris.
Active Wolf dens	800 m	April – September	Outside of the denning season, Project activities may proceed but the den site must be kept intact.
Bat roosts	100 m	May – August	In addition to the no-disturbance setback, the integrity of flight paths to the roost must be maintained.
Re-used raptor nest sites (Inactive)	Leave intact	N/A	Project activities may proceed, but care must be taken to ensure that the nest tree\cliff and the nest remain intact. For active raptor nest sites refer to Table 5.4-2**.**
Bank Swallow colonies (Inactive)	Leave intact	N/A	Project activities may proceed, but care must be taken to ensure that the nesting colony remains intact. For active colonies refer to Table 5.4-2**.**
Wildlife trees	Leave intact	N/A	

1 If the recommended setback is not feasible, a site-specific mitigation and monitoring plan will be developed in consultation with the appropriate authorities.

2 Guidelines consulted for the development of no-disturbance setbacks, include the *Forest Resources Act*: Wildlife Features Standard (Yukon EMR 2014); Guidelines for Industrial Activity in Bear Country (Environment Yukon 2008); Northern Land Use Guidelines: Northwest Territories Seismic Operations (AANDC 2011); Wildlife Habitat Features Summary of Management Guidelines: Northern Interior Forest Region (B.C. MWLAP 2004); and How Vulnerable are Denning Bears to Disturbance (Linnell et al. 2000).

Table 5.4-2 Recommended No-disturbance Buffers for Active Bird Nests

Wildlife Habitat Feature	No-disturbance Buffer[1,2]
Cliff-nesting raptors (e.g., Peregrine Falcon, Golden Eagle)	500 m
Ground-nesting raptors (e.g., Short-eared Owl, Northern Harrier)	400 m
Tree-nesting raptors (e.g., American Kestrel, Red-tailed Hawk, Great Horned Owl)	200 m
Grouse/Ptarmigan	25 m
Waterfowl	50 m
Bank Swallow colonies	50 m
Common Nighthawk	50 m
All other nesting birds	10 m

1 If the recommended setback is not feasible, a site-specific mitigation and monitoring plan will be developed in consultation with the appropriate authorities.

2 Guidelines consulted in the development of recommended setbacks include the Yukon Forest Resources Act: Wildlife Features Standard (Yukon EMR 2014), Guidelines for Raptor Conservation during Urban and Rural Land Development in British Columbia (BC MOE 2013), and Technical Information: Buffer Zone and Setback Distances (Environment Canada 2014).

5.5 PROCEDURES DURING OPERATION PHASE

The Operation Phase is the longest Project phase, with regular mining activities occurring throughout. Project-related effects to wildlife and wildlife habitats will be managed through the implementation of the Project Design **(Section 5.1**), General Wildlife Protection Measures (**Section 5.2**) and Species-specific Mitigation (**Section 5.3**). No additional mitigation measures have been developed for the Operation Phase.

6.0 WILDLIFE EFFECTS MONITORING FRAMEWORK

6.1 MONITORING OBJECTIVES

Wildlife monitoring programs for the Project must be relevant to the Project and focus on the possible effects from the Project on the environment, particularly where the effects assessment predictions were based on limited data, there was uncertainty in the predictions or where there is the potential for a significant effect. Monitoring will also assist in identifying any unanticipated Project-related effects so that mitigation actions can be implemented to reduce further harm.

The monitoring program framework for the Project was developed based on the following objectives:

- Monitor wildlife use of the Project area.
- Monitor and verify potential effects related to the Project.
- Monitor and evaluate the effectiveness of mitigation measures.
- Identify unanticipated Project-related effects.
- Discern Project-related changes from natural variability.
- Inform adaptive management measures.

6.2 MONITORING FRAMEWORK OVERVIEW

The monitoring programs will address differing information needs, from evaluating effects directly related to the Project to evaluating wildlife interactions with Project infrastructure and addressing the Proponent's commitments to supporting broader baseline information needs on wildlife in the region. Monitoring programs described in **Sections 6.3** to **6.7** are therefore categorized as 1) environmental surveillance, 2) baseline research contribution, or 3) environmental effects monitoring. Wildlife monitoring programs will include both general monitoring (also referred to as facility-specific monitoring) looking at potential Project interactions with multiple species, and more specific monitoring targeting indicator species or effects. Facility-specific monitoring (**Section 6.3**) will be a regularly occurring task for the Environment Department and will focus on the Project footprint and the immediately surrounding area. Indicator monitoring (**Sections 6.4** to **6.7**) will generally occur at a broader scale within an emphasis on focal species abundance and distribution within the broader Project area. Indicator monitoring will increase knowledge regarding wildlife occurrence within the Project area and monitor potential wildlife-Project interactions to validate Project effects predictions. The following indicator monitoring programs will be developed for the Project:

- Caribou (**Section 6.4**)
- Moose (**Section 6.5**)
- Thinhorn Sheep **(Section 6.6**)
- Wolf Road Use (**Section 6.7**)

Several other indicator monitoring programs may also be developed if necessary, including:

- **Trace Metals** — Baseline surveys included a sampling program to examine pre-development levels of trace metals within small mammal tissues. Trace metals sampling of vegetation will be conducted (details will be included in a vegetation management plan); if vegetation sampling shows a statistically significant increase or exceedance of Project-specific thresholds, small mammal tissue sampling for trace metals may be initiated.
- **Sharp-tailed Grouse leks** — Baseline surveys located several Sharp-tailed Grouse leks within the RSA; however, all documented leks were more than 3 km from Project infrastructure and are not expected to be influenced by Project activities. If Project monitoring were to locate a new lek within 3 km of the Project footprint, monitoring of the lek will be implemented.
- **Mineral Licks** — Baseline surveys have not located any active mineral licks within 500 m of the Project footprint. If a mineral lick were to be identified in this area, a specific monitoring program will be developed.

The findings of the facility-specific monitoring may also trigger additional indicator monitoring if the results suggest an effect that exceeds the Project-related effect predictions or documents an unanticipated effect. A summary of the monitoring program framework for indicator monitoring, with key considerations identified, is provided in **Table 6.2-1**.

Table 6.2-1 Coffee Gold Mine Wildlife Protection Plan Monitoring Framework for Indicator Monitoring

Monitoring Component	Description
Indicator Species	The species selected for monitoring
Monitoring Category	One of three categories: Surveillance, Baseline Research, Environmental Effects Monitoring
Design	Type of study (e.g., Before-After-Control-Effect, Opportunistic)
Measurable Parameter	A quantifiable feature used to assess potential effects on an indicator (e.g., movement)
Key Project Interactions	Identification of key Project features that result in residual effects on the Indicator and Measurable Parameter (e.g., clearing as a loss to Caribou (Indicator) forage habitat (Measureable Parameter))
Goal	Statement of the expected residual effect of the Project (e.g., the Project will have a not significant effect on grizzly bear mortality events)
Objective	Evaluate a potential response specific to the Project (e.g., evaluate mortality risk to local populations of wolverine)
Threshold	Early warning indicator (note: usually about an order of magnitude lower than the significance criteria used in the effects assessment)
Scope of Monitoring Work	Brief overview of key components of the monitoring program including temporal and spatial scale, frequency, and duration.
Agency/Partner Participation	Identification of agencies or key partners, if any, in the monitoring programs (e.g., Environment Yukon, First Nations)
Project Terms and Conditions	Indicates the Project Terms and Conditions (to be determined) that are being addressed by this monitoring plan component

6.3 FACILITY SPECIFIC MONITORING

Project infrastructure, including both the Mine Site and the NAR, and activities associated with these facilities pose potential risks to wildlife and obstacles to wildlife movement. Monitoring of several components will be implemented to determine whether effects are occurring and if mitigation and management measures are adequate. These include monitoring of the Mine Site footprint, traffic monitoring, Project activity monitoring, tracking wildlife observations, tracking Project-related mortality, and monitoring related to waste management. **Table 6.3-1** provides a general summary of the facility-specific monitoring programs that will be developed.

Monitoring will be conducted by the Environment Department. The on-site staff will be familiar with the Project's effects assessment and Project conditions related to wildlife, commitments made to mitigate effects on wildlife, and the adaptive management process used to manage responses to mitigation actions.

Table 6.3-1 Summary of General Project Monitoring related to Wildlife

Monitoring Component	Frequency	Description
Mine Site Footprint/ Habitat Loss Monitoring	Annual	Monitor and annually review the amount of wildlife habitat (i.e., vegetation communities) lost to the Mine Site footprint. Comparisons will be made between the planned footprint in the Project description and the actual footprint mapped using a GPS. This will quantify direct habitat loss in the Project footprint.
Building Assessment	Monthly	Check Mine Site infrastructure for use by nest predators (e.g., foxes, ravens etc.), nesting structures, or as a haven for potential problem wildlife.
Project Activity Monitoring	Ongoing	Track activities levels at the mine including human presence, construction and operational activities
Traffic Monitoring along NAR	Ongoing	Monitor project-related traffic volumes along the NAR. These levels will be compared to baseline traffic volumes along the road.
Waste Management	Monthly	Conduct regular surveillance of Project facilities and waste disposal sites to ensure that wildlife are not frequenting these areas. Additionally, perform audits periodically to assess the effectiveness of waste management practices.
Wildlife Observations	Ongoing	Track all wildlife observations reported by Project employees and contractors; data collected will include location, date, time, species, activity, etc.
Project-related Mortality	Ongoing	Document and track all near misses, collisions, and other observed wildlife mortalities within the Project area. Investigate any Project-related ungulate or large carnivore mortality to determine if further action is needed (other species will be dealt with on a species-by-species basis).

The Proponent will report annually on the findings of the general project monitoring. The annual reporting will be included in general project reporting that will be required as part of its Quartz Mining License and will summarize all general Project monitoring and the monitoring results. Additionally, annual reporting will:

- Summarize wildlife mitigation measures implemented.
- Describe any investigations of Project-related wildlife mortality, the results of the investigations, and any corrective actions taken.
- Summarize any consultation with regulators, Project-related working groups, First Nations, or Project stakeholders regarding on-site wildlife issues.

6.4 WILDLIFE INDICATOR MONITORING: CARIBOU

Caribou were recommended as a focal species for the Project by both government regulators (e.g., Suitor 2015) and First Nations (e.g., N. Becker, Pers. Comm. 2016). The effects assessment for the Project Proposal identified Caribou as a subcomponent within the broader Wildlife and Wildlife Habitats VC and evaluated effects to habitat, movement, and mortality. The Project may result in habitat loss resulting from the development of the Project footprint, sensory disturbance leading to avoidance of areas adjacent to the Project footprint, and effects to movement through the Project area, in addition to presenting an increased risk of mortality (direct and indirect).

Several potential Project-related effects to Caribou will be monitored, with monitoring activities guided, at least in part, by the general Project monitoring described in **Section 6.3**. For example, Project footprint monitoring will track direct habitat loss from the Mine Site footprint. Monitoring of both indirect habitat loss and habitat use will also occur at the local level by Project personnel tracking incidental observations of Caribou. In addition, several specific monitoring programs targeting Caribou will be implemented. Monitoring of both the Fortymile and Klaza Caribou herds will include the following:

- Late winter habitat use and Caribou distribution (aerial survey program) – monitoring of both indirect habitat loss and habitat use during the late winter season will be conducted at the regional level through aerial surveys (**Table 6.4-1**). Monitoring activities will focus on aerial surveys within 8 km of the road (consistent with baseline surveys) and 16 km of the Mine Site.
- Annual habitat use within 10 km of the Mine Site (pellet removal plot program) – this monitoring activity will track indirect habitat loss. Pellet-plot surveys were initiated during baseline studies, and will be used as a ground-based technique to monitor trends in habitat use in the Mine Site area over time (**Table 6.4-2**).
- Fortymile Caribou distribution and migration (analysis of satellite collar data) – collar data from the government-sponsored Caribou satellite collaring program will be analyzed to inform distribution patterns and observe broader variation that may not be directly related to Project effect(s), particularly in regards to migration movements on the Fortymile Caribou (**Table 6.4-3)**.

Caribou monitoring will be carried out during construction and the initial years of operation. Continued monitoring will be subject to analysis of the survey results and consultation with Project regulators and any working groups established to monitor Project-related effects.

Table 6.4-1 Wildlife Indicator Monitoring: Caribou and Moose Late Winter Habitat Use

Monitoring Component	Description
Indicator Species	Caribou and Moose
Monitoring Category	Surveillance, environmental effects monitoring
Design	Observational (aerial survey)
Measurable Parameter	Distribution during late winter
Key Project Interactions	Indirect habitat loss from Project activities that create sensory disturbances and temporarily reduce the effectiveness of habitats adjacent to the Project footprint.
Goal	The Project will not result in a significant adverse effect on the distribution of Caribou or Moose in the late winter.
Objective	Evaluate trends in Caribou and Moose distribution in late winter habitat.
Threshold	To be determined
Scope of Monitoring Work	Regional monitoring: an annual aerial survey within 8 km of the NAR and 16 km of the Mine Site to document relative abundance and distribution of Caribou and Moose relative to Project infrastructure. Surveys will be conducted the first 3 years of mine construction and operation.
Agency/Partner Participation	N/A
Project Terms and Conditions	Indicates the Project Terms and Conditions (to be determined following YESAB and permitting process) that will be addressed by this monitoring plan component.

Table 6.4-2 Wildlife Indicator Monitoring: Caribou Relative Use Trends in Mine Site Area

Monitoring Component	Description
Indicator Species	Caribou
Monitoring Category	Surveillance, environmental effects monitoring
Design	Pellet removal plots
Measurable Parameter	Relative abundance/relative use of the Mine Site area
Key Project Interactions	Potential of Project-related sensory disturbances resulting in reduced occurrence of Caribou near Project infrastructure.
Goal	The Project will have a not significant effect on distribution of Caribou in the RSA.
Objective	Evaluate trends in Caribou use of the Mine Site area.
Threshold	To be determined
Scope of Monitoring Work	Local monitoring: annual monitoring of pellet removal plots established out to 10 km from Mine Site infrastructure as identified in baseline reports and modified to detect trends in a statistically robust manner. Surveys will be conducted during the first 3–5 years of mine construction and operation.
Agency/Partner Participation	N/A
Project Terms and Conditions	Indicates the Project Terms and Conditions (to be determined following YESAB and permitting process) that will be addressed by this monitoring plan component.

Table 6.4-3 Wildlife Indicator Monitoring: Fortymile Distribution and Migration

Monitoring Component	Description
Indicator Species	Caribou
Monitoring Category	Baseline research, surveillance, environmental effects monitoring
Design	Analysis of satellite collar data
Measurable Parameter	Relative abundance/relative use of the Mine Site area
Key Project Interactions	Project-related sensory disturbances resulting in reduced occurrence of Caribou near Project infrastructure. Project infrastructure or Project-related sensory disturbances resulting in effects to Caribou movement through the Project area.
Goal	The Project will have a not significant effect on distribution of Caribou in the RSA. The Project will have a not significant effect on movement of Caribou through the RSA.
Objective	Evaluate trends in Caribou use of and movement through the Project area.
Threshold	To be determined
Scope of Monitoring Work	Regional monitoring: analysis of Fortymile Caribou satellite collar data from government-sponsored Caribou satellite collaring program to inform Caribou distribution patterns within the RSA and migration movements. Analysis will be conducted after three years of operation to assess for trends.
Agency/Partner Participation	Environment Yukon, Alaska Department of Fish and Game, Alaska Bureau of Land Management
Project Terms and Conditions	Indicates the Project Terms and Conditions (to be determined following YESAB and permitting process) that will be addressed by this monitoring plan component.

6.5 WILDLIFE INDICATOR MONITORING: MOOSE

Moose are widespread throughout the Project area, and concerns regarding potential Project effects on Moose were raised throughout the Project consultation process, including concerns brought forward by government regulators (e.g., Suitor 2015) and First Nations (e.g., N. Becker, Pers. Comm. 2016). The Project Proposal included an evaluation of Project-related effects to Moose as a subcomponent within the broader Wildlife and Wildlife Habitats VC, including effects to habitat use, effects during sensitive times of the year (i.e., during the post-rut period), and the potential for increased mortality as a direct result of Project activities and indirectly through increased harvest.

Direct habitat loss and Project-related mortality on Moose will be tracked along with other wildlife species as part of the general wildlife monitoring programs (i.e., Project footprint monitoring and Project-related mortality monitoring). Additionally, monitoring of habitat use will occur at the local level by Project personnel tracking incidental observations of Moose (wildlife observation monitoring). Outside of general Project monitoring, specific monitoring for Moose will include the following:

- Late winter habitat use and distribution (aerial survey program) – monitoring of both indirect habitat loss and habitat use during the late winter season will be conducted in conjunction with late winter monitoring for Caribou (see **Table 6.4-1**). Late winter aerial surveys for Moose and Caribou will focus on areas within 8 km of the road (consistent with baseline surveys) and 16 km of the Mine Site. Surveys will be conducted during the first 3–5 years of mine construction and operation.

6.6 WILDLIFE INDICATOR MONITORING: SHEEP

The cliffs on the north side of the Yukon River have been designated by Environment Yukon as a Wildlife Key Area for Thinhorn Sheep. The Project does not directly affect sheep habitats; however, the NAR is located within the Ballarat Creek valley in this area and may interact with sheep moving along the Yukon River cliffs. Project-related effects may result in sensory disturbance to sheep in this area, and may result in an increased risk of mortality (direct and indirect). Additionally, sheep are extremely sensitive to aircraft traffic, and fleeing behaviour can lead to direct injury or mortality. Environmental baseline surveys for the Project included several surveys for sheep within the RSA. Continued survey efforts will provide additional surveillance, contribute baseline information, and will involve two monitoring objectives:

- Monitor sheep habitat use and distribution along the Yukon River in the vicinity of the Project (**Table 6.6-1**).
- Monitor sheep movement along travel corridors through the Ballarat Creek valley (**Table 6.6-2**).

Table 6.6-1 Wildlife Indicator Monitoring: Thinhorn Sheep Habitat Use and Distribution

Monitoring Component	Description
Indicator Species	Thinhorn Sheep
Monitoring Category	Baseline research, surveillance, environmental effects monitoring
Design	Observational aerial surveys conducted in conjunction with raptor nest occupancy surveys
Measurable Parameter	Post-lambing distribution of sheep in the Focal Sheep Survey Area (refer to the Wildlife Baseline Report (Project Proposal, **Appendix 16-A**)
Key Project Interactions	Project activities may create sensory disturbances and/or temporarily reduce the effectiveness (usefulness) of habitats adjacent to the Project footprint, resulting in changed distribution and use.
Goal	The Project will not significantly affect distribution of Thinhorn Sheep within habitat identified in baseline studies.
Objective	Monitor Thinhorn Sheep distribution in the Focal Sheep Survey Area.
Threshold	Continued presence of sheep in the Focal Sheep Survey Area, consistent with range of variability documented in baseline surveys.
Scope of Monitoring Work	Local monitoring: aerial survey of Thinhorn Sheep habitats within the Focal Sheep Survey Area (refer to the Wildlife Baseline Report, Project Proposal, **Appendix 16-A**) conducted once annually the during construction and the first three years of mine operation; continued monitoring beyond the third year of operations will be subject to review of survey analysis results.
Agency/Partner Participation	N/A
Project Terms and Conditions	Indicates the Project Terms and Conditions (to be determined following YESAB and permitting process) that will be addressed by this monitoring plan component.

Table 6.6-2 Wildlife Indicator Monitoring: Thinhorn Sheep Movement Corridors

Monitoring Component	Description
Indicator Species	Thinhorn Sheep
Monitoring Category	Surveillance, environmental effects monitoring
Design	Observational (camera traps along movement corridors)
Measurable Parameter	Use of travel corridors
Key Project Interactions	Project activities along the NAR may create sensory disturbances and/or temporarily reduce the effectiveness (usefulness) of travel corridors through the Ballarat Creek valley, resulting in altered movement and use patterns by sheep.
Goal	The Project will not significantly affect Thinhorn Sheep travel corridors identified in baseline studies.
Objective	Monitor use of Thinhorn Sheep movement corridors.
Threshold	TBD
Scope of Monitoring Work	Local monitoring: continuous log of Thinhorn Sheep observations from Project personnel to document occurrence near Project facilities. Use camera traps for monitoring the travel corridors. Monitoring will occur during construction and the first three years of mine operation; continued monitoring beyond the third year of operations will be subject to review of survey analysis results.
Agency/Partner Participation	N/A
Project Terms and Conditions	Indicates the Project Terms and Conditions (to be determined following YESAB and permitting process) that will be addressed by this monitoring plan component.

6.7 WILDLIFE INDICATOR MONITORING: WOLF ROAD USE

During Project consultation, the Tr'ondëk Hwëch'in Technical Working Group and Environment Yukon both raised concerns regarding the potential use of the NAR corridor during the winter and the potential for year-round maintenance of the road to create new access for the predation of ungulates (April TH TWG Meeting, Pers. Comm. 2016, Suitor 2016). To address this concern, a monitoring program to track wolf presence along the NAR was initiated during baseline studies, and will continue through construction and the initial years of operation (**Table 6.7-1**). Continued monitoring will be subject to analysis of the survey results, consultation with Project regulators, and consultation with any groups established to monitor Project-related effects.

Wolf and other predator use of the NAR is intended as a research-level question to address the possibility that road maintenance activities may facilitate the use of the general area by predators. The exact relationship and how the use of roads relates to a natural predator/prey relationship is currently not well understood in Yukon or elsewhere.

Table 6.7-1 Wildlife Indicator Monitoring: Wolf Road Use

Monitoring Component	Description
Indicator Species	Wolves
Monitoring Category	Baseline research and surveillance
Design	Observational (remote camera) and opportunistic
Measurable Parameter	Trends in wolf/predator use of Project access roads
Key Project Interactions	Packed trails/cleared roads give predators easier access in winter to parts of the range that would otherwise be inaccessible to predators. This access may facilitate additional predation on wildlife (particularly Caribou and Moose).
Goal	Provide scientifically robust information on the characteristics of predator use of Project access roads.
Objective	Determine if wolf use of the roads along the NAR increases as a result of Project road maintenance.
Threshold	Not relevant
Scope of Monitoring Work	Local monitoring: use of camera traps along the NAR and nearby roads to document wolf use. Monitoring will focus on winter use of the roads and will be conducted during construction and the first three years of mine operation; continued monitoring beyond the third year of operations will be subject to review of survey analysis results.
Agency/Partner Participation	N/A
Project Terms and Conditions	Indicates the Project Terms and Conditions (to be determined following YESAB and permitting process) that will be addressed by this monitoring plan component.

6.8 COLLABORATION ON REGIONAL AND INDUSTRY RESEARCH

The Proponent takes its environmental responsibilities very seriously and is committed to making a positive difference in the areas in which Project teams work. While the effects of the Project on wildlife and wildlife habitats are expected to be managed through the mitigation actions and monitoring programs identified in this document, the Proponent recognizes that there may be knowledge gaps regarding wildlife and wildlife habitat, or the effects of industrial disturbance on wildlife that are not addressed by the identified Project-specific mitigation and monitoring programs. The Proponent is committed to developing strong partnerships to increase regional knowledge and industry management to improve understanding and future decision making.

During the baseline data collection stage, the Project team collaborated with local First Nations, government biologists, and academia in several initiatives, including, but not limited to:

- Collaboration with Environment Yukon on habitat modelling for the Fortymile Caribou herd (2015-2017).
- Support of the Environment Yukon early winter Moose survey in the Dawson Goldfields region (November 2015).
- Partnering with Yukon College and TH to develop and implement educational and training initiatives in conjunction with research opportunities at the Coffee Property (e.g. Northern Terrestrial Restoration course and reclamation research in 2015).

The Proponent will continue this collaborative approach to support research into regional or industry-related wildlife management issues. This ongoing support will be conducted in partnership with First Nations, government biologists, and academia. Support of specific program or research opportunities will be determined on a case-by-case basis.

7.0 WILDLIFE PROTECTION PLAN REPORTING

Once the Project is permitted and all licenses are acquired, the Proponent will report annually on Project mitigation and monitoring activities related to wildlife and wildlife habitats, as part of general annual reporting. The reporting will generally include the following information:

- Summary of Project activities
- Summary of wildlife mitigation efforts
- Summary of annual monitoring results
- Description of First Nations, regulators and/or stakeholder involvement
- Description of proposed changes to mitigation and monitoring plans, as required.

Every three years, or as appropriate based on data collection, the Proponent will review the results of the annual monitoring and develop a detailed report on trends in monitoring indicators. The report will include a retrospective analysis of wildlife distribution and abundance relative to baseline conditions and natural variability, as well as identified Project thresholds. Where appropriate, statistical analysis of the monitoring results will be performed.

8.0 ADAPTIVE MANAGEMENT

The purpose of the Wildlife Protection Plan is to minimize the effects of mine Construction and Operation-phase activities on wildlife and wildlife habitat. To best achieve this, the Wildlife Protection Plan will be considered a “living” document and will be revised as new information relevant to the protection of wildlife in the Project area becomes available.

The wildlife monitoring programs outlined in the Plan are designed to monitor the results of Project mitigation and identify any unanticipated Project-related effects so that mitigation actions can be implemented to reduce further adverse effects. As described in **Section 7.0**, monitoring results will be reported on annually, with a detailed, retrospective analysis conducted every three years, or as appropriate, to assess trends in monitoring results. Adaptive management measures will be employed to manage for any unanticipated effects from the Project.

Situations requiring adaptive management may include:

- Variance from predicted numerical values or exceedance of identified thresholds
- Unexpected events (e.g., identification of new Sharp-tailed Grouse leks within the Project footprint).

The Wildlife Protection Plan will be updated and revised on a recurring basis to ensure that mitigation measures adapt to results of the Project effects monitoring. The Wildlife Protection Plan updates will include consideration of monitoring results, management reviews, incident investigations, shared traditional or local knowledge, new or improved scientific methods, regulatory changes, or other Project-related changes. Mitigation and monitoring strategies for wildlife will be updated to maintain consistency with action plans, management plans, and best management practices that may become available during the life of the Project.

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