



# RAU TREND ACCESS ROAD

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## FISH AND WILDLIFE MONITORING AND ADAPTIVE MANAGEMENT PLAN

Version: 1 (2020-06-15)



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## DOCUMENT MAINTENANCE AND CONTROL

ATAC Resources Ltd. (ATAC) is responsible for the distribution, maintenance, and periodic updates of this document. Final plan details and any changes to the intent of the document must be approved by the Yukon Government Department of Energy, Mines and Resources (EMR). Changes that do not affect the intent of the document will be made as required on a regular basis (e.g., phone numbers, names of individuals).

This document will be reviewed periodically and revised as needed, taking into account changes in the law, results of environmental and traffic monitoring programs, and any other relevant changes.

The following table reflects all revisions to this document:

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## LIST OF ACRONYMS

AMP – Access Management Plan

ATAC – ATAC Resources Ltd.

CDC – Conservation Data Centre

COSEWIC – Committee on the Status of Endangered Wildlife in Canada

EDRR – Early Detection and Rapid Response

EMR – Yukon Government Department of Energy, Mines and Resources

ERP – Emergency Response Plan

ESCP – Erosion and Sediment Control Plan

FNNND – First Nation of Na-Cho Nyak Dun

FWMAMP – Fish and Wildlife Monitoring and Adaptive Management Plan

MBCA – *Migratory Birds Convention Act*

QEP – Qualified Environmental Professional

RTAR – Rau Trend Access Road

SARA – Species at Risk Act

SCP – Spill Contingency Plan

WAMP – Wildlife Attractant Management Plan

WKA – Wildlife Key Area

WRT – Wind River Trail

YESAA – *Yukon Environmental and Socio-economic Assessment Act*

YESAB – Yukon Environmental and Socio-economic Assessment Board

YG – Yukon Government

# 1 INTRODUCTION

ATAC Resources Ltd. (ATAC) is a Vancouver-based mineral exploration company focused on advancing activities on its Rackla Gold Property (the Property) in central Yukon, approximately 55 kilometers (km) northeast of Keno City. The Rau Trend forms the western portion of the Property and contains the Tiger Gold Deposit. To facilitate advanced exploration at the Tiger Gold Deposit, ATAC is proposing to build a 66 km all-season, gated, and access-controlled tote road to the deposit (Figure 1-1). This tote road, hereby referred to as the Rau Trend Access Road (RTAR; the Project), would begin at km 12 along the Hanson-McQuesten Road and follow an existing trail eastward for 1 km. The route would continue east along the south side of Ladue Lake to km 7 before following the Keno-Ladue River and Rankin Creek valleys to Clark Lakes to the north. From Clark Lakes, the route would follow the Wind River Trail (WRT) over two sections before crossing the Beaver River and continuing east to the Tiger Gold Deposit. Construction of the RTAR would involve upgrades to 14 km of existing trail and construction of 52 km of new access. The road corridor would be approximately 11-15 m wide and would require 47 watercourse crossings, including one multi-span bridge over the Beaver River, eight clear-span bridges, and 38 culverts. Construction activities would occur over one winter season (November to April) and two summer seasons (May to October).

The proposed RTAR is located entirely within the Traditional Territory of the First Nation of Na-Cho Nyäk Dun (FNNND). The FNNND is a self-governing First Nation with land management rights on settlement lands and land-use rights within the Project area as detailed in their Final Agreement and the Umbrella Final Agreement. The proposed road is located on Crown land, predominantly along Quartz Mining Claims held in good standing by ATAC, and does not overlap any FNNND Category A or Category B Settlement Lands.

## 1.1 Scope and Objectives

This Fish and Wildlife Monitoring and Adaptive Management Plan (FWMAMP) was developed as part of a comprehensive strategy to prevent or minimize potential Project-related effects on fish and wildlife during the construction and operation of the RTAR. The plan is intended to reduce the risk of Project-related injury or mortality to fish and wildlife, limit the loss of aquatic and terrestrial habitats, and ensure that fish and wildlife continue to use habitats adjacent to the proposed road and within the broader Project area, while maintaining safe access for exploration in the Rau Trend area.



## 1.2 Consultation

Consultation with FNNND and relevant stakeholders regarding access to the Rackla Gold Property has been ongoing since 2008. Mitigation measures in the FWMAMP were developed using feedback from various consultation phases during the decision process. ATAC is committed to addressing concerns raised through previous and future consultations and will adhere to all relevant mitigation measures, regulations, and best practices outlined in the FWMAMP. ATAC will regularly review and modify the FWMAMP to ensure it incorporates changes in concerns and priorities for all parties affected. For further details on ATAC's consultation activities pertaining to the RTAR, please see the report authored by ATAC entitled *Tiger & Rau Trend Tote Road Consultation Summary Report*, dated July 8, 2016.

## 1.3 Regulatory Framework

The following federal and territorial acts and regulations were considered in the development of this FWMAMP:

Federal statutes:

- *Fisheries Act*, RSC 1985, c. F-14
  - Canada-Yukon Freshwater Fisheries Agreement, YOIC 1989/060
- *Migratory Birds Convention Act*, SC 1994, c. 22 (MBCA)
  - Migratory Birds Regulations, 2018, CRC c. 1035
- *Species at Risk Act*, SC 2002, c.29 (SARA)
- *Yukon Act*, SC 2002, c. 7
- *Yukon Environmental and Socio-economic Assessment Act*, SC 2003, c.7 (YESAA)

Territorial statutes:

- *Environment Act*, RSY 2002, c.50
  - Numerous regulations under the Environment Act
- *Wildlife Act*
  - Wildlife Regulation, RSY 2002, c.229

The proposed RTAR was assessed by the Yukon Environmental and Socio-economic Assessment Board (YESAB) under provisions of the YESAA (file number 2016-0129). An Evaluation Report (YESAB 2017) for the Project was issued by YESAB in May 2017, with the Designated Office determining that *“the project will or is likely to result in significant and adverse effects to identified valued components, but that these significant and adverse effects could be eliminated, controlled, or reduced with the application of appropriate terms and conditions”*. Subsequently, a Consolidated Decision Document (Yukon Government 2018) was issued jointly by the Yukon Government (YG) and the FNNND in March 2018. Several terms and conditions were applied to the approved Project through the joint Decision Document; those relevant to this FWMAMP include:

- Term 1: *“A comprehensive access management plan (AMP) shall be developed by the proponent, Government of Yukon, and Na-Cho Nyak Dun prior to construction and use of the road. The plan must be approved by the Chief, Mining Land Use and the First nation of Na-Cho Nyak Dun prior to implementation, following consultation with the First Nation of Na-Cho Nyak Dun. The plan shall include, but is not limited to, access control methods, traffic*

*monitoring program, restricted use enforcement mechanisms, closure and reclamation, security for operations and closure, watercourse crossing and address impacts on other land users and adaptive management plan.” (emphasis added)*

- Term 4: *“Construction or decommissioning activities shall not occur within 1 km of nesting peregrine falcons as informed by writing to the Chief, Mining Lands.”*
- Section 110 Recommendation A: *“Any and all sanctioned traffic on the proposed road shall be recorded as well as traffic counts of all traffic. The objective of this monitoring program will be to assess the efficacy of access controls. At least two points shall be monitored for all traffic, one near the beginning of the proposed road and one near the crossing of the Beaver River. The monitoring program shall also record the state of physical obstructions and any enforcement actions taken. Wildlife collisions shall also be recorded as part of the monitoring program.”*
- Section 110 Recommendation B: *“An effects audit shall be conducted using pre-existing data on wildlife abundance and distribution in the project area and compared to ongoing wildlife monitoring data to establish changes to baseline conditions, primarily in relation to moose and moose habitat. This audit shall compare changes over a longer time span, from prior to project initiation until at least five years after road completion.”*

#### **1.4 Other Environmental Management Plans**

The following additional Environmental Management Plans are in place for the construction and operation of the RTAR, and should be read in conjunction with this plan:

- Access Management Plan (ATAC Resources Ltd. 2020a)
- Emergency Response Plan (ATAC Resources Ltd. 2020b)
- Erosion and Sediment Control Plan (Tetra Tech Inc. 2016a)
- Spill Contingency Plan (ATAC Resources Ltd. 2020c)
- Wildlife Attractant Management Plan (ATAC Resources Ltd. 2020d)

#### **1.5 Roles and Responsibilities**

ATAC is responsible for all activities associated with the construction and operation of the RTAR, including implementation and management of this FWMAMP. ATAC’s corporate contact information is provided below.

##### **ATAC Resources Ltd. Head Office**

1016-510 W. Georgia St., Vancouver, BC V6B 1L8

Phone: 604-687-2522

E-mail: [info@atacresources.com](mailto:info@atacresources.com)

##### **Designated Primary Contact**

Andrew Carne, VP Corporate and Project Development, ATAC Resources Ltd.

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E-mail: [acarne@atacresources.com](mailto:acarne@atacresources.com)

Prior to construction, the FWMAMP will be updated with specific contact information for the designated Project Manager (either with ATAC or the prime contractor). Contact information will be updated regularly as the Project proceeds through the construction and operational phases.

### 1.5.1 Managers and Supervisors

Managers and supervisors have a responsibility to ensure that all ATAC employees, contractors, consultants, and visitors are aware of ATAC's expectations regarding fish and wildlife mitigation and adhere to these practices. Additional supervisor and manager responsibilities include:

- Ensuring wildlife awareness training is conducted appropriately for all personnel, including contractors;
- Ensuring that all personnel adhere to recommended mitigation measures;
- Ensuring Qualified Environmental Professionals (QEPs) are used for tasks requiring specialized environmental expertise, including wildlife monitoring, assessments, and management.

### 1.5.2 Employees, Contractors and Consultants

All personnel conducting activities on site, including all ATAC employees, contractors and consultants, are required to implement this FWMAMP as it pertains to their activities on site. Specifically, these responsibilities include:

- Completing site orientation including wildlife awareness training;
- Adhering to appropriate fish and wildlife mitigation measures; and
- Reporting any wildlife incidents or incidental wildlife observations to the designated primary contact.

### 1.5.3 Qualified Environmental Professionals

Qualified Environmental Professionals (e.g., Registered Professional Biologists) will be consulted or used to conduct work where specialized training and experience are required, including:

- Training and/or supervision of pre-clearing nest surveys;
- Assessment of wildlife features (e.g., raptor nests);
- Development and implementation of focal species/components monitoring programs (e.g., moose surveys); and
- Development of site- or species-specific management plans that vary from standard mitigation measures (e.g., proposed variances to timing windows).

### 1.5.4 Pilots

All pilots (helicopter, fixed-wing, and drone) are responsible for:

- Avoiding sensory disturbances to wildlife as described in this plan including adherence to designated flight lines and other strategies to minimize disturbance (Sections 3.4).

## 2 ENVIRONMENTAL SETTING

Baseline environmental studies in support of the Project Proposal to YESAB were conducted throughout the Project area by Laberge Environmental Services from 2010 to 2013 (Laberge Environmental Services 2014). Wildlife surveys, vegetation assessments, benthic invertebrate

surveys, surface water quality sampling, stream sediment characterization, and fisheries assessments were completed. Wildlife surveys included both aerial- and ground-based surveys focused on moose (*Alces americanus*), woodland caribou (*Rangifer tarandus*), thimblehorn sheep (*Ovis dalli*), grizzly bear (*Ursus arctos*), black bear (*Ursus americanus*), wolverine (*Gulo gulo*), collared pika (*Ochotona collaris*), raptors, waterfowl, and amphibians. Incidental observations of wildlife species were also recorded. Vegetation assessments focused on mapping the major vegetation types in the Project area, including wetland and riparian areas. Fisheries assessments were completed at seven sites in the Project area and included habitat descriptions, fish inventory, and fish tissue metal sampling. Refer to Laberge Environmental Services' baseline report for further details on baseline environmental assessments conducted in the Project area.

## 2.1 Project Area

The Project is located within the Yukon Plateau-North ecoregion in the Nadaleen Range of the Selwyn Mountains. It is drained by watercourses that flow into the Beaver and Rackla rivers, which are both part of the Stewart River watershed. The local topography is mountainous and features north and south-trending rocky spurs and valleys that flank a main east-west trending ridge. Elevations range from 725 m along the Beaver River in the center of the Rau Trend to 1,800 m atop a peak that is referred to as Monument Hill. The climate in this region is characterized by cold, dry winters and warm, moist summers. The mean annual temperature is approximately -4°C with a mean winter temperature of -20°C and a mean summer temperature of 10.5°C (Ecological Framework of Canada 2020). Precipitation is relatively moderate and ranges from an annual mean of 300 mm in major valleys up to 600 mm at higher elevations (Ecological Framework of Canada 2020). Discontinuous permafrost is widespread throughout the region (Ecological Framework of Canada 2020).

The proposed road corridor is located predominantly along the lower slopes of the valleys associated with the Keno Ladue River, Rankin Creek, Scougale Creek, and Beaver River. This area is dominated by white spruce (*Picea glauca*) forests, with black spruce (*Picea mariana*) occurring in wetter areas along the valley floor, and balsam poplar (*Populus balsamifera*) occurring on south-facing, well-drained slopes. Undergrowth typically consists of shrubs and mosses. The density and size of vegetation gradually decreases with increasing elevation. Tree line in the Project area is at approximately 1,500 m (Ecological Framework of Canada 2020), with alpine and subalpine habitats characterized by rocky outcrops and talus slopes. Wetlands are common in the Keno-Ladue River and Beaver River valleys.

Mammal species known to occur in the Project area include, but are not limited to, moose, grizzly bear, black bear, grey wolf (*Canis lupus*), wolverine, Canada lynx (*Lynx canadensis*), red fox (*Vulpes vulpes*), American marten (*Martes americana*), beaver (*Castor canadensis*), and various small mammals. Moose was the most common mammal species detected during baseline environmental assessments. Wetlands in the McQuesten Lake and Beaver River valleys and subalpine regions in the Davidson and Patterson ranges appear to be important moose habitats. Environment Yukon has identified a Wildlife Key Area (WKA) for late winter moose habitat where the WRT runs along the Beaver River (Environment Yukon 2014). No other ungulates are common in the Project area. Grizzly bears and wolverine are known to use the Project area although observations during baseline environmental assessments were limited. No WKAs occur in the Project area for other mammal species.

The Project area also provides breeding habitat for several species of raptors, waterfowl, and songbirds including, but not limited to, bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), peregrine falcon (*Falco peregrinus*), osprey (*Pandion haliaetus*), trumpeter swan (*Cygnus buccinator*), mallard (*Anas platyrhynchos*), and a variety of diving duck species. Two active bald eagle nests were documented in the Project area during baseline environmental assessments. Three unoccupied golden eagle nests were also documented in addition to three falcon nests possibly occupied by peregrine falcon or gyrfalcon (*Falco rusticolus*). Seventy-seven species of songbird were documented during baseline environmental assessments. No WKAs occur in the Project area for avian species.

Fish species known to occur in the Project area include, but are not limited to, lake whitefish (*Coregonus clupeaformis*), round whitefish (*Prosopium cylindraceum*), slimy sculpin (*Cottus cognatus*), northern pike (*Esox lucius*), burbot (*Lota lota*), Chinook salmon (*Oncorhynchus tshawytscha*), Dolly Varden (*Salvelinus malma*), and Arctic grayling (*Thymallus arcticus*). Slimy sculpin and Arctic grayling were the most common fish species detected during baseline environmental assessments. Low numbers of juvenile Chinook salmon were documented, and only at the entrances of two tributaries to the Beaver River and in the Rackla River mainstream.

The wetland ecosystems in the McQuesten Lake, Clark Lakes, Scougale Lakes, and Beaver River valleys provide productive habitat for a variety of fish and wildlife species, particularly for moose, waterfowl, and fish species such as northern pike. Riparian areas along streams and rivers also provide important habitats for many wildlife species.

Several fish and wildlife species at risk may be found in the Project area. Table 2-1 lists the species at risk that are or may be located along the RTAR.

**Table 2-1: Fish and wildlife species at risk potential present in the RTAR project area<sup>1</sup>**

Common Name	Scientific Name	COSEWIC Status	SARA Status
Common Nighthawk	<i>Chordeiles minor</i>	Special Concern	Schedule 1
Olive-sided Flycatcher	<i>Contopus cooperi</i>	Special Concern	Schedule 1
Short-eared Owl	<i>Asio flammeus</i>	Special Concern	Schedule 1
Horned Grebe	<i>Podiceps auritus</i>	Special Concern	Schedule 1
Red-necked Phalarope	<i>Phalaropus lobatus</i>	Special Concern	Schedule 1
Rusty Blackbird	<i>Euphagus carolinus</i>	Special Concern	Schedule 1
Bank Swallow	<i>Riparia riparia</i>	Threatened	Schedule 1
Barn Swallow	<i>Hirundo rustica</i>	Threatened	Schedule 1
Grizzly bear, Western population	<i>Ursus arctos</i>	Special Concern	Schedule 1
Wolverine	<i>Gulo gulo</i>	Special Concern	Schedule 1
Little brown myotis	<i>Myotis lucifugus</i>	Endangered	Schedule 1
Dolly Varden, Western arctic population	<i>Salvelinus malma</i>	Special Concern	Schedule 1

<sup>1</sup> Collared pika (*Ochotona collaris*) and woodland caribou (*Rangifer tarandus*), both listed as species of Special Concern under COSEWIC and included on Schedule 1 of the SARA, are found in the broader region. However, baseline studies determined that the species were unlikely to be present along the RTAR.

### 3 MITIGATION MEASURES

Road construction and operation activities have the potential to affect fish and wildlife via habitat loss or alteration, displacement due to sensory disturbance, changes to fish and wildlife movement patterns, and increased mortality risk via direct and indirect pathways. To reduce or eliminate potential effects on fish and wildlife, and their associated habitats, ATAC has committed to numerous mitigation measures as outlined in the following sections. Some of these mitigation actions may be modified through the life of the Project as part of the adaptive management approach integrated into this plan (refer to Section 5).

The Project design considered several elements that will help to mitigate effects on the environment. Key elements that will limit the effects of the RTAR on fish and wildlife include:

- The final road alignment was chosen to minimize impacts on fish and wildlife — the Rankin Creek valley was selected over the McQuesten Lakes valley in order to minimize impacts to key moose and wetland habitats.
- The road was designed to minimize the footprint and earthwork quantities by aligning the route with the topography rather than forcing the alignment through the topography with large cuts and fills. To minimize future disturbances, the route was selected such that no realignments will be required if further upgrades to the RTAR are required at a later date.
- To avoid sensitive moose habitat and riparian areas near the valley floors, the RTAR was positioned as far uphill as topography allowed.
- To limit effects on fish and aquatic environments, the number of stream crossings was minimized where practical.
- To minimize impacts in the Scougale Lakes area, the existing Wind River Trail route was largely used, with the exception of a small section from km 41.8 to 45.1 which was re-routed up-slope to avoid wetland areas.
- Increased hunting was one of the primary concerns expressed during Project review. To mitigate the potential for increased hunting along the new access corridor, the road was designed to be private and gated. Access control gates will be placed at multiple locations along the RTAR as a deterrent to unauthorized road use (Figure 1-1). A gatehouse will be established at the start of new road construction and will be staffed during road operations and hunting seasons. Signage will be posted in a variety of locations along the RTAR stating that the road is private in nature and access is restricted and radio controlled. ATAC will work with the FNNND, YG, and local communities to develop, maintain, and enforce access control strategies that will be effective for large vehicles, small vehicles, and other traffic. Existing access along the WRT will be maintained and will not be gated. Refer to the Access Management Plan for further details on proposed access control measures.

#### 3.1 General Mitigation Measures

The following mitigation measures have been developed to prevent or minimize potential Project-related effects on fish and wildlife; these measures apply to all stages of the Project.

- ATAC has a strict no hunting and no fishing policy in place for all employees, contractors and consultants; no hunting or fishing will be permitted within 2 km of the RTAR. This policy will also apply to any other users for whom ATAC may issue an authorization to use the RTAR.

- Only authorized ATAC employees and contractors trained in firearm safety are permitted to carry and operate a firearm on site. A firearm will only be used as a last resort in the case of a hostile wildlife encounter. Bear-deterrents (such as bear bangers, bear spray and airhorns) will be kept on hand at all times and be ready for use.
- A no feeding of wildlife policy applies to all ATAC employees, contractors, consultants, and visitors.
- Waste management practices will be implemented to avoid attracting wildlife to the RTAR footprint during construction and operation activities. All personnel are to contain food, garbage, and other attractants in ways that make them unavailable to wildlife. Refer to the Wildlife Attractant Management Plan for further details.
- Garbage will be incinerated or transferred offsite to the municipal dump at Mayo; no garbage or non-flammable residue will be buried or left on site. Refer to the Wildlife Attractant Management Plan for further information on waste management.
- A wildlife right-of-way policy applies to all traffic on the RTAR. Mitigation measures and policies specific to RTAR operations are detailed in Section 3.3.
- The use of all-terrain or off-road vehicles, including snowmobiles, will be restricted to established roads and designated trails. ATAC employees, contractors and consultants are not permitted to use personal vehicles without prior approval. Personal all-terrain or off-road vehicles are prohibited.
- Equipment transported to the Project site will be pre-inspected for invasive plants (e.g. no large, obvious clods of mud present); where possible, vehicles and equipment should be washed prior to entering the Project site for the first time to ensure they are free of any soil, seeds, or plant parts.
- Personal use of unmanned aerial vehicles (UAVs or drones) is prohibited.
- All ATAC employees, contractors and consultants are required to report wildlife observations via the Wildlife Log. The information collected will include: date/time of observation, observer, location, species, number of animals observed, age and sex of animals, behaviour or activity, and any additional comments deemed relevant. See Section 4.1 for further details on the Wildlife Log.

### 3.1.1 Wildlife Awareness Training

All onsite ATAC employees, contractors and consultants will receive wildlife safety, awareness, and observation training to help prevent or minimize potential Project-related effects on fish and wildlife. ATAC considers managing the risk of human-bear conflict as a top priority. Wildlife awareness training will cover applicable Project conditions resulting from licensing and permitting in addition to:

- Bear awareness training;
- Review of mitigation measures as relevant to their role, including the no hunting/fishing policy, no feeding of wildlife, speed limits, wildlife right-of-way policy, waste management practices, and other applicable measures from this FWMAMP; and
- Instruction on wildlife observation recording (Section 4.1).

Refer to the Wildlife Attractant Management Plan for additional details related to wildlife awareness training.

### 3.1.2 Human-Wildlife Interactions

Several mitigation measures described in this FWMAMP aim to minimize the probability of direct and indirect human-wildlife conflicts. Should any human-wildlife interactions occur, the following procedure shall be followed. Refer to the Emergency Response Plan for further details.

- Any wildlife fatalities, near misses, or incidents must be immediately reported to the appropriate onsite manager/supervisor (or as soon as safely possible). This includes wildlife collisions along the RTAR, as well as encounters with bears or other wildlife acting defensively, showing signs of human habituation, or acting aggressively.
- If necessary, the senior management will notify the Conservation Officer Services. Potentially dangerous wildlife that clearly display signs of being habituated to humans or wildlife that display aggressive behaviour, will be immediately reported to Conservation Officer Services.
- Unless there is an immediate risk to human safety, site personnel will not attempt to handle or address nuisance or problem wildlife without specific instructions from Conservation Officer Services.
- All such interactions or observations will be recorded in a human-wildlife interactions logbook that will contain details on date, time, exact location, species, number, age/sex, and the nature of the interaction or observation.
- A follow-up investigation will be conducted for any mortality involving ungulates or large carnivores (other species will be dealt with on a case-by-case basis) and any human-wildlife conflicts. The investigation will look into potential causes and, where applicable, measures that could prevent future occurrences.
- Any observations of unauthorized hunting along the RTAR will be immediately reported to Conservation Officer Services.
  - Conservation Officer Services contact information:
    - Mayo District Office: 867-996-2202
    - Whitehorse Main Office: 867-667-5652
    - TIPP Line (24 hours): 1-800-661-0525

## 3.2 Mitigation for Road Construction

Many of the potential Project-related effects on fish and wildlife are likely to occur during RTAR construction activities. Fish and wildlife habitat may be lost or altered during construction either via direct removal of habitat or functional loss of habitat due to sensory disturbance. Fish and wildlife species may also experience increased risk of mortality due to construction activities. These Project-related effects will be managed through the implementation of General Mitigation Measures (Section 3.1) and several specific mitigation procedures to be implemented during construction. These include:

- Prior to site clearing or construction activities, roads will be ground truthed and flagged by qualified personnel. Any known habitat features or sensitive areas will be clearly marked on site plans and in the field.
- Vegetation clearing will fall trees into the road footprint. Trees should not be felled outside of the road right-of-way, except to remove or top danger trees to prevent hazards to workers and equipment.

- 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.
- Best management practices for works around water will be implemented for the protection of fish and aquatic habitats, including the use of fish timing windows, spill prevention measures, and erosion and sediment control measures, among others; refer to Section 3.2.1.
- A copy of the Spill Contingency Plan for petroleum products and other hazardous materials will be posted in all camps and at all fuel handling locations used during construction.
- Vegetation clearing will be conducted outside of the migratory bird nesting period (May 5 to August 15) wherever possible. If clearing outside of the bird nesting period is not possible, preclearing nest surveys will be conducted prior to clearing (refer to Section 3.2.2).
- Prior to construction, ATAC will contact the Chief, Mining Lands to enquire about known peregrine falcon or other raptors nests within the Project area; if necessary, a QEP will conduct a raptor nest survey in appropriate habitats along the proposed RTAR route to document any active raptor nesting sites. Any active nests will be protected within a no-disturbance buffer (see Section 3.2.2).
- No-disturbance buffers will be established around any identified wildlife habitat features (e.g., mineral licks, dens) during sensitive periods, as per the setback distances identified in Section 3.2.3. Outside of sensitive periods, wildlife habitat features will be kept structurally intact wherever practical.
- Prior to construction, an invasive plant survey will be conducted by a QEP, focused on any areas of existing or previous disturbance. If any invasive plants are identified in the Project area, construction activities will be managed to limit the spread of existing infestations (see Section 3.2.4).

### 3.2.1 Aquatic Habitats

The proposed RTAR requires forty-seven watercourse crossings, including one multi-span bridge over the Beaver River, eight clear-span bridges, and 38 culverts. Armored fords may also be used to cross ephemeral streams with no fish potential. While fish data is currently limited for the watercourse crossings along the proposed route (only seven streams were sampled for fish during baseline environmental assessments (Laberge Environmental Services 2014)), fish-bearing status will be assumed at all crossings except for the nine that have a gradient over 25% (Tetra Tech Inc. 2016b). The following mitigation measures will be implemented to prevent or minimize potential Project-related effects on fish and aquatic habitats:

- All confirmed or assumed fish-bearing streams will have either clear-span bridges or embedded culverts installed in order to maintain fish passage. Work within these streams will adhere to the applicable fish timing windows.
- Instream work will follow the relevant timing windows to minimize the potential for causing serious harm to fish. Applicable timing windows for watercourses within the Yukon Drainage (i.e. streams/rivers within the Project area) include:
  - Arctic grayling: July 1 to April 15;

- Dolly Varden: May 1 to September 1<sup>1</sup>;
- Chinook salmon (applies only to instream works in the Beaver River): June 10 to July 5 (Fisheries and Oceans Canada 2014).

Without completing additional fish sampling prior to construction activities, effects on Arctic grayling and Dolly Varden may be mitigated by merging the timing windows — i.e., from July 1 to September 1 for all watercourses along the proposed RTAR route except the Beaver River; instream works on the Beaver River should also include the timing window for Chinook salmon resulting in a merged timing window of July 1 to July 5. If significant instream work is required outside of this timing window, a QEP should be consulted. Additional investigations could be completed at specific watercourses to determine the suitability of spawning habitat for the respective species before work commences in order to refine the timing windows and/or associated mitigation.

- Wetlands will be avoided whenever possible. Where the RTAR footprint must intersect wetland habitat, the extent of overlap will be minimized to the greatest extent possible.
- Prior to construction, the proposed RTAR will be reviewed to identify wetland crossings and ensure sufficient culverts or other crossing structures are included in the road design where necessary to ensure the road does not block the movement of water, including subsurface water (e.g., in peatlands) and/or non-channelized flow.
- Best management practices will be implemented to control erosion and sediment during RTAR construction and maintenance to ensure sediment mobilization is minimized. Refer to the Erosion and Sediment Control Plan for further details.
- Vegetation near or within the riparian zones will be preserved to the greatest extent possible.
- Use of all-terrain or off-road vehicles will be minimized. Use of all-terrain or off-road vehicles will only occur in accordance with supporting road construction activities as authorized under a valid Quartz Mining Land Use Approval.
- Best management practices to prevent, contain, cleanup, and report any spills of deleterious substances will be implemented to protect aquatic environments. Machinery will be cleaned and inspected for leaks prior to working near a watercourse. Servicing of equipment and refueling will occur at a distance from any watercourse such that if a spill were to occur, it would not enter the water. A spill plan and an emergency spill kit will be on site and available for all work crews. Refer to the Spill Contingency Plan for further details.
- To ensure that crossing structures are installed properly from a fish passage perspective, and to ensure that the best management practices outlined in the Erosion and Sediment Control Plan, Spill Contingency Plan, and supporting documents are successfully implemented and properly adapted to changing site conditions, a qualified environmental monitor, with experience in fish passage and erosion and sediment control, will be on-site during construction activities in and around watercourse crossings.
- When working near water, Project operators will also adhere to the *Best Management Practices for Works Affecting Water in Yukon* document (Environment Yukon 2011), which

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<sup>1</sup> Based on timing windows from the adjacent Peel River Basin as there are no timing windows for Dolly Varden in the Yukon Drainage (Fisheries and Oceans Canada 2014).

includes measures for erosion and sediment control, contaminant control, in-stream work, runoff control, and watercourse crossings.

### 3.2.2 Birds and Bird Nests

The MBCA and its regulations provide protection for migratory birds, their eggs and nests, and their habitat, and regulate the hunting of migratory game birds. The MBCA and its regulations prohibit the incidental take (i.e., unintentional destruction) of migratory birds, their eggs, and active nests. To minimize disturbance to migratory birds and their nests, eggs, and habitat, ATAC will implement the following mitigation measures:

- Vegetation clearing activities will occur outside of the bird breeding season (i.e., approximately May 5 to August 15), whenever possible. If vegetation clearing is required between May 5 and August 15, a QEP and/or appropriately trained personnel will conduct pre-clearing nest surveys to determine if there are any nesting birds in the area.
- Active nests (containing eggs and/or nestlings) identified incidentally or during pre-clearing nest surveys will be avoided and a no-disturbance buffer (as outlined in Table 3-1) will be established around the nest until the young birds have naturally and permanently left the vicinity of the nest.
- Birds choosing to nest on occupied or utilized Project infrastructure will not be intentionally disturbed or harassed; however, Project activities will carry on as normal near the nest location.
- Prior to construction, ATAC will contact the Chief, Mining Lands to enquire about known peregrine falcon or other raptors nests within the Project area; if necessary, a QEP will conduct a raptor nest survey in appropriate habitats along the proposed RTAR route to document any active raptor nesting sites. Any active nests will be protected within a no-disturbance buffer (see Table 3-1).
- Since many cliff-nesting and tree-nesting raptors will occupy nesting territories for multiple years, or even generations, any unoccupied raptor nest sites identified will be protected (i.e., left intact) regardless of activity or evidence of breeding, unless otherwise directed in a site-specific management plan developed in consultation with a QEP.
- ATAC will maintain a raptor nest site database, including historic nest sites documented by Environment Yukon and the Yukon CDC as well as nest sites documented during baseline environmental assessments and any new nests discovered during RTAR construction and operation activities.

**Table 3-1: Recommended no-disturbance buffers for active bird nests and raptor nests.**

Species	Recommended Buffer <sup>1,2</sup>
Cliff-nesting raptors <ul style="list-style-type: none"> <li>Golden eagle, gyrfalcon, peregrine falcon</li> </ul>	1,000 m
Ground-nesting raptors <ul style="list-style-type: none"> <li>Northern harrier, short-eared owl, etc.</li> </ul>	400 m
Tree-nesting raptors <ul style="list-style-type: none"> <li>American kestrel, great horned owl, northern goshawk, red-tailed hawk, etc.</li> </ul>	200 m
Waterfowl and game birds <ul style="list-style-type: none"> <li>Ducks, geese, swans, loons, grouse, ptarmigan, etc.</li> </ul>	50 m
Songbirds and other small birds <ul style="list-style-type: none"> <li>Flycatchers, sparrows, thrushes, warblers, etc.</li> </ul>	10 m
Swallow Colonies <ul style="list-style-type: none"> <li>Bank swallows</li> </ul>	50 m
Any SARA-Schedule 1 or COSEWIC listed species not mentioned above	100 m

<sup>1</sup> If the recommended buffer is not feasible, a site-specific management plan will be developed by ATAC in conjunction with a QEP.

<sup>2</sup> The recommended setbacks were developed for groups of species based on species reaction to human disturbance (according to published literature and expert opinion). Several guidelines were consulted in the development of Recommended Buffers including the *Yukon Forest Resources Act: Wildlife Features Standard* (Yukon Energy Mines and Resources 2014), *Guidelines for Raptor Conservation during Urban and Rural Land Development in British Columbia* (Caskey and Chutter 2013), and *Technical Information: Buffer Zone and Setback Distances* (Environment Canada 2017).

### 3.2.3 Wildlife Habitat Features

Wildlife habitat features (e.g., mineral licks, wildlife trails, den sites) are important because they are often used for critical life requisites (e.g., breeding, hibernation) and/or are areas of concentrated use by multiple animals in a small area. As such, habitat loss/alteration or displacement due to sensory disturbance at these sites could have a disproportionately large affect to the surrounding population. To minimize potential effects to wildlife using habitat features, the following measures will be followed:

- If located, wildlife habitat features will be recorded and immediately reported to the designated supervisor. Operations in the vicinity of the feature should be temporarily suspended until mitigation measures are implemented.
- No-disturbance buffers associated with different types of features (as outlined in Table 3-2) may be implemented, or a site-specific management plan may be developed in consultation with a QEP. The QEP may consult Environment Yukon or the Regional Biologist for appropriate mitigation measures.

**Table 3-2: Recommended no-disturbance buffers for wildlife habitat features.**

Wildlife Habitat Feature	No-Disturbance Buffer <sup>1,2</sup>	Sensitive Period	Comments
Mineral Lick	200 m in forest; 800 m in open terrain	Variable depending on lick	In addition to the no-disturbance buffer, the integrity of the hydrology of the site (for wet licks) and wildlife trails leading to the lick must be maintained.
Major Wildlife Trail	N/A	Variable	Where major wildlife trails must be crossed by the RTAR, ensure ditches, berms, and the road bed do not impede crossing by wildlife.
Bear Den (Active)	1 km for high disturbance activities (e.g, blasting, earth works); 300 m for low disturbance activities	October – early May	Old bear dens dug into soil are rarely reused and do not need to be protected. However, rock caves can be reused for denning over multiple years and any rock caves with evidence of bear use will be assessed by a QEP.
Wolverine Den (Active)	1 km	January - July	Outside of the denning season, road construction may proceed but the site must be kept intact including any rock piles, downed trees, or other debris.
Wolf Den (Active)	800 m	April - September	Outside of the denning season, road construction 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. Outside of the roosting season, construction may proceed but the roost must be kept intact.

<sup>1</sup> If the recommended buffer is not feasible, a site-specific management plan for the wildlife habitat feature will be developed in consultation with a QEP. A site assessment by the QEP may be required to determine key factors necessary to implement appropriate mitigation measures.

<sup>2</sup> Several guidelines were consulted during the development of No-Disturbance Buffers including, but not limited to, the *Yukon Forest Resources Act: Wildlife Features Standard* (Yukon Energy Mines and Resources 2014), *Guidelines for Industrial Activity in Bear Country* (Mining and Petroleum Environment Research Group 2008), *Northern Land Use Guidelines: Northwest Territories Seismic Operations* (Indian and Northern Affairs Canada 2012), *Wildlife Habitat Features Summary of Management Guidelines: Northern Interior Forest Region* (British Columbia Ministry of Water, Land and Air Protection 2004), and *How Vulnerable are Denning Bears to Disturbance* (Linnell et al. 2000).

### 3.2.4 Invasive Plants

Best management practices should be implemented during road construction to prevent the introduction and spread of invasive plants.

- Prior to construction, a survey for invasive plants, focused on any areas of existing or previous disturbance, will be conducted by a QEP.
- If any invasive plants are identified during the pre-construction survey, construction activities will be managed to limit the spread of existing infestations — construction activities will avoid disturbing areas that are within or adjacent to existing invasive plant populations; if work must occur in these areas, activities will be conducted in advance of seed

development to minimize the potential for spreading seeds, and movement of equipment between infested and non-infested areas will be restricted to the extent possible. Where appropriate, targeted removal of invasive plants may be conducted.

### 3.3 Mitigation for Road Operations

The proposed RTAR is a 66 km private, single lane, radio-controlled road. The road will be 5 m wide with an additional 3-5 m cleared right-of-way on either side of the road. The RTAR will be open year-round with closures during freeze/thaw periods as necessary to prevent erosion and damage to the road. Increased hunting along new portions of the RTAR was one of the primary concerns raised for wildlife; as referenced at the start of Section 3, various access control measures will be implemented to mitigate the potential for increased hunting along the road, including: access control gates placed at multiple locations along the RTAR, a gatehouse at the start of new road construction which will be staffed during road operations and hunting seasons, and patrols conducted by representatives of ATAC or FNNND along the RTAR to deter unauthorized traffic and hunting. For further details on access control along the RTAR, refer to the Access Management Plan.

To minimize the risk of wildlife collisions along the RTAR and potential effects on wildlife crossing or using habitats adjacent to the RTAR, ATAC will implement the following mitigation measures:

- The maximum speed limit along the RTAR will be 50 km/h. Along narrow, winding, or rutted sections, or in adverse weather conditions, drivers are expected to reduce speed as appropriate for conditions. Speed limits will be posted along the RTAR.
- Temporary road closures, reduced speed limits, or other travel restrictions (i.e. requirement to convoy traffic) may be enforced at any time for wildlife or environmental concerns. For example, traffic along the RTAR may be reduced or suspended during sensitive time periods (e.g., calving).
- RTAR users must contact ATAC prior to travel to coordinate traffic such that wildlife and environmental concerns are minimized. Traffic along the RTAR will be scheduled such that vehicles travel in convoys, whenever possible.
- If warranted, signage will be posted along the RTAR in sensitive wildlife habitats or at known wildlife travel corridors to warn vehicle operators of the potential to encounter wildlife.
- Drivers are required to use two-way radios along the RTAR or travel in a radio-controlled convoy. The location of any wildlife observed along the RTAR must be communicated to other road users on the radio.
- Wildlife will be given the right-of-way on the RTAR. Vehicle operators will apply the following guidelines to allow wildlife to cross the RTAR safely.
  - If wildlife are observed **ON THE ROAD**: stop as far back as possible, alert other drivers, and wait until wildlife have crossed before proceeding. If wildlife stay on the road for >5 minutes, drivers may resume travel and pass the animals at <10km/hr if safe to do so.
  - If wildlife are observed **NEAR** the road **AND** are **MOVING TOWARDS THE ROAD**: stop as far back as possible, alert other drivers, and wait until wildlife have crossed before proceeding. If wildlife stay on the road for >5 minutes, drivers may resume travel and pass the animals at <10km/hr if safe to do so.

- If wildlife are observed **NEAR** the road **AND** are **RESTING, FEEDING, OR MOVING AWAY FROM THE ROAD**: proceed with caution, alert other drivers, and watch for change in behaviour.
- Drivers will not exit the vehicle to chase, catch, divert, follow, photograph, or otherwise harass wildlife.
- Vegetation along the sides of the RTAR will be mowed/brushed as necessary to ensure visibility of wildlife to minimize the risk of wildlife-vehicle collisions. Any clearing of vegetation along the right-of-way will follow the vegetation clearing guidelines outlined in Section 3.2.
- Alternative measures will be used for de-icing the RTAR (e.g., gravel) or dust suppression (e.g., water) along the RTAR whenever possible, as chloride-based salts (NaCl, CaCl<sub>2</sub>) are known to attract foraging wildlife. The use of chloride-based salts in traction grit for winter road management will be avoided whenever possible.
- During winter operations, plowed snow banks will be maintained at heights that will not prevent or deter wildlife crossing. If snow bank heights exceed 1 m, wildlife escape points will be maintained in plowed snow banks at regular intervals along the RTAR.
- If any wildlife carcasses or parts located on the RTAR (i.e., from hunters or other road users), ATAC will notify the Yukon Conservation Officer Services. If necessary, the carcass will be removed to avoid wildlife collisions (e.g., scavengers on road) or potential bear encounters.

### 3.4 Helicopter Operations

Helicopter use will be minimized as much as possible to limit effects of helicopters on wildlife and other land users (e.g., Indigenous hunters). When necessary, the following mitigation measures will be implemented to prevent or minimize the risk of disturbance to wildlife from helicopter operations in the Project area:

- Subject to safety considerations, helicopters will maintain minimum flight altitudes of 300 m above ground level to the extent practical.
- Apart from wildlife surveys conducted by a QEP, helicopters will not follow, hover, or circle around wildlife. If wildlife are spotted while in flight, the flight route will be modified to maintain a minimum vertical and horizontal separation of 300 m.
- No-flight zones may be developed for the protection of wildlife (e.g. a no-disturbance buffer around active cliff-nesting raptor nests). If warranted, ATAC will notify pilots of any sensitive wildlife habitats to be avoided, and this FWMAMP will updated with specific details on no-flight zones.

## 4 MONITORING PROGRAMS

With the implementation of the mitigation measures described in Section 3 of this FWMAMP, Project effects to fish and wildlife, and the terrestrial and aquatic environments that they inhabit, are expected to be effectively minimized. However, as with all predictions of anticipated Project effects, there is a degree of uncertainty in these predictions. Adaptive management refers to the process of continually improving management practices informed by ongoing information collection and by learning from the outcomes of current operational practices. This plan will be periodically updated and revised to ensure that mitigation measures adapt to Project observations. 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 (refer to Section 5 for more information on how an adaptive management approach will be integrated into this plan). The environmental monitoring programs described in this section are intended to address various information needs, including:

1. Evaluate the effectiveness of mitigation measures;
2. Meeting Project/regulatory requirements; and
3. Inform adaptive management.

These include several post-construction monitoring programs, a wildlife observation log, a traffic monitoring program, and an effects monitoring program to assess potential changes in moose abundance and distribution.

## **4.1 Post-construction Monitoring**

### **4.1.1 Fish and Fish Habitat**

Post-construction monitoring for fish and fish habitat will include an inspection of all crossing sites one-year post-construction (following freshet) and assessment of the following factors:

- Evaluation of the effectiveness of fish passage at each fish-bearing crossing site. Where necessary, this will include fish sampling upstream and downstream of each fish bearing (or assumed fish bearing) crossing and various measurements of the crossing (e.g., water velocities, depths). If required, adaptive management would include fish passage improvement design and implementation for any crossing that is posing a barrier to fish passage.
- An on-site evaluation of the erosion and sediment control measures implemented around each watercourse crossing to evaluate effectiveness and site stability and to document any potential sources of erosion that may be delivering sediment to the stream. Adaptive management would include addressing any erosion issues in a timely manner. Water quality in the form of turbidity should be taken during this visit, upstream and downstream of the crossing site.

Following the Year-1 detailed inspection and assessment, a yearly visual inspection of the RTAR and crossing sites is recommended to ensure that no significant changes have occurred to the watercourse crossings and there are no significant erosion issues.

Additionally, water quality surveys will be conducted on all major creeks, rivers and fish-bearing streams crossed by the RTAR. Water quality monitoring will include routine chemistry, total metals, dissolved metals, total organic carbon, total mercury, hydrocarbons and sediment quantities. The monitoring will be conducted quarterly during the open water season and will commence prior to construction and continue for two years after construction. Continued monitoring beyond the second year of road operations will be dependent on the monitoring results — if monitoring is showing Project-related effects on water quality and results are informing adaptive management, monitoring may be continued; if monitoring is not detecting an effect on water quality, the surveys may be discontinued.

### 4.1.2 Wetlands

Post-construction monitoring for wetlands should include an inspection of all sites one year post-construction and assessment of the following factors:

- An on-site evaluation of the erosion and sediment control measures implemented around each water crossing feature to evaluate effectiveness and site stability and to document any potential sources of erosion that may be delivering sediment to the stream/wetland. Adaptive management would include addressing any erosion issues in a timely manner. Water quality in the form of turbidity should be taken during this visit, upstream and downstream of the site.
- An on-site evaluation of any wetland crossings, and at regular intervals along wetland sections bisected by the road, to look for ponding water or other evidence of changes to the hydrologic regime, as well as any changes to the habitat structure adjacent to the road. Photos of each wetland crossing prior to or immediately following construction would be helpful in assessing future comparisons. Any issues identified should be addressed in a timely manner.
- Documentation of any signs of OTV/ATVs off-roading in the area along the RTAR, including any evidence of trails/ruts through wetland areas. If evidence of OTV/ATV off-roading or signs of trails/ruts through wetland areas are observed, revision of the Access Management Plan may be necessary to avoid future incursions.

Following the Year-1 detailed inspection and assessment, a yearly visual inspection of the wetlands along the RTAR is recommended to ensure that no significant changes have occurred to the effected wetlands and there are no significant erosion issues. Additionally, traffic monitoring/traffic patrols should continue to monitor for evidence of OTV/ATVs off-roading along the RTAR.

### 4.1.3 Invasive Plants

Prevention (i.e., limiting the potential for invasive species to be introduced to an area) and early detection and rapid response (EDRR) are the most cost-effective means of controlling invasive species. Post-construction monitoring for invasive plants should include an inspection of the entire RTAR footprint for invasive plants one and two years post-construction. Inspections should be conducted by a QEP.

- If invasive plants are detected during the initial post-construction surveys, targeted removal should be carried out unless pre-existing invasive plant populations were found to be widespread along portions of the proposed RTAR, in which case management should focus on containment of the existing infestation.
- Targeted removal will involve the collection of invasive plant materials (e.g., soil, seeds, plant parts) which will be contained in sealed bags for incineration or disposal off-site at a designated facility.
- If necessary, ATAC will work with the Yukon Invasive Species Council to develop and implement a mitigation plan aimed at eliminating the species or limiting its spread.
- If the initial post-construction surveys locate invasive plant species along the RTAR, surveys and targeted removal of invasive plants should be repeated annually. If no invasive plants are detected during the initial post-construction surveys, subsequent monitoring may be scaled back to once every three years.

## 4.2 Wildlife Log

ATAC maintains a Wildlife Log for the Rau Project which will be expanded to include the RTAR. The purpose of this Wildlife Log is to opportunistically collect information about the presence and distribution of wildlife within the Project area; the information collected will provide data to support management of wildlife interactions onsite and inform other monitoring components. All ATAC employees, contractors and consultants are required to report wildlife observations via the Wildlife Log. The information collected will include: date/time of observation, observer, location, species, number of animals observed, age and sex of animals, behaviour or activity, and any additional comments deemed relevant.

In addition to the Wildlife Log, ATAC will track all wildlife collisions, fatalities, near misses, or incidents within the Project area. A follow-up investigation will be conducted for any mortality involving ungulates or large carnivores (other species will be dealt with on a case-by-case basis). Information collected during the investigation will include date and time of the mortality, species involved, a description of the animal, potential causes and, where applicable, corrective measures that could prevent future occurrences.

## 4.3 Traffic Monitoring

As per the terms and conditions of the Consolidated Decision Document (Yukon Government 2018), a traffic monitoring program will be implemented along the RTAR to assess the efficacy of access control measures (see Section 110 Recommendation A listed in Section 1.3 of this FWMAMP). Traffic along the RTAR will be monitored using traffic counters and/or motion sensing cameras deployed at strategic locations along the road, including:

- Near the beginning of the proposed route (~ km 1-5);
- Along the southern section of the Rankin Creek valley (~ km 20);
- At the junction with the WRT (~ km 36); and
- East of the Beaver River crossing (~ km 52-55).

The proposed locations of the traffic counters/cameras is based on discrete sections of road as divided by the proposed access control gates (i.e. one traffic counter/camera per section of road). The traffic counters/cameras will be set up after road construction and used to monitor traffic volumes, as well as the timing and location of motorized road use. ATAC will document all authorized traffic on the RTAR for comparison with the traffic monitoring data. Reporting on the traffic monitoring program will also document the state of physical obstructions, any enforcement actions taken, and any wildlife collisions along the RTAR. This information will then be used to assess the effectiveness of the Access Management Plan and inform adaptive management triggers if needed.

## 4.4 Moose Monitoring

As per Section 110 Recommendation B of the terms and conditions in the Consolidated Decision Document (refer to Section 1.3 of this FWMAMP), a monitoring program to assess potential changes to wildlife abundance and distribution baseline conditions over time within the Project area, with specific focus on moose, will be conducted. This monitoring program will be initiated prior to Project initiation and continue for at least five years after road completion.

In response to concerns about the moose population in the Project region, the Yukon Government, Fish & Wildlife Branch conducted an early winter aerial moose survey in the Beaver River watershed in 2019. This survey was conducted using a new model-based technique to estimate population size and composition. The survey divided the study area into rectangular blocks 15.1-15.5 km<sup>2</sup> (2' latitude x 5' longitude) in size, and using helicopters, surveyed a subsample of the blocks to count every moose within the selected blocks. The surveyed blocks were selected using a combination of landscape characteristics and local knowledge to generate an initial map predicting the abundance of moose. As the survey progressed, survey results were used to refine the model, until sampling provided a total population estimate with adequate precision to make management decisions (and met other survey guidelines).

In March 2020, YG used a similar model-based survey method to conduct a late-winter survey in survey blocks within 10 km of the RTAR. YG has recommended that an annual late-winter survey be conducted following these methods to monitor abundance, distribution, and habitat use of moose within 10 km of the road. The survey would be conducted for a second year pre-construction, during construction, and at least two years post-construction, with subsequent monitoring to be determined based on the degree of road use and by responses of moose.

A full report from YG detailing the methodology and result of the 2019 and 2020 surveys is not yet available. However, ATAC will commit to supporting the proposed late winter moose monitoring program, as long as baseline data from the initial year of surveys indicates that the proposed survey method has the potential to detect changes in moose distribution and abundance in the range that might be expected for this Project.

## 5 ADAPTIVE MANAGEMENT

Adaptive management refers to the process of continually improving management practices by learning from the outcomes of current operational practices and through ongoing data collection. As a component of an adaptive management approach, components of this FWMAMP may be updated intermittently to reflect the following:

- Improved understanding of local fish and wildlife populations (from ongoing monitoring programs or other studies).
- Observed wildlife responses to existing management practices.
- Results of management reviews or incident investigations.
- Records of non-compliance.
- Shared traditional or local knowledge.
- Changes to the management of species at risk or rare species because of updated status reports, recovery strategies, action plans, or management plans.
- New or improved scientific methods or best management practices; and
- Regulatory or Project-related changes.

More formalized adaptive management strategies may be applied to site-specific or species-specific situations where Project activities have the potential to interact with fish or wildlife and where operational constraints prevent application of the most risk-adverse management practices (e.g. application of a no disturbance buffer or operations within a specified timing window). Although the

specific situations that may arise during road construction and operation are unknown, potential examples based on the fish and wildlife species that may be present in the Project area could include:

- Operations in proximity of a raptor nest;
- Operations near a wildlife feature, such as a mineral lick, wildlife trail, or den site;
- Operations within a fish-bearing watercourse required outside of the least-risk timing window; or
- Observations of erosion or sedimentation issues associated with a water crossing.

The approach applied in these situations will vary on a case-by-case basis but will follow these general steps:

- Involvement of a QEP;
- Development of a site-specific management plan that includes:
  - An initial site assessment, including a field assessment, if required;
  - An ecological rationale for the proposed management strategy;
  - Specific actions to mitigate effects on the affected species or habitats;
  - A monitoring protocol to assess potential effects;
  - Specific options to adjust management actions depending on the response of the affected species; and
  - Documentation of the final outcome of the management strategy and integration of the results into future operational practices.

These steps are consistent with the adaptive management process cycle: (1) assess the problem, (2) design the plan, (3) implement the plan, (4) monitor the results, (5) evaluate the outcomes, and (6) adjust practices (Duinker and Trevisan 2003).

## 6 REPORTING

ATAC is committed to reporting annually on RTAR mitigation and monitoring activities. An annual report will be prepared summarizing activities under the FWMAMP and will be submitted to the FNNND and YG (Chief Mining Land Use). Each annual report will include the following information:

- A description of the construction or operational activities completed during that year;
- A qualitative evaluation of existing mitigation measures and any proposed changes to improve effectiveness (i.e., adaptive management);
- Accounts of any wildlife-related issues or incidents, including any human-wildlife conflicts, wildlife-vehicle collisions, RTAR-related mortalities, or unauthorized access or hunting;
- A summary of wildlife sightings recorded by Project personnel; and
- A summary of ongoing monitoring programs.

## 7 EFFECTS TO KEY SPECIES/COMPONENTS

The YESAB Evaluation Report identified several fish and wildlife species as Valued Environmental and Socio-Economic Components for their assessment of the Project — these included moose, bears, avian wildlife, and fish and fish habitat. Of these, YESAB determined that the Project could result in significant and adverse effects in relation to peregrine falcons, and moose harvest sustainability for local and FNNND harvesters (YESAB 2017). Since the release of the Consolidated Decision Document,

YG has also identified several key wildlife and environmental values potentially at risk from the Project which have been suggested as candidate species/components for regional monitoring associated with the RTAR Project; these include moose, grizzly bear, wolverine, Dolly Varden, wetlands, and invasive plants (Environment Yukon 2020). While the current FWMMP does not include targeted monitoring for all of these species/components, the various mitigation measures described in the plan address potential Project-related effects to these species/components. The following section summarizes how Project-related effects to moose, grizzly bear, wolverine, cliff-nesting raptors, fish and fish habitat, wetlands and invasive plants are addressed. Note that no new mitigation or monitoring is presented in this section; rather the section discusses how the previously identified mitigation measures (in Section 3) and monitoring (in Section 4) address identified concerns related to these species/components.

## 7.1 Moose

Moose are relatively abundant throughout the Project area and are a valued harvest species for local hunters. Moose were included as a focal species in the YESAB assessment due to concerns that increased access may contribute to facilitated hunter harvest (YESAB 2017). YG also identified higher rates of harvest due to increased access for hunters along the RTAR as a key concern for moose, along with concerns over habitat loss and increased mortality risk due to moose-vehicle collisions and increased predation (Environment Yukon 2020). Wetlands and riparian areas in the McQuesten Lake and Beaver River valleys have been identified as important habitats for moose; this is illustrated by the Environment Yukon WKA for late winter moose habitat identified along the proposed RTAR where the WRT runs along the Beaver River. Project design took several steps to avoid impacts to high value moose habitats including routing the RTAR through the Rankin Creek valley rather than the McQuesten Lakes valley, and positioning the road as far upslope as topography allowed to avoid sensitive moose habitat along the valley floors. The mitigation measures listed in Section 3 are expected to provide further protection to moose and moose habitat. In particular, access control measures along the RTAR are expected to substantially minimize the risk of facilitated hunter harvest along the road corridor; this will be confirmed through the traffic monitoring program described in Section 4.3. Potential effects on moose will also be monitored through the late winter aerial moose survey program described Section 4.4.

## 7.2 Grizzly Bear

Bears, both grizzly bear and black bear, were included as focal species in the YESAB assessment due to concerns that fuel, food, or waste associated with the construction and operation of the RTAR will attract bears to the Project area and ultimately lead to increased bear mortality through the creation of nuisance bears (YESAB 2017). YG also identified grizzly bears as a key concern for the Project due to their status as a species at risk, concerns regarding increased mortality due to human-wildlife conflicts and facilitated harvest resulting from increased access, as well as habitat loss as a result of Project development (Environment Yukon 2020). ATAC considers managing the risk of human-bear conflict as a top priority — the Wildlife Attractant Management Plan has been developed to put in place a set of procedures and controls to minimize potential attraction of, and conflicts with, wildlife while conducting Project activities. Various other mitigation measures listed in Section 3 are expected to contribute to the protection of grizzly bears and their habitat in the Project area including access control measures, speed limits, and traffic monitoring (Section 4.3) along the RTAR.

These mitigation measures are expected to minimize the risk of facilitated hunter harvest and grizzly bear mortality from road operations.

### 7.3 Wolverine

Wolverines have large territories and can be found in a wide range of habitats throughout the Project area. Wolverine were identified as a Project concern by YG due to their status as a species at risk, and concerns of Project development causing loss of habitat, reduced habitat connectivity, and increased mortality risk due to human-wildlife conflict and from higher rates of harvest (Environment Yukon 2020). Mitigation measures listed in Section 3 are expected to provide adequate protection of wolverine and their habitat. Access control measures along the RTAR and traffic monitoring (Section 4.3) are expected to minimize the risk of wolverine mortality from road operations and facilitated harvest. Additionally, the low levels of traffic expected along the RTAR during operations will limit potential effects on habitat connectivity and minimize indirect habitat loss due to sensory disturbance in habitats adjacent to the road.

### 7.4 Cliff-nesting Raptors

Avian species were included as a focus in the YESAB evaluation due to declines in bird populations throughout North America, the high societal value placed on birds, and legislated protections for bird species as outlined in the MCBA and *Wildlife Act*. In particular, the YESAB assessment identified the potential for a significant adverse effect on nesting peregrine falcons in the Project area (YESAB 2017). ATAC has developed several mitigation measures to limit Project effects on birds, particularly during the construction phase of the Project (refer to Section 3.2.2). To ensure that the Project does not result in significant effects to raptors, ATAC will contact the Chief, Mining Lands to inquire about known peregrine falcon or other raptor nests within the Project area prior to Project construction. If necessary, a raptor nest survey will be conducted by a QEP in appropriate habitats along the proposed RTAR route to document active raptor nesting sites. Any active nests will be protected by no-disturbance buffers as outlined in Section 3.2.2.

### 7.5 Fish and Fish Habitat

Fish and fish habitat were identified as a focus in the YESAB assessment due to concerns about connectivity (i.e. barriers to fish passage) and sedimentation, as well as legislative requirements under the *Fisheries Act*. Similarly, YG identified Dolly Varden as a focal species for the Project due to their status as a species at risk, and concerns around fish passage and degradation of habitat quality due to increased sedimentation and/or hydrocarbon spills. To limit effects on fish habitats, ATAC has developed an Erosion and Sediment Control Plan and a Spill Contingency Plan for the Project. Along with the mitigation measures listed in Section 3.2.1 of this FWMMP these are expected to provide adequate protection of fish and fish habitat, including Dolly Varden. Additionally, post-construction monitoring will be conducted as outlined in Section 4.1.1 to ensure that no significant changes have occurred at watercourse crossings, no notable erosion issues have developed, fish passage is maintained, and allow for adaptive management strategies to be implemented if any issues are observed.

### 7.6 Wetlands

Wetlands were identified as a Project concern by YG because they provide valuable habitat for multiple fish and wildlife species and perform key roles in maintaining water quality and regulating

water flows. Potential Project effects to wetlands identified by YG include direct loss of wetland habitats due to the footprint of the road, indirect loss of wetland habitats and/or changes in wetland function beyond the road footprint due to hydrologic shifts created by the road or by ATV/OTV off-road access resulting in compaction and/or channeling, and adverse effects on water quality, aquatic life, and vegetation due to contamination of watercourses and sediment accumulation (Environment Yukon 2020). ATAC has committed to numerous mitigation measures which will limit potential effects to wetlands including measures listed in the Erosion and Sediment Control Plan, the Spill Contingency Plan, and the Access Management Plan, as well as specific measures for construction activities near aquatic habitats (Section 3.2.1 of this FWMMP). ATAC will also conduct post-construction monitoring of wetland habitats as outlined in Section 4.1.2 to ensure that no significant changes have occurred at wetland crossings, that no notable erosion issues have developed, and that fish passage is maintained. Traffic monitoring/traffic patrols will also monitor for evidence of OTVs/ATVs through wetland areas to inform adaptive management of the Access Management Plan if required.

## 7.7 Invasive Plants

Invasive plants were identified as a Project concern by YG because of the potential for road construction and operation activities to facilitate the dispersal of invasive plants resulting in potential effects on local plant and wildlife species (Environment Yukon 2020). The mitigation measures listed in Section 3, in combination with the post-construction monitoring for invasive plants described in Section 4.1.3, are expected to prevent the introduction and spread of invasive plants within the Project area.

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