



## **Appendix P.7**

### **draft Wildlife Mitigation and Monitoring Plan**

Appendix A Landbird SAR Mitigation and Monitoring Plan  
Completed for the Updated 2021 Beaver Dam Mine EIS



**DRAFT**  
**WILDLIFE MITIGATION AND MONITORING PLAN**  
**VERSION 1**

**Beaver Dam Mine Project 2021**  
**Marinette, Nova Scotia**  
**October 2021**

## REVISION HISTORY

Version	Date	Notes/Revisions
Version 1	October 2021	Submitted with the Beaver Dam Mine Project 2021 Environmental Impact Statement Update application to the Canadian Environmental Assessment Agency and Nova Scotia Environment. Describes the management practices that will be followed for the wildlife mitigation and monitoring plan.

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# 1 INTRODUCTION

## 1.1 Project Overview

Atlantic Mining NS Inc. (AMNS) is proposing the construction, operation, decommissioning, and reclamation of an open pit gold mine in Marinette, Nova Scotia. The Beaver Dam Mine Project (the Project) will have an ore production rate of approximately 6,000 tons per day, over a five-year period. Ore from the Project would be crushed and transported approximately 31 km by road to the Moose River (Touquoy) mine for processing. Components of the Project include an open pit, material storage facilities (i.e., waste rock, topsoil and organic materials), mine haul roads, mine infrastructure for crushing, water management, hauling, truck maintenance, administration, and road upgrades.

Baseline data was collected throughout the field seasons in 2014, 2015, 2016, 2019 and 2020 as part of the Environmental Impact Statement for the Project. Targeted surveys were completed for bats, mainland moose, and turtles. Incidental observations were recorded for all other fauna species including mammals, reptiles and amphibians, and invertebrates (including freshwater molluscs, lepidopterans, and odonates). The objective of the baseline studies was to:

- provide data to assess and manage future potential effects to wildlife during full construction and operations of the Mine;
- estimate the range of baseline values (variation) for a number of species' indicator variables (measurement endpoints);
- identify mitigation procedures and policies that could reduce effects to wildlife and wildlife habitat; and
- develop a monitoring program that is efficient and effective at detecting direct and indirect effects from the Mine on species' indicator variables.

Dedicated avifauna baseline surveys were conducted in 2014, 2015, 2016 and 2019, to support the Updated 2021 EIS (AMNS 2021). These surveys included breeding bird, spring migration, fall migration, winter, nocturnal owl, diurnal raptor migration and common nighthawk surveys. Additionally, incidental observations of Species at Risk (SAR) avifauna species were recorded during the suite of biophysical surveys which occurred within the Project Area.

A landbird SAR mitigation and monitoring plan (Appendix A) has been developed to reassess habitats within the Project Area, specifically the Beaver Dam Mine Site and Haul Road, that are known to support or have the potential to support landbird SAR and develop protocols in the event landbird SAR are observed during Project operations.

## 1.2 Concordance

The Project has the potential to affect wildlife through a number of effects mechanisms such as direct and indirect habitat loss, habitat fragmentation/connectivity, and changes in movement patterns, and increased mortality risk. The proposed mitigation measures and wildlife monitoring program described in this plan were designed to reduce or minimize the effects of the Project on wildlife and to monitor the effects of the Project to allow for effective adaptive management of mitigation measures over time to ensure that the Project-related effects on wildlife are avoided or minimized.

AMNS is committed to monitoring wildlife in relation to the Project as outlined in this document. The development of the Wildlife Mitigation and Monitoring Plan (WMMP) details at this early stage of the planning and regulatory process clearly demonstrates AMNS' commitment to build on lessons learned and carry out monitoring using best practices.

The federal and provincial regulatory framework outlines the requirements, with respect to wildlife, under which the Project will operate (Table 1-1). The regulatory responsibilities include the *Migratory Birds Convention Act & Regulations*, which prohibits the disturbance of migratory birds, their nests and eggs, *Nova Scotia Wildlife Act*, which protects wild species diversity and abundance, and the *Canada Wildlife Act*. Further protection is offered to SAR through the provincial *Nova Scotia Endangered Species Act* and the federal SARA.

**Table 1-1: Concordance of Legislation/Regulations, Terrestrial Fauna, and Wildlife Mitigation and Monitoring Plan**

Legislation/Regulation	Requirement	Responsible Regulatory Agency
<i>Migratory Birds Convention Act &amp; Regulations</i>	Potential authorization due to physical activities potentially relocating birds and destroying their habitat.	ECCC
<i>Species at Risk Act</i>	Potential authorization due to physical activities potentially impacting SARA listed species and/or their habitat.	DFO/ECCC
<i>Wildlife Act</i>	Prohibits taking, hunting, killing or possessing eagles, osprey, falcons, hawks, owls, and any other protected wildlife.	NS&LF
<i>Endangered Species Act</i>	Prohibits killing, injuring, disturbing, taking, or interfering with endangered or threatened species and/or their habitat.	NS&LF

### 1.3 Monitoring Focus

The primary goal of the WMMP is to minimize impacts on wildlife in the project area, with particular reference to focal species of interest (Valued Components) and Species at Risk.

Currently, the following Species at Risk / Species of Conservation Interest that were observed near the Project are focused in the WMMP and will be included in the monitoring of Project related effects:

- Mainland moose
- Snapping turtle

Incidental observations of other wildlife species such as coyote, American black bear, white-tailed deer, etc, will also be recorded.

The focus of the monitoring effort will remain flexible and adaptive for the life of the Project to respond to emerging concerns identified through the adaptive management process.

## 1.4 Engagement

Key issues raised during public consultation and Mi'kmaq engagement relating wildlife include potential effects from permanent loss of habitat associated with the footprint of the Beaver Dam Mine Site and Haul Road, as well as direct mortality associated with the hauling operation. Potential effects on traditional uses of land and resources by the Mi'kmaq were noted, including hunting and trapping of small game and deer.

The results of the public consultation and Mi'kmaq engagement have been considered in AMNS' commitments on mitigation and monitoring measures and proposed compliance and effects monitoring programs, as well as AMNS' broader commitment to ongoing public consultation and Mi'kmaq engagement.

## 1.5 Valued Components

Wildlife and the habitat upon which they rely, may be altered either directly or indirectly by proposed Project activities. While this valued component includes understanding the potential effects of the Project on all wildlife, the specific survey methods are mainly driven by identification of Species at Risk (SAR) and Species of Conservation Interest (SOCI).

Currently, the following SAR / SOCI that were observed near the Project are focused in the WMMP and will be included in the monitoring of Project related effects are the mainland moose and the snapping turtle. Incidental observations of other wildlife species such as coyote, American black bear, white-tailed deer, etc., will also be monitoring during lifecycle of the Project.

## 1.6 Approach to Wildlife Monitoring

The process of developing a WMMP is collaborative and requires input from communities, government, and other people interested in the Project. The process involves addressing the following questions:

- Why do we monitor?
- What components should we monitor?
- How do we monitor the selected components?

One of the main reasons we monitor wildlife is for follow-up on the concerns that communities, government and other regulators have with respect to the potential effects from the Project.

The different types of monitoring that are typically completed at a project such as:

- testing effects predictions, which can be related to measuring the response of the environment or population (i.e., monitoring component) to project stressors, and/or testing the assumptions associated with the predictions;
- testing the effectiveness of environmental design features and mitigation policies, practices, and procedures;
- contributing to the assessment and management of regional cumulative effects; and
- meeting and fulfilling regulatory requirements.



The information collected through the different types of monitoring may be used to guide mitigation at the Project. The results from monitoring also can be used to increase the confidence of impact predictions in future environmental assessments and may also contribute to the assessment and management of cumulative effects by government. For example, the WMMP will provide regional data on mainland moose that can be used to better understand the potential cumulative effects on these species and further the overall understanding of their habitat. Where possible, the WMMP for the Project will use appropriate and standardized study designs and methods so that the data from the Project and other existing gold mines can be used together.

After the reasons for monitoring are determined, the second goal is to determine what components of the environment and population should be monitored. For example, monitoring components for mainland moose are based on the effect's pathways evaluated in the EIS (AMNS 2021), which originate from the areas of public concern identified by communities and parties during the Indigenous Peoples and community engagement, and the EIS Guidelines (CEAA 2016).

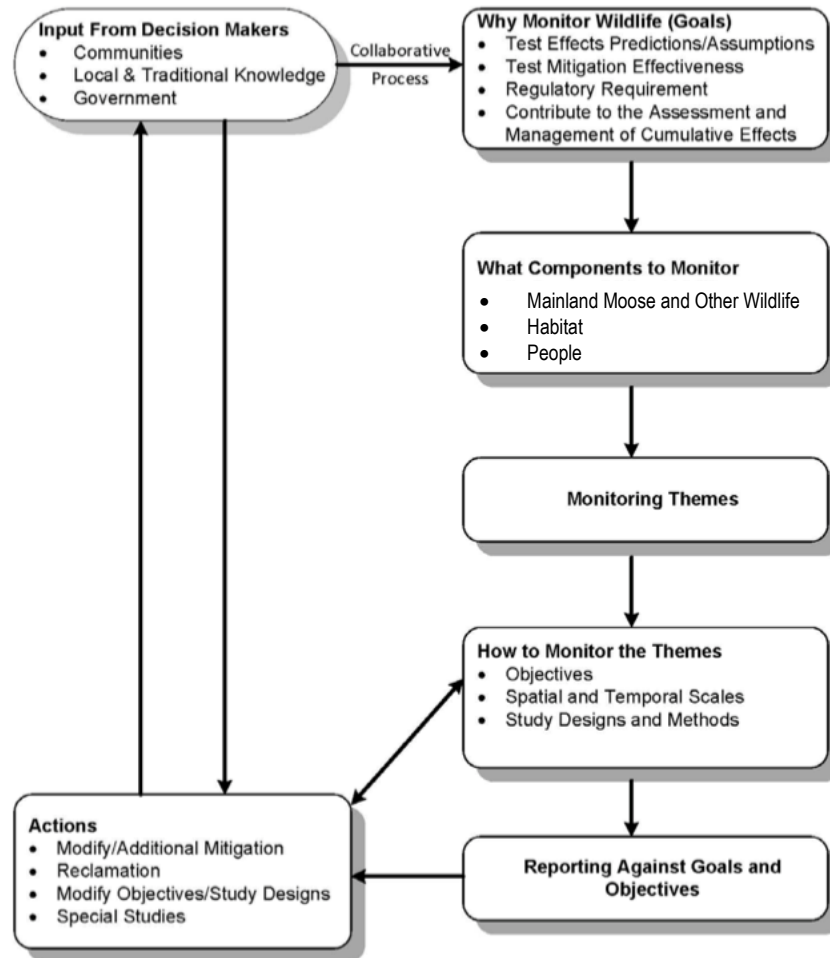
Monitoring components broadly include mainland moose and other wildlife (snapping turtle, bats, coyote, American black bear, white-tailed deer), habitat, and people (Figure 1-2).

People are included as a component related to the effects pathway of increased access for hunting and trapping of small game and deer within the study area. For each monitoring component, a set of clear and measurable objectives need to be defined. The objectives inform the appropriate spatial and temporal scales of the monitoring, and the study designs and sampling methods (Figure 1-2). The objectives must be achievable and linked to the different types of monitoring studies, and should consider the following:

- good knowledge of the variable is available to provide confidence in interpreting the results;
- accessibility and repeatability of collecting robust monitoring data (i.e., practical and cost-effective measurement endpoints);
- mine-related changes are easily separated from natural changes;
- provide reliable operations; and information for adaptive management of mine provide reliable data for collaborative regional studies that are designed for understanding and managing cumulative effects.

Results from monitoring programs are used to provide feedback to Project operations to determine if the goals and objectives are being met (Figure 1-2). Depending on the results, actions may be considered such as modifying and/or implementing additional mitigation. Similarly, changes to the objectives and/or study methods for monitoring programs may be required if it is determined that the measurement variable has a low sensitivity to detect Project-related changes or that the scale of the response does not match the objective. The results are shared with the (Figure 1-2), communities, government, and other people interested in the Project through annual monitoring and comprehensive analyses reports, and meetings.

Figure 1-2: Conceptual Adaptive Management Response Framework for Monitoring Wildlife



In accordance with the concept of adaptive management, the current proposed monitoring may change over the life of the Project. In keeping with the approach described above, this WMMP considered the following information sources:

- the EIS Guidance document (CEAA 2016), public consultation and Mi'kmaq engagement;
- analysis and assessment of effects pathways for the Project, and associated degree of uncertainty, presented in the EIS (AMNS 2021);
- wildlife monitoring and management programs for the Touquoy Mine Site;

## 1.7 Mitigation

The WMMP outlines how AMNS proposes to monitor wildlife that use the landscape surrounding the Project. AMNS will be implementing a number of best management practices, Project design features, and other wildlife mitigation measures to avoid or minimize effects on wildlife.

These best management practices, design features, and mitigation measures are presented below in relation to each of the expected Project-wildlife interactions that were assessed.

## 1.8 Potential Effects to Wildlife and Wildlife Habitat

The assessment of potential adverse interactions and effects of the Project on wildlife takes into account the potential for the Project to result in changes to:

- Permanent and temporary habitat alteration and fragmentation;
- Disturbance and/or displacement;
- Potential for direct and indirect mortality to individuals; and
- Sensory disturbance.

## 2 SPECIES OF CONSERVATION INTEREST AND SPECIES AT RISK

Priority wildlife SAR/SOCI observed during field surveys include the mainland moose and the snapping turtle. Each of these species have variable habitat preferences, depending on the time of year. Mainland moose are found in habitat mosaics of uneven age stands with abundant twigs and foliage for foraging. These uneven-aged mosaic forests that moose prefer can be formed from natural disturbance such as fire or wind throw, or anthropogenic disturbance such as timber harvesting. During the summer months, they are reliant upon aquatic systems (lakes, rivers, and wetlands) for submergent and emergent vegetation, and cover from thermal stress (NSDNR, 2007). Mainland moose are not particularly affected by habitat fragmentation based on habitat preference; however, increased access into a site (construction of new roads) may increase poaching levels. As such, low-level habitat fragmentation can indirectly affect mainland moose.

The snapping turtle can be found in a variety of freshwater ecosystems, such as slow-moving rivers, wetlands, lakes, streams, and ponds. Hibernation occurs in freshwater systems deep enough to prevent freezing through during the winter, with a mucky or muddy substrate. They are the most aquatic of freshwater turtles in Nova Scotia, but they do travel through upland habitat and use gravelly areas to nest. The preference for gravelly substrate during nesting is a threat to turtles, as gravid females are attracted to the gravelly shoulders of roads for nesting. The potential for direct mortality of reproductive females is highest where roads intersect or are adjacent to aquatic ecosystems. This risk is highest in June when females are nesting, particularly given the proposed increase in traffic along the Haul Road.

Table 2-1 outlines the mitigation measures that will be implemented by AMNS where direct loss of habitat is expected to support development of the Project.

**Table 2-1: Mitigation for Species of Conservation Interest and Species at Risk**

Species	SARA/COSEWIC	NSESA	Potential Adverse Effect	Mitigation Measure
Snapping turtle	Special Concern	Vulnerable	Habitat alteration, fragmentation, or loss	Provide wildlife awareness training to site personnel to reduce interactions between site personnel and wildlife.
				Upgrade existing roads, wherever practicable, instead of building new roads
				Replace crushed, hung, or improperly installed culverts, wherever practicable, to improve habitat connectivity
				Reduce disturbance through buffering of habitat - a 30m buffer on aquatic habitat deemed suitable for snapping turtles, wherever practicable
				Clearing and construction will be limited within wetlands that could support snapping turtles during winter hibernation period;
			Unintentional destruction of nests, eggs, hatchlings or adults	If snapping turtle activity is occurring within and/or adjacent to the Beaver Dam Mine Site or Haul Road, a turtle awareness and management program will be implemented to ensure all staff are well informed regarding the increased turtle activity, especially during breeding season
				Install turtle crossing signs near major watercourse crossings, or in areas where snapping turtles have been observed, in an effort to increase awareness and reduce vehicular collisions - preferably only seasonally when turtles are active
				A speed limit of 40 km/hr within the Beaver Dam Mine Site and 70 km/hr along the Haul Road (or not exceeding posted speed limits) will be implemented to reduce likelihood of collisions.
			Accidental mortality from vehicle strike	Install signage where specific wildlife concerns have been identified. Vehicles will yield to wildlife on roads.
				Monitor and manage road conditions through dust suppression and traction control (sand on icy roads) to reduce potential for collisions with wildlife. Implement Dust Control Plan
				If a turtle is found, report immediately to site Environmental Technician; if found on road, move away provided not actively nesting using proper moving technique
				Implement remediation plans to restore natural habitat and food source re-establishment to support fauna

Mainland moose		Endangered	Increased access into a site (construction of new roads) may increase poaching levels	Provide wildlife awareness training to site personnel to reduce interactions between site personnel and wildlife.
				Implement Moose Management and Monitoring Program including activities such as repeated winter track surveys and pellet group inventories
			Accidental mortality from vehicle strike	Implement wildlife observation reporting to appropriate site personnel during construction, operation, and decommissioning of Project
				Install signage where specific wildlife concerns have been identified. Vehicles will yield to wildlife on roads.
			Lowered viability of individual populations of moose by direct mortality and reduction in range	Upgrade existing roads, wherever practicable, instead of building new roads
				A speed limit of 40 km/hr within the Beaver Dam Mine Site and 70 km/hr along the Haul Road (or not exceeding posted speed limits) will be implemented to reduce likelihood of collisions.
				An un-vegetated buffer of 10 m along roadsides will be maintained, where possible, to improve visibility along roadsides and reduce the potential for collisions with wildlife.
			Habitat alteration, fragmentation, or loss	Monitor and manage road conditions through dust suppression and traction control (sand on icy roads) to reduce potential for collisions with wildlife. Implement Dust Control Plan
Site infrastructure will be fenced in, where practical, to reduce interactions between Project infrastructure and wildlife.				

Notes: Note: COSEWIC = Committee on the Status of Endangered Wildlife in Canada; SARA = *Species at Risk Act*; NSESA = *Nova Scotia Endangered Species Act*.

### 3 MITIGATION

In order to mitigate and reduce overall loss of function of habitat used by wildlife, and reduce direct impacts, the actions provided in Table 3.1 will be implemented by AMNS where direct loss of habitat is expected to support development of the Project.

Where direct impacts to habitat or wildlife are not expected, the Beaver Dam Mine Site and Haul Road development may still potentially cause indirect impacts through construction, operation, and closure activities. The following actions will be implemented to reduce the potential for indirect impacts to adjacent undisturbed habitat:

- For species which rely on wetland habitat, maintain pre-construction hydrological flows into and out of downstream wetland habitats, to the extent possible (post alteration wetland monitoring may be required as a result of the provincial permitting process);
- In order to protect adjacent habitats from accidental spills, ensure that spill control and contingency planning is in effect, and its procedures fully communicated to staff;
- Vegetation management will be conducted by cutting (i.e., no use of herbicides);
- Ensure all development related activity (construction areas, access roads, etc.) are located within areas where biophysical field evaluations have been completed and approvals/written authorizations are in place as required;
- Erosion control materials shall be clean, non-ore-bearing, non-watercourse derived and non-toxic materials;
- Machinery and personnel will be instructed not to enter the habitats outside of approved Project footprint; and
- Slopes will be re-vegetated to stabilize them and limit erosion and sedimentation into adjacent habitats.

**Table 3.1: Mitigation for Wildlife**

Project Phase	Mitigation Measure
Construction, Operation	Provide wildlife awareness training to site personnel to reduce interactions between site personnel and wildlife.
	Intact forest stands and wetlands will be avoided wherever practicable during detailed Project planning and design in favor of previously disturbed areas (e.g., stands disturbed by timber harvesting, roads, or other development). Micro-site Haul Road and mine infrastructure to avoid major fauna habitat.
	Where natural, intact habitat cannot be avoided, maintain existing vegetation cover whenever practicable and minimize overall areas of disturbance.
	Minimization of impact to old forest.
	For those species reliant on wetland habitat, a wetland alteration application will be submitted during Project planning and design to request an authorization to alter wetland habitat and to address loss of wetland function.
	Compensation for permanent loss of wetland function will be completed through wetland restoration activities to support no net loss of wetland function, subject to NSE approval.
	Habitat fragmentation will be reduced by limiting the area of new roads, favoring upgrading of existing roads where possible instead.
	Site infrastructure will be fenced in, where practical, to reduce interactions between Project infrastructure and wildlife.

	A speed limit of 40 km/hr within the Beaver Dam Mine Site and 70 km/hr along the Haul Road (or not exceeding posted speed limits) will be implemented to reduce likelihood of collisions with fauna.
	Install signage where specific wildlife concerns have been identified. Vehicles will yield to wildlife on roads.
	Monitor and manage road conditions through dust suppression and traction control (sand on icy roads) to reduce potential for collisions with wildlife. Implement Dust Control Plan
	An un-vegetated buffer of 10 m along roadsides will be maintained, where possible, to improve visibility along roadsides and reduce the potential for collisions with wildlife.
	Clearing and construction will be limited within wetlands that could support snapping turtles during winter hibernation period;
	Erosion and sediment control planning will be completed to ensure site runoff is not directed towards unaltered habitat. Implement Erosion and Sediment Control Plan.
	Culverts installed within wetlands and watercourses will provide an alternative crossing location to amphibians and reptiles, thereby reducing direct mortality of species attempting to cross a road. Upgrade culverts along the new and upgraded Haul Road sections to improve habitat connectivity.
	Implement Emergency Response and Spill Contingency Plans to protect wildlife and their habitat from accidental spills
	Store hazardous and non-hazardous waste in designated locations, in appropriate containers to reduce potential for spills, and to prevent attracting wildlife (e.g., food waste in bear proof containers).
	Follow the <i>Pit and Quarry Guidelines</i> to reduce impact of noise and vibration on wildlife
	Limit use of lights to the amount necessary to ensure safe operation within the PA, with the recognition that excessive lighting can be disruptive to wildlife. Install lights facing downward and wherever practicable using motion-sensing lights.
	Consider limiting use of lights that emit more blue shortwave light (e.g., LEDs, metal halides) which have greater impacts to wildlife at night, where practicable and considering operational safety.
	Restrict blasting to a specific and regular daytime schedule during weekdays to allow time for wildlife to recover from potential noise disturbance.
	Site-specific measures to protect wildlife will be addressed in the EPP.
Closure	Implement remediation plans to restore natural habitat and food source re-establishment to support wildlife Install signage where specific wildlife concerns have been identified. Vehicles will yield to wildlife on roads.
Post-Closure	A deterrent system should also be considered post closure at the Touquoy Mine Site when the pit fills as tailing deposition will be present. This will deter wildlife from using the pit during and after filling which may have deleterious effects resulting from long-term exposure.



## 4 MONITORING

Wildlife is expected to continue to be present near the Project during construction, operation and closure. Some wildlife species are attracted to human activity, and interactions or incidents between the Project and wildlife are anticipated. Incidents are defined in the WMMP as any wildlife interaction that requires a response by Project personnel. Species that are often attracted to industrial developments include coyotes, raccoons, skunks or black bears.

Site surveillance or local monitoring is proposed to identify the species, number, and location of wildlife incidents (including direct mine-related mortality), and identify risks to wildlife. Site surveillance monitoring also includes systematically recording the presence of all wildlife (i.e., common and uncommon species, and species at risk) within and around the Project footprint. The program is intended to provide direct feedback to mine operations regarding the effectiveness of waste management and wildlife mitigation practices. The effectiveness of mitigation may be judged based on concordance of predicted and observed responses. At any time, if the mitigation appears to be ineffective, the adaptive management approach will be initiated. However, it is rarely possible to directly test the effectiveness of mitigation, as the data are affected by both the impacts from the development and the mitigation.

Environment staff, will record the presence and movements of wildlife within and around the Project, which will help to keep environment staff apprised of wildlife activity and the potential for problems, and measure the effectiveness of mitigation. Regular inspections for wildlife and fresh wildlife sign around the Project, and regular communication with all staff will provide early warning of wildlife presence on-site before issues arise.

Site surveillance monitoring provides one of the few opportunities to immediately implement mitigation, and directly observe the effectiveness of that mitigation. This survey will consist of an inspection of areas within the Project site, scanning observations of wildlife, and records of recent wildlife sign (e.g., tracks, scat). A survey protocol with a targeted route and locations will be included in the final version of the WMMP. The survey will be completed on foot and by truck, and environment staff will record the area surveyed, and the nature and location of all observations.

Project staff and contractors will be required to report all observations of large mammals to environment staff, both at the Project site, and along the Project Haul Road. Environment staff will respond to, investigate, and record the presence and incidents involving deterrent actions, injury, or mortality of animals, and complete follow-up procedures or management actions as necessary. Wildlife sighting logs will be maintained at various areas around the Project site for staff to record observations of wildlife. If wildlife injury or mortality occurs, then environment staff will conduct an investigation to determine the cause, collect photographs, and store the carcass until further direction from the Department of Lands & Forest and complete the follow-up procedures or management actions as necessary. All wildlife sightings, deterrent actions, injuries, and mortalities will be reported in the annual Wildlife Monitoring Report.

Investigation and reporting of incidents will be completed as they occur. Monitoring will be continuous throughout the construction, operation, and closure phases of the Project. Environment staff may at any time suggest changes to environmental design features, mitigation and management practices and policies, or the need for additional training for staff, as a result of their investigations.

## 4.1 Monitoring Species of Conservation Interest and Species at Risk

### 4.1.1 Mainland Moose

Mainland moose have been recorded within 3.4 km of the Beaver Dam Mine Site, and within 7.5 km of the Haul Road. AMNS will work with the NSL&F to provide information and assist in reducing existing knowledge gaps in monitoring by:

1. Implementing a Mainland Moose Monitoring Program to describe frequency of occurrence of moose around the Project site.

Ten 1-km long transects will be established within a 2 km radius of the approved Project Area boundary. The transects will be established through the diversity of habitat types present within the Project Area and surrounding landscape, including undisturbed habitat, trails, and site roads. Furthermore, transects will be placed in areas of higher elevation wherever possible, to identify any potential altitudinal separation between Moose habitat and White-tailed Deer habitat.

Track surveys will be completed on foot by an observer trained in recognition of moose and deer tracks, scat and browse. Track surveys will be conducted twice annually, preferably prior to Feb 1st, in suitable weather conditions. Snow tracking results are best 3-7 days following a > 10 cm snow fall. Surveys should not be conducted during periods of rain, snowfall, or blowing snow. These monitoring surveys will be completed annually throughout the life of the Project.

The transects will be provided to the surveyor on a handheld GPS device. UTM coordinates will be recorded using GPS wherever moose and deer track-ways cross survey trails or transects, occur within or adjacent to survey trails or transects, or localized activity occurs. Any unusual wildlife signs will be recorded on the GPS unit, and photographed. Any live moose encountered will not be disturbed. Survey results will be presented to NSL&F in digital and hard copy report form annually by the years' end, and will contain a map showing transects and observation points.

2. Providing site personnel with information pertaining to the identification of moose and their activities (e.g., age and sex identification, evidence of breeding behaviors) for the purpose of monitoring population demographics and informing wildlife sighting reports.
3. Collecting samples of any pellet piles which are encountered, for submission to NSL&F for genetic analysis, where feasible.
4. Recording sightings and maintaining a database on-site for NSL&F to review. All wildlife sightings by site personnel are to reported to the onsite Environment Department, and will be used to track observations of mainland moose (and signs thereof). Observations of mainland moose by site personnel will be followed up with a microhabitat assessment, wherever possible.

### 4.1.2 Snapping Turtle

Snapping turtles seek out hibernation sites in the aquatic environment in order to keep from freezing during the winter. These may include lotic, lentic and mud environments. Within these habitats, the turtles appear to prefer the following characteristics for their

hibernacula: water shallow enough to let the turtle reach the surface to breathe, but deep enough so the water will not freeze to the bottom; a location that is likely to freeze over later in the season and thaw earlier in the spring; a thick layer of mud in which the turtle can bury itself; and additional submerged cover, such as a floating mat of vegetation, roots, stumps, branches or logs. Snapping turtles appear to show fidelity to their hibernation site, with many adults migrating annually several kilometers to return to their previous year's hibernacula.

Mating of Snapping turtles may occur throughout the active season, primarily in the fall. Females generally lay their eggs between late May and late June. Clutch size varies between 4 and 109 eggs, but a typical clutch contains 25 to 45 eggs. The eggs are generally laid on sand or gravel banks near the water, in locations where vegetation is absent or sparse. Females exhibit strong nesting site fidelity, returning to the same site year after year.

Within the Project area, snapping turtles have been observed. Suitable habitat for the snapping turtle was observed within the Beaver Dam Mine Site and Haul Road. While the Snapping turtle is among the most aquatic of Canadian freshwater turtles, they will use terrestrial habitats as a corridor between aquatic habitats. They are particularly drawn to roadsides near watercourses during the nesting season, since gravelly road shoulders provide suitable substrate for nesting. As such, these areas will be monitored during late May and Late June to determine the presence of snapping turtles.

If a snapping turtle is found, it must be immediately reported to the site Environmental Technician. If a turtle is found on or near a road, efforts should be taken to move the turtle away from the road, provided it is not actively nesting. Snapping turtles have an aggressive demeanor and a dangerous bite. If a turtle is to be relocated away from a road, please consider the following steps:

- Work in a team of two or three, ensuring proper footwear and gloves are being used.
- Never approach a Snapping turtle from the front. Snapping turtles have a surprisingly long reach and can snap quite quickly.
- There are several methods of reducing potential for turtle bites. Because Snapping turtles will snap when threatened, one approach to safely move a turtle is to place a stick in front of their face. They will bite onto it, and do not generally release once they've bitten something. Improvise other solutions to cover the turtles face, such as a cardboard box, hard hat, bucket, etc..
- Once the face is protected, you can try to move the turtle. Never lift a turtle by its tail or legs. Grip the top shell on either side of the tail, and use that grip to drag the turtle away from the road, or lift it into a crate, box, or wheel barrow.
- Move the turtle away from the road, near the closest watercourse if possible, in the same direction it was moving when identified.
- If a female turtle has begun digging a nest, but has not deposited eggs, they may still be moved. Female turtles will often dig several 'test pits' or scrapes before they begin laying eggs. A nest excavation which is near completion will be approximately the depth of the turtles fully extended hind leg. A turtle digging a nest that approaches this depth should be left alone.
- If a female turtle is in process of laying eggs or burying a nest when located, they cannot be moved. If it is safe to do so, place traffic cones near the turtle if it is located on a roadside, and have a team member check on the turtle until it is finished nesting.

If a nest, or nest in progress has been identified, a predator excluder should be placed on the nest. The predator excluder is a simple wooden frame (approximately 2' square), covered with wire mesh. The purpose of the predator excluder is threefold:

1. It serves as a nest marker, so it's location is known, and avoided by vehicles;
2. It reduces the likelihood that the eggs will be depredated by wild species such as raccoons, coyotes and foxes; and,
3. It acts as a protective barrier for turtle hatchlings when they emerge in the fall, so they can be collected and moved to a safe place, away from roadsides.

If a predator excluder is used, it's sides should be 'banked up' with rocks and soil to prevent species such as raccoons from digging up the eggs from the sides. Furthermore, it should be weighted down with one or more rocks. The major caution with predator excluders is that one person needs to be responsible for monitoring the excluder for hatchling emergence in the fall, so hatchlings can be released as soon as possible after emergence. It is recommended to check predator excluders daily, early in the morning. Hatchlings can be safely moved (with gloved hands) to the edge of the nearest watercourse, away from roadsides. Information on hatchling emergence can be collected at the time, if desired.

## 4.2 Monitoring Direct Habitat Loss

Construction of the Project will lead to the direct loss and alteration of vegetation and landscape features that currently provide wildlife habitat. Habitat within the Project area and surrounding landscape currently exhibits disturbed and fragmented conditions based on historic mine operations, existing road and trail networks, and current and historic timber harvesting activity within and adjacent to the Project area. However, project activities are still likely to result in direct habitat loss, increased habitat fragmentation and a decrease in habitat quality for those species which rely especially on interior forest conditions where intact interior forest remains. Many of the observed species are adaptable and commonly use anthropogenically disturbed environments (e.g., coyote, black bear, raccoon, white-tailed deer). Changes in habitat can influence the local abundance and distribution of wildlife, and will predominantly occur during construction and at certain periods during operation. Therefore, monitoring will be initiated during construction and continue into operations.

As-built drawings of the Project footprint and facilities will be prepared, and compared against existing vegetation maps to estimate vegetation classes disturbed, which will provide a measure of direct habitat loss for wildlife. The comparison will be quantitative. Typically, these maps are created through the purchase of satellite imagery, then delineated and digitized in a Geographical Information System (GIS) platform. However, AMNS may suggest alternate means of producing the as-built maps if the information is available through engineering activities.

### 4.3 Waste Stream Management

Carnivores and scavengers have a keen sense of smell and can be attracted from long distances if food items are frequently present. This increases the risk for accidental mortality of wildlife (e.g., collisions with vehicles) and the potential for wildlife interactions with people and the Project.

Good waste management practices and staff education are key to decreasing the availability of attractants at mine sites. Environmental design features, mitigation, and waste management plans will be implemented at the Project to limit the attraction of wildlife, and the associated increased risks of wildlife interactions and mortality. These mitigation strategies will be similar to proven best management practices and policies at the Touquoy Mine Site.

In conjunction with weekly site surveillance monitoring, environment staff will complete inspections of all waste management process components that involve potential attractants. The process will be described in the Waste Management Plan. Inspections will include surveys of waste storage onsite. Observations of wildlife and wildlife sign near waste or waste management facilities will be recorded. Wildlife incidents and wildlife deterrent actions will be reported to determine if they were linked to waste management processes.

Inspections will be completed by environment staff, and will document the areas inspected, the attractants found, infractions of the Waste Management Plan and follow-up actions. Inspections will be completed systematically throughout the year and during construction, operation, and closure. Should the inspections identify potential or actual availability of wildlife attractants (food waste in particular), or should observations of wildlife, wildlife sign, or wildlife incidents point to problems in the waste management process, immediate corrective actions will be taken or suggested by the environment staff. Some level of wildlife activity is anticipated regardless of the efficiency of waste management as wildlife may be present naturally or attracted to site even if there is no food reward. Regardless, the potential or actual availability of food waste for wildlife will be the trigger to initiate an investigation and corrective action.

## 5 ADAPTIVE MANAGEMENT

Adaptive management links environmental monitoring results to management responses; it is a structured, pre-defined response strategy to changes in regulatory, environmental or operational conditions. Adaptive management is generally considered to include four themes (Greig et al. 2008, WLWB 2010):

- learning to reduce management uncertainties;
- using what is learned to change policy and practice;
- focusing on improved management; and
- basing adaptive management on a structured and systematic approach.

Each year, the monitoring program will be reviewed by AMNS to assess whether the applied strategy is having the anticipated effect. AMNS will complete an annual report which will contain a summary of methods, current data collected, results and a record of wildlife observations, interactions, deterrent actions, and incidents (including mortalities). The report will also suggest changes for future years, if required.

### 5.1 Mitigation Audit

The mitigation described in this document stems from current practices at existing mines, or was suggested during the environmental assessment process. However, an auditing system is required to evaluate the mitigation. In other words, it should be confirmed that the mitigation proposed here is used and that it works. Further, new mitigation should be documented. Thus, an audit should be undertaken annually, specific to the mitigation listed in Section 3, to evaluate:

- if all mitigation has been implemented;
- which mitigation is perceived to be or shown to be successful;
- if new mitigation has been implemented in response to new issues; and
- if some mitigation is redundant.

This audit is implemented annually, as part of the WMMP annual report.

## 6 REPORTING

A report presenting the findings of the wildlife monitoring program, the effectiveness of mitigations and any applied adaptive management strategies will be submitted to regulators annually. If SOCI/SAR are observed during Project construction or operations, the appropriate regulatory agencies will be contacted to determine appropriate actions.

All wildlife sightings will be reported to the onsite Environment Department where a wildlife log will be developed to keep record of wildlife observations and interactions within the Project area. Any sightings of mainland moose will be recorded and included in an annual report to NSL&F.

In the event of encounters with injured wildlife at the worksite, the onsite Environment Department will contact the local Provincial Wildlife Officer. No attempt will be made to move the animal, and no person at the worksite will come into direct contact with the animal.

Any wildlife mortalities will be reported, as soon as possible, to the onsite Environment Department who will notify the local Provincial Wildlife Officer. The locations of wildlife will be marked and reported to the onsite Environment Department. The onsite Environment Department will record the date and time it was found; state of decomposition; injury sustained (if identifiable); and species. If an injured or sick mainland moose is identified, AMNS will consult with NSL&F to determine appropriate actions.

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## 8 ACRONYMS, UNITS, AND GLOSSARY

### 8.1 Acronyms and Abbreviations

AMNS	Atlantic Mining NS Inc.
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
ECCC	Environment and Climate Change Canada
EIS	Environmental Impact Statement
EPP	Environmental Protection Plan
DFO	Department of Fisheries and Ocean
GIS	Geographical Information System
NSESA	Nova Scotia Endangered Species Act
NSL&F	Nova Scotia Lands and Forest
PA	Project Area
SAR	Species at Risk
SARA	Species at Risk Act
SOCI	Species of Conservation Interest
VC	Valued Component
WMMP	Wildlife Mitigation and Monitoring Plan

**APPENDIX A**  
**LANDBIRD SAR MITIGATION AND MONITORING PLAN**

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**Landbird SAR Mitigation and Monitoring Plan  
Beaver Dam Mine Project**

Beaver Dam Mine Project  
Marinette, Nova Scotia  
Atlantic Mining Nova Scotia Inc.  
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## 1.0 Introduction

Atlantic Mining NS Inc. (AMNS) is proposing the construction, operation, decommissioning, and reclamation of an open pit gold mine in Marinette, Nova Scotia. The Beaver Dam Mine Project (the Project) would have an ore production rate of approximately 6,000 tons per day, over a five-year period. Ore from the Project would be crushed and transported approximately 31 km by road to the Moose River (Touquoy) mine for processing. Components of the Project include an open pit, material storage facilities (i.e., waste rock, topsoil and organic materials), mine haul roads, mine infrastructure for crushing, water management, hauling, truck maintenance, administration, and road upgrades.

McCallum Environmental Ltd. (MEL) has been contracted by AMNS to support in the responses to the second round of Information Requests (IR2) from the Canadian Environmental Assessment Agency (CEAA) and Nova Scotia Environment (NSE) (CEAA 2019) in response from the review of the Revised 2019 Environmental Impact Statement (EIS) for the proposed Project (AGC 2019). This landbird species at risk (SAR) monitoring plan has been developed to support the Updated 2021 EIS (AMNS 2021) and in response to IR2 CEAA-2-24 (AMNS 2021b):

- i. *Provide details on a landbird SAR monitoring program that would be implemented that includes adaptive management measures to be implemented in the event that unanticipated effects are detected.*

This plan has been developed in consultation with NSE, Nova Scotia Lands and Forestry (NSLF) and Environment and Climate Change Canada (ECCC), as per meetings held on October 10, 2020 (NSE), December 2, 2020 (NSE and NSLF) and April 6, 2021 (ECCC, NSE and NSLF).

The purpose of this Plan is to present monitoring protocols for landbird SAR during Project development phases and assess the effectiveness of applied mitigation measures, as well as satisfy the above stated conditions. This Plan aims to:

1. Outline the proposed mitigation measures designed to limit adverse effects from project operations to landbird SAR;
2. Present a revised pre-construction baseline survey based on the interaction of known landbird SAR habitats with Project infrastructure,
3. Provide a landbird SAR monitoring plan to be implement during Project operations to inform operational mitigation measures; and
4. Propose adaptive management strategies in the event that the Project results in unanticipated effects to landbird SAR.

## 1.1 Project Background

AMNS is proposing the construction, operation, and closure of an open pit gold mine located near Marinette, Nova Scotia. The Project Area (PA) consists of the three project components; Beaver Dam Mine Site, Touquoy Mine Site, and the Haul Road, and extends from Marinette to Moose River Gold Mines, Halifax County, NS. The ore from the Beaver Dam Mine Site is proposed to be transported by truck via the Haul Road to the existing Touquoy Mine Site for processing. The Beaver Dam Mine Site, Haul Road and Touquoy Mine Site are collectively referred to as the Project.

Dedicated avifauna baseline surveys were conducted in 2014, 2015, 2016 and 2019, to support the Updated 2021 EIS (AMNS 2021). These surveys included breeding bird, spring migration, fall migration, winter, nocturnal owl, diurnal raptor

migration and common nighthawk surveys. Additionally, incidental observations of SAR avifauna species were recorded during the suite of biophysical surveys which occurred within the PA.

## 1.2 Landbird SAR Mitigations

Breeding birds in Canada are protected under the *Migratory Birds Convention Act* (1994) and the Nova Scotia Wildlife Act, which prohibits the disturbance of migratory birds, their nests and eggs. SAR are further protected under federal *Species at Risk Act* (SARA) and the *Nova Scotia Endangered Species Act* (NSESA), and their associated regulations. The results of the proposed baseline survey and monitoring plan will aid in supplementing and refining, where necessary, the mitigation commitments outlined in the Updated 2021 EIS (AMNS 2021) and Wildlife Mitigation and Monitoring Plan. These mitigations will be implemented by the AMNS where disturbance to avifauna or direct loss of habitat is expected to support development of the Project and include the following:

- Avoiding clearing, grubbing and construction on native vegetation during the regional breeding season for migratory avifauna where practicable (beginning of April to end of August; ECCC 2015).
- Where this is not practicable, nesting bird surveys will be conducted by Environmental personal. AMNS will consult with NSLF prior to this work being conducted.
- Should any avifauna species initiate breeding or a nest be discovered in areas impacted by mine operations within the PA, the following actions will be taken:
  - The appropriate AMNS site personnel will be notified immediately. Regulatory agencies (ECCC and NSL&F) will be contacted to review appropriate mitigation measures and buffer zones.
  - Spatial setbacks and temporal restrictions will be applied to the nest until chicks have fledged.
  - Monitoring will occur by qualified personnel (e.g. Environmental Technician) to determine if the chicks have fledged and if operations can re-commence.
- Discourage ground- or burrow-nesting species (particularly common nighthawk and bank swallows, as directly requested by IR2 CEAA 2-24), by limiting the amount of exposed soil and stockpile slopes (< 70°) during the breeding season, where practicable.
  - If a bank swallow nest is observed outside of operational areas, the site will be maintained once chicks have fledged (flagged, buffer removed). The site will be monitored for reuse during the following breeding season, as part of the Operational Landbird SAR Monitoring Program. If a nest is found in operational areas (e.g., open pit), AMNS will consult with NSE to remove the nest/nest site.
- If a raptor nest is found within the forested areas to be cleared, a buffer zone appropriate to the species (as determined in consultation with NSL&F) would be placed around the nest.
- Monitor identified nests from a distance with a spotting scope or binoculars to verify the effectiveness of an identified buffer until the nests are inactive.
- Conduct routine inspections of the open pit area to remove any trapped or injured avifauna. If identified, determine a plan for removal in consultation with an avian specialist.

- Minimize on-site lighting while still allowing for safe operation and by installing downward-facing lights on site infrastructure and haul roads. Wherever practicable, install motion-sensing lights to ensure lights are not turned on when they are not necessary.
- Maintain speed limits on mine roads (max. 40 km/hr. within Beaver Dam Mine Site, 70 km/hr. along Haul Road) to minimize collisions with avifauna, implement dust suppression mitigations and conduct mobile refueling at least 30 m from any known breeding locations.
- While no significant impacts are expected from the Project to mature and interior forests, overall and in the greater adjacent area, in instances where these habitat types cannot be avoided specific mitigations are proposed in Section 6.10 of the Updated 2021 EIS (AMNS 2021).

In addition to the above, mitigations specific to landbird SAR are outlined in Table 6.13-17 of the Updated 2021 EIS (AMNS 2021) and include:

- A landbird SAR operational monitoring plan, as described in Section 1.3.2, will be implemented during Project development.
- Wetland monitoring will occur within the PA, in wetland habitat that will be avoided by the Project, to ensure that wetland integrity is maintained, as these are the locations which have the highest potential to support landbird SAR.
- Implement surface water quality monitoring program, as many landbird SAR are reliant on wetlands and sources of open water for critical life functions.
- Notify ECCC and NSL&F within 24 hours in the event of the mortality or injury of a landbird SAR.

Within the Beaver Dam Mine Site and Haul Road, wetland habitat which supports landbird SAR will be lost. A Wetland Compensation Plan (AMNS 2021) has been developed to restore wetland habitat area and function including habitat for identified landbird SAR that are known to breed in wetland, as requested by IR2 CEAA 2-24 (i.e., Canada warbler (*Cardellina canadensis*), olive-sided flycatcher (*Contopus cooperi*) and rusty black-bird (*Euphagus carolinus*)). This plan has been developed to mitigate wetland function (i.e., habitat loss) for observed landbird SAR as a result of the Project.

## 1.3 Landbird SAR Monitoring Program

As per condition i. (IR2 CEAA 2-24) a landbird SAR monitoring plan has been developed to reassess habitats within the PA, specifically the Beaver Dam Mine Site and Haul Road, that are known to support or have the potential to support landbird SAR and develop protocols in the event landbird SAR are observed during Project operations.

### 1.3.1 Baseline Survey Methodology

The plan will consist of a focused pre-construction baseline avifauna survey to confirm landbird SAR usage of the Beaver Dam Mine Site and Haul Road, in relation to Project infrastructure, and reconfirm findings presented in the Updated 2021 EIS (AMNS 2021). The baseline survey results will be used to guide the operational monitoring protocols and support the determination of mitigation and adaptive management measures.

The following landbird SAR species have been documented within the Beaver Dam Mine Site and Haul Road during EIS baseline surveys (AMNS 2021) and will be targeted during the landbird SAR monitoring program:

- Chimney Swift (*Chaetura pelagica*; COSEWIC & SARA: Threatened; NSESA: Endangered)

- Canada Warbler (*Cardellina canadensis*; COSEWIC & SARA: Threatened; NSESA: Endangered)
- Barn Swallow (*Hirundo rustica*, COSEWIC & SARA: Threatened; NSESA: Endangered)
- Olive-sided Flycatcher (*Contopus cooperi*; COSEWIC Special Concern; SARA & NSESA: Threatened)
- Common Nighthawk (*Chordeiles minor*, COSEWIC: Special Concern; SARA & NSESA: Threatened)
- Eastern Wood-pewee (*Contopus virens*, COSEWIC & SARA: Special Concern; NSESA: Endangered)
- Rusty Black-bird (*Euphagus carolinus*; COSEWIC & SARA: Special Concern; NSESA: Endangered)
- Evening Grosbeak (*Coccothraustes vespertinus*, COSEWIC & SARA: Special Concern; NSESA: Vulnerable)
- Peregrine Falcon (*Falco peregrinus*; COSEWIC: Not at Risk; SARA: Special Concerned; NSESA: Vulnerable)

All above listed species breed in Nova Scotia. Surveys will therefore take place during the breeding season (May 1 to August 30), and focused in the month of June where practicable, which is the peak breeding bird month (Maritime Breeding Bird Atlas, 2006). Survey methodology will follow breeding bird survey methods described in Section 6.13.3.2.8 of the Updated 2021 EIS (AMNS 2021).

Baseline surveys will take place prior to the commencement of construction. Pre-construction survey stations will be located in proximity to planned Beaver Dam Mine Site and Haul Road infrastructure. Survey effort will be focused on locations where historical observations of landbird SAR were recorded during baseline EIS surveys (AMNS 2021), specifically locations that are to be avoided or only partial impacted by proposed Project infrastructure, and in habitats with higher likelihood to support the observed landbird SAR. The survey stations will be a minimum distance of 250 m apart to avoid double counting observations and ensure adequate spatial coverage.

### 1.3.2 Landbird SAR Operational Monitoring Plan

Continued monitoring for landbird SAR will be conducted during construction and operations of the Beaver Dam Mine Site and Haul Road. The monitoring plan aims to detect, avoid, and mitigate Project interactions with landbird SAR through implementing the following protocols:

- Site personnel will be made aware of the mitigation and monitoring requirements outlined in this plan and the Wildlife Mitigation and Monitoring Plan. Site personnel will also be familiarized with the landbird SAR that have been identified on the Project and are known to nest around active construction, and their identifying features. These species will be included on the Wildlife Sighting Card.
- Daily inspections conducted by qualified personnel (i.e., Environmental Technician) of active Project areas, specifically the open pit, access roads, surface water structures, stockpiles and where landbird SAR were identified during the baseline surveys.
- Speed of vehicles will be monitored on site and the haul road, with posted speed limits.
- Should a nest be discovered, the appropriate authorities (ECCC and NSL&F) will be notified immediately so steps can be taken to identify the species and determine appropriate mitigation or avoidance.
- Should a nest or actively breeding birds be discovered during operations, the area will be avoided and undisturbed until they naturally leave the area after breeding season. Operations within the immediate area will



be immediately suspended until the necessary authorities (ECCC and NSL&F) are consulted to determine appropriate mitigative measures on a case-by-case basis.

General avifauna management protocols are outlined in the Wildlife Mitigation and Monitoring Plan, which will supplement the landbird SAR monitoring program.

## 1.4 Adaptive Management

In the event that mitigations are unsuccessful in adequately avoiding or eliminating Project impacts to landbird SAR, adaptive management strategies may be required. On-site observations and findings from the landbird SAR monitoring program will be studied to help determine appropriate adaptive management, in consultation with ECCC and NSL&F. Species-specific SARA Recovery Strategies and Management Plans will be evaluated in development of adaptive management approaches. These measures may include, but are not limited to:

- Auditory and visual deterrents (e.g., ultrasonics, predator decoys);
- Physical barriers (e.g., netting, perch deterrents);
- Increased monitoring, awareness training and/or reporting requirements; and
- Operational modifications, if practicable (dependent on activity and timing).

Implementation of deterrents will occur prior to breeding season, as to not disturb established species. Deterrent locations will be chosen based on findings from the SAR landbird baseline surveys, known occurrences from previous baseline surveys and observations made during the Landbird SAR Operational Monitoring Plan. If evidence of avifauna mortality or imminent danger is observed, ECCC and NSL&F will be contacted immediately contacted to determine appropriate actions.

Modifications to the landbird SAR monitoring program may be required to assess whether the applied strategy is having the anticipated effect. If the strategy has positive impacts on landbird SAR, it may be incorporated into the Project's mitigation measures. This process will be iterative as effectiveness monitoring will be used to refine and guide adaptive management approaches and mitigations.

## 1.5 Reporting and Correspondence

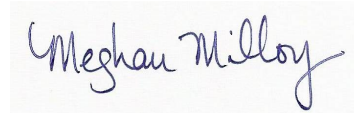
A report of the baseline survey findings will be submitted to NSL&F and ECCC prior to construction. A report presenting the findings of the landbird SAR monitoring program, the effectiveness of mitigations and any applied adaptive management strategies will be submitted to ECCC and NSL&F annually. If breeding activity or nests are observed during Project construction or operations, the appropriate regulatory agencies will be contacted, as discussed in Section 1.3, to determine appropriate actions. ECCC and NSL&F will be contacted within 24 hours in the event of the mortality or injury of a landbird SAR. In addition, the landbird SAR report, an annual report will be provided to ECCC and NSL&F describing all nests and bird interactions with the Project, as per the Wildlife Mitigation and Monitoring Plan.

## 2.0 Closure

Methods presented in this mitigation and monitoring plan are based on industry standards and best-practices. On-going monitoring will provide insight into the landbird SAR occupying and using the PA and their interactions with Project operations. This information will be used to assess mitigations and develop adaptive management strategies, as necessary.



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