Appendix A
Annual Compliance Report
Condition Requirements
Condition 4

2016 Rainy River Project Annual Report

newgold™ Rainy River Project

Project Name:

Rainy River Project

Proponent:

New Gold Inc.

Decision Statement Issued:

Jan 12th 2015

CEARIS Ref Number:

80007

Reporting Period:

2016

Condition 4:
Migratory Birds

Condition 4.1

The Proponent shall carry out all phases of the Designated Project in a manner that avoids harming or killing migratory birds, or disturbing, destroying or the taking of nests or eggs, with consideration of guidance provided in:

Status: Ongoing

Supporting Analysis:

Refer to supporting analysis 4.1.1 to 4.1.2

Condition 4.1.1

Environment Canada's policy on Incidental Take of Migratory Birds in Canada; and

Status: Ongoing

Supporting Analysis:

The Rainy River Project Environmental Team has implemented site wide notices regarding the bird breeding window, requirements for bird sweeps in new construction areas or areas that have been inactive for periods of time. The department is also the primary contact for any incidents or mortalities to birds, nests or eggs. In 2016, there was one incident of damage to a robin nest resulting in a loss of eggs. The cause was a lack of pre-inspection on a drill located in the open pit.

The Environmental Team will continue to implement monitoring programs and employee awareness in 2017.

Condition 4.1.2

Environment Canada's avoidance guidelines on General Nesting Periods of Migratory Birds in Canada.

Status: Ongoing

Supporting Analysis:

Members of the Rainy River Project Environmental Team have been trained by qualified professionals on conducting bird sweeps and identifying Species at Risk bird species. 233 bird sweeps were conducted between April and August in construction areas to ensure the absence of nesting birds or species at risk prior to excavation.

In areas where nests were found, appropriate buffers were flagged off around the perimeter of the buffer zone and the nests were monitored on a weekly basis until the nests were abandoned. Buffer zones were established based on input from New Gold RRP's consulting experts in conjunction with discussions from the Ministry of Natural Resources and Forestry. Vegetation clearing was prohibited during these months. This program will continue in 2017.

Condition 4.2

The Proponent shall, at all times, implement noise reduction measures to control sound levels from machinery to avoid harassing migratory birds.

Status: Ongoing

Supporting Analysis:

During the 2016 Construction Phase noise reduction measures employed were compliant with the EIS commitments. Reducing the size of blasts where appropriate and maintaining tree buffers where applicable provided other solutions to noise mitigation. Furthermore, vegetation clearing and constructing development in known nesting areas and mature forests was prohibited through the breeding bird window (May 1 to August 15).

Reporting during 2016 was completed as required by the Endangered Species Act permit for the Rainy River Project. As New Gold has been directed in the past by the Ontario Ministry of Natural Resources and Forestry that the Species at Risk information associated with the Rainy River Project is sensitive, copies of associated report(s) are not included herein. Please contact New Gold or the Ontario Ministry of Natural Resources and Forestry if you require further information.

Results indicated that there were no exceedances of the hourly sound criteria threshold at either receptor that were attributable to Project related activities.

Condition 4.3

The Proponent shall install and use site lighting fixtures in a manner that reduces light pollution in the surrounding environment to avoid disturbance to nocturnal species, such as the Common Nighthawk (Chordeiles minor).

Status: Ongoing

Supporting Analysis:

During the construction phase there are limited permanent lightning fixtures installed on the project site. Some temporary light plants are solar powered as shown in Figure 1: Example of Solar Light Plant, October 2016.

Temporary light plants are used only in areas where employees are working a night shift or if required for safety purposes. Light plants are designed so that lights can be angled toward the ground. During routine field inspections members of the Rainy River Environmental Department check light plants to ensure they are angled appropriately and used only when necessary. Monitoring and consideration to this condition will continue to be implemented as the project advances.

Figure 1: Example of Solar Light Plant, October 2016

Condition 4.4

The Proponent shall deter migratory birds from using the tailings management area.

Status: Not applicable at this time

Supporting Analysis:

During 2016 the Tailings Management Areas was not constructed due to permit delays. In mid-2017 a starter cell will be constructed in the TMA at which time tailings will be deposited and a plan to deter migratory birds from using the facility will be implemented.

Condition 4.5

The Proponent shall provide comparable replacement artificial nesting structures for Barn Swallows (Hirundo rustica) prior to the removal of existing nesting structures.

Status: Completed

Supporting Analysis:

Four artificial nesting structures were put in place in April 2015, prior to the 2015 breeding season. Information related to the success of these structures can be found in condition 4.8.

Figure 2: Barn Swallow Nest Box A, July 2016

Figure 3: Barn Swallow Nest Box B, July 2016

The four artificial nesting structures, called barn swallow nest boxes, are located in Overall Benefit Land on the following roads:

- Barn Swallow Nest Box A – Loslo Road, Figure 2
- Barn Swallow Nest Box B – Seven Bends, Figure 3
- Barn Swallow Nest Box C – Gallinger Road, Figure 4
- Barn Swallow Nest Box D – Teeple Road, Figure 5

Figure 4: Barn Swallow Nest Box C, July 2016

In the early spring of 2016 prior to the breeding bird window New Gold was required to eliminate one barn structure from the property due to safety and construction needs. As the project advances there will be additional homes and outbuildings that will be demolished or relocated. At that time the need to develop additional artificial nesting structures will be investigated.

Figure 5: Barn Swallow Nest Box D, July 2016

Condition 4.6

The Proponent shall monitor migratory birds, breeding activity and mortality, to evaluate the effectiveness of mitigation measures under conditions 4.1 to 4.3. If monitoring demonstrates an inconsistency with those conditions, then document how this has been rectified. Monitoring starts at construction and ceases at the end of the decommissioning phase.

Status: Ongoing

Supporting Analysis:

During 2016 the RRP obtained the professional assistance of AMEC Foster Wheeler to conduct appropriate monitoring of migratory birds and breeding activity in addition to site activities. Studies and activities included;

- Ongoing visual inspections of four artificial barn swallow nesting structures 2016. The structures were installed on April 2015. Nesting in a structure occurred in 2016.
- Development of a detailed Wildlife Monitoring Plan, included in SD 4.6a and 4.6b, that is currently under review by the MNRF which was implemented in 2016. The plan includes Species at Risk Monitoring and includes monitoring during the construction and operations phase as well as post mine closure.
- Acoustic monitoring in areas where Whip-poor-will were not known to be present to ensure sound decibels are within an appropriate range.
- Targeted point count surveys for diurnal SAR including Golden-winged Warbler, Barn Swallow and Bobolink and for woodland area-sensitive breeding birds in suitable habitat. Point counts will be based on standardized survey protocols described for the Ontario Breeding Bird Atlas Guide for Participants (OBBA 2001) so as to be consistent with baselines study methodology (Section 5.2.12);
- Incidental data collection for SAR and provincially rare species which are currently present at lower abundance including: Canada Warbler, Olive-sided Flycatcher, Short-eared Owl, American Pelican, Bald Eagle and Black-billed Magpie;
- Targeted twilight surveys for Eastern Whip-poor-will in suitable habitat. Whip-poor-will monitoring efforts will follow standardized survey protocols as outlined in the whip-poor-will Roadside Survey Participant's Guide (BSC 2012);
- Concurrent data collection for Common Nighthawk to be undertaken during targeted Eastern Whip-poor-will surveys as described above as no standardized survey protocols have been developed specifically for this species;
- Annual monitoring of active Bald Eagle nests which occur in close proximity the RRP site. Monitoring will attempt to establish fledging success;
- Implementation of a wildlife log of general breeding bird observations at the RRP site by employees (focused on raptors and raptor nests, and SAR species); and

In regard to mitigation strategies that are being implemented on the project to assist in monitoring and reduce adverse effects these include;

- Acquiring of 1468 hectares of lands to provide Eastern Whip-poor-will breeding territories and 348 hectares of field habitat suitable for Bobolink breeding habitat. These offset benefit lands are to compensate for habitat lost during the construction of the mine. Monitoring the success of these areas and potential impacts to the bird species is conducted through three phases; visual monitoring, monitoring of habitat use in the offset benefit lands and monitoring or rehabilitation plans during mine closure. In 2016 monitoring of phase 3 was completed.
- Reduction of speed limits on the project to reduce vehicle collisions with birds
- Restricting habitat displacement for mine infrastructure to periods outside the breeding bird season (May 1 to August 15).

In order to track mortality New Gold RRP has an onsite reporting system for employees to report any road collisions with birds and wildlife. During 2016 there were no bird mortalities reported.

Condition 4.7

The Proponent shall monitor use of the tailings management area by migratory birds under condition 4.4 from the start of the operations phase to the end of the decommissioning phase.

Status: Not applicable at this time.

Supporting Analysis:

Construction of the Tailings Management Area did not occur in 2016 therefore the need to monitor the area for use by migratory birds was not necessary.

When reviewing the 2016 New Gold RRP Wildlife Monitoring database there were reported sightings of pelicans in Marr Creek within the footprint of the Tailings Management Area.

Condition 4.8

The Proponent shall monitor the effectiveness of the artificial nesting structures created for Barn Swallows (Hirundo rustica).

Status: Ongoing

Supporting Analysis:

During the 2016 breeding season New Gold RRP Environmental team implemented the Bird Studies Canada Nest Watch protocol for monitoring the four artificial nesting structures located on site. Routine bi-weekly monitoring was completed between May and August 2016. Figure 6 shows the one nest built in a nesting structure, Barn Swallow Nest Box C, located on Gallinger Road.

Figure 6: Barn Swallow Nest in Nest Box C, July 2016

Figures

Supporting Documentation

SD 4.6a: RRP WMP Ver5 (June.7.2016)
SD 4.6b: RRP WMP Ver5 Appendices (June.7.2016)

RAINY RIVER PROJECT
FOLLOW-UP MONITORING PLAN
FOR
TERRESTRIAL SYSTEMS AND HABITAT RESTORATION
(INCLUDING MONITORING FOR SPECIES AT RISK)

PER PROVINCIAL ENVIRONMENTAL ASSESSMENT
NOTICE OF APPROVAL CONDITION 5

EA File No: EA 05-09-02 / EAIMS File No: 13102

VERSION 5

Date	Rev. #	Revision(s)	Originator
Jan. 22, 2015	0	None	Matt Evans, Amec Foster Wheeler
Apr. 20, 2015	1	From MNRF	Matt Evans, Amec Foster Wheeler
July 9, 2015	2	From MNRF and Nigel Fisher	Matt Evans, Amec Foster Wheeler
July 30, 2015	3	From Nigel Fisher	Matt Evans, Amec Foster Wheeler
Feb. 3, 2016	4	From MNRF	Matt Evans, Amec Foster Wheeler
May 25, 2016	5	From MNRF	Matt Evans, Amec Foster Wheeler

May 2016
TC111504

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TABLE OF CONTENTS

PAGE

TABLE OF CONTENTS (Cont'd)

PAGE

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1.0 PROJECT BACKGROUND

New Gold Inc. (NG; formerly Rainy River Resources Limited) is planning to construct, operate and eventually reclaim a new open pit and underground gold mine, the Rainy River Project (RRP) to produce doré bars (gold with silver) for sale.

Physical works related to the RRP will consist primarily of:

- Open pit;
- Underground mine;
- Overburden, mine rock and low grade ore stockpiles;
- Primary crusher and process plant;
- Tailings management area;
- 230 kilovolt transmission line;
- Relocation of a portion of gravel-surfaced Highway 600; and
- Associated buildings, facilities and infrastructure, supported by related piping and power infrastructure as needed.

Environmental baseline studies for the RRP have been ongoing since 2009 and have established a comprehensive understanding of the composition of local plant and wildlife communities within the Project footprint as well as on surrounding lands. Annual baseline reports have been produced in addition to annual Species at Risk (SAR) assessments. The assessment of potential environmental impacts was summarized in the RRP Final Environmental Assessment Report (Environmental Impact Statement) Version 2 (AMEC 2014a) submitted to the Federal and Provincial Governments, including for Aboriginal and public review.

Development of the RRP was initiated in 2015 following completion of the EA process and receipt of applicable environmental approvals. The entire RRP site will be under development through to the proposed 2017 Project production start date. NG has committed to considering environmental aspects, such as bird nesting seasons in the scheduling of RRP development activities. Tree clearing is to take place outside of the breeding bird nesting season (May 1 to August 15) and clearing or modification of known Trumpeter Swan breeding habitat will also be restricted to outside their respective breeding season (March 15 to August 15). Other RRP EA commitments are listed in Appendix 1.

2.0 REGULATORY FRAMEWORK

2.1 Environmental Assessment

The RRP involves activities listed in the Regulations Designating Physical Activities and was therefore subject to the *Canadian Environmental Assessment Act, 2012*. The Canadian Environmental Assessment Agency (CEA Agency) determined on October 18, 2012, that an EA was required. Rainy River Resources Ltd. (predecessor to New Gold Inc.; NG) also volunteered to be subject to an individual EA under the Ontario *Environmental Assessment Act*.

On January 17, 2014, NG submitted documentation intended to fulfill the EA requirements as defined by the Federal Environmental Impact Statement (EIS) Guidelines and Provincially-approved Terms of Reference:

- AMEC. 2014a. Rainy River Project, Township of Chapple, Final Environmental Assessment Report (Environmental Impact Statement), Version 2. Prepared for Rainy River Resources Ltd.

On January 12, 2015 the Rainy River Project was approved by the Federal Government and on January 28, 2015 it was approved by the Ontario Government. NG is committed throughout all phases of the RRP to inform its actions in meeting the Federal and Provincial Environmental Assessment (EA) Conditions by using the best available information and knowledge, based on validated methods and models, undertaken by qualified individuals using the best available technologies economically achievable for mitigation strategies.

2.2 Other Environmental Approvals

2.2.1 Other Federal Environmental Approvals

With respect to wildlife and wildlife habitats, no additional Federal environmental approvals are required beyond the Federal EA (under the *Canadian Environmental Assessment Act, 2012*).

The Federal *Migratory Birds Convention Act* (MBCA) nonetheless regulates the protection and conservation of migratory birds and prevents the disturbance or destruction of these birds, their nests, eggs and habitats. The MBCA makes it unlawful to pursue, hunt, take, capture, kill or sell birds listed therein. The statute does not discriminate between live or dead birds and also grants full protection to any bird parts including feathers, eggs and nests. Over 700 species are currently on the migratory bird list in Canada.

Compliance with the MBCA regulations and guidelines has been and will be undertaken during the RRP construction, operation and closure phases

2.2.2 Other Provincial Environmental Approvals

A Provincial *Endangered Species Act* (*ESA*) permit for Species at Risk (SAR; Eastern Whip-poor-will and Bobolink) is required and is described in Sections 6.2.1 and 6.3.1.3.

Compliance with regulations and guidelines for noise emissions, as recommended by the Ministry of the Environment and Climate Change in their *Environmental Noise Guideline NPC-300* (MOECC 2013) has been and will be undertaken during the RRP construction, operation and closure phases, as discussed in detail in the RRP Final EA Report / EIS (AMEC 2014a).

3.0 FOLLOW-UP MONITORING PLAN

3.1 Background and Context

In accordance with the *Canadian Environmental Assessment Act, 2012 (CEAA, 2012)* the purpose of the follow-up monitoring plan (FMP) is to verify the accuracy of the predictions made in the EA about the Project's impacts on wildlife and wildlife habitat, and to monitor the effectiveness of rehabilitation efforts for wildlife habitat and terrestrial environments. The FMP framework outlined herein is designed around four central principles of environmental protection:

- Do no harm culture;
- Respect for Aboriginal culture and values;
- Continuous improvement; and
- Compliance with all environmental approvals and authorizations.

The Provincially-approved Amended Terms of Reference (ToR) and the Federal EIS Guidelines provide for the development of a monitoring framework for compliance and effects monitoring, as part of the EA, with consideration being given to comments put forward by government agencies, Aboriginal groups and other stakeholders, including any FMPs developed through the Federal EA process. The approved Amended ToR also recognizes that monitoring details will be defined in part through the environmental approvals and permitting process that would follow EA approval.

In addition, the FMP is expected to:

- Provide for adaptive management in the event environmental effects are different from expected, new information becomes available, or mitigation measures prove to be less effective than anticipated; and

- Communicate the FMP results to RRP stakeholders and Aboriginal groups who are party to the program and to provide for their input into program results.

The FMP applies to the construction, operation, active closure and decommissioning, and post-closure phases of the RRP, as appropriate. NG will be responsible for carrying out the FMP but Federal and Provincial agencies and authorities will have a review and monitoring role regarding implementation of the FMP and will require NG to take corrective action for non-compliance as appropriate. Local Aboriginal groups are considered by NG to be involved parties for the purposes of the FMP, and accordingly, local First Nations and Métis will be provided with the annual results of the FMP. It is expected that the FMP will be reviewed from time to time to determine whether or not changes are required.

3.2 FMP Objectives

The RRP Final EA Report / EIS (AMEC 2014a) determined that approximately 2,170 hectares (ha) of terrestrial habitat will be directly displaced by RRP developments over the life of the mine. This 2,170 ha includes 1,352 ha of woodland habitat that will be cleared, with 1,090 ha consisting of second growth aspen-birch hardwood forest which is the dominant forest community type in the natural environment local study area (NLSA, as defined in AMEC 2014a). Forest clearing will impact 42 woodland features, 15 of which provide area sensitive woodland breeding bird habitat. Other community types comprising the largest areas of removal are active agricultural lands (277 ha), open wetland habitat (261 ha), coniferous swamp (16.5 ha) and cultural meadows or fallow fields (10.8 ha). Portions of 27 different community types will be removed, with 11 of these community types expected to experience displacements of less than 10 ha.

It is recognized that the NLSA supports a variety of wildlife species including species that are hunted and trapped, as well as breeding populations of nine SAR and three Provincially rare species (listed in Section 4.2). Species of greatest concern include two SAR: Eastern Whip-poor-will and Bobolink, which are both designated Federally and Provincially as Threatened. These two SAR are likely to be the species most impacted, both directly and indirectly, by the RRP.

The principal mitigation measures designed to limit adverse effects to terrestrial systems and to SAR are to develop as small an overall project footprint as practicable, and to avoid disturbance to SAR territories, such as known Eastern Whip-poor-will and Bobolink territories, where reasonably feasible. Where it is not reasonably feasible to avoid displacement or disturbance to known SAR territories, compensation through an *Endangered Species Act* (ESA) permit is being provided.

A FMP will monitor Project-related impacts and will ensure that the predicted effects on Valued Ecosystem Components (VECs; focusing on targeted species) were accurate and that they are properly mitigated. FMP monitoring will be based, where possible, on standard survey protocols used during baseline studies so that any changes in target species' populations may be detected.

The objectives of the FMP are to:

- Confirm and monitor the direct loss of habitat resulting from RRP activities for targeted species including SAR and area-sensitive species, and to monitor the expected recolonization of these habitats post closure;

- Monitor for any unanticipated reductions in habitat suitability for various targeted species resulting from disturbances caused by the RRP such as from sound and artificial lighting;

- Monitor and assess the use of alternate habitats within the NLSA or natural environment regional study area (NRSA) by targeted species displaced from the RRP footprint;

- Determine whether or not changes in vegetation structure, such as the construction of wetlands, promote new colonization by targeted species or provide alternate habitat for displaced individuals;

- Determine whether or not SAR compensatory habitat established under the Provincial ESA Permit (No. F-C-001-14) provides suitable habitat for the intended SAR (Eastern Whip-poor-will and Bobolink) and other species such as migratory birds;

- Monitor expected colonization and annual use of four artificial nest structures by Barn Swallows;

- Monitor indirect effects on SAR and Provincially rare species which are dependent on existing agricultural practices in the NLSA, such as Barn Swallow and Black-billed Magpie, which feed on insects attracted to the NLSA by livestock; and

- Monitor biodiversity (number of species present) as per Provincial Environmental Assessment Notice of Approval Conditions 14.1 and 14.2, including the production of a pre-construction biodiversity baseline report.

Except as defined otherwise below (e.g., for Eastern Whip-poor-will and Bobolink, winter aerial surveys for mammals and mammal tissue sampling), monitoring will occur:

- During the first two years of construction (2015 and 2016);

- In the first year following the completion of construction (2018) and at three year intervals thereafter, until completion of operations; and

- In years 1, 4, 7, 10 and 15 post closure, except for Eastern Whip-poor-will and Bobolink surveys which will be conducted until disturbed habitats have been recolonized (described in detail below in Section 6.3.1).

The FMP will be an outcome-based program and will be evaluated regularly. When predictions described in the RRP Final EA Report / EIS (AMEC 2014a) have been met (e.g., a focus species or habitat has returned to baseline conditions, or has returned to within 85% of the baseline conditions), or the objectives listed above have been met, discussions will be held with regulators regarding the cessation of that particular component of the monitoring program. New Gold has committed to conducting monitoring until year 15 post closure. A part of the evaluation process will be to determine if future monitoring is required beyond year 15 post closure and will be based on whether or not EA / EIS predictions or FMP objectives have been sufficiently met at this time.

4.0 SPECIES RECORDED IN THE PROJECT AREA

Environmental baseline studies for the RRP have been ongoing since 2009 and have established a comprehensive understanding of the composition of local plant and wildlife communities including SAR, within the Project footprint as well as on surrounding lands. Annual baseline reports have been produced (KCB 2011a; AMEC 2011a, 2012a, 2013a, 2013c, 2013d, 2013e, 2014b) in addition to SAR assessments (KCB 2011b; AMEC 2011b, 2012b, 2013b, 2014b). The assessment of potential environmental impacts was summarized in the RRP Final EA Report / EIS (AMEC 2014a), as well as the earlier drafts of the document, submitted to the Federal and Provincial Governments, and provided for an Aboriginal and public review periods.

4.1 Migratory Birds

Various types of breeding bird surveys were conducted between 2009 and 2014 to determine the diversity, density and distribution of breeding bird species utilizing the RRP site area, as described in detail in the various baseline reports, annual SAR assessments and in the RRP Final EA Report / EIS (AMEC 2014a).

A total of 167 bird species (Appendix 2) were observed during the RRP field investigations. Species diversity recorded during RRP investigations mirrored that of North American Breeding Birds Survey results occurring near the defined NLSA. Desktop analyses using high resolution aerial imagery coupled with baseline ground surveys indicated that bird habitat occurring within the NLSA is consistent with habitat occurring elsewhere in the NRSA. The strong diversity recorded in the area reflects the diversity of available habitat both in the NLSA and throughout the NRSA. This diversity derives in part from the proximity of the NRSA to the intersection of the Boreal Forest Region, the Great Lakes – St. Lawrence Forest Region, and the Prairie Grasslands Region, as well as the effect of Lake Superior on avian migration routes.

4.2 Species at Risk

Table 1 lists the 16 Federal and Provincial SAR that were recorded within the RRP NLSA during the 2009 to 2014 baseline surveys. The RRP Final EA Report / EIS (AMEC 2014a) provides detailed descriptions of these 16 SAR, where they were recorded within the NLSA and assesses potential Project-related effects on each.

Table 1: Federal and Provincial SAR Recorded within the RRP NLSA between 2009 and 2014

Species	Conservation Status		
	Provincial ESA	Federal SARA	Provincial S-Rank
BIRDS			
American White Pelican	Threatened	--	S2B
Bald Eagle *	Special Concern	--	S4
Barn Swallow *	Threatened	--	S4B
Bobolink *	Threatened	Threatened	S4B
Canada Warbler *	Special Concern	Threatened	S4B
Common Nighthawk *	Special Concern	Threatened	S4B
Eastern Whip-poor-will *	Threatened	Threatened	S4B
Golden-winged Warbler *	Special Concern	Threatened	S4B
Olive-sided Flycatcher *	Special Concern	Threatened	S4B
Peregrine Falcon	Special Concern	Special Concern	S4B
Red-headed Woodpecker *	Special Concern	Special Concern	S4B
Rusty Blackbird	--	Special Concern	S4B
Short-eared Owl	Special Concern	Special Concern	S4
REPTILES			
Snapping Turtle *	Special Concern	Special Concern	S5
MAMMALS			
Little Brown Myotis *	Endangered	--	S4
Northern Myotis *	Endangered	--	S3

Note:
* species known to breed or likely to breed within the NLSA

Appendix 3 lists 25 Federal and Provincial SAR that could potentially occur within the RRP NLSA and provides an assessment of the likelihood of occurrence within the NLSA based on several factors including the presence of appropriate habitat types.

No Federally or Provincially listed aquatic SAR were captured during baseline studies within the RRP NLSA. Three Lake Sturgeon were captured in the lower Pinewood River, approximately 27 km downstream of the RRP open pit and within the NRSA. COSEWIC has proposed six population Designatable Units (DU) for Lake Sturgeon within the Province of Ontario, but the Lake of the Woods – Rainy River populations currently have no schedule of status under the Federal *SARA*.

No plant SAR were recorded in the NLSA nor NRSA during the 2009 to 2014 baseline surveys. A review of the Natural Heritage Information Centre (MNR 2012) database revealed that two plant SAR are known to occur in the greater Rainy River area. Small-flowered Lipocarpha, listed Provincially as a Threatened Species and Federally as an Endangered Species, is confined to moist sandy beaches which have some protection from waves (COSEWIC 2002). This habitat does not exist within the NLSA. Western Silvery Aster, listed Provincially as Endangered and Federally as Threatened, grows in open bur oak savannahs on shallow soils over bedrock (MNR 2008) and this habitat does not exist within the NLSA either.

5.0 ANTICIPATED ENVIRONMENTAL IMPACTS ON WILDLIFE AND THEIR HABITATS

The potential for effects on migratory birds, SAR, local mammals and their habitats was assessed as part of the Federal and Provincial EA process and detailed results of this assessment are presented in the RRP Final EA Report / EIS (AMEC 2014a). Potential RRP-induced adverse effects to migratory bird communities, SAR, local mammal communities and their habitats include:

- Direct loss of habitat;
- Habitat abandonment due to chronic disturbance or a decrease in habitat quality;
- Decreased reproduction due to habitat loss or a decrease in habitat quality; and
- Mortality.

These effects may be incurred directly or indirectly through mine activities by means of land clearing, changes to habitat quality / suitability related to increased human presence and increased sound, light and dust emissions, and collisions with Project vehicles or structures.

As per the above, approximately 2,170 ha of terrestrial habitat will be directly displaced by RRP developments over the life of the mine, including 1,352 ha of woodland habitat that will be cleared resulting in a loss of habitat that could be used by migratory birds, SAR and other wildlife. Approximately 1,265 ha of woodlands providing deer yarding habitat, as well as the removal of bordering agricultural and shrub lands (277 ha and 79 ha, respectively) which provide foraging habitat will be lost, along with 10.2 ha of Moose late winter habitat.

Eastern Whip-poor-will and Bobolink individuals will be impacted through habitat loss and noise production associated with the RRP. The woodland and agricultural habitats identified above are habitats used by these species and it has been predicted that these species will likely be the species most impacted by the RRP.

Barn Swallow nests were recorded in four farm buildings occurring on rural properties near each of these locations. Buildings on six rural properties providing suitable nesting structures within the RRP footprint may be removed during operations in order that they do not pose a public safety hazard (due to lack of use / ongoing maintenance).

RRP construction, operation and decommissioning will likely result in increased traffic both within the RRP site, the NLSA and along Highway 71 which is expected to provide the primary access route of local workers to the mine. Given the high density of White-tailed Deer occurring within the NLSA and their desensitization to road traffic, collisions with deer may affect both local deer as well as humans. Project development will also result in decreased connectivity between local ungulate habitat areas; particularly between areas to the north and south of the RRP site. This will force ungulates to move around the site either to the east or to the west.

Noise disturbance can cause adverse effects on wildlife, particularly birds and bats, in a variety of ways, most notably interference with important signals such as communications by mates (e.g., Songs of territorial males, calls of females), begging or communication by offspring, and blockage of sounds made by competitors or approaching predators or prey (Dooling and Popper 2007, USFWS 2012). Chronic noise disturbance can decrease breeding success, increase mortality rates and lead to an overall decrease in population density and/or species diversity. Sound emissions at the RRP will be greatest in areas of heavy equipment operation, most notably in association with the open pit and stockpiling operations, as well as in association with process plant and crusher operations. Sound disturbance will have lesser adverse effects in areas of low traffic such as the proposed transmission line and the tailings management area.

The effects of dust on wildlife and their habitats is expected to be minimal and confined to narrow strips of habitat along roads. Dust will accumulate on roadside plants and this may affect the ability of a plant to produce seeds and berries, potentially decreasing food sources for some species in the affected areas. If seeds and berries are produced by plants affected by dust and are ingested by individuals, then the dust would also be ingested. Considering the availability of various types of habitat located throughout the NRSA and the region in general, it is expected that wildlife will forage mainly in higher quality, undisturbed habitats located away from road noise and away from plants influenced by dust accumulation.

6.0 MEASURES TO AVOID, MINIMIZE OR MANAGE ENVIRONMENTAL EFFECTS TO WILDLIFE AND THEIR HABITATS

6.1 Measures to Avoid Environmental Effects to Wildlife and their Habitats

As indicated in the RRP Final EA Report / EIS (AMEC 2014a; e.g., Table 11-1), NG has made considerable efforts to avoid migratory birds, SAR, mammals and their habitats. The strategies proposed to avoid impacts to migratory birds, SAR, mammals and their habitats include:

- Minimizing loss of migratory bird and SAR foraging and nesting habitat and critical mammal habitat by developing a compact RRP site to reduce overall habitat loss;
- Limiting potential adverse effects related to sound and dust emissions, to the extent practicable.
- Restricting habitat clearing to periods outside of the breeding bird season which extends between May 1 and August 15;
- Developing a compact RRP site to limit the extent of removal of Barn Swallow foraging habitat or nesting structures (i.e., farm buildings, bridges); and
- Altering the RRP footprint through consultation with the MNRF in order to further avoid known whip-poor-will territories where feasible, including maintenance of forest buffers between RRP components and whip-poor-will nesting and foraging habitat where practical.

6.2 Measures to Minimize or Manage Environmental Effects on Wildlife and their Habitats

The RRP Final EA Report / EIS (AMEC 2014a) considered many alternatives to the location and size of various Project components to minimize negative affects to wildlife including SAR. The RRP Final EA Report / EIS also considered numerous mitigation measures that will assist in minimizing negative effects, to the extent practicable, where avoidance was not possible.

General mitigation strategies for limiting adverse effects to SAR and their habitats within the NLSA include the following (specific mitigation measures and compensation activities related to the RRP *ESA* permit for Eastern Whip-poor-will and Bobolink are provided further below in Sections 6.2.1 and 6.3.1.3):

- Implementing sound abatement strategies where necessary to dampen sound infiltrating habitats surrounding high traffic areas of the mine;

- Maintaining forest buffers between RRP components and SAR nesting and foraging habitat where practical;

- Managing dust through dust suppression activities (best management practices);

- Where feasible, managing of site lighting fixtures to reduce excess light production near Eastern Whip-poor-will and Common Nighthawk foraging areas so as to minimize disturbing these nocturnal birds (with all appropriate health and safety issues considered);

- Identifying active and potential Barn Swallow nesting colonies prior to mine construction and if necessary, removing these nesting structures outside of the breeding bird season which occurs from May 1 to August 15. Creating artificial nesting structures to replace any removed Barn Swallow nesting sites, to encourage recolonization or new colonization by Barn Swallows in areas where farm structures are removed;

- Avoiding the use of herbicides and pesticides in areas that could impact SAR (herbicides and pesticides will not be used along the transmission line ROW);

- Enforcement of speed limits along mine-controlled roads to reduce the potential adverse effects and/or collisions with ungulates of increased vehicular traffic associated with the RRP. Signs warning drivers of the possibility of wildlife encounters will be posted in areas of high wildlife activity. A log of collisions will be kept to monitor the effectiveness of the proposed mitigation and additional mitigation measures will be implemented if necessary;

- Conducting environmental induction of RRP personnel, including training for SAR awareness, identification, sensitivities and knowledge of the RRP ESA permit conditions, and workers and contractors will be made aware of seasonal changes in wildlife behaviour or presence in proximity to the mine;

- Implementing a SAR monitoring plan for all SAR populations that may be present in proximity to the proposed mine and transmission line sites, within compensatory habitat areas and in appropriate control areas;

- Restoring disturbed habitats at mine closure and encouraging development of habitat types capable of supporting a diversity of wildlife species, including migratory birds, SAR, ungulates and other mammals;

- Limiting hunting, and in some cases restricting hunting, on lands owned by RRR around or contiguous with the mine site;

- Treatment of the tailings slurry for cyanide destruction and heavy metal precipitation before deposition in the tailings management;

- Fencing the tailings management area to prevent access;

- Covering the exposed tailings beach at closure with a layer of overburden and flooding the remaining tailings with a layer of water to prevent the tailings from oxidizing over the longer term. This will ensure that the tailings pond waters remain of high quality, such that they will not pose a threat to wildlife. The margins of the tailings pond will develop as wetland habitat; and

- Disposing of food wastes generated on site in a manner that limits the attraction of wildlife, such as Black Bear (a potential predator to ungulates).

6.2.1 Additional Measures to Minimize or Manage Environmental Effects Specific to Species at Risk

As per Section 11 of the RRP ESA permit, if a regulated SAR (presently listed by *SARA* or the *ESA*, or listed in the future) is encountered on the Project site:

- Any activities that may adversely impact the regulated species (that harm or harass the species or removes the species' habitat) will cease immediately;

- The MNRF will be contacted immediately to discuss how and when activities shall resume; and

- A Species Encounter Report will be provided to the MNRF within 30 days of the encounter.

If a regulated SAR (presently listed by *SARA* or the *ESA*, or listed in the future) is injured on the Project site, Project personnel will:

- Ensure that the individual is protected from further harm;

- Seek veterinary advice/care for the individual;

- Contact the MNRF by the next business day; and

- Submit a Species Encounter Report to MNRF within 30 days of the encounter.

If a regulated SAR (presently listed by *SARA* or the *ESA*, or listed in the future) is found dead within the Project site, Project personnel will:

- Collect the individual and store it in a safe and cool place;

- Contact MNRF within one business day;

- Comply with any instructions provided by MNRF regarding the handling of the dead individual; and

- Submit a Species Encounter Report to MNRF within 30 days of the encounter.

Implementation of Artificial Nesting Structures for Barn Swallows

NG has committed to identifying active and potential Barn Swallow nesting colonies prior to mine construction (Figure 2) and if necessary, removing these nesting structures outside of the breeding bird season which occurs from May 1 to August 15.

Artificial nesting structures will be developed to replace any removed Barn Swallow nesting sites, to encourage recolonization or new colonization by Barn Swallows in areas where farm structures are removed. Four free standing nesting structures have been placed in locations near Barn Swallow foraging habitat (Figure 2) and will be monitored annually for occupancy (e.g., nesting birds present) nest density and fledging success.

Additional Provincial Requirements (ESA) for Eastern Whip-poor-will and Bobolink

The RRP Final EA Report / EIS (AMEC 2014a) found that local Eastern Whip-poor-will and Bobolink individuals will be impacted through habitat loss and sounds associated with the RRP. As a result, NG has obtained an ESA 17(2)(c) Overall Benefits Permit (Permit No. FF-C-001-14).

Since 2012, considerable discussions have taken place between NG and the MNRF (Fort Frances District) on how best to accommodate the Eastern Whip-poor-will and Bobolink, where adverse effects are unavoidable and how best to develop compensation strategies to support these species and to achieve overall benefits for them. Through ongoing consultation with the MNRF, NG has agreed to the following components as part of overall benefits compensation packages required by Permit No. FF-C-001-14 for Eastern Whip-poor-will and Bobolink:

- Altering the RRP footprint through consultation with the MNRF in order to further avoid known Eastern Whip-poor-will territories where feasible;

- Providing over 1,530 ha of Eastern Whip-poor-will compensatory habitat (representing the equivalent of at least 37 whip-poor-will territories) and 348 ha of Bobolink compensatory habitat that protect known territories and other identified suitable habitat, and protects habitat used by other species such as Common Nighthawks and other sensitive grassland species;

- Developing and implementing a management plan for Eastern Whip-poor-will compensatory habitat areas (also known as overall benefit areas);

- Implementing a management plan for Bobolink compensatory habitat areas including maintaining compensatory habitats as hayfields in conditions suitable for Bobolink; consisting of late maturing grasses typical for the area, with at least one grass species that exceeds 50 cm in height under normal growing conditions, void of woody species and no haying shall occur between May 1 and July 31;

- Implementing monitoring plans for Eastern Whip-poor-will and Bobolink populations (and thus for Common Nighthawk populations and all grassland species as well) nesting in proximity to the proposed mine and transmission line sites, within compensatory habitat areas and in appropriate control areas, for the life of the Project including the post-closure phase;

- Developing Site Rehabilitation Plans for Eastern Whip-poor-will and Bobolink that will be implemented during progressive reclamation and at closure; and

- Implementing a multi-year Eastern Whip-poor-will habitat research program in collaboration with the MNRF, beginning in 2015, in order to further our understanding of this species, as part of a larger overall benefits compensation package required by the RRP ESA permit (leading to the publication of at least one government technical report).

6.3 Approach to Monitoring Wildlife and their Habitats

6.3.1 Monitoring the Effectiveness of Mitigation Measures and Predictions for Migratory Birds, SAR and Mammals

The RRP FMP for breeding migratory birds, SAR and their habitats follows EC's guidelines for surveys as outlined in *Mining Project Baseline Desktop Assessment and Survey Requirements* (EC 2014a) as well as other pertinent information found in *Incidental Take of Migratory Birds in Canada* (EC 2014b) and *General Nesting Periods of Migratory Birds in Canada* (EC 2014c).

Migratory bird and SAR surveys (with the exception of Eastern Whip-poor-will and Bobolink) will be conducted during the first two years of construction (2015 and 2016) and post construction monitoring surveys will be carried out in the first year following the completion of construction (2018) and at three year intervals during operations, as well as during the first 15 years after operations (in years 1, 4, 7, 10 and 15). This long term monitoring of migratory birds, SAR and wildlife habitats will be conducted concurrently at the same impact and control sites using survey techniques as detailed below.

6.3.1.1 Migratory Birds

Methods for monitoring adverse effects to migratory birds and their habitats following the implementation of proposed mitigation measures will include the following:

- Tracking habitat removal for development and operation of the RRP, in comparison to the proposed removal of habitats defined in the RRP Final EA Report / EIS (AMEC 2014a);

- Point count surveys for breeding migratory birds (including SAR) at long term monitoring control and impact survey stations.

- Habitat assessments of migratory bird breeding habitat at established long term monitoring point count stations (same locations as those described in the previous bullet);

- Additional SAR monitoring for Bobolink and Eastern Whip-poor-will as defined in the RRP *ESA* permit and/or outlined in Sections 6.2.1 and 6.3.1.3;

- Collecting incidental data during other wildlife monitoring surveys; and

- Implementation of a wildlife log (SAR, large mammals, raptors and raptor nests, frogs, turtles and snakes).

Long term monitoring of migratory birds and their habitats will be conducted at impact and control sites located in and around the periphery of the RRP footprint (Figure 1) to support a Before-After Control-Impact (BACI) study design to quantify Project-related effects on birds and their habitats. The BACI design is statistically powerful and defensible and this design will allow for comparisons across years and provides the ability to assess any changes in species occurrence, abundance, distribution and richness over time within the impact areas compared to areas located outside the impact zone.

Impact sites around the periphery of the mine site were selected from point count stations surveyed at least once during the 2009 to 2014 baseline breeding bird studies, and are located within an area where noise from mine operation is expected to be greater than the average ambient noise level of approximately 40 decibels (dB). During data analyses, these impact sites will be paired with control sites located at least 5 km from the proposed mine (Figure 1), chosen to reflect a similar representation of ecosites found at impact sites, but in areas further from mine components where the average ambient noise level is approximately 40 dB or less. Also during data analyses, the impact sites along the transmission line ROW will been paired with control sites located at least 1 km from the ROW (Figure 1).

Point count surveys will be conducted twice during the breeding bird season and follow standardized protocols (Fuller and Langslow 1994; EC 2014a).

6.3.1.2 Species at Risk

Methods for monitoring adverse effects to SAR and their habitats following the implementation of proposed mitigation measures will include the following:

- Conducting multi-year point count surveys for SAR (and migratory birds) at permanent control and impact survey stations;

- Conducting SAR habitat assessments at established long term monitoring point count stations (same locations as those described in the previous bullet);

- Monitoring Eastern Whip-poor-will and Common Nighthawk populations nesting in proximity to the proposed mine and transmission line sites, within compensatory habitat areas and in appropriate control areas, for the life of the Project including the post-closure phase (monitoring schedule outlined in Table 2);

- Monitoring Bobolink populations (and thus all grassland species) nesting in proximity to the proposed mine and transmission line sites, within compensatory habitat areas and in appropriate control areas, for the life of the Project including the post-closure phase (monitoring schedule outlined in Table 3);

- Monitoring management activities within the approximately 1,900 ha of Eastern Whip-poor-will and Bobolink compensatory habitat;

- Implementing a multi-year Eastern Whip-poor-will habitat research program starting in 2015, in order to further our understanding of this species;

- Implementing and monitoring Eastern Whip-poor-will and Bobolink Site Rehabilitation Plans;

- Monitoring Barn Swallow nesting at artificial nesting structures placed outside of the RRP footprint (Figure 2);

- Collecting incidental data during other wildlife monitoring surveys; and

- Implementing a wildlife log (focused on SAR, large mammals, raptors and raptor nests, frogs, turtles and snakes).

Barn Swallow

Four artificial nesting structures created for Barn Swallows will be monitored annually for occupancy, nest density and fledging success and the results of these surveys will be included in annual monitoring reports. The expectation is to maintain an active nesting population of Barn Swallows within these nesting structures through the life of the Project, and to return to a post closure population size within the rehabilitated Project footprint that is similar in size to the baseline population (29 individuals were recorded between 2009 and 2014).

Bald Eagle

Any known Bald Eagle nests will be monitored to determine annual and seasonal eagle activity at the nest site and to attempt to establish fledging success when active. Currently, a Bald Eagle nest is located east of the RRP footprint (Figure 3). No other Bald Eagle nests were located within 5 km of the RRP footprint. If new Bald Eagle nests are recorded during any phase of the RRP, the nest(s) will be monitored annually. If monitoring indicates that Project activities are having a negative effect on any nests or on the behaviour of the nesting eagles, Project works will be adjusted appropriately to reduce adverse effects.

6.3.1.3 Additional Monitoring Requirements for Eastern Whip-poor-will and Bobolink

Eastern Whip-poor-will Monitoring Plan

A long term RRP monitoring plan for Eastern Whip-poor-will has been designed in consultation with the MNRF (Fort Frances District) and is included in the RRP ESA permit (survey stations are shown in Figure 1). Eastern Whip-poor-will monitoring began in 2015 and will continue into the post closure phase until monitoring indicates that Project areas rehabilitated for Eastern Whip-poor-will are occupied by at least 13 territorial males for two consecutive years (in accordance with the conditions of the RRP ESA permit). The monitoring plan will have three phases, consisting of the following:

Phase 1: Monitoring will occur during and after construction and operation activities to determine whether areas within and peripheral to the Project footprint are occupied by Eastern Whip-poor-will. Phase 1 monitoring will also include an assessment of sound levels during the breeding season in three designated Eastern Whip-poor-will receptor habitats.

Phase 2: Monitoring will occur within the Eastern Whip-poor-will OB Areas to determine which areas are occupied by Eastern-Whip-poor-will and to assess their occupancy and distribution relative to habitat management actions implemented through the life of the RRP ESA permit (to be defined in the Management Plan with MNRF for Eastern Whip-poor-will OB Areas).

Phase 3: After implementation of the Eastern Whip-poor-will Site Rehabilitation (ESR Plan) at closure, monitoring for Eastern Whip-poor-will will be conducted in areas of the Project site that are rehabilitated for Eastern Whip-poor-will to determine:

- Which areas become re-occupied by Eastern Whip-poor-will;
- The effectiveness of rehabilitation actions outlined in the ESR Plan; and
- Whether the Project site is re-occupied by Eastern-Whip-poor-will at levels equal to or greater than levels prior to habitat clearing for construction.

All Eastern Whip-poor-will surveys will be conducted during the breeding season in May and June and will be conducted in accordance with the protocols described by the *Whip-poor-will Roadside Survey Participant's Guide* (BSC 2012) as well as protocols described by the Center for Conservation Biology Nightjar Survey Network (nightjars.org).

Table 2: Monitoring Schedule for Eastern Whip-poor-will in the Project Site, Areas around the Periphery of the Project Site and in OB Areas

Year	Project Site	Peripheral Areas	OB Areas
2015	Phase 1 Monitoring Sequence 1	Phase 1 Monitoring Sequence 1	
2016			Phase 2 Monitoring Sequence 1
2017			
2018			
2019	Implementation of the Management Plan for Eastern Whip-poor-will OB Areas		
2020		Phase 1 Monitoring Sequence	
2021			
2022	Phase 1 Monitoring Sequence 2	Phase 1 Monitoring Sequence	
2023			
2024		Phase 1 Monitoring Sequence	
2025			
2026			Phase 2 Monitoring Sequence 2
2027			
2028			
2029			
2030			
2031			
2032	Mine Closure		
2033	Phase 3 monitoring is conducted over three year periods recurring as necessary until Project areas rehabilitated for Eastern Whip-poor-will are occupied by at least 13 territorial males for two consecutive years (in accordance with condition 6.2(d) and 9.1(a) of the RRP ESA Permit).		
2034			
2035			
2033			
2034			
2035			
2036			
2037			
2038			
			Phase 2 monitoring continues in OB Areas until the RRP ESA permit expires. Surveys for three concurrent years followed by seven years of no monitoring. Repeat as necessary in accordance with condition 6.1(b), 6.2(b) and 9.1(a) of the RRP ESA Permit.

Eastern Whip-poor-will Research Program

The ultimate objective of the Eastern Whip-poor-will research program is to assess whip-poor-will breeding habitat selection in the area of the RRP and to use this information to enhance Whip-poor-will habitat utilization of the OB Areas, as well as to guide the restoration of disturbed Project lands at mine closure. If successful, the results of this study are expected to provide a solid prescriptive management framework for maintaining, enhancing, and restoring local whip-poor-will breeding habitat, directed at maximizing habitat functionality that will allow for long term occupancy and increased local reproductive output. In doing so, this study will provide additional overall benefits to the species, above and beyond those provided by protecting and monitoring compensatory habitats by way of: i) furthering our understanding of breeding habitat selection by this species; ii) developing sound breeding habitat management strategies, based on observational studies and scientific experimentation; and iii) disseminating this information to the scientific community through a technical report or a peer-reviewed journal publication.

To achieve this ultimate objective, several proximate objectives have been set for this study, designed to complement and inform OB habitat management objectives and other monitoring commitments already specified in the RRP ESA permit and in the RRP Final EA Report / EIS (AMEC 2014a). These proximate objectives are to:

1) Compare macro- and microhabitat features found within in areas occupied by Whip-poor-will, at both higher and lower densities, to areas that remain unoccupied, both within OB Areas and areas elsewhere in the RRP NLSA. Results from this aspect of the proposed study are expected to provide valuable information to be used in the development of the Management Plan for Eastern Whip-poor-will OB Areas and the RRP overall Eastern Whip-poor-will Site Rehabilitation Plan;

2) Conduct a whip-poor-will habitat reclamation study beginning with the reclamation of Tait Quarry, taking into consideration data on species utilization of the existing NG Roen Road aggregate pit site, which can be used to help guide quarry restoration plans. Results from this aspect of the proposed study could provide valuable information to be used in the development of the Management Plan for Eastern Whip-poor-will OB Areas and the RRP overall Eastern Whip-poor-will Site Rehabilitation Plan;

3) Assess management activities in OB Areas that are designed to enhance unoccupied Whip-poor-will habitat by monitoring responses in occupancy and density of these areas to experimental treatments (habitat manipulations) within the unoccupied OB Areas, through the life of the Project and the RRP ESA permit; and

4) Experiment with a variety of methods of restoring disturbed whip-poor-will habitat patches during progressive reclamation and post-closure, in an attempt to assess whip-poor-will breeding habitat selection by monitoring responses in occupancy and density of these areas through the life of the Project and the RRP ESA permit.

Habitat management strategies for whip-poor-will OB Areas will be developed within the RRP Management Plan for Eastern Whip-poor-will OB Areas and will be submitted to the MNRF for approval within four years of the effective date of the RRP ESA permit, as specified in the permit. This management plan will be based on the best available scientific information collected on site during this proposed study and from studies conducted elsewhere in North America, where applicable. The nature of a habitat management plan is to manage or alter designated habitat areas to achieve a particular goal.

The first goal of the Management Plan for Eastern Whip-poor-will OB Areas will be to maintain occupied areas in a state such that the habitat remains suitable for whip-poor-will for the life of the RRP ESA permit and remains occupied by the species. A second goal of the Management Plan for Eastern Whip-poor-will OB Areas will be to enhance unoccupied areas to make them more attractive to whip-poor-will and thus encourage colonization and annual occupancy, based in part on research findings linked to the study program defined herein. However, in order to achieve either of these goals NG first needs to determine, if possible, what the Eastern Whip-poor-will breeding habitat preferences are and at what scale they occur (e.g., at the forest stand scale, at the nest site scale, or a combination of the two). Ultimately, the proposed research program will provide valuable information to be used in the management plan and would lead to:

- An increase in the quality and amount of suitable habitat for the species;
- An increase in the number of breeding pairs located within the study area;
- An increase in the distribution of the species within the OB areas; and
- An increase in the local distribution of the species, within the OB Areas during Project operations, and around the Project site post-closure.

This research will build on the M.Sc. thesis results produced by Greg Rand at Trent University (Rand 2014) and will result in a government technical publication to be reviewed by government biologists and external whip-poor-will experts. The proposed actions and outcomes of this research could also contribute to the recovery and protection of this species by providing valuable information for guiding province-wide species recovery plans and by promoting increased public education and awareness.

To date, NG has acquired and protected compensatory habitat for the equivalent of 37.5 Whip-poor-will territories resulting in 1,562 ha of whip-poor-will OB areas, at a cost of over $5 million. NG has also contributed $150,000 to a Trent University study (2011 to 2012) that has resulted in the publication of a M.Sc. thesis (Rand 2014) and will likely result in the publication of at least one peer-reviewed scientific journal article. This partnership with Trent University (and the MNRF) has already resulted in assessing the merits of various methodologies used to study this species including the use of infra-red cameras, radio-transmitters, nest searching and the use of blood

stress hormones (corticosteroids) to assess stress physiology as it relates to habitat selection by this species. From 2011 to 2014, NG has also spent over $400,000 to employ AMEC Environment & Infrastructure (AMEC) to: i) research Whip-poor-will in the proposed Project NLSA; ii) locate suitable compensatory OB areas; and iii) to consult with the MNRF in obtaining an ESA 17(2)(c) Overall Benefits Permit. The research program proposed will serve as an effective tool to tie together the results of previous studies and to continue to provide new information regarding the ecology a species that is not well understood.

Bobolink Monitoring Plan

A long term RRP monitoring plan for Bobolink has been designed in consultation with the MNRF (Fort Frances District) and is included in the RRP ESA permit (survey stations are shown in Figure 1). Bobolink monitoring will begin in 2015 and will continue into the post closure phase until monitoring indicates that Project areas rehabilitated for Bobolink are occupied by territorial males for two consecutive years (in accordance with the conditions of the RRP ESA permit).

Monitoring will occur in areas within and around the periphery of the Project's footprint during all Project phases (for the life of the RRP ESA permit) and in protected compensatory habitat areas known as Bobolink OB Areas. The monitoring plan will have three phases, consisting of the following:

Phase 1: Monitoring will be conducted during and after construction and operation activities within the Project site and in peripheral occupancy areas in order to assess the response of Bobolink to the construction and operation activities.

Phase 2: Monitoring will occur within the Bobolink OB Areas to determine which areas are occupied by Bobolink and how many individuals are present.

Phase 3: After implementation of the Bobolink Site Rehabilitation (BSR Plan; in accordance with the conditions of the RRP ESA permit) at closure, monitoring for Bobolink will be conducted in areas of the Project site that are rehabilitated for Bobolink to determine:

- Which areas become re-occupied by Bobolink;
- The effectiveness of rehabilitation actions outlined in the BSR Plan; and
- Whether the Project site is re-occupied by Bobolink at levels equal to or greater than levels prior to habitat clearing for construction in.

Bobolink surveys will be conducted as morning point count surveys, occurring twice between mid-June and early July, at least 10 days apart, and will follow standardized protocols (Fuller and Langslow 1994, EC 2014a).

Table 3: Monitoring Schedule for Bobolink in the Project Site and in OB Areas

Year	Project Site	Overall Benefit Areas
2015	Phase 1 Monitoring Sequence 1	
2016		
2017		Phase 2 Monitoring Sequence 1
2018		
2019		
2020		
2021		
2022		
2023		
2024		
2025		
2026		Phase 2 Monitoring Sequence 2
2027		
2028		
2029		
2030		
2031		
2032	Mine Closure	
2033	Phase 3 Monitoring is conducted over three year periods following rehabilitation, recurring every three years as necessary until areas rehabilitated for Bobolink are occupied by territorial males for two consecutive years (in accordance with conditions 6.4(c) and 9.2(a) of the RRP ESA Permit).	
2034		
2035		
2036		Phase 2 Monitoring in OB Areas continues until RRP ESA permit expires, in accordance with conditions 6.3(b), 6.4(b) and 9.2(a) of the RRP ESA Permit.
2037		
2038		

Approach to Tracking Updates to Status of Listed Species

The status of species listed as a Schedule 1 SAR in SARA and/or listed in the Provincial ESA will be monitored on a regular basis, and no less frequently than annually, during the construction, operation and active closure phases of the RRP.

EC and the MNRF will be consulted should NG determine through this tracking of updates and/or ongoing field investigations / wildlife logs that:

- An unlisted species has become listed that is known to be present in the NLSA; and/or
- A new SAR should be recorded in the NLSA.

6.3.1.4 Mammals

Winter Aerial Surveys for Ungulates and Furbearers

Aerial surveys in early winter (late January – early February) and late winter (late February – early March) will be conducted to document numbers and distributions of White-tailed Deer, Moose, Wolves and other furbearers at locations representing suitable habitat directly adjacent to the RRP site and across control sites. As suggested by the MNRF, such surveys will be conducted every 10 years beginning in the first winter of the operation phase (2017) and continuing until the end of the active mine reclamation phase. Survey transects will be similar to those surveyed during the baseline studies (Figure 4) and will also co-ordinate with the MNRF's regional surveys.

Collecting White-tailed Deer Tissue and Organ Samples for Analyses

Wildlife exposure to potential contaminants such as metals (e.g., cadmium, copper, zinc) may come from ingestion of effected plants, soil or water, or by consuming animals that have been exposed to the contaminants. A White-tailed Deer tissue and organ sampling program will be implemented with the intent of determining exposure and ecological risk to local wildlife from mine-related contaminants and confirming the low risks to humans that consume local wildlife.

During White-tailed Deer hunting season, tissue collection stations will be set up to collect deer tissue and organ samples from hunters on a voluntary basis, in order to test for metal concentrations in deer in the immediate vicinity of the mine and at various distances away from the mine as control sites. Tissues collected in 2016 will serve as baseline levels and will be compared to tissues collected midway through Project operations and at closure.

Working with Aboriginal Hunters

NG will work closely with Aboriginal hunters with the objective of documenting, to the extent feasible, White-tailed Deer, Moose, Wolf and Black Bear harvesting activities in and around the

RRP site area. Hunting and trapping records across several years can provide useful information on the presence and distribution of mammals and changes in the number of individuals harvested are often indicative of changes in the relative abundance of individuals of a particular species. Therefore, monitoring annual Aboriginal hunting and trapping records in and around the RRP during all phases of the Project will be conducted to the extent feasible and data will be analyzed for patterns that may indicate a change in abundance or distribution of species has occurred.

Bat Acoustic Monitoring

Methods for monitoring adverse RRP-induced effects on bats following the implementation of proposed mitigation measures will include the use of acoustic monitoring devices placed at representative locations around the periphery of the mine site (Figure 5).

Nocturnal bat activity will be monitored from 30 minutes before sunset to 30 minutes after sunrise in May and June Detectors will be positioned 2 to 4 m above ground at locations where higher levels of bat activity are likely to occur, such as woodland and/or wetland edges (Furlonger et al. 1987). Bat detectors will be configured to begin recording when ultrasonic signals greater than 20 dB above the noise floor rolling average are detected. Upon trigger, a recording with a maximum duration of 8 seconds will be saved. Recordings will be identified to species using Sonobat or equivalent software. Data gathered from the recordings will provide information on species presence / absence, density and distribution which will be monitoring through all phases of the RRP.

Wildlife Observation Logs

Wildlife observation logs will be posted on bulletin boards in commonly used areas (e.g., cafeterias, lunch rooms, main hallways, etc.) in selected buildings so that Project personnel can report observations of large mammals (including collisions with vehicles) (as well as SAR, raptors, raptor nests, frogs, turtles and snakes) within the RRP footprint. These logs will be collected by on site NG environmental staff at the end of every month.

All Project personnel will undergo regular safety and environmental inductions that will include presentations outlining the importance of maintaining wildlife observation logs, how to properly maintain a wildlife log and who to contact when certain species such as SAR are observed or if road kills occur.

Wildlife information boards will also be installed in commonly used areas in selected buildings to notify Project personnel of local bear or wolf observations and all other pertinent wildlife awareness issues such as ESA permit conditions and annual reminders regarding the sensitivity of the breeding bird season and work restrictions in place between May 1 and August 15.

Monitoring of Black Bear Activity Related to Waste Disposal

The RRP Final EA Report / EIS (AMEC 2014a) outlines how food wastes generated on site will be disposed of by a means that limits the attraction of wildlife to the mine site, especially potentially nuisance or dangerous species such as bears, wolves, foxes, martens, ravens, magpies, vultures and Bald Eagles. The presence of bears and other wildlife species in the RRP footprint due to waste disposal and other issues will be monitored continuously as this is a safety concern for Project personnel and local residents, and can have adverse effects on wildlife.

If bears and other species become attracted to waste disposal sites, appropriate mitigation plans will be implemented, all Project personnel will be informed of the issue and the importance of avoiding attracting wildlife to the site, and the MNRF will be notified and consulted.

6.3.2 Using Baseline Levels to Determine the Effectiveness of Post Closure Rehabilitation Activities and the Accuracy of Recolonization Predictions for Migratory Birds and SAR

As discussed above in Sections 3.1 and 3.2, the purpose of the FMP is to verify the accuracy of the predictions made in the EA about the Project's impacts on wildlife and habitat, and to monitor the effectiveness of rehabilitation efforts for wildlife habitat and terrestrial environments. The RRP Final EA Report / EIS (AMEC 2014a) predicted that the restoration of disturbed habitats at mine closure and the development of habitat types capable of supporting migratory birds and SAR (and other wildlife species) would result in no significant long-term effects to migratory birds, SAR and their habitats. Therefore, it was predicted that the number of migratory bird species (species richness) and the number of individual migratory birds (bird density) and the number of SAR species would eventually return approximately to baseline conditions recorded prior to disturbance (Figures A2-a to A2-h in Appendix 2).

Based on the annual baseline studies the following calculations of bird species richness, abundance and density can be used as an indication when recolonization by migratory birds has reached baseline conditions.

The four year average number of migratory bird species (average species richness) recorded within individual point count plots ranges from 10.4 to 18.7 species per plot. Therefore, this is the target number of species to indicate that post closure recolonization by migratory birds has reached baseline conditions that existed prior to disturbance.

The four year average number of migratory birds (average species density) recorded within individual point count plots ranges from 12.4 to 31.2 birds per plot. Therefore, this is the target number of species to indicate that post closure recolonization by migratory birds has reached baseline conditions that existed prior to disturbance.

Additionally the baseline density and abundance of the five most common species recorded within the study area (NRSA) can be used as an indicator, or target, to measure recolonization success during the post closure phase. The five species with the highest recorded density across impact sites included Bobolink (0.41 ± 0.91 birds/ha), Common Yellowthroat (0.37 ± 0.81 birds/ha), Sedge Wrens (0.37 ± 0.78 birds/ha), Song Sparrow (0.30 ± 0.64 birds/ha), and American Goldfinch (0.28 ± 0.96 birds/ha). The five species with the highest recorded density across control sites included Nashville Warbler (0.57 ± 0.80 birds/ha), and Red-eyed Vireo (0.45 ± 0.64 birds/ha), Ovenbird (0.42 ± 0.80 birds/ha), Song Sparrow (0.26 ± 0.62 birds/ha), and American Goldfinch (0.20 ± 0.72 birds/ha).

The five most abundant species recorded across impact sites included Canada Goose (3.4 ±11.99 birds/count), Ovenbird (1.29 ±0.99 birds/count), White-throated Sparrow (1.27 ±1.07 birds/count), Red-eyed Vireo (1.27 ±0.92 birds/count), and Common Yellowthroat (1.10 ±1.10 birds/count). Similarly, the five most abundant species recorded across control sites included Ovenbird (1.38 ±1.23 birds/count), Nashville Warbler (1.32 ±1.05 birds/count), Red-eyed Vireo (1.28 ±0.97 birds/count), White-throated Sparrow (1.24 ±1.15 birds/count), and Song Sparrow (0.64 ±1.06 birds/count).

6.3.3 Monitoring the Effectiveness of Mitigation Measures and Predictions for Migratory Bird, SAR and Mammal Habitats.

Habitat assessments will be conducted at each of the long term impact and control point count stations described above each year that point count surveys are conducted. This will allow NG to monitor any changes in migratory bird, avian SAR (Table 1), or mammal habitats near the Project site during construction and operations. Habitat areas that are to be cleared during construction, as outlined in the RRP Final EA Report / EIS (AMEC 2014a), are considered to be destroyed and will not be monitored until reclamation activities begin when mining operations cease.

During construction, operations and active closure, winter aerial surveys (described in Section 6.3.1.4) around the periphery of the RRP footprint will be used to monitor habitat use by large mammals.

Post closure habitat assessments will be conducted in years 1, 4, 7, 10 and 15 post-operations and will monitor revegetation activities designed to restore disturbed habitats to the extent practical. Various habitat variables will be recorded during monitoring surveys to allow for multi-year comparisons between impact sites and control sites, in order to determine if migratory bird, SAR or mammal habitats around the periphery of cleared Project sites are being impacted and to what extent. The following habitat variables will be recorded:

- Vegetation species present (species composition) in the canopy and understory;
- Species density;
- Species richness;

- Percent canopy closure; and
- Percent ground cover.

7.0 TURTLES AND SNAKES

All Project personnel will be made aware of the importance of not harming or harassing turtles (especially Snapping Turtles which are Provincially listed as a species of Special Concern) and snakes through wildlife awareness training during environmental inductions performed by NG environmental staff. Project personnel will also be given information regarding on site environmental staff to contact when turtles or snakes are observed on site. Periodic surveys for turtles will also take place while conducting other aquatic monitoring activities such as water sampling. Other opportunistic surveys for turtles will be conducted during all terrestrial biological monitoring programs when in appropriate turtle habitat.

Where possible, turtles and snakes recorded within the RRP footprint will be captured and relocated outside of the footprint (designated release areas to be determined through consultation with the MNRF). If turtles or snakes are found to be common to a certain area of the RRP footprint, then localized fencing will be constructed in order to keep these animals from entering the Project site and weekly monitoring of these sites will be conducted during the active turtle season (April to October).

8.0 AMPHIBIANS

In addition to monitoring amphibian presence within the RRP footprint through wildlife observation logs, NG environmental technicians will conduct periodic annual surveys for amphibians along Highway 600 and the East Access Road during the amphibian migration and breeding seasons. These monitoring surveys will consist of driving along these two roadways and looking for amphibians on the road (dead or alive).

9.0 BIODIVERSITY

Biodiversity, in the form of animal and plant species present (e.g., species richness), will be monitored and compared to baseline conditions (Appendices 4 and 5), as per Provincial Environmental Assessment Notice of Approval Condition 14.1 and 14.2. Species lists will be created for each annual monitoring report and will be compared to the results of the 2009 to 2014 baseline studies.

10.0 PROPOSED HABITAT RESTORATION MEASURES

NG is committed to encouraging and, as practical, restoring the RRP site to productive, naturalized vegetation communities on cessation of mining, encouraging development of habitat types capable of supporting target species and other wildlife. This will involve the active revegetation of peripheral tailings management areas, mine rock stockpiles and remaining portions of the overburden stockpile, as well as the general mine site area.

Revegetation efforts associated with reclamation will use a combination of hydroseeding and hand planting of tree seedlings. Native seed mixes, where reasonably available commercially, will be used for hydroseeding, together with a nurse crop of oats, or equivalent (if necessary). General revegetation of the RRP site is readily achievable with current technologies, as demonstrated by revegetation efforts previously employed at other mine sites in Ontario.

Vegetation (and wildlife) recovery times will vary depending on the species / communities involved. Through active revegetation programs, early successional plant and wildlife communities would be expected to become established within three to five years of mine closure. The development of semi-mature aspen-birch and/or spruce woodlands (the most common forest community types currently in the area) would be expected to occur over a period of approximately 30 to 40 years. Intermediate community types would develop during the intervening period and would also provide habitat to various wildlife species at early seral stages of natural ecological succession.

A commitment was made by NG through the Federal and Provincial EA process to develop habitats that would be likely to support breeding migratory birds, SAR such as Whip-poor-will, Common Nighthawk and Bobolink, and White-tailed Deer. Specific habitat planning details will be developed during the period of mine operations and will be informed by monitoring, research programs linked to Whip-poor-will and Bobolink, and ongoing consultation with the MNRF, EC and Aboriginal group representatives. Such details will be included in future Closure Plan amendments developed toward the end of mine operations.

11.0 ADAPTIVE MANAGEMENT MEASURES

Adaptive management methods will be developed in consultation with EC and MNRF staff and Aboriginal group representatives, on a case-by-case basis as required. Analysis of monitoring data and observed wildlife behaviour in reaction to identified stressors and applied mitigation measures will be used to determine whether or not further corrective actions beyond those already planned are required to lessen impacts.

The FMP will be an outcome-based program and will be evaluated regularly. When predictions described in the EA have been met, or the objectives listed in Section 3.2 have been met, discussions will be held with regulators regarding the cessation of that particular component of the monitoring program.

12.0 REPORTING

Monitoring results will be provided to the CEA Agency, EC, MNRF and Aboriginal groups each monitoring year starting in 2016. Each report will present an analysis and summary of the implementation of the monitoring plan for the preceding year. Additional reporting to the MNRF on avian SAR has been prescribed in the Provincial *ESA* permit and may also be required by other Provincial and Federal environmental approvals. All SAR reporting is subject to confidentiality requirements of the Province of Ontario.

12.1 Reporting for the Provincial Eastern Whip-poor-will and Bobolink Monitoring Programs

In accordance with the RRP ESA permit, NG will submit a formal Eastern Whip-poor-will and Bobolink monitoring report to the MNRF following the completion of each monitoring sequence. The Eastern Whip-poor-will and Bobolink monitoring report shall contain the following:

- A summary of survey protocols used, survey dates, survey conditions and all observation data and corresponding shapefiles;
- An analysis of the monitoring results for the specified survey sequence including an estimate and illustration of site occupancy; and
- A summary of any habitat management activities taken.

Specifically with respect to Eastern Whip-poor-will, the monitoring report will provide:

- An assessment of the quality and functionality of habitat rehabilitated, created, enhanced or managed, including an estimate and illustration of the number of occupancy areas located at the Project site, and the Eastern Whip-poor-will OB Areas; and
- A description of Acoustic Audits and any abatement measures implemented.

Specifically with respect to Bobolink, the monitoring report will provide a summary of Bobolink OB Area occupancy, nesting periods and fledgling dates.

The Eastern Whip-poor-will and Bobolink monitoring report will be provided to the MNRF no later than six months following the last survey of each survey sequence.

12.2 Reporting for the Provincial Eastern Whip-poor-will Research Program

A detailed science design will be provided to the MNRF for review prior to the studies being undertaken. The science design will include a detailed account of the methods and approach.

Within two years following the completion of field data collection for the Eastern Whip-poor-will research program, NG will submit a technical report to the MNRF that includes:

- An abstract describing key results;
- An introduction that incorporates key background information;
- A detailed description of the methodology;
- Results and analysis;
- Discussion and conclusions; and
- References to key relevant literature.

Both the science design and the technical report will be peer reviewed by a minimum of two qualified reviewers who are experts in the field of study. NG will obtain approval from the MNRF on the manner that the sensitive SAR results of the technical report are made available to the public.

13.0 REFERENCES

AMEC. 2011a. Rainy River Gold Project, 2011 Wildlife Baseline Study.

AMEC. 2011b. Rainy River Gold Project Species at Risk Report for 2011.

AMEC. 2012a. Rainy River Gold Project, 2012 Terrestrial Baseline Study.

AMEC. 2012b. Rainy River Gold Project Species at Risk Report for 2012.

AMEC. 2013a. Rainy River Project. 2013 Terrestrial Baseline Study: Bats.

AMEC. 2013b. Rainy River Gold Project Species at Risk Report for 2013.

AMEC. 2013c. Rainy River Gold Project, 2012 Aquatic Resources Baseline Report.

AMEC. 2013d. Rainy River Project, 2013 Aquatic Resources Baseline Report.

AMEC. 2013e. Rainy River Project, 2013 Fish and Fish Habitat Existing Conditions for Highway 600 Realignment.

AMEC. 2014a. Rainy River Resources Ltd., Volume 2: Final Environmental Assessment Report (Environmental Impact Statement), Version 2, Rainy River Project, Township of Chapple, Ontario.

AMEC. 2014b. 2014 Rainy River Project Terrestrial Field Studies Along a Portion of Transmission Line A (West of Highway 71).

Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2002. COSEWIC Assessment and Update Status Report on the Small-flowered *Lipocrapha micrantha* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa, ON.

Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2007. COSEWIC Assessment and Status Report on the Common Nighthawk *Chordeiles minor* in Canada. Committee on the Status of Endangered Wildlife in Canada, Ottawa, ON.

Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2008. COSEWIC Assessment and Status Report on the Snapping Turtle *Chelydra serpentine* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa, ON.

Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2009. COSEWIC Assessment and Status Report on the Whip-poor-will *Caprimulgus vociferus* in Canada. Committee on the Status of Endangered Wildlife in Canada, Ottawa, Ontario.

Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2011. COSEWIC Assessment and Update Status Report on the Barn Swallow *Hirundo rustica* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa, ON.

Dooling R.J. and A.N. Popper. 2007. The Effects of Highway Noise on Birds. Report to the California Department of Transportation, Contract 43AO139. Accessed from http://www.dot.ca.gov/hq/env/bio/files/caltrans_birds_10-7-2007b.pdf.

Environment Canada (EC). 2014a. Mining Project Baseline Desktop Assessment and Survey Requirements. Released August 1, 2014. Government of Canada, Ottawa, Ontario.

Environment Canada (EC). 2014b. Environment Canada's Policy on Incidental Take of Migratory Birds in Canada. Government of Canada, Ottawa, Ontario. Accessed at http://ec.gc.ca/paom-itmb/default.asp?lang=EN&n=8D910CAC-1#.

Environment Canada (EC). 2014c. Environment Canada's Avoidance Guidelines on General Nesting Periods of Migratory Birds in Canada. Government of Canada, Ottawa, Ontario. Accessed at http://ec.gc.ca/paom-itmb/default.asp?lang=EN&n=8D910CAC-1#.

Fuller, R.J. and D.R. Langslow. 1984. Estimating numbers of birds by point counts: how long should counts last? *Bird Study*, 31:195-202.

Furlonger, C.L., H.J. Dewar and M.B. Fenton. 1987. Habitat Use by Foraging Insectivorous Bats. *Canadian Journal of Zoology*, 65:284-288.

Klohn Crippen Berger (KCB). 2011a. Rainy River Gold Project, Baseline Report 2008-2010.

Klohn Crippen Berger (KCB). 2011b. Rainy River Gold Project Species at Risk Baseline Report 2008-2010.

Ministry of Natural Resources (MNR). 2008. Western Silvery Aster (*Symphyotrichum sericeum*). Accessed at www.mnr.gov.on.ca/stdprodconsume/groups/lr/@mnr/@species/documents/document/270953.pdf.

Ministry of Natural Resources (MNR). 2012. Natural Heritage Information Centre. www.nhic.mnr.gov.on.ca/nhic.cfm.

Ministry of Natural Resources (MNR). 2013a. Technical Assessment of Whip-poor-will Occupancy at Rainy River Resources' Proposed Gold Mine Site. Unpublished Technical Analyses Provided to Rainy River Resources by the Ontario Ministry of Natural Resources and Forestry, Fort Frances District, Ontario.

Ministry of Natural Resources (MNR). 2013b. Reassessment of Bobolink Habitat Impacts Within the Revised Rainy River Project Footprint. Unpublished Technical Analyses Provided to Rainy River Resources by the Ontario Ministry of Natural Resources and Forestry, Fort Frances District, Ontario.

Ministry of Natural Resources (MNR). 2014. Endangered Species Act. Accessed at www.ontario.ca/environment-and-energy/species-risk.

Ministry of the Environment and Climate Change (MOECC). 2013. Updated Environmental Noise Guideline - NPC-300. Accessed at https://www.ontario.ca/environment-and-energy/environmental-noise-guideline-stationary-and-transportation-sources-approval

Rand, G.J. 2014. Home Range Use and Habitat Selection of Eastern Whip-poor-wills (*Antrostomus vociferous*) at the Northern Edge of their Range. M.Sc. Thesis, Trent University, Peterborough, Ontario, Canada. 40 pages.

United States Fish and Wildlife Service (USFWS). 2012. The Effects of Noise on Wildlife. Accessed at http://www.fws.gov/windenergy/docs/Noise.pdf.

400000 405000 410000 415000 420000 425000 430000 435000 440000 445000 450000

5425000 5420000 5415000 5410000 5405000

1-4

1-1

1-2

1-3

TRANSMISSION LINE

MUSKRAT LAKE

EAST ACCESS ROAD

Korpi Road

Highway 600

Highway 647

McCALLUM CREEK

WATER MANAGEMENT PIPELINE

PINEWOOD RIVER

TAIT CREEK

HIGHWAY 600 RE-ALIGNMENT

OPEN PIT

St. Lee Creek

Gallinger Road

Highway 71

Temple Road

Hazlewoods Road

Path: P:\EM\Projects\2011\TC111504 Rainy River\GIS\TerrestrialBird_monitoring_Plan_Nov2014\MXD\SAR_monitoring_stations_key_map_6.mxd

LEGEND

- Proposed Principal Project Facilities
- 230 kV Transmission Line

Long Term Monitoring Bird Locations

- Monitoring Control Stations
- Monitoring Impact Stations
- Monitoring Stations Located on Bobolink Compensation Lands
- Monitoring Stations Located on Whip-poor-will Compensation Lands
- Additional Whip-poor-will Stations (Periphery of Mine Site)

- Bobolink Compensation Areas
- Whip-poor-will Compensation Areas

NOTES:
- Pleiades imagery August 2014
- Site Plan from AMEC CAD drawing May 3, 2013, derived from BBA drawing 3098003-003000-41-D20-0001, April 29, 2013
- NOTES:
- Road data extracted from Land Information Ontario, Ontario Road Network, MNR
- Base map data from Geogratis NRCan Toporama DRG 1:50k sheets

Datum: NAD83
Projection: UTM Zone 15N

0 4 8 16 24 32 Kilometres

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RAINY RIVER PROJECT

Avian Monitoring Stations Key Map

DRAFT

PROJECT N°: TC111504 | **FIGURE: 1**

SCALE: 1:125,000 | DATE: July 2015

425000 426000 427000 428000 429000 430000 431000 432000 433000 434000 435000 436000 437000 438000 439000 440000 441000

5422000 5421000 5420000 5419000 5418000 5417000 5416000 5415000 5414000

MC-01 MC-02 MC-03 MC-04 MC-05 MC-06 MC-07 MC-08 MC-09 MC-10 MC-11 MC-12 MC-16 MC-17 MC-20 MC-21 MC-22 MC-23 MC-24 MC-25 MC-26 MC-27 MC-28 MC-29 MC-30 MC-51 MC-52 MC-53 MC-54 MC-55 MC-56 MC-57 MC-58 MC-59 MC-60 MC-62 MC-63 MC-64 MC-65 MC-66 MC-67 MC-68 MC-69 MC-70

TL-09 TL-10 TL-11 TL-12 TL-13 TL-14 TL-15 TL-16 TL-17 TL-18 TL-19 TL-20 TL-21 TL-22 TL-23 TL-24 TL-25 TL-26 TL-27 TL-28 TL-29 TL-30 TL-31 TL-32 TL-33 TL-34 TL-35 TL-36 TL-37 TL-38 TL-39 TL-40 TL-41 TL-42 TL-43 TL-44 TL-45 TL-46 TL-47 TL-48 TL-49 TL-50

W-19 W-23 W-24 MI-43

Fisher Rd Hwy 71 Mary Rd Manomin Rd Fleming Rd MUSKRAT TRANSMISSION LINE

Path: P:\EMP\projects\2011\TC111504 Rainy River\GIS\TerrestrialBird_monitoring_Plan_Nov2014\MXD\SAR_monitoring_stations_key_mapseries_Landscape6.mxd

LEGEND

- Proposed Principal Project Facilities
- 230 kV Transmission Line

Long Term Monitoring Bird Locations

- Monitoring Control Stations
- Monitoring Impact Stations
- Additional Whip-poor-will Stations (Periphery of Mine Site)

NOTES:
- Pleiades imagery August 2014
- Site Plan from AMEC CAD drawing May 3, 2013, derived from BBA drawing 3098003-003000-41-D20-0001, April 29, 2013
- NOTES:
- Road data extracted from Land Information Ontario, Ontario Road Network, MNR
- Base map data from Geogratis NRCan Toporama DRG 1:50k sheets

Datum: NAD83
Projection: UTM Zone 15N

0 1.25 2.5 5 7.5 10 Kilometres

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RAINY RIVER PROJECT

Avian Monitoring Stations

DRAFT

PROJECT N°: TC111504 | **FIGURE: 1-1**

SCALE: 1:42,000 | DATE: July 2015

423000 424000 425000 426000 427000 428000 429000 430000 431000 432000

5416000 5415000 5414000 5413000 5412000 5411000 5410000 5409000 5408000 5407000 5406000 5405000 5404000 5403000 5402000

Richardson Rd
Hwy 71
Hwy 600
Caul Rd
Taft Rd
Barwick Rd
Angus Rd

W-22 W-24 W-21 W-19 W-23 W-20 W-18 W-17 W-10 W-15 W-13 W-14 W-16 W-11 W-12 W-7 W-8 W-9

TL-19 TL-22 TL-25 TL-18 TL-21 TL-23 TL-20 TL-24 TL-17 TL-15 TL-16 TL-14 TL-13 TL-11 TL-10 TL-12 TL-09 TL-07 TL-08 TL-06 TL-05 TL-02 TL-03 TL-04 TL-01

MI-43 MI-44 MI-03 MI-07 MI-29 MI-21 MI-22 MI-05 MI-24 MI-23 MI-30 MI-25 MI-26 MI-09 MI-02 MI-28 MI-10 MI-19 MI-11 MI-27 MI-36 MI-32 MI-31

B-44 B-43 B-42 B-41 B-39 B-40

MC-45 MC-46 MC-47 MC-48 MC-44 MC-43 MC-42 MC-41

Path: P:\EM\Projects\2011\TC111504 Rainy River\GIS\Terrestrial\Bird_monitoring_Plan_Nov2014\MXD\SAR_monitoring_stations_key_mapseries_Port_6.mxd

LEGEND

- Proposed Principal Project Facilities
- Monitoring Control Stations
- Monitoring Impact Stations
- Monitoring Stations Located on Bobolink Compensation Lands
- Additional Whip-poor-will Stations (Periphery of Mine Site)
- Bobolink Compensation Areas

0 1 2 3 Kilometres

NOTES:
- Pleiades imagery August 2014
- Base map data from Geogratis NRCan Toporama DRG 1:50k sheets.

Datum: NAD83
Projection: UTM Zone 15N

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RAINY RIVER PROJECT

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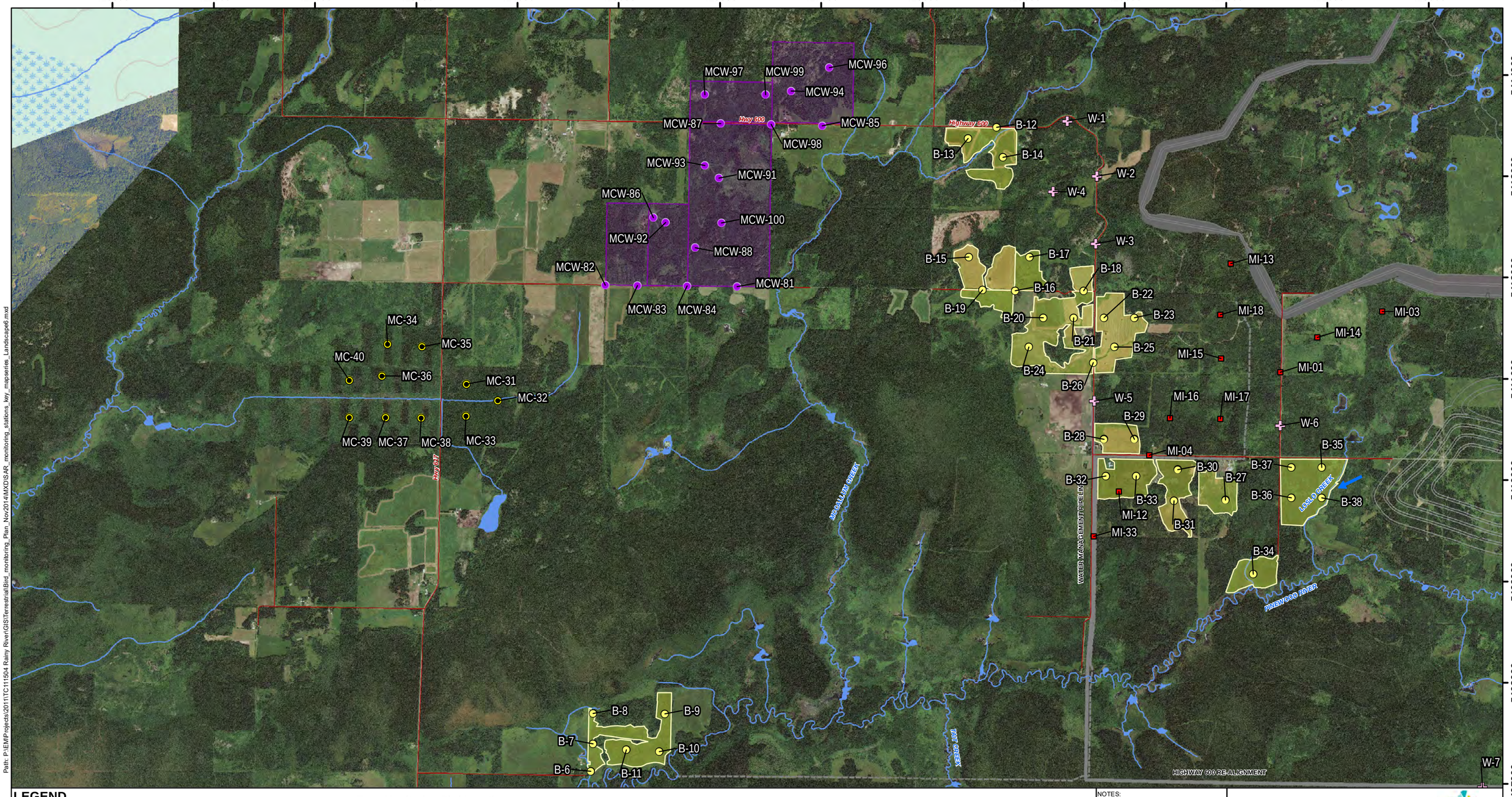
Avian Monitoring Stations

PROJECT N°: TC111504 | **FIGURE: 1-2**

SCALE: 1:40,000 | DATE: July 2015



Path: P:\EMP\projects\2011\TC111504 Rainy River\GIS\Terrestrial\Bird_monitoring_Plan_Nov2014\MXD\SAR_monitoring_stations_key_mapseries_Landscape6.mxd

LEGEND

- Proposed Principal Project Facilities
- 230 kV Transmission Line

Long Term Monitoring Bird Locations

- Monitoring Control Stations
- Monitoring Impact Stations
- Monitoring Stations Located on Bobolink Compensation Lands
- Monitoring Stations Located on Whip-poor-will Compensation Lands
- Additional Whip-poor-will Stations (Periphery of Mine Site)

- Bobolink Compensation Areas
- Whip-poor-will Compensation Areas

NOTES:
- Pleiades imagery August 2014
- Site Plan from AMEC CAD drawing May 3, 2013, derived from BBA drawing 3098003-003000-41-D20-0001, April 29, 2013
- NOTES:
- Road data extracted from Land Information Ontario, Ontario Road Network, MNR
- Base map data from Geogratis NRCan Toporama DRG 1:50k sheets

Datum: NAD83
Projection: UTM Zone 15N

0 1 2 4 6 8 Kilometres

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RAINY RIVER PROJECT

Avian Monitoring Stations

DRAFT

PROJECT N°: TC111504	**FIGURE: 1-3**
SCALE: 1:36,000	DATE: July 2015

414000 415000 416000 417000 418000 419000

5427000 5426000 5425000 5424000 5423000 5422000 5421000 5420000

MCW-32 MCW-34 MC-13 MCW-A MCW-33 MC-14 MCW-35 MCW-29 MC-15 MCW-28 MCW-B MCW-39 MCW-71 MC-18 MCW-75 MCW-25 MCW-70 MC-19 MCW-76 MCW-68 MCW-69 MCW-22 MCW-04 MC-71 MCW-C MCW-05 MCW-03 MCW-06 B-4 MCW-08 MCW-10 MCW-42 MC-72 MC-73 B-1 B-2 MCW-02 MCW-40 MCW-41 MCW-01 MCW-09 MCW-21 MCW-14 MCW-63 MCW-12 B-5 MCW-66 B-3 MCW-13 MC-76 MCW-76A MCW-65 MC-74 MC-77 MCW-58 MCW-20 MCW-59 MCW-11 MCW-80 MC-75 MCW-52 MCW-19 MCW-56 MC-78 MCW-43 MCW-57 MCW-18 MCW-51 MCW-50 MCW-48 MC-79 MCW-38 MCW-79 MCW-16 MCW-49 MCW-17 MCW-47 MC-80 MCW-37

Strachan Rd

Mathieu Rd

Hwy 600

Path: P:\EM\Projects\2011\TC111504 Rainy River\GIS\Terrestrial\Bird_monitoring_Plan_Nov2014\MXD\SAR_monitoring_stations_key_mapseries_Port_6.mxd

LEGEND

- Proposed Principal Project Facilities
- Monitoring Control Stations
- Monitoring Stations Located on Bobolink Compensation Lands
- Monitoring Stations Located on Whip-poor-will Compensation Lands
- Bobolink Compensation Areas
- Whip-poor-will Compensation Areas

NOTES:
- Pleiades imagery August 2014
- Base map data from Geogratis NRCan Toporama DRG 1:50k sheets.

Datum: NAD83
Projection: UTM Zone 15N

0 1 2 3 Kilometres

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RAINY RIVER PROJECT

Avian Monitoring Stations

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PROJECT N°: TC111504	**FIGURE: 1-4**
SCALE: 1:23,000	DATE: July 2015

415000 420000 425000 430000 435000

5415000 5410000 5405000

A B C D 1 2 3 4

Hwy 600 Hwy 71

Muskrat Lake

Pinewood River

Pinewood Lake

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LEGEND

- Proposed Principal Project Facilities
- Local Study Area (LSA)
- Regional Road / Highway
- Existing Transmission Line
- Permanent Watercourse
- Intermittent (Intermittent Watercourse)
- Waterbody

Barn Swallow Observations and Habitat Information

- Barn Swallow Artificial Nest Site Location (labelled with ID)
- Barn Swallow Nest Location - Active (AMEC 2013)
- Barn Swallow Nest Location - Inactive (AMEC 2013)
- Barn Swallow Observation (AMEC 2012)
- Barn Swallow Observation (AMEC 2011)
- Barn Swallow Observation (KCB 2010)

NOTES:
- Road data extracted from Land Information Ontario, Ontario Road Network, MNR
- Base map data from Geogratis NRCan Toporama DRG 1:50k sheets
- Habitats derived from MNR FRI data, MNR Ecosite data and conversion into Provincial ELC classes

Datum: NAD83
Projection: UTM Zone 15N

0 2.5 5 10 15 Kilometres

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RAINY RIVER PROJECT

Barn Swallow Observations and Locations of Artificial Nest Sites

DRAFT

PROJECT N°: TC111504 | **FIGURE: 2**

SCALE: 1:55,000 | DATE: July 2015

415000 420000 425000 430000 435000 440000

5420000 5415000 5410000

Burditt Lake
Little Pine Lake
Boundary Lake
Off Lake
Muskrat Lake
Hwy 615
Hwy 600
Hwy 71
OPEN PIT
Pinewood River
Pinewood Lake
Bald Eagle Nest

P:\EM\Projects\2011\TC111504 Rainy River\GIS\Terrestrial\Wildlife_Monitoring_Plan_July2015\MXD_Maps\SAR_BaldEagle_Nest_Observation_2.mxd

LEGEND

- Proposed Principal Project Facilities
- Local Study Area (LSA)
- Regional Road / Highway
- Existing 230 kV Transmission Line
- Bald Eagle Nest Location

NOTES:
- Road data extracted from Land Information Ontario, Ontario Road Network, MNR
- Base map data from Geogratis NRCan Toporama DRG 1:50k sheets

Datum: NAD83
Projection: UTM Zone 15N

0 2.5 5 10 15 20 Kilometres

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RAINY RIVER PROJECT

Bald Eagle Nest in Woodland 122 Outside of RRP Footprint

DRAFT

PROJECT N°: TC111504 | **FIGURE: 3**

SCALE: 1:72,000 | DATE: July 2015

414000 417000 420000 423000 426000 429000 432000 435000 438000 441000 444000 447000 450000

5424000 5421000 5418000 5415000 5412000 5409000 5406000

Strachan Rd
Fisher Rd
Hwy 600
Richardson Rd
Hwy 71
Manomin Rd
Hwy 617
Tait Rd
Caul Rd
Barwick Rd
Orr Lk Rd
Hwy 615
Fleming Rd
Hwy 613
Government Landing

1 2 3 4 5

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z AA BB CC DD EE FF GG HH II JJ

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LEGEND

- Proposed Principal Project Facilities
- Flight Line Transect (ID labelled on map)

NOTES:
- Background topographic map extracted from Toporama, Geogratis, NRCan 1:50k DRG

Datum: NAD83
Projection: UTM Zone 15N

0 2 4 8 12 16 20 Kilometres

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RAINY RIVER PROJECT

Aerial Survey Transect Lines for Follow-up Monitoring

DRAFT

PROJECT N°: TC111504	**FIGURE: 4**
SCALE: 1:100,000	DATE: July 2015

408000 411000 414000 417000 420000 423000 426000 429000 432000 435000 438000 441000 444000

5424000 5421000 5418000 5415000 5412000 5409000 5406000

Detector 24
Detector 23
Detector 20
Detector 21
Detector 25

Strachan Rd
Lange Rd
Fisher Rd
Richardson Rd
Hwy 71
Manomin Rd
Sutherland 2 Rd
Hwy 615
Caul Rd
Fleming Rd

P:\EM\Projects\2011\TC111504 Rainy River\GIS\Terrestrial\Wildlife_Monitoring_Plan_July2015\MXD_Maps\Locations_of_Bat_Detectors_1.mxd

LEGEND

- Proposed Principal Project Facilities
- Bat Detector Locations (labelled with ID)

NOTES:
- Background topographic map extracted from Toporama, Geogratis, NRCan 1:50k DRG

0 2 4 8 12 16 20 Kilometres

Datum: NAD83
Projection: UTM Zone 15N

N W E S

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RAINY RIVER PROJECT

Locations of Bat Detectors for Follow-up Monitoring

PROJECT N°: TC111504	**FIGURE: 5**
SCALE: 1:100,000	DATE: July 2015

APPENDIX 1

A LIST OF RAINY RIVER PROJECT EA COMMITMENTS RELATED TO WILDLIFE AND WILDLIFE HABITAT

Appendix 1: A List of EA Commitments Related to Wildlife and Wildlife Habitat, including those Related to Monitoring and Wildlife Habitat Restoration at Closure

#	Commitment / Mitigation [1]	EIS Source [2]	Status
9.	Sound mitigation measures will be used, such as selection of quieter equipment. Implementation of sound abatement strategies to dampen sound infiltrating habitats and migratory bird leks surrounding high traffic areas of the mine.	7.4.1.3 7.12.3 7.14.3 7.15.2.3 7.15.3.3 7.16.3 7.18.4.1	Ongoing
82.	Monitoring of key terrestrial systems and SAR will occur during the construction and operations phase, with post closure habitat development and utilization by wildlife to continue at reduced frequencies consistent with SAR Permit requirements.	T-10	Ongoing
86.	In regards to the transmission line: • Additional rare plant and breeding bird surveys to be undertaken in May and June, 2014 to identify any further potential environmental constraints that might require construction modification, such avoidance of disruption to rare plant sites (if present) through site specific habitat protection measures; • Undertaking transmission line construction in winter (normally December 1 to March 31) to better protect ground cover in sensitive areas where the protection of wetlands, rare plants and SAR is required, and completion of the remainder of transmission line construction in the late summer and fall, outside of the breeding bird season; • Vegetation removal will be reduced to the extent necessary to support construction activities and longer-term transmission line reliability (from interference with conductors and fall of adjacent hazard trees). Minimizing vegetation removal includes retaining existing low vegetation ground cover; • Access to the right of way (ROW) will be provided from existing infrastructure (some of which may need to be upgraded, as reasonable for personnel, material and equipment access), but no new permanent access roads are proposed. Generally, where access is poor, the ROW will be accessed along the ROW itself. Construction vehicles will not be allowed to travel through surface waters; and • Mechanical means will be used for periodic vegetation height maintenance along the transmission line, instead of herbicides.	MNRF Transmission Line Alternatives Assessment	Survey complete Ongoing
87.	Scheduling of RRP development activities will consider environmental aspects. Clearing of forests having a density of at least 10 cavity trees per hectare with a diameter at breast height greater than 25 cm will be limited to outside of the bat roosting season (April 1 to November 15) unless cleared by a bat biologist that has surveyed the trees for bat activity. Timing of the transmission line construction will be planned to avoid the breeding bird and main tourist season, as possible.	4.16 4.18 7.11.3 7.12.3 7.15.3.3 7.16.3	Ongoing
95.	The primary mitigation strategies for limiting adverse effects to wildlife will include: • Restoration of disturbed habitats at closure, including the development of habitats capable of supporting a diversity of wildlife species, including ungulates, large predators, furbearers and bats;	7.9.3 7.10.3 7.11.3	Ongoing
97	Generally abiotic conditions will be created within the fenced tailings management area during operations to limit the interest of the pond to waterfowl.	7.12.3	Ongoing

#	Commitment / Mitigation [1]	EIS Source [2]	Status
98.	Scheduling of RRP development activities will consider environmental aspects, such as fish spawning and bird nesting seasons. Tree and woodland clearing will be restricted to periods outside of the breeding bird season (May 1 to August 15). Clearing or modification of known Trumpeter Swan breeding habitat will be restricted to outside the breeding season (March 15 to August 15).	4.16 4.18 7.11.3 7.12.3 7.15.3.3 7.16.3	Ongoing
99.	A monitoring plan will be developed for Common Nighthawk and Eastern Whip-poor-will, in partnership with the MNRF, Environment Canada and interested First Nation communities including the standardized information suggested well as a mortality trigger that will be decided upon during consultation with the MNRF and Environment Canada, and in consideration of conditions under the ESA Overall Benefit Permit developed by the MNRF.	T-45	Ongoing
100.	Breeding bird surveys are proposed to be carried out along portions of the preferred transmission line corridor in late Spring / early Summer, 2014. Prior to transmission line construction, additional data collection will be undertaken for that portion of the proposed transmission line routing (Alternative A) west of Highway 71, where there is a baseline data gap for breeding bird surveys. This additional data collection will be undertaken to support transmission line permitting, and would consist of point count surveys for breeding birds between late May and early July, spread across a 2 km corridor (1 km on either side the transmission line). Results will be made available to MNRF once the report is complete.	MNRF 6 CM, 7 CM; MNRF Transmission Line Alternatives Assessment	Complete
101.	The primary mitigation strategies for limiting adverse effects to birds and habitat: • Inclusion of wildlife awareness information into regular safety and environmental inductions performed by the mine. Wildlife sighting logs or information boards will be installed to notify workers of local observations. Workers will be made aware of seasonal changes in local animal behaviour or presence in proximity to the mine; • Minimizing the level of potentially disturbing activities near any known or subsequently discovered active raptor and raven nest sites until the nest is vacated; • Annual monitoring of the Bald Eagle nest in Woodland 122 to determine seasonal eagle activity at the nest site which will guide RRP activities occurring in proximity to the nest. Should eagles continue to use the nest site and raise offspring, work will be adjusted appropriately to reduce adverse effects to the breeding success of the local pair;	7.12.3 7.13.3	Ongoing

#	Commitment / Mitigation [1]	EIS Source [2]	Status
101.	• Maintenance of a safe distance between RRP activities and the nest as well as maintenance of landscape buffer areas (preferably forested or natural) between the activity and nest trees. To avoid disturbing nesting Bald Eagles, no buffer is necessary around nest sites outside of the breeding season once the juvenile eagles are known to have vacated the defined significant wildlife habitat; • Limiting less typical activities in proximity to the nest site during the nest building and breeding season. The local eagle pair appears tolerant of agricultural activities and road grading; • Environmental induction programs and ongoing environmental updates provided to workers will make them aware of Bald Eagle nesting activities prior to the commencement of new or irregular activities in proximity to an active eagle nest (within 500 m), and having them observe proper protocol in order to avoid disturbance during these activities; • Restriction of tree and woodland clearing to periods outside of the breeding bird season which extends between May 1 and August 15; • Protection of suitable breeding habitat as a result of the provision of compensatory habitat for species protected under the ESA; • Restoration of disturbed habitats at closure to habitats capable of supporting a diversity of wildlife species; • Implementation of sound abatement strategies; • Enforcement of speed limits along proposed mine access roads to reduce the potential adverse effects of increased vehicular traffic associated with the RRP. Signs warning drivers of the possibility of wildlife encounters will be posted in areas of high wildlife activity. A log of collisions will be kept to monitor the effectiveness of the proposed mitigation and additional mitigation measures will be implemented if necessary; • Restrictions to clearing or modification of known Trumpeter Swan breeding habitat to outside the breeding season (March 15 to August 15) to prevent the disturbance of nesting swans or impact the likelihood of cygnet survival; • Disposing of food wastes generated on site in an appropriate manner that limits the attraction of wildlife, including Common Ravens, Turkey Vultures and Bald Eagles; • Timely removal of carcasses of road-killed animals or any other carcasses found onsite to limit the attraction of wildlife, such as Common Ravens and Turkey Vultures; and • Treatment of tailings slurry containing cyanide and associated heavy metals from the ore leaching process in the process plant using the SO_2/Air process before being discharged to the tailings management area; and • Creation of generally abiotic conditions within the fenced tailings management area during operations to limit the interest of the pond to waterfowl.		

#	Commitment / Mitigation [1]	EIS Source [2]	Status
102.	In regards to the transmission line: • Additional rare plant and breeding bird surveys to be undertaken in May and June, 2014 to identify any further potential environmental constraints that might require construction modification, such avoidance of disruption to rare plant sites (if present) through site specific habitat protection measures; • Tree clearing to take place outside of the breeding bird nesting season, defined as the period from May 1 to July 31; • Undertaking transmission line construction in winter (normally December 1 to March 31) to better protect ground cover in sensitive areas where the protection of wetlands, rare plants and SAR is required, and completion of the remainder of transmission line construction in the late summer and fall, outside of the breeding bird season; • Direct impacts to raptor nesting areas will be avoided. There are currently no stick nests on or near the proposed ROW. Should any stick nests be identified during construction, the area will be avoided until a qualified avian biologist can be contacted for direction; • Conductor wire separation distances will be sufficiently far apart to preclude larger avian species, particularly raptors which frequently use hydro pole for perching or nesting, from electrocution by contacting two conductor wires simultaneously; • Construction crews will be advised not to interfere with or harass wildlife. No hunting or fishing by construction crews will be allowed. Disciplinary actions will be taken should either occur; and • Contractors will be required to handle food and food wastes in a responsible manner, and to educate workers to ensure no feeding of wildlife.	MNRF Transmission Line Alternatives Assessment	Survey complete Ongoing
103.	The site will be rendered suitable for other compatible land uses and functions after the mine has closed and the land has been reclaimed. RRR will encourage and, as practical, actively restore the RRP site to productive, naturalized vegetation communities on cessation of mining capable of supporting a diversity of wildlife species. RRP revegetation efforts at closure will include providing suitable habitat for SAR species, most notably whip-poor-will, and other species of interest, if practical.	4.1 4.3.2.1 4.19.1 4.19.2 7.8.3 7.9.3	Ongoing
104.	The RRP footprint has been altered through consultation with the MNRF in order to further avoid known Eastern Whip-poor-will territories where feasible, including maintenance of forest buffers between RRP components and whip-poor-will nesting and foraging habitat where practical. Provide compensatory whip-poor-will habitat that protects known territories and other identified suitable habitat. Where feasible, manage site lighting fixtures to reduce excess light production near whip-poor-will foraging areas, so as to minimize disturbing these nocturnal birds (with all appropriate health and safety issues considered).	7.15.1.3 7.16.3	Ongoing
105.	RRR will implement a monitoring plan for Eastern Whip-poor-will populations and nesting in proximity to the proposed mine and transmission line sites, within compensatory habitat areas. Continue funding external research programs in collaboration with the MNRF in order to further our understanding of this poorly studied species, as part of a larger overall benefits compensation package required by the ESA permit.	7.15.1.3	Ongoing
106.	RRR will implement a monitoring plan for Bobolink populations and nesting in proximity to the proposed mine site within compensatory habitat areas, and in appropriate control areas - developed through consultation with the MNRF. Acquire and protect compensatory open country breeding bird habitat suitable for Bobolink breeding at a ratio of 1:1 for open-country habitat removed for RRP development.	7.15.2.2, 13.7.1, 13.7.3	Ongoing

#	Commitment / Mitigation [1]	EIS Source [2]	Status
107.	RRR will identify Barn Swallow nesting colonies prior to mine construction. Establish zones where Barn Swallow colonization is desired, tolerated or not wanted. Create artificial nesting structures to encourage recolonization or new colonization by Barn Swallows in areas where farm structures are removed. Implement a monitoring plan for Barn Swallow populations in proximity to the proposed mine and transmission line sites and in appropriate control areas.	7.15.3.3	Ongoing
108.	Where feasible, RRP lighting fixtures will be directed in such a fashion as to reduce excess production of light to the surrounding environment (for Eastern Whip-poor-will, Common Nighthawk and Short-eared Owl).	7.15.1.3, 7.16.3	Ongoing
109.	Monitoring of key terrestrial systems and SAR: during the construction and operations phase, with post closure habitat development and utilization by wildlife to continue at reduced frequencies consistent with SAR Permit requirements	T-10	Ongoing
110.	• Mitigation measures that will be used to reduce potential adverse effects to Eastern Whip-poor-will will include the following: • Provision of compensatory whip-poor-will habitat that protects known territories and other identified suitable habitat; • Restricting the clearing of habitats to periods outside the breeding bird season which occurs from May 1 to August 15; • Implementation of sound abatement strategies to dampen sound infiltrating habitats surrounding high traffic areas of the mine; • Where feasible, management of site lighting fixtures to reduce excess light production near whip-poor-will foraging areas so as to minimize disturbing these nocturnal birds (with all appropriate health and safety issues considered); • Maintenance of forest buffers between RRP components and whip-poor-will nesting and foraging habitat where practical; • Management of dust through dust suppression activities (best management practices); • Enforcement of speed limits along mine-controlled roads to reduce the potential adverse effects of increased vehicular traffic associated with the RRP. Signs warning drivers of the possibility of wildlife encounters will be posted in areas of high wildlife activity. A log of collisions will be kept to monitor the effectiveness of the proposed mitigation and additional mitigation measures will be implemented if necessary; • Environmental induction of RRP personnel, including SAR identification and sensitivities, and knowledge of ESA permit conditions; • Implementation of a monitoring plan for Eastern Whip-poor-will populations and nesting in proximity to the proposed mine and transmission line sites, within compensatory habitat areas and in appropriate control areas; and • Continue funding external research programs in collaboration with the MNRF in order to further our understanding of this poorly studied species, as part of a larger overall benefits compensation package required by the ESA permit.	7.15.1.3	Ongoing

#	Commitment / Mitigation [1]	EIS Source [2]	Status
111.	The primary mitigation strategies for limiting adverse effects to Bobolink will include: • Restricting the development of open country habitats to periods outside the breeding bird season which occurs from May 1 to July 31; • Acquiring and protecting compensatory open country breeding bird habitat suitable for Bobolink breeding at a ratio of 1:1 for open-country habitat removed for RRP development; • Enforcement of speed limits along mine controlled roads to reduce the potential adverse effects of increased vehicular traffic associated with the RRP. Signs warning drivers of the possibility of wildlife encounters will be posted in areas of high wildlife activity. A log of collisions will be kept to monitor the effectiveness of the proposed mitigation and additional mitigation measures will be implemented if necessary; • Environmental induction of RRP personnel, including SAR identification and sensitivities and knowledge of ESA permit conditions; • Implementation of sound abatement strategies to dampen sound infiltrating habitats surrounding high traffic areas of the mine; • Restoration of disturbed habitats at mine closure or encouraging development of habitats capable of supporting Bobolink and other open country species; and • Implementation of a monitoring plan for Bobolink populations and nesting in proximity to the proposed mine site within compensatory habitat areas, and in appropriate control areas.	7.15.2.3	Ongoing
112.	• Mitigation measures that will be used to reduce potential adverse effects to Barn Swallows will include the following: • Identification of Barn Swallow nesting colonies prior to mine construction; • Restricting habitat displacement for mine infrastructure to periods outside the breeding bird season which occurs from May 1 to August 15; • Creation of artificial nesting structures to encourage recolonization or new colonization by Barn Swallows in areas where farm structures are removed; • Restoration of disturbed habitats at closure or encouraging development of habitats capable of providing suitable Barn Swallow foraging habitat; • Sound abatement strategies will be implemented to dampen sound infiltrating habitats surrounding high traffic areas of the mine; • Establishment of zones where Barn Swallow colonization is desired, tolerated or not wanted. These measures may be necessary to prevent colonization in areas of high human or vehicular activity that would put swallows and swallow breeding success at risk or where order and cleanliness are desired. In this case, discouraging tactics may be implemented to discourage colonization. Conversely, protection may be provided to swallows nesting in other locations where their presence is encouraged and does not cause problems to mine operations; • Enforcement of speed limits along mine controlled roads to reduce potential adverse effects of increased vehicular traffic associated with the RRP. Signs warning drivers of the possibility of wildlife encounters will be posted in areas of high wildlife activity. A log of collisions will be kept to monitor the effectiveness of the proposed mitigation and additional mitigation measures will be implemented if necessary; and • Implementation of a monitoring plan for Barn Swallow populations in proximity to the proposed mine and transmission line sites and in appropriate control areas.	7.15.3.3	Ongoing

#	Commitment / Mitigation [1]	EIS Source [2]	Status
113.	Mitigation measures that will be used to reduce potential adverse effects to all species of Special Concern and Provincially rare species will include the following: • Restriction of principal habitat displacement for mine infrastructure to periods outside the breeding bird season which MNRF has indicated occurs from May 1 to August 15; • Implementation of sound abatement strategies to dampen sound infiltrating habitats surrounding high traffic areas of the mine; • Where feasible, RRP lighting fixtures will be directed in such a fashion as to reduce excess production of light to the surrounding environment. • Establishment of zones where Black-billed Magpie colonization is desired, tolerated, or not wanted. These measures may be necessary to prevent colonization in areas of high human vehicular activity that could put magpie and magpie breeding success at risk. Discouraging tactics may be implemented to discourage colonization. Conversely, protection may be provided to magpies nesting in other locations where their presence is encouraged and does not cause problems to mine operations. • Enforcement of speed limits along mine controlled roads to reduce the potential for adverse effects of increased vehicular traffic associated with the RRP. Signs warning drivers of the possibility of wildlife encounters will be posted in areas of high wildlife activity. A log of collisions will be kept to monitor the effectiveness of the proposed mitigation and additional mitigation measures will be implemented if necessary; • Inclusion of wildlife awareness information into regular safety inductions performed by the mine. Workers will be made aware of seasonal changes in wildlife behaviour or presence in proximity to the mine; • Treatment of tailings slurry containing cyanide and associated heavy metals in the process plant using the SO_2/Air process before being discharged to the tailings management area; and • Restoration of disturbed habitats at closure including the development of habitats capable of supporting a diversity of wildlife species, including Species of Special Concern and rare species.	7.16.3	Ongoing
114 (and 87).	Timing of the transmission line construction will be planned to avoid the breeding bird and main tourist season, as possible.	4.16	Ongoing
117.	RRR has an open invitation for First Nations, the MNO and regional stakeholders to participate in all baseline and environmental monitoring programs, including Whip-poor-will, where appropriate and to share monitoring results. RRR will continue to advise of the opportunity at public forums in order to encourage anyone who's interested to participate (Letter to Chiefs from Kyle Stanfield, October 2013).	Table 3-4	Ongoing
181.	Environmental monitoring will be conducted in accordance with standard practice and regulatory requirements, including any site-specific environmental approvals.	7.21.3 13 (and others)	Ongoing
186.	Monitoring details will be developed through ongoing stakeholder consultation during the EA process, and through conditions placed on regulatory instruments such as permits, authorizations and approvals, issued by the Federal and Provincial regulatory agencies.	13.1	
187.	A Follow up Monitoring Program (FMP) is provided in Section 13 of the Final EA Report, which subject to modification through the EA review process, will be implemented by NG in the manner and schedule identified, to: • Verify the accuracy of the environmental assessment of a designated project; and • Determine the effectiveness of any mitigation measures.	13	

#	Commitment / Mitigation [1]	EIS Source [2]	Status
188.	Subject to acceptance in writing of the FMP by the Federal and Provincial governments, monitoring results will be provided to the parties involved in the FMP annually during the construction and operation phases of the RRP.	13	

Notes:

1 Commitments are stated as submitted to the Canadian Environmental Assessment Agency (Version 9), except where Proponent / project name required revision for clarity.

2 **Bold** text refers to Final EA Report / EIS references. Other references relate to follow up comments / response tables. Note that the commitment may also have been made in other locations not specifically referenced herein.

APPENDIX 2

MIGRATORY BIRD SPECIES DIVERSITY AND DENSITIES IN 2011, 2012, 2014 AND 2015

415000 420000 425000 430000 435000 440000

5435000 5430000 5425000 5420000 5415000 5410000 5405000 5400000 5395000

MATHIEU RD
Big Grassy River
Caliper Lake Provincial Park
Sturgeon River
HWY 600
HWY 615
TAIT RD
BARWICK RD
ANGUS RD
OFFLEY RD
MOULTON RD

BBS-2-2
BBS-2-4
BBS-2-7
BBS-2-14
BBS-1-28
AMEC 12
BBS-1-24
BBS-2-17
BBS-2-16
BBS-2-11
BBS-2-19
AMEC 13
BBS-2-23
BBS-2-21
BBS-1-22
BBS-1-24
BBS-1-26
BBS-1-25
BBS-2-20
AMEC 31
BBS-1-20
BBS-1-15
BBS-1-5
BBS-1-3
BBS-1-8
AMEC 33
BBS-1-10
BBS-1-12
BBS-1-19

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LEGEND

- Transmission Line
- Road
- Watercourse
- Waterbody
- Approximate Principal RRP Facilities

Breeding Bird Survey Location - Richness (Labelled with Location ID)

- 6 to 10 Species
- 11 to 15 Species
- 16 to 20 Species
- 21 to 25 Species
- 26 to 30 Species

NOTES:
- Pleiades imagery September 2015
- Road and watercouse data extracted from Land Information Ontario, MNRF.
- Base map data from Geogratis NRCan Toporama DRG 1:50k sheets.

0 1 2 4 6 8 10 Kilometres

Datum: NAD83
Projection: UTM Zone 15N

N W E S

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RAINY RIVER PROJECT

2011 Bird Species Richness

PROJECT N°: TC111504	**FIGURE: A2-a**
SCALE: 1:115,000	DATE: January 2016

415000 420000 425000 430000 435000 440000

5435000 5430000 5425000 5420000 5415000 5410000 5405000 5400000 5395000

MATTHIEU RD
Big Grassy River
Caliper Lake Provincial Park
Gohn Bay
Southern River
HWY 600
HWY 615
TAIT RD
BARWICK RD
ANGUS RD
MOULTON RD
OFFLEY RD

TL24 TL23 TL22 TL21 TL20 TL19 TL18 TL17 TL16 TL15 TL14 TL13 TL12 TL11 TL10 TL9 TL8 TL7 TL6

B55 B67 B48 B68 B47 B49 B46 B42 B65 B53 B43 B52 B41 B54 B40 B66 B39 B44 B51 B29 B38 B50 B28 B30 B45 B26 B64 B62 B36 B25 B27 B63 B35 B37 B22 B31 B32 B33 B23 B24 B34 B20 B18 B19

B72 B60 B61 B70 B71 B69 B59 B73 B58 B74 B57 B75 B77 B80 B81 B76 B78 B3 B79 B4 B2 B5 B1 B6

B56 B10 T1 B17 B9 T2 B16 B8 B11 T3 B7 T4 B12 B13 T5 B15 B14

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LEGEND

- Transmission Line
- Road
- Watercourse
- Waterbody
- Approximate Principal RRP Facilities

Breeding Bird Survey Location - Richness (Labelled with Location ID)

- 6 to 10 Species
- 10 to 15 Species
- 16 to 20 Species
- 21 to 25 Species

NOTES:
- Pleiades imagery September 2015
- Road and watercouse data extracted from Land Information Ontario, MNRF.
- Base map data from Geogratis NRCan Toporama DRG 1:50k sheets.

Datum: NAD83
Projection: UTM Zone 15N

0 1 2 4 6 8 10 Kilometres

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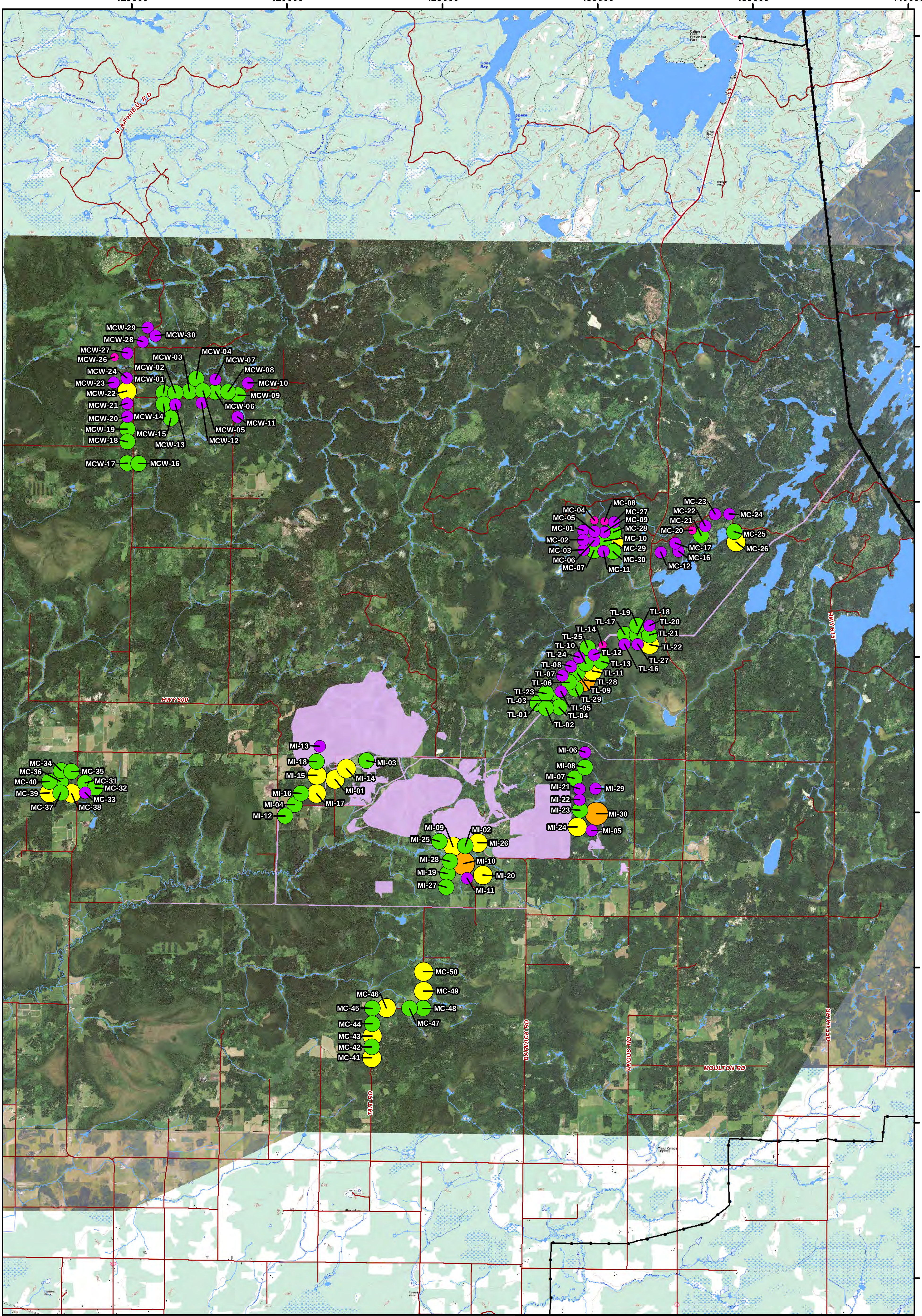
RAINY RIVER PROJECT

2012 Bird Species Richness

PROJECT N°: TC111504	**FIGURE: A2-b**
SCALE: 1:115,000	DATE: January 2016



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HWY 615
TAIT RD
BARWICK RD
ANGUS RD
OFF LK RD
MOULTON RD
Caliper Lake Provincial Park
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MCW-02
MCW-03
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MCW-10
MCW-11
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LEGEND

- Transmission Line
- Road
- Watercourse
- Waterbody
- Approximate Principal RRP Facilities

Breeding Bird Survey Location - Richness (Labelled with Location ID)

- 1 to 5 Species
- 6 to 10 Species
- 11 to 15 Species
- 16 to 20 Species
- 21 to 25 Species

0 1 2 4 6 8 10 Kilometres

NOTES:
- Pleiades imagery September 2015
- Road and watercouse data extracted from Land Information Ontario, MNRF.
- Base map data from Geogratis NRCan Toporama DRG 1:50k sheets.

Datum: NAD83
Projection: UTM Zone 15N

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RAINY RIVER PROJECT

2014 Bird Species Richness

PROJECT Nº: TC111504	FIGURE: A2-c
SCALE: 1:115,000	DATE: January 2016

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5435000 5430000 5425000 5420000 5415000 5410000 5405000 5400000 5395000

MATHIEU RD
Big Grassy River
Sturgeon River
Gohn Bay
Caliper Lake Provincial Park
HWY 600
HWY 615
TAIT RD
BARWICK RD
ANGUS RD
MOULTON RD
OFF LK RD

MC-13 MC-14 MC-15 MC-72 B-5 B-4 MC-19 MC-71 MC-73 MC-77 B-1 B-3 B-2 MC-76 MC-74 MC-75 MC-78 MC-79 MC-80

MC-08 MC-04 MC-09 MC-05 MC-27 MC-01 MC-28 MC-02 MC-29 MC-03 MC-30 MC-06 MC-07 MC-10 MC-11

MC-67 MC-22 MC-20 MC-23 MC-68 MC-24 MC-25 MC-21 MC-26 MC-17 MC-16 MC-69 MC-12

MC-51 MC-60 MC-52 MC-54 MC-56 MC-55 MC-59 MC-61 MC-57 MC-62 MC-65 MC-58 MC-53 MC-63

B-12 B-13 B-14 B-17 B-18 B-22 B-15 B-23 MI-13 MI-18 MI-14 B-19 MI-15 MI-03 B-16 B-20 B-21 MI-01 B-26 B-25 MI-17 MI-16 B-29 B-37 B-28 B-35 MI-04 B-38 B-32 B-36 MI-12 B-27 MI-33 B-33 B-34 B-31 B-30

MC-35 MC-34 MC-36 MC-31 MC-40 MC-32 MC-39 MC-33 MC-37 MC-38

B-44 B-43

MI-29 MI-07 MI-21 MI-24 B-42 MI-22 B-41 MI-23 MI-05 MI-30

MI-09 MI-02 MI-25 MI-26 MI-28 MI-10 MI-19 MI-11 MI-27 MI-36

B-39 B-40

B-8 B-9 B-7 B-10 B-6 B-11

MI-32 MI-31 MC-46 MC-48 MC-45 MC-47 MC-44 MC-43 MC-42 MC-41

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LEGEND

- Transmission Line
- Road
- Watercourse
- Waterbody
- Approximate Principal RRP Facilities

Breeding Bird Survey Location - Richness (Labelled with Location ID)

- 1 to 5 Species
- 6 to 10 Species
- 11 to 15 Species
- 16 to 20 Species
- 21 to 25 Species
- 26 to 30 Species

NOTES:
- Pleiades imagery September 2015
- Road and watercouse data extracted from Land Information Ontario, MNRF.
- Base map data from Geogratis NRCan Toporama DRG 1:50k sheets.

0 1 2 4 6 8 10 Kilometres

Datum: NAD83
Projection: UTM Zone 15N

N W E S

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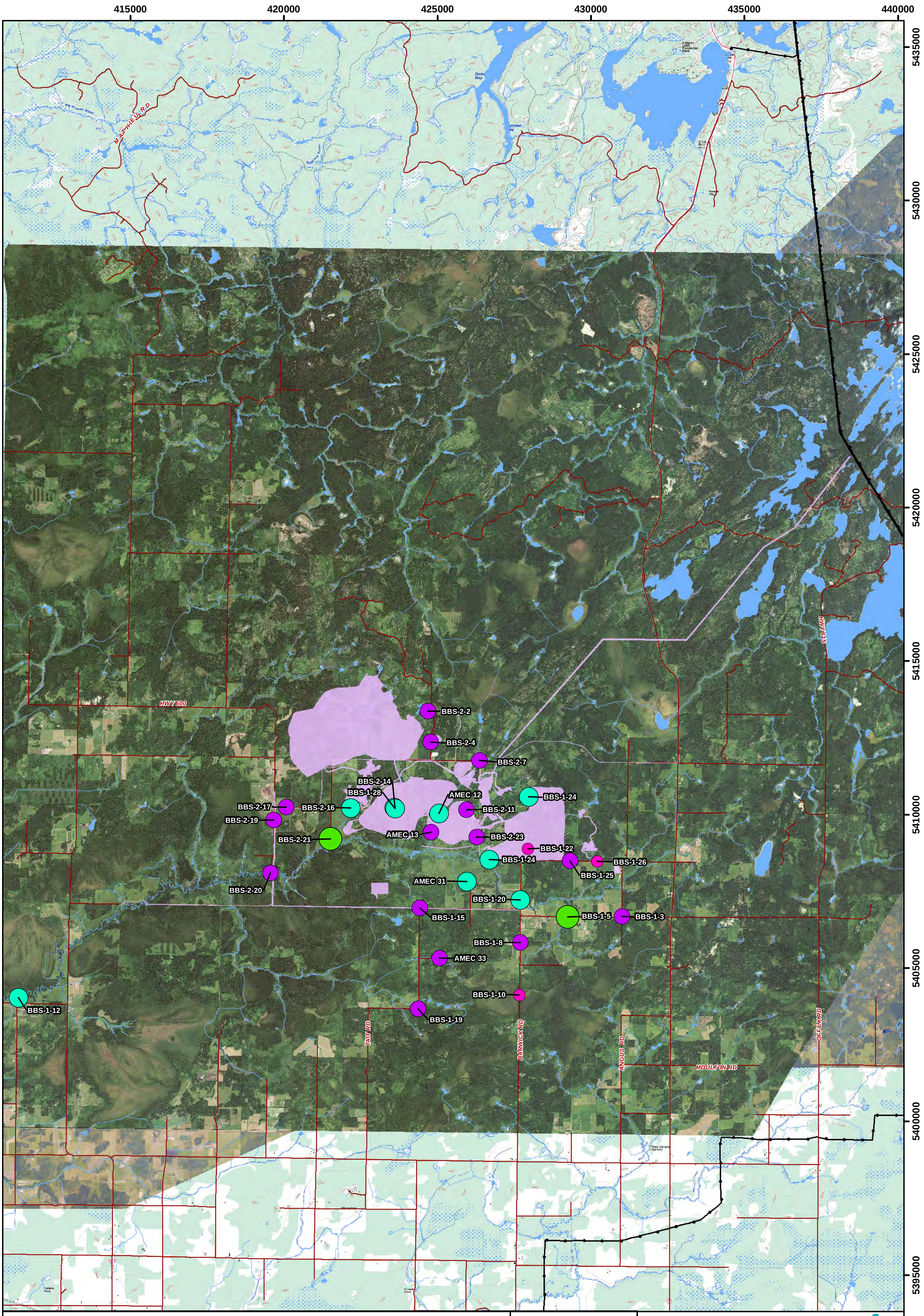
amec foster wheeler

RAINY RIVER PROJECT

2015 Bird Species Richness

PROJECT N°: TC111504	**FIGURE: A2-d**
SCALE: 1:115,062	DATE: January 2016



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5420000
5415000
5410000
5405000
5400000
5395000
MATHIEU RD
Big Grassy River
Caliper Lake Provincial Park
HWY 600
HWY 615
TAIT RD
BARWICK RD
ANGUS RD
OFF LK RD
MOULTON RD
BBS-2-2
BBS-2-4
BBS-2-7
BBS-2-14
BBS-1-28
AMEC 12
BBS-1-24
BBS-2-17
BBS-2-16
BBS-2-11
BBS-2-19
AMEC 13
BBS-2-23
BBS-2-21
BBS-1-22
BBS-1-24
BBS-1-26
BBS-1-25
AMEC 31
BBS-2-20
BBS-1-20
BBS-1-15
BBS-1-5
BBS-1-3
BBS-1-8
AMEC 33
BBS-1-12
BBS-1-10
BBS-1-19

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LEGEND

- Transmission Line
- Road
- Watercourse
- Waterbody
- Approximate Principal RRP Facilities

Breeding Bird Survey Location - Density (Labelled with Location ID)

- 11 to 20 birds
- 21 to 30 birds
- 31 to 40 birds
- 41 o 50 birds

0 1 2 4 6 8 10 Kilometres

NOTES:
- Pleiades imagery September 2015
- Road and watercouse data extracted from Land Information Ontario, MNRF.
- Base map data from Geogratis NRCan Toporama DRG 1:50k sheets.

Datum: NAD83
Projection: UTM Zone 15N

N W E S

newgold™ Rainy River Project

amec foster wheeler

RAINY RIVER PROJECT

2011 Bird Density

PROJECT N°: TC111504	FIGURE: A2-e
SCALE: 1:115,000	DATE: January 2016

415000 420000 425000 430000 435000 440000

5435000 5430000 5425000 5420000 5415000 5410000 5405000 5400000 5395000

MATTHIEU RD
Big Grassy River
Caliper Lake Provincial Park
Gohn Bay
Southwest River
HWY 600
HWY 615
TAIT RD
BARWICK RD
ANGUS RD
MOULTON RD
OFFLK RD

TL24 TL23 TL22 TL21 TL20 TL19 TL18 TL17 TL16 TL15 TL14 TL13 TL12 TL11 TL10 TL9 TL8 TL7 TL6

B55 B67 B48 B68 B47 B49 B46 B42 B65 B53 B43 B41 B52 B54 B40 B66 B29 B39 B44 B51 B38 B50 B28 B30 B45 B26 B64 B62 B36 B25 B27 B63 B35 B37 B22 B31 B32 B33 B23 B24 B34 B20 B18 B19

B72 B60 B61 B70 B71 B69 B59 B73 B58 B74 B57 B75 B77 B80 B81 B76 B78 B3 B79 B4 B2 B5 B1 B6

B56 B10 T1 B17 T2 B16 B9 B11 B8 T3 T4 B12 B7 T5 B15 B13 B14

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LEGEND

- Transmission Line
- Road
- Watercourse
- Waterbody
- Approximate Principal RRP Facilities

Breeding Bird Survey Location - Density (Labelled with Location ID)

- 1 to 10 Birds
- 11 to 20 Birds
- 21 to 30 Birds
- 31 to 40 Birds
- 41 to 50 Birds

NOTES:
- Pleiades imagery September 2015
- Road and watercouse data extracted from Land Information Ontario, MNRF.
- Base map data from Geogratis NRCan Toporama DRG 1:50k sheets.

Datum: NAD83
Projection: UTM Zone 15N

0 1 2 4 6 8 10 Kilometres

N W E S

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RAINY RIVER PROJECT

2012 Bird Density

PROJECT N°: TC111504 | **FIGURE: A2-f**

SCALE: 1:115,000 | DATE: January 2016

415000 420000 425000 430000 435000 440000

5435000 5430000 5425000 5420000 5415000 5410000 5405000 5400000 5395000

MATHIEU RD
Big Grassy River
Sturgeon River
Gohn Bay
Caliper Lake Provincial Park
HWY 600
HWY 615
TAIT RD
BARWICK RD
ANGUS RD
OFFLY RD
MOULTON RD

MCW-29 MCW-30 MCW-28 MCW-27 MCW-26 MCW-24 MCW-23 MCW-22 MCW-21 MCW-20 MCW-19 MCW-18 MCW-17 MCW-16 MCW-15 MCW-14 MCW-13 MCW-12 MCW-11 MCW-10 MCW-09 MCW-08 MCW-07 MCW-06 MCW-05 MCW-04 MCW-03 MCW-02 MCW-01

MC-01 MC-02 MC-03 MC-04 MC-05 MC-06 MC-07 MC-08 MC-09 MC-10 MC-11 MC-12 MC-16 MC-17 MC-20 MC-21 MC-22 MC-23 MC-24 MC-25 MC-26 MC-27 MC-28 MC-29 MC-30

MC-31 MC-32 MC-33 MC-34 MC-35 MC-36 MC-37 MC-38 MC-39 MC-40

MC-41 MC-42 MC-43 MC-44 MC-45 MC-46 MC-47 MC-48 MC-49 MC-50

TL-01 TL-02 TL-03 TL-04 TL-05 TL-06 TL-07 TL-08 TL-09 TL-10 TL-11 TL-12 TL-13 TL-14 TL-16 TL-17 TL-18 TL-19 TL-20 TL-21 TL-22 TL-23 TL-24 TL-25 TL-27 TL-28 TL-29

MI-01 MI-02 MI-03 MI-04 MI-05 MI-06 MI-07 MI-08 MI-09 MI-10 MI-11 MI-12 MI-13 MI-14 MI-15 MI-16 MI-17 MI-18 MI-19 MI-20 MI-21 MI-22 MI-23 MI-24 MI-25 MI-26 MI-27 MI-28 MI-29 MI-30

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LEGEND

- Transmission Line
- Road
- Watercourse
- Waterbody
- Approximate Principal RRP Facilities

Breeding Bird Survey Location - Density (Labelled with Location ID)

- 1 to 10 Birds
- 11 to 20 Birds
- 21 to 30 Birds
- 31 to 40 Birds
- 41 to 50 Birds

NOTES:
- Pleiades imagery September 2015
- Road and watercouse data extracted from Land Information Ontario, MNRF.
- Base map data from Geogratis NRCan Toporama DRG 1:50k sheets.

Datum: NAD83
Projection: UTM Zone 15N

0 1 2 4 6 8 10 Kilometres

N W E S

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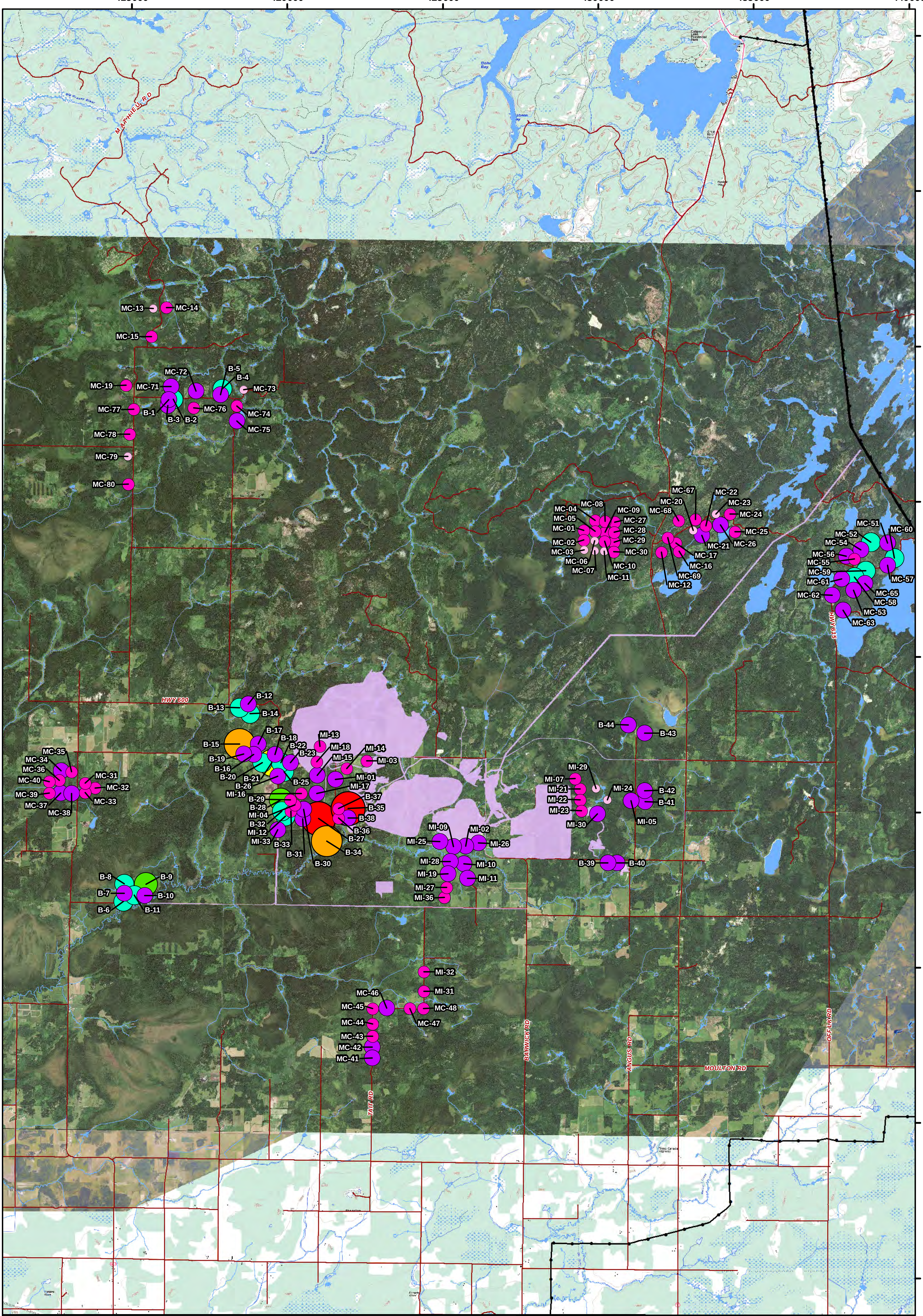
RAINY RIVER PROJECT

2014 Bird Density

PROJECT N°: TC111504 | **FIGURE: A2-g**

SCALE: 1:115,000 | DATE: January 2016


415000
420000
425000
430000
435000
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5435000
5430000
5425000
5420000
5415000
5410000
5405000
5400000
5395000
MATHIEU RD
Big Grassy River
Caliper Lake Provincial Park
HWY 600
HWY 615
TAIT RD
BARWICK RD
ANGUS RD
OFF LK RD
MOULTON RD
Trans Canada Highway
MC-13
MC-14
MC-15
MC-19
MC-71
MC-72
B-5
B-4
MC-73
MC-77
B-1
B-3
B-2
MC-76
MC-74
MC-75
MC-78
MC-79
MC-80
MC-67
MC-22
MC-20
MC-23
MC-68
MC-24
MC-08
MC-04
MC-09
MC-05
MC-27
MC-01
MC-28
MC-02
MC-29
MC-03
MC-30
MC-06
MC-10
MC-07
MC-11
MC-25
MC-21
MC-26
MC-17
MC-16
MC-69
MC-12
MC-51
MC-60
MC-52
MC-54
MC-56
MC-55
MC-59
MC-57
MC-61
MC-65
MC-62
MC-58
MC-53
MC-63
B-12
B-13
B-14
B-44
B-43
B-15
B-17
B-18
B-22
MI-13
MI-18
B-23
MI-14
MI-03
B-19
B-16
B-20
B-21
MI-15
MI-01
B-25
B-26
MI-16
MI-17
B-29
B-37
B-35
B-28
MI-04
B-38
B-32
MI-12
B-36
B-27
MI-33
B-33
B-31
B-34
B-30
MC-35
MC-34
MC-36
MC-31
MC-40
MC-32
MC-39
MC-37
MC-38
MC-33
MI-29
MI-07
MI-21
MI-24
B-42
MI-22
B-41
MI-23
MI-30
MI-05
MI-09
MI-02
MI-25
MI-26
MI-28
MI-10
MI-19
MI-11
MI-27
MI-36
B-39
B-40
B-8
B-9
B-7
B-10
B-6
B-11
MI-32
MI-31
MC-46
MC-45
MC-48
MC-47
MC-44
MC-43
MC-42
MC-41

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LEGEND

- Transmission Line
- Road
- Watercourse
- Waterbody
- Approximate Principal RRP Facilities

Breeding Bird Survey Location - Density (Labelled with Location ID)

- 6 to 10 Birds
- 11 to 20 Birds
- 21 to 30 Birds
- 31 to 40 Birds
- 41 to 50 Birds
- 51 to 60 Birds
- 61 to 70 Birds
- 71 to 80 Birds

0 1 2 4 6 8 10 Kilometres

NOTES:
- Pleiades imagery September 2015
- Road and watercouse data extracted from Land Information Ontario, MNRF.
- Base map data from Geogratis NRCan Toporama DRG 1:50k sheets.

Datum: NAD83
Projection: UTM Zone 15N

N W E S

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RAINY RIVER PROJECT

2015 Bird Density

PROJECT N°: TC111504

FIGURE: A2-h

SCALE: 1:115,000

DATE: January 2016

APPENDIX 3

LIKELIHOOD OF SAR OCCURRING WITHIN THE RAINY RIVER PROJECT NLSA

Appendix 3: Likelihood of SAR Occurring within the RRP NLSA

Species	*Species at Risk Act*	*Endangered Species Act*	Provincial NHIC S-Rank	Critical Habitat	Likelihood of Occurrence within the RRP NLSA
Plants					
Small-flowered Lipocarpha (*Lipocarpha micrantha)*	END (Schedule 1)	THR	S2	This species is confined to moist sandy beaches which have some protection from waves (COSEWIC 2002).	**Low** – Sandy beaches not occur in the NLSA.
Western Silvery Aster *(Symphyotrichum sericeum)*	THR (Schedule 1)	END	S1	This plant species grows in open bur oak savannahs on shallow soils over bedrock (MNR 2008).	**Low** – Prairie habitat does not occur in the NLSA.
Mammals					
Little Brown Myotis *(Myotis lucifugus)*	--	END	S4	Little Brown Myotis requires cavity trees of large diameter to use as maternity roots as well as foraging habitat such as wetlands and open woodlands. Bat hibernacula generally consist of caves, abandoned mine shafts, and underground foundations (MNR 2012c).	**Observed** – The study area provides an abundance of forest edge interface as well as low-lying swamplands which provide ample foraging habitat. Woodlands consisting of large-diameter Trembling Aspen likely provide suitable cavities for maternal roosts.
Northern Myotis *(Myotis septentrionalis)*	--	END	S3	Northern Myotis requires cavity trees of large diameter to use as maternity roots as well as foraging habitat such as wetlands and open woodlands. Bat hibernacula generally consist of caves, abandoned mine shafts, and underground foundations (MNR 2012c)	**Observed** – The study area provides an abundance of forest edge interface as well as low-lying swamplands which provide ample foraging habitat. Woodlands consisting of large-diameter Trembling Aspen likely provide suitable cavities for maternal roosts.
American Badger (*Taxidea taxus jacksonii)*	END	END	S2	Preferred areas include natural and undisturbed grasslands, shrubby areas and woodlots (Ontario American Badger Recovery Team 2010).	**Low – Moderate** – While this habitat does occur within the NLSA, the American Badger is a very rare species and two sightings were confirmed in the Rainy River – Fort Frances area between 2000 and 2008 (Ontario American Badger Recovery Team 2010).
Grey Fox (*Urocyon cinereoargenteus)*	THR	THR	S1	In Ontario, the Grey Fox prefers deciduous forests, especially swampy areas (Royal Ontario Museum 2008). Grey Fox occurrence in Ontario generally hugs the border with the United States.	**Moderate** – The NLSA provides suitable habitat. Three commercial traplines partially intersect the NLSA. MNR records from fur harvest between 1993 and 2008 show that Grey Fox had been captured in the general area.

Species	*Species at Risk Act*	*Endangered Species Act*	Provincial NHIC S-Rank	Critical Habitat	Likelihood of Occurrence within the RRP NLSA
Birds					
Eastern Whip-poor-will *(Antrostomus vociferous)*	THR (Schedule 1)	THR	S4B	This species prefers rock or sand barrens with scattered trees, savannahs, old burns in early succession, and open conifer plantations (Cadman et al. 2007). Accordingly, pine (barrens and plantations), oak (barrens and savannahs), and aspen and birch (early to mid-succession) are common tree species associations (COSEWIC 2009a).	**Observed** – Suitable habitat in the form of rocky outcrops and open forests is widespread within the NLSA.
Common Nighthawk (*Chordeiles minor*)	THR (Schedule 1)	Special Concern	S4B	Common Nighthawks utilize a wide variety of natural open country habitats including sand dunes, cutovers, burns, rocky outcrops, bogs, short-grass prairies, open forests, marshes, lakeshores, rock barrens, and forest clearings (COSEWIC 2007). This species has also adapted to anthropogenically modified habitats including mine tailings, quarries, urban parks, airports, gravel roads, and flat-topped buildings. Despite this species' tolerance of disturbed lands, it prefers natural habitats.	**Observed** – This species was observed both in proximity to the proposed mine footprint and along the proposed transmission line corridor. Cumulative studies between 2010 and 2011 indicated that nighthawks were most readily observed where cleared forest and rocky outcrops were present, particularly in proximity to the proposed transmission line. Cleared forest in this area undoubtedly provides both nesting habitat and open foraging habitat for this species.
Short-eared Owl (*Asio flammeus*)	Special Concern (Schedule 1)	Special Concern	S3S4	This species nests in areas of tall grass in grasslands, agricultural lands and wetlands (Cadman et al. 2007). This species uses similar habitat for foraging.	**Observed** – One individual was observed in 2010. Subsequent surveys between 2011 and 2014 did not provide additional observations.
Bobolink (*Dolichonyx oryzivorus)*	THR (Schedule status pending)	THR	S4B	The Bobolink nests primarily in forage crops (e.g., hayfields and pastures) and old field habitat. It can adapt to low-moderate livestock grazing, but not intensive grazing. The preferred habitat characteristics are often found in old (≥8 years) forage crops (COSEWIC 2010a). Nesting success is positively correlated to larger habitat size, although this species will utilize smaller areas of 10 to 30 ha.	**Observed** – The presence of agricultural lands is extensive within the NLSA, consisting primarily of hay fields and pasture lands (row cropping is rare in the area). Scattered populations of Bobolink are known to exist in the Rainy River District.
American White Pelican *(Pelecanus erythrorhynchos)*	NAR	THR	S2B	In Ontario, this species breeds on small, remote, low bedrock islands in fresh water lakes. Breeding colonies occur on islands within Lake of the Woods (Cadman et al. 2007).	**Observed** – The closest known pelican colony to the NLSA exists on Lake of the Woods (Cadman et al. 2007). Pelicans are known to forage at considerable distances (50 to 100 km) from breeding colonies and may use the NLSA as foraging habitat only.

Species	*Species at Risk Act*	*Endangered Species Act*	Provincial NHIC S-Rank	Critical Habitat	Likelihood of Occurrence within the RRP NLSA
Bald Eagle (*Haliaeetus leucocephalus)*	NAR	Special Concern	S4	Bald Eagles use shoreline habitat associated with lakes and large rivers (rarely small lakes and rivers) for nesting and foraging and often prefer nesting on islands (MNR 2000). Hunting areas consist of productive areas of open water or deep water marshes supporting large quantities of fish (MNR 2000).	**Observed** – Bald Eagles feed primarily on fish and thus usually require large open waterbodies to hunt. The Pinewood River, located within the NLSA, may support suitable fish populations.
Peregrine Falcon *(Falco peregrines)*	Special Concern (Schedule 1)	Special Concern	S2S3	Peregrine Falcons nest on ledges found on vertical cliff faces, but will also utilize manmade structures such as: tall buildings, bridges and the walls of open pit mines. In Ontario, suitable vertical faces are generally 50 to 200 m high and will typically overlook water bodies and forested areas.	**Observed** – One individual was observed in 2010, flying across the NLSA during migration. No cliff faces are present in the study area, and therefore, no nesting habitat is present.
Olive-sided Flycatcher *Contopus cooperi)*	THR (Schedule 1)	Special Concern	S4B	This species prefers natural forest openings created by forest fires or other natural disturbance. Snags of large trees remaining on disturbed landscapes are an important ecological element of flycatcher habitat as they provide elevated perches used for foraging and may provide habitat for insects.	**Observed** – The Olive-sided Flycatcher is a widespread species in Northern Ontario. The NLSA provides suitable breeding habitat in the form of forests with natural openings created by rocky outcroppings.
Canada Warbler (*Cardellina Canadensis)*	THR (Schedule 1)	Special Concern	S4B	Canada Warbler will nest in the interior of wet mixed woodlands or swamps (Cadman et al. 2007).	**Observed** – Moist mixed forests and slopes representing suitable Canada Warbler habitat are rare in the NLSA and likely inhibit this species from occurring in greater numbers.
Least Bittern (*Ixobrychus exilis)*	THR (Schedule 1)	THR	S4B	Least Bittern breed strictly in marshes with tall emergent vegetation (usually cattails) that have relatively stable water levels (less than 1 m, and usually 10 to 50 cm) and about 50% open water interspersed in small pockets throughout the vegetated areas (COSEWIC 2009b). Larger wetlands (>5 to 10 ha) are said to be particularly important.	**Low** – Records in the OBBA show that Least Bittern is not common within the Rainy River District and those records are from cattail marshes near Fort Frances (Cadman et al. 2007). Cattail marshes are sporadic within the NLSA.
Black Tern (*Chlidonias niger)*	NAR	Special Concern	S3B	Black Terns nest in loose colonies and prefer large marshes with 50:50 open water and emergent vegetation (Cadman et al. 2007).	**Low** – Black Tern colonies are known to occur at Lake of the Woods, west of the NLSA. No known colonies occur within the NLSA where suitable large, open marshes are rare.

Species	*Species at Risk Act*	*Endangered Species Act*	Provincial NHIC S-Rank	Critical Habitat	Likelihood of Occurrence within the RRP NLSA
Yellow Rail (*Coturnicops noveboracensis)*	Special Concern (Schedule 1)	Special Concern	S4B	This species breeds in damp, sedge-dominated habitat that maintains up to 15 cm of standing water throughout the breeding season (Cadman et al. 2007).	**Low – Moderate** – This species is known to occur in the Rainy River District; however, suitable breeding habitat is uncommon in the NLSA. The presence of this secretive species may be difficult to confirm.
Eastern Meadowlark (*Sturnella magna)*	THR (Schedule status pending)	THR	S4B	This species prefers native grasslands but will nest in pastures and agricultural hay fields. It also uses old fields and meadows, often over-grown with shrubs, and prefers dry habitat to wet and tall grass to short (COSEWIC 2011b).	**Low – Moderate** – The presence of agricultural lands is extensive within the NLSA, consisting primarily of hay fields and pasture lands (row cropping is rare in the area). Scattered populations of Eastern Meadowlark are known to exist in the Rainy River District. The NLSA occurs in a region where the ranges of Eastern and Western Meadowlark overlap.
Chimney Swift (*Chaetura pelagic)*	THR (Schedule 1)	THR	S4B, S4N	Chimney Swifts nest and roost predominantly in old chimneys, although some may utilize hollow trees, other tree cavities, and cracks in cliffs (Cadman et al. 2007). This species requires the presence of dated human settlement, cliffs, or large trees of large diameter or snags.	**Moderate** – The Chimney Swift is known to occur in the Rainy River District (Cadman et al. 2007). The NLSA contains a small rural settlement which may provide suitable habitat. Rocky outcroppings occur within the NLSA and may provide suitable cliff nesting habitat. Cavity trees of large diameter likely occur in forested areas of the NLSA, although swift nesting in such locations is uncommon.
Red-headed Woodpecker *(Melanerpes erythrocephalus)*	THR (Schedule 1)	Special Concern	S4B	Red-headed Woodpeckers are associated with the Carolinian forest where they inhabit open woodlands, oak savannah, riparian forest, and hedgerows. This species is particularly drawn to American Beech trees on which they forage for beach nuts and insects (Cadman et al. 2007).	**Observed** – It is estimated that 30 to 50 pairs occur in 10 OBBA survey squares in the Rainy River Clay Plain (Cadman et al. 2007). Although oak savannah is not present in the NLSA, open woodlands and riparian forest may provide suitable habitat.
Barn Swallow (*Hirundo rustica)*	THR (Schedule status pending)	THR	S4B	Barn Swallows nest largely in and on artificial structures, including barns and other outbuildings, garages, houses, bridges, and road culverts. Barn Swallows prefer various types of open habitat for foraging, including grassy fields, pastures, various kinds of agricultural crops, lake and river shorelines, cleared right-of ways, cottage areas and farmyards, islands, wetlands, and subarctic tundra (COSEWIC 2011a).	**Observed** – The NLSA contains a small rural settlement which may provide artificial structures with suitable breeding habitat. The presence of agricultural lands, suitable for foraging habitat, is extensive within the NLSA, consisting primarily of hay fields and pasture lands (row cropping is rare in the area).
Golden-winged Warbler *(Vermivora chrysoptera)*	THR (Schedule 1)	Special Concern	S4B	Golden-winged Warblers breed in successional / shrub, or old field habitats surrounded by forests. This species is associated with deciduous of mixed forests occurring over upland landscapes (Cadman et al. 2007).	**Observed** – This species is known to occur near Rainy River. The NLSA contains ample suitable breeding habitat in the form of successional forests, old fields, and upland deciduous or mixedwood forests.

Species	*Species at Risk Act*	*Endangered Species Act*	Provincial NHIC S-Rank	Critical Habitat	Likelihood of Occurrence within the RRP NLSA
Reptiles					
Snapping Turtle (*Chelydra serpentine)*	Special Concern (Schedule 1)	Special Concern	S4	Snapping Turtles inhabit a wide variety of aquatic habitats including ponds, sloughs, shallow bays or river edges, and slow streams. Snapping Turtles are tolerant of disturbance and will inhabit man-made ponds, ditches and canals. This species nests in sand and gravel banks along waterways and well as within a variety of man-made features (COSEWIC 2008).	**Observed** – Suitable Snapping Turtle habitat in the form of slow streams, ponds and ditches are present within the NLSA. Beaver ponds are widespread. Natural sand and gravel substrates are not common.
Invertebrates					
Monarch Butterfly (*Danaus plexippus)*	Special Concern	--	S2N, S4B	Monarch Butterfly habitat exists primarily wherever milkweed (Asclepius) and wildflowers such as goldenrods, asters, and Purple Loosestrife exist, including abandoned farmland, along roadsides, and other open spaces where these plants grow (COSEWIC 2010b).	**Moderate** – This wide-ranging, strong-flying species may occur anywhere milkweed or flowering meadow plants occur within 500 km of the Great Lakes.

Notes:

*** =** Observed in the NLSA during AMEC or KCB field investigations to date
SARA = *Species at Risk Act* and is the Federal Status. Rankings are provided by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC)
SARO =*Species at Risk in Ontario*, is the Provincial Status. Rankings are provided by the Committee on the Status of Species at Risk in Ontario (COSSARO)
NHIC = Natural Heritage Information Centre and is a database maintained by the MNR
ESA = *Endangered Species Act*

SARA

NAR	Not at Risk
SC	Special Concern
THR	Threatened
END	Endangered

SARO

NAR	Not at Risk
SC	Special Concern
THR	Threatened
END	Endangered

NHIC S-Rank

S1	Critically Imperilled
S2B	Imperilled - Breeding Migrants
S3?	Vulnerable - Rank uncertain
S4	Apparently Secure
S4B	Apparently Secure Breeding Migrants
S4N	Apparently Secure Non-breeding Migrants
S5	Secure
S5B	Secure Breeding Migrants
S5N	Secure Non-breeding Migrants
SNA	Status Rank not Applicable

APPENDIX 4

MONITORING SUMMARY TABLES

Table 4-a: Monitoring Framework for Migratory Birds

	General Migratory Bird Surveys	Point Count Surveys for Migratory Birds	Surveys Tracking Migratory Bird Habitat Removal	Migratory Bird Habitat Assessments	Incidental Data On Migratory Birds
Predicted Project-Related Impacts	• Direct loss of habitat • Habitat abandonment due to chronic disturbance or a decrease in habitat quality • Decreased reproduction due to habitat loss or a decrease in habitat quality	• Direct loss of habitat • Habitat abandonment due to chronic disturbance or a decrease in habitat quality • Decreased reproduction due to habitat loss or a decrease in habitat quality	• Direct loss of habitat	• Direct loss of habitat • Habitat abandonment due to chronic disturbance or a decrease in habitat quality • Decreased reproduction due to habitat loss or a decrease in habitat quality	• N/A
Proposed Mitigation Measures	• Discussed in • Section 6.2	• Discussed in • Section 6.2	• Discussed in • Section 6.2	• Discussed in • Section 6.2	• N/A
Monitoring Objectives	• Verify accuracy of the EA and effectiveness of mitigation measures • Fulfil Provincial and Federal compliance monitoring requirements • Confirm direct loss of habitat and monitor revegetation and recolonization post closure • Monitor for unanticipated reductions in habitat suitability • Determine if SAR compensatory habitat provides suitable habitat • Determine when migratory bird recolonization levels reach baseline numbers based on key thresholds such as; species richness (10.4 to 18.7 species per plot), overall abundance (12.4 to 31.2 birds per plot), top 5 species based on density (birds/ha) (Bobolink 0.41, Common Yellowthroat 0.37, Sedge Wren 0.37, Song Sparrow 0.31, American Goldfinch 0.28), and top 5 species based on abundance (birds/count) (Canada Goose 3.44, Ovenbird 1.29, White-throated Sparrow 1.27, Red-eyed Vireo 1.27, Common Yellowthroat 1.10).	• Verify accuracy of the EA and effectiveness of mitigation measures • Fulfil Provincial and Federal compliance monitoring requirements • Confirm direct loss of habitat and monitor revegetation and recolonization post closure • Monitor for unanticipated reductions in habitat suitability • Determine if SAR compensatory habitat provides suitable habitat • Determine when migratory bird recolonization levels reach baseline numbers based on key thresholds such as; species richness (10.4 to 18.7 species per plot), overall abundance (12.4 to 31.2 birds per plot), top 5 species based on density (birds/ha) (Bobolink 0.41, Common Yellowthroat 0.37, Sedge Wren 0.37, Song Sparrow 0.31, American Goldfinch 0.28), and top 5 species based on abundance (birds/count) (Canada Goose 3.44, Ovenbird 1.29, White-throated Sparrow 1.27, Red-eyed Vireo 1.27, Common Yellowthroat 1.10).	• Fulfil Provincial and Federal compliance monitoring requirements • Confirm direct loss of habitat and monitor revegetation	• Verify accuracy of the EA and effectiveness of mitigation measures • Fulfil Provincial and Federal compliance monitoring requirements • Confirm direct loss of habitat and monitor revegetation and recolonization	• Fulfil Provincial and Federal compliance monitoring requirements

	General Migratory Bird Surveys	Point Count Surveys for Migratory Birds	Surveys Tracking Migratory Bird Habitat Removal	Migratory Bird Habitat Assessments	Incidental Data On Migratory Birds
Variables Being Measured by the Monitoring Surveys	Bird species occurrence, abundance, distribution and richness over time	Bird species occurrence, abundance, distribution and richness over time	Vegetation species occurrence, abundance, distribution and richness over time	Vegetation species present, species density and richness, percent canopy closure and percent ground cover	Various variables / indicators. Species presence / absence
Monitoring Survey Methods	Will adhere to standard provincial protocols and will be conducted between late-May and early July. Monitoring to occur at designated long-term impact and control sites located in and around the periphery of the RRP footprint to support Before-After Control-Impact (BACI) study	Will adhere to standard provincial protocols and will be conducted between late-May and early July. Monitoring to occur at impact and control sites located in and around the periphery of the RRP footprint to support BACI study	Monitoring to occur at impact and control sites located in and around the periphery of the RRP footprint to support BACI study	Monitoring to occur at impact and control sites located in and around the periphery of the RRP footprint to support BACI study	Incidental data will be collected and recorded during all terrestrial and aquatic monitoring surveys
Location of Monitoring Surveys (Scale / Coverage)	RRP footprint and appropriate long-term control sites outside of the footprint (Figure 1)	RRP footprint and appropriate long-term control sites outside of the footprint (Figure 1)	RRP footprint and appropriate long-term control sites outside of the footprint (Figure 1)	RRP footprint and appropriate long-term control sites outside of the footprint (Figure 1)	RRP footprint and appropriate long-term control sites outside of the footprint
Frequency of Monitoring Surveys	During the first two years of construction (2015 and 2016), in the first year following the completion of construction (2018) and at three year intervals during operations, and in years 1, 4, 7, 10 and 15 post closure	During the first two years of construction (2015 and 2016), in the first year following the completion of construction (2018) and at three year intervals during operations, and in years 1, 4, 7, 10 and 15 post closure	To be completed throughout the construction process	Conducted during the Point Count Surveys during the first two years of construction (2015 and 2016), in the first year following the completion of construction (2018) and at three year intervals during operations, and in years 1, 4, 7, 10 and 15 post closure	Ongoing
Duration of Monitoring Surveys	Duration of the project and post closure phase (during the breeding bird season)	Duration of the project and post closure phase (during the breeding bird season)	Throughout the construction phase	Duration of the project and post closure phase	Ongoing
Baseline Data Collected?	Yes	Yes	Yes	Yes	Yes

Table 4-b: Monitoring Framework for Species at Risk (SAR)

	SAR Point Count Surveys	Eastern Whip-poor-will and Common Nighthawk Surveys	Bobolink (and Other Grassland Species) Surveys	SAR Habitat Assessments in and around the Project Footprint	Eastern Whip-poor-will and Bobolink Compensatory Habitat Surveys
Predicted Project-Related Impacts	• Direct loss of habitat • Habitat abandonment due to chronic disturbance or a decrease in habitat quality • Decreased reproduction due to habitat loss or a decrease in habitat quality	• Direct loss of habitat • Habitat abandonment due to chronic disturbance or a decrease in habitat quality • Decreased reproduction due to habitat loss or a decrease in habitat quality	• Direct loss of habitat • Habitat abandonment due to chronic disturbance or a decrease in habitat quality • Decreased reproduction due to habitat loss or a decrease in habitat quality	• Direct loss of habitat • Habitat abandonment due to chronic disturbance or a decrease in habitat quality • Decreased reproduction due to habitat loss or a decrease in habitat quality •	• N/A
Proposed Mitigation Measures	• Discussed in • Section 6.3	• Discussed in • Section 6.3	• Discussed in Section 6.3	• Discussed in • Section 6.3	• N/A
Monitoring Objectives	• Verify accuracy of the EA and effectiveness of mitigation measures • Fulfil Provincial and Federal compliance monitoring requirements • Confirm direct loss of habitat and monitor revegetation and recolonization post closure • Monitor for unanticipated reductions in habitat suitability • Determine if SAR compensatory habitat provides suitable habitat	• Verify accuracy of the EA and effectiveness of mitigation measures • Fulfil Provincial and Federal compliance monitoring requirements • Confirm direct loss of habitat and monitor revegetation and recolonization post closure • Monitor for unanticipated reductions in habitat suitability • Determine if SAR compensatory habitat provides suitable habitat	• Verify accuracy of the EA and effectiveness of mitigation measures • Fulfil Provincial and Federal compliance monitoring requirements • Confirm direct loss of habitat and monitor revegetation and recolonization post closure • Monitor for unanticipated reductions in habitat suitability • Determine if SAR compensatory habitat provides suitable habitat	• Verify accuracy of the EA and effectiveness of mitigation measures • Fulfil Provincial and Federal compliance monitoring requirements • Confirm direct loss of habitat and monitor revegetation and recolonization post closure	• Fulfil Provincial ESA permit conditions • Determine if SAR compensatory habitat provides suitable habitat
Variables being Measured by the Monitoring Surveys	Species occurrence, abundance, distribution and richness over time	Species occurrence, abundance and distribution	Species occurrence, abundance and distribution	Vegetation, species density, species richness, percent canopy closure and percent ground cover	Management activity success / failure
Monitoring Survey Methods	Will adhere to standard provincial protocols and will be conducted between late-May and early July. Monitoring to occur at designated long-term impact and control sites located in and around the periphery of the RRP footprint to support	Monitoring occurrence, abundance and distribution in the vicinity of the Project's footprint, within appropriate control areas (long-term control sites for point count surveys) and in designated compensatory habitat areas	Monitoring occurrence, abundance and distribution in the vicinity of the Project's footprint, within appropriate control areas (long-term control sites for point count surveys) and in designated compensatory habitat areas	Detailed habitat assessments will take place at point count survey stations. Habitat areas to be cleared during construction will not be monitored until the rehabilitation activities commence post closure.	Monitoring management activities within 1,900 ha of compensatory habitat (both species combined) to determine effectiveness of techniques utilized

	SAR Point Count Surveys	Eastern Whip-poor-will and Common Nighthawk Surveys	Bobolink (and Other Grassland Species) Surveys	SAR Habitat Assessments in and around the Project Footprint	Eastern Whip-poor-will and Bobolink Compensatory Habitat Surveys
	Before-After Control-Impact study				
Location of Monitoring Surveys (Scale / Coverage)	RRP footprint and appropriate long-term control sites outside of the footprint (Figure 1)	RRP footprint and appropriate long-term control sites outside of the footprint and in designated compensatory habitat areas (Figure 1)	RRP footprint and appropriate long-term control sites outside of the footprint and in designated compensatory habitat areas (Figure 1)	RRP footprint and appropriate long-term control sites outside of the footprint (Figure 1)	RRP footprint and appropriate long-term control sites outside of the footprint and in designated compensatory habitat areas (Figure 1)
Frequency of Monitoring Surveys	During the first two years of construction (2015 and 2016), in the first year following the completion of construction (2018) and at three year intervals during operations, and in years 1, 4, 7, 10 and 15 post closure	During the first two years of construction (2015 and 2016), in the first year following the completion of construction (2018) and at three year intervals during operations, and in years 1, 4, 7, 10 and 15 post closure, and as outlined in the ESA permit (Section 6 and Appendix G)	During the first two years of construction (2015 and 2016), in the first year following the completion of construction (2018) and at three year intervals during operations, and in years 1, 4, 7, 10 and 15 post closure, and as outlined in the ESA permit (Section 6 and Appendix J)	During the first two years of construction (2015 and 2016), in the first year following the completion of construction (2018) and at three year intervals during operations, and in years 1, 4, 7, 10 and 15 post closure	To be determined in the Management Plans, as outlined in Section 5 of the ESA permit.
Duration of Monitoring Surveys	Duration of the project and post closure phase (during the breeding bird season)	Duration of the project and post closure phase (during the breeding bird season)	Duration of the project and post closure phase (during the breeding bird season)	Duration of the project and post closure phase (during the breeding bird season)	Ongoing for the life of the ESA permit
Baseline Data Collected?	Yes	Yes	Yes	Yes	Eastern Whip-poor-will: Desk-top data available Bobolink: Yes

Table 4-c: Monitoring Framework for Species at Risk (SAR)

	Eastern Whip-poor-will Site Rehabilitation Plan	Bobolink Site Rehabilitation Plan	Barn Swallows	Incidental SAR Data	Wildlife Log
Predicted Project-Related Impacts	• Direct loss of habitat	• Direct loss of habitat	• Direct loss of habitat	• N/A	• N/A
Proposed Mitigation Measures	• Revegetation (progressive reclamation and post closure)	• Revegetation (progressive reclamation and post closure)	• Placement of four artificial nesting structures	• N/A	• N/A
• Monitoring Objectives	• Verify accuracy of the EA and effectiveness of mitigation measures • Confirm direct loss of habitat and monitor revegetation and recolonization post closure • Fulfil Provincial ESA permit conditions	• Verify accuracy of the EA and effectiveness of mitigation measures • Confirm direct loss of habitat and monitor revegetation and recolonization post closure • Fulfil Provincial ESA permit conditions	• Monitor annual use of four artificial nest structures	• Fulfil Provincial and Federal compliance monitoring requirements	• Fulfil Provincial and Federal compliance monitoring requirements
Variables being Measured by the Monitoring Surveys	Whip-poor-will presence / absence as an indicator of the effectiveness of rehabilitated habitat	Bobolink presence / absence as an indicator of the effectiveness of rehabilitated habitat	Nest occupancy, nest density and fledgling success	Various variables / indicators	Large mammals, raptors and raptor nests, reptile and amphibian presence / absence
Monitoring Survey Methods	Surveys will take place in breeding bird period (May and June) in accordance with the *Whip-poor-will Roadside Survey Participants Guide* (BSC 2012) and protocols from the Center for Conservation Biology Nightjar Survey Network (nightjars.org). Surveys for Common Nighthawks will be conducted during all Whip-poor-will surveys. Phase 1 will determine presence / absence of species within/in vicinity of RRP footprint and acoustic audit. Phase 2 will determine areas of occupancy and distribution relative to habitat management actions. Phase 3 will monitor rehabilitated sites	• Surveys will be conducted as standardized point count surveys following provincial protocols and will be conducted between late-May and early July. Monitoring will occur in areas within and around the periphery of the Project's footprint and in Bobolink Overall Benefit (OB) Areas. • Phase 1 will assess responses of Bobolink to construction and operation activities. Phase 2 will determine areas of occupancy and number of individuals present. Phase 3 will monitor rehabilitated sites	Nest surveys will be conducted at four artificial nesting structures placed outside of the RRP footprint to determine the reproductive success and effectiveness of the structures	Incidental data will be collected and recorded during all terrestrial and aquatic monitoring surveys	General wildlife observations (outside of formal wildlife monitoring programs) to be recorded at the RRP site by all employees and contractors
Location of Monitoring Surveys (Scale / Coverage)	RRP footprint	RRP footprint	At four artificial nesting structures placed outside of the RRP footprint (Figure 2)	RRP footprint and appropriate long-term control sites outside of the footprint	RRP footprint
Frequency of Monitoring Surveys	As outlined in the ESA permit (Section 6 and Appendix G)	As outlined in the ESA permit (Section 6 and Appendix J)	Annually during the breeding bird period	Ongoing	Ongoing

	Eastern Whip-poor-will Site Rehabilitation Plan	Bobolink Site Rehabilitation Plan	Barn Swallows	Incidental SAR Data	Wildlife Log
Duration of Monitoring Surveys	Ongoing for the life of the ESA permit	Ongoing for the life of the ESA permit	Duration of the project and post closure phase (during the breeding bird season)	Ongoing	Ongoing
Baseline Data Collected?	Yes	Yes	Yes	Yes	Yes

Table 4-d: Monitoring Framework for Species at Risk (SAR)

	Turtle and Snake Monitoring	Bald Eagle Nest Monitoring	Tracking Up-listings of SAR	Eastern Whip-poor-will Habitat Research Program
Predicted Project-Related Impacts	• Direct loss of habitat • Habitat abandonment due to chronic disturbance or a decrease in habitat quality • Decreased reproduction due to habitat loss or a decrease in habitat quality • Mortality	• Habitat abandonment due to chronic disturbance or a decrease in habitat quality • Decreased reproduction due to habitat loss or a decrease in habitat quality •	• N/A	• N/A
Proposed Mitigation Measures	• Relocation if discovered within the footprint during construction and thought to be susceptible to harm	• N/A (nest is outside of the Project footprint)	• N/A	• N/A
Monitoring Objectives	• Fulfil Provincial and Federal compliance monitoring requirements • Monitor for individuals within the footprint that may require relocation	• Fulfil Provincial and Federal compliance monitoring requirements • Monitor annual nest occupancy	• Fulfil Provincial ESA permit conditions • Stayed up to date on Provincial and Federal SAR listings as species within the NLSA that are not currently listed may one become listed (up-listed) in the future	• Conduct Eastern Whip-poor-will research that provides an overall benefit to the species, as per Section 7.5 of the ESA permit
Variables Being Measured by the Monitoring Surveys	Presence / absence	Seasonal eagle activity, fledgling success	Status of species list as Schedule 1 in SARA and/or listed in the Provincial ESA	Whip-poor-will breeding habitat characteristics, presence of breeding / nesting Whip-poor-will
Monitoring Survey Methods	Wildlife awareness training to inform RRP personnel and employees. Opportunistic surveys during all aquatic and terrestrial monitoring activities. Individual capture and relocation when found within RRP project footprint. If species are localized, exclusion fencing will be implemented.	Nest in woodland 122 east of the Project footprint will be monitored annually (surveyed three times each year) during the nesting season. If new nests are encountered, they will also be monitored annually	Species status will be tracked. If an unlisted species becomes listed of a new SAR is recorded in the area, EC and the MNRF will be consulted. If additional measures will be required to avoid and mitigate impacts to newly listed species, actions will be taken by New Gold to prevent / avoid impacts to the newly listed species and its habitat.	New Gold in partnership with Trent University and MNRF will conduct a study to determine Whip-poor-will breeding habitat selection in the area of the RRP and use this information to enhance habitat utilization in the OB Areas as well as guide the restoration of disturbed Project lands at mine closure. The project will entail the following: 1) conducting surveys to assess macro and micro habitat features, 2) conduct a habitat reclamation study of the Tait Quarry, 3) assess management activities in OB Areas, 4) experimenting with a variety of methods to restore whip-poor-will habitat, 5) develop habitat management strategies for OB Areas. Study will cumulate with a manuscript published in a scientific journal.
Location of Monitoring Surveys (Scale / Coverage)	RRP footprint, areas of operation and areas of exclusion	RRP footprint and appropriate long-term control sites outside of the footprint (Figure 3)	N/A	RRP footprint and appropriate long-term control sites outside of the footprint as well as Tait Quarry.

	Turtle and Snake Monitoring	Bald Eagle Nest Monitoring	Tracking Up-listings of SAR	Eastern Whip-poor-will Habitat Research Program
Frequency of Monitoring Surveys	Opportunistic surveys during the construction period. However, weekly surveys will be conducted if exclusion fencing is implemented at the site	Annually	Ongoing	Ongoing multi-year study as outlined in the 2014 Proposed Eastern Whip-poor-will Habitat Enhancement and Restoration Experimental Study (AMEC 2014)
Duration of Monitoring Surveys	Duration of construction activities	Duration of construction activities	Ongoing	Ongoing multi-year study as outlined in the 2014 Proposed Eastern Whip-poor-will Habitat Enhancement and Restoration Experimental Study (AMEC 2014)
Baseline Data Collected?	Yes	Yes	N/A	Yes

Table 4-e: Monitoring Framework for Mammals

	Aerial Surveys	Working with Aboriginal Hunters	Bat Acoustic Monitoring	Wildlife Log	Black Bear Activity	Monitoring the Effectiveness of Mitigation Measures on Mammal Habitat
Predicted Project-Related Impacts	• Direct loss of habitat • Habitat abandonment due to chronic disturbance or a decrease in habitat quality	• N/A	• Direct loss of habitat • Habitat abandonment due to chronic disturbance or a decrease in habitat quality •	• N/A	• Direct loss of habitat • Mortality •	• Direct loss of habitat • Habitat abandonment due to chronic disturbance or a decrease in habitat quality • Decreased reproduction due to habitat loss or a decrease in habitat quality • Mortality
Proposed Mitigation Measures	• Discussed in Section 6.3	• N/A	• Discussed in Section 6.3	• N/A	• Discussed in Section 6.3	• N/A
Monitoring Objectives	• Verify accuracy of the EA and effectiveness of mitigation measures • Fulfil Provincial and Federal compliance monitoring requirements • Confirm direct loss of habitat and monitor revegetation and recolonization post closure • Monitor for unanticipated reductions in habitat suitability	• Verify accuracy of the EA and effectiveness of mitigation measures • Fulfil Provincial and Federal compliance monitoring requirements	• Verify accuracy of the EA and effectiveness of mitigation measures • Fulfil Provincial and Federal compliance monitoring requirements • Confirm direct loss of habitat and monitor revegetation and recolonization post closure • Monitor for unanticipated reductions in habitat suitability	• Fulfil Provincial and Federal compliance monitoring requirements	• Fulfil Provincial and Federal compliance monitoring requirements	• Verify accuracy of the EA and effectiveness of mitigation measures • Fulfil Provincial and Federal compliance monitoring requirements • Confirm direct loss of habitat and monitor revegetation and recolonization post closure • Monitor for unanticipated reductions in habitat suitability
Variables Being Measured by the Monitoring Surveys	Presence / absence of ungulates and furbearers	Aboriginal hunting and tracking records	Bat presence / absence, density and distribution	Species presence / absence	Presence / absence	Vegetation species present, species density, species richness, percent canopy closure, percent ground cover
Monitoring Survey Methods	Periodic aerial surveys will be completed via helicopter to assess populations of White-tailed Deer, Moose, Wolves and other furbearers at locations representing suitable habitat directly adjacent to the RRP site	Aboriginal hunting and tracking records will be collected and examined to determine possible correlations between harvesting and the relative abundances of species. Records from within and around the Project area will	Nocturnal bat activity will be monitored 30 minutes after sunrise and 30 minutes before sunset in May and June using ultrasonic recording devices (bat detectors). Devices will be placed at locations where high levels	Personnel will be trained to utilize wildlife observation logs that will be available in commonly utilized areas located on site. Project personnel will be expected to report observations of SAR, large mammals, raptors,	Presence of nuisance bears (and other species such as foxes, ravens, magpies and vultures) will be monitored. Appropriate mitigation plans will be utilized if nuisance animals become an issue.	Winter aerial surveys will be used to monitor habitat use by large mammals around the periphery of the RRP Project footprint. Migratory bird habitat assessments conducted around the periphery of the project footprint will also aid in

	Aerial Surveys	Working with Aboriginal Hunters	Bat Acoustic Monitoring	Wildlife Log	Black Bear Activity	Monitoring the Effectiveness of Mitigation Measures on Mammal Habitat
	and across control sites located within the transects (Figure 4)	be monitored and examined.	of bat activity are likely to occur such as woodland and wetland edges. Species will be identified through analyzing audio recordings.	raptor nests, amphibians and reptiles. Wildlife logs will be reviewed and if there is indication that species occurrences are higher than those indicated in baseline data, further mitigation measures will be implemented to avoid causing impact to the species and/or habitat.		monitoring changes in mammal habitats.
Location of Monitoring Surveys (Scale / Coverage)	RRP footprint and appropriate long-term control sites outside of the footprint (Figure 4)	RRP footprint and appropriate long-term control sites outside of the footprint	RRP footprint and appropriate long-term control sites outside of the footprint	RRP footprint	RRP footprint	RRP footprint and appropriate long-term control sites outside of the footprint
Frequency of Monitoring Surveys	Beginning in 2017 and at ten year intervals up until year 15 post closure. The aerial surveys will be conducted twice during each survey year, once in early winter (late January - early February) and once in late winter (late February to early March)	Ongoing	May and June	Ongoing	Ongoing	Ongoing
Duration of Monitoring Surveys	Duration of the project and post closure phase	Duration of the project and post closure phase	Duration of the project and post closure phase	Duration of construction and operation. Log books will be collected monthly.	Duration of construction and operations	Duration of the project and post closure phase
Baseline Data Collected?	Some	Yes	Yes	Yes	Yes	Yes

Table 4-f: Monitoring Framework for Amphibians

	Amphibians	Biodiversity
Predicted Project-Related Impacts	• Direct loss of habitat • Habitat abandonment due to chronic disturbance or a decrease in habitat quality • Decreased reproduction due to habitat loss or a decrease in habitat quality • Mortality	• Direct loss of habitat and thus a decrease in habitat diversity • Habitat abandonment and thus a decrease in species diversity
Proposed Mitigation Measures	• Discussed in Section 6 (as they apply to amphibians and their habitats)	• Discussed in Section 6 (as they apply to all animal and plant species and their habitats)
Monitoring Objectives	• Verify accuracy of the EA and effectiveness of mitigation measures • Fulfil Provincial and Federal compliance monitoring requirements • Monitor for unanticipated road mortalities along Highway 600 and the Eastern Access Road	• Verify accuracy of the EA and effectiveness of mitigation measures • Fulfil Provincial and Federal compliance monitoring requirements • Monitor revegetation and recolonization post closure
Variables Being Measured by the Monitoring Surveys	Presence / absence of amphibians along Highway 600 and the East Access Road, where the MNRF has expressed concern with the potential for road mortalities due to the presence of new amphibian habitat (water-filled ditches) along these roadways.	Number of animal and plant species present
Monitoring Survey Methods	In addition to monitoring amphibian presence within the RRP footprint through wildlife observation logs (as discussed in Section 6), NG environmental technicians will conduct periodic annual surveys for amphibians along Highway 600 and the East Access Road during the amphibian migration and breeding seasons. These monitoring surveys will consist of driving along these two roadways and looking for amphibians on the road (dead or alive).	Data from all animal and plant monitoring surveys listed herein will be used to create annual species lists which will be compared to baseline numbers.
Location of Monitoring Surveys (Scale / Coverage)	Along Highway 600 and the East Access Road	RRP footprint and appropriate long-term control sites outside of the footprint (Figure 1)
Frequency of Monitoring Surveys	During the first two years of construction (2015 and 2016), in the first year following the completion of construction (2018) and at three year intervals during operations, and in years 1, 4, 7, 10 and 15 post closure	During the first two years of construction (2015 and 2016), in the first year following the completion of construction (2018) and at three year intervals during operations, and in years 1, 4, 7, 10 and 15 post closure
Duration of Monitoring Surveys	Duration of the project and post closure phase	Duration of the project and post closure phase
Baseline Data Collected?	Some	Yes

newgold™ Rainy River Project

APPENDIX 5

BIODIVERSITY BASELINE REPORT

RAINY RIVER PROJECT

BIODIVERSITY BASELINE REPORT

PER PROVINCIAL ENVIRONMENTAL ASSESSMENT NOTICE OF APPROVAL
EAIMS File No. 13102

VERSION 1

Date	Rev. #	Revision(s)	Originator
August 21, 2015	0	None	ME, Amec Foster Wheeler
September 24, 2015	1	From Nigel Fisher	ME, Amec Foster Wheeler

September 2015
TC111504

newgold™ Rainy River Project

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TABLE OF CONTENTS

PAGE

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

1.0 PROJECT BACKGROUND

New Gold Inc. (New Gold) is currently constructing a new open pit gold mine, the Rainy River Project (RRP) with an aim of producing doré bars (gold with silver) for sale during the production phase. Under full operation, physical works related to the RRP will consist primarily of:

- Open pit;
- Underground mine;
- Overburden, mine rock and low grade ore stockpiles;
- Primary crusher and process plant;
- Tailings management area;
- 230 kilovolt transmission line;
- Relocation of a portion of gravel-surfaced Highway 600; and
- Associated buildings, facilities and infrastructure.

Extensive terrestrial and aquatic plant and wildlife species and habitat investigations (baseline studies) were conducted between 2009 and 2014 in support of the mine design and environmental assessment / approvals processes, as detailed in the various environmental baseline reports and Species at Risk (SAR) reports (KCB 2011a, 2011b, AMEC 2011a, 2011b, 2012a, 2012b, 2012c, 2012d, 2013a, 2013b, 2013c, 2013d, 2013e, 2013f, 2014a). These reports are described in the RRP Final Environmental Assessment (EA) Report (AMEC 2014b).

Follow-up monitoring is proposed to occur during the remainder of the construction phase, as well as during the operation, decommissioning and post-closure phases of the RRP, consistent with the Final EA Report (AMEC 2014b), the *Draft Follow-Up Monitoring Plan (FMP) for Terrestrial Systems and Habitat Restoration Plan* (Amec Foster Wheeler 2015); other environmental approvals issued for the RRP; and environmental effects monitoring as per the Metal Mining Effluent Regulations (MMER).

2.0 PURPOSE OF THIS BIODIVERSITY BASELINE SUMMARY REPORT

Through the environmental approvals process for construction and operation of the RRP, New Gold is required to prepare a number of plans for submission to the Ministry of the Environment and Climate Change (MOECC). This document has been prepared in order to present baseline biodiversity levels recorded in the RRP Natural Local Study Area (NLSA) and to satisfy the following requirements as per the Provincial EA Notice of Approval:

14. Protection of Biodiversity and the Terrestrial Systems and Habitat Monitoring Plan

14.1 *The Proponent shall assess and utilize best practices to protect the biodiversity of existing species within the area of the Undertaking. Building on the baseline studies, including aquatic resources, terrestrial and species at risk baselines, already completed during the Environmental Assessment process, the Proponent shall establish a pre-construction biodiversity baseline and report on biodiversity levels within the area of the Undertaking.*

The Proponent shall as part of the Compliance Reports required under Condition 6, or otherwise specified in writing by the Director, provide details to the Ministry on how the requirements set out in this condition are being met.

14.2 *In addition to fulfilling all commitments with regard to rehabilitating wildlife habitat and terrestrial systems, the Proponent shall consult with Ministry of Natural Resources and Forestry on the development of a monitoring plan for terrestrial systems and habitat. The Proponent shall prepare the monitoring plan before the start of construction and shall provide a draft plan to Ministry of Natural Resources and Forestry for review before the plan is finalized. The Proponent shall carry out the plan during construction, operation and closure of the Undertaking. The purpose of the monitoring plan is to verify the accuracy of the predictions the Proponent made during the EA about the Undertaking's impacts on wildlife and habitat and to monitor the effectiveness of rehabilitation efforts for wildlife habitat and terrestrial environments. The Proponent shall report on biodiversity baseline and results required in Condition 14.1 through the Terrestrial Systems and Habitat Monitoring Plan.*

This report is intended as a summary compilation to establish a pre-construction biodiversity baseline as per Condition 14.1 above, and readers should refer to the source baseline reports for additional details. Annual compliance reporting will provide details on how the requirements of Condition 14.1 are being met.

The requirements of Condition 14.2 have been addressed in the *Draft Follow-Up Monitoring Plan (FMP) for Terrestrial Systems and Habitat Restoration Plan* (Amec Foster Wheeler 2015; e.g., see Sections 3.1 and 3.2) that has been developed through consultation with the Ministry of Natural Resources and Forestry (MNRF) and Environment Canada (EC). It is envisioned that

the FMP may evolve over the life of the RRP and be revised as additional site specific data is collected and interpreted.

3.0 BIODIVERSITY - BACKGROUND INFORMATION

Biodiversity describes the variety of life (biological diversity) on Earth or the variability among living organisms, and is composed of genetic diversity, species diversity, community diversity and ecosystem diversity (CBD 2010, OBC 2011). According to the Ontario Biodiversity Council (OBC 2011), there are six main threats to Ontario's biodiversity:

- Habitat loss;
- Invasive alien species;
- Population growth;
- Pollution;
- Unsustainable use; and
- Climate change.

This document summarizes the species, community and ecosystem diversity recorded during the baseline studies conducted at RRP between 2009 and 2014, as per Condition 14.1 of the Provincial Environmental Assessment Notice of Approval.

3.1 Ontario Biodiversity Strategy

In 2005, the Ontario government formed the Ontario Biodiversity Council with the mandate to implement Ontario's newly developed Biodiversity Strategy (OBS 2005). In 2011, Ontario's Biodiversity Strategy was updated with a renewed commitment to protecting the Province's variety of species, communities and ecosystems (OBC 2011). The 2011 Strategy puts forward a guiding framework for conserving Ontario's biodiversity over the next decade by identifying conservation goals, challenges, and strategic directions with long-term objectives and key actions (OBC 2011). The 2011 Strategy also provides a series of core principles (e.g., ecological, societal and management principles) centered on adaptive management and the process of on-going performance monitoring, reporting and assessment.

3.2 Mining Association of Canada Towards Sustainable Mining Program

The Towards Sustainable Mining (TSM) initiative was launched by the Mining Association of Canada (MAC) in 2004 to improve key performance areas at Canadian mines, such as tailings management, energy use and greenhouse gas emissions management, Aboriginal and community outreach, crisis management planning, health and safety, and biodiversity (MAC 2013, 2015). The TSM *Biodiversity Conservation Management Assessment Program* provides standardized guiding principles and expectations for MAC members to use on a voluntary basis to assess their biodiversity conservation performance by tracking the following three performance indicators:

- Corporate biodiversity conservation commitment, accountability and communications;
- Facility-level biodiversity conservation planning and implementation; and
- Biodiversity conservation reporting.

The purpose of the first performance indicator (corporate commitment) is to confirm that corporate commitment and accountabilities are in place and communicated to relevant employees to support the management of biodiversity conservation issues. The second performance indicator (facility-level planning and implementation) is to confirm that effective plans and management systems are implemented at the facility-level in order to manage significant biodiversity aspects. The third performance indicator (reporting) is meant to confirm that biodiversity conservation reporting systems (e.g., policy and monitoring) are in place to inform decision-making and to communicate performance publicly.

Supporting guidelines in the TSM *Biodiversity Conservation Management Assessment Program* allow for consistency in monitoring and reporting biodiversity within and amongst companies, allow for consistency of self-assessments of biodiversity conservation performance, and enable external verification for transparency and accountability.

The TSM Biodiversity Conservation Management Assessment Program defines *significant biodiversity aspects* as significant project-related issues that have been identified by the project and regulators for specific management or regulatory requirements, to avoid or mitigate potential impacts on biodiversity or to address community or other stakeholder concerns. Examples of significant biodiversity aspects include valued ecosystem components, critical habitats for both plants and wildlife, protected areas such as National and Provincial Parks, species at risk, and ecosystem services (e.g., provision of clean water).

3.3 Commitment to Monitoring and Protecting Local Biodiversity

New Gold is committed to monitoring, assessing and protecting local biodiversity at the RRP using best practices, and guided by the frameworks laid out in the Ontario 2011 Biodiversity Strategy and MAC TSM, where appropriate and practical.

Environmental baseline studies completed for the RRP between 2009 and 2014 established a comprehensive understanding of the composition of local terrestrial and aquatic plant and wildlife species, communities and ecosystems present within the Project footprint and on surrounding lands. Annual baseline reports and SAR reports were produced (KCB 2011a, 2011b, AMEC 2011a, 2011b, 2012a, 2012b, 2012c, 2012d, 2013a, 2013b, 2013c, 2013d, 2013e, 2013f, 2014a). The assessment of potential environmental impacts was summarized in the RRP Final EA Report (AMEC 2014a) as well as the earlier drafts of the document, submitted to the Federal and Provincial Governments, and provided for Aboriginal and public review periods.

The RRP FMP (Amec Foster Wheeler 2015) includes various monitoring surveys focused on monitoring plant and wildlife species, and local biodiversity, during construction, operation, active closure and decommissioning (active closure), and post-closure phases of the RRP. New Gold are responsible for carrying out the FMP, but Federal and Provincial agencies and authorities will have a review and monitoring role. Local Aboriginal groups are considered by New Gold to be involved parties for the purposes of the FMP, and accordingly, local First Nations and Métis will be provided the annual results of the FMP.

It is expected that the FMP will be reviewed from time to time in consideration of comments received on the annual report, to determine whether or not changes are required. It is anticipated that the FMP may evolve over the life of the RRP as additional site specific data is collected and interpreted.

4.0 SPECIES DIVERSITY

4.1 Summary of Baseline Conditions

A list of plant and wildlife species recorded during the 2009 to 2014 baseline studies at the RRP is provided in Appendix 1. A total of 656 species of plants and wildlife were recorded, along with 59 families of benthic invertebrates.

Extensive SAR baseline surveys were conducted between 2009 and 2013 and a number of SAR reports were produced (KCB 2011b, AMEC 2011b, 2012b, 2013b). The assessment of potential environmental impacts on SAR was summarized in the RRP Final EA Report (AMEC 2014a). The specific locations and distributions of SAR have not been released to the public, as requested by the MNRF.

4.2 Plants

Vegetation surveys were conducted by Klohn Crippen Berger (KCB) in 2009 and 2010 and by AMEC in 2012. Vegetation surveys undertaken by KCB were conducted on 24 dates between June 2009 and October 2010 for a total of approximately 95 hours. Surveys were focused on visiting the full range of vegetation types and communities in the NLSA as determined by a review of aerial photographs and Forest Resource Inventory maps. Vegetation sampling occurred at over 300 field stations (Figure 5-13 in AMEC 2014a). Data collection included ecosites (Racey et al. 1996), forest vegetation type (V-type; Sims et al. 1997) and wetland vegetation type (W-type; Harris et al. 1996). Soil texture, depth and moisture regime were determined by auguring at selected stations and trees were aged using an increment borer. A plant species inventory was compiled for the NLSA.

The 2012 vegetation surveys were conducted on June 18 to 21 and July 3 to 7 (AMEC 2012a); 2014 vegetation surveys were conducted on June 19 to 24 (AMEC 2014a). Surveys were undertaken by two botanists and typically lasted 10 hours each day. Site investigations were targeted at several polygons within the NLSA (Figure 5-13 in AMEC 2014a). These vegetation survey polygons covered approximately 1,300 ha and overlapped with new locations for certain RRP components. Existing Forest Resource Inventory mapping was acquired from the MNRF prior to site investigations and was used to guide field transects during surveying. Each of the Forest Resource Inventory communities within each vegetation survey polygon was visited to confirm the community classification.

Provincially rare species are those identified as rare or historical in Ontario based on records kept by the Natural Heritage Information Centre. Provincially rare species include those who are assigned S-Rank codes of S1 (extremely rare), S2 (very rare), or S3 (rare to uncommon). A historical information review indicate that no rare vegetation communities are present in the NLSA but discovered that rare plants in the Fort Frances District are often associated with the following features: rock outcrops and/or rocky lake shorelines, conifer swamps, uncommon

forest types (elm stands, silver maple stands, yellow birch stands, basswood stands, ironwood stands, white ash stands and Hill's oak stands) or uncommon ecosites, climatically modified areas (banks of Rainy River), southern / prairie influences (shoreline of Lake of the Woods), mesic prairie – Long Sault Rapids, oak stands – groves and savannahs, and ash stands (Van den Broeck 2006). Searches for the habitat of rare plant species and rare plants were conducted concurrently with the vegetation surveys as described above.

A total of 377 plant species were observed in the NLSA between 2009 and 2012 (Appendix 1). The species are mostly boreal and Great Lake St. Lawrence in affiliation. Boreal species are particularly well represented in peatland habitats. The majority (88%) of these species are Provincially ranked as S4 or S5 (Secure) and globally ranked as G4 or G5 (Common to Very Common). Approximately 16% of the recorded species are exotic weeds typically associated with pastureland, roadsides and other disturbed habitats.

4.3 Birds

Various types of breeding bird surveys were conducted between 2009 and 2012 to determine the diversity, abundance and distribution of breeding bird species utilizing the RRP site area, as described in detail in the various baseline reports (KCB 2011a, AMEC 2011a, 2012a, 2013a, 2013c, 2013d, 2013e, 2014b), annual SAR assessments (KCB 2011b, AMEC 2011b, 2012b, 2013b) and in the RRP Final EA Report (AMEC 2014a). The surveys accounted for the species guilds, variety of habitat types and temporal behaviours of local breeding species.

A total of 167 bird species (Appendix 1) were observed during the RRP field investigations. Species diversity recorded during RRP investigations mirrored that of North American Breeding Birds Survey results occurring near the defined NLSA.

4.4 Mammals

Mammal species and habitat types within the NLSA were recorded by KCB and AMEC between 2009 and 2014 through encounter transects, incidental observations during all fieldwork, and during winter aerial surveys conducted in 2012 (AMEC 2012d) and 2013 (AMEC 2013f).

RRP baseline surveys recorded a total of 20 mammal species (Appendix 1) in the NLSA between 2009 and 2014, which were observed either directly or were indirectly detected through evidence of tracks, browsing or droppings. Mammals recorded included game mammals (ungulates, Black Bear and Snowshoe Hare), furbearers (wolves, foxes, mustelids, Beaver and Muskrat) and bats. A number of other small mammal species (e.g., shrews, voles, mice) are also likely to be present in the NLSA.

4.5 Amphibians

Amphibian breeding surveys were conducted annually between 2009 and 2012, utilizing the Marsh Monitoring Program Amphibian Survey protocol (BSC 2009). Eighteen stations were surveyed by KCB in 2009 and 2010, 20 stations were surveyed by AMEC in 2011 and 38 stations were surveyed by AMEC in 2012 (Figure 5-17 in AMEC 2014a). Two rounds of monitoring during each season ensured early and late-breeding frog species were detected. Calling species were recorded during a three minute period with a recording radius of unlimited distance. The calls of each amphibian species were assigned specific call level codes in accordance with the protocol (BSC 2009). Studies were conducted at night beginning 30 minutes after sunset (twilight) and were concluded before midnight.

Amphibian observations were also recorded opportunistically during all other fieldwork. Searches of Significant Wildlife Habitat (e.g., Seasonal Concentration Areas, Specialized Habitat for Wildlife, Habitats for Species of Conservation Concern and Amphibian Movement Corridors; as outlined in MNR 2000) were also conducted concurrently with all fieldwork. Vernal pools were also searched for frog and salamanders and their eggs. Typical amphibian habitat including logs, leaf litter and other forms of cover were also turned over and replaced, looking for salamanders.

A total of eight frog species were observed in the NLSA between 2009 and 2012 (Appendix 1). These species included early spring breeders (Spring Peeper, Wood Frog, Northern Leopard Frog and Boreal Chorus Frog), late spring breeders (American Toad and Tetraploid Gray Treefrog), and summer breeders (Mink Frog and Green Frog).

4.6 Reptiles

Reptile observations were recorded opportunistically during all fieldwork. Basking logs and soil banks were also examined for signs of basking turtles and nesting.

Three reptile species were observed in the NLSA between 2009 and 2012 including the Western Painted Turtle, Snapping Turtle and Eastern Gartersnake. Very few snake observations were recorded during field studies and no snake hibernacula features were found in the NLSA.

Observations of Western Painted Turtles near Muskrat Lake and Little Pine Lake indicate that these small lakes provide locally important habitat for this species. The observation of two painted turtles along a logging road north of the Little Pine Lake during June may indicate that turtles using this lake as overwintering habitat migrate north to suitable breeding habitat. One turtle observed north of Little Pine Lake was greater than 400 m from any wetland features.

Two adult Snapping Turtles (listed Provincially as Special Concern) were observed within the NLSA in 2010, one in the Pinewood River just north of Tait Road, near Black Hawk Road and

the second was found crossing Roan Road near the West Creek crossing. No evidence of turtle nesting was observed.

4.7 Insects

4.7.1 Benthic Invertebrates

Benthic studies carried out by KCB in 2009 and 2010 were limited to the Pinewood River and West Creek (KCB 2011a and Table 5-7 in AMEC 2014a). In 2011, AMEC sampled benthic invertebrate communities at seven locations on the Pinewood River, one location on Tait Creek, three locations on Loslo Creek, six locations on Marr Creek, five locations on West Creek, three locations on Clark Creek and one location on Blackhawk Creek (AMEC 2012c, and see Table 5-7 and Figure 5-10 in AMEC 2014a). In 2012, AMEC collected additional benthic samples from 14 locations on the Pinewood River, two locations on McCallum Creek, one location on Tait Creek, one location on Unnamed Tributary 2, five locations on Loslo Creek, one location on Unnamed Tributary 5, two locations on West Creek Tributary 1 and one location on Clark Creek (AMEC 2013c, and see Table 5-7 and Figure 5-10 in AMEC 2014a).

KCB collected benthic samples from the Pinewood River using both an Eckman dredge and a Petite Ponar sampler (KCB 2011a). Benthic samples from West Creek were collected by KCB using a cylindrical Hess sampler. KCB collected replicate samples and preserved all samples in accordance with standard industry methods. All AMEC samples were collected using a Petite Ponar grab sampler (AMEC 2013c, 2013d). Three replicate sub-samples were taken and pooled (homogenized) at each replicate station to improve sample representativeness, by reducing intra-sample variation inherent to benthic communities. All samples were preserved in 10% formalin.

Benthic invertebrates were identified to the family level, and therefore the number of benthic species present is unavailable. A total of 59 families were recorded within the NLSA.

4.7.2 Other Insects

Incidental observations of dragonflies and damselflies (odonates) were compiled during all years of fieldwork between 2009 and 2012. Observations included adults and exuviae (shed larval skins). Incidental observations of butterflies were also recorded by AMEC during fieldwork conducted in 2011 and 2012.

Searches for habitat for species of conservation concern (Monarch Butterfly, Midland Clubtail Green-faced Clubtail and Variegated Meadowhawk) were conducted concurrently with all field surveys. Monarch Butterfly habitat exists primarily wherever milkweed and wildflowers such as goldenrods, asters and Purple Loosestrife exist, including abandoned farmland, along roadsides and other open spaces where these plants grow (COSEWIC 2010).

A total of 21 species of dragonfly and damselfly were observed in the NLSA between 2009 and 2012 (Appendix 1). The list is dominated by species preferring wetlands, ponds and slow moving streams, whereas species requiring fast rocky streams and those associated with large lakes and rivers are lacking. Three Provincially rare dragonfly species were observed in the NLSA including Horned Clubtail (ranked S3), Arrowhead Spiketail (ranked S1) and Lilypad Clubtail (ranked S3). Two other dragonfly species were identified during the background information review as potentially occurring within or near to the NLSA, including Green-faced Clubtail (ranked S1) and Midland Clubtail (ranked S3).

A total of 26 butterfly species were observed in the NLSA by AMEC in 2011 and 2012 (Appendix 1). In June, butterflies are abundant across the NLSA, particularly Great Spangled and Meadow Fritillaries, Mourning Cloaks and Eyed Browns. During the summer of 2012, Red Admirals were particularly abundant which mirrored the banner year for this species across Canada. Neither Monarch Butterfly nor the host plant for Monarch larvae (Milkweed) were recorded in the NLSA.

4.8 Fish

Fisheries studies conducted by KCB in 2009 and 2010 included coverage of the Pinewood River in the general vicinity of the RRP site, four Pinewood River tributaries (Clark Creek, West Creek, Marr Creek and Loslo Creek), as well as McCallum Creek, Tait Creek and a number of smaller creek systems peripheral to the Pinewood River watershed (KCB 2011a and Table 5-7 and Figure 5-11 in AMEC 2014a). The majority of the fisheries work conducted by KCB involved the use of minnow traps with more limited use of electro-fishing (West Creek) and gill and seine netting (Pinewood River). Gill netting was used to target larger fish species (Northern Pike, White Sucker and Brown Bullhead). Fishing and fish habitat assessment efforts by KCB were undertaken in the summer of 2009 and in the late winter, spring, summer and fall of 2010.

Fish community sampling techniques employed by AMEC between 2011 and 2013 included the use of gillnetting, minnow traps, seine netting, boat and backpack electroshocking, dip netting and angling (AMEC 2012c, 2013c, 2013d, 2013e, and see Table 5-6 in AMEC 2014a). These techniques were deployed to provide a range of passive and active sampling methods for capturing small and large-bodied fish species in pond and fluvial habitats.

A total of 34 fish species were recorded during the baseline studies conducted between 2009 and 2013.

5.0 COMMUNITY AND ECOSYSTEM DIVERSITY

5.1 Summary of Baseline Conditions

The RRP site is located in a low density rural area within which some agricultural (focused on cattle and fodder cropping) and logging activities occur. Adjacent areas show mainly second growth poplar-dominated forests and wetlands. Lands in the immediate RRP site vicinity are typically gently rolling to flat, with forested wetlands occurring in low-lying areas and rounded bedrock outcrops and subcrops occurring in upland areas and some of the area has been cleared for agricultural development. Local drainage systems are characterized by numerous small creeks draining into the Pinewood River. Portions of the natural drainage systems have been altered near the RRP site through the development of agricultural drains, road development and ongoing beaver activities. Area creeks are also small and frequently intermittent in nature. There are no lakes within the immediate RRP site area except along the NLSA transmission line corridor.

The MNRF's *Ecological Land Classification for Southern Ontario* manual (Lee et al. 1998) provides the following definitions:

- Community: *an assemblage of organisms that exist and interact with one another on the same site*;
- Community Type: *a group of similar vegetation stands that share common characteristics of vegetation, structure and soils*; and
- Ecosystem: *a complex interacting system that includes all plants, animals, fungi and microorganisms and their environment within a particular area at whatever size segment of the world that is chosen for study*.

Eleven broad vegetation types were recorded within the RRP NLSA, and for the purposes of this report and future biodiversity monitoring at RRP, these 11 categories will be considered ecosystems made up of various vegetation communities (ecosites; see Figure 1). These 11 ecosystems included the following (also listed in Table 1 below with their associated vegetation communities):

- Hardwood Forest: covers 47.6% (12,699 ha) of the total NLSA area;
- Coniferous Swamp: 18.3% (4874.6 ha) of the NLSA;
- Coniferous Forest: 9.9% (2637.2 ha) of the NLSA;
- Meadow and Shallow Marsh: 4.6% (1239.8 ha) of the NLSA;
- Thicket Swamp: 3.2% (865.2 ha) of the NLSA;
- Fen: 3.6% (954.8 ha) of the NLSA;
- Bog: less than 0.01% (2.2 ha) of the NLSA;
- Rock and Mineral Barren: less than 1% (77 ha) of the NLSA;

- Agricultural Land: 7.7% (2,044 ha) of the NLSA;
- Cultural Meadow: 2.1% (570 ha) of the NLSA; and
- Open Water: 2.7% (714 ha) of the NLSA.

Table 1: Ecological Land Classification Vegetation Communities

Ecosystem Type	Northwest Ontario Ecosite Code	Ontario Boreal ELC Ecosite Code	Ontario Boreal ELC Ecosite Community Name	Area in NLSA (ha)
Hardwood Forest	ES19	B055	Dry to Fresh, Coarse: Aspen – Birch Hardwood	1,640.3
	ES28	B104	Fresh, Silty to Fine Loamy: Aspen – Birch Hardwood	176.8
	ES29	B088	Fresh, Clayey: Aspen – Birch Hardwood	10,523.8
	ES30	B089, B105	Black Ash Hardwood: Fresh, Silty Clayey Soil	139.3
	ES33	B119	Moist, Fine: Aspen – Birch Hardwood	219.1
Coniferous Swamp	ES35	B127	Organic Poor Conifer Swamp	2,260.5
	ES36	B128	Organic Intermediate Conifer Swamp	1,646.2
	ES37	B129	Organic Rich Conifer Swamp	705.7
	ES38	B130	Intolerant Hardwood Swamp	262.2
Coniferous Forest	ES11	B011	Very Shallow, Dry to Fresh: Red Pine – White Pine Conifer	397.0
	ES12	B012	Very Shallow, Dry to Fresh: Pine – Black Spruce Conifer	1,109.8
	ES13	B034	Dry, Sandy: Jack Pine – Black Spruce Dominated	61.2
	ES14	B035	Dry, Sandy: Pine – Black Spruce Conifer	31.1
	ES16	B040	Dry, Sandy: Red Pine – White Pine Dominated	56.1
	ES17	B051, B066, B115	Cedar (Hemlock) Conifer (Dry to Fresh, Coarse; Moist, Coarse; or Moist, Fine)	30.3
	ES18	B048, B054	Dry to Fresh, Coarse: Red Pine – White Pine Conifer and Dry to Fresh, Coarse: Red Pine – White Pine Mixed Wood	285.6
	ES20	B049	Dry to Fresh, Coarse: Jack Pine – Black Spruce Dominated	79.9
	ES21	B052	Dry to Fresh, Coarse: Spruce – Fir Conifer	202.9
	ES22	B065	Moist, Coarse: Black Spruce – Pine Conifer	3.9
	ES25	B098	Fresh, Silty to Fine Loamy: Black Spruce – Jack Pine Dominated	35.8
	ES26	B082, B083	Spruce-Pine / Feathermoss: Fresh, Fine Loamy-Clayey Soil	64.3
	ES27	B101	Fir-Spruce Mixedwood: Fresh, Silty-Fine Loamy Soil	75.5
	ES31	B114	Moist, Fine: Black Spruce – Pine Conifer	138.1
	ES32	B116	Fir-Spruce Mixedwood: Moist, Silty-Clayey Soil	65.7
Meadow and Shallow Marsh	ES46	B142 B144	Mineral or Organic Meadow Marsh	1,106.5
	ES46 or ES47	B142, B144, B149	Meadow or Shallow Marsh	8.5
	ES47	B149	Organic Shallow Marsh	124.8
Thicket Swamp	ES44	B134, B135	Mineral Thicket Swamp or Organic Thicket Swamp	865.2
Fen	ES40	B136	Sparse Treed Fen	462.6
	ES41	B139	Poor Fen	88.9
	ES42	B140	Open Moderately Rich Fen: Ericaceous Shrub / Sedge: Organic Soil	13.9
	ES45	B147	Shrub Shore Fen	389.4
Bog	ES39	B138	Open Bog: Ericaceous Shrub / Sedge / Sphagnum: Organic Soil	2.2
Rock and Mineral Barren	ES7	B164	Rock Barren	71.1
	ES9	B007	Active Mineral Barren	5.9
Agricultural Land	--	Agriculture	Agriculture	2,044.3
Cultural Meadow	--	CUM	Cultural Meadow	569.5

Ecosystem Type	Northwest Ontario Ecosite Code	Ontario Boreal ELC Ecosite Code	Ontario Boreal ELC Ecosite Community Name	Area in NLSA (ha)
Open Water	--	Open Water	Open Water	714.4
Total Area of NLSA				**26,678.3**

5.2 Hardwood Forest

Hardwood Forest represents the most extensive forest type (ecosystem) in the NLSA and covers 47.6% (12,699 ha) of the total NLSA area. This forest type is largely dominated by Trembling Aspen although smaller components of White Birch and Black Ash are present.

The Aspen – Birch Hardwood Forest type represents 96.9% of the hardwood forest within the NLSA. Aspen – Birch Hardwood Forest occurs across four soil types (Dry to Fresh Course, Fresh Silty to Fine Loamy, Fresh Clayey and Moist Fine) and is represented by four ELC codes (B055, B088, B104, and B119). Fresh Clayey Aspen - Birch Hardwood Forest is the most extensive ELC community (B088) within the NLSA. Aspen forests are herb and shrub rich and commonly include an understory of Mountain Maple, raspberry species, other deciduous shrubs, grasses and sedges. The ground layer is most commonly dominated by typical hardwood forest species such as Wild Sarsaparilla and White Snakeroot. Much of the hardwood forest in proximity to the RRP site is young and in various stages of regeneration. Younger, regenerating hardwood forest often included pockets of exposed bedrock, which limited the frequency and size of trees.

Black Ash and White Elm occur occasionally within some polygons although very rarely occur in such proportions as to be individually mapped as its own specific polygon. Black Ash Hardwood Forest (B089, B105 and B130) covers just 401.5 ha of the NLSA and represents 1.5% of the total area.

5.3 Coniferous Swamp

Coniferous Swamp (B127, B128, and B129) covered 18.3% (4874.6 ha) of the NLSA and is the second largest vegetation ecosystem type therein. The most common species in the canopy and subcanopy were Black Spruce, White Spruce, Tamarack and Eastern White Cedar. The understory is dominated by Labrador Tea, Low Bush Blue Berry, Velvet Leaf Blueberry, Leatherleaf, Bunchberry and Speckled Alder surrounding the edges. Sphagnum and Feathermoss cover most of the ground layer with occasional emergence of sedges such as Bladder Sedge, Fringed Sedge, Fox Sedge and Hop Sedge where moss covers less of the ground.

Most swamps within the NLSA occur in close proximity to each other (about 1 km apart) and are hydrologically connected to permanent or intermittent watercourses. Such features may make them significant for wildlife movement and distribution of plant species.

5.4 Coniferous Forest

Coniferous Forest (B011, B012, B034, B035, B040, B048, B049, B051, B052, B054, B065, B066, B082, B083, B098, B101, B114, B115, B116) represents 9.9% (2637.2 ha) of the vegetation cover in the NLSA. Coniferous forest cover is varied and consists of 15 ELC communities occurring across a variety of soil types. Rocky outcrops are occasionally encountered within coniferous communities throughout the northern portion of the NLSA. These communities are typically dominated by pine and/or spruce species. The herbaceous layer of these communities includes Large-leaved Aster, Pale Corydalis, blueberry species and Fringed Black Bindweed.

In some cases where Eastern White Cedar dominated upland forest communities are present (B051, B066 and B115) understory diversity is poor and the ground layer is dominated by needle litter. Conifer forests growing on shallow soils (B011 and B012) also tend to be deficient in herbaceous ground cover and are often associated with exposed bedrock.

5.5 Meadow and Shallow Marsh

Meadow and Shallow Marsh (B142, B144 and B149) comprised 4.6% (1239.8 ha) of the NLSA. Marshes occupied flood plains of permanent and intermittent watercourses throughout the NLSA such as the Pinewood River and its tributaries (Clark Creek, Loslo Creek, Marr Creek and West Creek). These marshes occur where seasonal flooding prevents colonization of Sphagnum and other peatland plants, and slows the rate of peat accumulation.

Marshes were typically graminoid, dominated by various sedge and grass species (narrow emergent species) with rare occasions of broad leaved emergent species (broad emergent species). The most dominant grass species include Canada Blue Joint, Common Cattail, Fowl Blue Grass and Fowl Manna Grass. Water Sedge, Lake Sedge, Bladder Sedge, Slender Sedge and Bebb's Sedge were also common. Broad emergent species such as Wild Calla, Broadleaf Arrowhead and Marsh Marigold were common in open water areas of marshes along with floating and submergent species such as Floating-leaf Pondweed, Coontail and Great Duckweed. Herbaceous species such as Northern Bugleweed and shrub species such as Speckled Alder and Narrow-leaved Meadow-sweet were common along marsh edges.

5.6 Thicket Swamp

Speckled Alder and Willow species were often found as thickets along the peripheries of open wetlands. Mineral and Organic Thicket Swamp (B134 and B135) types cover 3.2% (865.2 ha) of the NLSA.

5.7 Fen

Sparse Treed Fen (B136) and Poor Fen (B129) cover 3.6% (954.8 ha) of the NLSA. Vegetation consists of widely-spaced Tamarack and Black Spruce (2 to 10 m tall) over a Sphagnum carpet with sedges and ericaceous shrubs. Other dominant species include Bog Birch and Shrubby Cinquefoil along with a diversity of sedges and herbs.

5.8 Bog

Open Bog (B138) covers much less than 0.01% (2.2 ha) of the NLSA. Vegetation consists of extremely sparse and stunted Black Spruce and is dominated by ericaceous shrubs, sedges and sphagnum mosses. Common shrubs include leatherleaf, bog laurel, bog rosemary and Labrador-tea. Herbaceous plants include pitcher plant, round-leaved sundew, dense cottongrass and few-seeded sedge. The system is hydrologically isolated.

5.9 Rock and Mineral Barren

Barren habitat consisting of Rock Barren (B164) and Active Mineral Barren (B007) covers less than 1% (77 ha) of the NLSA and is found largely in the northern part of the NLSA amongst tracts of coniferous forest of very shallow soils. One area of Active Mineral Barren (B007) is present in the form of a gravel pit occurring along Roen Road.

5.10 Agricultural Land

Agricultural lands cover 7.7% (2,044 ha) of the NLSA. Agriculture is largely limited to hayfields and cattle pastures containing Timothy, Smooth Brome, Reed Canary Grass, Alfalfa, clovers, Blue-joint Grass and other graminoids. Agricultural lands largely occur along roads in well-drained clay areas of the NLSA. The majority of agricultural lands within the NLSA have been active in the last five years.

5.11 Cultural Meadow

Cultural Meadow covers 2.1% (569.5 ha) of the NLSA. Fallow agricultural fields are common, although generally of small size. These fields tended to be dominated be non-native grasses and herbs such as Timothy, Smooth Brome and clovers (including Red Clover).

5.12 Open Water

Open Water covers the remaining 2.7% (714 ha) of the NLSA.

5.13 Other Community Assessments

In addition to the ELC communities discussed above, MNRF designated bird community types (per the *Significant Wildlife Habitat Technical Guide*; MNR 2000) that were present within the NLSA were identified. These bird communities included the following:

- Area sensitive woodland birds;
- Waterfowl and wetland birds;
- Open country birds;
- Shrub / early succession birds;
- Aerial insectivores; and
- Raptors.

Community types for other groups of wildlife (mammals, amphibians, reptiles, insects and fish) were captured in the ELC community classification process. In addition, as part of the ELC community surveys and classifications, detailed information is collected regarding the sampling environs.

6.0 GENETIC MONITORING

6.1 Summary of Baseline Conditions

Sampling for genetic diversity was not conducted during the RRP baseline studies. New Gold is currently considering the feasibility and utility of conducting genetic diversity monitoring of insects at the RRP.

7.0 REFERENCES

AMEC. 2011a. Rainy River Gold Project, 2011 Wildlife Baseline Study.

AMEC. 2011b. Rainy River Gold Project Species at Risk Report for 2011.

AMEC. 2012a. Rainy River Gold Project, 2012 Terrestrial Baseline Study.

AMEC. 2012b. Rainy River Gold Project Species at Risk Report for 2012.

AMEC. 2012c. Rainy River Gold Project, Aquatic Resources 2011 Baseline Investigation.

AMEC. 2012d. Rainy River Gold Project, 2012 Winter Aerial Survey for Mammals.

AMEC. 2013a. Rainy River Gold Project. 2013 Terrestrial Baseline Study: Bats.

AMEC. 2013b. Rainy River Gold Project Species at Risk Report for 2013.

AMEC. 2013c. Rainy River Gold Project, 2012 Aquatic Resources Baseline Report.

AMEC. 2013d. Rainy River Gold Project, 2013 Aquatic Resources Baseline Report.

AMEC. 2013e. Rainy River Gold Project, 2013 Fish and Fish Habitat Existing Conditions for Highway 600 Realignment.

AMEC. 2013f. Rainy River Gold Project, 2013 Winter Aerial Survey for Mammals.

AMEC. 2014a. 2014 Rainy River Project Terrestrial Field Studies Along a Portion of Transmission Line A (West of Highway 71).

AMEC. 2014b. Final Environmental Assessment Report (Environmental Impact Statement), Version 2, Rainy River Project, Township of Chapple, Ontario.

Amec Foster Wheeler (AmecFW). 2015. Draft Follow-Up Monitoring Plan for Rainy River Project Terrestrial Systems and Habitat Restoration (Including Monitoring For Species At Risk).

Bakowsky, W.D. and M.J. Oldham. 1998. Significant Prairie and Savannah Vegetation in Northwestern Ontario. Natural Heritage Information Centre, Ontario Ministry of Natural Resources, Peterborough, Ontario.

Bird Studies Canada (BSC). 2009. Marsh Monitoring Program Participants Handbook for Surveying Amphibians. Published by Bird Studies Canada in cooperation with Environment Canada and the U.S. Environmental Protection Agency.

Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2010a. COSEWIC Assessment and Status Report on the Monarch *Danaus plexippus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa, ON.

Convention on Biological Diversity (CBD). 2010. The Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets. Accessed at http://www.cbd.int/doc/decisions/COP-10/cop-10-dec-02-en.pdf

Harris, A.G., S.C. McMurray, P.W.C. Uhlig, J.K. Jeglum, R.F. Foster and G.D. Racey. 1996. Field Guide to the Wetland Ecosystem Classification for Northwestern Ontario. Ministry of Natural Resources, Northwest Science and Technology. Thunder Bay, Ontario. Field Guide FG-01.

Klohn Crippen Berger (KCB). 2011a. Rainy River Gold Project, Baseline Report 2008-2010.

Klohn Crippen Berger (KCB). 2011b. Rainy River Gold Project Species at Risk Baseline Report 2008-2010.

Lee H., W. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig, and S. McMurray. 1998. Ecological Land Classification for Southern Ontario: First Approximation and Its Application. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02.

Mining Association of Canada (MAC). 2013. Biodiversity Assessment Protocol.

Mining Association of Canada (MAC). 2015. Towards Sustainable Mining. Accessed at http://www.mining.ca/site/index.php/en/towards-sustainable-mining.html

Ontario Biodiversity Council (OBC). 2011. Ontario's Biodiversity Strategy, 2011: Renewing Our Commitment to Protecting What Sustains Us. Ontario Biodiversity Council, Peterborough, Ontario.

Ontario's Biodiversity Strategy (OBS). 2005. Protecting What Sustains Us: Ontario's Biodiversity Strategy, 2005. Accessed at: http://www.mnr.gov.on.ca/en/Business/Biodiversity/2ColumnSubPage/STEL02_166816.html

Ontario Ministry of Natural Resources (MNR). 2000. Significant Wildlife Habitat Technical Guide. Fish and Wildlife Branch, Wildlife Section, Science Development and Transfer Branch, South-central Sciences Section. 151 pages.

Racey, G.D., A.G. Harris, J.K. Jeglum, R.F. Foster and G.M. Wickware. 1996. Terrestrial and Wetland Ecosites of Northwestern Ontario. Ministry of Natural Resources, Northwest Science and Technology. Thunder Bay, Ontario. Field Guide FG-02.

Sims, R.A., W.D. Towill, K.A. Baldwin, P. Uhlig and G.M. Wickware. 1997. Field Guide to the Forest Ecosystem Classification for Northwestern Ontario. Ministry of Natural Resources, Northwest Science and Technology. Thunder Bay, Ontario. Field Guide FG-03.

Van den Broeck, J. 2006. Review and Inventory Strategy for Rare Plants Crossroute Forest 2007 – 2017. Version 3. Unpublished.

8.0 QUALIFICATIONS OF AUTHOR AND REVIEWERS

Prepared by:

Dr. Matthew Evans has 26 years of experience as a terrestrial ecologist in Canada and the United States and has worked on several large-scale environmental assessment and monitoring projects identifying and mitigating the impacts of development on various ecosystems (arctic, alpine, boreal, grassland, wetland and marine ecosystems) and on various species of wildlife and plants, including several Species at Risk. His experience includes environmental screening and scoping studies, baseline studies, environmental assessments and monitoring programs for mining, oil, gas, forestry, hydro, transportation and renewable energy projects. Matt has considerable experience working on municipal, provincial, territorial, state and federal environmental assessments and designing and implementing construction and post-construction environmental monitoring and management programs. Matt has been the senior lead for all terrestrial baseline studies and effects assessments on the New Gold Inc. Rainy River Gold Project since 2011.

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Sheila Daniel, M.Sc., P.Geo. is a Principal, Mining Environmental with Amec Foster Wheeler Environment & Infrastructure. Ms. Daniel has approximately 25 years of global mining environmental consulting experience, with a Canadian focus over the past 15 years. Ms. Daniel provides consulting services to all phases of mineral development from grassroots to advanced exploration, project design and engineering, construction, operation and closure. She has been the Project Manager for Amec Foster Wheeler Environment & Infrastructure for environmental aspects of the development of RRP since 2011.

Sheila Daniel, M.Sc., P.Geo.
Principal, Mining Environmental

415000 417500 420000 422500 425000 427500 430000 432500 435000

5410000 5407500 5405000 5402500

Hwy 600

Hwy 71

Pinewood R.

Pinewood L.

P:\EM\Projects\2011\TC111504 Rainy River\GIS\Terrestrial\M. Evans_Misc\Biodiversity_Monitoring_Plan_Sept2015\MXD_Maps\Vege_Cover_Types_A_4_1.mxd

INDEX MAP

MAP B

MAP C

MAP A

LEGEND

Ecological Land Classifications

(1) Agriculture
(2) Cultural Meadow (CUM)
(3) Open Bog (B138)
(4) Open Water

Rock and Mineral Barren

(5) Rock Barren (B164)
(6) Active Mineral Barren (B007)

Hardwood Forest

(7) Dry to Fresh, Coarse: Aspen – Birch Hardwood (B055)
(8) Fresh, Silty to Fine Loamy: Aspen – Birch Hardwood (B104)
(9) Fresh, Clayey: Aspen – Birch Hardwood (B088)
(10) Moist, Fine: Aspen – Birch Hardwood (B119)
(11) Intolerant Hardwood Swamp (B130)
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(16) Dry, Sandy: Jack Pine – Black Spruce Dominated (B034)
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(22) Dry to Fresh, Coarse: Spruce – Fir Conifer (B052)
(23) Moist, Coarse: Black Spruce – Pine Conifer (B065)
(24) Fresh, Silty to Fine Loamy: Black Spruce – Jack Pine Dominated (B098)
(25) Fresh, Clayey: Black Spruce – Pine Conifer (B083)
(26) Fresh, Silty-Fine Loamy: Spruce – Fir Conifer (B101)
(27) Moist, Fine: Black Spruce – Pine Conifer (B114)
(28) Moist, Fine: Spruce – Fir Conifer (B116)

Coniferous Swamp

(29) Organic Poor Conifer Swamp (B127)
(30) Organic Intermediate Conifer Swamp (B128)
(31) Organic Rich Conifer Swamp (B129)

Fen

(32) Sparse Treed Fen (B136)
(33) Poor Fen (B139)
(34) Open Moderately Rich Fen (B140)
(35) Shrub Shore Fen (B147)

Meadow and Shallow Marsh

(36) Mineral Meadow Marsh (B142)
(37) Organic Shallow Marsh (B149)
(38) Organic Meadow Marsh (B144)

Thicket Swamp

(39) Organic Thicket Swamp (B135)
(40) Mineral Thicket Swamp (B134)

Approximate Principal RRP Facilities (index map)

Natural Environment Local Study Area (NLSA)

NOTES:
- Road data extracted from Land Information Ontario, Ontario Road Network, MNR
- Ontario base data extracted from Land Information Ontario (MNR) data warehouse, Queen's Printer for Ontario, 2011-2012
- Watershed delineations are approximate and are derived from MNR Ontario
- Most ecosite data provided by MNR, some ecosite data derived from FRI data provided by MNR.
- Base map data from Geogratis NRCan Toporama DRG 1:50,000 NTS sheets
- ELC data derived from ecosite classifications

Datum: NAD83
Projection: UTM Zone 15N

0 1.5 3 6 9 12 15 Kilometres

N W E S

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RAINY RIVER PROJECT

Vegetation Cover Types Map A

PROJECT N°: TC111504	**FIGURE: 1a**
SCALE: 1:57,000	DATE: September 2015

415000 417500 420000 422500 425000 427500 430000 432500

5420000 5417500 5415000 5412500

INDEX MAP

MAP B

MAP C

MAP A

Hwy 71

Hwy 600

McCallum Cr.

Muskrat L.

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0 1 2 4 6 8 10 Kilometres

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Datum: NAD83
Projection: UTM Zone 15N

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RAINY RIVER PROJECT

Vegetation Cover Types Map B

PROJECT N°: TC111504	FIGURE: 1b
SCALE: 1:44,000	DATE: September 2015

427500 5420000 430000 432500 435000 437500 440000

5425000 5422500 5420000

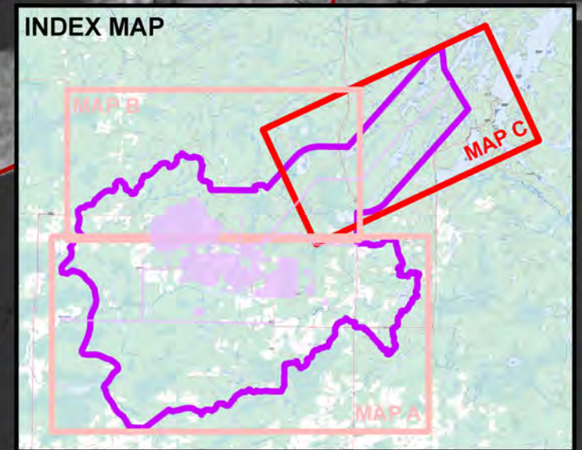
Hwy 71

Little Pine lake

Beadle Lake

Boundary Lake

INDEX MAP



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Datum: NAD83
Projection: UTM Zone 15N

0 1 2 4 6 8 10 Kilometres

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RAINY RIVER PROJECT

Vegetation Cover Types Map C

PROJECT N°: TC111504 | **FIGURE: 1c**

SCALE: 1:37,000 | DATE: September 2015

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APPENDIX 1

COMPILED SPECIES LISTS

Table A1-A: Compiled Plant Species List

Common Name	Latin Name	Coefficient of Conservatism[1]	Wetness Index[2]	Provincial S-RANK (NHIC)[3]	Federal SARA Status[4]	Provincial SARO Status[5]	Global G-RANK[6]	Ontario General Status	Canada General Status
Herbaceous Flowering Species									
Common Yarrow	*Achillea millefolium var. millefolium*	-	3	SNA	-	-	G5T5?	Exotic	Exotic
Sweet Flag	*Acorus americanus*		-5	S4	-	-	G5	Secure	Secure
Baneberry sp.	*Actaea sp.*	-	-	-	-	-	-	-	-
White Snakeroot	*Ageratina altissima var. altissima*	5	3	S5	-	-	G5T5	Secure	Secure
Agrimony	*Agrimonia gryposepala*	2	2	S5	-	-	G5	Secure	Secure
Woodland Agrimony	*Agrimonia striata*	-	-	S4?	-	-	G5	Secure	Secure
Common Water-plantain	*Alisma plantago-aquatica*	-	-	S4?	-	-	-	-	-
Small Round-leaved Orchis	*Amerorchis rotundiflora*		-5	S4S5	-	-	G5	Secure	Secure
Pearly Everlasting	*Anaphalis margaritacea*	3	5	S5	-	-	G5	Secure	Secure
Canada Anemone	*Anemone canadensis*	3	-3	S5	-	-	G5	Secure	Secure
Wood Anemone	*Anemone quinquefolia*	7	0	S5	-	-	G5	Secure	Secure
Thimbleweed	*Anemone virginiana*	4	5	S5	-	-	G5	Secure	Secure
Field Pussytoes	*Antennaria neglecta*	3	5	S5	-	-	G5	Secure	Secure
Spreading Dogbane	*Apocynum androsaemifolium* ssp. *androsaemifolium*	3	5	S5	-	-	G5	Secure	Secure
Columbine	*Aquilegia canadensis*	5	1	S5	-	-	G5	Secure	Secure
Tower Mustard	*Arabis glabra*	4	5	S5	-	-	G5	Secure	Secure
Bristly Sarsaparilla	*Aralia hispida*		5	S5	-	-	G5	Secure	Secure
Wild Sarsaparilla	*Aralia nudicaulis*	4	3	S5	-	-	G5	Secure	Secure
Common Burdock	*Arctium minus* ssp. *minus*	-	-	SNA	-	-	GNRTNR	-	-
Swamp-pink	*Arethusa bulbosa*	10	-5	S4	-	-	G4	Secure	Secure
Jack-in-the-pulpit	*Arisaema triphyllum* ssp. *triphyllum*	5	-2	S5	-	-	G5	Secure	Secure
Canada Wild-ginger	*Asarum canadense*	6	5	S5	-	-	G5	Secure	Secure
Marsh Marigold	*Caltha palustris*	5	-5	S5	-	-	G5	Secure	Secure
Marsh Bellflower	*Campanula aparinoides*	7	-5	S5	-	-	G5	Secure	Secure
Harebell	*Campanula rotundifolia*	7	1	S5	-	-	G5	Secure	Secure
Common Shephard's Purse	*Capsella bursa-pastoris*	-	1	SNA	-	-	GNR	Exotic	Exotic
Scarlet Indian-paintbrush	*Castilleja coccinea*		0	S5	-	-	G5	Secure	Secure
Common Mouse-ear Chickweed	*Cerastium fontanum*	-	3	SNA	-	-	GNR	Exotic	Exotic
Nodding Chickweed	*Cerastium nutans*	4	2	S4	-	-	G5	Secure	Secure
Pineapple-weed	*Chamomilla sauveolens*	-	-	SNA	-	-	G5	Exotic	Exotic
Pipsissewa	*Chimaphila umbellata* spp. *cisatlantica*		5	S5	-	-	G5	Secure	Secure
Bulbet-bearing Water Hemlock	*Cicuta bulbifera*	5	-5	S5	-	-	G5	Secure	Secure
Spotted Water Hemlock	*Cicuta maculate*	6	-5	S5	-	-	G5	Secure	Secure
Enchanter's Nightshade	*Circaea quadrisulcata*	-	-	S5	-	-	G5	Secure	Secure
Swamp Thistle	*Circium muticum*		-5	S5	-	-	G5	Secure	Secure
Canada Thistle	*Cirsium arvense*	-	3	SNA	-	-	GNR	Exotic	Exotic
Bull Thistle	*Cirsium vulgare*	-	4	SNA	-	-	GNR	Exotic	Exotic
Clintonia	*Clintonia borealis*	7	-1	S5	-	-	G5	Secure	Secure

Table A1-A: Compiled Plant Species List

Common Name	Latin Name	Coefficient of Conservatism[1]	Wetness Index[2]	Provincial S-RANK (NHIC)[3]	Federal SARA Status[4]	Provincial SARO Status[5]	Global G-RANK[6]	Ontario General Status	Canada General Status
Toadflax	*Comandra umbellata*	6	3	S5	-	-	G5	Secure	Secure
Marsh Cinquefoil	*Comarum palustre*	7	-5	S5	-	-	G5	Secure	Secure
Marsh Cinquefoil	*Comarum palustris*	7	-5	S5	-	-	G5	Secure	Secure
Goldthread	*Coptos trifolia* ssp. *groenlandica*	7	-3	S5	-	-	G5	Secure	Secure
Spotted Coral Root	*Corallorhiza maculata*	7	4	S5	-	-	G5	Secure	Secure
Early Coral Root	*Corallorhiza trifida*	7	-2	S5	-	-	G5	Secure	Secure
Pale Corydalis	*Corydalis flavula*	7	5	S5	-	-	G4G5	Secure	Secure
Narrow-leaf Hawksbeard	*Crepis tectorum*	-	5	SNA	-	-	GNR	Exotic	Exotic
Pink Lady's-slipper	*Cypripedium acaule*	7	-3	S5	-	-	G5	Secure	Secure
Pink Lady's-slipper	*Cypripedium acaule*	7	-3	S5	-	-	G5	Secure	Secure
Yellow Large Lady's-slipper	*Cypripedium parviflorum var. pubescens*	5	-1	S5	-	-	G5T5	-	-
Showy Lady's-slipper	*Cypripedium reginae*	7	-4	S4	-	-	G4	Secure	Secure
Wild Carrot	*Daucus corata*	-	5	SNA	-	-	GNR	Exotic	Exotic
Flat-topped Aster	*Doellingeria umbellatus*	-	-	S5	-	-	G5T5	Secure	Secure
Round-leaved Sundew	*Drosera rotundifolia*	7	-5	S5	-	-	G5	Secure	Secure
Common Viper's-bugloss	*Echium vulgare*	-	5	SNA	-	-	GNR	Exotic	Exotic
Fireweed	*Epilobium angustifolia*	3	0	S5	-	-	G5	Secure	Secure
Philadelphia Fleabane	*Erigeron philadelphicus*	1	-3	S5	-	-	G5	Secure	Secure
Daisy Fleabane	*Erigeron strigosus*	0	1	S5	-	-	G5	Secure	Secure
Common Boneset	*Eupatorium perfoliatum*	2	-4	S5	-	-	G5	Secure	Secure
Spotted Joe-pye-weed	*Eupatroium maculatum* spp. *maculatum*	-	-	S5	-	-	G5TNR	-	-
Large-leaved Wood-aster	*Eurybia macrophyllus*	5	5	S5	-	-	G5	Secure	Secure
Woodland Strawberry	*Fragaria vesca* ssp. *americana*	4	4	S5	-	-	G5	Secure	Secure
Wild Strawberry	*Fragaria virginiana*	2	1	S5	-	-	G5	Secure	Secure
Bristle-stem Hempnettle	*Galeopsis tetrahit*	-	5	SNA	-	-	GNR	Exotic	Exotic
Rough Bedstraw	*Galium asprellum*	6	-5	S5	-	-	G5	Secure	Secure
Northern Bedstraw	*Galium boreale*	7	0	S5	-	-	G5	Secure	Secure
Bog Bedstraw	*Galium labradoricum*		-5	S5	-	-	G5	Secure	Secure
Marsh Bedstraw	*Galium palustre*	5	-5	S5	-	-	G5	Secure	Secure
Small Bedstraw	*Galium trifidum*	4	-5	S5	-	-	G5	Secure	Secure
Sweet-scented Bedstraw	*Galium triflorum*	4	2	S5	-	-	G5	Secure	Secure
Northern Comandra	*Geocaulon lividum*	0	-2	S5	-	-	G5	Secure	Secure
Bicknell Northern Crane's-bill	*Geranium bicknelli*	5	5	S4	-	-	G5	Secure	Secure
Herb-robert	*Geranium robertianum*	-	5	SNA	-	-	G5	Exotic	Exotic
Yellow Avens	*Geum aleppicum* var. *strictum*	2	-1	S5	-	-	G5	Secure	Secure
White Avens	*Geum canadense*	3	0	S5	-	-	G5	Secure	Secure
Dwarf Rattlesnake-plantain	*Goodyera repens*		3	S5	-	-	G5	Secure	Secure
Spurred Gentian	*Halenia deflexa*	7	0	S5	-	-	G5	Secure	Secure
Cow-parsnip	*Heracleum maximum*	3	-3	S5	-	-	G5	Secure	Secure

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Orange Hawkweed	*Hieracium aurantiacum*	-	-	SNA	-	-	GNR	Exotic	Exotic
Common Hop	*Humulus lupulis*	-	3	S4	-	-	G5	Secure	Secure
Spotted Jewel-weed	*Impatienscapensis*	4	-3	S5	-	-	G5	Secure	Secure
Blueflag	*Iris versicolor*	5	-5	S5	-	-	G5	Secure	Secure
Bog Laurel	*Kalmia polifolia*	10	-5	S5	-	-	G5	Secure	Secure
Canada Lettuce	*Lactuca canadensis*	3	2	S5	-	-	G5	Secure	Secure
Prickly Lettuce	*Lactuca serriola*	-	0	SNA	-	-	GNR	Exotic	Exotic
Wood Nettle	*Laportea canadensis*	6	-3	S5	-	-	G5	Secure	Secure
Pale Vetchling	*Lathyrus ochroleucuc*		5	S4	-	-	G4G5	Secure	Secure
Peavine Vetchling	*Lathyrus palustris*	6	-3	S5	-	-	G5	Secure	Secure
Smooth Veiny Peavine	*Lathyrus venosus*		0	S4	-	-	G5	Secure	Secure
Ox-eye Daisy	*Leucanthemum vulgare*	-	-	SNA	-	-	GNR	Exotic	Exotic
Heartleaf Twayblade	*Listera cordata*		-3	S5?	-	-	G5	Secure	Secure
Great Blue Lobelia	*Lobelia siphilitica*	6	-4	S5	-	-	G5	Secure	Secure
Birds-foot Trefoil	*Lotus corniculatus*	-	1	SNA	-	-	GNR	Exotic	Exotic
White Campion	*Lychnis alba*	-	-	-	-	-	-	-	-
Northern Bugleweed	*Lycopus uniflorus*	5	-5	S5	-	-	G5	Secure	Secure
Fringed Loosestrife	*Lysimachia ciliata*	4	-3	S5	-	-	G5	Secure	Secure
Tufted Loosestrife	*Lysimachia thyrsiflora*	7	-5	S5	-	-	G5	Secure	Secure
Wild-lily-of-the-valley	*Maianthemum canadense*	5	0	S5	-	-	G5	Secure	Secure
Three-leaf Solomon's Seal	*Maianthemum trifolium*	10	-5	S5	-	-	G5	Secure	Secure
Black Medic	*Medicago lupulina*	-	1	SNA	-	-	GNR	Exotic	Exotic
Alfalfa	*Medicago sativa ssp. sativa*	-	5	SE5	-	-	G?T?	Exotic	Exotic
American Cow-wheat	*Melampyrum lineare*	6	1	S4S5			G5	Secure	Secure
White Sweet- clover	*Melilotus alba*	-	3	SNA	-	-	G5	Exotic	Exotic
Field Mint	*Mentha arvensis*	3	-3	S5	-	-	G5	Secure	Secure
Bog Buckbean	*Menyanthes trifoliate*		-5	S5	-	-	G5	Secure	Secure
Northern Bluebells	*Mertensia paniculata*	-	-	S5	-	-	G5	Secure	Secure
Naked Bishop's-cap	*Mitella nuda*	6	-3	S5	-	-	G5	Secure	Secure
One-flower Wintergreen	*Moneses uniflora*	10	0	S5	-	-	G5	Secure	Secure
Indian Pipe	*Monotropa uniflora*	6	3	S5	-	-	G5	Secure	Secure
Catnip	*Nepeta cataria*	-	1	SNA	-	-	GNR	Exotic	Exotic
Common Evening Primrose	*Oenothera biennis*	0	3	S5	-	-	G5	Secure	Secure
One-sided Wintergreen	*Orthilia secunda*	5	-1	S5	-	-	G5	Secure	Secure
Hairy Sweet-cicely	*Osmorhiza claytonii*	5	4	S5	-	-	G5	Secure	Secure
Northern Sweet-coltsfoot	*Petasites frigidus*		-3	S5	-	-	G5	Secure	Secure
Arrow-leaved Sweet-coltsfoot	*Petasites sagittatus*	-	-	S5	-	-	G5	-	-
Common Plantain	*Plantago major*	-	-1	SNA	-	-	G5	Exotic	Exotic
Hooker's Orchid	*Platanthera hookeri*		-1	S3	-	-	G4	Secure	Secure
Northern Bog-orchid	*Platanthera hyperborea*	-	-	S4	-	-	-	-	-

Table A1-A: Compiled Plant Species List

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Small Northern Bog-orchid	*Platanthera obtusata*		-3	S5	-	-	G5	Secure	Secure
Gaywing Milkwort	*Polygala pauciflora*	6	3	S5	-	-	G5	Secure	Secure
Dock-leaf Smartweed	*Polygonum lapathifolium*	2	-4	S5	-	-	G5	Secure	Secure
Climbing False Buckwheat	*Polygonum scandens*	3	0	S4S5	-	-	G5	Secure	Secure
Rough Cinquefoil	*Potentilla norvegica*	0	0	S5	-	-	G5	Secure	Secure
Rough-fruited Cinquefoil	*Potentilla recta*	-	5	SNA	-	-	GNR	Exotic	Exotic
White Rattlesnake-root	*Prenanthes alba*	6	3	S5	-	-	G5	Secure	Secure
Self-heal	*Prunella vulgaris ssp. Lanceolata*	5	5	S5	-	-	G5T5	Secure	Secure
Pink Wintergreen	*Pyrola asarifolia*	7	-3	S5	-	-	G5	Secure	Secure
Tall Buttercup	*Rananculus acris*	-	-2	SNA	-	-	G5	Exotic	Exotic
Bristly Buttercup	*Ranunculus hispidus var. hispidus*		0	S3	-	-	G5T5	-	-
Bristly Buttercup	*Ranunculus pensylvanicus*	-	-	S5	-	-	-	-	-
Nodding Trillium	*Rilliuum cemuum*		0	S5	-	-	G5	Secure	Secure
Sheep Sorrel	*Rumex acetosella* spp. *acetosella*	-	-	SE	-	-	-	Exotic	Exotic
Curly Dock	*Rumex crispus*	-	-1	SNA	-	-	GNR	Exotic	Exotic
Bloodroot	*Sanguinaria canadensis*	5	4	S5	-	-	G5	Secure	Secure
Black Snakeroot	*Sanicula marilandica*	5	3	S5	-	-	G5	Secure	Secure
Pitcher Plant	*Sarracenia purpurea*	10	-5	S5	-	-	G5	Secure	Secure
Hooded Skullcap	*Scutellaria galericulata*	6	-5	S5	-	-	G5	Secure	Secure
Balsam Ragwort	*Senecio pauperculus*	7	-1	S5	-	-	G5	Secure	Secure
Strict Blue-eyed Grass	*Sisyrinchium montanum*	4	-1	S5	-	-	G5	Secure	Secure
Water-parsnip Hemlock	*Sium suave*	4	-5	S5	-	-	G5	Secure	Secure
Tall Goldenrod	*Solidago altissima* var. *altissima*	-	-	S4?	-	-	-	-	-
Marsh Goldenrod	*Solidago uliginosa*		-5	S5	-	-	G4G5	Secure	Secure
Marsh Hedge-nettle	*Stachys palustris*	-	-5	SNA	-	-	G5	Secure	Secure
Longleaf Stitchwort	*Stellaria longifolia*	2	-4	S5	-	-	G5	Secure	Secure
Chickweed Stitchwort	*Stellaria media ssp. pallida*	-	-	SNA	-	-	GNRTNR	Exotic	Exotic
Rose Twisted Stalk	*Streptopus roseus*	7	0	S5	-	-	G5	Secure	Secure
Lindley's Aster	*Symphyotrichum ciliolatum*	6	4	S5	-	-	G5	Secure	Secure
Heart-leaved Aster	*Symphyotrichum cordifolium*	5	5	S5	-	-	G5	Secure	Secure
Hairy Aster	*Symphyotrichum pilosum var. pilosum*	4	2	S5	-	-	G5T5	-	-
Swamp Aster	*Symphyotrichum puniceum*	6	-5	S5	-	-	G5	Secure	Secure
Common Tansy	*Tanacetum vulgare*	-	5	SNA	-	-	GNR	Exotic	Exotic
Common Dandelion	*Taraxacum officinale*	-	3	SNA	-	-	G5	Secure	Secure
Tall Meadow-rue	*Thalictrum pubescens*	5	-2	S5	-	-	G5	Secure	Secure
Field Penny-cress	*Thlaspi arvense*	-	5	SNA	-	-	GNR	Exotic	Exotic
Poison Ivy	*Toxicodenron radicans* ssp. *negundo*	5	-1	S5	-	-	G5T5	Secure	Secure
Marsh St. John's-wort	*Triadenum fraseri*	7	-5	S5	-	-	G5	Secure	Secure
Northern Starflower	*Trientalis borealis* ssp. *borealis*	6	-1	S5	-	-	G5	Secure	Secure
Alsike Clover	*Trifolium hybridum*	-	1	SNA	-	-	GNR	Exotic	Exotic

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Red Clover	*Trifolium pratense*	-	2	SNA	-	-	GNR	Exotic	Exotic
White Clover	*Trifolium repens*	-	2	SNA	-	-	GNR	Exotic	Exotic
Common Cattail	*Typha latifolia*	3	-5	S5	-	-	G5	Secure	Secure
Stinging Nettle	*Urtica dioica ssp. gracilis*	2	-1	S5	-	-	G5T5	Secure	Secure
Tall Nettle	*Urtica procera*	-	-	-	-	-	-	-	-
Sessile-leaved Bellwort	*Uvularia sessilifolia*	7	1	S4	-	-	G5	Secure	Secure
Common Mullein	*Verbascum thapsus*	-	-	SNA	-	-	GNR	Exotic	Exotic
Purslane Speedwell	*Veronica peregrine var. xalapensis*	-	-	S5	-	-	-	-	-
Marsh Speedwell	*Veronica scutellata*	7	-5	S5	-	-	G5	Secure	Secure
Cow Vetch	*Vicia cracca*	-	5	SNA	-	-	GNR	Exotic	Exotic
New England Violet	*Viola novea-angliae*	-	-	S3	-	-	G4	May be at risk	Sensitive
Kidney-leaf Violet	*Viola renifolia*	7	-3	S5	-	-	G5	Secure	Secure
Violet sp.	*Viola sp.*	-	-	-	-	-	-	-	
Barren Strawberry	*Waldsteinia fragarioides*	5	5	S5	-	-	G5	Secure	Secure
Grasses, Sedges and Rushes									
Rough Hair Grass	*Agrostis scabra*	0	-3	S5	-	-	G5	Secure	Secure
Short-awned Foxtail	*Alopecurus aequalis*	-	-	S4S5	-	-	-	-	-
Smooth Brome-grass	*Bromus inermis ssp. inermis*	-	5	SNA	-	-	G5TNR	Exotic	Exotic
Canada Blue-joint	*Calamagrostis canadensis*	4	-5	S5	-	-	G5	Secure	Secure
Crowned Sedge	*Carex adusta*	-	-	S4S5	-	-	G5	Secure	Secure
Fernald's Hay Sedge	*Carex aenea*		5	S5	-	-	G5	Secure	Secure
Water Sedge	*Carex aquatilis*	7	-5	S5	-	-	G5	Secure	Secure
Awned Sedge	*Carex atherodes*	6	-5	S4S5	-	-	G5	Secure	Secure
Bebb's Sedge	*Carex bebbii*	3	-5	S5	-	-	G5	Secure	Secure
Silvery Sedge	*Carex canescens*	7	-5	S5	-	-	G5	Secure	Secure
Chestnut-colored Sedge	*Carex castanea*	7	-4	S5	-	-	G5	Secure	Secure
Creeping Sedge	*Carex chordorrhiza*	10	-5	S5	-	-	G5	Secure	Secure
Field Sedge	*Carex conoidea*		2	S3	-	-	G5	Sensitive	Secure
Fringed Sedge	*Carex crinita*	6	-4	S5	-	-	G5	Secure	Secure
Two-stamen Sedge	*Carex diandra*	7	-5	S5	-	-	G5	Secure	Secure
Two-seeded Sedge	*Carex disperma*		-5	S5	-	-	G5	Secure	Secure
Graceful Sedge	*Carex gracillima*	4	3	S5	-	-	G5	Secure	Secure
Northern Bog Sedge	*Carex gynocrates*	10	-5	S5	-	-	G5	Secure	Secure
Bladder Sedge	*Carex intumescens*	6	-4	S5	-	-	G5	Secure	Secure
Lake-bank Sedge	*Carex lacustris*	5	-5	S5	-	-	G5	Secure	Secure
Slender Sedge	*Carex lasiocarpa*		-5	S5	-	-	G5	Secure	Secure
Bristle-stalked Sedge	*Carex leptalea*		-5	S5	-	-	G5	Secure	Secure
Finely-nerved Sedge	*Carex leptonervia*	5	0	S4	-	-	G5	Secure	Secure
Mud Sedge	*Carex limosa*	10	-5	S5	-	-	G5	Secure	Secure

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Hop Sedge	*Carex lupulina*	6	-5	S5	-	-	G5	Secure	Secure
Sallow Sedge	*Carex lurida*	6	-5	S5	-	-	G5	Secure	Secure
Boreal Bog Sedge	*Carex magellanica*	-	-	S5	-	-	G5	Secure	Secure
Few-flowered Sedge	*Carex pauciflora*	10	-5	S5	-	-	G5	Secure	Secure
Stellate Sedge	*Carex radiata*	4	5	S4	-	-	G4	Secure	Secure
Retrorse Sedge	*Carex retrorsa*	5	-5	S5	-	-	G5	Secure	Secure
Rosy Sedge	*Carex rosea*	-	-	S5	-	-	G5	Secure	Secure
Stalk-grain Sedge	*Carex stipata*	3	-5	S5	-	-	G5	Secure	Secure
Tussock Sedge	*Carex stricta*	4	-5	S5	-	-	G5	Secure	Secure
Slender Sedge	*Carex tenera*	4	-1	S4S5	-	-	G5	Secure	Secure
Sparse-flowered Sedge	*Carex tenuiflora*	10	-5	S5	-	-	G5	Secure	Secure
Blunt Broom Sedge	*Carex tribuloides*	5	-4	S4S5	-	-	G5	Secure	Secure
Three-fruited Sedge	*Carex trisperma*	-	-	S5	-	-	G5	Secure	Secure
Beaked Sedge	*Carex utriculata*	7	-5	S5	-	-	G5	Secure	Secure
Sheathed Sedge	*Carex vaginata*	10	-5	S5	-	-	G5	Secure	Secure
Fox Sedge	*Carex vulpinoidea*	3	-5	S5	-	-	G5	Secure	Secure
Slender Woodreed	*Cinna latifolia*	7	-4	S5	-	-	G5	Secure	Secure
Orchard Grass	*Dactylis glomerata*	-	3	SNA	-	-	GNR	Exotic	Exotic
Poverty Oat Grass	*Danthonia spicata*	5	5	S5	-	-	G5	Secure	Secure
Three-way Sedge	*Dulichium arundinaceum*	7	-5	S5	-	-	G5	Secure	Secure
Blunt Spike-rush	*Eleocharis obtusa*	5	-5	S5	-	-	G5	Secure	Secure
Marsh Spike-rush	*Elocharis smallii*	6	-5	S5	-	-	G5?	Secure	Secure
Quack Grass	*Elymus repens*	-	3	SNA	-	-	GNR	Exotic	Exotic
Slender Wheat Grass	*Elymus trachycaulus*	-	-	S4?	-	-	G5T5	Secure	Secure
Slender Cottongrass	*Eriophorum gracile*	10	-5	S5	-	-	G5	Secure	Secure
Tussock Cotton-grass	*Eriophorum vaginatum*	10	-5	S5	-	-	G5	Secure	Secure
Green Keeled Cottongrass	*Eriophorum viridicarinatum*		-5	S5	-	-	G5	Secure	Secure
Hard Fescue	*Festuca trachyphylla*	-	-	SNA	-	-	GNR	Exotic	Exotic
Small Floating Manna-grass	*Glyceria borealis*		-5	S5	-	-	G5	Secure	Secure
American Mannagrass	*Glyceria grandis*	5	-5	S4S5	-	-	G5	Secure	Secure
Fowl Manna-grass	*Glyceria striata* var. *stricta*	-	-	S4S5	-	-	G5T5	-	-
Toad Rush	*Juncus bufonius*	1	-4	S5	-	-	G5	Secure	Secure
Canada Rush	*Juncus canadensis*	6	-5	S5	-	-	G5	Secure	Secure
Soft Rush	*Juncus effuses* spp. *solutus*	4	-5	S5	-	-	G5	Secure	Secure
Knotted Rush	*Juncus nodosus*	5	-5	S5	-	-	G5	Secure	Secure
Slender, Path Rush	*Juncus tenuis*	0	0	S5	-	-	G5	Secure	Secure
Hairy Wood Rush	*Luzula acuminata*	6	1	S5	-	-	G5	Secure	Secure
Impoverished Panic Grass	*Panicum depauperatum*	-	-	S4	-	-	-	-	-
Reed-canary Grass	*Phalaris arundinacea*	0	-4	S5	-	-	G5	Secure	Secure
Timothy	*Phleum pratense*	-	3	SNA	-	-	GNR	Exotic	Exotic

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Common Reed	*Phragmites australis*	-	-	SNA	-	-	GNR	Exotic	Exotic
Canada Bluegrass	*Poa compressa*	0	2	SNA	-	-	GNR	Secure	Secure
Fowl Bluegrass	*Poa palustris*	5	-4	S5	-	-	G5	Secure	Secure
Kentucky Bluegrass	*Poa pratensis spp. pratensis*	0	2	S5	-	-	G5T5	Secure	Secure
Purple Oat	*Schizachne purpurascens*	6	2	S5	-	-	G5	Secure	Secure
Black Bulrush	*Scirpus atrovirens*	3	-5	S5	-	-	G5?	Secure	Secure
Wool-grass	*Scirpus cyperinus*	4	-5	S5	-	-	G5	Secure	Secure
Small-fruited Bulrush	*Scirpus microcarpus*	4	-5	S5	-	-	G5	Secure	Secure
Bulrush sp.	*Scirpus sp.*	-	-	-	-	-	-	-	-
Softstem Bulrush	*Scirpus validus*	-	-	S5	-	-	G5	Secure	Secure
Common Bog Arrow-grass	*Triglochin maritimum*		-5	S5	-	-	G5	Secure	Secure
Common Cattail	*Typha latifolia*	3	-5	S5	-	-	G5	Secure	Secure
Aquatic Plants									
Lake Cress	*Armoracia lacustris*	-	-	S3?	-	-	-	-	-
Water Shield	*Brasenia schreberi*	7	-5	S5	-	-	G5	Secure	Secure
Wild Calla	*Calla palustris*		-5	S5	-	-	G5	Secure	Secure
Vernal Water Starwort	*Callitriche palustris*	6	-5	S5	-	-	G5	Secure	Secure
Hornwort Coontail	*Ceratophyllum demersum*	4	-5	S5	-	-	G5	Secure	Secure
Common Mare's Tail	*Hippuris vulgaris*	10	-5	S5	-	-	G5	Secure	Secure
Lesser Duckweed	*Lemna minor*	2	-5	S5	-	-	G5	Secure	Secure
Star Duckweed	*Lemna trisulca*	4	-5	S5	-	-	G5	Secure	Secure
Common Water Milfoil	*Myriophyllum sibiricum*	6	-5	S5	-	-	G5	Secure	Secure
Yellow Cowlily	*Nuphar lutea ssp. variegata*	-	-	S5	-	-	G5T5	Secure	Secure
Small White Water-lily	*Nymphaea leibergii*	-	-	-	-	-	-	-	-
Fragrant Water Lily	*Nymphaea odorata*	-	-	S5?	-	-	G5T5	Secure	Secure
Water Smartweed	*Polygonum amphibium*	5	-5	S5	-	-	G5	Secure	Secure
Alpine Pondweed	*Potamogeton alpines*	10	-5	S5	-	-	G5	Secure	Secure
Large-leaf Pondweed	*Potamogeton amplifolius*	5	-5	S5	-	-	G5	Secure	Secure
Leafy Pondweed	*Potamogeton foliosus*	4	-5	S5	-	-	G5	Secure	Secure
Floating-leaf Pondweed	*Potamogeton natans*	5	-5	S5	-	-	G5	Secure	Secure
Slender Pondweed	*Potamogeton pusillus*	5	-5	S4S5	-	-	G5	Secure	Secure
Red-head Pondweed	*Potamogeton richardsonii*	5	-5	S5	-	-	G5	Secure	Secure
Flat-stemmed Pondweed	*Potamogeton zosteriformis*	5	-5	S5	-	-	G5	Secure	Secure
Small Yellow Water Crowfoot	*Ranunculus gmelinii*	-	-	S5	-	-	G5	Secure	Secure
Curly White Water Crowfoot	*Ranunculus longirostris*	-	-	-	-	-	-	-	-
Broadleaf Arrowhead	*Sagittaria latifolia*	4	-5	S5	-	-	G5	Secure	Secure
Floating Bur-reed	*Sparganium angustifolium*	-	-	S4?	-	-	-	-	-
Green-fruit Bur-reed	*Sparganium emersum*	5	-5	S5	-	-	G5	Secure	Secure
Large Bur-reed	*Sparganium eurycarpum*	3	-5	S5	-	-	G5	Secure	Secure
Great Duckweed	*Spirodela polyrihiza*	-	-	S5	-	-	G5	-	-

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Flat-leaved Bladderwort	*Utricularia intermedia*		-5	S5	-	-	G5	Secure	Secure
Lesser Bladderwort	*Utricularia minor*		-5	S5	-	-	G5	Secure	Secure
Greater Bladderwort	*Utricularia vulgaris*	4	-5	S5	-	-	G5	Secure	Secure
Tape Grass	*Vallisneria americana*	6	-5	S5	--	--	G5	Secure	Secure
Ferns and Allies									
Maidenhair Spleenwort	*Asplenium trichomanes* spp. *trichomanes*		5	S5	-	-	G5	Secure	Secure
Lady Fern	*Athyrium filix-femina*	-	-	S5	-	-	G5T5	Secure	Secure
Rattlesnake Fern	*Botrychium virginianum*	5	3	S5	-	-	G5	Secure	Secure
Bulblet Fern	*Cystopteris bulbifera*	5	-2	S5	-	-	G5	Secure	Secure
Spinulose Wood Fern	*Dryopteris carthusiana*	5	-2	S5	-	-	G5	Secure	Secure
Crested Wood Fern	*Dryopteris criststa*	-	-	-	-	-	-	-	-
Field Horsetail	*Equisetum arvense*	0	0	S5	-	-	G5	Secure	Secure
Water Horsetail	*Equisetum fluviatile*	7	-5	S5	-	-	G5	Secure	Secure
Woodland Horsetail	*Equisetum sylvaticum*	7	-3	S5	-	-	G5	Secure	Secure
Horsetail sp.	*Equisetum* sp.	-	-	-	-	-	-	-	-
Oak Fern	*Gymnocarpium dryopteris*	7	0	S5	-	-	G5	Secure	Secure
Stiff Clubmoss	*Lycopodium annotinum*	7	0	S5	-	-	G5	Secure	Secure
Running Pine	*Lycopodium clavatum*	6	0	S5	-	-	G5	Secure	Secure
Tree Clubmoss	*Lycopodium obscurum*	6	3	S4	-	-	G5	Secure	Secure
Ostrich Fern	*Matteuccia struthiopteris* var. *pensylvanica*	5	-3	S5	-	-	G5	Secure	Secure
Sensitive Fern	*Onoclea sensibilis*	4	-3	S5	-	-	G5	Secure	Secure
Interrupted Fern	*Osmunda claytoniana*	7	-1	S5	-	-	G5	Secure	Secure
Rock Polypody	*Polypodium virginianum*	6	5	S5	-	-	G5	Secure	Secure
Bracken Fern	*Pteridium aquilinum*	2	3	S5	-	-	G5	Secure	Secure
Marsh Fern	*Thelypteris palusris*	5	-4	S5	-	-	G5	Secure	Secure
Rusty Woodsia	*Woodsia ilvensis*		5	S5	-	-	G5	Secure	Secure
Vines									
Field Bindweed	*Convolvulus arvensis*	-	5	SNA	-	-	GNR	Exotic	Exotic
Honeysuckle Fly	*Lonicera canadensis*	6	3	S5	-	-	G5	Secure	Secure
Mountain Honeysuckle	*Lonicera dioica*	5	3	S5	-	-	G5	Secure	Secure
Hairy Honeysuckle	*Lonicera hirsuta*	7	0	S5	-	-	G4G5	Secure	Secure
Virginia Creeper	*Parthenocissus quinquefolia*	6	1	S4?	-	-	G5	Secure	Secure
Fringed Black Bindweed	*Polygonum cilinode*	2	5	S5	-	-	G5	Secure	Secure
Coniferous Trees and Shrubs									
Balsam Fir	*Abies balsamea*	5	-3	S5	-	-	G5	Secure	Secure
Common Juniper	*Juniperus communis*	4	3	S5	-	-	G5	Secure	Secure
Larch	*Larix laricina*	7	-3	S5	-	-	G5	Secure	Secure
White Spruce	*Picea glauca*	6	3	S5	-	-	G5	Secure	Secure
Black Spruce	*Picea mariana*		-3	S5	-	-	G5	Secure	Secure

Table A1-A: Compiled Plant Species List

Common Name	Latin Name	Coefficient of Conservatism[1]	Wetness Index[2]	Provincial S-RANK (NHIC)[3]	Federal SARA Status[4]	Provincial SARO Status[5]	Global G-RANK[6]	Ontario General Status	Canada General Status
Jack Pine	*Pinus banksiana*		3	S5	-	-	G5	Secure	Secure
Red Pine	*Pinus resinosa*		3	S5	-	-	G5	Secure	Secure
Eastern White Pine	*Pinus strobus*	4	3	S5	-	-	G5	Secure	Secure
Eastern White Cedar	*Thuja occidentalis*	4	-3	S5	-	-	G5	Secure	Secure
Eastern Hemlock	*Tsuga canadensis*	7	3	S5	-	-	G4G5	Secure	Secure
Deciduous Shrubs									
Mountain Maple	*Acer spicatum*	6	3	S5	-	-	G5	Secure	Secure
Speckled Alder	*Alnus incana ssp. rugosa*	6	-5	S5	-	-	G5	Secure	Secure
Serviceberry sp.	*Amelanchier sp.*	-	-	-	-	-	-	-	-
Bog Rosemary	*Andromeda polifolia var. glaucophylla*	-	-	S5	-	-	G5T5	-	-
Dwarf Birch	*Betula pumila*		-5	S5	-	-	G5	Secure	Secure
Leatherleaf	*Chamaedaphne calyculata*		-5	S5	-	-	G5	Secure	Secure
Bunchberry	*Cornus canadensis*	7	0	S5	-	-	G5	Secure	Secure
Grey Dogwood	*Cornus foemina ssp.racemosa*	2	-2	S5	-	-	G5	Secure	Secure
Round-leaved Dogwood	*Cornus rugosa*	6	5	S5	-	-	G5	Secure	Secure
Red-osier Dogwood	*Cornus sericea*	5	-4	S5	-	-	G5	Secure	Secure
Beaked Hazel	*Corylus cornuta*	5	5	S5	-	-	G5	Secure	Secure
Hawthorn sp.	*Crategus sp.*	-	-	-	-	-	-	-	-
Northern Bush-honeysuckle	*Diervilla lonicera*	5	5	S5	-	-	G5	Secure	Secure
Creeping Snowberry	*Gaultheria hispidula*		-3	S5	-	-	G5	Secure	Secure
Labrador Tea	*Ledum groenlandicum*		-5	S5	-	-	G5	Secure	Secure
Twinflower	*Linnaea borealis*	7	0	S5	-	-	G5	Secure	Secure
Fly Honeysuckle	*Lonicera involucrate*	-	-	S5	-	-	G5	Secure	Secure
Swamp Fly-honeysuckle	*Lonicera oblongifolia*		-5	S4S5	-	-	G4	Secure	Secure
Swamp Fly-honeysuckle	*Lonicera villosa*	10	-3	S5	-	-	G5	Secure	Secure
Sweet Gale	*Myrica gale*	6	-5	S5	-	-	G5	Secure	Secure
Choke Cherry	*Prunus virginiana ssp. Virginiana*	2	1	S5	-	-	G5	Secure	Secure
Alder-leaved Buckthorn	*Rhamnus alnifolia*	7	-5	S5	-	-	G5	Secure	Secure
Buckthorn sp.	*Rhamnus sp.*	-	-	-	-	-	-	-	-
Smooth Sumac	*Rhus glabra*	1	5	S5	-	-	G5	Secure	Secure
Prickly Gooseberry	*Ribes cynosbati*	4	5	S5	-	-	G5	Secure	Secure
Smooth Gooseberry	*Ribes hirtellum*	6	-3	S5	-	-	G5	Secure	Secure
Northern Wild Black Currant	*Ribes hudsonianum*		-5	S5	-	-	G5	Secure	Secure
Bristly Black Currant	*Ribes lacustre*	7	-3	S5	-	-	G5	Secure	Secure
Bristly Wild Gooseberry	*Ribes oxyacanthoides*	-	-	S5	-	-	G5	Secure	Secure
Swamp Red Currant	*Ribes triste*	6	-5	S5	-	-	G5	Secure	Secure
Prickly Wild Prickly Wild Rose	*Rosa acicularis*	7	3	S5	-	-	G5	Secure	Secure
Allegheny Blackberry	*Rubus allegheniensis*	2	2	S5	-	-	G5	Secure	Secure
Cloudberry	*Rubus chamaemorus*	-	-	S5	-	-	G5	Secure	Secure
Wild Red Raspberry	*Rubus idaeus*	-	-	S5	-	-	G5	Secure	Secure

Table A1-A: Compiled Plant Species List

Common Name	Latin Name	Coefficient of Conservatism[1]	Wetness Index[2]	Provincial S-RANK (NHIC)[3]	Federal SARA Status[4]	Provincial SARO Status[5]	Global G-RANK[6]	Ontario General Status	Canada General Status
Dwarf Raspberry (Catherinettes Berry)	*Rubus pubescens*	4	-4	S5	-	-	G5	Secure	Secure
Bebb's Willow	*Salix bebbiana*	4	-4	S5	-	-	G5	Secure	Secure
Hoary Willow	*Salix candida*	10	-5	S5	-	-	G5	Secure	Secure
Pussy Willow	*Salix discolor*	3	-3	S5	-	-	G5	Secure	Secure
Crack Willow	*Salix fragilis*	-	-1	SNA	-	-	GNR	Exotic	Exotic
Shining Willow	*Salix lucida*	5	-4	S5	-	-	G5	Secure	Secure
Meadow Willow	*Salix petiolaris*	3	-4	S5	-	-	G5	Secure	Secure
Balsam Willow	*Salix pyrifolia*	10	-4	S5	-	-	G5	Secure	Secure
Willow sp.	*Salix sp.*	-	-	-	-	-	-	-	-
Northern Mountain-ash	*Sorbus decora*		3	S5	-	-	G4G5	Secure	Secure
Narrow-leaved Meadow-sweet	*Spiraea alba*	3	-4	S5	-	-	G5	Secure	Secure
Late Low-bush Blueberry	*Vaccinium angustifolium*	6	3	S5	-	-	G5	Secure	Secure
Huckleberry Dwarf	*Vaccinium caespitosum*	-	-	S4?	-	-	G5	Secure	Secure
Large Cranberry	*Vaccinium macrocarpon*	10	-5	S4S5	-	-	G4	Secure	Secure
Velvetleaf Blueberry	*Vaccinium myrtilloides*	7	-2	S5	-	-	G5	Secure	Secure
Small Cranberry	*Vaccinium oxyoccos*	10	-5	S5	-	-	G5	Secure	Secure
Mountain Cranberry	*Vaccinium vitis-idaea*	-	-	S5	-	-	G5	Secure	Secure
High-bush Cranberry	*Viburnum opulus var. americanum*	5	-3	S5	-	-	G5T5	Secure	Secure
Downy Arrow-wood	*Viburnum rafinesquianum*	7	5	S5	-	-	G5	Secure	Secure
High-bush Cranberry	*Viburnum opulus var. americanum*	5	-3	S5	-	-	G5	Secure	Secure
Deciduous Trees									
Red Maple	*Acer rubrum*	4	0	S5	-	-	G5	Secure	Secure
White Birch	*Betula papyrifera*	2	2	S5	-	-	G5	Secure	Secure
Black Ash	*Fraxinus nigra*	7	-4	S5	-	-	G5	Secure	Secure
Balsam Poplar	*Populus balsamea*	4	-3	S5	-	-	G5	Secure	Secure
Large-tooth Aspen	*Populus grandifolia*	5	3	S5	-	-	G5	Secure	Secure
Trembling Aspen	*Populus tremuloides*	2	0	S5	-	-	G5	Secure	Secure
White Elm	*Ulmus americana*	3	-2	S5	-	-	G5?	Secure	Secure

Notes:

1 **Coefficient of Conservatism**: Values for range from 0 for extremely weedy species, to 10 for those species which exhibit a marked fidelity to specialized habitats. Plants found in a wide variety of plant communities, including disturbed sites, are ranked 0 to 3. Taxa that typically are associated with a specific plant community, but tolerate moderate disturbance, are assigned ranks of 4 to 6. Rankings of 7 to 8 apply to those taxa associated with a plant community in an advanced successional stage that has undergone minor disturbance. Those plants with high degrees of fidelity to a narrow range of synecological parameters are assigned a value of 9 to 10.

Table A1-A: Compiled Plant Species List

2 **Wetness Index**: The "+" sign denotes that the species generally has a greater estimated probability of occurring in uplands. The "-" sign denotes that the species generally has a lesser estimated probability of occurring in wetlands. A value of -5 is assigned to obligate wetland species and a value of 5 to obligate upland species.

[3] = Provincial S-rank (NHIC)		[4] = Federal SARA Status		[5] = Provincial SARO Status		[6] = Global G-rank (NHIC)	
S1	Critically Imperilled	NAR	Not at Risk	NAR	Not at Risk	G1	Extremely rare
S2B	Imperilled - Breeding Migrants	SC	Special Concern	SC	Special Concern	G2	Very rare
S3?	Vulnerable - Rank Uncertain	THR	Threatened	THR	Threatened	G3	Rare to Uncommon
S4	Apparently Secure	END	Endangered	END	Endangered	G4	Common
S4B	Apparently Secure Breeding Migrants					G5	Very common
S4N	Apparently Secure Non-breeding Migrants					T#	Rank applies to a subspecies or variety
S5	Secure					G?	Unranked or tentatively assigned rank
S5B	Secure Breeding Migrants					GNR	Unranked
S5N	Secure Non-breeding Migrants					GNA	Not Applicable
SNA	Status Rank Not Applicable						
DD	Data Deficient						

Table A1-B: Compiled Wildlife Species List

Common Name	Latin Name	Federal SARA[1] Status	Provincial SARO[2] Status	Provincial S-Rank[3] (NHIC)	Protective Legislation[4,5,6]
Mammals					
Beaver	*Castor canadensis*	--	--	S5	FWCA
Black Bear	*Ursus americanus*	NAR	NAR	S5	FWCA
Coyote	*Canis latrans*	--	--	S5	FWCA
Eastern Chipmunk	*Tamias striatus*	--	--	S5	FWCA
Hoary Bat	*Lasiurus cinereus*	--	--	S4	FWCA
Little Brown Myotis	*Myotis lucifugus*	--	END	S4	FWCA
Mink	*Mustela vison*	--	--	S5	FWCA
Moose	*Alces alces*	--	--	S5	FWCA
Muskrat	*Odantra zibethicus*	--	--	S5	FWCA
Northern Myotis	*Myotis septentrionalis*	--	END	S3	FWCA
Red Bat	*Lasiurus borealis*	--	--	S4	FWCA
Red Fox	*Vulpes vulpes*	--	--	S5	FWCA
Red Squirrel	*Tamiasciurus hudsonicus*	--	--	S5	FWCA
River Otter	*Lutra canadensis*	--	--	S5	FWCA
Silver-haired Bat	*Lasionycteris noctivagans*	--	--	S4	FWCA
Snowshoe Hare	*Lepus americanus*	--	--	S5	FWCA
Striped Skunk	*Mephitis mephitis*	--	--	S5	FWCA
Timber Wolf	*Canis lupus*	NAR	NAR	S4	FWCA
White-tailed Deer	*Odocoileus virginianus*	--	--	S5	FWCA
Woodchuck	*Marmota monax*	--	--	S5	--
Birds					
Alder Flycatcher	*Empidonax alnorum*	--	--	S5B	MBCA
American Bittern	*Botaurus lentiginosus*	--	--	S4B	MBCA
American Crow	*Corvus brachyrhynchos*	--	--	S5B	--
American Golden Plover	*Pluvialis dominica*	--	--	S2B, S4N	MBCA
American Goldfinch	*Carduelis tristis*	--	--	S5B	MBCA
American Kestrel	*Falco sparverius*	--	--	S5	FWCA
American Pipit	*Anthus rubescens*	--	--	S4	MBCA
American Redstart	*Setophaga ruticilla*	--	--	S5B	MBCA
American Robin	*Turdus migratorius*	--	--	S5B	MBCA
American Three-toed Woodpecker	*Picoides dorsalis*	--	--	S4	MBCA
American Tree Sparrow	*Spizella arborea*	--	--	S4B	MBCA
American White Pelican	*Pelecanus erythrorhynchos*	NAR	THR	S2B	FWCA
American Woodcock	*Scolopax minor*	--	--	S5N	MBCA
Bald Eagle	*Haliaeetus leucocephalus*	NAR	SC	S4	FWCA
Baltimore Oriole	*Icterus galbula*	--	--	S4B	MBCA
Bank Swallow	*Riparia riparia*	--	--	S4B	MBCA
Barn Swallow	*Hirundo rustica*	THR	THR	S4B	MBCA
Barred Owl	*Strix varia*	--	--	S4S5	FWCA
Bay-breasted Warbler	*Setophaga castanea*	--	--	S5B	MBCA
Belted Kingfisher	*Ceryle alcyon*	--	--	S4B	FWCA
Black-and-white Warbler	*Mniotilta varia*	--	--	S5B	MBCA
Black-backed Woodpecker	*Picoides arcticus*	--	--	S4B	MBCA
Black-billed Cuckoo	*Coccyzus erythropthalmus*	--	--	S5B	MBCA
Black-billed Magpie	*Pica pica*	--	--	S3?	MBCA
Blackburnian Warbler	*Setophaga fusca*	--	--	S5B	MBCA
Black-capped Chickadee	*Poecile atricapillus*	--	--	S5	MBCA
Black-throated Blue Warbler	*Setophaga caerulescens*	--	--	S5B	MBCA
Black-throated Green Warbler	*Setophaga virens*	--	--	S5B	MBCA
Blue Jay	*Cyanocitta cristata*	--	--	S5B	FWCA
Blue-headed Vireo	*Vireo solitarius*	--	--	S5B	MBCA
Blue-winged Teal	*Anas discors*	--	--	S4	MBCA

Table A1-B: Compiled Wildlife Species List

Common Name	Latin Name	Federal SARA[1] Status	Provincial SARO[2] Status	Provincial S-Rank[3] (NHIC)	Protective Legislation[4,5,6]
Bobolink	*Dolichonyx oryzivorus*	THR	THR	S4B	MBCA
Boreal Chickadee	*Poecile hudsonica*	--	--	S5	MBCA
Brewer's Blackbird	*Euphagus cyanocephalus*	--	--	S4B	FWCA
Broad-winged Hawk	*Buteo platypterus*	--	--	S5	FWCA
Brown Creeper	*Certhia americana*	--	--	S5B	MBCA
Brown Thrasher	*Toxostoma rufum*	--	--	S4B	MBCA
Brown-headed Cowbird	*Molothrus ater*	--	--	S4B	--
Canada Goose	*Branta canadensis*	--	--	S5B	MBCA
Canada Warbler	*Cardellina canadensis*	THR	SC	S4B	MBCA
Cape May Warbler	*Setophaga tigrina*	--	--	S5B	MBCA
Cedar Waxwing	*Bombycilla cedrorum*	--	--	S5B	MBCA
Chestnut-sided Warbler	*Setophaga pensylvanica*	--	--	S5B	MBCA
Chipping Sparrow	*Spizella passerina*	--	--	S5B	MBCA
Clay-coloured Sparrow	*Spizella pallida*	--	--	S4B	MBCA
Cliff Swallow	*Petrochelidon pyrrhonota*	--	--	S4B	MBCA
Common Goldeneye	*Bucephala clangula*	--	--	S5	MBCA
Common Grackle	*Quiscalus quiscula*	--	--	S5B	--
Common Loon	*Gavia immer*	NAR	NAR	S5B, S5N	MBCA
Common Merganser	*Mergus merganser*	--	--	S5B, S5N	MBCA
Common Nighthawk	*Chordeiles minor*	THR	SC	S4B	MBCA
Common Raven	*Corvus corax*	--	--	S5B	FWCA
Common Yellowthroat	*Geothlypis trichas*	--	--	S5B	MBCA
Connecticut Warbler	*Oporornis agilis*	--	--	S4B	MBCA
Dark-eyed Junco	*Junco hyemalis*	--	--	S5B	MBCA
Double-crested Cormorant	*Phalacrocorax auritus*	NAR	NAR	S5B	MBCA
Downy Woodpecker	*Picoides pubescens*	--	--	S5B	MBCA
Eastern Bluebird	*Sialia sialis*	NAR	NAR	S5B	MBCA
Eastern Kingbird	*Tyrannus tyrannus*	--	--	S4B	MBCA
Eastern Phoebe	*Sayornis phoebe*	--	--	S5B	MBCA
Eastern Whip-poor-will	*Antrostomus vociferous*	THR	THR	S4B	MBCA
Eastern Wood-Pewee	*Contopus virens*	--	--	S4B	MBCA
European Starling	*Sturnus vulgaris*	--	--	SNA	--
Evening Grosbeak	*Coccothraustes vespertinus*	--	--	S4B	MBCA
Forster's Tern	*Sterna forsteri*	DD	DD	S2B	MBCA
Golden-crowned Kinglet	*Regulus satrapa*	--	--	S5B	MBCA
Golden-winged Warbler	*Vermivora chrysoptera*	THR	SC	S4B	MBCA
Gray Catbird	*Dumetella carolinensis*	--	--	S4B	MBCA
Gray Jay	*Perisoreus canadensis*	--	--	S5B	FWCA
Great Blue Heron	*Ardea herodias*	--	--	S5	MBCA
Great Crested Flycatcher	*Myiarchus crinitus*	--	--	S4B	MBCA
Great Horned Owl	*Bubo virginianus*	--	--	S5	FWCA
Great Gray Owl	*Strix nebulosa*	--	--	S5	FWCA
Greater Yellowlegs	*Tringa melanoleuca*	--	--	S4B, S4N	MBCA
Green Heron	*Butorides virescens*	--	--	S4	MBCA
Green-winged Teal	*Anas crecca*	--	--	S4	MBCA
Hairy Woodpecker	*Picoides villosus*	--	--	S5B	MBCA
Hermit Thrush	*Catharus guttatus*	--	--	S5B	MBCA
Herring Gull	*Larus argentatus*	--	--	S5B, S5N	MBCA
Hooded Merganser	*Lophodytes cucullatus*	--	--	S5B, S5N	MBCA
House Sparrow	*Passer domesticus*	--	--	SNA	MBCA
House Wren	*Troglodytes aedon*	--	--	S5B	MBCA
Horned Lark	*Eremophila alpestris*	--	--	S5	MBCA
Indigo Bunting	*Passerina cyanea*	--	--	S4B	MBCA

Table A1-B: Compiled Wildlife Species List

Common Name	Latin Name	Federal SARA[1] Status	Provincial SARO[2] Status	Provincial S-Rank[3] (NHIC)	Protective Legislation[4,5,6]
Killdeer	*Charadrius vociferus*	--	--	S5B	MBCA
Lapland Longspur	*Calcarius lapponicus*	--	--	S3B	MBCA
Least Flycatcher	*Empidonax minimus*	--	--	S4B	MBCA
LeConte's Sparrow	*Ammodramus leconteii*	--	--	S4B	MBCA
Lincoln's Sparrow	*Melospiza lincolnii*	--	--	S5B	MBCA
Long-eared Owl	*Asio otus*	--	--	S4	FWCA
Magnolia Warbler	*Setophaga magnolia*	--	--	S5B	MBCA
Mallard	*Anas platyrhynchos*	--	--	S5	MBCA
Marsh Wren	*Cistothorus palustris*	--	--	S4B	MBCA
Merlin	*Falco columbarius*	NAR	NAR	S4	FWCA
Mourning Dove	*Zenaida macroura*	--	--	S5B	MBCA
Mourning Warbler	*Geothlypis philadelphia*	--	--	S4B	MBCA
Nashville Warbler	*Oreothlypis ruficapilla*	--	--	S5B	MBCA
Northern Flicker	*Colaptes auratus*	--	--	S4B	MBCA
Northern Goshawk	*Accipiter gentilis*	NAR	NAR	S4B	FWCA
Northern Harrier	*Circus cyaneus*	NAR	NAR	S4	FWCA
Northern Hawk Owl	*Surnia ulula*	NAR	NAR	S4	FWCA
Northern Parula	*Setophaga americana*	--	--	S4B	MBCA
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	--	--	S4B	MBCA
Northern Saw-whet Owl	*Aegolius acadicus*	--	--	S4	FWCA
Northern Shrike	*Lanius excubitor*	--	--	SNA	MBCA
Northern Three-toed Woodpecker	*Picoides dorsalis*	--	--	S4	MBCA
Northern Waterthrush	*Parkesia noveboracensis*	--	--	S5B	MBCA
Olive-sided Flycatcher	*Contopus cooperi*	THR	SC	S4B	MBCA
Osprey	*Pandion haliaetus*	--	--	S5B	FWCA
Ovenbird	*Seiurus aurocapilla*	--	--	S4B	MBCA
Palm Warbler	*Setophaga palmarum*	--	--	S5B	MBCA
Peregrine Falcon	*Falco peregrinus*	SC	THR	S2S3	FWCA
Philadelphia Vireo	*Vireo philadelphicus*	--	--	S5B	MBCA
Pied-billed Grebe	*Podilymbus podiceps*	--	--	S4B, S4N	MBCA
Pileated Woodpecker	*Dryocopus pileatus*	--	--	S5	MBCA
Pine Siskin	*Spinus pinus*	--	--	S5B	MBCA
Pine Warbler	*Setophaga pinus*	--	--	S5B	MBCA
Purple Finch	*Haemorhous purpureus*	--	--	S5B	MBCA
Red-breasted Nuthatch	*Sitta canadensis*	--	--	S5	MBCA
Red Crossbill	*Loxia curvirostra*	--	--	S4B	MBCA
Red-eyed Vireo	*Vireo olivaceus*	--	--	S5B	MBCA
Redhead	*Aythya americana*	--	--	S2B, S4N	MBCA
Red-headed Woodpecker	*Melanerpes erythrocephalus*	THR	SC	S4B	MBCA
Red-shouldered Hawk	*Buteo lineatus*	SC	NAR	S4B	FWCA
Red-tailed Hawk	*Buteo jamaicensis*	NAR	NAR	S5	FWCA
Red-winged Blackbird	*Agelaius phoeniceus*	--	--	S4	--
Ring-billed Gull	*Larus delawarensis*	--	--	S5B	MBCA
Ring-necked Duck	*Aythya collaris*	--	--	S5	MBCA
Rock Pigeon	*Columba livia*	--	--	SNA	MBCA
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	--	--	S4B	MBCA
Ruby-crowned Kinglet	*Regulus calendula*	--	--	S4B	MBCA
Ruby-throated Hummingbird	*Archilochus colubris*	--	--	S5B	MBCA
Ruffed Grouse	*Bonasa umbellus*	--	--	S5B	FWCA
Rusty Blackbird	*Euphagus carolinus*	SC	--	S4B	FWCA
Sandhill Crane	*Grus canadensis*	NAR	NAR	S5B	MBCA
Savannah Sparrow	*Passerculus sandwichensis*	--	--	S4B	MBCA
Scarlet Tanager	*Piranga olivacea*	--	--	S4B	MBCA

Table A1-B: Compiled Wildlife Species List

Common Name	Latin Name	Federal SARA[1] Status	Provincial SARO[2] Status	Provincial S-Rank[3] (NHIC)	Protective Legislation[4,5,6]
Sedge Wren	*Cistothorus platensis*	NAR	NAR	S4B	MBCA
Sharp-shinned Hawk	*Accipiter striatus*	NAR	NAR	S5	FWCA
Sharp-tailed Grouse	*Tympanuchus phasianellus*	--	--	S4	FWCA
Short-eared Owl	*Asio flammeus*	SC	SC	S2N, S4B	FWCA
Snow Bunting	*Plectrophenax nivalis*	--	--	SNA	MBCA
Song Sparrow	*Melospiza melodia*	--	--	S5B	MBCA
Sora	*Porzana carolina*	--	--	S4B	MBCA
Spotted Sandpiper	*Actitis macularia*	--	--	S5	MBCA
Swainson's Thrush	*Catharus ustulatus*	--	--	S4B	MBCA
Spruce Grouse	*Falcipennis canadensis*	--	--	S5	FWCA
Swamp Sparrow	*Melospiza georgiana*	--	--	S5B	MBCA
Tennessee Warbler	*Oreothlypis peregrina*	--	--	S5B	MBCA
Tree Swallow	*Tachycineta bicolor*	--	--	S4B	MBCA
Trumpeter Swan	*Cygnus buccinator*	NAR	NAR	S4	MBCA
Turkey Vulture	*Cathartes aura*	--	--	S5B	FWCA
Veery	*Catharus fuscescens*	--	--	S4B	MBCA
Virginia Rail	*Rallus limicola*	--	--	S5B	MBCA
Warbling Vireo	*Vireo gilvus*	--	--	S5B	MBCA
Whimbrel	*Numenius phaeopus*	--	--	S3B, S4N	MBCA
White-throated Sparrow	*Zonotrichia albicollis*	--	--	S5B	MBCA
White-winged Crossbill	*Loxia leucoptera*	--	--	S5B	MBCA
Wilson’s Snipe	*Gallinago delicata*	--	--	S5B	MBCA
Wilson's Warbler	*Cardellina pusilla*	--	--	S4B	MBCA
Winter Wren	*Troglodytes troglodytes*	--	--	S5B	MBCA
Wood Duck	*Aix sponsa*	--	--	S5B	MBCA
Wood Thrush	*Hylocichla mustelina*	--	--	S4B	MBCA
Yellow Warbler	*Setophaga petechia*	--	--	S5B	MBCA
Yellow-bellied Flycatcher	*Empidonax flaviventris*	--	--	S5B	MBCA
Yellow-bellied Sapsucker	*Sphyrapicus varius*	--	--	S5B	MBCA
Yellow-rumped Warbler	*Setophaga coronata*	--	--	S5B	MBCA
Yellow-throated Vireo	*Vireo flavifrons*	--	--	S4B	MBCA
Reptiles					
Eastern Gartersnake	*Thamnophis sirtalis sirtalis*	--	--	S5	--
Snapping Turtle	*Chelydra serpentina*	SC	SC	S5	FWCA
Western Painted Turtle	*Chrysemys picta bellii*	--	--	S5	--
Amphibians					
American Toad	*Bufo americanus*	--	--	S5	--
Boreal Chorus Frog	*Pseudacris maculata*	--	--	S5	--
Mink Frog	*Rana septentrionalis*	--	--	S5	--
Northern Green Fro	*Rana clamitans*	--	--	S5	--
Northern Leopard Frog	*Rana pipiens*	NAR	NAR	S5	--
Spring Peeper	*Pseudacris crucifer*	--	--	S5	--
Tetraploid Gray Treefrog	*Hyla versicolor*	--	--	S5	FWCA
Wood Frog	*Rana sylvatica*	--	--	S5	--
Butterflies					
American Painted Lady	*Vanessa virginiensis*	--	--	S5	--
Atlantis Fritillary	*Speyeria atlantis*	--	--	S5	--
Canadian Tiger Swallowtail	*Papilio canadensis*	--	--	S5	FWCA
Clouded Sulphur	*Colias philodice*	--	--	S5	--
Common Wood-Nymph	*Cercyonis pegala*	--	--	S5	--
European Skipper	*Thymelicus lineola*	--	--	SE	--
Great Spangled Fritillary	*Speyeria cybele*	--	--	S5	--
Grey Comma	*Polygonia progne*	--	--	S5	--

Table A1-B: Compiled Wildlife Species List

Common Name	Latin Name	Federal SARA[1] Status	Provincial SARO[2] Status	Provincial S-Rank[3] (NHIC)	Protective Legislation[4,5,6]
Harris' Checkerspot	*Chlosyne harrisii*	--	--	S4	--
Harvester	*Feniseca tarquinius*	--	--	S4	--
Hoary Comma	*Polygonia gracilis*	--	--	S4	--
Little Wood-Satyr	*Megisto cymela*	--	--	S5	--
Meadow Fritillary	*Boloria bellona*	--	--	S5	--
Milbert's Tortoiseshell	*Nymphalis milberti*	--	--	S5	--
Monarch	*Danaus plexippus*	SC	--	S2N, S4B	FWCA
Mourning Cloak	*Nymphalis antiopa*	--	--	S5	--
Mustard White	*Pieris oleracea*	--	--	S4	--
Northern Cloudy Wing	*Thorybes pylades*	--	--	S5	--
Northern Crescent	*Phycoides pascoensis*	--	--	S5	--
Northern Pearly Eye	*Enodia anthedon*	--	--	S4	--
Orange Sulphur	*Colias eurytheme*	--	--	S5	--
Painted Lady	*Vanessa cardui*	--	--	S5	--
Red Admiral	*Vanessa atalanta*	--	--	S5	--
Silver-bordered Fritillary	*Boloria selene*	--	--	S5	--
Tawny Crescent	*Phyciodes batesii*	--	--	S4	--
Variegated Fritillary	*Euptoieta claudia*	--	--	SNA	--
White Admiral	*Limenitis arthemis*	--	--	S5	--
Odonata					
American Emerald	*Cordulia shurtleffi*	--	--	S5	--
Arrowhead Spiketail	*Cordulegaster obliqua*	--	--	S1	--
Aurora Damsel	*Chromagrion conditum*	--	--	S5	--
Baskettail Sp.	*Epitheca sp.*	--	--	S5	--
Belted Whiteface	*Leucorrhinia proxima*	--	--	S5	--
Canada Darner	*Aeshna canadensis*	--	--	S5	--
Chalk-fronted Corporal	*Ladona julia*	--	--	S5	--
Common Whitetail	*Plathemis lydia*	--	--	S5	--
Dot-tailed Whiteface	*Leucorrhinia intacta*	--	--	S5	--
Duskywing Sp.	*Erynnis sp.*	--	--	S5	--
Four-spotted Skimmer	*Libellula quadrimaculata*	--	--	S5	--
Frosted Whiteface	*Leucorrhinia frigida*	--	--	S5	--
Horned Clubtail	*Arigomphus cornutus*	--	--	S3	--
Hudsonian Whiteface	*Leucorrhinia hudsonica*	--	--	S5	--
Kennedy's Emerald	*Somatochlora kennedyii*	--	--	S4	--
Lilypad Clubtail	*Arigomphus furcifer*	--	--	S3	--
Racket-tailed Emerald	*Dorocordulia libera*	--	--	S5	--
River Jewelwing	*Calopteryx aequabilis*	--	--	S5	--
Saffron-bordered Meadowhawk	*Sympetrum costiferum*	--	--	S4	--
Twelve-spotted Skimmer	*Libellula pulchella*	--	--	S5	--
Twin-spotted Spiketail	*Cordulegaster maculate*	--	--	S4	--
Fish					
Black Crappie	*Pomoxis nigromaculatus*	--	--	S4	--
Blackchin Shiner	*Notropis heterodon*	NAR	--	S4	--
Blacknose Dace	*Rhinichthys atratulus*	--	--	S5	--
Blackside Darter	*Percina maculata*	--	--	S4	--
Brassy Minnow	*Hybognathus hankinsoni*	--	--	S5	--
Brook Stickleback	*Culaea inconstans*	--	--	S5	--
Brown Bullhead	*Ameiurus nebulosus*	--	--	S5	--
Central Mudminnow	*Umbra limi*	--	--	S5	--
Common Shiner	*Luxilus cornutus*	--	--	S5	--
Creek Chub	*Semotilus atromaculatus*	--	--	S5	--
Emerald Shiner	*Notropis atherinoides*	--	--	S5	--

Table A1-B: Compiled Wildlife Species List

Common Name	Latin Name	Federal SARA[1] Status	Provincial SARO[2] Status	Provincial S-Rank[3] (NHIC)	Protective Legislation[4,5,6]
Fathead Minnow	*Pimephales promelas*	--	--	S5	--
Finescale Dace	*Phoxinus neogaeus*	--	--	S5	--
Golden Shiner	*Notemigonus crysoleucas*	--	--	S5	--
Iowa Darter	*Etheostoma exile*	--	--	S5	--
Johnny Darter	*Etheostoma nigrum*	--	--	S5	--
Lake Chub	*Couesius plumbeus*	--	--	S5	--
Mimic Shiner	*Notropis volucellus*	--	--	S5	--
Northern Pearl Dace	*Margariscus margarita*	--	--	S5	--
Northern Pike	*Esox lucius*	--	--	S5	--
Northern Redbelly Dace	*Phoxinus eos*	--	--	S5	--
Pumpkinseed	*Lepomis gibbosus*	--	--	S5	--
Rock Bass	*Ambloplites rupestris*	--	--	S5	--
Sauger	*Sander canadensis*	--	--	S4	--
Shorthead Redhorse	*Moxostoma macrolepidotum*	--	--	S5	--
Smallmouth Bass	*Micropterus dolomieu*	--	--	S5	--
Spottail Shiner	*Notropis hudsonius*	--	--	S5	--
Trout-perch	*Percopsis omiscomaycus*	--	--	S5	--
Walleye	*Sander vitreus*	--	--	S5	--
White Sucker	*Catostomus commersonii*	--	--	S5	--
Yellow Perch	*Perca flavescens*	--	--	S5	--

Notes:
1. SARA = *Species at Risk Act*
2. SARO = Species at Risk in Ontario
3. S-Rank = Provincial rankings as determined by the MNRF (see table below for codes)
4. FWCA = *Fish and Wildlife Conservation Act, 17*
5. MBCA = *Migratory Bird Convention Act, 14*
6. ESA = Ontario's *Endangered Species Act, 2007*

Federal SARA Status		Provincial SARO Status		Provincial S-Rank (NHIC)	
NAR	Not at Risk	NAR	Not at Risk	S1	Critically Imperilled
SC	Special Concern	SC	Special Concern	S2B	Imperilled - Breeding Migrants
THR	Threatened	THR	Threatened	S3?	Vulnerable - Rank Uncertain
END	Endangered	END	Endangered	S4	Apparently Secure
				S4B	Apparently Secure Breeding Migrants
				S4N	Apparently Secure Non-breeding Migrants
				S5	Secure
				S5B	Secure Breeding Migrants
				S5N	Secure Non-breeding Migrants
				SNA	Status Rank Not Applicable
				DD	Data Deficient