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AECOM

Labrador Iron Mines

2009 Breeding Bird Monitoring Report – James, Redmond, Silver Yards, Knob Lake, Houston, Howse, and Proposed Road Crossing Areas

draft for discussion • privileged and confidential • prepared at the request of counsel

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Executive Summary

Labrador Iron Mines (LIM) has acquired control of most of the approximately 100 million tones of defined reserves and resources formerly held by the Iron Ore Company of Canada (IOC) in western Labrador. This part of Labrador contains one of the largest iron-ore resources in the world, and mining began in the area in the early 1950's. LIM plans to reactivate the development and mining of iron ore deposits in an area centered by Schefferville, Quebec that had been mined by IOC up until the mid-1980s. Specifically, LIM intends to reactivate the development of the Houston, Howse, James, Silver Yards and Redmond pits, as well as initiating development of the Knob Lake deposit. In addition, LIM intends to construct a road between the Redmond and Houston pits in order to make travel more efficient between the two locations.

In 2009, AECOM was retained to conduct annual breeding bird monitoring surveys in the six pit areas, in follow-up to the 2008 baseline studies, as well as to conduct baseline surveys along the corridor for the proposed road crossing between the Redmond and Houston pits. The methodology employed during the 2009 breeding bird surveys replicated that employed during the 2008 baseline surveys, and utilized the same point count stations and survey methods. In addition, 11 new point count stations were created in the new Proposed Road Crossing study area.

A total of 38 bird species was observed during point counts. This number increased to 46 when species observed outside of the point counts were included. The numbers of species and birds observed were lower than those observed during the 2008 survey, likely due to a later onset of spring weather conditions in 2009. Six of the species recorded in 2009 are considered as extra-limital as they were observed beyond their known breeding range.

The Gray-cheeked Thrush and the Rusty Blackbird are provincially-listed as Vulnerable on Schedule C in the Newfoundland and Labrador Endangered Species Act. Rusty Blackbird is also federally-listed as Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

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1. Introduction

Labrador Iron Mines (LIM) has acquired control of most of the approximately 100 million tones of defined reserves and resources formerly held by the Iron Ore Company of Canada (IOC) in western Labrador. This part of Labrador contains one of the largest iron-ore resources in the world, and mining began in the area in the early 1950's. LIM plans to reactivate the development and mining of iron ore deposits in an area centered by Schefferville, Quebec that had been mined by IOC up until the mid-1980s. Specifically, LIM intends to reactivate the development of the Houston, Howse, James, Silver Yards and Redmond pits, as well as initiating development of the Knob Lake deposit. In addition, LIM intends to construct a road between the Redmond and Houston pits in order to make travel more efficient between the two locations.

In 2008, AECOM was retained by LIM to complete an Avifauna Baseline Monitoring Report for the existing and proposed pit areas, which was documented in two reports, entitled *"Labrador Iron Mines Baseline Avifauna Report – James, Redmond & Silver Yards"* (November 2008) and (Draft – October 2008).

In 2009, AECOM was retained to conduct annual breeding bird monitoring surveys in the six pit areas, in follow-up to the 2008 baseline studies, as well as to conduct baseline surveys along the corridor for the proposed road crossing between the Redmond and Houston pits. This report describes the field sampling techniques employed during the 2009 field season, summarizes the findings of the surveys, provides a discussion of the ecological significance of the species encountered and recommends actions for conserving these species during mine development.

2. Description of the Study Team

The 2009 breeding bird monitoring surveys were conducted by AECOM ecologists Sarah Richer and Vince Deschamps.

Ms. Sarah Richer is an Ecologist/Ornithologist at AECOM with over six years experience in conducting Species at Risk population and habitat surveys, environmental stewardship, and natural heritage interpretation. She obtained her BA (Hons) in Geography and B.Sc. minor in GIS and Environmental Analysis from the University of Guelph, and completed a Post-Graduate Certificate in Ecosystem Restoration at Niagara College. Sarah has applied her birding skills with various organizations in both the government and not-for-profit sector, including the Ontario Ministry of Natural Resources, Ducks Unlimited Canada, The Friends of Wye Marsh, and the Canadian Wildlife Service, in southern and central Ontario forests and marshes as well as Alberta prairies. She has a broad understanding of the vegetation communities of both forested and freshwater wetland ecosystems. She is also trained and experienced with the application of the Ecological Land Classification (ELC) System for Southern Ontario, is adept at conducting avifauna, herpefauna, and wetland floral inventories, assisting with fish and aquatic invertebrate sampling, monitoring vegetation communities, and evaluating natural heritage features and functions in both the Carolinian Zone and central Ontario.

Mr. Vince Deschamps is a Senior Environmental Planner based in AECOM's Guelph office. He has a broad range of experience in Canada and internationally, with over nineteen years of professional experience in environmental assessments, resource economics, conservation planning and biological inventories. Vince specializes in the impacts of mining on biodiversity, and has experience with large-scale gold and iron ore mine projects in Southeast Asia, Eastern Europe and Canada. Specific undertakings have included reviewing ecological baseline studies, developing and coordinating extensive ecological field investigations, managing expert staff and sub-consultants, analyzing data, developing management options and preparing technical reports and planning documents. In 2007/2008, Vince assisted the Iron Ore Company of Canada to assess the potential impacts of proposed community facilities in Labrador City on their long-term mine plan. Vince has conducted numerous breeding and migratory bird investigations in support of Environmental Impact Studies and monitoring requirements for mines, quarries, wind farms and residential land development. Vince has also managed bird conservation projects and initiatives as an employee for Bird Studies Canada, Parks Canada and the Wye Marsh Wildlife Centre.

3. Study Objectives

Breeding bird surveys were undertaken in 2009 as part of LIM's annual monitoring program, and to build upon the findings of the 2008 baseline surveys conducted by AECOM in the six pit areas (i.e., the Houston, Howse, James, Silver Yards and Redmond pits, and the Knob Lake deposit). In addition, baseline breeding bird surveys were conducted along the corridor for the proposed road between the Redmond and Houston sites.

The primary objective of the 2009 surveys was to characterize the populations of birds (in terms of species numbers and diversity) breeding on, and immediately adjacent to, the pits and proposed road corridor in order to fulfill LIM's Environmental Assessment requirements. As a secondary objective, the surveys intended to assist LIM in developing appropriate management strategies through the identification of federally- or provincially-listed Species at Risk (SAR) and/or unique species in the study area.

4. Description of the Study Area

The study area is comprised of the six pit areas (i.e., Houston, Howse, James, Silver Yards and Redmond pits, and the Knob Lake deposit) and the area that contains the corridor for the proposed road crossing between the Redmond and Houston sites. The pit areas were previously described in the respective Baseline Avifauna Reports prepared by AECOM in October and November 2008. All of these pits are located in the general vicinity of Schefferville, in the province of Quebec, although most of the pits and the road crossing corridor are located in Labrador. **Map 1** illustrates the study sites for the 2009 breeding bird surveys. Maps 2-8 illustrate the sampling locations for each of the study sites. A general description of the study area is as follows:

4.1 James Property

The James site **(Map 2)** was approximately 50% disturbed from past mining activities. The site was surveyed primarily from the edge of the service road, and was uniform in habitat composition. The site consisted of black spruce, lichen woodland, and alder thickets along the recently cleared roadsides and powerline right-of-ways. The site also contained several areas of wetland and bog near the road edges. The western part of this site had steep slopes, with the forest thinning towards the summit. Two pits are planned for the area, the James North and James South pits. They will be established on either side of a buffer which will be created around an upwelling that divides the two pits.

4.2 Redmond Property

The Redmond site **(Map 3)** had a wide range of habitat types, largely due to the presence of a former mine and pit operation. The habitats ranged from completely bare ore piles and service roads, to heavily blanketed areas with alder and willow thickets. This area also had a large, flooded pit in the southwest corner of the site. The undisturbed areas of the site contained mature black spruce at lower elevations, with stunted spruce-lichen along the ridge summits. This site also contained several wetland areas, most notably a large sedge fen enclosed by the former railway turning circle, as well as a lake/fen complex located where the main service road enters the Redmond site.

4.3 Silver Yards Property

The Silver Yards **(Map 4)** were similar in nature to the Redmond site, with numerous service roads encircling the flooded pits of the James sites. Although the former rail spur lines have been removed, linear infrastructure (roads and the spur rail bed) were still present and in good condition. In general, the Silver Yards site was a large valley bordered on the east by a talus slope forested at the base, and to the west by another slope heavily covered with spruce at the base thinning to almost bare near the summit. The service roads, along the north and south orientation, were extensively bordered with alder and willow regeneration. The pit edges had minimal to no vegetation cover, and while the open water component of the pits provided loafing areas for herring gulls, no viable waterbird nesting habitat was present. The south end of this site had more extensive vegetation cover, with some areas consisting of dense spruce, and extensive thicket habitat along the roadsides.

Map 1: 2009 Breeding Bird Survey Study Site Locations

Map 2: James Property

Map 3: Redmond Property

Map 4: Silver Yards Property

4.4 Knob Lake Property

The Knob Lake site **(Map 5)** consisted of small black spruce of varying densities, depending on elevation. Lower lying areas were composed of larger trees with the slopes and summits consisting of some dwarf spruce, lichen and heath, however they were largely bare. The roadside edges consisted of shrubby alder regeneration, and the areas adjacent to the north shore of Le Jeune Lake were densely wooded with alder, spruce and lichen.

4.5 Houston Property

The Houston site **(Map 6)** was accessed by a central service road that ran the length of the site, following the elevation changes and habitat characteristics of the area. Houston was dominated by spruce-lichen forest, of varying age and density. The lower moist areas had some patches of mature spruce as well as willow and alder thickets, mostly along roadsides and disturbed sites. Tamarack were scattered throughout. Higher elevations and ridge tops were sparsely vegetated with dwarf spruce and heath, and had some areas becoming nearly bare resembling an alpine desert condition. The area also contained scattered lakes and several fen-like wetlands along the eastern edge of this area, and the south west corner of the site, adjacent to Astray Lake, was a regenerating burn.

4.6 Howse Property

Howse **(Map 7)** presented a unique site within the study area, consisting of vast open spaces and sparse tree cover throughout the southern two-thirds of the site. These open areas consisted of scattered small spruce, heath and lichen with some patches of shrubby ground cover, while some areas of the site could be considered sub-arctic tundra. The western edge of the site included Irony Mountain, which had slopes and summit that were alpine tundra in character, with an accompanying suite of breeding bird species more typical of these habitats. The northern edge of the site sloped towards a drainage feature and was wetter and had a denser tree cover than the rest of the site, consisting of some mature spruce and tamarack.

4.7 Road Crossing Corridor

The area surveyed for the proposed Road Crossing corridor **(Map 8)** extended from the railway line to the immediate west of the mouth of the Gilling's River (i.e., the Redmond, or "west side" of the Road Crossing), eastward to the Houston central service road just north of Astray Lake (i.e., the Houston, or "east side" of the Road Crossing). As the exact location for the Road Crossing had yet to be determined at the time of the survey, a broad east-west "corridor" between the two terminuses was delineated, and a number of representative habitats were selected for baseline surveys. These habitats included alder-willow thickets, spruce forests, open rock, open vegetation (i.e., lichen-dominated), fens, lacustrine and riverine/riparian.

Map 5: Knob Lake Property

Map 6: Houston Property

Map 7: Howse Property

Map 8: Road Crossing Corridor

5. Methodology

The methodology employed during the 2009 breeding bird surveys was consistent with that employed during the 2008 baseline surveys, and consisted of background literature review and field sampling.

5.1 Background Literature Review

To aid in the field investigations the following reports and websites were reviewed as part of the 2008 baseline surveys to gain a better understanding of the study area:

- New Millennium Capital Group, Paul F. Wilkinson and Associates Inc. – Project Registration, Direct Shipping Ore Project. 2008.
- Ministry of Natural Resources, 2000. Significant Wildlife Habitat: Technical Guide.
- Natural Heritage Information Centre (NHIC) Global Status Ranks – webpage

In addition, the following were reviewed as part of the 2009 breeding bird surveys:

- Labrador Iron Mines Baseline Avifauna Report – James, Redmond & Silver Yards (AECOM, November 2008)
- Labrador Iron Mines Baseline Avifauna Report – Knob Lake, Houston & Howse (AECOM, Draft – October 2008)
- Government of Canada Species at Risk (SAR) Public Registry, available at: http://www.sararegistry.gc.ca/sar/index/map_e.cfm

5.2 Field Sampling

Field surveys were conducted from July 15 to 22, 2009 and replicated the approach employed in the 2008 baseline surveys. This involved using the point-count method consistent with methods used by the Canadian Wildlife Service (CWS). Point-count stations established during the 2008 baseline surveys were located in the field (using GPS coordinates provided in the baseline reports) and flagged in order to make them easier to find in the future. For the Road Crossing corridor, which had not been surveyed as part of the 2008 baseline survey, new point-counts were established in representative habitats as described in Section 4.7, flagged in the field and their locations recorded with a hand-held GPS unit in NAD 83. Maps 2 to 8 illustrate the sampling locations for each of the study sites. GPS coordinates for the point-count stations are provided in Appendix A of this report. Appendix B provides representative photographs of each of the point-count stations.

Point-counts were 5 minutes in duration and consisted of an unlimited radius, except where adjacent count circles overlapped. All birds heard or seen during the five-minute “count” were recorded. The highest level of breeding, as defined in the Ontario Breeding Bird Atlas, was recorded at each point-count station for each species encountered. The total number of individuals of each species was recorded, in order to develop an understanding of population dynamics at each site. Efforts were made to ensure that point-counts were conducted in conditions considered acceptable for proper data gathering (i.e., no rain, light winds, and good visibility) although weather conditions were not always optimal.

6. Results

A total of 38 bird species was observed during point counts. This number increased to 46 when species observed outside of the point counts were included. The following section summarizes the findings from the 2009 breeding bird surveys. Species observed as possible, probable, or confirmed breeders are listed for each site along with their global ranks. A comprehensive species list for the study area and each property is provided in Appendix C. Global ranks (G Ranks) are also included; these are assigned by a consensus of the network of Conservation Data Centres, scientific experts, and the Nature Conservancy to designate a rarity rank based on the range-wide status of a species, subspecies, or variety.

G1 Extremely Rare - usually 5 or fewer occurrences in the overall range or very few remaining individuals; or because of some factor(s) making it especially vulnerable to extinction.

G2 Very Rare - usually between 5 and 20 occurrences in the overall range or with many individuals in fewer occurrences; or because of some factor(s) making it vulnerable to extinction.

G3 Rare to Uncommon - usually between 20 and 100 occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.

G4 Common - usually more than 100 occurrences; usually not susceptible to immediate threats.

G5 Very Common - demonstrably secure under present conditions.

Table 1 lists all the species recorded from the study area and their preferred habitat.

Table 1: Observed Bird Species and Preferred Habitat

Common Merganser (*Mergus merganser*) – G5 **Preferred Habitat: Deep, clear lakes and rivers; nests in tree cavities or on ground near ponds and rivers.**
Lesser Scaup (*Aythya affinis*) – G5 **Preferred Habitat:** Nests in marshy vegetation in or near lakes and ponds.
Common Goldeneye (*Bucephala clangula*) – G5 **Preferred Habitat:** Wetlands, rivers or lakes with deep (~2 m) water; open lakes with nearby woodlands and marshy edges. May also be found in bulrushes in water 1 m deep. Species breeding distribution depends on availability of trees >30 cm diameter at breast height (dbh).
Bufflehead (*Bucephala albeola*) – G5 **Preferred Habitat**: Lakes, harbours, and bays; nests in tree cavities near ponds and rivers.
Surf Scoter *(Melanitta perspicillata*) – G5 **Preferred Habitat**: Uncommon to rare inland, more common on open salt water. Nests on the ground near ponds, often under low branches of spruce trees.
Spruce Grouse (*Falcipennis canadensis)* – G5 **Preferred Habitat:** Uncommon in dense spruce forests with mossy ground; nests on ground, often sits quietly in spruce trees, unwary and usually solitary.
Willow Ptarmigan (*Lagopus lagopus)* – G5 **Preferred Habitat:** Tundra; nests on a raised hummock or ridge on the ground.
Common Loon (*Gavia immer)* – G5 **Preferred Habitat:** nests on ground, usually on islands with undisturbed shorelines on large rivers or lakes; always very near water.

Osprey (*Pandion haliaetus*) – G5 **Preferred Habitat:** Lakes, rivers. Species nests in trees near water's edge or over water. Species will use artificial structures as well as nest in small, loose colonies.
Semipalmated Plover (*Charadrius semipalmatus)* – G5 **Preferred Habitat:** Nests on tundra, sand and gravel bars along rivers and lake shorelines, usually near water; feeds on shorelines.
Wilson's Snipe *(Gallinago gallinago*) – G5 **Preferred Habitat**: Freshwater marshes and swamps. Species often frequents open landscapes.
Spotted Sandpiper (*Actitis macularia*) – G5 **Preferred Habitat:** A variety of habitat types near water. Species often forages on floating logs.
Solitary Sandpiper (*Tringa solitaria)* – G5 **Preferred Habitat:** Nests in a spruce tree in a bog, heavily forested wetland, stream, or fen; will reuse other songbird nests. Feeds on aquatic invertebrates by stalking shorelines.
Herring Gull (*Larus argentatus*) – G5 **Preferred Habitat:** Nests singly or colonially on undisturbed islands, peninsulas, cliffs, or open beaches, usually with other gulls.
Three-toed Woodpecker *(Picoides tridactylus*) – G5 **Preferred Habitat:** Moist, mature or old growth coniferous woodlands of cedar-balsam fir. Species may be found near burns with stands of dead timber, as well as riparian areas, bogs. Species is loosely colonial where nesting habitat is particularly suitable and food supply abundant, furthermore uses dead trees > 30 cm dbh and needs extensive (>40 ha) of forest.
Northern Flicker (*Colaptes auratus*) – G5 **Preferred Habitat:** Open deciduous, coniferous or mixed woodlands; forest edges; suburbs, farm woodlots and wetlands. May also use dead or dying trees with a dbh >30 cm. Very adaptable, not dependent on forest size.
Yellow-bellied Flycatcher (*Empidonax flaviventris*) – G5 **Preferred Habitat:** Coniferous forest of pine and spruce with dense shrubs. Species can also be found in shrubby spruce/alder swamps, and wet thickets bordering ponds, streams, bogs, and talus slopes.
Alder Flycatcher (*Empidonax alnorum*) – G5 **Preferred Habitat:** Open areas with thickets bordering lakes or streams; low damp thickets in or near bogs, and swamps or marshes. Species prefers alders, willows, alders or sumacs.
Northern Shrike (*Lanius excubitor)* – G5 **Preferred Habitat:** Uncommon to rare, nests in open spruce woods. Perches on high exposed branch or wire when foraging.
Gray Jay (*Perisoreus canadensis*) – G5 **Preferred Habitat:** Coniferous, mixed wood forests; forest openings, and bogs. Requires varied forest structure for food storage. Species is highly territorial.
Common Raven (*Corvus corax*) – G5 **Preferred Habitat:** Relatively undisturbed habitat of boreal or mixed forest. May nest on steep cliffs or in tall trees, uses and builds onto same nest in consecutive years.
Tree Swallow (*Tachycineta bicolor*) – G5 **Preferred Habitat:** Nests singly in bird houses or tree cavities in open fields or over water; often in large flocks, forages over fields or water for berries and insects.
Boreal Chickadee (*Poecile hudsonicus*) – G5 **Preferred Habitat:** Conifers (spruce), wooded swamps, bogs, and thickets. Species nests in natural cavities, woodpecker holes, or their own excavation in decaying wood. Species territory is about 1-2 ha of woodland.
Ruby-crowned Kinglet (*Regulus calendula*) – G5 **Preferred Habitat:** Coniferous or mixed woodlands with stands of fir, spruce, tamarack or pine, evergreen in a variety of habitats. Also coniferous open/edge areas with thickets of brush and bogs.
Gray-cheeked Thrush (*Catharus minimus*) – G5 **Preferred Habitat:** Moist northern woodlands and riparian areas up to Arctic tundra.
Swainson's Thrush (*Catharus ustulatus*) – G5 **Preferred Habitat:** Coniferous forest interiors (spruce, fir), with deciduous shrubs. May also be found in low, damp woods near water and riverbanks. The species may also be observed in young or mature stands and will also use mixed woods.

Hermit Thrush (*Catharus guttatus*) – G5 **Preferred Habitat**: Boreal forest or Great Lakes-St. Lawrence forest zones. Consisting of rocky, dry, jack pine forests, as well as dry sandy coniferous or deciduous woods with dense young undergrowth. Species may also be found in spruce bogs, borders of wooded swamps and damp forest, and brushy pasture. Species appears to need at least 100 ha of forest in south.
American Robin (*Turdus migratorius*) – G5 **Preferred Habitat:** Residential areas, gardens, ornamental trees, shrubberies. May also be found in forest edges and openings, burns, cut-over areas, as well as fens, bogs; lake or river shores.
Nashville Warbler (*Vermivora ruficapilla*) – G5 **Preferred Habitat:** Wet, open coniferous/deciduous/mixed woods of young secondary growth. Also cedar, spruce swamps; dry or moist overgrown pastures/old field with scattered trees and shrubs. Species nests in depressions in ground under dead, dry ferns.
Tennessee Warbler (*Vermivora peregrine*) – G5 **Preferred Habitat:** Brushy, semi-open land including grassy openings in coniferous/deciduous/mixed woods with dense shrubs and scattered clumps of young trees. Species can also be found in treed fens or boggy areas, dry pine plantations and beach ridges.
Yellow Warbler (*Dendroica petechia*) – G5 **Preferred Habitat: Habitat:** Open areas with dense scrub, shrubby wetland areas; stream and river banks or lakeshores with scattered small trees or dense shrubbery. May also be found in farmlands, orchards or suburban yards.
Yellow-rumped Warbler (*Dendroica coronata*) – G5 **Preferred Habitat:** Dry coniferous or mixed forests dominated by fir, spruce, pine, hemlock or cedar with scattered openings from logging, fire or abandoned fields. May also be found in evergreen plantations; young coniferous growth at woodland edges as well as wetter habitat of black spruce or tamarack. Species is adaptable and opportunistic.
Blackpoll Warbler (*Dendroica striata*) – G5 **Preferred Habitat:** Coniferous forests during breeding season; during migration found chiefly in tall deciduous/coniferous trees.
Yellow Palm Warbler (*Dendroica palmarum*) – G5 **Preferred Habitat:** Open bogs with a border of spruce or other trees, will also use edge or open habitats like weedy fields, dunes.
Northern Waterthrush (*Seiurus noveboracensis*) – G5 **Preferred Habitat:** Cool, shady wet ground with open shallow pools; shrubby tangles and fallen logs. May be found in wooded swamps, bogs, creeks, stream banks or lakeshores. Species nests in banks, upturned tree roots, under mossy logs or stumps.
Wilson's Warbler (*Wilsonia pusilla*) – G5 **Preferred Habitat:** Boggy areas with cedar, tamarack or spruce. As well as swampy, brushy lands, streamside thickets and tangles. Species may also be found in wet, wooded high shrubs or low deciduous trees.
White-crowned Sparrow (*Zonotrichia leucophrys*) – G5 **Preferred Habitat:** Nests on ground in open area/shrub growth; woodland or stream edge, forest burns, willow clumps on tundra.
White-throated Sparrow (*Zonotrichia albicollis*) – G5 **Preferred Habitat:** Coniferous or mixed, semi-open forests with jack pine or spruce, balsam fir, aspen, and white birch. May also be found in old cut-overs or burns with forest regeneration and slash piles, brushy clearings, and borders of bogs. Nests on ground in brush piles or under logs.
American Tree Sparrow (*Spizella arborea*) – G5 **Preferred Habitat:** Open areas with scattered trees, brush; low-lying tundra with stands of shrubs, stunted willow, birch, alder. During winter, species may be found in weedy, brushy fields, open country with groves of small trees, hedgerows, and marshes
Dark-eyed Junco (*Junco hyemalis*) – G5 **Preferred Habitat:** Coniferous woodlands with aspen, birch and clearings; young jack pine stands; burned areas, and forest edges. Species may also be found in borders of streams or clearings. Nests in depression on ground, under cover (e.g., logs, roots, etc.).
Lincoln's Sparrow (*Melospiza lincolnii)* – G5 **Preferred Habitat:** Nests in dense brushy areas near water, usually solitary.
Fox Sparrow (*Passerella iliaca*) – G5 **Preferred Habitat:** Thickets and edges of coniferous, mixed, or second-growth forests or chaparral.
Rusty Blackbird (*Euphagus carolinus*) – G5 **Preferred Habitat:** Openings in coniferous woodlands bordering bodies of water as well as tree-bordered marshes, beaver ponds, muskegs, bogs, fens or wooded swamps. Species may also be found in stream borders with alder, willow; wooded islands on lakes.

Pine Grosbeak (*Pinicola enucleator*) – G5 **Preferred Habitat:** Open coniferous forests with spruce or fir as well as forest edges, and clearings.
White-winged Crossbill (*Loxia leucoptera*) – G5 **Preferred Habitat:** Boreal forest with tamarack, spruce, fir or hemlock.
Common Redpoll (*Carduelis flammea*) – G5 **Preferred Habitat:** Low shrub tundra or barren-lands with patches of spruce, tamarack, alder, and willow thickets. Species winters near alder/birches in snow-covered weedy fields, frequents feeders.

6.1 James Property

A total of 27 species was observed at the James property, all of which displayed some level of breeding activity. One of the 27 species was a confirmed breeder, one was a probable breeder, and the remainder were classified as possible breeders.

6.2 Redmond Property

A total of 21 species was recorded at the Redmond property, all of which demonstrated some level of breeding activity. Two species were confirmed breeders, two were probable breeders, and the remainder were classified as possible breeders.

6.3 Silver Yards Property

A total of 17 species was observed at the Silver Yards property, all of which displayed some level of breeding activity. One species was classified as a confirmed breeder; the remainder were classified as possible breeders.

6.4 Knob Lake Property

A total of 18 species was observed at the Knob Lake property, 16 of which displayed some level of breeding activity. Four of these species were confirmed breeders; the remainder were classified as possible breeders. Two Herring Gulls and a Common Raven were observed, though they did not display any evidence of breeding at the site.

6.5 Houston Property

A total of 20 species was observed at the Houston property, 18 of which displayed some level of breeding activity. Two species were confirmed breeders, two were probable, and the remainder were possible breeders. A Herring Gull and a Common Goldeneye were observed but exhibited no evidence of breeding on the site.

6.6 Howse Property

Despite the unique characteristics associated with the Howse property, the site had populations of breeding birds similar to those recorded in the other, more heavily-forested study sites. A total of 15 species was observed at the Howse property, all of which displayed some level of breeding activity. One species was a confirmed breeder, one was classified as a probable breeder, and the remainder were classified as possible breeders.

6.7 Road Crossing Corridor

A total of 17 species was observed along the proposed road crossing corridor, all of which displayed some level of breeding activity. One was a confirmed breeder, two were probable, and the remainder were classified as possible breeders.

6.8 Other Observations

6.8.1 Species Observed Outside of Point Counts

Some species were not observed while conducting point counts but were observed either after the survey period or while travelling to and from study sites. Those species are listed in **Table 2.**

Table 2: Species Observed Outside of Point Counts

Scientific Name	Common Name	Total Observed	Location	Notes on Observation/Breeding Evidence
Gavia immer	Common Loon	3	Houston, Town of Schefferville	One observed flying south over town, and a pair observed calling loudly while circling overhead of main road in Houston, over suitable breeding habitat
Falcipennis canadensis	Spruce Grouse	1	Houston	A female observed flying away from the road, in suitable breeding habitat
Lagopus lagopus	Willow Ptarmigan	1	Howse	A female observed running into cover, in suitable breeding habitat
Charadrius semipalmatus	Semipalmated Plover	1	Howse	One observed foraging in a small drainage area by the main service road, not in suitable breeding habitat
Tringa solitaria	Solitary Sandpiper	1	Redmond	One observed agitated, calling from atop a spruce, in suitable breeding habitat
Lanius excubitor	Northern Shrike	1	Redmond	One observed hunting insects from a tree perch, in suitable breeding habitat
Tachycineta bicolor	Tree Swallow	7	Town of Schefferville	Several pairs confirmed breeding, observed using nest boxes and feeding young
Melospiza lincolnii	Lincoln's Sparrow	4	Town of Schefferville	Several males heard singing on town periphery from suitable breeding habitat

6.8.2 Mammals

All mammals or mammal signs observed within or adjacent to the study area were recorded, both during and outside of the point count periods. A list of mammals observed is provided in Table 3.

Table 3: Mammals Observed Within/Adjacent to Study Area

Scientific Name	Common Name	Number	Location	Notes on Observation
Rangifer tarandus	Woodland Caribou	-	Howse	Relatively fresh scat was observed in the middle of the main service road, at the far north end of Howse.
Lynx canadensis	Lynx	1	Road Crossing (West), by Point 3	Single adult observed walking north on the railway.
Mustela erminea	Short-tailed Weasel	1	Silver Yard Point 2	Single adult observed taking cover on a talus slope.
Ursus americanus	Black Bear	Minimum of 11	Schefferville Dump	Scat and tracks observed throughout study area. Adults and one yearling observed foraging at dump. One adult observed by James point count station 1.
Canis lupus	Gray Wolf	1	Beside road by Dump	Scat and tracks observed throughout study area. One adult observed along main road outside of dump.
Vulpes vulpes	Red Fox	1	Silver Yard Point 7	One adult observed foraging along bare rock at Silver Yards. Scats and/or tracks at Houston, Howse and Silver Yard.
Tamiasciurus hudsonicus	Red Squirrel	11	Throughout study area	Typically observed by their scolding calls.
Lepus americanus	Snowshoe Hare	2	Road Crossing (West)	Smaller individuals (possibly young of year) observed taking cover off ATV trail while en route back from surveying.

7. Discussion

In comparison with the 2008 results, the 2009 surveys yielded lower species diversity and overall numbers of birds, particularly waterfowl and land passerines, being recorded throughout the study area. The only species observed in 2009 that was not observed in 2008 is the Bufflehead; Table 4 lists the species observed in 2008 that were not observed in 2009.

Table 4: Species Observed in 2008 That Were Not Observed in 2009

Scientific Name	Common Name
Anas crecca	Green-winged Teal
Aythya collaris	Ring-necked Duck
Aythya marila	Greater Scaup
Melanitta fusca	White-winged Scoter
Haliaeetus leucocephalus	Bald Eagle
Tringa melanoleuca	Greater Yellowlegs
Limnodromus griseus	Short-billed Dowitcher
Troglodytes troglodytes	Winter Wren
Anthus rubescens	American Pipit
Vermivora celata	Orange-crowned Warbler
Carduelis pinus	Pine Siskin

The likely reason for the lower diversity and overall numbers recorded in 2009 was a significantly late onset of spring weather combined with a cooler-than-average summer in the study area. Residents of Schefferville stated that 2009's spring snow melt was later than usual, and that the summer seemed cooler and less sunny. Residents also stated that the local wild berry crop was far less than previous summers. These conditions are likely to negatively affect all wildlife populations as well, including birds.

7.1 James Property

The most frequently recorded species at the James property preferred spruce forest, followed by those that preferred wetland, open, successional, or shrub habitat (see Table 5). Dark-eyed Junco was the most commonly-observed species, and was recorded from the most locations. Northern Waterthrush was found on 8 of 13 counts and is commonly associated with wetland-adjacent alder thickets. White-throated Sparrow was recorded on 7 of 13 point count stations and was usually found in moist or bog-like habitats.

Table 5: Most Frequently Observed Species - James Property

	Species	Number of Survey Points Recorded	Total Number of Observations	Average Number per Point Count	Foraging Guild
1	Dark-eyed Junco	11 / 13	19	0.7	spruce
2	Fox Sparrow	10 / 13	15	1.2	spruce

	Species	Number of Survey Points Recorded	Total Number of Observations	Average Number per Point Count	Foraging Guild
3	Swainson's Thrush	9 / 13	17	1.3	spruce
4	Northern Waterthrush	8 / 13	10	0.8	wetland / successional
5	American Robin	8 / 13	10	0.8	spruce / open
6	White-throated Sparrow	7 / 13	8	0.6	spruce / wetland
7	Blackpoll Warbler	7 / 13	10	0.8	spruce / shrub
8	White-crowned Sparrow	7 / 13	9	0.7	spruce / open

Species of note included:

Alder Flycatcher - Three birds noted on three counts. This observation is marginally north of its mapped range.

White-throated Sparrow - Eight birds noted on seven counts. Observations are marginally north of its mapped range.

Swainson's Thrush - A total of 17 birds noted on nine counts. Observations are marginally north of its mapped range.

Gray-cheeked Thrush - Two individuals noted on one point count, listed as 'Vulnerable' [Schedule C] for Newfoundland and Labrador.

Nashville Warbler - One male noted on one count. This observation is marginally north of where it is mapped as rare.

Yellow Palm Warbler - One bird noted on one count. This observation is approximately 250 km north of its mapped range.

Rusty Blackbird - One bird noted on one count. COSEWIC Special Concern species, listed as 'Vulnerable' [Schedule C] for Newfoundland and Labrador.

7.2 Redmond Property

The most frequently recorded species at the Redmond property were those that preferred primarily spruce forest, followed by those that preferred open, wetland, shrub and successional habitat (see Table 6). White-crowned Sparrow was the most common species, both in terms of the number of individuals and point count stations where they were observed. Alder Flycatcher and Northern Waterthrush were recorded at four of the 24 counts and were commonly associated with wetlands and shrub/alder/successional habitat.

Table 6: Most Frequently Observed Species - Redmond Property

	Species	Number of Survey Points Recorded	Total Number of Observations	Average Number per Point Count	Foraging Guild
1	White-crowned Sparrow	16 / 24	26	1.1	spruce / open
2	Dark-eyed Junco	12 / 24	19	0.8	spruce

	Species	Number of Survey Points Recorded	Total Number of Observations	Average Number per Point Count	Foraging Guild
3	Swainson's Thrush	10 / 24	13	0.5	spruce
4	Fox Sparrow	9 / 24	12	0.5	spruce
5	White-winged Crossbill	8 / 24	12	0.5	spruce
6	American Robin	7 / 24	9	0.4	spruce / open
7	Alder Flycatcher	4 / 24	4	0.2	alder / shrub / wetland
8	Northern Waterthrush	4 / 24	5	0.2	wetland / successional

Species of note included:

Alder Flycatcher - Four birds recorded at four point count stations. Observations are marginally north of its mapped range.

Swainson's Thrush - A total of 13 birds recorded at 10 point count stations. Observations are marginally north of its mapped range.

White-throated Sparrow - Three birds recorded at three point count stations. Observations are marginally north of its mapped range.

Rusty Blackbird - One bird recorded at one point count station. COSEWIC Special Concern species, listed as 'Vulnerable' [Schedule C] in Newfoundland and Labrador.

7.3 Silver Yards Property

The most frequently recorded species at the Silver Yards property preferred spruce forest (see Table 7). This site had the highest number of species that favour wetlands and successional/shrub habitats, such as Alder Flycatcher, Yellow Warbler and Northern Waterthrush. White-crowned Sparrow was the most common species, both in terms of the number of individuals and point count stations where they were observed. The occurrences of Common Raven could be directly attributed to the proximity of the Schefferville dump, or the nearby cliffs that may have served as nesting grounds.

Table 7: Most Frequently Observed Species - Silver Yards Property

	Species	Number of Survey Points Recorded	Total Number of Observations	Average Number per Point Count	Foraging Guild
1	White-crowned Sparrow	6 / 7	12	1.7	spruce / open
2	Fox Sparrow	5 / 7	7	1.0	spruce
3	Yellow-rumped Warbler	5 / 7	6	0.9	spruce
4	Common Raven	4 / 7	6	0.9	various
5	Alder Flycatcher	3 / 7	3	0.4	alder / shrub / wetland
6	Blackpoll Warbler	3 / 7	3	0.4	spruce / shrub
7	Swainson's Thrush	2 / 7	2	0.3	spruce
7	Yellow Warbler	2 / 7	2	0.3	shrub / wetland / successional

	Species	Number of Survey Points Recorded	Total Number of Observations	Average Number per Point Count	Foraging Guild
7	Northern Waterthrush	2 / 7	2	0.3	wetland / successional
7	Dark-eyed Junco	2 / 7	2	0.3	spruce

Species of note included:

Alder Flycatcher - Three birds recorded at three point count stations. Observations are marginally north of its mapped range.

Swainson's Thrush- Two birds recorded at two point count stations. Observations are marginally north of mapped range.

Gray-cheeked Thrush - One bird recorded at one point count station; listed as 'Vulnerable' [Schedule C] in Newfoundland and Labrador.

Nashville Warbler - Three males recorded at one point count station. Observations are marginally north of where it is mapped as rare.

White-throated Sparrow - Two birds recorded at one point count station. Observations are marginally north of its mapped range.

7.4 Knob Lake Property

The most frequently recorded species from the Knob Lake property were those that preferred spruce forest and open habitat. Dark-eyed Junco was the most frequently-recorded species and, along with White-crowned Sparrow, was recorded at eight of the nine point count stations (see Table 8).

Table 8: Most Frequently Observed Species - Knob Lake Property

	Species	Number of Survey Points Recorded	Total Number of Observations	Average Number per Point Count	Foraging Guild
1	Dark-eyed Junco	8 / 9	11	1.2	spruce
2	White-crowned Sparrow	8 / 9	9	1.0	spruce / open
3	American Robin	6 / 9	6	0.7	spruce / open
4	Yellow-rumped Warbler	5 / 9	6	0.7	spruce
5	Gray Jay	4 / 9	6	0.7	spruce / open
6	Swainson's Thrush	4 / 9	4	0.4	spruce
7	Blackpoll Warbler	4 / 9	5	0.6	spruce / shrub
8	Fox Sparrow	4 / 9	6	0.7	spruce

Species of note included:

Bufflehead - One adult female with a brood of four downy young. This observation is well north of its mapped breeding range, by approximately 700 km.

Swainson's Thrush - Four birds recorded at four point count stations. Observations are marginally north of mapped range.

White-throated Sparrow - One bird recorded at one point count station. This observation is marginally north of its mapped range.

Rusty Blackbird - One bird recorded at one point count station. COSEWIC Special Concern species, listed as 'Vulnerable' [Schedule C] in Newfoundland and Labrador.

7.5 Houston Property

The most frequently recorded species from the Houston property preferred spruce forest and/or open habitat. White-crowned Sparrow was the most frequently-recorded species, while Dark-eyed Junco was recorded at the most locations. Fox Sparrow and American Robin were also common, and were recorded at 11 and 10 of the 20 point count stations, respectively. All other species observed were recorded in lower numbers (see Table 9).

Table 9: Most Frequently Observed Species - Houston Property

	Species	Number of Survey Points Recorded	Total Number of Observations	Average Number per Point Count	Foraging Guild
1	Dark-eyed Junco	13 / 20	13	0.7	spruce
2	White-crowned Sparrow	12 / 20	27	1.4	spruce / open
3	Fox Sparrow	11 / 20	12	0.6	spruce
4	American Robin	10 / 20	15	0.8	spruce / open
5	Boreal Chickadee	4 / 20	4	0.2	spruce /
6	Swainson's Thrush	3 / 20	3	0.2	spruce
7	Common Redpoll	3 / 20	5	0.3	successional / alder
8	Blackpoll Warbler	2 / 20	3	0.2	spruce / shrub
8	Pine Grosbeak	2 / 20	3	0.2	spruce
8	Gray Jay	2 / 20	2	0.1	spruce / open
8	Yellow-rumped Warbler	2 / 20	2	0.1	spruce

Species of note included:

Alder Flycatcher - One bird recorded at one point count station. This observation is marginally north of its mapped range.

Swainson's Thrush - Three birds recorded at three point count stations. Observations are marginally north of its mapped range.

White-throated Sparrow - One bird recorded at one point count station. This observation is marginally north of its mapped range.

7.6 Howse Property

The most frequently recorded species at the Howse property was White-crowned Sparrow, which prefers spruce and/or open habitats. American Tree Sparrow, which prefers taiga or open habitats, was observed at seven of the 13 survey points (see Table 10). Common Redpoll, which prefers successional or thicket habitat, was observed at six of the 13 point count stations.

Table 10: Most Frequently Observed Species - Howse Property

	Species	Number of Survey Points Recorded	Total Number of Observations	Average Number per Point Count	Foraging Guild
1	White-crowned Sparrow	11 / 13	30	2.3	spruce / open
2	American Tree Sparrow	7 / 13	11	0.8	taiga / open
3	American Robin	6 / 13	8	0.6	spruce / open
4	Common Redpoll	6 / 13	7	0.5	successional / alder
5	Blackpoll Warbler	3/ 13	3	0.2	spruce / shrub
6	Dark-eyed Junco	3 / 13	4	0.3	spruce
7	Gray Jay	2 / 13	2	0.2	spruce / open
8	Fox Sparrow	2 / 13	2	0.2	spruce

Species of note included:

Swainson's Thrush - One bird recorded at one point count station. This observation is marginally north of its mapped range.

Yellow Palm Warbler - One bird recorded at one point count station. This observation is approximately 250 km north of its mapped range.

Rusty Blackbird - A pair of adult birds, one carrying food in its beak, was recorded at one point count station. COSEWIC Special Concern species, listed as 'Vulnerable' [Schedule C] in Newfoundland and Labrador.

7.7 Road Crossing Corridor

The most frequently recorded species from the Road Crossing corridor preferred spruce forest or a mix of spruce forest and open areas (see Table 11). Swainson's Thrush was the most common species, and was observed at all of the point count stations.

Table 11: Most Frequently Observed Species – Proposed Road Crossing Corridor

	Species	Number of Survey Points Recorded	Total Number of Observations	Average Number per Point Count	Foraging Guild
1	Swainson's Thrush	11 / 11	18	1.6	spruce
2	White-throated Sparrow	9 / 11	13	1.2	spruce / wetland
3	American Robin	7 / 11	7	0.6	spruce / open
4	White-crowned Sparrow	6 / 11	9	0.8	spruce / open
5	Fox Sparrow	5 / 11	5	0.5	spruce
6	Dark-eyed Junco	5 / 11	8	0.7	spruce
7	Yellow-rumped Warbler	3 / 11	4	0.4	spruce
8	Hermit Thrush	3 / 11	4	0.4	spruce / shrub

Species of note included:

Swainson's Thrush - 18 birds recorded at 11 point count stations. Observations are marginally north of its mapped range.

White-throated Sparrow - 13 birds recorded at 11 point count stations. Observations are marginally north of its mapped range.

7.8 Extra-limital Species

At this time there are no Breeding Bird Atlas data available for northern Quebec and Labrador that include the study area. As such, the range limits used in this report are based on The Sibley Field Guide to Birds of Eastern North America (2003). Based on the range maps provided in that field guide, six species recorded during the 2009 surveys are considered to be extra-limital (i.e., recorded outside of their recognized range). Descriptions of these species, and their observations during the 2009 surveys, are as follows:

Bufflehead was found at three point count stations: one adult female at **Houston**, one adult female at **James**, and one adult female with four ducklings at **Knob Lake**. These observations are well north, approximately 700 to 800 km, of the species' known breeding range, and they are considered rare on the north-northeast shore of Labrador approximately 600 km to the east. This breeding record and the observation of two separate single females show that this species may be more common inland than previous sources indicate.

Alder Flycatcher was found at 13 point count stations: five points in **James**, four points in **Redmond**, one point in **Houston** and three points in **Silver Yard**. These observations are marginally north (~100 km) of the species' known breeding range. This species was also observed during the 2008 survey.

Swainson's Thrush was found at 29 point count stations, distributed throughout all of the study sites. The Sibley Guide shows that these observations are marginally north (~100 km) of the species' known breeding range. This species was also observed during the 2008 survey.

Nashville Warbler was found at two point count stations: one singing male at the **James** property, and another three singing males at one point count station at the **Silver Yard** site. These observations are

marginally north of where the species is mapped as rare. The four observations of this species, especially the occurrence of three singing males at the same station, suggest that Nashville Warbler is a more regular visitor than its mapped distribution would indicate. This species was also observed during the 2008 survey.

Yellow Palm Warbler was found at two point count stations; one singing male at **Howse**, and another singing male at **James**. These observations are approximately 250 km north of its mapped range. This species was also observed during the 2008 survey.

White-throated Sparrow was found at 24 point counts, at all of the study sites except **Howse**. The Sibley Guide shows that these observations are marginally north (~100 km) of the species' known breeding range. This species was also observed during the 2008 survey.

The observations of extra-limital species could reflect either a lack of knowledge of these species' northern limits, or an example of natural or climate change-based northward range expansion since the period their ranges were last documented. Although the Bufflehead observations were far enough from their known range to designate them as vagrant records, the fact that more than one Bufflehead was observed (including an observation of an adult female with young), indicates that they are more likely representative of a previously undocumented inland-Labrador breeding population, the extent of which would require further study by the scientific ornithological community. None of the extra-limital species observed are ranked as a species at risk either provincially or nationally.

7.9 Assessment of Significance

This section summarizes globally, nationally and provincially significant bird species that have been found in the study area.

7.9.1 Globally Significant

All birds observed are ranked as G5, which means they are considered to be "very common". No globally significant bird species were observed within the study area.

7.9.2 Federally Significant

Rusty Blackbird: Classified as "Special Concern" by COSEWIC. The species was observed at the James, Redmond, Knob Lake, and Howse properties during the 2009 surveys. Only one bird was recorded during the 2008 surveys. The entire study area is well within this species' core range, and suitable breeding and foraging habitats (i.e., spruce trees beside bogs and wetlands, wooded swamps) are widespread. It is likely that this species is more common and widespread throughout the study area than indicated by the surveys conducted to date.

7.9.3 Provincially Significant

Rusty Blackbird: listed as 'Vulnerable' [Schedule C] in Newfoundland and Labrador. See description in Section 7.9.2.

Gray-cheeked Thrush: listed as 'Vulnerable' [Schedule C] in Newfoundland and Labrador. The species was recorded at both the James and Silver Yard properties during the 2009 surveys. During the 2008 surveys, it was recorded with possible or probable breeding evidence in all survey locations. The entire study area is well within this species' core range, and it is likely that all resident birds are breeding on-site.

8. Conclusions and Recommendations

As LIM prepares to initiate the development of the pits and construct the new road crossing, efforts should be made to minimize negative impacts to wildlife, and generally avoid any nesting birds or significant bird habitats. The lack of observations of species during either survey season does not preclude their presence, as many species expected to occur within that area of Labrador and Quebec can be cryptic and difficult to detect even under ideal survey conditions. Any other bird species whose status changes during the interim period between this report and the mining/land clearing activities should be handled on a case-by-case basis by evaluating habitat requirements, local status and abundance, and alternatives designed to lessen impacts. Certain habitat types should be given higher levels of scrutiny, based on their comparative rarity within the study areas. These would include all wetland habitats (marshes, bogs, fens, etc.) as well as locally unusual areas such as sub-arctic tundra and alpine tundra. Although all species of birds potentially affected by mining activities should be given due consideration, this section focuses on species with an at-risk status that are likely to be affected.

Rusty Blackbird – The Rusty Blackbird is listed by COSEWIC as a species of Special Concern, and is listed as 'Vulnerable' on Schedule C of the Newfoundland and Labrador Endangered Species Act. In 2009, a total of five birds were observed from four study sites, which is more than the single bird recorded during the 2008 surveys. However, the lack of observations in other study sites does not preclude their presence. This species would be affected where their breeding and foraging habitat (spruce trees beside bogs and wetlands, wooded swamps) is disturbed or removed.

There are numerous areas of habitat suitable for this species within and adjacent to the study area. In order to lessen potential impacts, the clearing of vegetation generally takes place in the fall or winter after the bird breeding season to limit the destruction of bird nests to adhere to the federal Migratory Bird Act. Also, a 15 m buffer from bodies of water or watercourses is standard in accordance with the Newfoundland and Labrador Policy for Flood Plain Management as administered by the Department of Environment and Conservation (Government of Newfoundland and Labrador, 1996). Displacement of Rusty Blackbird is not likely to be a significant impact as this species may likely relocate to other nearby suitable habitat. It is recommended that land clearing for any purpose must be undertaken during breeding periods (the months of May through mid-August specifically). A qualified ornithologist should perform nest searches in any area that will be affected by the mining activities, to ensure that nesting birds are not disturbed or displaced.

Gray-cheeked Thrush – This species is listed as 'Vulnerable' on Schedule C of the Newfoundland and Labrador Endangered Species Act. Although it was found in only two study locations during the 2009 survey period, it was found in all study locations during the 2008 season. As such, the lack of observations in other study locations this year does not preclude their presence. This species would likely be affected by the mining activities due to the widespread distribution of its habitat (spruce woods) within the study site. As with the Rusty Blackbird, displacement of this species is not likely to be a significant impact as this species may likely relocate to other nearby suitable habitat. At a minimum, all land clearing should be undertaken outside of the breeding periods. It is recommended that land clearing be undertaken during breeding periods (the months of May through mid August specifically). A qualified ornithologist should perform nest searches in any area that will be affected by the mining activities, to ensure that nesting birds, especially those that are listed species at risk, are not disturbed or displaced.

9. References

AECOM. 2008. Labrador Iron Mines Baseline Avifauna Report – James, Redmond & Silver Yards. November 2008.

AECOM. 2008. Labrador Iron Mines Baseline Avifauna Report – Knob Lake, Houston & Howse. Draft – October 2008.

Government of Canada Species at Risk (SAR) Public Registry. Available at: http://www.sararegistry.gc.ca/sar/index/map_e.cfm

Government of Newfoundland and Labrador; Endangered Species Act. Copyright 2006: Queen's Printer, St. John's, Newfoundland and Labrador, Canada. Available at: http://www.assembly.nl.ca/legislation/sr/statutes/e10-1.htm

Government of Newfoundland and Labrador; Department of Environment and Conservation, Policy for Flood Plain Management. Issue Date May 13 1996. Available at: http://www.env.gov.nl.ca/env/Env/waterres/Policies/PDWR96-1_Revised.asp

Ministry of Natural Resources, 2000. Significant Wildlife Habitat: Technical Guide.

Natural Heritage Information Centre online database. Available at: http://nhic.mnr.gov.on.ca/nhic_.cfm

New Millennium Capital Group, in collaboration with Paul F. Wilkinson and Assoc. Inc., Project Registration, Direct Shipping Ore Project, 29 April 2008.

Sibley, David Allen. 2003. The Sibley Field Guide to Birds of Eastern North America. Alfred A. Knopf Inc., New York.

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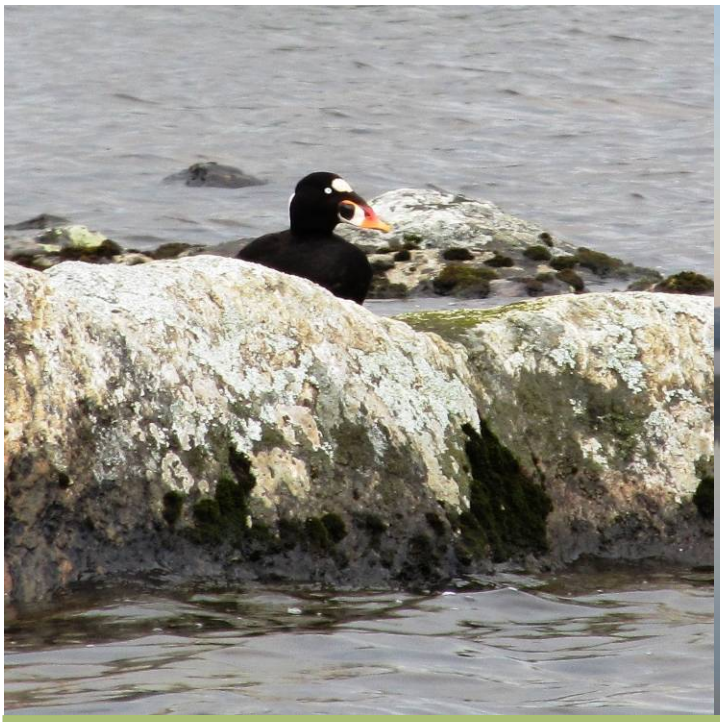

Inventaire des oiseaux nicheurs du site minier du projet KéMag

NEW MILLENNIUM IRON

TATA

Rapport technique

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^{0}C	Celsius
%	Pourcentage
CCCEP	Conseil canadien pour la conservation des espèces en péril
CDPNQ	Centre de données sur le patrimoine écologique du Québec
COSEPAC	Comité sur la situation des espèces en péril au Canada
BNDT	Banque nationale de données topographiques
DSOP	Projet de minerai de fer à enfournement direct (Direct Shipping Ore Project)
DTT	Dithiothréitol
DRL	Dénombrement à rayon limité
ESDMV	Espèce susceptible d'être désignée menacée ou vulnérable au Québec
HNE	Heure normale de l'est
IOCC	Iron Ore Company of Canada
IPA	Indice ponctuel d'abondance
km	Kilomètre
km^2	Kilomètre carré
km/h	Kilomètre heure
m	Mètre
NML	New Millennium Iron Corp.
TSMC	Tata Steel Minerals Canada
MRNF	Ministère des Ressources naturelles et de la Faune
OTDD	Observation de la Terre pour le développement durable des forêts
s.o.	Sans objet
UICN	Union internationale pour la conservation de la nature

GLOSSAIRE

Biotope

Milieu délimité offrant à une population animale ou végétale bien déterminée des conditions d'habitat permettant son développement (Hydro-Québec, 1992).

Écotone

Zone intermédiaire entre deux biotopes (Parent, 1990).

Richesse

Nombre absolu d'espèces animales ou végétales au sein d'une communauté (Parent, 1990). Appelée aussi richesse spécifique.

1 INTRODUCTION

1.1 Contexte de l'étude

New Millennium Iron Corp. (NML) et Tata Steel Global Minerals Holdings Pte Limited (Tata Steel) mènent actuellement une étude de faisabilité concernant un projet d'envergure qui permettrait l'exploitation de deux gisements de taconite de la Chaîne ferrifère Millennium. Ce grand projet, intitulé le Projet Taconite, vise un gisement au Québec (KéMag) et un à Terre-Neuve-et-Labrador (LabMag).

Le présent rapport porte sur le site minier KéMag, localisé approximativement à 50 km au nord-ouest de Schefferville, dans la province du Québec. Il s'agit de l'un des plus grands gisements de minerai magnétique de fer non exploités au monde, avec 2,1 milliards de tonnes de réserves prouvées ou probables à une teneur moyenne de 31,3 % de fer.

1.2 Mandat et objectif

Dans le but d'évaluer les impacts de l'exploitation du gisement KéMag sur l'avifaune, Groupe Hémisphères a été mandaté pour réaliser un inventaire des oiseaux nicheurs de l'emplacement du site minier et du concentrateur projetés. Les objectifs de cette étude sont :

- effectuer une évaluation du potentiel de présence des oiseaux à statut précaire;
- effectuer un inventaire quantitatif des oiseaux terrestres nicheurs;
- effectuer un inventaire des oiseaux à statut précaire.

2 MÉTHODOLOGIE

2.1 Description de l'aire d'étude

L'aire d'étude des oiseaux nicheurs correspond à la superficie de certains des titres miniers de NML agrandie d'une zone tampon de 1 km (figure 2). Une partie de la rivière Goodwood en aval du lac Gillespie B a été ajoutée à l'aire d'étude. Sa superficie est de 139,3 km².

L'aire d'étude est localisée en bordure de la rivière Goodwood et des lacs Harris et Gillespie, dans la province de Québec, et jouxte la frontière de Terre-Neuve-et-Labrador. Elle fait partie du territoire non organisé de Rivière-Koksoak, dans la région administrative Nord-du-Québec (figure 1). Les principales infrastructures projetées sont une mine à ciel ouvert, des haldes, un bassin de décantation, un camp et un concentrateur.

L'aire d'étude est localisée dans une large vallée alignée selon un axe sud-est/nord-ouest. La rivière Goodwood y coule à travers un chapelet de grands lacs dont l'altitude moyenne est de 530 m. Les collines qui bordent la vallée culminent à 760 m. La végétation de la vallée est caractérisée par la pessière à mousse et la pessière à lichen ainsi que par de grands fens minérotrophes à mares. D'autres lacs et milieux humides de moindre superficie parsèment les versants. La végétation diminue de hauteur avec l'augmentation de l'altitude et la forêt succède à une arbustaie, puis, à partir de 670 m, la toundra règne.

2.2 Revue de littérature

Une revue de la littérature pertinente et des banques de données sur les oiseaux a permis d'évaluer les espèces aviaires qui pouvaient potentiellement nicher dans la région et de connaître leurs dates de nidification. Les inventaires aviaires récents dans les régions limitrophes comprennent ceux de Whitford

(January 2003), Golder Associates Ltd and Global Environnement (2005), Groupe Hémisphères (2009), Guérette *et al*. (2009), ainsi que Groupe Hémisphères (en cours).

L'avifaune de l'aire d'étude sera comparée avec celle de la région Nord-du-Québec (figure 1) de la liste commentée de David (1996). Ce document présente le statut des espèces d'oiseaux nicheurs par région et leur abondance relative. C'est dans cette vaste région que se trouve le site minier KéMag. D'autres cartes de répartition des espèces ont été consultées pour s'assurer de la pertinence des mentions douteuses ou problématiques (Avibase; Paquin et Caron, 1998; Sibley, 2000; Kaufman, 1996).

Pour ce qui est des espèces à statut précaire, les listes les plus récentes du gouvernement fédéral (COSEPAC, 2011) et du gouvernement provincial (MRNF, 2011) ont été consultées, tant pour identifier les espèces à statut précaire que pour leur biologie.

Finalement, la banque de données du Centre de données sur le patrimoine naturel du Québec (CDPNQ) du MRNF et la banque SOS-POP opérée par le Regroupement QuébecOiseaux ont été consultées lors de l'analyse préparatoire.

Figure 1. Délimitation de la région Nord-du-Québec

2.3 Préparation des travaux de terrain

Une analyse des documents cartographiques disponibles a permis de déterminer et de localiser les biotopes qui devaient faire l'objet d'un inventaire des oiseaux nicheurs. Il s'agit de photos aériennes de 1973 à l'échelle 1/20 000 du MRNF ainsi que de l'Observation de la Terre pour le développement durable des forêts (OTDD) et de la Base nationale des données topographiques (BNDT) de Ressources naturelles Canada. Du point de vue de la faune aviaire, les biotopes ont été regroupés en quatre catégories principales, soit le milieu humide, la forêt de conifères, l'arbustaie et la toundra.

2.4 Techniques d'inventaires

2.4.1 Méthodes de dénombrement des oiseaux nicheurs

Les passereaux et les autres espèces d'oiseaux terrestres ont été dénombrés à l'aide de la méthode du dénombrement à rayon limité (DRL) et de l'indice ponctuel d'abondance (IPA). La technique du DRL (Bibby *et al*., 1992) consiste à dénombrer aux cinq minutes tous les oiseaux vus ou entendus à l'intérieur d'un cercle imaginaire d'un rayon de 50 m, durant 10 minutes. La méthode de l'IPA (Blondel *et al*., 1981) a été utilisée concurremment à celle du DRL. Elle se distingue de la précédente par le fait qu'il n'y a aucune limite de distance dans les oiseaux dénombrés. Chacune des stations d'écoute a fait l'objet d'un seul dénombrement des oiseaux par ces méthodes. Suite à une période d'accalmie d'environ cinq minutes, permettant aux oiseaux de se remettre du dérangement occasionné par le déplacement des observateurs, le DRL débutait. La période de dénombrement des oiseaux nicheurs s'amorçait dès le lever du soleil (lorsque c'était possible de commencer à cette heure) jusqu'à environ cinq heures plus tard dans la journée. Deux observateurs ont participé au dénombrement des oiseaux nicheurs. Une rencontre préalable a été effectuée avec ces ornithologues dans le but de s'assurer de la bonne compréhension des méthodes.

Le dénombrement des oiseaux nicheurs a été effectué dans quatre biotopes : la forêt de conifères, l'arbustaie, la toundra et les milieux humides (fen minérotrophe). Toutefois, les méthodes de dénombrement dans les milieux humides ont fait l'objet de quelques ajustements (voir paragraphe suivant). Les espèces fréquentant les écotones ont été notées lors des déplacements, mais leur densité de population n'a pas été mesurée. Les stations de dénombrement des oiseaux ont été sélectionnées en fonction des biotopes présents et de l'accessibilité plutôt qu'en fonction de l'emplacement des futures infrastructures. Elles ont été espacées de plus de 250 m et localisées à plus de 125 m de tout écotone. Les déplacements vers la majorité des stations de dénombrement ont été effectués soit en bateau, lorsque c'était possible, ou en hélicoptère. Tous biotopes confondus, un total de 51 stations ont fait l'objet d'un dénombrement des oiseaux nicheurs.

Les techniques du DRL et de l'IPA ont aussi été utilisées dans les milieux humides. Elles visaient à la fois le dénombrement des oiseaux terrestres qui pouvaient se retrouver dans ce milieu, mais aussi celui des limicoles et des autres oiseaux aquatiques qui pouvaient y nicher. Cette activité s'est déroulée à toute heure de la journée. La séance durait au minimum 15 minutes. La plupart de ces stations ont été dénombrées à deux reprises, la deuxième fois en fin de journée, pour évaluer et comparer les activités aviaires entre le matin et la fin de la journée. Neuf stations en milieux humides ont fait l'objet d'un dénombrement des oiseaux. Ainsi, au total, le dénombrement d'oiseaux nicheurs a été réalisé dans 51 stations.

Bien que les inventaires réalisés par les méthodes du DRL et de l'IPA visent essentiellement les passereaux et les pics, toutes les observations des autres espèces d'oiseaux ont été notées. On entend par observation la mention d'un individu entendu ou aperçu. Pour certains groupes, tels les oiseaux de proie, le nombre d'observations surestime certainement le nombre d'individus parce que le même oiseau peut être observé à plusieurs reprises durant toute la période d'inventaire.

Les oiseaux observés lors des déplacements entre les stations ou au camp et les observations réalisées par les biologistes des autres équipes de terrain ont également été comptabilisés et utilisés pour le calcul de la richesse (nombre d'espèces). Dans certains cas, ces observations ont pu aussi confirmer la nidification de certaines espèces.

Afin de déterminer le niveau de certitude de nidification des espèces, les indices de nidification provenant du protocole de l'Atlas des oiseaux nicheurs du Québec ont été utilisés (Annexe I). Les noms français,

anglais et latin des oiseaux reposent sur la 7e édition et 52e mise à jour de la liste des oiseaux de l'Amérique du Nord (AOU, 2011).

Avant le début de l'inventaire des oiseaux nicheurs, l'approche méthodologique a été soumise au bureau régional du MRNF ainsi qu'au bureau du Service canadien de la faune de Québec pour commentaires (voir les communications personnelles en référence). L'effort d'inventaire s'inspire de Hanson *et al.* (2009) à l'exception que le succès de reproduction n'a pas été entrepris. Le SCF dit qu'il ne s'agit pas d'un secteur sensible requérant des inventaires particuliers ou non standards et admet n'avoir aucune donnée d'inventaire dans un rayon de 20 km du centroïde du Projet.

Le nombre de couples nicheurs a été compilé et les espèces observées sont présentées en fonction du biotope où elles ont été observées. Les couples nicheurs détectés à l'intérieur du rayon de 50 m sont ceux comptabilisés pour la densité des couples.

2.4.2 Stations de dénombrement dans la zone témoin

À titre comparatif, des inventaires ont été effectués dans une zone témoin (figure 2), dans laquelle des biotopes similaires à ceux rencontrés dans l'aire d'étude sont présents, soit la toundra, l'arbustaie, la forêt et les milieux humides, dans des proportions similaires.

Les techniques du DRL et de l'IPA ont aussi été utilisées dans la zone témoin. Elles visaient le dénombrement des mêmes groupes d'oiseaux que dans l'aire d'étude. Huit stations de dénombrement, tous biotopes confondus, ont été réalisées dans cette zone.

2.4.3 Recherche d'espèces à statut précaire

Des efforts d'inventaire supplémentaires ont été effectués en hélicoptère pour rechercher deux espèces à statut précaire observées lors des inventaires de migration printanière. Ces espèces sont le hibou des marais et l'arlequin plongeur. Pour ce qui est des nids de faucon pèlerin, d'aigle royal ou de pygargue à tête blanche, deux survols complets de l'aire d'étude en mai 2011 lors de l'inventaire des oiseaux migrateurs (Groupe Hémisphères, en cours) n'ont révélé aucun signe de leur présence.

2.5 Analyse des données

Toutes les observations des espèces détectées dans l'ensemble des biotopes ont été consignées dans une base de données nommée SYSGIO et classées en trois groupes : oiseaux de proie, oiseaux aquatiques et oiseaux terrestres, ce dernier comprenant essentiellement les pics et les passereaux. La densité spécifique a été déterminée dans chaque biotope en calculant l'abondance moyenne par station en utilisant les valeurs obtenues au moyen du DRL pour chaque espèce (50 m de rayon).

3 REVUE DE LITTÉRATURE – ESPÈCES À STATUT PRÉCAIRE

La présente section a pour but de dresser la liste des espèces à statut précaire susceptibles de fréquenter l'aire d'étude. Pour ce faire, une analyse des données disponibles dans les bases de données gouvernementales et une revue de la littérature de la région ont été effectuées. Un résumé de la biologie de chacune des espèces retenues suit la revue.

3.1 Mention historique

Une demande d'informations indiquant l'aire d'étude avec une zone tampon de 10 km a été soumise au bureau régional Nord-du-Québec du MRNF. Les résultats obtenus révèlent l'absence d'un site d'intérêt faunique désigné ou qui pourrait le devenir. Il en va de même de site d'espèce aviaire à statut précaire au CDPNQ. Une requête similaire faite à SOS-POP ne signale la présence d'aucun site de nidification d'espèce d'oiseau à statut précaire.

Les seules données historiques proviennent d'un inventaire des oiseaux nicheurs dont la zone tampon recoupe celle de la présente étude (Groupe Hémisphères, 2009). Il recense une richesse de 52 espèces d'oiseaux, incluant une espèce à statut précaire dont la nidification a été confirmée, soit le quiscale rouilleux (*Euphagus carolinus*). Le rapport mentionne aussi l'observation d'un aigle royal en septembre, mais ne le considère pas nicheur compte tenu de la date tardive et l'absence de falaise dans l'aire d'étude.

3.2 Espèces à statut précaire susceptibles de fréquenter l'aire d'étude

On dénombre six espèces à statut précaire susceptibles de fréquenter l'aire d'étude (tableau 1). Cela inclut celles qui pourraient théoriquement s'y reproduire d'après leur aire de nidification et l'existence d'habitats potentiels (MRNF, 2011; Environment and Conservation, 2011; COSEPAC, 2011).

Tableau 1. Oiseaux à statut précaire susceptibles de fréquenter l'aire d'étude

NOM FRANÇAIS	NOM SCIENTIFIQUE	STATUT	
		Québec	Canada
Aigle royal	*Aquila chrysaetos*	Vulnérable	Non en péril
Arlequin plongeur	*Histrionicus histrionicus*	Vulnérable	Préoccupante
Faucon pèlerin *anatum/tundrius*	*Falco peregrinus anatum/tundrius*	Vulnérable	Préoccupante
Hibou des marais	*Asio flammeus*	ESDMV*	Préoccupante
Pygargue à tête blanche	*Haliaeetus leucocephalus*	Vulnérable	Non en péril
Quiscale rouilleux	*Euphagus carolinus*	ESDMV*	Préoccupante

* Espèce susceptible d'être désignée menacée ou vulnérable au Québec

3.3 Biologie des espèces à statut précaire

3.3.1 Aigle royal

L'aigle royal (*Aquila chrysaetos*) habite généralement les secteurs montagneux ou montueux, mais parfois peu vallonnés (Brodeur et Morneau, 1999). L'espèce chasse essentiellement dans les habitats ouverts, notamment les sommets dénudés, les brûlis, les tourbières, les marais et même dans des coupes à blanc (Tjernberg, 1983; Brodeur et Morneau, 1999; McGrady *et al*., 2004). La superficie de milieux ouverts s'avère cruciale pour l'occupation d'un territoire de nidification (Morneau 2003; McGrady *et al*., 2004). Dans la forêt boréale, les connaissances actuelles indiquent que l'occupation d'un territoire de nidification par l'aigle royal est souvent temporaire; la succession végétale finissant tôt ou tard par faire disparaître les brûlis et les espaces dénudés jusqu'à la prochaine perturbation majeure (Whitfield *et al*. 1969; Morneau, 2003). Les couples habitent un domaine vital qui varie généralement entre 25 et 100 km^2 (McGrady *et al*., 2004). Les falaises constituent le principal support des nids au Québec (Morneau *et al*., 1994). L'aire d'étude est impropre à la nidification de cette espèce mais offre de larges aires d'alimentation.

3.3.2 Arlequin plongeur

L'arlequin plongeur (*Histrionicus histrionicus*) niche le long des cours d'eau pourvus de rapides. Il habite généralement les cours d'eau d'ordre ≥ 4 (Morneau *et al*., 2008; Robert, 1995). Un cours d'eau d'ordre 1 n'a pas de tributaire, mais se déverse dans un cours d'eau d'ordre 2 et ainsi de suite. L'arlequin plongeur, aussi appelé canard arlequin, s'alimente principalement de larves d'insectes tapissant le fond rocheux des rapides. Sa répartition est mal connue dans le nord du Québec. L'aire d'étude recèle un habitat propice à la nidification de cette espèce, en l'occurrence la partie aval de la rivière Goodwood.

3.3.3 Faucon pèlerin des sous-espèces anatum / tundrius

Au départ, le COSEPAC a évalué séparément la situation des trois sous-espèces de faucon pèlerin (*Falco peregrinus*) au Canada : sous-espèce *anatum* (en voie de disparition en avril 1978, menacée en avril 1999 et en mai 2000), sous-espèce *tundrius* (menacée en avril 1978 et préoccupante en avril 1992) et sous-espèce *pealei* (préoccupante en avril 1978, en avril 1999 et en novembre 2001). En avril 2007, le faucon pèlerin au Canada a été évalué en tant que deux unités distinctes : sous-espèce *pealei* (sous-espèce exclusivement présente dans l'ouest du Canada) et *anatum/tundrius*. Le faucon pèlerin *anatum/tundrius* a été désigné espèce « préoccupante » en avril 2007 (COSEPAC, 2011).

Les sous-espèces de faucon pèlerin *anatum* et *tundrius* ont été démontrés comme étant génétiquement indissociables. Il existe une intergradation entre eux et il est impossible de déterminer avec certitude de quelle sous-espèce est issu un faucon pèlerin observé au Québec.

Le faucon pèlerin niche essentiellement sur des falaises ou des structures d'origine anthropique, tels des ponts, des édifices en hauteur et des carrières (Bird, 1997). Les effectifs du faucon pèlerin ont décliné dramatiquement à la suite de la contamination au DTT dans les années 1950 et 1960. Après avoir été réintroduit et suite à l'arrêt de l'utilisation du DTT en Amérique du Nord, ses effectifs ont augmenté considérablement tant dans le sud du Québec que dans le nord. Le faucon pèlerin qu'on associait autrefois à la sous-espèce *anatum* habite le sud de la province, la limite nordique de son aire de répartition se trouvant à la hauteur de la rivière Saguenay et de l'Abitibi. Les populations nordiques du faucon pèlerin, qu'on associait autrefois à la sous-espèce *tundrius,* nichent dans la région de la baie d'Ungava, mais on ignore exactement quelle est la limite sud de l'aire de reproduction de celle-ci.

L'aire d'étude est impropre à la nidification de cette espèce mais offre de larges aires d'alimentation.

3.3.4 Hibou des marais

En période de nidification, le hibou des marais (*Asio flammeus*) fréquente une variété de milieux ouverts étendus, comme des milieux dunaires, des tourbières, des marais, des prairies humides, des pâturages ou les vastes étendues de la toundra arctique (Holt et Leasure, 1993). L'abondance de l'espèce est tributaire de celle des campagnols, qui fluctue grandement. Si ces derniers subissent une baisse démographique importante, le hibou des marais peut être absent certaines années. L'espèce se trouve probablement dans toutes les régions du Québec en période de nidification (Todd, 1963). Sa nidification n'est pas facile à confirmer malgré le fait qu'il niche au sol en milieu ouvert (Bélanger et Bombardier, 1995). Les grandes tourbières minérotrophes exemptent d'arbuste de l'aire d'étude représentent un habitat propice à la nidification de cette espèce.

3.3.5 Pygargue à tête blanche

Le pygargue à tête blanche (*Haliaeetus leucocephalus*) habite les rives des grands lacs, des rivières et de la mer (Lessard, 1996; Fradette, 1998). Étant principalement piscivore, dans le nord, son nid se situe généralement à moins de 200 m d'une eau riche en poisson et à fort courant permettant d'être libérée des glaces tôt dans l'année (Gerrard et Bertolotti, 1988). Des preuves de nidification du pygargue ont été trouvées dans toutes les régions du Québec (Bird et Henderson, 1995). L'aire d'étude recèle des habitats propices à la nidification et à l'alimentation de cette espèce.

3.3.6 Quiscale rouilleux

En période de reproduction, le quiscale rouilleux (*Euphagus carolinus*) habite près de l'eau. Il fréquente les tourbières, les marécages, les marais en bordure des forêts, les bois humides et les fourrés de grands buissons où persistent des mares d'eau. Dans les régions septentrionales, il niche principalement dans les régions de muskeg de la taïga où se retrouvent plusieurs lacs et tourbières (Kaufman, 1996). Contrairement aux autres quiscales, il niche généralement loin des régions habitées. Le quiscale rouilleux est commun partout au sud de la limite des arbres au Québec (Nadeau, 1995). Il revient année après année au même site de nidification. Cette espèce niche certainement à de maints endroits de l'aire d'étude.

4 RÉSULTATS ET DISCUSSION

Les inventaires des oiseaux nicheurs se sont déroulés du 2 au 7 juillet 2011. Les résultats sont rassemblés dans ce chapitre, après la présentation des conditions et effort d'inventaire.

4.1 Conditions et effort d'inventaire

L'emplacement des stations d'inventaire peut être visualisé à la figure 2. Même si le nombre de stations visitées et le temps alloué à l'observation en milieu humide ont été moindres qu'en milieu forestier, les informations recueillies durant ces périodes (incluant le déplacement sur le terrain) ont permis de déterminer la présence d'espèces exclusives à ce milieu ouvert, car la technique des stations d'enregistrement a été adaptée à ceux-ci.

Des quatre biotopes inventoriés (tableau 2), la forêt de conifère constitue l'habitat dans lequel les efforts d'inventaires ont été le plus important suivi de l'habitat du milieu humide.

Tableau 2. Effort d'échantillonnage des oiseaux nicheurs par biotope

BIOTOPE	FORÊT DE CONIFÈRE	ARBUSTAIE	TOUNDRA	MILIEU HUMIDE	TOTAL
Nombre de stations	25	7	10	9	51
Temps total alloué (minutes)	250	70	100	144	584
Pourcentage de l'effectif des stations	49,0 %	13,7 %	19,6 %	17,6 %	100 %

Les conditions d'inventaire ont été classées de bonnes à moyennes pendant les dénombrements dans la majorité des cas. Les mauvaises conditions étaient reliées à la pluie. Le vent, surtout dans la toundra, a parfois rendu les conditions d'écoute moyennes.

La température moyenne durant les journées d'inventaire variait entre 9 et 14° C. La température maximale atteinte a été de 18°C. Le matin d'inventaire le plus froid était d'environ 6° C. Pour plus de détail, l'annexe II rassemble les données météorologiques quotidiennes de l'aéroport de Schefferville.

4.2 Généralités sur l'avifaune

La richesse recensée dans l'aire d'étude est de 53 espèces d'oiseaux. Cela comprend 4 espèces d'oiseaux de proie, 16 espèces d'oiseaux aquatiques et 33 espèces d'oiseaux terrestres. Les passereaux dominent dans tous les habitats terrestres en termes de nombre d'espèces (figure 3).

Chez les oiseaux aquatiques, hormis le plongeon huard (*Gavia immer*), le goéland argenté (*Larus argentatus*) et la sterne arctique (*Sterna paradisaea*), les espèces observées se divisent en deux grandes familles, soit les anatidés (canards et oies) avec six espèces, et les scolopacidés (oiseaux de rivage) avec sept espèces.

Un reportage photographique disponible à l'annexe III montre chacun des biotopes et certaines espèces d'oiseaux qui leur sont associées. La liste de toutes les espèces observées dans l'aire d'étude suit à l'annexe IV.

Point Count - KéMag Mine Site

Stations de dénombrement - Site minier du projet KéMag

New Millennium Iron Corp.

LEGEND/LÉGENDE

Bird Surveys/inventaires d'oiseaux

- Listening point/ Station d'écoute en milieu terrestre
- Wetland point/ Station d'écoute en milieu humide
- Study area/aire d'étude
- Control area/zone témoin
- *Base camp/camp de base*

Infrastructure and mining components
infrastructures et composantes minières

- Kemag claim/ droits miniers Kemag

Map base/Fond de carte

- Road/route
- Border/frontière
- Intermittent watercourse/ cours d'eau intermittent
- Watercourse/ cours d'eau
- Waterbody/plan d'eau
- Wetland/milieu humide
- Contour interval/ courbe de niveau

*Hydronyms are oriented along the direction of water flow
*Les hydronymes sont orientés selon le sens d'écoulement de l'eau

0 1 2 3

Kilometers/kilomètres

SCALE/ÉCHELLE: 1:60,000 UTM 19N NAD 83

FILE, VERSION, DATE, AUTHOR/
FICHIER, VERSION, DATE, AUTEUR:

GH-0309-00, 2012-03-15, L.B.

SOURCES:
Government of Canada, NTDB, 1:50,000, 1979
Government of NL and government of Quebec,
Boundary used for claims
New Millennium Capital Corp., Mining sites and roads
Groupe Hémisphères, Hydrology update, 2009

Gouvernement du Canada, BNDT, 1/50 000, 1979
Gouvernement de T-N-L et gouvernement du Québec,
frontière utilisée pour les titres miniers
New Millennium Capital Corp., gisements et routes
Groupe Hémisphères, mise à jour de l'hydrologie, 2009

GroupeHemispheres

Figure 2

Selon David (1996), l'ensemble des espèces observées sont considérées comme nicheuses au Québec et la majorité de celles-ci comme migratrices. Seuls quelques oiseaux terrestres peuvent être considérés comme nicheurs résidents à l'année ou nicheurs sédentaires (c'est-à-dire que l'espèce se déplace peu en période post-nuptiale), tels la mésange à tête brune (*Poecile hudsonica)*, le sizerin flammé (*Carduelis flammea)* et le tétras du Canada (*Falcipennis canadensis)*.

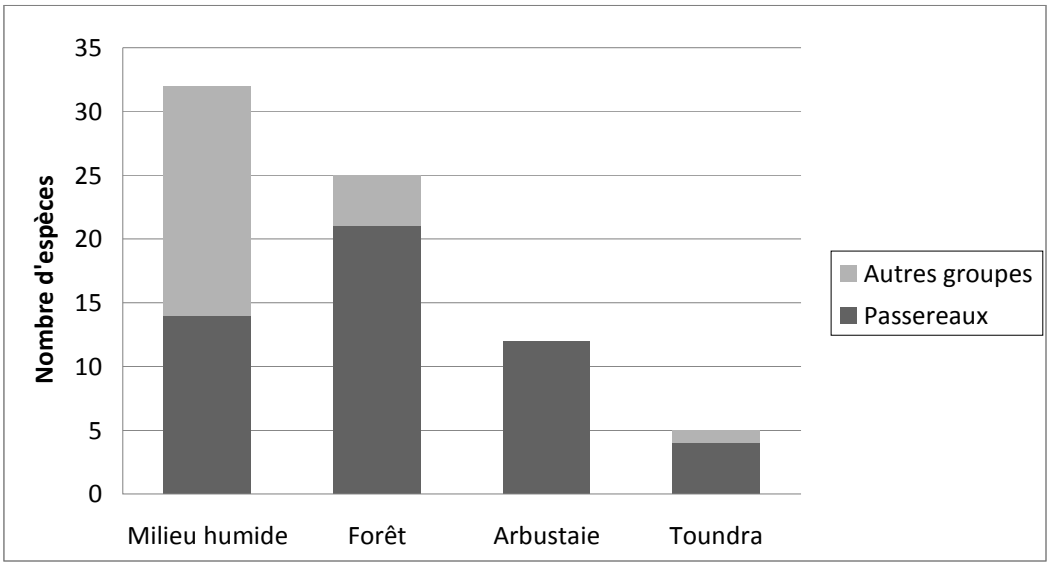

Figure 3. Distribution du nombre d'espèces d'oiseaux nicheurs par groupe et biotope

4.3 Indice de présence des espèces à statut précaire

Deux espèces à statut précaire ont été observées durant le séjour effectué dans l'aire d'étude pour les inventaires d'oiseaux nicheurs. Il s'agit du pygargue à tête blanche et du quiscale rouilleux. Seul le quiscale rouilleux a présenté des signes de nidification dans l'aire d'étude.

4.3.1 Arlequin plongeur

La présence de l'arlequin plongeur n'a pu être confirmée durant la période de nidification sur le territoire à l'étude. Malgré le survol à plusieurs reprises d'une section de la rivière Goodwood en aval des lacs Gillespie, le seul tronçon propice dans l'aire d'étude, aucun indice de la présence de l'espèce n'a été observé. Les observations du printemps, soit un couple le 28 mai, pourraient être des oiseaux en migration (Groupe Hémisphères, en cours).

Le tronçon de la rivière Goodwood qui a fait l'objet d'un survol présente les caractéristiques nécessaires à la nidification de l'arlequin plongeur. Toutefois, Robert (2002) mentionne qu'une bonne partie de la population nicheuse au Québec niche plus au nord, soit au Nunavik et dans le nord du Labrador.

4.3.2 Pygargue à tête blanche

Un pygargue à tête blanche a été observé dans l'aire d'étude. Il survolait le lac Harris et se dirigeait vers la tourbière à l'est du lac Harris. Le fait que le site possède plusieurs plans d'eau de bonnes dimensions, propices comme sites de pêche, et une section forestière mature avec des épinettes noires de haute taille, rend possible la nidification de l'espèce dans l'aire d'étude. Toutefois, malgré le survol en

hélicoptère du territoire, aucun nid actif n'a été localisé, sauf un nid très ancien d'espèce indéterminée. Bird et Henderson (1995) mentionnent, qu'en période de nidification, le pygargue occupe un vaste domaine vital se situant entre 10 à 15 km^2 et pouvant atteindre jusqu'à 65 km^2. Il est donc possible que l'aire d'étude chevauche le domaine vital de l'individu observé. Le cas échéant, son lieu de nidification serait éloigné d'au moins 4 km, soit le rayon de la zone tampon utilisée pour l'inventaire de la migration des oiseaux.

4.3.3 Hibou des marais

Des survols à très basse altitude en hélicoptère au-dessus des grands fens en bordure des lacs Harris et Gillespie A et le parcours à pied de certains secteurs de ces milieux humides n'ont pas permis de confirmer la présence du hibou des marais durant la période de nidification. Toutefois, cette espèce avait été observée durant les inventaires printaniers dans l'aire d'étude. Par contre, il ne s'avère pas possible de déterminer si l'espèce y niche.

Le hibou des marais est une espèce qui est difficile à détecter en période de nidification. Le nid est construit sur le sol dans des herbacées d'une hauteur d'environ 45 cm, ce qui le rend difficilement visible (Wiggins *et al.*, 2006). Les individus restent généralement au sol, mais le mâle défend le nid lorsque des prédateurs s'en approchent (Wiggins *et al.*, 2006).

4.3.4 Quiscale rouilleux

Le quiscale rouilleux a été entendu à 21 reprises lors des inventaires des stations. Ces observations ont toutes été effectuées dans les milieux humides. De plus, des adultes de l'espèce ont été observés au vol avec de la nourriture dans le bec, ce qui révèle qu'ils allaient nourrir des oisillons au nid. Cela confirme la nidification de l'espèce dans l'aire d'étude. D'après la densité observée et la superficie de son habitat, son abondance est estimée à environ une vingtaine de couples nicheurs.

4.4 Espèces d'intérêts

En plus des espèces à statut précaire, les inventaires ont révélé la présence de sept espèces aviaires d'intérêt qui, selon David (1996), possèdent pour l'ensemble du Québec un attribut de nicheur peu commun à rare (tableau 3).

Tableau 3. Espèces aviaires d'intérêt observées dans l'aire d'étude

NOM FRANÇAIS	NOM SCIENTIFIQUE	NOM ANGLAIS	ATTRIBUT
Macreuse à bec jaune	*Melanitta americana*	Black Scoter	Nicheur migrateur peu commun
Bécassin roux	*Limnodromus griseus*	Short-Billed Dowitcher	Nicheur migrateur rare
Phalarope à bec étroit	*Phalaropus lobatus*	Red-necked Phalarope	Nicheur migrateur rare
Sterne arctique	*Sterna paradisaea*	Artic Tern	Nicheur migrateur peu commun
Chouette épervière	*Surnia ulula*	Northern Hawk Owl	Nicheur résident rare
Jaseur boréal	*Bombycilla garrulus*	Bohemian Waxwing	Nicheur migrateur
Durbec des sapins	*Pinicola enucleator*	Pine Grosbeak	Nicheur résident peu commun

On remarque la présence de trois espèces nicheuses considérées comme rares au Québec : le bécassin roux (*Limnodromus griseus*), le phalarope à bec étroit (*Phalaropus lobatus*) et la chouette épervière (*Surnia ulula*).

La population de l'Est du bécassin roux est une sous-espèce distincte (*Limnodromus griseus griseus)* qui niche dans le centre nord du Québec et l'ouest du Labrador, approximativement du 52^{e} de latitude Nord au sud jusqu'à la baie d'Ungava au nord, de la Baie-James et du sud-est de la baie d'Hudson à l'ouest jusqu'au centre du Labrador à l'est (Godfrey, 1986; Cotter, 1995). Nichant dans les tourbières, son aire de nidification est relativement vaste dans le nord du Québec. Cependant, on recense peu de confirmations de nidification de l'espèce au Québec. Le nombre élevé d'observations porte à croire que l'aire d'étude est une zone d'importance pour l'espèce. L'inventaire rapporte 12 observations qui incluaient des vols nuptiaux. Ces indices confirment la nidification du bécassin roux dans l'aire d'étude selon les critères de l'Atlas des oiseaux nicheurs du Québec (Annexe I).

Le phalarope à bec étroit n'est pas considéré comme une espèce à statut précaire. Toutefois, le COSEPAC l'a mis sur la liste des espèces candidates à évaluation prioritaire afin de mieux connaître sa situation (COSEPAC, 2011). Son statut au niveau mondial est le suivant : Classée comme *espèce très préoccupante* par le Comité technique sur les oiseaux de rivage d'Environnement Canada; classée comme *espèce modérément préoccupante (Moderate Concern)* dans le Plan canadien de conservation des oiseaux de rivage et le U.S. Shorebird Conservation Plan; sur la liste rouge de l'UICN (Union internationale pour la conservation de la nature) avec statut *préoccupation mineure*, vraisemblablement en raison de la grande population mondiale (pour un oiseau de rivage) et de l'aire de reproduction étendue. Selon les données du COSEPAC, le pourcentage de l'aire de répartition mondiale au Canada est d'environ 74 % de l'aire de reproduction nord-américain, alors que 60 % de la population mondiale se trouvent au Canada (COSEPAC, 2011).

La chouette épervière est définie comme une espèce de la forêt boréale (Bombardier et Gauthier, 1995). Durant la période de nidification, cette chouette fréquente les forêts de conifères claires, les tourbières et d'autres milieux ouverts, des milieux fréquemment observés dans l'aire d'étude. Encore une fois, le fait que l'espèce niche dans des secteurs peu fréquentés rend la confirmation de nidification peu fréquente. De plus, on mentionne que l'espèce niche rarement deux fois au même endroit.

La sterne arctique a été confirmée nicheuse dans l'aire d'étude. Un adulte a été trouvé sur son nid. Il n'existe pas de statut particulier au Québec pour cette espèce et aucune désignation particulière par le COSEPAC. Toutefois, le Conseil canadien pour la conservation des espèces en péril (CCCEP, 2011) mentionne que l'espèce est considérée comme sensible à Terre-Neuve-et-Labrador.

4.5 Oiseaux aquatiques

Les inventaires effectués au début de juillet 2011 ont permis de distinguer 16 espèces d'oiseaux aquatiques (tableau 4). L'observation d'un fuligule n'a pu permettre de déterminer clairement l'espèce, il est donc classé comme fuligule sp.

Dans ce groupe d'oiseaux, on distingue quatre familles d'oiseaux : les anatidés (canards et oies), les scolopacidés (limicoles), les gaviidés (plongeon huard) et les laridés (goélands et sternes). Chez les limicoles, le bécasseau minuscule (*Calidris minutilla)*, le bécassin roux et la bécassine de Wilson (*Gallinago delicata)* sont très fréquents dans l'aire d'étude. Ces espèces ont toutes été observées à plus de dix reprises. La sterne arctique est l'espèce la plus fréquemment observée et la seule dont nous avons pu observer un adulte sur un nid (figure 4).

Tableau 4. Liste des oiseaux aquatiques observés

NOM FRANÇAIS	NOM SCIENTIFIQUE	NOM ANGLAIS	NOMBRE D'OBSERVATIONS	NIVEAU DE CERTITUDE DE LA NIDIFICATION
Bernache du Canada	*Branta canadensis*	Canada Goose	6	Confirmée
Fuligule milouinan	*Aythya marila*	Greater Scaup	1	Possible
Fuligule sp.	*Aythya sp.*	Scaup sp.	1	Possible
Macreuse à front blanc	*Melanitta perspicillata*	Surf Scoter	1	Possible
Macreuse à bec jaune	*Melanitta americana*	Black Scoter	2	Possible
Grand harle	*Mergus merganser*	Common Merganser	2	Possible
Harle huppé	*Mergus serrator*	Red-breasted Merganser	5	Possible
Plongeon huard	*Gavia immer*	Common Loon	5	Possible
Grand chevalier	*Tringa melanoleuca*	Greater Yellowlegs	8	Probable
Chevalier solitaire	*Tringa solitaria*	Solitary Sandpiper	3	Possible
Bécasseau minuscule	*Calidris minutilla*	Least Sandpiper	12	Confirmée
Bécassin roux	*Limnodromus griseus*	Short-Billed Dowitcher	12	Confirmée
Bécassine de Wilson	*Gallinago delicata*	Wilson's Snipe	13	Probable
Phalarope à bec étroit	*Phalaropus lobatus*	Red-necked Phalarope	4	Possible
Goéland argenté	*Larus argentatus*	Herring Gull	6	Possible
Sterne arctique	*Sterna paradisaea*	Artic Tern	21	Confirmée

Figure 4. Sterne arctique sur son nid

4.6 Oiseaux de proie

Quatre espèces d'oiseaux de proie ont été observées dans l'aire d'étude (tableau 5). À l'exception de la buse à queue rousse (*Buteo jamaicensis)*, elles ont toutes été observées à une seule occasion. Les oiseaux de proie diurnes ont pu être identifiés visuellement en vol alors qu'ils survolaient les alentours du lac Harris. Pour ce qui est des oiseaux de proie nocturnes (strigidé), seule la chouette épervière a été repérée, mais seulement au son même s'il était possible de la voir en activité durant le jour. Il est donc possible que cette mention soit inexacte puisque les cris de certaines espèces se ressemblent.

Tableau 5. Liste des oiseaux de proie observés

NOM FRANÇAIS	NOM SCIENTIFIQUE	NOM ANGLAIS	NOMBRE D'OBSERVATIONS	NIVEAU DE CERTITUDE DE LA NIDIFICATION
Balbuzard pêcheur	*Pandion haliaetus*	Osprey	1	Possible
Pygargue à tête blanche	*Haliaeetus leucocephalus*	Bald Eagle	1	Non nicheur
Buse à queue rousse	*Buteo jamaicensis*	Red-tailed Hawk	5	Possible
Chouette épervière	*Surnia ulula*	Northern Hawk Owl	1	Possible

4.7 Passereaux et autres oiseaux terrestres

Au total, 31 espèces de passereaux et 2 autres espèces terrestres, en sus d'un pic qui n'a pu être spécifié, ont été recensées durant les inventaires. Outre les passereaux et le pic, ce sont le tétras du Canada et le lagopède des saules (*Lagopus lagopus*) qui complètent le tableau des espèces terrestres observées dans l'aire d'étude. Le tétras du Canada a été observé seulement dans la forêt de conifères, tandis que le lagopède des saules a été observé seulement dans la toundra.

Les espèces terrestres suivantes ont été observées seulement hors du rayon limité ou lors des déplacements des observateurs : lagopède des saules, tétras du Canada, moucherolle à ventre jaune (*Empidonax flaviventris*), grand corbeau (*Corvus corax*), roitelet à couronne dorée (*Regulus satrapa*), alouette hausse-col (*Eremophila alpestris*) et paruline obscure (*Oreothlypis peregrina*). Il est possible que ces espèces utilisent l'aire d'étude pour la nidification. Un nid abandonné de grand corbeau a été trouvé dans une crevasse lors de l'inventaire des oiseaux migrateurs du printemps.

4.7.1 Espèces à l'intérieur du rayon de 50 m

L'inventaire aux stations a permis de confirmer la présence de couples nicheurs appartenant à 24 espèces de passereaux et autres espèces terrestres qui se retrouvaient à l'intérieur du rayon de 50 m. Parmi ces espèces, certaines se démarquent par leur abondance relative, comme la grive à joues grises (*Catharus minimus*), la paruline rayée (*Setophaga striata)*, le bruant hudsonien (*Spizella arborea*), le bruant à couronne blanche (*Zonotrichia leucophrys*) et le quiscale rouilleux. Ce dernier se concentre principalement dans les milieux humides. En effet, les résultats d'inventaire montrent que le quiscale rouilleux représente 1,22 couple par station dans les milieux humides (tableau 6).

Tableau 6. Nombre total et nombre moyen de couples nicheurs d'oiseaux terrestres par station par biotope

ESPÈCE		MILIEU HUMIDE		FORÊT DE CONIFÈRES		ARBUSTAIE		TOUNDRA	
	NB TOTAL DE STATION	9		25		7		10	
Nom français	Niveau de certitude de la nidification	nb	Moy./Station	nb	Moy./station	nb	Moy./station	nb	Moy./station
Pic sp.	s.o.			1	0,04				
Mésangeai du Canada	Confirmé	1	0,11	6	0,24				
Hirondelle bicolore	Probable	2	0,22			1	0,14		
Mésange à tête brune	Possible			2	0,08				
Roitelet à couronne rubis	Probable	2	0,22	6	0,24	1	0,14		
Grive à joues grises	Probable	5	0,56	11	0,44	6	0,86		
Grive solitaire	Possible			1	0,04				
Merle d'Amérique	Confirmé	1	0,11	7	0,28			4	0,40
Pipit d'Amérique	Probable							4	0,40
Paruline sp.	s.o.	1	0,11	1	0,04				
Paruline jaune	Possible	1	0,11						
Paruline à croupion jaune	Probable	2	0,22	6	0,24	1	0,14		
Paruline à courrone rousse	Probable			5	0,20				
Paruline rayée	Confirmé	1	0,11	15	0,60			1	0,10
Paruline des ruisseaux	Confirmé	3	0,33	7	0,28	2	0,29		
Paruline à calotte noire	Probable			1	0,04				
Bruant hudsonien	Confirmé	9	1,00	6	0,24	5	0,71	5	0,50
Bruant des prés	Possible	3	0,33						
Bruant fauve	Probable			7	0,28	3	0,43	3	0,30
Bruant de Lincoln	Possible	1	0,11						
Bruant à gorge blanche	Probable			2	0,08	1	0,14		
Bruant à cour. blanche	Probable	1	0,11	3	0,12	4	0,57	7	0,70
Junco ardoisé	Probable			9	0,36				
Quiscale rouilleux	Confirmé	11	1,22	1	0,04	1	0,14		
Durbec des sapins	Possible	2	0,22	3	0,12				
Sizerin flammé	Probable	1	0,11	2	0,08				

Les calculs effectués par catégorie de biotope font état d'une densité assez variable selon le biotope. Les calculs tiennent compte que les stations des milieux humides ont été visitées deux fois. Le tableau 7 montre que la densité des couples nicheurs est maximale dans la forêt de conifères et les milieux humides alors qu'elle est beaucoup moindre dans le biotope de la toundra.

Tableau 7. Densité des couples nicheurs selon le biotope

BIOTOPE	DENSITÉ DES COUPLES NICHEURS (nb/ha)
Milieu humide	4,41
Forêt de conifères	4,26
Arbustaie	3,64
Toundra	2,55

4.7.2 Espèces selon toutes méthodes confondues

Onze espèces de passereaux ont fait l'objet de 20 observations ou plus (tableau 8). Les deux espèces les plus fréquemment observées sont la grive à joues grises et le bruant hudsonien. L'abondance est traitée à la prochaine section. Le bruant à couronne blanche et le merle d'Amérique (*Turdus migratorius*) ont été observés dans les quatre biotopes inventoriés. C'est dans la forêt de conifères que l'on retrouve le plus d'espèces terrestres, avec une vingtaine de passereaux.

Tableau 8. Liste des oiseaux terrestres les plus fréquemment observés

NOM FRANÇAIS	NOM SCIENTIFIQUE	NOM ANGLAIS	NOMBRE D'OBSERVATIONS
Grive à joues grises	*Catharus minimus*	Gray-cheecked Thrush	53
Merle d'Amérique	*Turdus migratorius*	American Robin	30
Paruline à croupion jaune	*Setophaga coronata*	Yellow-rumped Warbler (Myrtle Warbler)	20
Paruline rayée	*Setophaga striata*	Blackpoll Warbler	29
Paruline des ruisseaux	*Parkesia noveboracencis*	Northern Waterthrush	27
Bruant hudsonien	*Spizella arborea*	American Tree Sparrow	50
Bruant fauve	*Passerella iliaca*	Fox Sparrow	22
Bruant à couronne blanche	*Zonotrichia leucophrys*	White-crowned Sparrow	37
Junco ardoisé	*Junco hyemalis*	Dark-eyed Junco (Slate-colored Junco)	32
Quiscale rouilleux	*Euphagus carolinus*	Rusty Blackbird	21
Sizerin flammé	*Carduelis flammea*	Common Redpoll	28

5 CONCLUSION

La richesse estimée de l'aire d'étude est de 54 espèces d'oiseaux et toutes étaient déjà connues comme nicheur confirmé, probable ou possible dans le Nord-du Québec (David, 1996). Un total de 4 espèces d'oiseaux de proie, 16 espèces d'oiseaux aquatiques et 33 espèces d'oiseaux terrestres ont été observées et identifiées. L'inventaire par la méthode du DRL a permis de détecter des couples nicheurs appartenant à 24 espèces d'oiseaux terrestres. La densité des couples est la plus grande dans la forêt de conifères et les milieux humides.

Dans l'ensemble, le niveau de certitude de la nidification de la majorité des espèces d'oiseaux fréquentant l'aire d'étude durant l'inventaire est celui de confirmé ou de probable. La plupart des espèces exclues comme nicheuses sont des oiseaux de proie.

Une espèce à statut précaire a été confirmée nicheuse, il s'agit du quiscale rouilleux. Un plan de mitigation a été élaboré pour un autre projet minier de la région afin protéger la zone riparienne utilisée par le quiscale rouilleux pendant la période de nidification (Groupe Hémisphères, 2011). Il est basé sur la protection du couvert végétal englobant les différentes strates végétales ce qui inclut les plantes herbacées, les arbustes et les arbres adjacents au plan d'eau ou au milieu humide (Gagnon et Gangbazo, 2007). Un tel plan devrait être adapté pour le présent projet.

Les milieux humides semblent représenter un milieu important pour l'avifaune dans l'aire d'étude. Un total de 32 espèces a été détecté dans ce biotope comparativement à 25 espèces dans la forêt de conifères, à 12 espèces pour l'arbustaie et à 5 espèces dans la toundra.

6 RÉFÉRENCES

Communications personnelles

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Cartes et bases de données consultées

AVIBASE. Listes d'oiseaux mondiales, Newfoundland-Labrador. Site internet: http://avibase.bsc-eoc.org/checklist.jsp? region=canl&list=howardmoore

BNDT [Base nationale de données topographiques]. Secteur des sciences de la terre de Ressources naturelles Canada.

CDPNQ [Centre de données sur le patrimoine naturel du Québec] Direction du développement de la faune, Ministère des Ressources naturelles et de la Faune.

OTDD [Observations de la Terre pour le développement durable des forêts]. Service canadien des forêts de Ressources naturelles Canada.

SOS-POP [Les oiseaux en péril du Québec]. Banque informatisée des sites importants pour la conservation des oiseaux en péril. Regroupement Québec Oiseaux et Service canadien de la faune d'Environnement Canada.

Bibliographie

AOU [American Ornithologists' Union] (2011) *Check-list of North American Birds, 7th edition, 52nd supplement*. North American Classification Committee, American Ornithologists' Union. Site internet : http://www.aou.org/checklist/north/

Bélanger, L. et M. Bombardier (1995) *Hibou des marais* pp. 610-613 dans Gauthier, J. et Y. Aubry (sous la direction de) (1995) *Les oiseaux nicheurs du Québec : Atlas des oiseaux nicheurs du Québec méridional*, Association québécoise des groupes d'ornithologues, Société québécoise de protection des oiseaux, Service canadien de la faune, Environnement Canada, région du Québec, Montréal, xviii + 1295 p.

Bibby, C.J., N.D. Burgess, et D.A. Hill (1992) *Bird census techniques*. British Trust for Ornithology and Royal Society for the Protection of Birds, Academic Press, London, 257 p.

Bird, D.M. (1997) *Rapport sur la situation du faucon pèlerin (*Falco peregrinus*) au Québec*. Ministère de l'Environnement et de la Faune, Direction de la faune et des habitats. 76 p.

Bird, D.M. et D. Henderson (1995) *Pygargue à tête blanche* pp. 364-367 dans Gauthier, J. et Y. Aubry (sous la direction de) (1995) *Les oiseaux nicheurs du Québec : Atlas des oiseaux nicheurs du Québec méridional*, Association québécoise des groupes d'ornithologues, Société québécoise de protection des oiseaux, Service canadien de la faune, Environnement Canada, région du Québec, Montréal, xviii + 1295 p.

Blondel, J., C. Ferry et B. Frochot. (1981) Point counts with unlimited distance. Pages 414-420 in C.J. Ralph et J.M. Scott, éd. Estimating the numbers of terrestrial birds. Studies in Avian Biology No 6.

Brodeur, S. et F. Morneau (1999) *Rapport sur la situation de l'aigle royal (*Aquila chrysaetos*) au Québec*. Société de la faune et des parcs du Québec, Direction de la faune et des habitats. 75 p.

CCCEP [Conseil canadien pour la conservation des espèces en péril] (2011) *Wild species/les espèces sauvages*. , site internet : www.wildspecies.qc.ca, consulté en décembre 2011

COSEPAC, [Comité sur la situation des espèces en péril au Canada] (2011) Site internet : http://www.cosewic.gc.ca/fra/sct1/SearchResult_f.cfm?commonName=scienceName=&boxTaxonomic=2&location=6&Submit=Soumettre, consulté en décembre 2011

COSEPAC (2011) *Faucon pèlerin anatum/tundrius*. Site internet : http://www.cosewic.gc.ca/fra/sct1/searchdetail_f.cfm?id=995&StartRow=1&boxStatus=All&boxTaxonomic=All&location=All&change=All&board=4&commonName=&scienceName=&returnFlag=0&Page=1, consulté en décembre 2011

Cotter, R.C. (1995) Bécasseau roux, pp. 488-491 dans Gauthier, J. et Y. Aubry (sous la direction de). *Les oiseaux nicheurs du Québec : Atlas des oiseaux nicheurs du Québec méridional*. Association québécoise des groupes d'ornithologues, Société québécoise de protection des oiseaux, Service canadien de la faune, Environnement Canada, région du Québec, Montréal.

David, N. (1996) *Liste commentée des oiseaux du Québec.* Association québécoise des groupes d'ornithologues. 89 p. et 5 annexes + carte

Environment and Conservation (2011) *Species at risk. Department of Environment and Conservation, Newfoundland and Labrador.* Internet Site: http://www.env.gov.nl.ca/env/wildlife/endangeredspecies/index.html, Consulted on November 2011

Fradette, P. (1998*) Inventaire de la population nicheuse du Pygargue à tête blanche au Québec*. Association québécoise des groupes d'ornithologues. Rapport présenté à la Direction de la faune et des habitats, ministère de l'Environnement et de la Faune du Québec, Fondation de la faune du Québec, Service canadien de la faune et Société québécoise de protection des oiseaux. 43 p.

Gagnon, É. et G. Gangbazo (2007) *Efficacité des bandes riveraines: analyse de la documentation scientifique et perspectives.* Québec, ministère du Développement durable, de l'Environnement et des Parcs, Direction des politiques de l'eau, ISBN: 978-2-550-49213-9, 17 p.

Gauthier, J. et Y. Aubry (sous la direction de) (1995) *Les oiseaux nicheurs du Québec : Atlas des oiseaux nicheurs du Québec méridional*, Association québécoise des groupes d'ornithologue, Société québécoise de protection des oiseaux, Service canadien de la faune, Environnement Canada, région du Québec, Montréal, xviii + 1295 p.

Gerrard, J.M. et G.R. Bertolotti (1988) Pygargue à tête blanche, pp. 364-367 dans Gauthier, J. et Y. Aubry (sous la direction de). *Les oiseaux nicheurs du Québec : Atlas des oiseaux nicheurs du Québec méridional*. Association québécoise des groupes d'ornithologues, Société québécoise de protection des oiseaux, Service canadien de la faune, Environnement Canada, région du Québec, Montréal.

Godfrey, W.E. (1986) *Les oiseaux du Canada,* édition revisée, Éditions Broquet, Musée national des sciences naturelles, 650 p.

Golder Associates Ltd and Global Environnement (2005) *Breeding Bird Data Collection in the Howells River Basin of Labrador*. Submitted to LabMag GP Inc.

Groupe Hémisphères (en cours) *Migrating Bird Survey for the KéMag Project. Preliminary Technical Report submitted to New Millennium Iron Corp*

Groupe Hémisphères (2011) *Plan de mitigation pour la protection du Quiscale rouilleux, Projet DSO*. Rapport réalisé par le Groupe Hémisphères inc. pour New Millennium Capital Corp., 13 p.

Groupe Hémisphères (2009) *Inventaire 2008 et 2009 des oiseaux nicheurs du futur site DSO*. Rapport technique réalisé pour New Millennium Capital Corp., 22 p et 4 annexes

Guérette M.A., E. Berthiaume, M. Darveau, S. Cumming, D. Bordage, S. Lapointe et L.V. Lemelin (2009) *Répartition de la sauvagine en période de nidification entre les 51º et 58º de latitude nord dans la province de Québec*. Rapport technique n° Q14, Canards Illimités Canada – Québec, Québec, 43 p.

Hanson, A., I. Goudie, A. Lang, C. Gjerdrum, R. Cotter et G. Donaldson (2009) *Cadre pour l'évaluation scientifique des impacts potentiels des projets sur les oiseaux*. Service canadien de la faune, Environnement Canada. Série de rapport technique No 508. Région de l'Atlantique, 69 p

Holt, D. W. et S. M. Leasure (1993) *Short-eared Owl (*Asio flammeus*)*. In The Birds of North America, No. 62 (A. Poole et F. Gill, éd..). The Birds of North America, inc., Philadelphie.

Hydro-Québec (1992) *Vocabulaire des études environnementales*. Publication réalisée par Vice-présidence Environnement en collaboration avec Vice-présidence Communications et Relations publiques, 2e édition, 137 p.

Lepage, D. (2011) *Liste des oiseaux observés au Québec*. Site internet : http://www.oiseauxqc.org/listeannotee.jsp

Lessard, S. (1996) *Rapport sur la situation du pygargue à tête blanche (*Haliaeetus leucocephalus*) au Québec*. Ministère de l'Environnement et de la Faune, Direction de la faune et des habitats. 73 p.

Kaufman, K. (1996) *Lives of North American Birds*. Houghton Mifflin, Boston, 673 p.

McGrady, M.J., S.J. Petty et D.R.A. Mcleod (2004) *Potential impacts of new native woodland expansion on golden eagles in Scotland.* Scottish Natural Heritage Commission Report No. 018 (ROAME No F99LD01).

Morneau, F., M. Robert, J.-P. Savard, P. Lamothe, M. Laperle, N. D'Astous, S. Brodeur et R. Décarie (2008*) Abundance and distribution of Harlequin Ducks in the Hudson Bay and James Bay area, Québec*. Waterbirds 31:110-121. Sp. Iss. 2

Morneau, F. (2003) *Aménagement hydroélectrique de la Sainte-Marguerite-3. Suivi de l'avifaune 1994-2002 – phase construction. Faune aviaire* ; rapport synthèse présenté à Hydro-Québec. Montréal: xii, 91 p.

Morneau, F., S. Brodeur, R. Décarie, S. Carrière, and D. M. Bird (1994) *Abundance and distribution of nesting Golden Eagles in Hudson Bay, Quebec*. J. Raptor Res. 28:220-225

MRNF [Ministère des Ressources naturelles et de la Faune] (2011) *Liste des espèces de la faune désignées menacées ou vulnérables.* Site internet : http://www3.mrnf.gouv.qc.ca/faune/especes/menacees/liste.asp, consulté en novembre 2011

Nadeau, C. (1995) *Quiscale rouilleux* pp. 1040-1043 dans Gauthier, J. et Y. Aubry (sous la direction de) (1995) *Les oiseaux nicheurs du Québec : Atlas des oiseaux nicheurs du Québec méridional*, Association québécoise des groupe d'ornithologues, Société québécoise de protection des oiseaux, Service canadien de la faune, Environnement Canada, région du Québec, Montréal, xviii + 1295 p.

Paquin, J, et G. Caron (1998) *Oiseaux du Québec et des maritimes*, Éditions Michel Quintin, Waterloo, Qc, 390 p.

Parent, S. (1990) *Dictionnaire des sciences de l'environnement*. Éditions Broquet, Ottawa, On, 748 p.

Robert, M. (2002) *Le lutin des prairies humides*, p. 51-53 dans Les espèces en péril. QuébecOiseaux hors série, volume 14

Robert, M. (1995) Canard arlequin, p. 320-323 dans Gauthier, J. et Y. Aubry (sous la direction de). *Les oiseaux nicheurs du Québec : Atlas des oiseaux nicheurs du Québec méridional*. Association

québécoise des groupes d'ornithologues, Société québécoise de protection des oiseaux, Service canadien de la faune, Environnement Canada, région du Québec, Montréal.

Sibley, D.A. (2000) *The Sibley Guide to Birds.* Knopf, New York, 545 p.

Tjernberg, M. (1983) *Prey abundance and reproductive success of the Golden Eagles* Aquila chrysaetos *in Sweden*. Holarctic Ecology 6:17-23.

Todd, W. E. C. (1963) *Birds of the Labrador Peninsula and Adjacent Areas*. Univ. of Toronto Press, Toronto

Whitfield, D.W.A., D.W. Davis, J.M. Gerrard et W.J. Maher (1969) *Golden eagles in central Saskatchewan*. Blue Jay 27:74-79

Whitford, J. (January 2003) *Waterfowl Component Study Trans Labrador Highway (Happy Valley-Goose Bay to Cartwright Junction).* Project no. Nfs08243 presented to Department of Works, Services and Transportation, NFL, 53 p. and 3 appendices

Wiggins, D. A., D. W. Holt and S. M. Leasure (2006) *Short-eared Owl (Asio flammeus),* The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/062

ANNEXES

Annexe I

Indices de nidification et certitude de nidification associée

INFORMATION PROVENANT DU PROTOCOLE DE L'ATLAS DES OISEAUX NICHEURS DU QUÉBEC

X Espèce observée pendant sa période de reproduction, mais dans un habitat non propice à sa nidification (aucun indice de nidification).

NIDIFICATION POSSIBLE

H Espèce observée pendant sa période de reproduction dans un habitat de nidification propice.

S Individu chantant ou sons associés à la reproduction (p. ex. cris, tambourinage) entendus pendant la période de reproduction de l'espèce dans un habitat de nidification propice.

NIDIFICATION PROBABLE

M Au moins 7 individus chantant ou produisant des sons associés à la reproduction (p. ex. cris, tambourinage), entendus au cours d'une même visite pendant la période de reproduction de l'espèce dans un habitat de nidification propice.

P Couple observé pendant la période de reproduction de l'espèce dans un habitat de nidification propice.

T Territoire présumé sur la base de l'audition de chants ou de sons associés à la reproduction (p. ex. cris, tambourinage) ou de l'observation d'un oiseau adulte, deux journées différentes à au moins une semaine d'intervalle pendant la période de reproduction de l'espèce, au même endroit dans un habitat de nidification propice.

C Comportement nuptial entre un mâle et une femelle (p. ex. parade, nourrissage, copulation) ou comportement agonistique entre deux individus (p. ex. querelle, poursuite), pendant la période de reproduction de l'espèce dans un habitat de nidification propice.

V Oiseau visitant un site probable de nidification pendant la période de reproduction de l'espèce dans un habitat de nidification propice.

A Comportement agité ou cris d'alarme de la part d'un adulte pendant la période de reproduction de l'espèce dans un habitat de nidification propice.

B Plaque incubatrice ou protubérance cloacale observée sur un individu adulte capturé pendant la période de reproduction de l'espèce dans un habitat de nidification propice.

N Construction d'un nid par un troglodyte ou excavation d'une cavité par un pic.

NIDIFICATION CONFIRMÉE

CN Construction d'un nid (sauf pour les pics et les troglodytes), y compris le transport de matériel de nidification.

DD Oiseau tentant de détourner l'attention du nid ou des jeunes en simulant une blessure ou en utilisant une autre parade de diversion.

NU Nid vide ayant été utilisé dans la période de l'atlas, ou coquilles d'œufs pondus dans cette même période.

JE Jeune ayant récemment quitté le nid (espèces nidicoles) ou jeune en duvet (espèces nidifuges), incapable d'un vol soutenu.

NO Adulte occupant, quittant ou gagnant un site probable de nidification (visible ou non) et dont le comportement est révélateur d'un nid occupé.

FE Adulte transportant un sac fécal.

AT Adulte transportant de la nourriture pour un ou plusieurs jeunes.

NF Nid contenant un ou plusieurs œufs.

NJ Nid contenant un ou plusieurs jeunes (vus ou entendus).

Annexe II

Données météorologiques quotidiennes de l'aéroport de Schefferville

Environnement Canada Environment Canada Canada

Rapport de données quotidiennes pour juillet 2011

SCHEFFERVILLE A
QUEBEC

Latitude: 54°48'00,000" N Longitude: 66°48'00,000" O Altitude: 521,00 m

Identification Climat: 7117827 Identification OMM: 71828 Identification TC: YKL

Rapport de données quotidienne pour juillet 2011

Jour	Temp. max. °C	Temp. min. °C	Temp. moy. °C	DJC °C	DJR °C	Pluie tot. mm	Neige tot. cm	Précip. tot. mm	Neige au sol cm	Dir. raf. max. 10's deg	Vit. raf. max. km/h
01†	17,7	5,4	11,6	6,4	0,0	M	M	0,0		2	32
02†	14,7	9,8	12,3	5,7	0,0	M	M	4,0		1	32
03†	18,0	10,3	14,2	3,8	0,0	M	M	15,0		13	41
04†	17,5	9,2	13,4	4,6	0,0	M	M	14,5		15	35
05†	13,5	8,8	11,2	6,8	0,0	M	M	7,5		26	44
06†	10,4	3,7	7,1	10,9	0,0	M	M	0,0			<31
07†	16,2	2,7	9,5	8,5	0,0	M	M	0,0			<31
08†	18,6	9,5	14,1	3,9	0,0	M	M	0,0			<31
09†	12,1	7,1	9,6	8,4	0,0	M	M	13,0		1	32
10†	17,6	6,1	11,9	6,1	0,0	M	M	6,0			<31
11†	15,4	6,1	10,8	7,2	0,0	M	M	1,0			<31
12†	17,0	9,0	13,0	5,0	0,0	M	M	2,0		5	37
13†	18,0	7,2	12,6	5,4	0,0	M	M	0,0		36	37
14†	21,5	8,3	14,9	3,1	0,0	M	M	0,0		28	33
15†	23,7	12,3	18,0	0,0	0,0	M	M	0,0		27	33
16†	28,0	13,2	20,6	0,0	2,6	M	M	0,0		21	32
17†	21,8	12,1	17,0	1,0	0,0	M	M	5,0		3	44
18†	15,7	6,6	11,2	6,8	0,0	M	M	0,5		32	46
19†	15,6	6,0	10,8	7,2	0,0	M	M	1,5		21	50
20†	13,6	5,4	9,5	8,5	0,0	M	M	2,5		29	41
21†	14,5E	5,5E	10,0E	8,0E		M	M	3,0E		M	M
Somme				**117,3***	**2,6***	**0,0***	**0,0***	**75,5***			
Moy.	**17,2***	**7,8***	**12,5***								
Ext.	**28,0***	**2,7***								**21***	**50***

Légende
[vide] = Aucune donnée disponible
M = Données manquantes
E = Valeur estimée
A = Valeur accumulée
C = Précipitation, quantité incertaine
L = des précipitation peuvent avoir eu lieu
F = Valeur accumulée et estimée
N = Température manquante, mais > 0
Y = Température manquante, mais < 0
S = À plus d'une reprise
T = Trace
* = La valeur affichée est basée sur des données incomplètes.

† = Ces données journalières n'ont subi qu'un contrôle de qualité préliminaire

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We'd like to hear from you! Please click "Contact Us" to share your comments and suggestions.

Date Modified: 2011-05-18

Annexe III

Reportage photographique

Biotope : Forêt de conifère

Bruant à couronne blanche

Biotope : Arbustaie

Biotope : Toundra

Merle d'Amérique

Biotope : Milieu humide

Bécassin roux

Grand Chevalier

Phalarope à bec étroit

Lacs et rivières

Annexe IV

Liste des espèces observées

Liste de toutes les espèces observées pendant la nidification

*** indique une espèce à statut au sens de la Loi canadienne ou québécoise

Code et statut		Nom français	Nom anglais	Nom latin
PLHU	NM, HE(4)	Plongeon huard	Common Loon	*Gavia immer*
BECA	N, H	Bernache du Canada	Canada Goose	*Branta canadensis*
PYTB	NM, H ***	Pygargue à tête blanche	Bald Eagle	*Haliaeetus leucocephalus*
LASA	NM	Lagopède des saules	Willow Ptarmigan	*Lagopus lagopus*
GRCH	NM	Grand Chevalier	Greater Yellowlegs	*Tringa melanoleuca*
CHSO	NM	Chevalier solitaire	Solitary Sandpiper	*Tringa solitaria*
BEMI	NM	Bécasseau minuscule	Least Sandpiper	*Calidris minutilla*
BERO	M (N)	Bécassin roux	Short-billed Dowitcher	*Limnodromus griseus*
BEWI	N, H	Bécassine de Wilson	Wilson's Snipe	*Gallinago delicata*
PHBE	M (N)	Phalarope à bec étroit	Red-necked Phalarope	*Phalaropus lobatus*
GOAR	R	Goéland argenté	Herring Gull	*Larus argentatus*
STAR	NM	Sterne arctique	Arctic Tern	*Sterna paradisaea*
CHEP	R	Chouette épervière	Northern Hawk Owl	*Surnia ulula*
SPPI		Picidé sp. (pic)	Woodpecker	-
MOVJ	NM	Moucherolle à ventre jaune	Yellow-bellied Flycatcher	*Empidonax flaviventris*
ALHC	NM	Alouette hausse-col	Horned Lark	*Eremophila alpestris*
HIBI	NM	Hirondelle bicolore	Tree Swallow	*Tachycineta bicolor*
MECA	R	Mésangeai du Canada	Gray Jay	*Perisoreus canadensis*
GRCO	R	Grand Corbeau	Common Raven	*Corvus corax*
METB	R	Mésange à tête brune	Boreal Chickadee	*Poecile hudsonicus*
ROCD	R	Roitelet à couronne dorée	Golden-crowned Kinglet	*Regulus satrapa*
ROCR	NM, HE(4)	Roitelet à couronne rubis	Ruby-crowned Kinglet	*Regulus calendula*
GRJG	M (N)	Grive à joues grises	Gray-cheeked Thrush	*Catharus minimus*
GRSO	N, H	Grive solitaire	Hermit Thrush	*Catharus guttatus*
MEAM	NM	Merle d'Amérique	American Robin	*Turdus migratorius*
PIAM	NM	Pipit d'Amérique	American Pipit	*Anthus rubescens*
SPPA		Paruline sp.	Warbler	-
PAJA	NM	Paruline jaune	Yellow Warbler	*Setophaga petechia*
PACJ	N, H	Paruline à croupion jaune	Yellow-rumped Warbler	*Setophaga coronata*
PACR	NM	Paruline à couronne rousse	Palm Warbler	*Setophaga palmarum*
PARA	NM	Paruline rayée	Blackpoll Warbler	*Setophaga striata*
PARU	NM	Paruline des ruisseaux	Northern Waterthrush	*Parkesia noveboracensis*
PACN	NM	Paruline à calotte noire	Wilson's Warbler	*Cardellina pusilla*
BRHU	H (N)	Bruant hudsonien	American Tree Sparrow	*Spizella arborea*
BRPR	NM, HE(2)	Bruant des prés	Savannah Sparrow	*Passerculus sandwichensis*
BRFV	NM, HE(4)	Bruant fauve	Fox Sparrow	*Passerella iliaca*
BRLI	NM, HE(2)	Bruant de Lincoln	Lincoln's Sparrow	*Melospiza lincolnii*
BRGB	N, H	Bruant à gorge blanche	White-throated Sparrow	*Zonotrichia albicollis*
BRCB	NM, HE(18	Bruant à couronne blanche	White-crowned Sparrow	*Zonotrichia leucophrys*
JUAR	N, H	Junco ardoisé	Dark-eyed Junco	*Junco hyemalis*
QURO	NM ***	Quiscale rouilleux	Rusty Blackbird	*Euphagus carolinus*
DUSA	R	Durbec des sapins	Pine Grosbeak	*Pinicola enucleator*
SIFL	R	Sizerin flammé	Common Redpoll	*Acanthis flammea*

Liste de toutes les espèces observées pendant la nidification

*** indique une espèce à statut au sens de la Loi canadienne ou québécoise

Code et statut	Nom français	Nom anglais	Nom latin

Les codes suivants ont été utilisés pour décrire le statut et l'abondance de chaque espèce :

D - Espèce disparue / Extinct species
H - Hivernant
M - Migrateur / migrant
N - Nicheur confirmé / confirmed breeder
(N)- Nicheur limité au nord du Québec/ breeder in northern Québec
R - Résident / resident
V - Visiteur / visitor
OC - Espèce exotique (origine captive) / Exotic species
XX - Espèce non-retenue / Rejected species

c - commun / common : Observé à tous les ans au Québec, habituellement en bon nombre. Relativement facile à observer sous les bonnes conditions (endroit et période).
o - occasionnel / occasional : Observé à pratiquement tous les ans au Québec. Cependant pas facile à observer, même sous des conditions favorables.
r - rare / rare : Jamais plus de quelques mentions par an pour tout le Québec, souvent moins. Difficile à observer en tout temps. Parfois imprévisible.
e - présence exceptionnelle / Exceptional (nombre de mentions / nb. mentions) : Totalement imprévisible. Peut ne pas être observés pendant de longues périodes (plusieurs années).
- espèce non-documentée / undocumented species espèce pour laquelle il n'existe pas de mentions documentées par une photo ou un spécimen (ou pour laquelle la documentation a été jugée insuffisante).
? - statut incertain / uncertain status
x - extirpé / extirpated : Espèce disparue ou qui n'est plus observé au Québec depuis longtemps.

Source : David (1996) et Lepage (2011)

GroupeHemispheres

Migrating Birds Survey for the LabMag Project Mine Site, Spring and Fall 2011

NEW MILLENNIUM IRON

TATA

Technical Report

Our file: PR85-34-11

Your order: NML-00-2064

May 16, 2012

info@hemis.ca

QUÉBEC : 57, chemin du Domaine, Beaumont (Qc) G0R 1C0 418 649-3641

MONTRÉAL : 1453, rue Beaubien Est, suite 301, Montréal (Qc) H2G 3C6 514 509-6572

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Subcontractor

Sikumiut Environmental Management Ltd	Juliana Coffey, Biologist, Fieldwork in spring
	Leroy Metcalfe, Senior Biologist, Advisor
Héli-Nation	Helicopter

(Refer also to the list of personal communications in the References section)

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LIST OF ABBREVIATIONS AND SYMBOLS

^{0}C	Degrees Celsius
AOU	American Ornithologists' Union
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CWS	Canadian Wildlife Service
DSO	Direct Shipping Ore
GHI	Groupe Hémisphères
GPS	Global Positioning System
GIS	Geographic Information System
hr	Hour
km	Kilometer
km/hr	Kilometer per hour
m	Meter
min	Minute
MRNF	Ministère des Ressources naturelles et de la Faune
NML	New Millennium Iron Corp.

1 INTRODUCTION

Groupe Hémisphères (GHI) was mandated by New Millennium Iron Corp (NML) to conduct environmental studies on a future taconite mine, called the LabMag Project, located in Labrador west of Schefferville. This report describes the bird communities that were encountered there during the spring and fall migrations of 2011.

1.1 Birds Potentially Found in the Study Area

In order to properly prepare inventories, the birds potentially found in the study area need to be known. Birds are typically classified in three categories: terrestrial birds, aquatic birds and birds of prey. A brief description of these classes, including their presence in Labrador, is presented below. The study area is described in Section 2.3.

1.1.1 Terrestrial Birds

Terrestrial birds include songbirds and woodpeckers, as well as cuckoos, hummingbirds, Galliformes (partridges, grouse and ptarmigan), pigeons, doves, nighthawks, kingfishers and swifts. A total of 99 species of terrestrial birds are typically found in Labrador (AVIBASE, 2011).

1.1.2 Aquatic Birds

This group comprises the Anatidae family, including ducks, swans and geese, as well as other taxonomic groups considered aquatic birds, namely loons, grebes, cormorants, herons, cranes, rails, shorebirds, gulls and terns. AVIBASE list 96 species of birds in this category for Labrador, but 26 of them are exclusively found in marine habitats or close to the coast, so they will not be found in the study area.

1.1.3 Birds of Prey

This group comprises many taxonomic groups. Among diurnal birds of prey (Falconidae), 12 species are found regularly in Labrador. Among nocturnal birds of prey (Strigidae), 6 species of owls can be spotted in Labrador.

1.2 Species with Status

There are four species with status the distribution of which covers the study area (Table 1) (Environment and Conservation, October 2010). Some biotopes in the study area may be suitable for migrating stopovers. The survey techniques used are also designed to detect species of concern that may be present in the study area during their migrations. Eagles no longer have status under Federal legislation but they still do under Quebec legislation.

Table 1. Species with Status Potentially Found in the Study Area

COMMON NAME	SCIENTIFIC NAME	STATUS	
		Newfoundland and Labrador	Canada
Golden Eagle	*Aquila chrysaetos*	_	None
Harlequin Duck	*Histrionicus histrionicus*	Vulnerable	Special Concern
Peregrine Falcon	*Falcon peregrinus*	Endangered	Special Concern
Short-eared Owl	*Asio flammeus*	Vulnerable	Special Concern
Bald Eagle	*Haliaeetus leucocephalus*	_	None
Rusty Blackbird	*Euphagus carolinus*	_	Special Concern

1.3 Documents Consulted

The survey was designed in accordance with the current Canadian guidelines and with knowledge of the site being studied. The level of effort is considered sufficient to comply with survey requirements (Hanson *et al.*, 2009).

The following sources were consulted:

- Lists of bird species with status potentially found in the study area:
  - The federal species at risk list (COSEWIC, 2011);
  - the list of species protected under the *Endangered Species Act* of Newfoundland and Labrador (Environment and Conservation, 2011);
- Previous bird studies conducted in the vicinity of the study area:
  - *Breeding Bird Data Collection in the Howells River Basin of Labrador* (Golder Associates Ltd. and Global Environment, 2005);
  - *LabMag Iron Ore Project Waterfowl Breeding Pair Surveys* (Minaskuat Limited Partnership, 2008);
  - *Inventaire 2008 et 2009 des oiseaux nicheurs du futur site DSO* (Groupe Hémisphères, 2009);
- Previous bird studies in Labrador:
  - The Waterfowl Component Study Trans Labrador Highway (Happy Valley-Goose Bay to Cartwright Junction) report by Jacques Whitford (January 2003);
  - The Timing of Waterfowl Arrival and Dispersion during Spring Migration in Labrador, a scientific article by Chaulk and Turner (2007).

These sources gave information on:

- Species with status that may use the study area during their migrations;
- Species that are present regionally;
- Potential dates of migration for the aquatic birds.

The survey methodology took into account the information found in these sources.

2 METHODOLOGY

2.1 Validation Method

The proposed survey methodology was submitted to the Government of Newfoundland and Labrador and to the Canadian Wildlife Service (CWS) division of Environment Canada.

2.2 Classification

The English, French and Latin names of birds are based on the 7th edition and 52nd supplement to the list of birds North America (AOU, 2011).

2.3 Study Area

The NML LabMag claims area plus a buffer 3 km wide around its perimeter constitutes the study area.

2.4 Spring and Fall Migrations: Detailed Survey Techniques

Three types of surveys were performed: overland flights, short transects and adapted visits. The last two types are ground surveys done by walking. The overland flight paths and the locations of the ground surveys can be found respectively in Figures 1 and 2. Because the fall migration lasts much longer than the spring migration (Bauchinger and Klaassen, 2005), two separate visits were made in fall. The first visit, in August, targeted passerines and shorebirds, while the second, in late September, targeted geese and ducks.

A sighting refers to a bird that was heard or seen. For some groups, such as birds of prey, the number of sightings certainly overestimates the number of individuals present in the study area, because the same bird can be observed repeatedly throughout the survey period. An effort was made not to count an individual more than once on the same day.

2.4.1 Overland Flights

In the spring, waterfowl were surveyed by helicopter in a two-phase survey: one on May 21 and another on May 28, for a total of 10 hr 23 min of flight. During the fall season, waterfowl surveying by helicopter took place over three consecutive days, from September 27 to 29, for a total flight time of 6 hr 32 min. The overland flights targeted waterfowl, but all birds that could be identified were noted, including birds of prey, other aquatic birds (gulls, shorebirds, loons) and terrestrial birds.

The crew was composed of four members:

- The pilot;
- An observer-navigator, seated next to the pilot, who was responsible for maintaining the flight path. The observer-navigator recorded the GPS coordinates and entered all of the relevant bird sightings on a data observation sheet;
- An observer-identifier, seated behind the pilot, who was responsible for making bird sightings and providing information to the observer/navigator on the species, number, sex and maturity, when possible, of all birds observed on that side of the aircraft;
- A fourth observer-identifier, seated behind the observer-navigator, who was in charge of locating birds, and providing information to the observer-navigator on the species, number, sex and maturity, when possible, of all birds observed on that side of the aircraft.

On completion of the survey, the GPS coordinates unique numbers were loaded into a GIS program and merged with the observation data spreadsheets to produce a single spreadsheet combining all of the

location and sighting data. When different species were observed at the same GPS unique number, a decimal number was added to the unique number for each species seen.

Overland flights also included the following:

- All open waterbodies and wetlands were overflown to locate waterfowl and other birds near the shorelines;
- Airspeed varied between 70 and 150 km/hr and flight altitude above ground level was between 20 and 50 m (Bordage *et al.,* 1992; Guérette *et al.*, 2009);
- The number of individuals, species, sex (if possible) and age (if possible) were recorded;
- The habitats of species with status were given special attention. These include rapids for Harlequin Ducks, cliffs for Golden Eagles and Peregrine Falcons and large open boggy habitats for Short-eared Owls;
- Date and time, weather and biotope were also noted.

2.4.2 Short Transects

Short transects are used to survey terrestrial birds, mostly songbirds and woodpeckers. They are conducted as follows:

- The survey is done in the morning, in the first five hours of light, if minimum weather requirements are met;
- The survey starts at least 5 min after the helicopter has shut down its engine;
- Two observers, spaced at least 150 m apart, walk 500 m in opposite directions and observe birds while doing so;
- Distance categories from the transect centre line (0 to 50 m, 50 to 100 m, more than 100 m) are recorded;
- The survey lasts about 30 min;
- The following data are recorded: number of bird observations, species and distance from the transect (category);
- Other recorded data are: date and time, weather, biotope, human or natural disturbances.

Transect locations were determined in a manner ensuring that each biotope surveyed (i.e., coniferous forest, shrubland and tundra) would be represented proportionately to its occurrence in the study area. During the spring survey, the songbird surveys were conducted between the two phases of the helicopter survey, namely on May 23 and 26. Ten short transects were each surveyed twice. These surveys took 12 hr and 12 min of effort. During the fall survey, short transects were carried out only once, on August 20, 21, 22 and 25, and took 6 hr and 32 min of effort.

Short Transects, Adapted Visits and Overland Flights
Spring

Virées courtes, visites adaptées et survols
Printemps

New Millennium Iron Corp.

LEGEND/LÉGENDE

Methodology/méthodologie

- Adapted visit/visite adaptée
- Short transect/virée courte
- Study area/aire d'étude
- Airborne route/trajet aéroporté

Infrastructure and mining components
infrastructures et composantes minières

- Labmag claim/ titres miniers Labmag

Map base/fond de carte

- Road/route
- Border/frontière
- Watercourse/cours d'eau
- Contour interval/courbe de niveau
- Waterbody/plan d'eau

*Hydronyms are oriented along the direction of water flow
*Les hydronymes sont orientés selon le sens d'écoulement de l'eau

0 1 2 3 4
Kilometers/Kilomètres

SCALE/ÉCHELLE: 1:105,000 UTM 19N NAD 83

FILE, VERSION, DATE, AUTHOR/
FICHIER, VERSION, DATE, AUTEUR:
GH-0271-a-01, 2012-03-02, P.L et L.B.

SOURCES:
Government of Canada, BNDT, 1:250,000, 1979
Government of Canada, CanVec, 1:50,000, 2002
Government of NL and government of Quebec, Boundary used for claims
New Millennium Capital Corp., Mining sites and roads

Gouvernement du Canada, BNDT, 1/250 000, 1979
Gouvernement du Canada, CanVecT, 1/50 000, 2002
Gouvernement de T-N-L et gouvernement du Québec, frontière utilisée pour les titres miniers
New Millennium Capital Corp., gisements et routes

GroupeHemispheres

Figure 1

Short Transects, Adapted Visits and Overland Flights
Fall

Virées courtes, visites adaptées et survols
Automne

New Millennium Iron Corp.

LEGEND/LÉGENDE

Methodology/méthodologie

- Adapted visit/visite adaptée
- Short transect/virée courte
- Study area/aire d'étude
- Airborne route/trajet aéroporté

Infrastructure and mining components
infrastructures et composantes minières

- Labmag claim/ titres miniers Labmag

Map base/fond de carte

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*Hydronyms are oriented along the direction of water flow
*Les hydronymes sont orientés selon le sens d'écoulement de l'eau

0 1 2 3 4
Kilometers/Kilomètres

SCALE/ÉCHELLE: 1:105,000 UTM 19N NAD 83

FILE, VERSION, DATE, AUTHOR/
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SOURCES:
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New Millennium Capital Corp., Mining sites and roads

Gouvernement du Canada, BNDT, 1/250 000, 1979
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Gouvernement de T-N-L et gouvernement du Québec, frontière utilisée pour les titres miniers
New Millennium Capital Corp., gisements et routes

GroupeHemispheres

Figure 2

2.4.3 Adapted Visits

Migratory staging areas, such as shallow ponds, lakeshores and herb fens, were identified during overland flights and were then revisited to survey for shorebirds using the adapted visits protocol. This protocol is similar to that of the short transects. It was developed to survey shorebirds that cannot be identified and counted from the air and is conducted as follows:

- The survey can be done at any time when there is sufficient daylight. The shorebirds are identified by sight and they might rest all day at the same place, so this survey is not restricted to the morning hours;
- The helicopter lands at a minimum distance of 100 m from the selected habitat;
- The survey starts at least 5 min after the helicopter has shut down its engine;
- Distance categories of sightings from the transect centre line (0 to 50 m, 50 to 100 m, more than 100 m) were recorded;
- The survey lasts between 20 and 40 min, depending on the size of the wetland;
- The following data are recorded: number of individuals, species and distance from the transect (category);
- Other recorded data are: date and time, weather, biotope, human or natural disturbances.

Five adapted visits in wetlands were carried out on foot, each visited twice in spring from May 21 to 28. In the fall, they were carried out only once, on August 20, 22 and 25 respectively, but the same five transects used in spring were visited. The total effort for these visits was 3 hr and 36 min in May, and 1 hr and 40 min in August. The total helicopter travel time during the short transects and adapted visits was 6 hr and 35 min in the spring, and 4 hr and 2 min in the fall.

3 RESULTS AND DISCUSSION

In spring 2011, 51 identified species of birds were recorded, while 39 species were recorded in fall. Both counts included species spotted in transit to and from the survey areas (Appendix I). For both seasons combined, 65 bird species were recorded. Four different biotopes were surveyed for migrating birds: coniferous forest, shrubland, tundra and wetland (Appendix II). The wetlands demonstrated the greatest diversity of birds in the spring, though the number of sightings was much lower in fall. A complete list of the bird species observed, both seasons combined, showing the survey code and the English, French and Latin names can found in Appendix III. Some pictures of birds taken during the surveys can be seen in Appendix IV.

3.1 Survey Conditions

Observation conditions varied from average to excellent, but the majority of the surveys were carried out in good or excellent conditions. May 24 was the only field day cancelled due to bad weather (rain and snow). Cloud cover was variable during the rest of the survey period, but no fog was encountered. The temperature varied between -5°C and 13°C during the survey period. Environment Canada's daily meteorological data for the survey months are available in Appendix V.

3.2 Effort

Tables 2 and 3 show the effort for the short transects and the adapted visits.

Table 2. Survey Effort in Short Transects and Adapted Visits, Spring 2011

BIOTOPE	CONIFEROUS FOREST	SHRUBLAND	TUNDRA	WETLAND (ADAPTED VISITS)
Transects per biotope	6	3	1	5
Amount of Time Per biotope	7 h 38	2 h 59	0 h 55	3 h 36
Transect Name	VC1, VC2, VC3, VC4, VC7, VC8	VC6, VC9, VC10	VC5	VA1, VA2, VA3, VA4, VA5

Table 3. Survey Effort in Short Transects and Adapted Visits, Fall 2011

BIOTOPE	CONIFEROUS FOREST	SHRUBLAND	TUNDRA	WETLAND (ADAPTED VISITS)
Transects per biotope	11	3	1	5
Amount of Time Per biotope	4 h 12	1 h 02	0 h 20	1 h 40
Transect Name	VC1, VC2, VC3, VC4, VC7, VC8, VC11, VC12, VC 13, VC14, VC15, VC16	VC6, VC9, VC10	VC5	VA1, VA2, VA3, VA4, VA5

3.3 Overland Flights

3.3.1 Spring

Figure 3 shows the sightings of waterfowl in spring. The most abundant species were the Green-winged Teal (*Anas crecca*) (81 sightings), Surf Scoter (*Melanitta perspicillata*) (61 sightings), Common Goldeneye (*Bucephala clangula*) (29 sightings), Common Merganser (*Mergus merganser*) (28 sightings) Canada Goose (*Branta canadensis*) (26 sightings) and American Black Duck (*Anas rubripes*) (26 sightings). Despite the high number of sightings of Canada Geese (26), Abraham Chemaganish, a Naskapi from Kawawachikamach, reported that local hunters had found it hard to find Canada Geese in the Schefferville and Kawawachikamach vicinity. They had had to drive as far as Menihek Dam.

Wilson's Snipe *(Gallinago delicata*) (45 sightings) and Short-billed Dowitchers (*Limnodromus griseus*) (22 sightings) were also encountered numerous times during the overland flights.

The birds of prey that were recorded included two sightings of Ospreys (*Pandion haliaetus*), one of Bald Eagle (*Haliaeetus leucocephalus*), one of Sharp-shinned Hawk (*Accipiter striatus*), two of Red-tailed Hawks (*Buteo jamaicensis*) and one of Northern Hawk Owl (*Surnia ulula*).

The detailed list of the birds seen during the spring overland flights, including GPS coordinates, species name, number of sightings, sex (if noted) is available in Appendix VI.

3.3.2 Fall

Figure 4 shows the sightings of waterfowl in fall. The most common species were the Hooded Merganser (*Lophodytes cucullatus*) (38 sightings), Common Merganser (32 sightings.) and Common Goldeneye (27 sightings). Other species observed included Green-winged Teal (5 sightings), Common Loon (*Gavia immer*) (4 sightings), Lesser Scaup (*Aythya affinis*) (3 sightings), Surf Scoter (2 sightings), Northern Pintail (*Anas acuta*) (1 sighting) and Red-breasted Merganser (*Mergus serrator*) (1 sighting).

Birds of prey were well represented, with three sightings of Bald Eagles, three of Rough-legged Hawks (*Buteo lagopus*) and one of Red-tailed Hawk.

The complete list of birds seen during the fall overland flights is available in Appendix I.

3.4 Short Transects

Three different biotopes were surveyed during the short transects. The bird list per biotope is presented in Appendix II. In general, birds were more abundant in spring than in fall.

3.4.1 Coniferous Forest

In spring, 244 sightings belonging to 24 species were made during the 6 short transects carried out in the coniferous forest. In descending order of importance, the most common species were Common Redpoll (*Acanthis flammea*) (59 sightings), White-crowned Sparrow (*Zonotrichia leucophrys*) (28 sightings), Ruby-crowned Kinglet (*Regulus calendula*) (26 sightings), American Robin (*Turdus migratorius*) (25 sightings) and Dark-eyed Junco (*Junco hyemalis*) (16 sightings). The coniferous forest was the only biotope where Spruce Grouse (*Falcipennis canadensis*), Northern Hawk Owl, American Three-toed Woodpecker (*Picoides dorsalis*), Brown Creeper (*Certhia americana*) and Boreal Chickadee (*Poecile hudsonicus*) were found.

In fall (late August), 120 sightings belonging to 20 species were made during the 11 short transects carried out in the coniferous forest. In descending order of importance, the most common species were the Common Redpoll (50 sightings), Gray Jay (*Perisoreus canadensis*) (18 sightings), Yellow-rumped

Warbler (*Setophaga coronata*) (8 sightings), White-crowned Sparrow (7 sightings), Dark-eyed Junco (6 sightings) and Blackpoll Warbler (*Setophaga striata*) (6 sightings). The Gray-cheeked Thrush (*Catharus minimus*), Black-backed Woodpecker (*Picoides arcticus*), Northern Shrike (*Lanius excubitor*), Wilson's Warbler (*Cardellina pusilla*), Blackpoll Warbler and Northern Waterthrush (*Parkesia noveboracensis*) were found exclusively in fall.

The coniferous forest biotope is the most extensive habitat in the study area. As a result, much more effort was spent there than in any other biotope.

3.4.2 Shrubland

In spring, 79 sightings belonging to 13 species were made during the 3 short transects carried out in the shrubland biotope. In descending order of importance, the most common species were the Common Redpoll (21 sightings), White-crowned Sparrow (16 sightings), American Robin (12 sightings), Willow Ptarmigan (*Lagopus lagopus*) (11 sightings) and American Tree Sparrow (*Spizella arborea*) (5 sightings).

In fall, 13 sightings belonging to 4 species were made during the 3 short transects. The Willow Ptarmigan was the most common species (8 sightings), while the other species encountered were the American Tree Sparrow (2 sightings), White-crowed Sparrow (2 sightings) and Common Redpoll (1 sighting).

3.4.3 Tundra

In spring, 34 sightings belonging to 7 species were made during the single transect carried out in the tundra biotope. The most common species were the White-crowned Sparrow (10 sightings), American Robin (9 sightings), Common Redpoll (6 sightings) and Willow Ptarmigan (4 sightings).

In fall, a lone Common Redpoll was the only bird seen during the single transect carried out.

Overland Flight Results
Spring

Observations du survol
Printemps

New Millennium Iron Corp.

LEGEND/LÉGENDE

Observations

Other species/autres espèces

Waterfowl/Sauvagine

Anatidae/anatidé

Wader/limicole

Species with status/Espèce à statut précaire

Bald Eagle/pygargue à tête blanche

Rusty Blackbird/quiscale rouilleux

Harlequin Duck/arlequin plongeur

Multiple observations - single point/ observations multiples - point unique

Study area/aire d'étude

91.2: GPS unique number/ no. unique du GPS

Infrastructure and mining components
infrastructures et composantes minières

Labmag claim/ titres miniers Labmag

Map base/fond de carte

Road/route

Border/frontière

Watercourse/cours d'eau

Contour interval/ courbe de niveau

Waterbody/ plan d'eau

Wetland/milieu humide

*Hydronyms are oriented along the direction of water flow
*Les hydronymes sont orientés selon le sens d'écoulement de l'eau

0 1 2 3 4
Kilometers/Kilomètres

SCALE/ÉCHELLE: 1:90,000 UTM 19N NAD 83

FILE, VERSION, DATE, AUTHOR/
FICHIER, VERSION, DATE, AUTEUR:
GH-0272-b-01, 2012-03-02, P.L et L.B.

SOURCES:
Government of Canada, BNDT, 1:250,000, 1979
Government of Canada, CanVec, 1:50,000, 2002
Government of NL and government of Quebec, Boundary used for claims
New Millennium Capital Corp., Mining sites and roads

Gouvernement du Canada, BNDT, 1/250 000, 1979
Gouvernement du Canada, CanVecT, 1/50 000, 2002
Gouvernement de T-N-L et gouvernement du Québec, frontière utilisée pour les titres miniers
New Millennium Capital Corp., gisements et routes

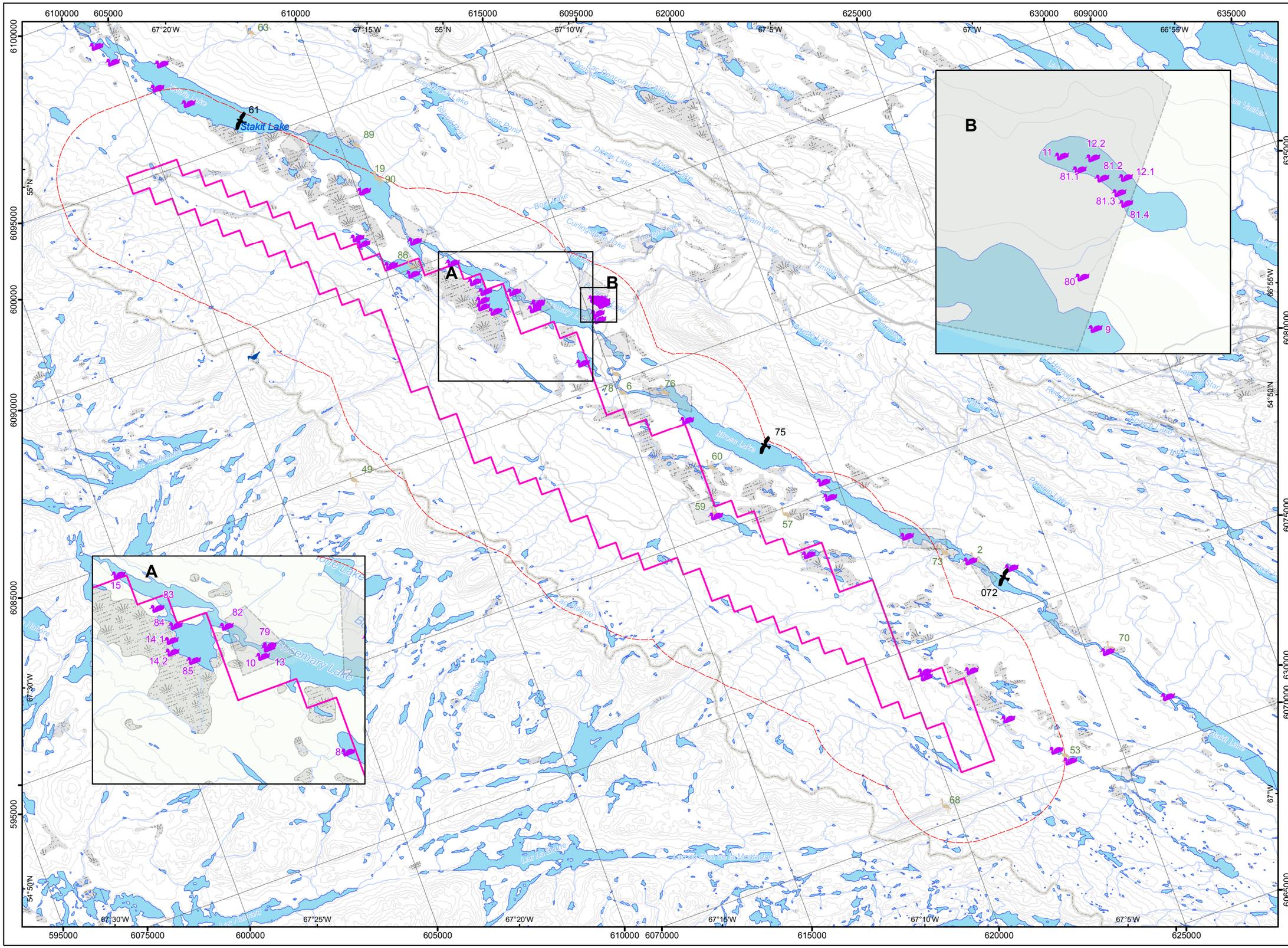
GroupeHemispheres

Figure 3

Overland Flight Results
Fall

Observations du survol
Automne

New Millennium Iron Corp.



LEGEND/LÉGENDE

Observations

- Other species/autres espèces

Waterfowl/Sauvagine

- Anatidae/anatidé
- Wader/limicole

Species of status/Espèce à statut

- Bald Eagle/pygargue à tête blanche

- Study area/aire d'étude
- Multiple observations - single point/ observations multiples - point unique

12.2: GPS unique number/ no. unique du GPS

Infrastructure and mining components
infrastructures et composantes minières

- Labmag claim/ titres miniers Labmag

Map base/Fond de carte

- Road/route
- Border/frontière
- Watercourse/cours d'eau
- Contour interval/ courbe de niveau
- Waterbody/ plan d'eau
- Wetland/milieu humide

*Hydronyms are oriented along the direction of water flow
*Les hydronymes sont orientés selon le sens d'écoulement de l'eau

0 1 2 3 4
Kilometers/Kilomètres

SCALE/ÉCHELLE: 1:100,000 UTM 19N NAD 83

FILE, VERSION, DATE, AUTHOR/
FICHIER, VERSION, DATE, AUTEUR:
GH-0272-b-01, 2012-03-02, P.L et L.B.

SOURCES:
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Gouvernement du Canada, BNDT, 1/250 000, 1979
Gouvernement du Canada, CanVecT, 1/50 000, 2002
Gouvernement de T-N-L et gouvernement du Québec, frontière utilisée pour les titres miniers
New Millennium Capital Corp., gisements et routes

GroupeHemispheres

Figure 4

3.5 Adapted Visits

3.5.1 Spring

In spring, the wetland was the richest biotope for bird diversity, with 32 species and 140 sightings (Appendix II), confirming its importance as a migration stopover. Bird diversity in this ecosystem was probably enhanced by the fact that, at this time of the year, there is less snow cover in wetlands than in any other biotope.

American Robin (30 sightings), American Pipit (*Anthus rubescens*) (21 sightings) and Rusty Blackbird (16 sightings) were the most abundant species. The Rusty Blackbird is a species with status and is fully presented in section 3.6.3.

For shorebirds, the Semipalmated Plover (*Calidris pusilla*) (5 sightings) was the most common species, followed by the Wilson's Snipe (4 sightings), Least Sandpiper (*Calidris minutilla*) (3 sightings), Greater Yellowlegs (*Tringa melanoleuca*) (2 sightings), Solitary sandpiper (*Tringa solitaria*) (2 sightings), and Lesser Yellowlegs (*Tringa flavipes*) (2 sightings).

3.5.2 Fall

In the fall, the wetlands were not as rich as in the spring. Only 22 sightings from 9 species were made. Gray Jay (5 sightings), Herring Gull (*Larus argentatus*) (5 sightings) and White-crowned Sparrow (3 sightings) were the most common species encountered. The observation of a single Red-breasted Nuthatch (*Sitta canadensis*) was noteworthy that far north. The only Lincoln Sparrow (*Melospiza lincolnii*) found in August was also in a wetland.

The only aquatic species seen other than the Herring Gull was a Common Loon. No shorebirds were found during this period. It appears that shorebirds probably use a different migration path and different staging areas in fall, most of them avoiding this region. Most species of shorebirds do not use the same staging areas in fall as in spring (Myers, 1983).

3.6 Species with Status

3.6.1 Harlequin Duck

A pair of Harlequin Ducks (*Histrionicus histrionicus*) was found along Howells River on May 21 (Figure 3). Eastern North American populations are listed as vulnerable in Canada (COSEWIC, 2011) and in Newfoundland and Labrador (Environment and Conservation, 2011). Considering that individuals, pairs or small groups tend to head directly from wintering grounds to breeding grounds (Kuchel, 1977), it appears likely that these birds were breeding in the study area. Smith (1998) observed that males were not found near nests 4–10 days after females began incubating. Considering that the eggs of Harlequin Ducks hatch in the last 10 days of July in northern Labrador (Rodway, 1998), it appears that the beginning of August would be the best time to confirm breeding for this species by attempting to spot the females with ducklings. Harlequin Ducks may prefer swift-moving sections of river early in the breeding season, and slower-moving stretches during brood-rearing (Kuchel, 1977).

3.6.2 Bald Eagle

A single adult Bald Eagle was seen in flight along Howells River near a waterfowl concentration area on May 28 (Figure 3). There were six sightings during overland flights in late September (Figure 4). Bald Eagles typically breed in forested areas adjacent to large bodies of water (less than 2 km from a suitable foraging waterbody) (Buehler, 2000). However, no nest structure was found near the lakes or anywhere

else in the study area The Bald Eagle is not considered a species of special concern in Canada or in Newfoundland and Labrador, but it is in Québec which is quite close.

3.6.3 Rusty Blackbird

There were 29 sightings of Rusty Blackbirds (*Euphagus carolinus*) during the spring survey. Most of them (16) were seen during adapted visits in the wetland biotope (VA1, VA2, VA3 and VA5). Nine were reported during short transects (VC2, VC3, VC6, VC7 and VC8) (Figure 1). Four sightings were noted in overland flights (Figure 3). Some of the Rusty Blackbirds observed were still in flocks, which suggests that some of them were still in migration, and their breeding density in the study area should not be expected to be very high. The Rusty Blackbird was also observed in fall, in August, with one on short transect VC7 and two in adapted visits (one in VA1 and another in VA5).

NML developed a mitigation plan to protect the riparian habitat used by the Rusty Blackbird for breeding (Groupe Hémisphères, 2011). It is based on protecting all plant strata (herbaceous species, shrubs and trees) adjacent to a watercourse, lake or wetland (Gagnon and Gangbazo, 2007).

3.7 Species of interest

Some unexpected species of birds were encountered in the study zone: in some cases the literature suggests that they are rare in the study area, while in other cases they have not previously been recorded so far north.

3.7.1 Hooded Merganser

There were 38 sightings of Hooded Mergansers in fall, but none in spring. The northern breeding limit of Hooded Merganser in Canada is poorly defined (Godfrey, 1986; Dugger *et al.*, 2009). Most recent maps of Hooded Merganser distribution do not include Labrador as part of the breeding range, but it appears that this species is probably more common in the north than what was previously thought. Recent studies have shown that this species breeds at low densities (2.3 pairs per 100 km²) in Quebec between the 51st and 58th parallels (Berthiaume *et al.*, 2009). Considering that the sightings of Hooded Mergansers in the study area were made in fall, it is possible that they migrate north to moult after the breeding season.

3.7.2 Short-billed Dowitcher

There were 22 sightings of Short-billed Dowitcher in spring during the overland flight, but none in fall. The Short-billed Dowitcher is a distinct subspecies (*Limnodromus griseus griseus*) that nests in north-central Quebec and western Labrador, from approximately the 52nd parallel north to Ungava Bay and from James Bay and south-eastern Hudson Bay east to central Labrador (Godfrey 1986; Cotter, 1995). Few nesting confirmations are known and David (1996) considers this species a rare migrant in Quebec.

3.7.3 Northern Hawk-Owl

There were two sightings of Northern Hawk-Owl in spring. Ranked as of “Medium” concern (85th of 297 birds considered) among the Canadian birds evaluated for setting conservation, research, and monitoring priorities (Dunn 1997), the species is considered as a low-density breeding bird, with 0–6 pairs/100 km² in the Yukon (Rohner *et al.,* 1995). It is considered as a rare bird and one of the least studied birds in North America (Duncan *et al.*, 1998).

3.7.4 Brown Creeper

There were three sightings of Brown Creeper in spring, all in mature coniferous forest in the Howells River valley. The northernmost confirmed breeding records for this species in Quebec/Labrador come from Lac

Mistassini (Harrap and Quinn, 1995) and Harrington Harbour (Shaffer and Alvo, 1996). There have been no previous sightings of this species in Labrador, even though it does breed in Newfoundland (Tyler, 1948). The three sightings in the study area were made at two different locations and included a pair observed foraging together and a single singing male.

4 CONCLUSION

GHI was mandated by NML to conduct bird surveys during the 2011 spring and fall migrations. Three techniques were used in order to properly evaluate each group of birds: overland flights were used to count waterfowl, short transects were used for terrestrial birds in forest, shrubland and tundra biotopes while adapted visits were done in wetlands to identify shorebirds.

The study area was used by more species in spring (51 species) than in fall (39 species). Sixty-five (65) species were recorded in spring and fall combined. The overland flights showed the greatest difference in use between seasons; with a similar effort, there were 423 bird sightings in the spring compared to 131 in the fall.

The wetland biotope was the richest habitat in terms of bird diversity. Small numbers of shorebirds were found in wetlands in spring, but none in fall. Shorebird species, beginning with the most frequent all methods combined, were Wilson's Snipe, Short-billed Dowitcher, Semipalmated Plover, Least Sandpiper, Greater Yellowlegs, Solitary sandpiper and Lesser Yellowlegs.

The Rusty Blackbird, a species with status, uses the wetland habitat for foraging during its spring migration (16 sightings), but it was also found in the coniferous forest and shrubland habitats during the short transects. A total of 29 sightings of Rusty blackbird was recorded in spring.

A pair of Harlequin Ducks (also a species with status) was also found during an overland flight in an apparent breeding habitat along Howells River.

The Bald Eagle, not a species with status in Newfoundland and Labrador or in Canada, was observed both in spring (1 sighting) and fall (6 sightings).

The survey revealed the presence of four species of interest. These are rare species such the Short-billed Dowitcher and the Northern Hawk-Owl or species north of their known distribution, such as the Hooded Merganser and the Brown Creeper.

In general, spring was the season when the study area was most critical as a staging area. In general fewer birds were found in fall. Despite the fact that the scientific community agrees that the migration routes of birds are poorly known in Canada, we can still say that, in a regional context, the study area is located within a valley that seems to act as an important corridor for the spring migration.

5 REFERENCES

Personal communication

Abraham Chemaganish	Kawawachikamach resident
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Database Consulted

AVIBASE (2011) Bird Checklists of the World, Newfoundland and Labrador. This list is managed by Denis Lepage and hosted by Bird Studies Canada, the Canadian copartner of Birdlife International.http://avibase.bsc-eoc.org/checklist.jsp?region=canl&list=howardmoore

Bibliography

AOU [American Ornithologists' Union] (2011) *Check-list of North American Birds, 7th edition, 52nd supplement*. North American Classification Committee, American Ornithologists' Union. Internet Site: http://www.aou.org/checklist/north/

Bauchinger, U. and M. Klaassen (2005) *Longer days in spring than in autumn accelerate migration speed of passerine birds*. Journal of Avian Biology 36: 3-5

Berthiaume, E., D. Bordage, S. Cummings, M. Darveau, S. Lapointe, L.V. Lemelin et A.G. Guérette. (2009). *Répartition de la sauvagine en période de nidification entre le 51° et le 58° de latitude nord dans la province de Québec*. Rapport technique n°14, Canards Illimités Canada, 54 p.

Bordage, D., N. Plante et M. Grenier (1992) *Milieux propices à la reproduction de la Bernache du Canada, de la Macreuse à bec jaune et de la Macreuse à front blanc. Projet pilote-Complexe Grande-Baleine*. Rapport présenté à la vice-présidence Environnement d'Hydro-Québec, Service canadien de la faune, région du Québec, 78 p.

Buehler, D.A. (2000) *Bald Eagle (Haliaeetus leucocephalus), The Birds of North America Online (A. Poole, Ed.)*. Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/506doi:10.2173/bna.506

Chaulk, K.G. and B. Turner (2007) *The Timing of Waterfowl Arrival and Dispersion during Spring Migration in Labrador*. Northeastern Naturalist 14(3): 375-386

COSEWIC [Comittee on the Status of Endangered Wildlife in Canada] (2011) Internet Site: http://www.cosepac.gc.ca/eng/sct5/index_e.cfm

Cotter, R.C. (1995) *Bécasseau roux*, pp. 488-491 in Gauthier, J. et Y. Aubry (sous la direction de). *Les oiseaux nicheurs du Québec : Atlas des oiseaux nicheurs du Québec méridional*. Association québécoise des groupes d'ornithologues, Société québécoise de protection des oiseaux, Service canadien de la faune, Environnement Canada, région du Québec, Montréal.

David, N. (1996) *Liste commentée des oiseaux du Québec.* Association québécoise des groupes d'ornithologues, 89 p. et 5 annexes

Dugger, B. D., K. M. Dugger and L. H. Fredrickson (2009) *Hooded Merganser (Lophodytes cucullatus)*, The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/098doi:10.2173/bna.98

Duncan, James R. and Patricia A. Duncan (1998) *Northern Hawk Owl (Surnia ulula)*, The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/356doi:10.2173/bna.356

Dunn, E. H. (1997) *Setting priorities for conservation, research and monitoring of Canada's landbirds*. Tech. Rep. Ser. No. 293. Can. Wildl. Serv. Ottawa, ON.

Environment and Conservation (2011) *Species at risk. Department of Environment and Conservation, Newfoundland and Labrador.* Internet Site: http://www.env.gov.nl.ca/env/wildlife/endangeredspecies/index.html.

Gagnon, É. et G. Gangbazo (2007) *Efficacité des bandes riveraines: analyse de la documentation scientifique et perspectives.* Québec, Ministère du Développement durable, de l'Environnement et des Parcs, Direction des politiques de l'eau, ISBN: 978-2-550-49213-9, 17 p.

Guérette M.A., E. Berthiaume, M. Darveau, S. Cumming, D. Bordage, S. Lapointe et L.V. Lemelin (2009) *Répartition de la sauvagine en période de nidification entre les 51º et 58º de latitude nord dans la province de Québec*. Rapport technique n° Q14, Canards Illimités Canada – Québec, Québec, 43 p.

Godfrey, W.E. (1986) *Les oiseaux du Canada.* Édition revisée, Éditions Broquet, Musée national des sciences naturelles, 650 p.

Golder Associates Ltd. and Global Environnement (2005) *Breeding Bird Data Collection in the Howells River Basin of Labrador*. Submitted to LabMag GP Inc.

Groupe Hémisphères (2009) *Inventaire 2008 et 2009 des oiseaux nicheurs du futur site DSO*. Rapport technique réalisé pour New Millennium Capital Corp., 22 p et 4 annexes

Groupe Hémisphères (2011) *Plan de mitigation pour la protection du Quiscale rouilleux, Projet DSO*. Rapport réalisé pour New Millennium Capital Corp. 13 pp

Hanson, A., I Goudie, A. Lang, C. Gjerdrum, R. Cotter and G. Donaldson (2009) *A Framework for the Scientific Assessment of Potential Project Impacts on Birds*. Wildlife Canadian Service, Technical report n° 508, Atlantic Region, 73 p.

Harrap, S. and D. Quinn (1995) *Chickadees, tits, nuthatches and treecreepers*. Princeton Univ. Press, Princeton, NJ

Kuchel, C. R. (1977) *Some aspects of the behavior and ecology of Harlequin Ducks breeding in Glacier National Park, Montana.* Master's Thesis. Univ. of Montana, Missoula.

Minaskuat Limited Partnership (2008) *LabMag Iron Ore Project Waterfowl Breeding Pair Surveys*. Technical Report presented to LabMag GP Inc.

Myers, JP. 1983. Conservation of migrating shorebirds: staging areas, geographic bottlenecks, and regional movements. American Birds, 37(1): 23-25

Rodway, M. S. (1998). *Habitat use by Harlequin Ducks breeding in Hebron Fiord, Labrador*. Can. J. Zool. 76:897-901.

Rohner, C., J. N. M. Smith, J. Stroman, and M. Joyce (1995) *Northern Hawk-owls in the Nearctic boreal forest: Prey selection and population consequences of multiple prey cycles*. Condor 97:208-220

Shaffer, F. and R. Alvo (1996) *Brown Creeper*. Pp 748-751 in The breeding birds of Quebec: atlas of the breeding birds of southern Quebec. (Gauthier, J. and Y. Aubry, Eds.) Assoc. québecoise des groupes d'ornithologues, Prov. of Quebec Soc. for the protection of birds, Can. Wildl. Serv., Environ. Canada, Québec Region, Montréal

Smith, C. M. (1998) *Banff National Park Harlequin Duck research project: 1997 progress report*. Unpubl. Tech. Report. Heritage Resour. Conserv., Parks Canada, Banff, AB.

Tyler, W. M. (1948) *Brown Creeper*. Pp 56-79 in Life histories of North American nuthatches, wrens, thrashers and their allies. (Bent, A. C., Ed.) U.S. Natl. Mus. Bull. no. 195.

Whitford, J. (January 2003) *Waterfowl Component Study Trans Labrador Highway (Happy Valley-Goose Bay to Cartwright Junction).* Project No. Nfs08243 presented to Department of Works, Services and Transportation, NFL, 53 p. and 3 appendices

APPENDICES

Appendix I

Bird Species Observed in Migration, by Season

Bird Species Observed during the Migration Season - Fall

*** indicates the species is listed as federally or provincially at risk

Site / Survey	Group	Code & Name	Number of observations: overland flight	short transect	long transect*	adapted visit	travel	TOTAL
TACONITE - LABMAG PROJECT			**139**	**134**		**22**	**49**	**344**
MIGAULM11			**139**	**134**		**22**	**49**	**344**
BIRDS OF PREY			**7**	**1**				**8**
	*** PYTB	Bald Eagle	3					3
	BUQR	Red-tailed Hawk	1	1				2
	BUPA	Rough-legged Hawk	3					3
AQUATIC BIRDS			**120**	**3**		**6**		**129**
	PLHU	Common Loon	4			1		5
	SPAN	Anatid (Duck or Swan)	3					3
	SAHI	Green-winged Teal	5					5
	CAPI	Northern Pintail	1					1
	PEFU	Lesser Scaup	3					3
	SPMA	Scoter sp.	1					1
	MAFB	Surf Scoter	2					2
	GAOO	Common Goldeneye	27					27
	HACO	Hooded Merganser	38					38
	GRHA	Common Merganser	32					32
	HAHU	Red-breasted Merganser	1					1
	SPOR	Shorebird	1					1
	CHSO	Solitary Sandpiper		1				1
	GOAR	Herring Gull	2	2		5		9
LANDBIRDS			**4**	**130**		**16**	**49**	**199**
	TECA	Spruce Grouse	1				7	8
	LASA	Willow Ptarmigan		8				8
	SPPI	Woodpecker		1				1
	PIDR	American Three-toed Woodpecker		1			1	2
	PIDN	Black-backed Woodpecker		1				1
	MECA	Gray Jay		18		5		23
	GRCO	Common Raven	2			1		3
	METB	Boreal Chickadee		1			6	7
	SIPR	Red-breasted Nuthatch				1		1
	ROCR	Ruby-crowned Kinglet		1				1
	GRJG	Gray-cheeked Thrush		3				3
	MEAM	American Robin		6		1		7
	PGGR	Northern Shrike		1				1
	PAJA	Yellow Warbler					1	1
	PACJ	Yellow-rumped Warbler		8			7	15
	PARA	Blackpoll Warbler		6				6
	PARU	Northern Waterthrush		1				1
	PACN	Wilson's Warbler		1			1	2
	BRHU	American Tree Sparrow		5				5
	BRFV	Fox Sparrow					2	2
	BRLI	Lincoln's Sparrow				1	1	2

Project : Taconite Project (NML & TSMC)
Query : 01-02-2012

Bird Species Observed during the Migration Season - Fall

*** indicates the species is listed as federally or provincially at risk

Site / Survey	Group	Code & Name	Number of observations: overland flight	short transect	long transect	adapted visit	travel	TOTAL
	BRCB	White-crowned Sparrow		9		3		12
	JUAR	Dark-eyed Junco		6			2	8
***	QURO	Rusty Blackbird		1		2	20	23
	SIFL	Common Redpoll		52				52
	TAPI	Pine Siskin					1	1
	SPPS	Passerine				2		2
	SPSP	Bird	1					1
MAMMALS			**8**					**8**
	CASTH	North American Beaver lodge	6					6
	SPMAM	Mammal	2					2

* method not use in this project

Bird Species Observed during the Migration Season - Spring

*** indicates the species is listed as federally or provincially at risk

Site / Survey	Group	Code & Name	Number of observations: overland flight	short transect	long transect*	adapted visit	travel	TOTAL
TACONITE - LABMAG PROJECT			**424**	**357**		**140**	**1**	**922**
MIGPRLM11			**424**	**357**		**140**	**1**	**922**
BIRDS OF PREY			**6**	**1**		**1**	**1**	**9**
	BAPE	Osprey	2			1		3
	*** PYTB	Bald Eagle	1					1
	EPBR	Sharp-shinned Hawk	1					1
	BUQR	Red-tailed Hawk	2					2
	CHEP	Northern Hawk Owl		1			1	2
AQUATIC BIRDS			**407**	**10**		**20**		**437**
	PLHU	Common Loon	5					5
	BECA	Canada Goose	26	2		1		29
	SAHI	Green-winged Teal	81			1		82
	CANO	American Black Duck	26					26
	CACO	Mallard	1					1
	CAPI	Northern Pintail	4			1		5
	SPFU	*Aythya sp.*	3					3
	PEFU	Lesser Scaup	17					17
	*** ARPL	Harlequin Duck	1					1
	HAKA	Long-tailed Duck	5					5
	MANO	Black Scoter	4					4
	MAFB	Surf Scoter	61					61
	GAOO	Common Goldeneye	29					29
	GRHA	Common Merganser	28					28
	HAHU	Red-breasted Merganser	13					13
	SPOR	Shorebird	20					20
	PLSE	Semipalmated Plover				5		5
	GRCH	Greater Yellowlegs	9	1		2		12
	CHSO	Solitary Sandpiper	4			2		6
	BEMI	Least Sandpiper				3		3
	BERO	Short-billed Dowitcher	22					22
	BEWI	Wilson's Snipe	45	5		4		54
	GOAR	Herring Gull	3	2		1		6
LANDBIRDS			**10**	**346**		**119**		**475**
	TECA	Spruce Grouse	3	2				5
	LASA	Willow Ptarmigan	2	15				17
	SPPI	Woodpecker		1				1
	PIDR	American Three-toed Woodpecker		1				1
	PIFL	Northern Flicker				1		1
	ALHC	Horned Lark		2				2
	HIBI	Tree Swallow		1				1
	MECA	Gray Jay		10		12		22
	METB	Boreal Chickadee		9		1		10
	GRBR	Brown Creeper		3				3

Project : Taconite Project (NML & TSMC)
Query : 01-02-2012

Bird Species Observed during the Migration Season - Spring

*** indicates the species is listed as federally or provincially at risk

Site / Survey	Group	Code & Name	Number of observations: overland flight	short transect	long transect	adapted visit	travel	TOTAL
	ROCR	Ruby-crowned Kinglet		27		8		35
	MEAM	American Robin		46		30		76
	PIAM	American Pipit		2		21		23
	JABO	Bohemian Waxwing		5		5		10
	PGGR	Northern Shrike	1					1
	SPPA	Warbler		2				2
	PACJ	Yellow-rumped Warbler		12		1		13
	SPBR	Sparrow		2				2
	BRHU	American Tree Sparrow		15		3		18
	BRPR	Savannah Sparrow				1		1
	BRFV	Fox Sparrow		12		1		13
	BRLI	Lincoln's Sparrow		3				3
	BRGB	White-throated Sparrow		1				1
	BRCB	White-crowned Sparrow		54		7		61
	JUAR	Dark-eyed Junco		18		1		19
***	QURO	Rusty Blackbird	4	9		16		29
	DUSA	Pine Grosbeak		7				7
	SIFL	Common Redpoll		86		11		97
	SPPS	Passerine		1				1
MAMMALS			**1**					**1**
	OURSN	American black bear	1					1

* method not use in this project

Appendix II

Bird Species by Biotope vs Ground Survey

Bird Species Observed during the Migration Season - Biotope vs Ground Survey

Site / Survey	Code & Name		Number of observations
TACONITE - LABMAG PROJECT			**497**
SPRING BIRD MIGRATION LABMAG PROJECT - MINE SITE			497
SHRUBLAND			79
	BECA	Canada Goose	2
	LASA	Willow Ptarmigan	11
	BEWI	Wilson's Snipe	1
	GOAR	Herring Gull	1
	ALHC	Horned Lark	2
	ROCR	Ruby-crowned Kinglet	1
	MEAM	American Robin	12
	PIAM	American Pipit	2
	BRHU	American Tree Sparrow	5
	BRCB	White-crowned Sparrow	16
	JUAR	Dark-eyed Junco	2
	QURO	Rusty Blackbird	2
	SIFL	Common Redpoll	21
	SPPS	Passerine	1
CONIFEROUS FOREST			244
	TECA	Spruce Grouse	2
	GRCH	Greater Yellowlegs	1
	BEWI	Wilson's Snipe	4
	GOAR	Herring Gull	1
	CHEP	Northern Hawk Owl	1
	SPPI	Woodpecker	1
	PIDR	American Three-toed Woodpecker	1
	HIBI	Tree Swallow	1
	MECA	Gray Jay	10
	METB	Boreal Chickadee	9
	GRBR	Brown Creeper	3
	ROCR	Ruby-crowned Kinglet	26
	MEAM	American Robin	25
	JABO	Bohemian Waxwing	3
	SPPA	Warbler	2
	PACJ	Yellow-rumped Warbler	12
	SPBR	Sparrow	1
	BRHU	American Tree Sparrow	8
	BRFV	Fox Sparrow	12
	BRLI	Lincoln's Sparrow	3
	BRGB	White-throated Sparrow	1
	BRCB	White-crowned Sparrow	28

Bird Species Observed during the Migration Season - Biotope vs Ground Survey

Site / Survey	Code & Name		Number of observations
	JUAR	Dark-eyed Junco	16
	QURO	Rusty Blackbird	7
	DUSA	Pine Grosbeak	7
	SIFL	Common Redpoll	59
WETLAND			140
	BECA	Canada Goose	1
	SAHI	Green-winged Teal	1
	CAPI	Northern Pintail	1
	BAPE	Osprey	1
	PLSE	Semipalmated Plover	5
	GRCH	Greater Yellowlegs	2
	CHSO	Solitary Sandpiper	2
	BEMI	Least Sandpiper	3
	BEWI	Wilson's Snipe	4
	GOAR	Herring Gull	1
	PIFL	Northern Flicker	1
	MECA	Gray Jay	12
	METB	Boreal Chickadee	1
	ROCR	Ruby-crowned Kinglet	8
	MEAM	American Robin	30
	PIAM	American Pipit	21
	JABO	Bohemian Waxwing	5
	PACJ	Yellow-rumped Warbler	1
	BRHU	American Tree Sparrow	3
	BRPR	Savannah Sparrow	1
	BRFV	Fox Sparrow	1
	BRCB	White-crowned Sparrow	7
	JUAR	Dark-eyed Junco	1
	QURO	Rusty Blackbird	16
	SIFL	Common Redpoll	11
TUNDRA			34
	LASA	Willow Ptarmigan	4
	MEAM	American Robin	9
	JABO	Bohemian Waxwing	2
	SPBR	Sparrow	1
	BRHU	American Tree Sparrow	2
	BRCB	White-crowned Sparrow	10
	SIFL	Common Redpoll	6

Bird Species Observed during the Migration Season - Biotope vs Ground Survey

Site / Survey	Code & Name		Number of observations
TACONITE - PROJET LABMAG			**156**
FALL BIRD MIGRATION LABMAG PROJECT - MINE SITE			156
SHRUBLAND			13
	LASA	Willow Ptarmigan	8
	BRHU	American Tree Sparrow	2
	BRCB	White-crowned Sparrow	2
	SIFL	Common Redpoll	1
CONIFEROUS FOREST			120
	BUQR	Red-tailed Hawk	1
	CHSO	Solitary Sandpiper	1
	GOAR	Herring Gull	2
	SPPI	Woodpecker	1
	PIDR	American Three-toed Woodpecker	1
	PIDN	Black-backed Woodpecker	1
	MECA	Gray Jay	18
	METB	Boreal Chickadee	1
	ROCR	Ruby-crowned Kinglet	1
	GRJG	Gray-cheeked Thrush	3
	MEAM	American Robin	6
	PGGR	Northern Shrike	1
	PACJ	Yellow-rumped Warbler	8
	PARA	Blackpoll Warbler	6
	PARU	Northern Waterthrush	1
	PACN	Wilson's Warbler	1
	BRHU	American Tree Sparrow	3
	BRCB	White-crowned Sparrow	7
	JUAR	Dark-eyed Junco	6
	QURO	Rusty Blackbird	1
	SIFL	Common Redpoll	50
WETLAND			22
	PLHU	Common Loon	1
	GOAR	Herring Gull	5
	MECA	Gray Jay	5
	GRCO	Common Raven	1
	SIPR	Red-breasted Nuthatch	1
	MEAM	American Robin	1
	BRLI	Lincoln's Sparrow	1
	BRCB	White-crowned Sparrow	3
	QURO	Rusty Blackbird	2
	SPPS	Passerine	2

Bird Species Observed during the Migration Season - Biotope vs Ground Survey

Site / Survey	Code & Name		Number of observations
TUNDRA			1
	SIFL	Common Redpoll	1

Appendix III

Complete List of Bird Species

Bird Survey - Migration - Taconite - LabMag Project

Code		English Name	French Name	Latin Name
PLHU		Common Loon	Plongeon huard	*Gavia immer*
SPAN		Anatid (Duck or Goose)	Anatidés sp. (canard ou oie)	-
BECA		Canada Goose	Bernache du Canada	*Branta canadensis*
SAHI		Green-winged Teal	Sarcelle d'hiver	*Anas crecca*
CANO		American Black Duck	Canard noir	*Anas rubripes*
CACO		Mallard	Canard colvert	*Anas platyrhynchos*
CAPI		Northern Pintail	Canard pilet	*Anas acuta*
SPFU		*Aythya* sp.	Fuligule sp.	*Aythya* sp.
PEFU		Lesser Scaup	Petit Fuligule	*Aythya affinis*
ARPL	***	Harlequin Duck	Arlequin plongeur	*Histrionicus histrionicus*
HAKA		Long-tailed Duck	Harelde kakawi	*Clangula hyemalis*
SPMA		Scoter sp.	Macreuse sp.	*Melanitta* sp.
MANO		Black Scoter	Macreuse à bec jaune	*Melanitta americana*
MAFB		Surf Scoter	Macreuse à front blanc	*Melanitta perspicillata*
GAOO		Common Goldeneye	Garrot à oeil d'or	*Bucephala clangula*
HACO		Hooded Merganser	Harle couronné	*Lophodytes cucullatus*
GRHA		Common Merganser	Grand Harle	*Mergus merganser*
HAHU		Red-breasted Merganser	Harle huppé	*Mergus serrator*
BAPE		Osprey	Balbuzard pêcheur	*Pandion haliaetus*
PYTB	***	Bald Eagle	Pygargue à tête blanche	*Haliaeetus leucocephalus*
EPBR		Sharp-shinned Hawk	Épervier brun	*Accipiter striatus*
BUQR		Red-tailed Hawk	Buse à queue rousse	*Buteo jamaicensis*
BUPA		Rough-legged Hawk	Buse pattue	*Buteo lagopus*
TECA		Spruce Grouse	Tétras du Canada	*Falcipennis canadensis*
LASA		Willow Ptarmigan	Lagopède des saules	*Lagopus lagopus*
SPOR		Shorebird	Oiseau de rivage sp.	-
PLSE		Semipalmated Plover	Pluvier semipalmé	*Charadrius semipalmatus*
GRCH		Greater Yellowlegs	Grand Chevalier	*Tringa melanoleuca*
CHSO		Solitary Sandpiper	Chevalier solitaire	*Tringa solitaria*
BEMI		Least Sandpiper	Bécasseau minuscule	*Calidris minutilla*
BERO		Short-billed Dowitcher	Bécassin roux	*Limnodromus griseus*
BEWI		Wilson's Snipe	Bécassine de Wilson	*Gallinago delicata*
GOAR		Herring Gull	Goéland argenté	*Larus argentatus*
CHEP		Northern Hawk Owl	Chouette épervière	*Surnia ulula*
SPPI		Woodpecker	Picidé sp. (pic)	-
PIDR		American Three-toed Woodpecker	Pic à dos rayé	*Picoides dorsalis*
PIDN		Black-backed Woodpecker	Pic à dos noir	*Picoides arcticus*
PIFL		Northern Flicker	Pic flamboyant	*Colaptes auratus*
ALHC		Horned Lark	Alouette hausse-col	*Eremophila alpestris*
HIBI		Tree Swallow	Hirondelle bicolore	*Tachycineta bicolor*
MECA		Gray Jay	Mésangeai du Canada	*Perisoreus canadensis*
GRCO		Common Raven	Grand Corbeau	*Corvus corax*
METB		Boreal Chickadee	Mésange à tête brune	*Poecile hudsonicus*

Bird Survey - Migration - Taconite - LabMag Project

Code	English Name	French Name	Latin Name
SIPR	Red-breasted Nuthatch	Sittelle à poitrine rousse	*Sitta canadensis*
GRBR	Brown Creeper	Grimpereau brun	*Certhia americana*
ROCR	Ruby-crowned Kinglet	Roitelet à couronne rubis	*Regulus calendula*
GRJG	Gray-cheeked Thrush	Grive à joues grises	*Catharus minimus*
MEAM	American Robin	Merle d'Amérique	*Turdus migratorius*
PIAM	American Pipit	Pipit d'Amérique	*Anthus rubescens*
JABO	Bohemian Waxwing	Jaseur boréal	*Bombycilla garrulus*
PGGR	Northern Shrike	Pie-grièche grise	*Lanius excubitor*
SPPA	Warbler	Paruline sp.	-
PAJA	Yellow Warbler	Paruline jaune	*Setophaga petechia*
PACJ	Yellow-rumped Warbler	Paruline à croupion jaune	*Setophaga coronata*
PARA	Blackpoll Warbler	Paruline rayée	*Setophaga striata*
PARU	Northern Waterthrush	Paruline des ruisseaux	*Parkesia noveboracensis*
PACN	Wilson's Warbler	Paruline à calotte noire	*Cardellina pusilla*
SPBR	Sparrow	Bruant sp.	-
BRHU	American Tree Sparrow	Bruant hudsonien	*Spizella arborea*
BRPR	Savannah Sparrow	Bruant des prés	*Passerculus sandwichensis*
BRFV	Fox Sparrow	Bruant fauve	*Passerella iliaca*
BRLI	Lincoln's Sparrow	Bruant de Lincoln	*Melospiza lincolnii*
BRGB	White-throated Sparrow	Bruant à gorge blanche	*Zonotrichia albicollis*
BRCB	White-crowned Sparrow	Bruant à couronne blanche	*Zonotrichia leucophrys*
JUAR	Dark-eyed Junco	Junco ardoisé	*Junco hyemalis*
QURO ***	Rusty Blackbird	Quiscale rouilleux	*Euphagus carolinus*
DUSA	Pine Grosbeak	Durbec des sapins	*Pinicola enucleator*
SIFL	Common Redpoll	Sizerin flammé	*Acanthis flammea*
TAPI	Pine Siskin	Tarin des pins	*Spinus pinus*
SPPS	Passerine	Passereau sp.	-
SPSP	Bird	Oiseau sp.	-
OURS	American black bear	Ours noir	*Ursus americanus*
CASTH	North American Beaver lodge	Hutte de castor du Canada	*Castor canadensis*
SPMA	Mammal	Mammifère sp.	

*** indicates the species is listed as federally or provincialy threatened

Appendix IV

Pictures of Birds Taken at LabMag Mine Site during Surveys

Semipalmated Plover in frozen wetland, LabMag, May 2011

Rusty Blackbird, wetland, LabMag, May 2011

Male Willow Ptarmigan in tundra, LabMag, May 2011

Harlequin Ducks, male and female, Howells River, LabMag, May 2011

Appendix V

Daily Meteorological Data Report for May, August and September 2011 from Environment Canada

Environment Canada Environnement Canada

Canada

Daily Data Report for May 2011

SCHEFFERVILLE A
QUEBEC

Latitude: 54°48'00.000" N Longitude: 66°48'00.000" W Elevation: 521.00 m

Climate ID: 7117827 WMO ID: 71828 TC ID: YKL

Daily Data Report for May 2011

Day	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days °C	Cool Deg Days °C	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's deg	Spd of Max Gust km/h
01†	11.6	0.3	6.0	12.0	0.0	M	M	0.0		26	33
02†	9.7	0.5	5.1	12.9	0.0	M	M	3.0		21	59
03†	1.6	-7.9	-3.2	21.2	0.0	M	M	4.5		33	35
04†	3.8	-9.6	-2.9	20.9	0.0	M	M	0.0			<31
05†	2.7	-8.8	-3.1	21.1	0.0	M	M	0.0			<31
06†	2.5	-5.9	-1.7	19.7	0.0	M	M	2.0		12	46
07†	5.8	-1.2	2.3	15.7	0.0	M	M	1.0			<31
08†	2.3	-5.4	-1.6	19.6	0.0	M	M	0.0		35	37
09†	0.1	-10.0	-5.0	23.0	0.0	M	M	0.0		34	33
10†	5.2	-12.1	-3.5	21.5	0.0	M	M	0.0			<31
11†	9.4	-4.3	2.6	15.4	0.0	M	M	0.0			<31
12†	5.4	-5.2	0.1	17.9	0.0	M	M	0.0			<31
13†	3.7	-6.8	-1.6	19.6	0.0	M	M	0.0			<31
14†	5.3	-4.7	0.3	17.7	0.0	M	M	0.0		33	39
15†	0.5	-5.4	-2.5	20.5	0.0	M	M	0.5		35	48
16†	4.1	-4.0	0.1	17.9	0.0	M	M	0.0		2	44
17†	11.8	1.0	6.4	11.6	0.0	M	M	0.5		25	54
18†	15.1	0.2	7.7	10.3	0.0	M	M	0.0		26	48
19†	6.6	-4.8	0.9	17.1	0.0	M	M	0.0		7	35
20†	7.6	-4.9	1.4	16.6	0.0	M	M	0.0			<31
21†	6.9	-7.1	-0.1	18.1	0.0	M	M	0.0			<31
22†	13.3	-3.8	4.8	13.2	0.0	M	M	0.0		22	37
23†	6.3	-0.6	2.9	15.1	0.0	M	M	5.5			<31
24†	2.5	-3.4	-0.5	18.5	0.0	M	M	18.0		36	48
25†	1.7	-4.1	-1.2	19.2	0.0	M	M	1.5		33	32
26†	6.3	-6.1	0.1	17.9	0.0	M	M	0.5		25	37
27†	6.5	-4.5	1.0	17.0	0.0	M	M	0.0			<31
28†	14.9	-5.2	4.9	13.1	0.0	M	M	0.5			<31
29†	12.1	3.0	7.6	10.4	0.0	M	M	7.0		24	41
30†	8.0	-0.2	3.9	14.1	0.0	M	M	1.0		35	41
31†	8.4	-1.2	3.6	14.4	0.0	M	M	0.5			<31
Sum				**523.2**	**0.0**	**0.0***	**0.0***	**46.0**			
Avg	**6.5**	**-4.3**	**1.1**								
Xtrm	**15.1**	**-12.1**								**21**	**59**

Legend
[empty] = No data available

Environment Canada Environnement Canada

Canada

Daily Data Report for August 2011

SCHEFFERVILLE A
QUEBEC

Latitude: 54°48'00.000" N Longitude: 66°48'00.000" W Elevation: 521.00 m

Climate ID: 7117827 WMO ID: 71828 TC ID: GKL

Daily Data Report for August 2011

Day	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days	Cool Deg Days	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's deg	Spd of Max Gust km/h
01†	20.9	10.8	15.9	2.1	0.0	M	M	0.0		14	37
02†	22.9	11.5	17.2	0.8	0.0	M	M	0.0		17	33
03†	22.9	12.0	17.5	0.5	0.0	M	M	0.0		19	33
04†	23.7	14.4	19.1	0.0	1.1	M	M	2.5			<31
05†	24.3	13.8	19.1	0.0	1.1	M	M	1.5		22	48
06†	22.7	12.8	17.8	0.2	0.0	M	M	1.0		24	32
07†	17.8	10.6	14.2	3.8	0.0	M	M	1.0		29	32
08†	18.4	7.9	13.2	4.8	0.0	M	M	4.0			<31
09†	19.5	5.9	12.7	5.3	0.0	M	M	0.0			<31
10†	21.6	10.2	15.9	2.1	0.0	M	M	0.5		17	44
11†	14.6	11.7	13.2	4.8	0.0	M	M	0.0		17	35
12†	18.6	11.5	15.1	2.9	0.0	M	M	8.0			<31
13†	20.3	11.1	15.7	2.3	0.0	M	M	1.0		30	37
14†	16.1	6.6	11.4	6.6	0.0	M	M	0.0		30	35
15†	17.0	9.0	13.0	5.0	0.0	M	M	6.5		21	39
16†	15.1	7.1	11.1	6.9	0.0	M	M	1.0		32	35
17†	13.0	7.3	10.2	7.8	0.0	M	M	0.0		30	33
18†	17.3	5.7	11.5	6.5	0.0	M	M	0.0			<31
19†	17.6	10.0	13.8	4.2	0.0	M	M	3.0			<31
20†	22.3	13.2	17.8	0.2	0.0	M	M	3.5			<31
21†	20.5	9.5	15.0	3.0	0.0	M	M	3.0			<31
22†	16.6	8.5	12.6	5.4	0.0	M	M	27.5		14	56
23†	14.5	8.5	11.5	6.5	0.0	M	M	2.0		30	46
24†	16.9	7.5	12.2	5.8	0.0	M	M	3.5		18	52
25†	16.9	8.8	12.9	5.1	0.0	M	M	14.0		33	44
26†	17.3	7.7	12.5	5.5	0.0	M	M	0.5		33	41
27†	16.7	8.3	12.5	5.5	0.0	M	M	2.5		20	50
28†	12.6	7.1	9.9	8.1	0.0	M	M	0.0		29	35
29†	11.8	6.5	9.2	8.8	0.0	M	M	4.0		6	33
30†	15.2	7.1	11.2	6.8	0.0	M	M	2.5			<31
31†	15.4	6.4	10.9	7.1	0.0	M	M	2.5		33	35
Sum				**134.4**	**2.2**	**0.0***	**0.0***	**95.5**			
Avg	**18.1**	**9.3**	**13.7**								
Xtrm	**24.3**	**5.7**								**14**	**56**

Summary, average and extreme values are based on the data above.

Environment Canada Environnement Canada

Canada

Daily Data Report for September 2011

SCHEFFERVILLE A
QUEBEC

Latitude: 54°48'00.000" N Longitude: 66°48'00.000" W Elevation: 521.00 m

Climate ID: 7117827 WMO ID: 71828 TC ID: GKL

Daily Data Report for September 2011

Day	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days	Cool Deg Days	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's deg	Spd of Max Gust km/h
01†	18.4	7.4	12.9	5.1	0.0	M	M	0.0		27	37
02†	22.6	11.9	17.3	0.7	0.0	M	M	4.0		3	74
03†	15.0	3.5	9.3	8.7	0.0	M	M	1.0		27	80
04†	9.2	2.3	5.8	12.2	0.0	M	M	0.0		31	35
05†	10.7	-0.7	5.0	13.0	0.0	M	M	0.0			<31
06†	15.0	-1.7	6.7	11.3	0.0	M	M	0.0			<31
07†	17.8	6.6	12.2	5.8	0.0	M	M	0.5		25	56
08†	9.8	2.8	6.3	11.7	0.0	M	M	7.5		24	56
09†	8.3	2.4	5.4	12.6	0.0	M	M	6.0		2	35
10†	7.3	2.0	4.7	13.3	0.0	M	M	0.5		33	37
11†	13.8	3.4	8.6	9.4	0.0	M	M	6.0		25	56
12†	8.2	1.4	4.8	13.2	0.0	M	M	1.0		31	50
13†	9.4	0.3	4.9	13.1	0.0	M	M	9.0		16	50
14†	7.6	-2.8	2.4	15.6	0.0	M	M	0.0		30	56
15†	7.2	-3.1	2.1	15.9	0.0	M	M	1.5			<31
16†	3.9	0.1	2.0	16.0	0.0	M	M	12.0		33	61
17†	9.3	0.5	4.9	13.1	0.0	M	M	4.0		32	50
18†	15.0	7.0	11.0	7.0	0.0	M	M	0.0		26	44
19†	17.3	6.4	11.9	6.1	0.0	M	M	0.0		25	46
20†	11.6	4.5	8.1	9.9	0.0	M	M	0.0		20	37
21†	10.7	2.6	6.7	11.3	0.0	M	M	0.5		28	41
22†	6.2	1.6	3.9	14.1	0.0	M	M	0.0			<31
23†	12.8	2.4	7.6	10.4	0.0	M	M	0.5			<31
24†	12.8	9.0	10.9	7.1	0.0	M	M	0.5		3	67
25†	12.8	4.3	8.6	9.4	0.0	M	M	0.0		29	61
26†	6.6	1.2	3.9	14.1	0.0	M	M	0.0		32	46
27†	9.0	0.4	4.7	13.3	0.0	M	M	0.0		35	32
28†	17.2	5.8	11.5	6.5	0.0	M	M	0.0		24	46
29†	17.7	4.7	11.2	6.8	0.0	M	M	9.0			<31
30†	4.7	-1.0	1.9	16.1	0.0	M	M	27.5		35	46
Sum				**322.8**	**0.0**	**0.0***	**0.0***	**91.0**			
Avg	**11.6**	**2.8**	**7.2**								
Xtrm	**22.6**	**-3.1**								**27**	**80**

Summary, average and extreme values are based on the data above.

Legend

[empty] = No data available
M = Missing
E = Estimated
A = Accumulated
C = Precipitation occurred, amount uncertain
L = Precipitation may or may not have occurred
F = Accumulated and estimated
N = Temperature missing but known to be > 0
Y = Temperature missing but known to be < 0
S = More than one occurrence
T = Trace
* = The value displayed is based on incomplete data
† = Data for this day has undergone only preliminary quality checking

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We'd like to hear from you! Please click "Contact Us" to share your comments and suggestions.

Date Modified: 2012-01-11

Appendix VI

Birds Observed during Overland Flights

Birds Observed during Overland Flights

*** indicates the species is listed as federally or provincially at risk

Site/Survey GPS	Date	Code & Name		Number of observations Undifferentiated	Male	Female
TACONITE - LABMAG PROJECT						
SPRING BIRD MIGRATION LABMAG PROJECT - MINE SITE						
001	21-05-2011	QURO	Rusty Blackbird	3		
002	21-05-2011	CACO	Mallard		1	1
003	21-05-2011	OURS	American black bear	1		
004	21-05-2011	BEWI	Wilson's Snipe	2		
005	21-05-2011	BEWI	Wilson's Snipe	2		
006	21-05-2011	BEWI	Wilson's Snipe	3		
007	21-05-2011	BEWI	Wilson's Snipe	4		
008	21-05-2011	BEWI	Wilson's Snipe	1		
009	21-05-2011	CANO	American Black Duck	2		
010	21-05-2011	GAOO	Common Goldeneye	2		
011	21-05-2011	GRHA	Common Merganser	1		
012	21-05-2011	BECA	Canada Goose	2		
013	21-05-2011	SAHI	Green-winged Teal	4		
014	21-05-2011	SAHI	Green-winged Teal	3	4	4
014	21-05-2011	CACO	Mallard		1	1
015	21-05-2011	BECA	Canada Goose	2		
016	21-05-2011	BEWI	Wilson's Snipe	6		
017	21-05-2011	SAHI	Green-winged Teal		6	6
018	21-05-2011	SAHI	Green-winged Teal	3		
019	21-05-2011	ARPL	Harlequin Duck	1	1	1
020	21-05-2011	CANO	American Black Duck	6		
020	21-05-2011	CACO	Mallard		1	1
021	21-05-2011	SAHI	Green-winged Teal	2		
021	21-05-2011	PEFU	Lesser Scaup		1	1
023	21-05-2011	GOAR	Herring Gull	2		
024	21-05-2011	BECA	Canada Goose	1		
024	21-05-2011	SAHI	Green-winged Teal	6		
025	21-05-2011	EPBR	Sharp-shinned Hawk	1		
026	21-05-2011	SAHI	Green-winged Teal	2		
026	21-05-2011	MAFB	Surf Scoter		1	1
026	21-05-2011	GAOO	Common Goldeneye	6		
027	21-05-2011	SAHI	Green-winged Teal		2	2
027	21-05-2011	GAOO	Common Goldeneye	2		
028	21-05-2011	SAHI	Green-winged Teal	7		
028	21-05-2011	GAOO	Common Goldeneye		1	1
029	21-05-2011	SAHI	Green-winged Teal		1	1
030	21-05-2011	MAFB	Surf Scoter		2	2
031	21-05-2011	SAHI	Green-winged Teal		3	3
031	21-05-2011	CAPI	Northern Pintail		1	1
032	21-05-2011	CANO	American Black Duck	1		
032	21-05-2011	GAOO	Common Goldeneye		1	1
033	21-05-2011	BECA	Canada Goose	8		
034	21-05-2011	GAOO	Common Goldeneye		1	1

Birds Observed during Overland Flights

*** indicates the species is listed as federally or provincially at risk

Site/Survey GPS	Date	Code & Name		Number of observations Undifferentiated	Male	Female
035	21-05-2011	SAHI	Green-winged Teal		1	1
035	21-05-2011	GAOO	Common Goldeneye		1	1
036	21-05-2011	SAHI	Green-winged Teal		1	1
038	21-05-2011	BEWI	Wilson's Snipe	4		
039	21-05-2011	BEWI	Wilson's Snipe	2		
040	21-05-2011	BECA	Canada Goose	1		
041	21-05-2011	QURO	Rusty Blackbird	1		
042	21-05-2011	BEWI	Wilson's Snipe	1		
044	21-05-2011	BUQR	Red-tailed Hawk	1		
045	21-05-2011	BEWI	Wilson's Snipe	1		
046	21-05-2011	TECA	Spruce Grouse	1		
047	21-05-2011	SAHI	Green-winged Teal	19		
047	21-05-2011	SAHI	Green-winged Teal	4		
047	21-05-2011	CANO	American Black Duck	4		
047	21-05-2011	CAPI	Northern Pintail	2		
047	21-05-2011	GAOO	Common Goldeneye	2		
048	21-05-2011	BEWI	Wilson's Snipe	1		
050	21-05-2011	PEFU	Lesser Scaup	2	1	1
050	21-05-2011	GAOO	Common Goldeneye	4	2	2
051	21-05-2011	BEWI	Wilson's Snipe	3		
052	21-05-2011	LASA	Willow Ptarmigan	1		
087	28-05-2011	GAOO	Common Goldeneye	2	1	1
087	28-05-2011	GAOO	Common Goldeneye	2	1	1
088	28-05-2011	PEFU	Lesser Scaup	2	1	1
089	28-05-2011	SPOR	Shorebird	2		
090	28-05-2011	GAOO	Common Goldeneye	1	1	1
091	28-05-2011	SAHI	Green-winged Teal	8		
091	28-05-2011	CANO	American Black Duck	4		
091	28-05-2011	CAPI	Northern Pintail	2	2	2
091	28-05-2011	PEFU	Lesser Scaup	2	1	1
091	28-05-2011	GAOO	Common Goldeneye	2	1	1
092	28-05-2011	BAPE	Osprey	2	1	1
093	28-05-2011	GRHA	Common Merganser	2	1	1
094	28-05-2011	HAHU	Red-breasted Merganser	2	1	1
095	28-05-2011	MAFB	Surf Scoter	16		
096	28-05-2011	GRHA	Common Merganser	1	1	1
097	28-05-2011	SAHI	Green-winged Teal	2	1	1
098	28-05-2011	MAFB	Surf Scoter	6		
098	28-05-2011	HAHU	Red-breasted Merganser	2	1	1
099	28-05-2011	BECA	Canada Goose	1		
099	28-05-2011	SPFU	*Aythya* sp.	1		
099	28-05-2011	GRHA	Common Merganser	3	3	3
100	28-05-2011	PYTB	Bald Eagle	1		
101	28-05-2011	MANO	Black Scoter	4	2	2
101	28-05-2011	MAFB	Surf Scoter	1	1	1
102	28-05-2011	SAHI	Green-winged Teal	2	1	1

Birds Observed during Overland Flights

*** indicates the species is listed as federally or provincially at risk

Site/Survey GPS	Date	Code & Name		Number of observations Undifferentiated	Male	Female
102	28-05-2011	GRHA	Common Merganser	4		
103	28-05-2011	GRCH	Greater Yellowlegs	2		
104	28-05-2011	CANO	American Black Duck	2	1	1
104	28-05-2011	GRHA	Common Merganser	1		
105	28-05-2011	GRHA	Common Merganser	2	1	1
106	28-05-2011	PEFU	Lesser Scaup	8	4	4
106	28-05-2011	GRHA	Common Merganser	2	1	1
107	28-05-2011	HAHU	Red-breasted Merganser	2	1	1
108	28-05-2011	HAHU	Red-breasted Merganser	3	2	2
108	28-05-2011	GOAR	Herring Gull	1		
109	28-05-2011	BUQR	Red-tailed Hawk	1		
110	28-05-2011	BEWI	Wilson's Snipe	1		
111	28-05-2011	SAHI	Green-winged Teal	1		
111	28-05-2011	CANO	American Black Duck	6		
111	28-05-2011	BERO	Short-billed Dowitcher	5		
112	28-05-2011	BERO	Short-billed Dowitcher	2		
113	28-05-2011	BERO	Short-billed Dowitcher	1		
114	28-05-2011	SPOR	Shorebird	7		
115	28-05-2011	HAKA	Long-tailed Duck	3	1	1
116	28-05-2011	PLHU	Common Loon	1		
117	28-05-2011	MAFB	Surf Scoter	6	3	3
117	28-05-2011	HAHU	Red-breasted Merganser	2	1	1
118	28-05-2011	BECA	Canada Goose	2		
119	28-05-2011	SPFU	*Aythya* sp.	2	1	1
119	28-05-2011	HAKA	Long-tailed Duck	2		
119	28-05-2011	GAOO	Common Goldeneye	2	1	1
119	28-05-2011	HAHU	Red-breasted Merganser	2	1	1
120	28-05-2011	BERO	Short-billed Dowitcher	3		
120	28-05-2011	BEWI	Wilson's Snipe	2		
121	28-05-2011	TECA	Spruce Grouse	1		
122	28-05-2011	GRHA	Common Merganser	9		
123	28-05-2011	GAOO	Common Goldeneye	1	1	1
123	28-05-2011	GRHA	Common Merganser	1		
124	28-05-2011	PLHU	Common Loon	2		
124	28-05-2011	BECA	Canada Goose	4		
124	28-05-2011	MAFB	Surf Scoter	30		
124	28-05-2011	GAOO	Common Goldeneye	2	1	1
125	28-05-2011	SAHI	Green-winged Teal	2	1	1
126	28-05-2011	SPOR	Shorebird	1		
127	28-05-2011	PLHU	Common Loon	2		
128	28-05-2011	SAHI	Green-winged Teal	2		
128	28-05-2011	GRHA	Common Merganser	1	1	1
129	28-05-2011	BEWI	Wilson's Snipe	2		
130	28-05-2011	BEWI	Wilson's Snipe	1		
131	28-05-2011	CHSO	Solitary Sandpiper	2		
132	28-05-2011	SPOR	Shorebird	4		

Birds Observed during Overland Flights

*** indicates the species is listed as federally or provincially at risk

Site/Survey GPS	Date	Code & Name		Number of observations Undifferentiated	Male	Female
132	28-05-2011	BEWI	Wilson's Snipe	1		
133	28-05-2011	BEWI	Wilson's Snipe	1		
134	28-05-2011	CHSO	Solitary Sandpiper	1		
135	28-05-2011	BERO	Short-billed Dowitcher	4		
136	28-05-2011	BECA	Canada Goose	2		
137	28-05-2011	BERO	Short-billed Dowitcher	3		
138	28-05-2011	SAHI	Green-winged Teal	2		
139	28-05-2011	GRCH	Greater Yellowlegs	1		
140	28-05-2011	GAOO	Common Goldeneye	1		
141	28-05-2011	GRCH	Greater Yellowlegs	2		
142	28-05-2011	GRCH	Greater Yellowlegs	1		
143	28-05-2011	MAFB	Surf Scoter	2	1	1
144	28-05-2011	SPOR	Shorebird	3		
144	28-05-2011	GRCH	Greater Yellowlegs	2		
145	28-05-2011	SAHI	Green-winged Teal	2	1	1
146	28-05-2011	SAHI	Green-winged Teal	2	1	1
147	28-05-2011	GRHA	Common Merganser	1	1	1
148	28-05-2011	CANO	American Black Duck	1	1	1
148	28-05-2011	CACO	Mallard	1	1	1
149	28-05-2011	PEFU	Lesser Scaup	3	2	2
150	28-05-2011	TECA	Spruce Grouse	1		
151	28-05-2011	SAHI	Green-winged Teal	6		
152	28-05-2011	PGGR	Northern Shrike	1		
153	28-05-2011	SPOR	Shorebird	1		
154	28-05-2011	GRCH	Greater Yellowlegs	1		
154	28-05-2011	CHSO	Solitary Sandpiper	1		
154	28-05-2011	BERO	Short-billed Dowitcher	1		
155	28-05-2011	SAHI	Green-winged Teal	1	1	1
155	28-05-2011	BEWI	Wilson's Snipe	1		
156	28-05-2011	SAHI	Green-winged Teal	1	1	1
157	28-05-2011	SPOR	Shorebird	1		
158	28-05-2011	BECA	Canada Goose	1		
159	28-05-2011	BECA	Canada Goose	2		
160	28-05-2011	SPOR	Shorebird	1		
160	28-05-2011	BEWI	Wilson's Snipe	1		
163	28-05-2011	BEWI	Wilson's Snipe	1		
164	28-05-2011	BEWI	Wilson's Snipe	1		
165	28-05-2011	BEWI	Wilson's Snipe	1		
166	28-05-2011	BERO	Short-billed Dowitcher	3		
166	28-05-2011	BEWI	Wilson's Snipe	2		
167	28-05-2011	LASA	Willow Ptarmigan	1	1	1
AUTUMN BIRD MIGRATION LABMAG PROJECT - MINE SITE						
001	27-09-2011	HAHU	Red-breasted Merganser	1		
002	27-09-2011	GRCO	Common Raven	1		
003	27-09-2011	MAFB	Surf Scoter	2		

Birds Observed during Overland Flights

*** indicates the species is listed as federally or provincially at risk

Site/Survey GPS	Date	Code & Name		Number of observations Undifferentiated	Male	Female
004	27-09-2011	GRHA	Common Merganser	5		
005	27-09-2011	PLHU	Common Loon	1		
006	27-09-2011	SPSP	Bird	1		
006	27-09-2011	CAST	North American Beaver lodge	1		
008	27-09-2011	HACO	Hooded Merganser	2		
009	27-09-2011	GRHA	Common Merganser	2	1	1
010	27-09-2011	GAOO	Common Goldeneye	1	1	1
011	27-09-2011	HACO	Hooded Merganser	4	2	2
012	27-09-2011	SAHI	Green-winged Teal	2	1	1
012	27-09-2011	GAOO	Common Goldeneye	3		
013	27-09-2011	GAOO	Common Goldeneye	1	1	1
014	27-09-2011	GAOO	Common Goldeneye	1	1	1
014	27-09-2011	HACO	Hooded Merganser	2	2	2
015	27-09-2011	GAOO	Common Goldeneye	1	1	1
016	27-09-2011	HACO	Hooded Merganser	1	1	1
017	27-09-2011	HACO	Hooded Merganser	2		
018	27-09-2011	GAOO	Common Goldeneye	2		
019	27-09-2011	GOAR	Herring Gull	1	1	1
020	27-09-2011	GAOO	Common Goldeneye	1	1	1
021	27-09-2011	GAOO	Common Goldeneye	3	3	3
022	27-09-2011	HACO	Hooded Merganser	3	3	3
023	27-09-2011	HACO	Hooded Merganser	1	1	1
048	27-09-2011	SPOR	Shorebird	1		
049	27-09-2011	BUPA	Rough-legged Hawk	1		
050	27-09-2011	SPMA	Scoter sp.	1		
050	27-09-2011	HACO	Hooded Merganser	4	4	4
051	27-09-2011	HACO	Hooded Merganser	2		
052	28-09-2011	PLHU	Common Loon	1		
053	28-09-2011	CAST	North American Beaver lodge	1		
054	28-09-2011	HACO	Hooded Merganser	1	1	1
055	28-09-2011	HACO	Hooded Merganser	2		
056	28-09-2011	PEFU	Lesser Scaup	1		
057	28-09-2011	BUPA	Rough-legged Hawk	1		
058	28-09-2011	SPAN	Anatid (Duck or Goose)	2		
059	28-09-2011	SPMA	Mammal	1		
060	28-09-2011	TECA	Spruce Grouse	1		
061	28-09-2011	PYTB	Bald Eagle	1		
062	28-09-2011	PEFU	Lesser Scaup	2		
063	28-09-2011	SPMA	Mammal	1		
068	28-09-2011	GRCO	Common Raven	1		
069	29-09-2011	GRHA	Common Merganser	1		
070	29-09-2011	BUQR	Red-tailed Hawk	1		
071	29-09-2011	GAOO	Common Goldeneye	1		
072	29-09-2011	PYTB	Bald Eagle	1		
073	29-09-2011	CAST	North American Beaver lodge	1		
074	29-09-2011	GRHA	Common Merganser	5	5	5

Birds Observed during Overland Flights

*** indicates the species is listed as federally or provincially at risk

Site/Survey				Number of observations		
GPS	Date	Code & Name		Undifferentiated	Male	Female
075	29-09-2011	PYTB	Bald Eagle	1		
076	29-09-2011	CAST	North American Beaver lodge	1		
077	29-09-2011	GAOO	Common Goldeneye	7	5	5
078	29-09-2011	CAST	North American Beaver lodge	1		
079	29-09-2011	GRHA	Common Merganser	8	6	6
080	29-09-2011	HACO	Hooded Merganser	2	2	2
081	29-09-2011	SAHI	Green-winged Teal	3		
081	29-09-2011	CAPI	Northern Pintail	1		
081	29-09-2011	GAOO	Common Goldeneye	2		
081	29-09-2011	HACO	Hooded Merganser	2	2	2
082	29-09-2011	GRHA	Common Merganser	7		
083	29-09-2011	GRHA	Common Merganser	1	1	1
084	29-09-2011	SPAN	Anatid (Duck or Goose)	1		
085	29-09-2011	HACO	Hooded Merganser	5	5	5
086	29-09-2011	BUPA	Rough-legged Hawk	1		
087	29-09-2011	HACO	Hooded Merganser	5	2	2
088	29-09-2011	GAOO	Common Goldeneye	4	2	2
089	29-09-2011	CAST	North American Beaver lodge	1		
090	29-09-2011	GOAR	Herring Gull	1		
091	29-09-2011	GRHA	Common Merganser	3	3	3
092	29-09-2011	PLHU	Common Loon	2		

GroupeHemispheres

Migrating Birds Surveys at the KéMag Project Mine Site, Spring and Fall 2011

NEW MILLENNIUM IRON

TATA

Technical Report

Our file: PR85-34-11

Your order: NML-00-2064

August 31, 2012

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Héli-Nation	Helicopter

(Refer also to the list of personal communications in the References section)

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LIST OF ABBREVIATIONS AND SYMBOLS

^{0}C	Degrees Celsius
AOU	American Ornithologists' Union
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CWS	Canadian Wildlife Service
DSO	Direct Shipping Ore
GHI	Groupe Hémisphères
GIS	Geographic Information System
GPS	Global Positioning System
hr	Hour
km	Kilometer
km/hr	Kilometer per hour
m	Meter
min	Minute
MRNF	Ministère des Ressources naturelles et de la Faune
NML	New Millennium Iron Corp.

1 INTRODUCTION

Groupe Hémisphères (GHI) was mandated by New Millennium Iron Corp (NML) to conduct environmental studies on a future taconite mine, called the KéMag Project, located in Quebec. This report describes the bird communities that were encountered in the study area during the spring and fall migrations of 2011.

1.1 Birds Potentially Found in the Study Area

To prepare appropriate inventories, bird species that potentially occupy the study area must be identified. Birds are typically classified in three categories: terrestrial birds, aquatic birds and birds of prey. A brief description of these classes, including their presence in Quebec, is presented below. The study area is described in Section 2.3.

1.1.1 Terrestrial Birds

Terrestrial birds include songbirds and woodpeckers, as well as cuckoos, hummingbirds, Galliformes (partridges, grouse and ptarmigan), pigeons, doves, nighthawks, kingfishers and swifts. There is a total of 152 species of terrestrial birds in Quebec (Gauthier and Aubry, 1995).

1.1.2 Aquatic Birds

This group comprises the Anatidae family, including ducks, swans and geese, as well as other taxonomic groups considered aquatic birds, namely loons, grebes, cormorants, herons, cranes, rails, shorebirds, gulls and terns. Gauthier and Aubry (1995) list 87 species of birds in this category for Quebec North, but 26 of them are exclusively found in marine habitats or close to the coast, and are therefore unlikely to be found in the study area.

1.1.3 Birds of Prey

This group comprises many taxonomic groups. Durnal birds of prey (Falconidae) include 15 species that breed in Quebec. Nocturnal birds of prey (Strigidae) include 10 species of owls that are found regularly in the province. The Turkey Vulture is considered as part of the Cathartidae family. Although it is genetically closer to storks and marabouts, it behaves ecologically as a bird of prey (SCF, 2005).

1.2 Species with Status

There are six species with status potentially found in the study area (Table 1) (MNRF, 2011). Some biotopes in the study area may be suitable for migrating stopovers. The survey techniques used are also designed to detect species of concern potentially found in the study area during their migrations. Eagles no longer have status under Federal legislation but they still do under Quebec legislation.

Table 1. Species with Status Potentially Found in the Study Area

COMMON NAME	SCIENTIFIC NAME	STATUS	
		Québec	Canada
Golden Eagle	*Aquila chrysaetos*	Vulnerable	_
Harlequin Duck	*Histrionicus histrionicus*	Vulnerable	Vulnerable
Peregrine Falcon	*Falcon peregrinus*	Vulnerable	Vulnerable
Short-eared Owl	*Asio flammeus*	ESDMV	Vulnerable
Bald Eagle	*Haliaeetus leucocephalus*	Vulnerable	_
Rusty Blackbird	*Euphagus carolinus*	_	Vulnerable

1.3 Documents Consulted

The survey was designed in accordance with the current Canadian guidelines and with knowledge of the site from previous studies. The level of effort is considered sufficient to comply with survey requirements (Hanson *et al.*, 2009).

The following sources were consulted:

- Lists of bird species with status potentially found in the study area:
  - The federal species at risk list (COSEWIC, 2011);
  - the list of species protected under « Liste des espèces de la faune désignées menacées vulnérables au Québec » (MRNF, Ministère des Ressources naturelles et de la faune, 2011)
- Previous bird studies conducted in the vicinity of the study area:
  - *Breeding Bird Data Collection in the Howells River Basin of Labrador* (Golder Associates Ltd. and Global Environment, 2005);
  - *LabMag Iron Ore Project Waterfowl Breeding Pair Surveys* (Minaskuat Limited Partnership, 2008);
  - *Inventaire 2008 et 2009 des oiseaux nicheurs du futur site DSO* (Groupe Hémisphères, 2009);
- Previous bird studies in the region:
  - The Waterfowl Component Study Trans Labrador Highway (Happy Valley-Goose Bay to Cartwright Junction) report by Jacques Whitford (January 2003);
  - The Timing of Waterfowl Arrival and Dispersion during Spring Migration in Labrador, a scientific article by Chaulk and Turner (2007).

These sources gave information on:

- Species with status that may use the study area during their migrations;
- Species that can be found regionally;
- Potential dates of migration for aquatic birds.

The survey methodology took into account the information found in these sources.

2 METHODOLOGY

2.1 Validation Method

The proposed survey methodology was submitted to the Quebec Department of Natural Resources and to the Canadian Wildlife Service (CWS) division of Environment Canada.

2.2 Classification

The English, French and Latin names of birds are based on the 7th edition and 52nd supplement to the list of birds of North America (AOU, 2011).

2.3 Study Area

The NML KeMag claims area plus a buffer 3 km wide around its perimeter constitutes the study area.

2.4 Spring and Fall Migrations: Detailed Survey Techniques

Three types of surveys were performed: overland flights, short transects and adapted visits. The last two types were carried out on foot as ground surveys. The overland flight paths and the locations of the ground surveys can be found respectively in Figures 1 and 2. Because the fall migration lasts much longer than the spring migration (Bauchinger and Klaassen, 2005), two visits were made in fall. The first visit, in August, targeted passerines and shorebirds, while the second, in late September, targeted geese and ducks. Under these conditions, the term fall migration is used as a common expression describing the return migration of birds.

A sighting refers to a bird that was heard or seen. For some groups, such as birds of prey, the number of sightings could potentially overestimate the number of individuals present in the study area, because the same bird may be observed repeatedly throughout the survey period. An effort was made not to count an individual more than once on the same day.

2.4.1 Overland Flights

In the spring, waterfowl were surveyed by helicopter in a two-phase survey: one on May 22 and another on May 28, for a total of 9 hr 11 min of flight. During the fall season, waterfowl surveying by helicopter took place over three consecutive days, from September 27 to 29, for a total flight time of 6 hr 27 min. The overland flights targeted waterfowl, but all birds that could be identified were noted, including birds of prey, other aquatic birds (gulls, shorebirds, loons) and terrestrial birds.

The crew was composed of four members:

- The pilot;
- An observer-navigator, seated next to the pilot, who was responsible for maintaining the flight path. The observer-navigator recorded the GPS coordinates and entered all of the relevant bird sightings on a data observation sheet;
- An observer-identifier, seated behind the pilot, who was responsible for making bird sightings and providing information to the observer/navigator on the species, number, sex and maturity, when possible, of all birds observed on that side of the aircraft;
- A fourth observer-identifier, seated behind the observer-navigator, who was in charge of finding birds and providing information to the observer-navigator on the species, number, sex and maturity, when possible, of all birds observed on that side of the aircraft.

On completion of the survey, the GPS coordinates unique numbers were loaded into a GIS program and merged with the observation data spreadsheets to produce a single spreadsheet combining all of the

location and sighting data. When different species were observed at the same GPS unique number, a decimal number was added to the unique number for each species seen.

Overland flights also included the following:

- All open waterbodies and wetlands were overflown to locate waterfowl and other birds near the shorelines;
- Airspeed varied between 70 and 150 km/hr and flight altitude above ground level was between 20 and 50 m (Bordage *et al.,* 1992; Guérette *et al*., 2009);
- The number of individuals, species, sex (if possible) and age (if possible) were recorded;
- The habitats of species with status were given special attention. These include rapids for Harlequin Ducks, cliffs for Golden Eagles and Peregrine Falcons and large open boggy habitats for Short-eared Owls;
- Date and time, weather and biotope were also noted.

2.4.2 Short Transects

Short transects are used to survey terrestrial birds, mostly songbirds and woodpeckers. They are conducted as follows:

- The survey is done in the morning, in the first five hours of light, if minimum weather requirements are met;
- The survey starts at least 5 min after the helicopter has shut down its engine;
- Two observers, spaced at least 150 m apart, walk and watch for birds 500 m in opposite directions;
- Distance categories from the transect centre line (0 to 50 m, 50 to 100 m, more than 100 m) are recorded;
- The survey lasts about 30 min;
- The following data are recorded: number of bird observations, species and distance from the transect (category);
- Other recorded data are: date and time, weather, biotope, human or natural disturbances.

Transect locations were determined in a manner ensuring that each biotope surveyed (i.e., coniferous forest, shrubland and tundra) would be represented proportionately to its occurrence in the study area. During the spring survey, the songbird surveys were conducted between the two phases of the helicopter survey, namely on May 25 and 27. Nine short transects were each surveyed twice, and two other short transects were visited only once. These surveys took 10 hours and 41 minutes of effort. During the fall survey, short transects were carried out only once, from August 23 to 26, and took 4 hours and 42 minutes of effort.

Short Transects, Adapted Visits and Overland Flights
Spring

Virées courtes, visites adaptées et survols
Printemps

New Millennium Iron Corp.

LEGEND/LÉGENDE

Methodology/méthodologie

- Adapted visit/visite adaptée
- Short transect/virée courte
- Study area/aire d'étude
- Base camp/camp de base
- Airborne route/trajet aéroporté

Infrastructure and mining components
infrastructures et composantes minières

- Kemag claim/ titres miniers Kemag

Map base/fond de carte

- Road/route
- Border/frontière
- Watercourse/cours d'eau
- Contour interval/courbe de niveau
- Waterbody/plan d'eau

*Hydronyms are oriented along the direction of water flow
*Les hydronymes sont orientés selon le sens d'écoulement de l'eau

0 1 2 3
Kilometers/Kilomètres

SCALE/ÉCHELLE: 1:70 000

UTM 19N NAD 83

FILE, VERSION, DATE, AUTHOR/
FICHIER, VERSION, DATE, AUTEUR:
GH-0271-a-01, 2012-05-31, P.L, L.B et E.D.

SOURCES:
Government of Canada, BNDT, 1:250,000, 1979
Government of Canada, CanVec, 1:50,000, 2002
Government of NL and government of Quebec,
Boundary used for claims
New Millennium Capital Corp., Mining sites and roads

Gouvernement du Canada, BNDT, 1/250 000, 1979
Gouvernement du Canada, CanVecT, 1/50 000, 2002
Gouvernement de T-N-L et gouvernement du Québec,
frontière utilisée pour les titres miniers
New Millennium Capital Corp., gisements et routes

GroupeHemispheres

Figure 1

Short Transects, Adapted Visits and Overland Flights
Fall

Virées courtes, visites adaptées et survols
Automne

New Millennium Iron Corp.

LEGEND/LÉGENDE

Methodology/méthodologie

- Adapted visit/visite adaptée
- Short transect/virée courte
- Study area/aire d'étude
- Base camp/camp de base
- Airborne route/trajet aéroporté

Infrastructure and mining components
infrastructures et composantes minières

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Map base/fond de carte

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- Watercourse/cours d'eau
- Contour interval/courbe de niveau
- Waterbody/plan d'eau

*Hydronyms are oriented along the direction of water flow
*Les hydronymes sont orientés selon le sens d'écoulement de l'eau

0 1 2 3
Kilometers/Kilomètres

SCALE/ÉCHELLE: 1:70 000 UTM 19N NAD 83

FILE, VERSION, DATE, AUTHOR/
FICHIER, VERSION, DATE, AUTEUR:
GH-0271-a-01, 2012-05-31, P.L, L.B et E.D.

SOURCES:
Government of Canada, BNDT, 1:250,000, 1979
Government of Canada, CanVec, 1:50,000, 2002
Government of NL and government of Quebec,
Boundary used for claims
New Millennium Capital Corp., Mining sites and roads

Gouvernement du Canada, BNDT, 1/250 000, 1979
Gouvernement du Canada, CanVecT, 1/50 000, 2002
Gouvernement de T-N-L et gouvernement du Québec,
frontière utilisée pour les titres miniers
New Millennium Capital Corp., gisements et routes

GroupeHemispheres

Figure 2

2.4.3 Adapted Visits

Migratory staging areas, such as shallow ponds, lakeshores and herb fens, were identified during overland flights and were then revisited to survey for shorebirds using the adapted visits protocol. This protocol is similar to that of the short transects. It was developed to survey shorebirds that cannot be identified and counted from the air and is conducted as follows:

- The survey can be done at any time when there is sufficient daylight. The shorebirds are identified by sight and they might rest all day at the same place, so this survey is not restricted to the morning hours;
- The helicopter lands at a minimum distance of 100 m from the selected habitat;
- The survey starts at least 5 min after the helicopter has shut down its engine;
- Distance categories of sightings from the transect centre line (0 to 50 m, 50 to 100 m, more than 100 m) are recorded;
- The survey lasts between 20 and 40 min, depending on the size of the wetland;
- The following data are recorded: number of individuals, species and distance from the transect (category);
- Other recorded data are: date and time, weather, biotope, human or natural disturbances.

Five adapted visits in wetlands were carried out on foot; each wetland was visited twice in spring, from May 25 to 27. In the fall, the same five stations were carried out only once, on August 24 and August 25. The total effort for these visits was 3 hours and 24 minutes in May, and 1 hour and 38 minutes in August. Total helicopter travelling time during the short transects and adapted visits was 6 hours and 20 minutes in the spring, and 6 hours and 27 minutes in the fall.

3 RESULTS AND DISCUSSION

In spring 2011, 49 species of birds were recorded, while 43 species were recorded in fall. Both counts included species spotted in transit to and from the survey areas (Appendix I). For both seasons combined, 65 bird species were recorded. Four different biotopes were surveyed for migrating birds: coniferous forest, shrubland, tundra and wetland (Appendix II). The wetlands demonstrated the greatest diversity of birds. A complete list of the bird species observed, both seasons combined, showing the survey code and the English, French and Latin names can found in Appendix III. Some pictures of birds taken during the surveys can be seen in Appendix IV.

3.1 Survey Conditions

Observation conditions varied from average to excellent, but the majority of the surveys were carried out in good or excellent conditions. May 24 was the only field day cancelled due to bad weather (rain and snow). Cloud cover was variable during the rest of the survey period, but no fog was encountered. The temperature varied between -5°C and 13°C during the survey period. Environment Canada's daily meteorological data for the survey months are available in Appendix V.

3.2 Effort

Tables 2 and 3 show the effort for the short transects and the adapted visits.

Table 2. Survey Effort in Short Transects and Adapted Visits, Spring 2011

BIOTOPE	CONIFEROUS FOREST	SHRUBLAND	TUNDRA	WETLAND (ADAPTED VISITS)
Transects per Biotope	3	6	2	4
Amount of Time per Biotope	2 h 57	5 h 21	1 h 48	3 h 24
Transect Code	KVC4, KVC5, KVC6	KVC1, KVC2, KVC3, KVC7, KVC9, KVC10	KVC8 et KVC11	KVA2, KVA3, KVA4, KVA5

Table 3. Survey Effort in Short Transects and Adapted Visits, Fall 2011

BIOTOPE	CONIFEROUS FOREST	SHRUBLAND	TUNDRA	WETLAND (ADAPTED VISITS)
Transects per Biotope	9	8	3	5
Amount of Time per Biotope	4 h 01	2 h 32	1 h 09	1 h 38
Transect Code	KVC4, KVC5, KVC6, KVC12, KVC14, KVC17, KVC18, KVC19, KVC20	KVC1, KVC2, KVC7, KVC9, KVC10, KVC13, KVC16	KVC8, KVC11, KVC15	KVA1, KVA2, KVA3, KVA4, KVA5

3.3 Overland Flights

The complete list of birds seen during the spring and the fall overland flights is available in Appendix I. A detailed list of the birds seen during the spring and the fall overland flights, including GPS coordinates, species name, number of sightings and sex (if noted), is available in Appendix VI.

3.3.1 Spring

Figure 3 shows the sightings of waterfowl in spring. The most abundant species were the Wilson's Snipe *(Gallinago delicata*) (34 sightings) Canada Goose (*Branta canadensis*) (27 sightings), Surf Scoter (*Melanitta perspicillata*) (26 sightings) and Green-winged Teal (*Anas crecca*) (24 sightings). Despite the high number of sightings of Canada Geese, Abraham Chemaganish, a Naskapi from Kawawachikamach, reported that local hunters had found it hard to find Canada Geese in the Schefferville and Kawawachikamach vicinity. They had had to drive as far as Menihek Dam to find them.

Common Goldeneye (*Bucephala clangula*) (17 sightings), Short-billed Dowitchers (*Limnodromus griseus*) (16 sightings), American Black Duck (*Anas rubripes*) and Northern Pintail (*Anas acuta*) (9 sightings) were also encountered numerous times during the overland flights.

The birds of prey that were recorded included two sightings of Ospreys (*Pandion haliaetus*), one of Bald Eagle (*Haliaeetus leucocephalus*), and three Short-eared Owl (*Asio flammeus*) sightings, probably representing two individuals.

3.3.2 Fall

Figure 4 shows the sightings of waterfowl in fall. The most common species was Common Merganser (*Mergus merganser*) (64 sightings), which was more common than all the other species of ducks put together. Unrecorded in spring, Lesser Scaup (*Aythya affinis*) was the second most common species during the fall surveys (14 sightings). More Lesser Scaup may have been present, because the species is difficult to determine with certainty and eight sightings were classified as either Greater or Lesser Scaup. Eight Hooded Mergansers (*Lophodytes cucullatus*) were observed. These sightings were north of the current known distribution of that species. Other species observed included Herring Gull (*Larus argentatus*) (7 sightings), Red-breasted Merganser (*Mergus serrator*) (3 sightings), Surf Scoter (2 sightings), Common Loon (*Gavia immer*) (2 sightings) and Common Goldeneye (1 sighting)

Birds of prey were well represented, with six sightings of Bald Eagles, four of Rough-legged Hawks (*Buteo lagopus*) and one of Northern Goshawk (*Accipiter gentilis*).

3.4 Short Transects

Three different biotopes were surveyed during the short transects. In spring, 245 sightings belonging to 23 species were found. A similar abundance and diversity were found in fall, with 222 sightings belonging to 29 species. The bird list per biotope is presented in Appendix II. The abundance of terrestrial birds was similar in both migration seasons.

3.4.1 Coniferous Forest

In spring, 40 sightings belonging to 14 species were made during the 3 short transects carried out in the coniferous forest. In descending order of importance, the most common species were White-crowned Sparrow (*Zonotrichia leucophrys*) (9 sightings), Dark-eyed Junco (*Junco hyemalis*) (7 sightings), Ruby-crowned Kinglet (*Regulus calendula*) (4 sightings) and Bohemian Waxwing (*Bombycilla garrulus*) (4 sightings).

In fall (late August), 95 sightings belonging to 25 species were made during the 9 short transects carried out in the coniferous forest. In descending order of importance, the most common species were the White-crowned Sparrow (26 sightings), Blackpoll Warbler (6 sightings) Common Redpoll (6 sightings), Boreal Chickadee (*Poecile hudsonicus*) (5 sightings) and Yellow-rumped Warbler (*Setophaga coronata*) (4 sightings). Northern Waterthrush (*Parkesia noveboracensis*) and White-winged Crossbill (*Loxia leucoptera*) were found exclusively in fall.

The coniferous forest biotope is the most extensive habitat in the study area. As a result, much more effort was spent there than in any other biotope.

3.4.2 Shrubland

In spring, 135 sightings belonging to 17 species were made during the 6 short transects carried out in the shrubland biotope. In descending order of importance, the most common species were the Common Redpoll (52 sightings), American Robin (*Turdus migratorius*) (19 sightings), White-crowned Sparrow (19 sightings), American Tree Sparrow (*Spizella arborea*) (9 sightings) and Dark-eyed Junco (8 sightings). Noteworthy was a singing Brown Creeper in KVC10 far north of its previously known distribution in Quebec (Hejl *et al.*, 2002).

In fall, 72 sightings belonging to 10 species were made during the 7 short transects. In descending order of importance, the most common species were the Common Redpoll (29 sightings), White-Crowned Sparrow (22 sightings), American Tree Sparrow (6 sightings) and Blackpoll Warbler (4 sightings). Other species found were American Robin (4 sightings), Gray Jay (*Perisoreus canadensis*) (3 sightings), Yellow-rumped Warbler (1 sighting), Northern Shrike (*Lanius excubitor*) (1 sighting), Herring Gull (1 sighting), and Rusty Blackbird (1 sighting).

3.4.3 Tundra

In spring, 70 sightings belonging to 8 species were made during the 2 short transects carried out in the tundra biotope. In descending order of importance, the most common species were the Horned Lark (*Eremophila alpestris*) (37 sightings), American Robin (12 sightings), Common Redpoll (7 sightings) and Willow Ptarmigan (*Lagopus lagopus*) (7 sightings). Most of the birds that were observed were still in migration and had not settled down for the breeding season. However, Willow Ptarmigans were already defending their breeding territory and were ready to mate.

In fall, 70 sightings belonging to 14 species were made during the 3 short transects carried out in the tundra biotope. In descending order of importance, the most common species were the White-crowned Sparrow (31 sightings), American Pipit (*Anthus rubescens*) (9 sightings), Yellow-rumped Warbler (8 sightings), Gray Jay (7 sightings) and American Tree Sparrow (5 sightings). Wilson's Warbler (*Wilsonia pusilla*), a species unrecorded during spring surveys, was also found in this habitat (2 sightings).

Overland Flight Results
Spring

Observations du survol
Printemps

New Millennium Iron Corp.

LEGEND/LÉGENDE

Observations

- Other species/autres espèces

Waterfowl/Sauvagine

- Anatidae/anatidé
- Wader/limicole

Specie with status /Espèce à statut précaire

- Bald Eagle/pygargue à tête blanche
- Golden Eagle/aigle royal
- Rusty Blackbird/quiscale rouilleux
- Short-eared Owl/hibou des marais
- Harlequin Duck/arlequin plongeur
- Multiple observations - single point/ observations multiples - point unique
- Study area/aire d'étude
- Base camp/camp de base
- 91.2: GPS unique number/ no. unique du GPS

Infrastructure and mining components
infrastructures et composantes minières

- Kemag claim/ titres miniers Kemag

Map base/fond de carte

- Road/route
- Border/frontière
- Watercourse/cours d'eau
- Contour interval/ courbe de niveau
- Waterbody/ plan d'eau
- Wetland/milieu humide

*Hydronyms are oriented along the direction of water flow
*Les hydronymes sont orientés selon le sens d'écoulement de l'eau

0 1 2 3
Kilometers/Kilomètres

SCALE/ÉCHELLE: 1:70 000 UTM 19N NAD 83

FILE, VERSION, DATE, AUTHOR/
FICHIER, VERSION, DATE, AUTEUR:
GH-0322-01, 2012-05-31, P.L, L.B et E.D.

SOURCES:
Government of Canada, BNDT, 1:250,000, 1979
Government of Canada, CanVec, 1:50,000, 2002
Government of NL and government of Quebec,
Boundary used for claims
New Millennium Capital Corp., Mining sites and roads

Gouvernement du Canada, BNDT, 1/250 000, 1979
Gouvernement du Canada, CanVecT, 1/50 000, 2002
Gouvernement de T-N-L et gouvernement du Québec,
frontière utilisée pour les titres miniers
New Millennium Capital Corp., gisements et routes

GroupeHemispheres

Figure 3

Overland Flight Results
Fall

Observations du survol
Automne

New Millennium Iron Corp.

Control area/zone témoin

595000 6120000 600000 605000 6115000 610000
67°30'W 67°25'W 67°20'W 55°10'N 67°15'W
590000 6120000 67°35'W 6110000 67°15'W
6115000 55°10'N 585000 67°40'W 6100000 67°20'W
6110000 585000 6105000 590000 595000 6100000 600000 605000
67°40'W 67°35'W 67°30'W 67°25'W

64 67 65 66 113 114 47 46 45 112 042 109 110 41 44 111 43 40 36 33 104 103 108 107 106 37 A 100 32 35 105 34 102 101 38 039 28.2 28.1 97 30 98 31 99 027 94 95 96 26 26.1 25 93 24 115 23 22

LEGEND/LÉGENDE

Observations

- Other species/autres espèces

Waterfowl/Sauvagine

- Anatidae/anatidé

Species of status/Espèce à statut

- Bald eagle/pygargue à tête blanche
- Base camp/camp de base
- Study area/aire d'étude
- Control area/zone témoin

12.2: GPS unique number/ no. unique du GPS

Infrastructure and mining components
infrastructures et composantes minières

- Kemag claim/ titres miniers Kemag

Map base/Fond de carte

- Road/route
- Border/frontière
- Watercourse/cours d'eau
- Contour interval/ courbe de niveau
- Waterbody/ plan d'eau
- Wetland/milieu humide

*Hydronyms are oriented along the direction of water flow
*Les hydronymes sont orientés selon le sens d'écoulement de l'eau

0 1 2 3
Kilometers/Kilomètres

SCALE/ÉCHELLE: 1:70 000 UTM 19N NAD 83

FILE, VERSION, DATE, AUTHOR/
FICHIER, VERSION, DATE, AUTEUR:
GH-0272-b-01, 2012-05-31, P.L, L.B et E.D.

SOURCES:
Government of Canada, BNDT, 1:250,000, 1979
Government of Canada, CanVec, 1:50,000, 2002
Government of NL and government of Quebec, Boundary used for claims
New Millennium Capital Corp., Mining sites and roads

Gouvernement du Canada, BNDT, 1/250 000, 1979
Gouvernement du Canada, CanVecT, 1/50 000, 2002
Gouvernement de T-N-L et gouvernement du Québec, frontière utilisée pour les titres miniers
New Millennium Capital Corp., gisements et routes

GroupeHemispheres

Figure 4

3.5 Adapted Visits

3.5.1 Spring

In spring, the wetland was the richest biotope for bird diversity, with 29 species and 305 sightings (Appendix II), confirming its importance as a migration stopover. Bird diversity and abundance in this biotope was probably enhanced by the fact that, at this time of the year, there is less snow cover in wetlands than in any other biotope.

American Robin (81 sightings) and Rusty Blackbird (63 sightings) were the most abundant species. The Rusty Blackbird is a species with status and is described more fully presented in section 3.6.5.

For shorebirds, the Short-billed Dowitcher (29 sightings) was the most common species, followed by the Wilson's Snipe (23 sightings), Least Sandpiper (*Calidris minutilla*) (5 sightings), Greater Yellowlegs (*Tringa melanoleuca*) (3 sightings), Solitary sandpiper (*Tringa solitaria*) (3 sightings) and Semipalmated Plover (*Calidris pusilla*) (3 sightings).

The abundance of Short-billed Dowitchers in the study area is particularly interesting considering that some of them appeared to already be on breeding grounds, which are poorly known in Québec and Labrador. The origin of the eastern population of Short-billed Dowitchers remained unclear for a long period. It was not until the late 1950s that recently fledged young were located in Central Québec (Todd, 1963), and only in 1989 that the first nest with eggs was discovered, in the Schefferville area (Harris, 1989).

The eastern Short-billed Dowitcher population is believed to be declining, but further research is required to confirm this. For much of the 19th century, the Short-billed Dowitcher was an extremely common and sought-after game bird (Jehl *et al.*, 2001). The Shorebird Survey, 1974–91 (Morrison *et al*., 1994), indicates both a significant decline, with the rate varying with the type of analysis. Trends based on the maximum size of migrating flocks, mainly on the Atlantic coast, also indicate a decline (Jehl *et al.*, 2001). No special status has been granted to the Short-billed Dowitcher either in Canada or in Québec.

3.5.2 Fall

In the fall, the wetlands were not as rich as in the spring. Only 31 sightings from 14 species were made. Semipalmated Sandpiper (2 sightings) (not recorded in spring), Solitary Sandpiper (1 sighting), Greater Yellowlegs (1 sighting) and Wilson's Snipe (1 sighting) were the shorebird species encountered. A single Short-eared Owl was observed, suggesting that this endangered species may have spent the summer in marshy habitats around Harris Lake.

3.6 Species with Status

3.6.1 Harlequin Duck

A pair of Harlequin Ducks (*Histrionicus histrionicus*) was found north of Harris Lake on May 28 (Figure 3). Eastern North American populations are listed as vulnerable in Canada (COSEWIC, 2011) and in Quebec (MRNF, 2011). Considering that individuals, pairs or small groups tend to head directly from wintering grounds to breeding grounds (Kuchel, 1977), it appears likely that these birds were breeding in the study area. Smith (1998) observed that males were not found near by starting 4–10 days after females began incubating. Considering that eggs hatch in the last 10 days of July in northern Labrador (Rodway, 1998), it appears that the beginning of August would be the best time to confirm breeding for this species by attempting to spot the females with ducklings. Harlequin Ducks may prefer swift-moving sections of river early in the breeding season, and slower-moving stretches during brood-rearing (Kuchel, 1977).

3.6.2 Bald Eagle

Two immature adult Bald Eagles were seen in flight over Harris Lake from station KVA3 on May 22 (Figure 3). There were six sightings during overland flights in late September (Figure 4). Bald Eagles typically breed in forested areas adjacent to large bodies of water (less than 2 km from a suitable foraging waterbody) (Buehler, 2000). It takes up to five and a half years for Bald Eagles to acquire their definitive basic plumage (McCollough, 1989) Immature birds engage in a prolonged period of exploration that can last for four years until their definitive plumage is attained (Buehler, 2000). Considering that the two Bald Eagles observed were younger than three years, it appears that they were only passing through and were unlikely to have been breeding in the study area. Three more Bald Eagles were observed outside the breeding season during aerial surveys in late September.

3.6.3 Golden Eagle

An adult Golden Eagle was observed in flight on May 22 during waterfowl aerial survey (see Figure 3). In eastern North America, Golden Eagle occurs typically in areas with high topographic relief dominated by low-arctic tundra plant species (Poole and Bromley, 1988) and in areas with cuesta relief (asymmetric hills or ridges with gentle slopes and steep escarpments) and rugged topography in eastern Hudson Bay region (Morneau *et al.* 1994). They nest near burns, open marshes, meadows, bogs, lakes and forages in open and semi-open mountainous or hilly terrain (Brodeur *et al.*,, 1996). Nevertheless, Golden Eagle is known to be breeding mainly on cliffs (Morneau *et al.,* 1994) and no large cliff was observed in the study area making it unlikely that it would be breeding nearby. It appears that the Golden Eagle observed during this survey was either a late migrant or an unpaired wandering subadult.

3.6.4 Short-eared Owl

The Short-eared Owl was observed four times during the spring surveys. These four records imply at least two different individuals (see Figure 3). The Short-eared Owl inhabits a wide variety of open habitats: dunes, bogs, marsh, wet meadows, pastures and arctic tundra (Holt and Leasure, 1993). Even though the habitat where the species was found around Harris Lake would be appropriate for breeding, further research would be needed later in the season to confirm that these birds were not merely migrants. Breeding for the Short-eared Owl begins only in June in the High Arctic (Wiggins *et al*., 2006). Considering the important amount of snow on the ground during survey, it appears that these birds were using the herbaceous fen around Harris Lake as a migratory stopover. However, a single sighting of a Short-eared Owl in August suggests that at least one individual may have spent the summer in the vicinity of Harris Lake. The absence of other individuals may suggest a failed breeding attempt or simply a lone unpaired bird.

3.6.5 Rusty Blackbird

There were 73 sightings of the Rusty Blackbird (*Euphagus carolinus*) during the spring survey. Most of them (64) were seen during adapted visits in the wetland biotope (KVA2, KVA3, KVA4 and KVA5). Five were reported during short transects (KVC3, KVC5, KVC8 and KVC11) (Figure 1). Four sightings were noted in overland flights (Figure 3). Some of the Rusty Blackbirds observed were still in flocks, which suggests that they were still in migration, and their breeding density in the study area is not expected to be very high. However, it is expected to find a Rusty Blackbird breeding site during June or July in the study zone. In fall, only four individuals were seen respectively in KVC6, KVC11, KVC16, and KVA5.

NML developed a mitigation plan to protect the riparian habitat used by the Rusty Blackbird for breeding (Groupe Hémisphères, 2011). It is based on protecting all plant strata (herbaceous species, shrubs and trees) adjacent to a watercourse, lake or wetland (Gagnon and Gangbazo, 2007).

3.7 Species of Interest

Some unexpected species of birds were encountered in the study area: in some cases the literature suggests that they are rare in the study area, while in other cases they have not previously been recorded so far north.

3.7.1 Hooded Merganser

There were 8 sightings of Hooded Mergansers in fall, but none in spring. The northern breeding limit of Hooded Merganser in Canada is poorly defined (Godfrey, 1986 cited in Dugger *et al.*, 2009). Most recent distribution maps of the Hooded Merganser do not include the Schefferville area as part of the breeding range, but it appears that this species is probably more common in the north than was originally thought. Recent studies have shown that this species breeds at low densities (2.3 pairs per 100 km²) in Quebec between the 51st and 58th parallels (Guérette Montminy *et al.*, 2009). Considering that the sightings of Hooded Mergansers in the study area were made in fall, it is possible that they migrate north to moult after the breeding season.

3.7.2 Northern Hawk-Owl

There was one sighting of the Northern Hawk-Owl in fall in the study area. Ranked as of "Medium" concern (85th of 297 birds considered) among the Canadian birds evaluated for setting conservation, research, and monitoring priorities (Dunn 1997), the species is considered as a low-density breeding bird, with 0–6 pairs/100 km² in the Yukon (Rohner *et al.,* 1995). It is considered as a rare bird and one of the least studied birds in North America (Duncan *et al.*, 1998).

3.7.3 Short-billed Dowitcher

There were 45 sightings of the Short-billed Dowitcher in spring during the overland flights, but none in fall. The Short-billed Dowitcher is a distinct subspecies (*Limnodromus griseus griseus*) that nests in north-central Quebec and western Labrador, from approximately the 52nd parallel north to Ungava Bay and from James Bay and south-eastern Hudson Bay east to central Labrador (Godfrey 1986; Cotter, 1995). As previously noted, the few known confirmations are recent and are in the vicinity of the study area, but David (1996) considers this species a rare migrant in Quebec.

3.7.4 Brown Creeper

There was one sighting of a Brown Creeper in spring, a singing male in mature coniferous forest biotope. The northernmost confirmed breeding records for this species in Quebec/Labrador come from Lac Mistassini (Harrap and Quinn, 1995) and Harrington Harbour (Shaffer and Alvo, 1996). There are no previous sightings of this species in Labrador (Tyler, 1948). This sighting, north of the 55th parallel, was potentially the northernmost ever recorded in eastern Canada.

4 CONCLUSION

GHI was mandated by NML to conduct bird surveys at the KeMag mine site during the 2011 spring and fall migrations. Three techniques were used in order to properly evaluate each group of birds: overland flights were used to count waterfowl; short transects were used for terrestrial birds in forest, shrubland and tundra biotopes; and adapted visits were done in wetlands to identify shorebirds.

The study area was used by more species in spring (49 species) than in fall (43 species). Sixty-five (65) species were recorded in spring and fall combined. The overland flights showed the greatest difference of use between seasons; with a similar effort, 227 bird sightings were made in the spring compared to 129 sightings in the fall.

The wetland biotope was the richest habitat for bird diversity. An abundance and a good diversity of shorebirds was found in wetlands in spring (144 sightings), but very few in fall (12 sightings). Shorebird species in descending order of abundance all methods combined were Wilson's Snipe, Short-billed Dowitcher, Semipalmated Plover, Least Sandpiper, Greater Yellowlegs, Solitary Sandpiper and Semipalmated Sandpiper.

The Rusty Blackbird, a species with status, uses the wetland habitat for foraging during its spring migration (63 sightings), but it was also found in the coniferous forest and shrubland habitats during the short transects. A total of 73 sightings of the Rusty blackbird was recorded in spring, but only 4 in fall.

A pair of Harlequin Ducks (also a species with status) was also found during an overland flight in an apparent breeding habitat north of Lake Gillespie.

The Bald Eagle (considered as vulnerable in Quebec) were observed both in spring (2 sightings) and fall (11 sightings).

The survey recorded the presence of four species of interest. These are rare species, such as Short-billed Dowitcher and Northern Hawk-Owl, or species north of their known distribution, such as Hooded Merganser and Brown Creeper.

In general, spring was the season when the study area was most critical as a staging area. In general fewer birds were found in fall. Despite the fact that the scientific community agrees that the migration routes of birds are poorly known in Canada, we can still say that, in a regional context, the study area is located within a valley that seems to act as an important corridor for the spring migration. Essentially, it is the combination of large water bodies and large wetlands at the bottom of a sheltered valley that attract an abundance of migrating birds.

5 REFERENCES

Personal communication

Abraham Chemaganish	Kawawachikamach resident
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Daniel Bergeron	Scientific Advisor, Strategy and Program Integration, CWS, Quebec Region

Database Consulted

AVIBASE (2011) Bird Checklists of the World, Newfoundland and Labrador. This list is managed by Denis Lepage and hosted by Bird Studies Canada, the Canadian copartner of Birdlife International.http://avibase.bsc-eoc.org/checklist.jsp?region=canl&list=howardmoore

COSEWIC [Comittee on the Status of Endangered Wildlife in Canada] (2011) Government of Canada. Internet Site: http://www.cosepac.gc.ca/eng/sct5/index_e.cfm

Bibliography

AOU [American Ornithologists' Union] (2011) *Check-list of North American Birds, 7th edition, 52nd supplement*. North American Classification Committee, American Ornithologists' Union. Internet Site: http://www.aou.org/checklist/north/

Bauchinger, U. and M. Klaassen (2005) *Longer days in spring than in autumn accelerate migration speed of passerine birds*. Journal of Avian Biology 36:3-5

Bordage, D., N. Plante et M. Grenier (1992) *Milieux propices à la reproduction de la Bernache du Canada, de la Macreuse à bec jaune et de la Macreuse à front blanc. Projet pilote-Complexe Grande-Baleine*. Rapport présenté à la vice-présidence Environnement d'Hydro-Québec, Service canadien de la faune, région du Québec, 78 p.

Brodeur, S., R. Décarie, D. M. Bird and M. Fuller (1996) *Complete migration cycle of Golden Eagles breeding in northern Quebec.* Condor 98:293-299.

Buehler, D.A. (2000) *Bald Eagle (*Haliaeetus leucocephalus*), The Birds of North America Online (A. Poole, Ed.*). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/506doi:10.2173/bna.506

Chaulk, K.G. and B. Turner (2007) *The Timing of Waterfowl Arrival and Dispersion during Spring Migration in Labrador*. Northeastern Naturalist 14(3):375-386

Cotter, R.C. (1995) *Bécasseau roux*, pp. 488-491 in Gauthier, J. et Y. Aubry (sous la direction de). *Les oiseaux nicheurs du Québec : Atlas des oiseaux nicheurs du* Québec *méridional*. Association québécoise des groupes d'ornithologues, Société québécoise de protection des oiseaux, Service canadien de la faune, Environnement Canada, région du Québec, Montréal.

David, N. (1996) *Liste commentée des oiseaux du Québec.* Association québécoise des groupes d'ornithologues, 89 p. et 5 annexes

Dugger, B. D., K. M. Dugger and L. H. Fredrickson (2009) *Hooded Merganser (Lophodytes cucullatus)*, The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/098doi:10.2173/bna.98

Duncan, James R. and Patricia A. Duncan (1998) *Northern Hawk Owl (Surnia ulula)*, The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/356doi:10.2173/bna.356

Dunn, E. H. (1997) *Setting priorities for conservation, research and monitoring of Canada's landbirds*. Tech. Rep. Ser. No. 293. Can. Wildl. Serv., Ottawa, ON.

Gagnon, É. et G. Gangbazo (2007) *Efficacité des bandes riveraines: analyse de la documentation scientifique et perspectives.* Québec, Ministère du Développement durable, de l'Environnement et des Parcs, Direction des politiques de l'eau, ISBN: 978-2-550-49213-9, 17 p.

Gauthier, J. et Y. Aubry (1995) *Les Oiseaux nicheurs du Québec: Atlas des oiseaux nicheurs du Québec méridional*. Gauthier, J. et Y. Aubry (sous la direction de). Association québecoise des groupes d'ornithologues, Société Québecoise pour la Protection des Oiseaux, Service canadien de la faune, Environnement Canada, région du Québec, Montréal, Québec, xviii + 1295 p.

Guérette-Montminy A., M.A., E. Berthiaume, M. Darveau, S. Cumming, D. Bordage, S. Lapointe et L.V. Lemelin (2009) *Répartition de la sauvagine en période de nidification entre les 51º et 58º de latitude nord dans la province de Québec*. Rapport technique n° Q14, Canards Illimités Canada – Québec, 43 p.

Godfrey, W.E. (1986) *Les oiseaux du Canada.* Édition revisée, Éditions Broquet, Musée national des sciences naturelles, 650 p.

Golder Associates Ltd. and Global Environment (2005) *Breeding Bird Data Collection in the Howells River Basin of Labrador*. Submitted to LabMag GP Inc.

Groupe Hémisphères (2009) *Inventaire 2008 et 2009 des oiseaux nicheurs du futur site DSO*. Rapport technique réalisé pour New Millennium Capital Corp., 22 p et 4 annexes

Groupe Hémisphères (2011) *Plan de mitigation pour la protection du Quiscale rouilleux, Projet DSO*. Rapport réalisé pour New Millennium Capital Corp., 13 p.

Hanson, A., I Goudie, A. Lang, C. Gjerdrum, R. Cotter and G. Donaldson (2009) *A Framework for the Scientific Assessment of Potential Project Impacts on Birds*. Wildlife Canadian Service, Technical report n° 508, Atlantic Region, 73 p.

Harrap, S. and D. Quinn (1995) *Chickadees, tits, nuthatches and treecreepers*. Princeton Univ. Press, Princeton, NJ

Harris, R. E. (1989) *Breeding biology of the Short-billed Dowitcher in the Schefferville area, Quebec-Labrador*. Master's Thesis, Univ. of Ottawa, Ottawa, Ontario

Hejl, S. J., K. R. Newlon, M. E. Mcfadzen, J. S. Young and C. K. Ghalambor (2002) *Brown Creeper (Certhia americana), The Birds of North America Online (A. Poole, Ed.)*. Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/669doi:10.2173/bna.669

Holt, D. W. and S. M. Leasure (1993) *Short-eared Owl (Asio flammeus).* In the Birds of North America, No. 62 (A. Poole et F. Gill, ed.). The Birds of North America inc., Philadelphia

Jehl, Jr., J. R., Joanna J. K. and R. E. Harris (2001) *Short-billed Dowitcher (Limnodromus griseus), The Birds of North America Online (A. Poole, Ed.).* Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/564doi:10.2173/bna.564

Kuchel, C. R. (1977) *Some aspects of the behavior and ecology of Harlequin Ducks breeding in Glacier National Park, Montana.* Master's Thesis, Univ. of Montana, Missoula

McCollough, M. A. (1989) *Molting sequence and aging of Bald Eagles*. Wilson Bull 101:1-10

Minaskuat Limited Partnership (2008) *LabMag Iron Ore Project Waterfowl Breeding Pair Surveys*. Technical Report presented to LabMag GP Inc.

Morrison, R. I. G., C. Downes, and B. Collins (1994) *Population trends of shorebirds on fall migration in eastern Canada 1974-1991*. Wilson Bull 106:431-447

Morneau, F., S. Brodeur, R. Décarie, S. Carrière, and D. M. Bird. 1994. *Abundance and distribution of nesting Golden Eagles in Hudson Bay, Quebec*. J. Raptor Res. 28:220-225

MRNF [ministère des Ressources naturelles et de la Faune] (2011) *Liste des espèces de la faune désignées menacées ou vulnérables.* http://www3.mrnf.gouv.qc.ca/faune/especes /menacees/liste.asp, avril 2011

Poole, K. G. and R. G. Bromley (1988) *Interrelationships within a raptor guild in the central Canadian arctic*. Can. J. Zool. 66:2275-2282

Rodway, M. S. (1998) *Habitat use by Harlequin Ducks breeding in Hebron Fiord, Labrador*. Can. J. Zool. 76:897-901

Rohner, C., J.N.M. Smith, J. Stroman, and M. Joyce (1995) *Northern Hawk-owls in the Nearctic boreal forest: Prey selection and population consequences of multiple prey cycles*. Condor 97:208-220

SCF [Service canadien de la faune] (2005) *Les éoliennes et les oiseaux. Revue de littérature pour les évaluations environnementales.* Version provisoire du 12 mai 2005, Service canadien de la faune, Environnement Canada, 63 p.

Shaffer, F. and R. Alvo (1996) *Brown Creeper*. Pp 748-751 in The breeding birds of Quebec: atlas of the breeding birds of southern Quebec. (Gauthier, J. and Y. Aubry, Eds.) Assoc. québecoise des groupes d'ornithologues, Prov. of Quebec Soc. for the protection of birds, Can. Wildl. Serv., Environ. Canada, Québec Region, Montréal

Smith, C. M. (1998) *Banff National Park Harlequin Duck research project: 1997 progress report*. Unpubl. Tech. Report. Heritage Resour. Conserv., Parks Canada, Banff, AB

Todd, W. E. C. (1963) *Birds of the Labrador Peninsula and adjacent areas*. Univ. of Toronto Press, Toronto

Tyler, W. M. (1948) *Brown Creeper*. Pp 56-79 in Life histories of North American nuthatches, wrens, thrashers and their allies. (Bent, A. C., Ed.) U.S. Natl. Mus. Bull. no. 195

Whitford, J. (January 2003) *Waterfowl Component Study Trans Labrador Highway (Happy Valley-Goose Bay to Cartwright Junction).* Project No. Nfs08243 presented to Department of Works, Services and Transportation, NFL, 53 p. and 3 appendices

Wiggins, D. A., D. W. Holt and S. M. Leasure. (2006) *Short-eared Owl (Asio flammeus), The Birds of North America Online (A. Poole, Ed.).* Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/062doi:10.2173/bna.62

APPENDICES

Appendix I

Bird Species Observed in Migration, by Season

Bird Species Observed during the Migration Season - Spring

*** indicates the species is listed as federally or provincially at risk

Site / Survey	Group	Code & Name	Number of observations: overland flight	short transect	long transect*	adapted visit	travel	TOTAL
TACONITE - KEMAG PROJECT			**227**	**245**		**305**		**777**
MIGPRKM11			**227**	**245**		**305**		**777**
	BIRD OF PREY		**6**	**1**		**3**		**10**
		BAPE Osprey	2	1				3
		*** PYTB Bald Eagle				2		2
		*** AIRO Golden Eagle	1					1
		*** HIMA Short-eared Owl	3			1		4
	AQUATIC BIRDS		**217**	**2**		**76**		**295**
		PLHU Common Loon		1				1
		BECA Canada Goose	27			2		29
		SAHI Green-winged Teal	24			2		26
		CANO American Black Duck	9					9
		CAPI Northern Pintail	9			4		13
		SPFU *Aythya* sp.	5					5
		*** ARPL Harlequin Duck	2					2
		MAFB Surf Scoter	26					26
		GAOO Common Goldeneye	17					17
		GRHA Common Merganser	7			2		9
		HAHU Red-breasted Merganser	6					6
		SPOR Shorebird	17					17
		PLSE Semipalmated Plover				3		3
		SPCH Plover	2					2
		GRCH Greater Yellowlegs	3			3		6
		CHSO Solitary Sandpiper	6			3		9
		BEMI Least Sandpiper				5		5
		BERO Short-billed Dowitcher	16			29		45
		BEWI Wilson's Snipe	34			23		57
		GOAR Herring Gull	7	1				8
	LANDBIRDS		**4**	**242**		**226**		**472**
		TECA Spruce Grouse		1				1
		LASA Willow Ptarmigan		7				7
		SPPI Woodpecker		2				2
		PIDN Black-backed Woodpecker		1				1
		ALHC Horned Lark		37				37
		HIBI Tree Swallow				1		1
		MECA Gray Jay		4		2		6
		GRCO Common Raven		2				2
		METB Boreal Chickadee		2				2
		GRBR Brown Creeper		1				1
		ROCR Ruby-crowned Kinglet		10		3		13
		MEAM American Robin		33		81		114
		PIAM American Pipit				7		7
		JABO Bohemian Waxwing		7		5		12

Project : Taconite Project (NML & TSMC)
Query : 10-05-2012

Bird Species Observed during the Migration Season - Spring

*** indicates the species is listed as federally or provincially at risk

Site / Survey	Group	Code & Name	Number of observations: overland flight	short transect	long transect*	adapted visit	travel	TOTAL
	PACJ	Yellow-rumped Warbler		1		1		2
	SPBR	Sparrow		2				2
	BRHU	American Tree Sparrow		11		19		30
	BRPR	Savannah Sparrow				1		1
	BRFV	Fox Sparrow		7		2		9
	BRCB	White-crowned Sparrow		30		10		40
	JUAR	Dark-eyed Junco		15		5		20
	BRLA	Lapland Longspur				10		10
	BRNE	Snow Bunting				1		1
	*** QURO	Rusty Blackbird	4	6		63		73
	DUSA	Pine Grosbeak		1		3		4
	SIFL	Common Redpoll		62		12		74

* method not use in this project

Bird Species Observed during the Migration Season - Fall

*** indicates the species is listed as federally or provincially at risk

Site / Survey	Group	Code & Name	Number of observations: overland flight	short transect	long transect*	adapted visit	travel	TOTAL
TACONITE - KEMAG PROJECT			**129**	**222**		**46**	**25**	**422**
FALL MIGRATION			**129**	**222**		**46**	**25**	**422**
	BIRD OF PREY		**11**	**2**		**1**		**14**
	***	PYTB Bald Eagle	6	2				8
		AUPA Northern Goshawk	1					1
		BUPA Rough-legged Hawk	4					4
	***	HIMA Short-eared Owl				1		1
	AQUATIC BIRDS		**110**	**18**		**10**	**19**	**157**
		PLHU Common Loon	2	3		2	1	8
		BECA Canada Goose					17	17
		FUMI Greater Scaup	1					1
		PEFU Lesser Scaup	14	5				19
		SPFF Lesser or Greater Scaup	8					8
		MAFB Surf Scoter	2					2
		GAOO Common Goldeneye	1					1
		HACO Hooded Merganser	8					8
		GRHA Common Merganser	64					64
		HAHU Red-breasted Merganser	3					3
		SPOR Shorebird				2		2
		PLSE Semipalmated Plover		4				4
		GRCH Greater Yellowlegs				1		1
		CHSO Solitary Sandpiper				1		1
		BESE Semipalmated Sandpiper				2		2
		BEWI Wilson's Snipe		1		1		2
		GOAR Herring Gull	7	5		1	1	14
	LANDBIRDS		**3**	**202**		**35**	**6**	**246**
		TECA Spruce Grouse		2			1	3
		LASA Willow Ptarmigan		1			4	5
		ALHC Horned Lark				2		2
		MECA Gray Jay	2	13		5		20
		GRCO Common Raven	1	2				3
		METB Boreal Chickadee		5				5
		ROCR Ruby-crowned Kinglet		4			1	5
		MEAM American Robin		7				7
		PIAM American Pipit		2		10		12
		JABO Bohemian Waxwing		2				2
		PGGR Northern Shrike		2				2
		PACJ Yellow-rumped Warbler		13				13
		PARA Blackpoll Warbler		11				11
		PARU Northern Waterthrush		1				1
		PACN Wilson's Warbler		2				2
		SPBR Sparrow		1				1
		BRHU American Tree Sparrow		13		6		19

Bird Species Observed during the Migration Season - Fall

*** indicates the species is listed as federally or provincially at risk

Site / Survey	Group	Code & Name	Number of observations: overland flight	short transect	long transect*	adapted visit	travel	TOTAL
	BRFV	Fox Sparrow		2				2
	BRLI	Lincoln's Sparrow				1		1
	BRGB	White-throated Sparrow		1				1
	BRCB	White-crowned Sparrow		75		3		78
	*** QURO	Rusty Blackbird		3		1		4
	DUSA	Pine Grosbeak		1				1
	BCBI	White-winged Crossbill		3				3
	SIFL	Common Redpoll		36		7		43
BIRDS			**3**					**3**
	SPNI	Bird nest	2					2
	SPNP	Bird nest of raptor	1					1
MAMMALS			**2**					**2**
	RENRO	Red fox	1					1
	CASTH	North American Beaver lodge	1					1

* method not use in this project

Appendix II

Bird Species by Biotope vs Ground Survey

Bird Species Observed during the Migration Season - Biotope vs Ground Survey

Site / Survey	Habitat	Code & Name		Number of observations
TACONITE - KEMAG PROJECT				**550**
	SPRING BIRD MIGRATION KÉMAG PROJECT - MINE SITE			550
	SHRUBLAND			135
		PLHU	Common Loon	1
		BAPE	Osprey	1
		GOAR	Herring Gull	1
		SPPI	Woodpecker	1
		MECA	Gray Jay	3
		GRCO	Common Raven	1
		METB	Boreal Chickadee	1
		GRBR	Brown Creeper	1
		ROCR	Ruby-crowned Kinglet	6
		MEAM	American Robin	19
		JABO	Bohemian Waxwing	3
		SPBR	Sparrow	2
		BRHU	American Tree Sparrow	9
		BRFV	Fox Sparrow	5
		BRCB	White-crowned Sparrow	19
		JUAR	Dark-eyed Junco	8
		QURO	Rusty Blackbird	1
		DUSA	Pine Grosbeak	1
		SIFL	Common Redpoll	52
	CONIFEROUS FOREST			40
		TECA	Spruce Grouse	1
		SPPI	Woodpecker	1
		PIDN	Black-backed Woodpecker	1
		MECA	Gray Jay	1
		METB	Boreal Chickadee	1
		ROCR	Ruby-crowned Kinglet	4
		MEAM	American Robin	2
		JABO	Bohemian Waxwing	4
		PACJ	Yellow-rumped Warbler	1
		BRHU	American Tree Sparrow	2
		BRFV	Fox Sparrow	1
		BRCB	White-crowned Sparrow	9
		JUAR	Dark-eyed Junco	7
		QURO	Rusty Blackbird	2
		SIFL	Common Redpoll	3
	WETLAND			305
		BECA	Canada Goose	2

Bird Species Observed during the Migration Season - Biotope vs Ground Survey

Site / Survey	Habitat	Code & Name		Number of observations
		SAHI	Green-winged Teal	2
		CAPI	Northern Pintail	4
		GRHA	Common Merganser	2
		PYTB	Bald Eagle	2
		PLSE	Semipalmated Plover	3
		GRCH	Greater Yellowlegs	3
		CHSO	Solitary Sandpiper	3
		BEMI	Least Sandpiper	5
		BERO	Short-billed Dowitcher	29
		BEWI	Wilson's Snipe	23
		HIMA	Short-eared Owl	1
		HIBI	Tree Swallow	1
		MECA	Gray Jay	2
		ROCR	Ruby-crowned Kinglet	3
		MEAM	American Robin	81
		PIAM	American Pipit	7
		JABO	Bohemian Waxwing	5
		PACJ	Yellow-rumped Warbler	1
		BRHU	American Tree Sparrow	19
		BRPR	Savannah Sparrow	1
		BRFV	Fox Sparrow	2
		BRCB	White-crowned Sparrow	10
		JUAR	Dark-eyed Junco	5
		BRLA	Lapland Longspur	10
		BRNE	Snow Bunting	1
		QURO	Rusty Blackbird	63
		DUSA	Pine Grosbeak	3
		SIFL	Common Redpoll	12
	TUNDRA			70
		LASA	Willow Ptarmigan	7
		ALHC	Horned Lark	37
		GRCO	Common Raven	1
		MEAM	American Robin	12
		BRFV	Fox Sparrow	1
		BRCB	White-crowned Sparrow	2
		QURO	Rusty Blackbird	3
		SIFL	Common Redpoll	7

Bird Species Observed during the Migration Season - Biotope vs Ground Survey

Site / Survey	Habitat	Code & Name		Number of observations
TACONITE - KEMAG PROJECT				**268**
FALL BIRD MIGRATION KÉMAG PROJECT - MINE SITE				268
	SHRUBLAND			72
		GOAR	Herring Gull	1
		MECA	Gray Jay	3
		MEAM	American Robin	4
		PGGR	Northern Shrike	1
		PACJ	Yellow-rumped Warbler	1
		PARA	Blackpoll Warbler	4
		BRHU	American Tree Sparrow	6
		BRCB	White-crowned Sparrow	22
		QURO	Rusty Blackbird	1
		SIFL	Common Redpoll	29
	CONIFEROUS FOREST			95
		PLHU	Common Loon	3
		PEFU	Lesser Scaup	5
		PYTB	Bald Eagle	2
		TECA	Spruce Grouse	2
		PLSE	Semipalmated Plover	4
		BEWI	Wilson's Snipe	1
		GOAR	Herring Gull	4
		MECA	Gray Jay	4
		GRCO	Common Raven	1
		METB	Boreal Chickadee	5
		ROCR	Ruby-crowned Kinglet	2
		MEAM	American Robin	3
		PIAM	American Pipit	2
		JABO	Bohemian Waxwing	2
		PGGR	Northern Shrike	1
		PACJ	Yellow-rumped Warbler	4
		PARA	Blackpoll Warbler	6
		PARU	Northern Waterthrush	1
		SPBR	Sparrow	1
		BRHU	American Tree Sparrow	3
		BRFV	Fox Sparrow	2
		BRCB	White-crowned Sparrow	26
		QURO	Rusty Blackbird	1
		DUSA	Pine Grosbeak	1
		BCBI	White-winged Crossbill	3
		SIFL	Common Redpoll	6

Bird Species Observed during the Migration Season - Biotope vs Ground Survey

Site / Survey	Habitat	Code & Name		Number of observations
	WETLAND			31
		PLHU	Common Loon	2
		SPOR	Shorebird	2
		GRCH	Greater Yellowlegs	1
		CHSO	Solitary Sandpiper	1
		BESE	Semipalmated Sandpiper	2
		BEWI	Wilson's Snipe	1
		GOAR	Herring Gull	1
		HIMA	Short-eared Owl	1
		ALHC	Horned Lark	1
		MECA	Gray Jay	4
		PIAM	American Pipit	1
		BRHU	American Tree Sparrow	5
		BRLI	Lincoln's Sparrow	1
		QURO	Rusty Blackbird	1
		SIFL	Common Redpoll	7
	TUNDRA			70
		LASA	Willow Ptarmigan	1
		ALHC	Horned Lark	1
		MECA	Gray Jay	7
		GRCO	Common Raven	1
		ROCR	Ruby-crowned Kinglet	2
		PIAM	American Pipit	9
		PACJ	Yellow-rumped Warbler	8
		PARA	Blackpoll Warbler	1
		PACN	Wilson's Warbler	2
		BRHU	American Tree Sparrow	5
		BRGB	White-throated Sparrow	1
		BRCB	White-crowned Sparrow	30
		QURO	Rusty Blackbird	1
		SIFL	Common Redpoll	1

Appendix III

Complete List of Bird Species

Bird Survey - Migration - Taconite - KeMag Project

Code		English Name	French Name	Latin Name
PLHU		Common Loon	Plongeon huard	*Gavia immer*
BECA		Canada Goose	Bernache du Canada	*Branta canadensis*
SAHI		Green-winged Teal	Sarcelle d'hiver	*Anas crecca*
CANO		American Black Duck	Canard noir	*Anas rubripes*
CAPI		Northern Pintail	Canard pilet	*Anas acuta*
SPFU		*Aythya* sp.	Fuligule sp.	*Aythya* sp.
FUMI		Greater Scaup	Fuligule milouinan	*Aythya marila*
PEFU		Lesser Scaup	Petit Fuligule	*Aythya affinis*
SPFF		Lesser or Greater Scaup	Fuligule milouinan ou petit	*Aythya affinis ou marila*
ARPL	***	Harlequin Duck	Arlequin plongeur	*Histrionicus histrionicus*
MANO		Black Scoter	Macreuse à bec jaune	*Melanitta americana*
MAFB		Surf Scoter	Macreuse à front blanc	*Melanitta perspicillata*
GAOO		Common Goldeneye	Garrot à oeil d'or	*Bucephala clangula*
HACO		Hooded Merganser	Harle couronné	*Lophodytes cucullatus*
GRHA		Common Merganser	Grand Harle	*Mergus merganser*
HAHU		Red-breasted Merganser	Harle huppé	*Mergus serrator*
BAPE		Osprey	Balbuzard pêcheur	*Pandion haliaetus*
PYTB	***	Bald Eagle	Pygargue à tête blanche	*Haliaeetus leucocephalus*
AUPA		Northern Goshawk	Autour des palombes	*Accipiter gentilis*
BUQR		Red-tailed Hawk	Buse à queue rousse	*Buteo jamaicensis*
BUPA		Rough-legged Hawk	Buse pattue	*Buteo lagopus*
AIRO	***	Golden Eagle	Aigle royal	*Aquila chrysaetos*
TECA		Spruce Grouse	Tétras du Canada	*Falcipennis canadensis*
LASA		Willow Ptarmigan	Lagopède des saules	*Lagopus lagopus*
SPOR		Shorebird	Oiseau de rivage sp.	-
PLSE		Semipalmated Plover	Pluvier semipalmé	*Charadrius semipalmatus*
SPCH		Plover	Chevalier sp.	-
GRCH		Greater Yellowlegs	Grand Chevalier	*Tringa melanoleuca*
CHSO		Solitary Sandpiper	Chevalier solitaire	*Tringa solitaria*
BESE		Semipalmated Sandpiper	Bécasseau semipalmé	*Calidris pusilla*
BEMI		Least Sandpiper	Bécasseau minuscule	*Calidris minutilla*
BERO		Short-billed Dowitcher	Bécassin roux	*Limnodromus griseus*
BEWI		Wilson's Snipe	Bécassine de Wilson	*Gallinago delicata*
GOAR		Herring Gull	Goéland argenté	*Larus argentatus*
STAR		Arctic Tern	Sterne arctique	*Sterna paradisaea*
CHEP		Northern Hawk Owl	Chouette épervière	*Surnia ulula*
HIMA	***	Short-eared Owl	Hibou des marais	*Asio flammeus*
SPPI		Woodpecker	Picidé sp. (pic)	-
PIDN		Black-backed Woodpecker	Pic à dos noir	*Picoides arcticus*
ALHC		Horned Lark	Alouette hausse-col	*Eremophila alpestris*
HIBI		Tree Swallow	Hirondelle bicolore	*Tachycineta bicolor*
MECA		Gray Jay	Mésangeai du Canada	*Perisoreus canadensis*
GRCO		Common Raven	Grand Corbeau	*Corvus corax*

Bird Survey - Migration - Taconite - KeMag Project

Code	English Name	French Name	Latin Name
METB	Boreal Chickadee	Mésange à tête brune	*Poecile hudsonicus*
GRBR	Brown Creeper	Grimpereau brun	*Certhia americana*
ROCR	Ruby-crowned Kinglet	Roitelet à couronne rubis	*Regulus calendula*
GRJG	Gray-cheeked Thrush	Grive à joues grises	*Catharus minimus*
MEAM	American Robin	Merle d'Amérique	*Turdus migratorius*
PIAM	American Pipit	Pipit d'Amérique	*Anthus rubescens*
JABO	Bohemian Waxwing	Jaseur boréal	*Bombycilla garrulus*
PGGR	Northern Shrike	Pie-grièche grise	*Lanius excubitor*
PAOB	Tennessee Warbler	Paruline obscure	*Oreothlypis peregrina*
PACJ	Yellow-rumped Warbler	Paruline à croupion jaune	*Setophaga coronata*
PACR	Palm Warbler	Paruline à couronne rousse	*Setophaga palmarum*
PARA	Blackpoll Warbler	Paruline rayée	*Setophaga striata*
PARU	Northern Waterthrush	Paruline des ruisseaux	*Parkesia noveboracensis*
PACN	Wilson's Warbler	Paruline à calotte noire	*Cardellina pusilla*
SPBR	Sparrow	Bruant sp.	-
BRHU	American Tree Sparrow	Bruant hudsonien	*Spizella arborea*
BRPR	Savannah Sparrow	Bruant des prés	*Passerculus sandwichensis*
BRFV	Fox Sparrow	Bruant fauve	*Passerella iliaca*
BRLI	Lincoln's Sparrow	Bruant de Lincoln	*Melospiza lincolnii*
BRGB	White-throated Sparrow	Bruant à gorge blanche	*Zonotrichia albicollis*
BRCB	White-crowned Sparrow	Bruant à couronne blanche	*Zonotrichia leucophrys*
JUAR	Dark-eyed Junco	Junco ardoisé	*Junco hyemalis*
BRLA	Lapland Longspur	Plectrophane lapon	*Calcarius lapponicus*
BRNE	Snow Bunting	Plectrophane des neiges	*Plectrophenax nivalis*
QURO ***	Rusty Blackbird	Quiscale rouilleux	*Euphagus carolinus*
DUSA	Pine Grosbeak	Durbec des sapins	*Pinicola enucleator*
BCBI	White-winged Crossbill	Bec-croisé bifascié	*Loxia leucoptera*
SIFL	Common Redpoll	Sizerin flammé	*Acanthis flammea*
SPNI	Bird nest	Nid d'oiseau	
SPNP	Bird nest of raptor	Nid d'oiseau de proie	
RENR	Red fox	Renard roux	*Vulpes vulpes*
CASTH	North American Beaver lodge	Hutte de castor du Canada	*Castor canadensis*

*** indicates the species is listed as federally or provincialy threatened

Appendix IV

Pictures of Birds Taken at KéMag Mine Site during Surveys

Lapland Longspur, in frozen wetland, KéMag, May 2011

Bald Eagle, subadult III, KéMag, May 2011

Greater Yellowlegs, wetland, KéMag, May 2011

Short-billed Dowitcher, wetland, KéMag, May 2011

Appendix V

Daily Meteorological Data Report for May, August and September 2011 from Environment Canada

Environment Canada Environnement Canada

Canada

Daily Data Report for May 2011

SCHEFFERVILLE A
QUEBEC

Latitude: 54°48'00.000" N Longitude: 66°48'00.000" W Elevation: 521.00 m

Climate ID: 7117827 WMO ID: 71828 TC ID: YKL

Daily Data Report for May 2011

Day	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days °C	Cool Deg Days °C	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's deg	Spd of Max Gust km/h
01†	11.6	0.3	6.0	12.0	0.0	M	M	0.0		26	33
02†	9.7	0.5	5.1	12.9	0.0	M	M	3.0		21	59
03†	1.6	-7.9	-3.2	21.2	0.0	M	M	4.5		33	35
04†	3.8	-9.6	-2.9	20.9	0.0	M	M	0.0			<31
05†	2.7	-8.8	-3.1	21.1	0.0	M	M	0.0			<31
06†	2.5	-5.9	-1.7	19.7	0.0	M	M	2.0		12	46
07†	5.8	-1.2	2.3	15.7	0.0	M	M	1.0			<31
08†	2.3	-5.4	-1.6	19.6	0.0	M	M	0.0		35	37
09†	0.1	-10.0	-5.0	23.0	0.0	M	M	0.0		34	33
10†	5.2	-12.1	-3.5	21.5	0.0	M	M	0.0			<31
11†	9.4	-4.3	2.6	15.4	0.0	M	M	0.0			<31
12†	5.4	-5.2	0.1	17.9	0.0	M	M	0.0			<31
13†	3.7	-6.8	-1.6	19.6	0.0	M	M	0.0			<31
14†	5.3	-4.7	0.3	17.7	0.0	M	M	0.0		33	39
15†	0.5	-5.4	-2.5	20.5	0.0	M	M	0.5		35	48
16†	4.1	-4.0	0.1	17.9	0.0	M	M	0.0		2	44
17†	11.8	1.0	6.4	11.6	0.0	M	M	0.5		25	54
18†	15.1	0.2	7.7	10.3	0.0	M	M	0.0		26	48
19†	6.6	-4.8	0.9	17.1	0.0	M	M	0.0		7	35
20†	7.6	-4.9	1.4	16.6	0.0	M	M	0.0			<31
21†	6.9	-7.1	-0.1	18.1	0.0	M	M	0.0			<31
22†	13.3	-3.8	4.8	13.2	0.0	M	M	0.0		22	37
23†	6.3	-0.6	2.9	15.1	0.0	M	M	5.5			<31
24†	2.5	-3.4	-0.5	18.5	0.0	M	M	18.0		36	48
25†	1.7	-4.1	-1.2	19.2	0.0	M	M	1.5		33	32
26†	6.3	-6.1	0.1	17.9	0.0	M	M	0.5		25	37
27†	6.5	-4.5	1.0	17.0	0.0	M	M	0.0			<31
28†	14.9	-5.2	4.9	13.1	0.0	M	M	0.5			<31
29†	12.1	3.0	7.6	10.4	0.0	M	M	7.0		24	41
30†	8.0	-0.2	3.9	14.1	0.0	M	M	1.0		35	41
31†	8.4	-1.2	3.6	14.4	0.0	M	M	0.5			<31
Sum				**523.2**	**0.0**	**0.0***	**0.0***	**46.0**			
Avg	**6.5**	**-4.3**	**1.1**								
Xtrm	**15.1**	**-12.1**								**21**	**59**

Legend
[empty] = No data available

Environment Canada Environnement Canada

Canada

Daily Data Report for August 2011

SCHEFFERVILLE A
QUEBEC

Latitude: 54°48'00.000" N Longitude: 66°48'00.000" W Elevation: 521.00 m

Climate ID: 7117827 WMO ID: 71828 TC ID: GKL

Daily Data Report for August 2011

Day	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days	Cool Deg Days	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's deg	Spd of Max Gust km/h
01†	20.9	10.8	15.9	2.1	0.0	M	M	0.0		14	37
02†	22.9	11.5	17.2	0.8	0.0	M	M	0.0		17	33
03†	22.9	12.0	17.5	0.5	0.0	M	M	0.0		19	33
04†	23.7	14.4	19.1	0.0	1.1	M	M	2.5			<31
05†	24.3	13.8	19.1	0.0	1.1	M	M	1.5		22	48
06†	22.7	12.8	17.8	0.2	0.0	M	M	1.0		24	32
07†	17.8	10.6	14.2	3.8	0.0	M	M	1.0		29	32
08†	18.4	7.9	13.2	4.8	0.0	M	M	4.0			<31
09†	19.5	5.9	12.7	5.3	0.0	M	M	0.0			<31
10†	21.6	10.2	15.9	2.1	0.0	M	M	0.5		17	44
11†	14.6	11.7	13.2	4.8	0.0	M	M	0.0		17	35
12†	18.6	11.5	15.1	2.9	0.0	M	M	8.0			<31
13†	20.3	11.1	15.7	2.3	0.0	M	M	1.0		30	37
14†	16.1	6.6	11.4	6.6	0.0	M	M	0.0		30	35
15†	17.0	9.0	13.0	5.0	0.0	M	M	6.5		21	39
16†	15.1	7.1	11.1	6.9	0.0	M	M	1.0		32	35
17†	13.0	7.3	10.2	7.8	0.0	M	M	0.0		30	33
18†	17.3	5.7	11.5	6.5	0.0	M	M	0.0			<31
19†	17.6	10.0	13.8	4.2	0.0	M	M	3.0			<31
20†	22.3	13.2	17.8	0.2	0.0	M	M	3.5			<31
21†	20.5	9.5	15.0	3.0	0.0	M	M	3.0			<31
22†	16.6	8.5	12.6	5.4	0.0	M	M	27.5		14	56
23†	14.5	8.5	11.5	6.5	0.0	M	M	2.0		30	46
24†	16.9	7.5	12.2	5.8	0.0	M	M	3.5		18	52
25†	16.9	8.8	12.9	5.1	0.0	M	M	14.0		33	44
26†	17.3	7.7	12.5	5.5	0.0	M	M	0.5		33	41
27†	16.7	8.3	12.5	5.5	0.0	M	M	2.5		20	50
28†	12.6	7.1	9.9	8.1	0.0	M	M	0.0		29	35
29†	11.8	6.5	9.2	8.8	0.0	M	M	4.0		6	33
30†	15.2	7.1	11.2	6.8	0.0	M	M	2.5			<31
31†	15.4	6.4	10.9	7.1	0.0	M	M	2.5		33	35
Sum				**134.4**	**2.2**	**0.0***	**0.0***	**95.5**			
Avg	**18.1**	**9.3**	**13.7**								
Xtrm	**24.3**	**5.7**								**14**	**56**

Summary, average and extreme values are based on the data above.

Environment Canada Environnement Canada

Canada

Daily Data Report for September 2011

SCHEFFERVILLE A
QUEBEC

Latitude: 54°48'00.000" N Longitude: 66°48'00.000" W Elevation: 521.00 m

Climate ID: 7117827 WMO ID: 71828 TC ID: GKL

Daily Data Report for September 2011

Day	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days	Cool Deg Days	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's deg	Spd of Max Gust km/h
01†	18.4	7.4	12.9	5.1	0.0	M	M	0.0		27	37
02†	22.6	11.9	17.3	0.7	0.0	M	M	4.0		3	74
03†	15.0	3.5	9.3	8.7	0.0	M	M	1.0		27	80
04†	9.2	2.3	5.8	12.2	0.0	M	M	0.0		31	35
05†	10.7	-0.7	5.0	13.0	0.0	M	M	0.0			<31
06†	15.0	-1.7	6.7	11.3	0.0	M	M	0.0			<31
07†	17.8	6.6	12.2	5.8	0.0	M	M	0.5		25	56
08†	9.8	2.8	6.3	11.7	0.0	M	M	7.5		24	56
09†	8.3	2.4	5.4	12.6	0.0	M	M	6.0		2	35
10†	7.3	2.0	4.7	13.3	0.0	M	M	0.5		33	37
11†	13.8	3.4	8.6	9.4	0.0	M	M	6.0		25	56
12†	8.2	1.4	4.8	13.2	0.0	M	M	1.0		31	50
13†	9.4	0.3	4.9	13.1	0.0	M	M	9.0		16	50
14†	7.6	-2.8	2.4	15.6	0.0	M	M	0.0		30	56
15†	7.2	-3.1	2.1	15.9	0.0	M	M	1.5			<31
16†	3.9	0.1	2.0	16.0	0.0	M	M	12.0		33	61
17†	9.3	0.5	4.9	13.1	0.0	M	M	4.0		32	50
18†	15.0	7.0	11.0	7.0	0.0	M	M	0.0		26	44
19†	17.3	6.4	11.9	6.1	0.0	M	M	0.0		25	46
20†	11.6	4.5	8.1	9.9	0.0	M	M	0.0		20	37
21†	10.7	2.6	6.7	11.3	0.0	M	M	0.5		28	41
22†	6.2	1.6	3.9	14.1	0.0	M	M	0.0			<31
23†	12.8	2.4	7.6	10.4	0.0	M	M	0.5			<31
24†	12.8	9.0	10.9	7.1	0.0	M	M	0.5		3	67
25†	12.8	4.3	8.6	9.4	0.0	M	M	0.0		29	61
26†	6.6	1.2	3.9	14.1	0.0	M	M	0.0		32	46
27†	9.0	0.4	4.7	13.3	0.0	M	M	0.0		35	32
28†	17.2	5.8	11.5	6.5	0.0	M	M	0.0		24	46
29†	17.7	4.7	11.2	6.8	0.0	M	M	9.0			<31
30†	4.7	-1.0	1.9	16.1	0.0	M	M	27.5		35	46
Sum				**322.8**	**0.0**	**0.0***	**0.0***	**91.0**			
Avg	**11.6**	**2.8**	**7.2**								
Xtrm	**22.6**	**-3.1**								**27**	**80**

Summary, average and extreme values are based on the data above.

Legend

[empty] = No data available
M = Missing
E = Estimated
A = Accumulated
C = Precipitation occurred, amount uncertain
L = Precipitation may or may not have occurred
F = Accumulated and estimated
N = Temperature missing but known to be > 0
Y = Temperature missing but known to be < 0
S = More than one occurrence
T = Trace
* = The value displayed is based on incomplete data
† = Data for this day has undergone only preliminary quality checking

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We'd like to hear from you! Please click "Contact Us" to share your comments and suggestions.

Date Modified: 2012-01-11

Appendix VI

Birds Observed during Overland Flights

Birds Observed during Overland Flights

*** indicates the species is listed as federally or provincially at risk

Site/Survey GPS	Date	Code & Name		Number of observations Undifferentiated	Male	Female
TACONITE - PROJET KEMAG						
SPRING BIRD MIGRATION KÉMAG PROJECT - MINE SITE						
169	28-05-2011	BEWI	Wilson's Snipe	2		
170	28-05-2011	BERO	Short-billed Dowitcher	4		
171	28-05-2011	BEWI	Wilson's Snipe	2		
172	28-05-2011	SPOR	Shorebird	3		
172	28-05-2011	BEWI	Wilson's Snipe	2		
173	28-05-2011	BEWI	Wilson's Snipe	2		
174	28-05-2011	BEWI	Wilson's Snipe	4		
175	28-05-2011	SPOR	Shorebird	2		
176	28-05-2011	CHSO	Solitary Sandpiper	2		
176	28-05-2011	BERO	Short-billed Dowitcher	3		
176	28-05-2011	BEWI	Wilson's Snipe	1		
177	28-05-2011	BEWI	Wilson's Snipe	1		
179	28-05-2011	HAHU	Red-breasted Merganser	1	1	1
180	28-05-2011	GAOO	Common Goldeneye	2	1	1
182	28-05-2011	HAHU	Red-breasted Merganser	4	2	2
183	28-05-2011	CANO	American Black Duck	8		
183	28-05-2011	CAPI	Northern Pintail	1	1	1
183	28-05-2011	MAFB	Surf Scoter	10	5	5
184	28-05-2011	SPOR	Shorebird	1		
185	28-05-2011	GOAR	Herring Gull	1		
186	28-05-2011	SPFU	*Aythya* sp.	3		
186	28-05-2011	MAFB	Surf Scoter	14		
186	28-05-2011	GAOO	Common Goldeneye	1		
186	28-05-2011	HAHU	Red-breasted Merganser	1	1	1
187	28-05-2011	SPOR	Shorebird	1		
188	28-05-2011	GOAR	Herring Gull	2		
189	28-05-2011	GAOO	Common Goldeneye	2	1	1
190	28-05-2011	GAOO	Common Goldeneye	1	1	1
191	28-05-2011	BEWI	Wilson's Snipe	1		
192	28-05-2011	SPFU	*Aythya* sp.	2	1	1
193	28-05-2011	BERO	Short-billed Dowitcher	2		
194	28-05-2011	BEWI	Wilson's Snipe	1		
195	28-05-2011	CAPI	Northern Pintail	1	1	1
196	28-05-2011	BEWI	Wilson's Snipe	1		
197	28-05-2011	BERO	Short-billed Dowitcher	2		
198	28-05-2011	SPOR	Shorebird	2		
198	28-05-2011	BEWI	Wilson's Snipe	1		
199	28-05-2011	BECA	Canada Goose	3		
200	28-05-2011	GOAR	Herring Gull	1		
201	28-05-2011	CHSO	Solitary Sandpiper	1		
202	28-05-2011	HIMA	Short-eared Owl	1		
203	28-05-2011	CHSO	Solitary Sandpiper	1		
204	28-05-2011	ARPL	Harlequin Duck	2	1	1

Birds Observed during Overland Flights

*** indicates the species is listed as federally or provincially at risk

Site/Survey					Number of observations		
	GPS	Date	Code & Name		Undifferentiated	Male	Female
	206	28-05-2011	SAHI	Green-winged Teal	2		
	207	28-05-2011	GAOO	Common Goldeneye	1	1	1
	208	28-05-2011	BERO	Short-billed Dowitcher	3		
	209	28-05-2011	SPOR	Shorebird	2		
	211	28-05-2011	HIMA	Short-eared Owl	1		
	212	28-05-2011	BEWI	Wilson's Snipe	1		
	213	28-05-2011	BEWI	Wilson's Snipe	1		
	214	28-05-2011	BEWI	Wilson's Snipe	2		
	215	28-05-2011	CAPI	Northern Pintail	2	1	1
	216	28-05-2011	CANO	American Black Duck	1		
	217	28-05-2011	GRCH	Greater Yellowlegs	1		
	217	28-05-2011	BERO	Short-billed Dowitcher	2		
	217	28-05-2011	BEWI	Wilson's Snipe	1		
	218	28-05-2011	SPOR	Shorebird	1		
	219	28-05-2011	BEWI	Wilson's Snipe	1		
	220	28-05-2011	BEWI	Wilson's Snipe	3		
	221	28-05-2011	GRHA	Common Merganser	2	1	1
	222	28-05-2011	SAHI	Green-winged Teal	2	1	1
	223	28-05-2011	SPOR	Shorebird	3		
	223	28-05-2011	GRCH	Greater Yellowlegs	2		
	224	28-05-2011	BEWI	Wilson's Snipe	1		
	225	28-05-2011	BEWI	Wilson's Snipe	1		
	226	28-05-2011	SPCH	Plover	2		
	227	28-05-2011	BEWI	Wilson's Snipe	1		
	228	28-05-2011	BEWI	Wilson's Snipe	1		
	229	28-05-2011	BAPE	Osprey	0		
	230	28-05-2011	BECA	Canada Goose	2	1	1
	231	28-05-2011	SPOR	Shorebird	1		
	232	28-05-2011	BECA	Canada Goose	1		
	233	28-05-2011	SPOR	Shorebird	1		
	234	28-05-2011	BECA	Canada Goose	2		
	234	28-05-2011	GAOO	Common Goldeneye	2	1	1
	235	28-05-2011	GAOO	Common Goldeneye	1	1	1
	236	28-05-2011	GRHA	Common Merganser	3	3	3
	53	22-05-2011	GAOO	Common Goldeneye	2	1	1
	54	22-05-2011	SAHI	Green-winged Teal	2	1	1
	55	22-05-2011	QURO	Rusty Blackbird	4		
	56	22-05-2011	SAHI	Green-winged Teal	2	1	1
	57	22-05-2011	BECA	Canada Goose	1		
	58	22-05-2011	BECA	Canada Goose	4		
	58	22-05-2011	GAOO	Common Goldeneye	1	1	1
	59	22-05-2011	GAOO	Common Goldeneye	2	1	1
	60	22-05-2011	BAPE	Osprey	2		
	61	22-05-2011	CAPI	Northern Pintail	3		
	61	22-05-2011	BEWI	Wilson's Snipe	1		
	62	22-05-2011	BECA	Canada Goose	6		

Birds Observed during Overland Flights

*** indicates the species is listed as federally or provincially at risk

Site/Survey				Number of observations		
GPS	Date	Code & Name		Undifferentiated	Male	Female
62	22-05-2011	SAHI	Green-winged Teal	14		
62	22-05-2011	CAPI	Northern Pintail	2		
63	22-05-2011	GRHA	Common Merganser	2	2	2
64	22-05-2011	BECA	Canada Goose	2		
65	22-05-2011	MAFB	Surf Scoter	2	1	1
65	22-05-2011	GOAR	Herring Gull	2		
66	22-05-2011	GAOO	Common Goldeneye	2	1	1
67	22-05-2011	AIRO	Golden Eagle	1		
69	22-05-2011	BECA	Canada Goose	2		
70	22-05-2011	CHSO	Solitary Sandpiper	1		
71	22-05-2011	GOAR	Herring Gull	1		
73	22-05-2011	BECA	Canada Goose	2		
74	22-05-2011	HIMA	Short-eared Owl	1		
76	22-05-2011	BECA	Canada Goose	2		
77	22-05-2011	SAHI	Green-winged Teal	2	1	1
78	22-05-2011	BEWI	Wilson's Snipe	1		
79	22-05-2011	BEWI	Wilson's Snipe	1		
81	22-05-2011	CHSO	Solitary Sandpiper	1		
AUTUMN BIRD MIGRATION KÉMAG PROJECT - MINING SITE						
024	27-09-2011	HACO	Hooded Merganser	1		
025	27-09-2011	GRHA	Common Merganser	9		
026	27-09-2011	AUPA	Northern Goshawk	1		
026	27-09-2011	GRHA	Common Merganser	1		
027	27-09-2011	PYTB	Bald Eagle	1		
028	27-09-2011	MAFB	Surf Scoter	1	1	1
028	27-09-2011	GRHA	Common Merganser	5		
030	27-09-2011	RENR	Red fox	1		
031	27-09-2011	PLHU	Common Loon	1		
032	27-09-2011	PYTB	Bald Eagle	1		
033	27-09-2011	GRHA	Common Merganser	1	1	1
034	27-09-2011	GOAR	Herring Gull	2		
035	27-09-2011	GRHA	Common Merganser	2	2	2
036	27-09-2011	GRHA	Common Merganser	4		
037	27-09-2011	FUMI	Greater Scaup	1	1	1
037	27-09-2011	GRHA	Common Merganser	2		
038	27-09-2011	GRHA	Common Merganser	1	1	1
039	27-09-2011	MECA	Gray Jay	2		
040	27-09-2011	SPNI	Bird nest	1		
041	27-09-2011	PYTB	Bald Eagle	1		
042	27-09-2011	GRHA	Common Merganser	17		
043	27-09-2011	GOAR	Herring Gull	1		
044	27-09-2011	SPFF	Lesser or Greater Scaup	7		
045	27-09-2011	GRHA	Common Merganser	1	1	1
046	27-09-2011	GRHA	Common Merganser	7	7	7
047	27-09-2011	GRHA	Common Merganser	9		

Birds Observed during Overland Flights

*** indicates the species is listed as federally or provincially at risk

Site/Survey					Number of observations		
	GPS	Date	Code & Name		Undifferentiated	Male	Female
	064	28-09-2011	BUPA	Rough-legged Hawk	1		
	065	28-09-2011	PEFU	Lesser Scaup	10		
	066	28-09-2011	GAOO	Common Goldeneye	1	1	1
	067	28-09-2011	BUPA	Rough-legged Hawk	2		
	093	29-09-2011	HACO	Hooded Merganser	3	3	3
	094	29-09-2011	HACO	Hooded Merganser	3	3	3
	095	29-09-2011	SPNP	Bird nest of raptor	1		
	096	29-09-2011	GOAR	Herring Gull	1		
	097	29-09-2011	HAHU	Red-breasted Merganser	3		
	098	29-09-2011	MAFB	Surf Scoter	1		
	099	29-09-2011	PLHU	Common Loon	1		
	100	29-09-2011	PYTB	Bald Eagle	1		
	101	29-09-2011	GOAR	Herring Gull	1		
	102	29-09-2011	GOAR	Herring Gull	1		
	103	29-09-2011	PEFU	Lesser Scaup	1	1	1
	104	29-09-2011	PYTB	Bald Eagle	1		
	105	29-09-2011	PYTB	Bald Eagle	1		
	106	29-09-2011	GRCO	Common Raven	1		
	107	29-09-2011	GOAR	Herring Gull	1		
	108	29-09-2011	BUPA	Rough-legged Hawk	1		
	109	29-09-2011	PEFU	Lesser Scaup	3		
	110	29-09-2011	HACO	Hooded Merganser	1	1	1
	111	29-09-2011	SPNI	Bird nest	1		
	112	29-09-2011	GRHA	Common Merganser	4	4	4
	113	29-09-2011	CAST	North American Beaver lodge	1		
	114	29-09-2011	GRHA	Common Merganser	1		
	115	29-09-2011	SPFF	Lesser or Greater Scaup	1	1	1