



**BASELINE SMALL MAMMAL AND FURBEARER SURVEYS
FOR
PROPOSED WABUSH 3 MINE SITE AND POTENTIAL SKI HILL LOCATION
LABRADOR CITY, NEWFOUNDLAND AND LABRADOR**

Submitted to:

Iron Ore Company of Canada
2 Avalon Drive
Labrador City, NL
Canada A2V 2Y6

Submitted by:

AMEC Environment & Infrastructure
a Division of AMEC Americas Limited
133 Crosbie Road, PO Box 13216
St. John's, Newfoundland and Labrador
Canada A1B 4A5

November 2012

Project No. TF1243033.2008

Important Notice

This report was prepared exclusively for Iron Ore Company of Canada (IOC) by AMEC Environment & Infrastructure, a division of AMEC Americas Limited (AMEC). The quality of the information, conclusions and estimates contained herein is consistent with the level of effort involved in AMEC's services and based on i) information available at the time of preparation, ii) data supplied by outside sources and iii) the assumptions, conditions and qualification set forth in this report. This report is for use by IOC only. Any other use of, or reliance on, this report by any third party is at that party's sole risk.

Executive Summary

IOC is proposing to develop a new open pit mine, Wabush 3, within its western Labrador operations. As this new mine may interfere with the Smokey Mountain ski hill, an area for potential relocation of the ski hill has been identified. Construction of a new concentrator facility, CEP3, had originally been proposed, although this project is currently no longer being developed. These projects are likely to have direct and indirect effects on terrestrial species through deforestation and loss of habitat. Most of the study area is densely vegetated, and provides terrestrial habitats that are potentially favorable to a number of mammal species, including two federally and provincially protected species at risk with the potential to occur in the area, woodland caribou and wolverine. In order to evaluate the potential effects of the proposed projects on furbearers and small mammals, site-specific information within the Wabush 3, ski hill and CEP3 sites (the study area) is needed.

A desktop review was conducted to obtain existing information on presence of furbearers and other mammals in western Labrador. A total of eighteen small mammal and furbearer species were reported; however, little information specific to the Labrador City area was available.

Terrestrial fauna surveys were conducted in order to determine the presence and relative abundance of mammal species in the area of the proposed projects. Surveys were conducted in April, June, July and September of 2012. The April surveys primarily targeted furbearers, and have been reported previously. The primary focus of the June and July surveys was breeding birds, but observations and signs of mammal species were noted and are summarized in this report. The September field work included a small mammal trapping program sampling the major habitat types in the study area. Signs of mammal presence were identified to the species level where possible. In total, evidence was recorded for fourteen mammal species within the three study sites. The greatest diversity of species was found at Wabush 3, which is also the largest of the three sites with the greatest habitat diversity. The lowest species diversity was found at CEP3, which is not unexpected given the proximity of the site to the existing concentrator facilities; however, in the small mammal trapping survey, CEP3 had the highest number of animals captured per trap-night (namely, red-backed vole and masked shrew) due to an abundance of suitable habitat for these species in the survey area. No mammalian species at risk were observed during the surveys.

TABLE OF CONTENTS

	PAGE
1.0 INTRODUCTION	5
2.0 BACKGROUND AND SCOPE	1
3.0 REVIEW OF EXISTING INFORMATION	4
4.0 STUDY METHODS	6
5.0 RESULTS.....	8
5.1 WABUSH 3 MINE SITE	8
5.2 PROPOSED SKI HILL SITE	8
5.3 CEP3 SITE	8
5.4 INCIDENTAL OBSERVATIONS.....	9
6.0 SUMMARY AND DISCUSSION	9
7.0 REFERENCES	11

LIST OF TABLES

Table 6.1: Mammal Species Observed in Survey Sites	9
--	---

LIST OF FIGURES

Figure 2.1: Study Area	3
Figure 4.1: Small Mammal Trapping Locations	7

LIST OF APPENDICES

Appendix A	Mammal Species Observed in the Study Area
Appendix B	Photographs

LIST OF ACRONYMS

ACCDC	Atlantic Canada Conservation Data Centre
AMEC	AMEC Environment & Infrastructure, a division of AMEC Americas Limited
CEP3	Concentrate Expansion Project – 3 rd phase
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
EIS	Environmental Impact Statement
ELC	Ecological Land Classification
ESA	<i>Endangered Species Act</i>
ha	hectare
IEMR	Institute for Environmental Monitoring and Research
IOC	Iron Ore Company of Canada
NLDEC	Newfoundland and Labrador Department of Environment and Conservation
SARA	<i>Species at Risk Act</i>
SMMN	Small Mammal Monitoring Network

1.0 INTRODUCTION

AMEC Environment & Infrastructure, a division of AMEC Americas Limited (AMEC), was retained by Iron Ore Company of Canada (IOC) to conduct surveys for small mammal species in the proposed mine site and replacement ski hill location, as well as the site of the new concentrator facility which had been proposed early in 2012, in Labrador City, NL. This report discusses the methodologies and field activities, and presents findings for the field surveys conducted between September 11th and 16th, 2012. Incidental observations of mammal species during June and July field surveys are also reported here, along with observations of non-target terrestrial fauna species that were identified (excluding birds, which are discussed in a separate report).

This document includes the following sections:

- Section 1 Introduction;
- Section 2 Background and Scope;
- Section 3 Review of Existing Information;
- Section 4 Study Methods;
- Section 5 Results;
- Section 6 Summary and Discussion;
- Section 7 References; and
- Appendices

2.0 BACKGROUND AND SCOPE

IOC is proposing to develop a new open pit mine within its western Labrador operations, Wabush 3. The development of Wabush 3 may interfere with the operation of the local ski hill and, in order to mitigate this potential impact, IOC has selected a potential area for relocation of the ski hill. A separate and distinct project, the construction of a new concentrator facility (CEP3), was originally proposed for the area; while this project is presently no longer being developed, surveys for the area had been conducted and the results are presented in this report.

Figure 2.1 illustrates the proposed mine, concentrator and potential ski hill sites, as provided by IOC. Most of the study area is densely vegetated and provides terrestrial habitats favorable to a number of flora and fauna species, including species at risk. The project is likely to have direct and indirect effects on terrestrial species through deforestation and loss of habitat. General descriptions of the habitat types found in the three sites are provided here. Refer to the Ecological Land Classification (ELC) report for more detailed habitat information on the Wabush 3 and proposed ski hill sites (AMEC).

The Wabush 3 mine site property is located north of Labrador City, slightly overlapping the Smokey Mountain ski hill to the east. While the actual proposed footprint of the Wabush 3 Pit will be 220 hectares, the Wabush 3 study area was 440 hectares. The extra area allows for peripheral development, such as access roads. Coniferous forest covers approximately 50% of the 440 hectare (ha) Wabush 3 site, with alpine shrub and low alpine herb habitat over 33% of the total area, and exposed rocky outcroppings on the higher elevation areas in the southeast and the north of the site comprising 12% of the total area. Small areas of mixed and hardwood forest, and herb and shrub fen make up the remaining 5%. The more open areas of the site are subject to heavy recreational use, as evidenced by the abundance of snowmobile/ATV trails, human footprints, and the presence of the ski hill and associated lift structures. An unpaved road runs through the middle of the site in a north-south direction, although a locked gate restricts vehicle access beyond approximately 600 m from the southern edge of the property. There are two small lakes on the western side of the site connected to each other by a watercourse; the southernmost small lake drains westward into Leg Lake via a small unnamed stream. Another small watercourse, Dumbell Stream, originates from a small fen near the middle of the site and flows eastward into Dumbell Lake.

The proposed replacement ski hill location is located north of Labrador City and approximately one kilometre south of the Smokey Mountain ski hill. The ski hill site is 111 ha in area; dense forest covers over 80% of the site, predominantly hardwood to the west (17% of the total area), and predominantly conifer to the east and centre of the site (66%). Disturbed habitats including cutover and burn habitat comprise over 11% of the total area; much of this is found along roadsides and a cleared power transmission corridor that crosses the site in an east-west direction near the northern border. Exposed earth (primarily roads and trails) covers 3% of the area. Alpine shrub and low alpine herb habitats, comprising 3% of the total area, are primarily found on the higher elevations of the northwest portion of the site. There are two small watercourses on the site, both flowing into Beverly Lake; one flows through the southeastern corner of the property, and the other flows in an easterly direction along the northern boundary.

There is evidence of recreational use on the property, including trapping, snowmobile and ATV use, and cross-country skiing.

CEP3, the site of the previously proposed new concentrator, has an area of 15 ha and is located slightly to the northeast of the existing concentrator. Ecological land classification for this site was not completed; however, most of the habitat consists of young mixed forest, with some cutover areas and open shrub habitat. The adjacent areas to the south and east of the site are highly disturbed, an active rail line runs along the western site boundary, and there is a landfill located less than 100 m to the north.



Species at risk and their habitats are protected by legislation at both the federal level (*Species At Risk Act*, or *SARA*) and provincially (Newfoundland and Labrador's *Endangered Species Act*, or *ESA*). Data on presence and distribution across the study area are necessary to adequately evaluate the potential effects of the project on mammalian species at risk. In addition to the regulatory drivers for designated species at risk, the economic, cultural and scientific importance of furbearers and other mammal species to the local community must be considered.

The limited available site-specific information on mammal species in the study area needs to be supplemented with focused field surveys in order to adequately assess the potential effects of the project. The objective of the present report is to acquire and summarize data to permit evaluation of the Projects' potential effects on furbearers and small mammals. The development of the surveys described herein was based on a review of methods used by the Newfoundland and Labrador Small Mammal Monitoring Network (IEMR 2008).

The scope of work for this project included a review of existing information on mammal species use of the study area, identification of the general habitat types located within the study area based on available aerial photography, and completion of September field surveys for small mammals. In addition to the September small mammal survey results, incidental observations of mammals in the study area during summer field surveys are also summarized in this report. The results of winter surveys conducted in April 2012 for furbearers and other mammals have been summarized in a previous report (AMEC 2012).

Figure 2.1: Study Area



NOTES					
1. ALL DIMENSIONS ARE IN METRES.					
2. DO NOT SCALE FROM DRAWING.					
3. THIS DRAWING IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.					
4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.					
5. ALL DATA IN NAD27 UTM ZONE 18.					
No.	Date	Description	Drawn	Chk'd	App'd
LEGEND					
 Study Area					
 AMEC Environment & Infrastructure AMEC Americas Limited					
CLIENT Rio Tinto Iron Ore Company of Canada					
PROJECT DESCRIPTION IOC Baseline Small Mammal Surveys					
DRAWING TITLE Study Area					
PROJECT NUMBER TF1243033.2008					
SCALE 0 450 900 Meters					
DRAWN BY	APPROVED BY	REVIEWED BY			
JA	MCM	BP			
FIGURE NO.	DATE	REV			
2.1	October 2012	0			

3.0 REVIEW OF EXISTING INFORMATION

Winter mammal track surveys were conducted in April 2012 in order to determine the presence and relative abundance of mammal species (primarily furbearers) on the Wabush 3, replacement ski hill and CEP3 properties, as well as a second potential ski hill location near Walsh River (AMEC 2012). Red squirrel (*Tamiasciurus hudsonicus*) and snowshoe hare (*Lepus americanus*) tracks and sign (scat and vocalizations) were commonly observed, and evidence of porcupine and northern flying squirrel were less frequently encountered, on both the Wabush 3 and ski hill sites. Red fox (*Vulpes vulpes*), wolf (*Canis lupus*), marten (*Martes americana*) and short-tailed weasel (*Mustela erminea*) signs were also observed at Wabush 3. Two distinct types of small mammal tracks were seen at the replacement ski hill site; one was believed to be from a shrew and the other considered likely vole tracks. No mammal sign was observed during surveys conducted near the CEP3 site; however, the CEP3 site footprint that had been provided for the April surveys differed from that provided for more recent field surveys.

Prior to the 2012 surveys, little site-specific information existed on furbearers and small mammals in the study area. From past surveys of the IOC Labrador City property (JWEL 2001a, 2001b, 2000), it was known that red fox, snowshoe hare, red squirrel, moose (*Alces alces*), wolf, marten, mink (*Mustela vison*), muskrat (*Ondatra zibethicus*), beaver (*Castor canadensis*) and river otter (*Lontra canadensis*) are present. In Schefferville, approximately 200 km north of Labrador City, black bear (*Ursus americanus*), short-tailed weasel, and lynx (*Lynx lynx*) have been reported as well as an unidentified jumping mouse (Labrador Iron Mines 2009). This may have been a meadow jumping mouse, a species which has elsewhere been reported in Labrador (Rodrigues 2010).

The Newfoundland and Labrador Small Mammal Monitoring Network (SMMN) was established in 2007 with the intent of identifying species present in the province, and ultimately tracking changes in their population levels and distributions. A consistent methodology was established and put into place at 24 locations throughout the province, including ten in Labrador. While none of the locations are in the study area (the closest monitoring station is in Churchill Falls, approximately 240 km east of Labrador City), it is likely that a similar species composition occurs in Labrador City. Between 2007 and 2009, the following small mammal species were reported throughout the Labrador portion of the province (Rodrigues 2010):

- Meadow jumping mouse (*Zapus hudsonius*)
- Southern red-backed vole (*Myodes* [or *Clethrionomys*] *gapperi*)
- Labrador (or Ungava) collared lemming (*Dicrostonyx hudsonius*)
- Meadow vole (*Microtus pennsylvanicus*)
- Deer mouse (*Peromyscus maniculatus*)
- Eastern heather vole (*Phenacomys ungava*)
- Northern bog lemming (*Synaptomus borealis*)
- Masked shrew (*Sorex cinereus*)

The Small Mammal Data Compilation project was an initiative intended to gather all data

sources on small mammals in Newfoundland and Labrador into one location, to aid in assessment of historic distribution and population trends, and identify knowledge gaps. The resulting report (Garland 2008) provides a list of all small mammal species reported to occur in the province between 1960 and 2005. In addition to the above-mentioned species, the report stated that the following have been known to occur in Labrador:

- House mouse (*Mus musculus*)
- Norway rat (*Rattus norvegicus*)
- Rock vole (*Microtus chrotorrhinus*)
- Pygmy shrew (*Sorex hoyi*)
- Water shrew (*Sorex palustris*)
- Woodland jumping mouse (*Napaeozapus insignis*)
- Star-nosed mole (*Condylura cristata*)
- Arctic shrew (*Sorex arcticus*)
- Northern flying squirrel (*Glaucomys sabrinus*)
- Least weasel (*Mustela nivalis*)

A 2006 proposal by Golder Associates stated that small mammal trapping was conducted on IOC property in Labrador City in 2003; species captured included the northern red-backed vole (*Myodes* [or *Clethrionomys*] *rutilus*) and meadow jumping mouse (Golder 2006). However, the reported North American range of the northern red-backed vole is west of Hudson Bay (Linzey *et al.* 2008), and the possibility that these were actually southern red-backed vole should be considered.

Three mammal species at risk have been recorded in Labrador. The eastern population of wolverine (*Gulo gulo*), considered endangered under Newfoundland and Labrador *ESA*, *SARA* and the federal Committee on the Status of Endangered Wildlife in Canada (COSEWIC), is believed to range through much of the region. However, no confirmed sightings have been reported in Labrador or Quebec in the past 25 years (NLDEC 2011a). Wolverines have extremely large home ranges, and are very sparsely populated throughout their range. The polar bear (*Ursus maritimus*) is considered to be at risk, both federally (*SARA* and COSEWIC: Special concern) and provincially (*ESA*: Vulnerable); however, this species is found in coastal habitats, primarily on sea ice (NLDEC 2011b), and so is considered highly unlikely to occur in the study area. The woodland caribou (*Rangifer tarandus caribou*) is a provincially listed species at risk (*ESA*: Threatened) with potential to occur in the study area; aerial surveys for large mammals including caribou were conducted in the winter of 2012 (IOC personnel, personal communication), and are discussed in a separate report. Another species that has been reported in Labrador, the rock vole, is designated as “sensitive” in Labrador in NLDEC’s General Status Rankings (NLDEC 2005). This designation does not afford any regulatory protection to the species, but it indicates that the species is not immediately at risk of extinction, but is “sensitive to exploitation or habitat loss and may require special attention or protection to prevent them from becoming at risk” (NLDEC 2005). Rock voles tend to be found in mossy, rocky areas, particularly near flowing water in coniferous forests with ferns and mossy debris (Linzey & NatureServe 2008).

The Atlantic Canada Conservation Data Centre (ACCDC) was contacted in order to obtain records of rare and endangered species sightings in the vicinity of the project. In a circle with a 5 km radius encompassing the entire study area, there were no records of rare or endangered mammal species. Based on expert opinion maps, which are generated by ACCDC in consultation with species-specific experts to indicate where it is likely that species at risk may occur, it is believed that woodland caribou possibly occurs in the study area (ACCDC 2012). As previously mentioned, caribou are the subject of a separate field survey report, and so are not discussed further in this report.

4.0 STUDY METHODS

The small mammal survey protocol was modified from that used by the Newfoundland and Labrador Small Mammal Monitoring Network (SMMN) (IEMR 2008). The SMMN uses a grid of eight trap lines in a study area of uniform habitat. In the present study, a total of eight trap lines were deployed over three sites, sampling the different major habitat types in the project footprint: four at Wabush 3, three at the proposed ski hill, and one at CEP3 (Figure 4.1). As in the SMMN protocol, each trap line consisted of 15 stations spaced approximately ten metres apart. At each station, two Victor M150 snap traps were placed and baited with a mixture of peanut butter and rolled oats.

To supplement the snap traps and employ a more diverse sampling strategy, small pitfall traps were deployed along with the snap traps; a group of four spaced one metre apart was placed along each trap line. One-litre straight-walled plastic cups approximately 25 cm deep, with an opening diameter of 15 cm, were used for the pitfalls.

The traps were deployed for three nights, for a total of 720 trap-nights for snap traps and 96 pitfall trap-nights. In the morning, the traps were checked and the condition of each was noted; any trap that had been sprung was re-baited and set. Each animal caught was placed in a Ziploc-style plastic bag along with a waterproof label indicating the date captured, trap location, and preliminary identification (e.g. "vole," "shrew"). Specimens were later identified to the species level, then packed in a cooler with ice and shipped to the Newfoundland and Labrador Department of Environment and Conservation (NLDEC) Wildlife Division in Corner Brook, NL.

During the September survey, as well as during June and July surveys conducted by AMEC in the study area, signs of mammal presence including tracks, scat, browse signs, dens, scrapes, remains, sightings and vocalizations of individuals were noted.

Figure 4.1: Small Mammal Trapping Locations



NOTES					
1. ALL DIMENSIONS ARE IN METRES.					
2. DO NOT SCALE FROM DRAWING.					
3. THIS DRAWING IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.					
4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.					
5. ALL DATA IN NAD27 UTM ZONE 19.					
No.	Date	Description	Drawn	Chk'd	App'd
LEGEND					
Study Area Trapping Locations					
AMEC Environment & Infrastructure AMEC Americas Limited					
CLIENT					
Rio Tinto Iron Ore Company of Canada					
PROJECT DESCRIPTION					
IOC Baseline Small Mammal Surveys					
DRAWING TITLE					
Small Mammal Trapping Locations					
PROJECT NUMBER					
TF1243033.2008					
SCALE					
0 450 900 Meters					
DRAWN BY		APPROVED BY		REVIEWED BY	
JA		MCM		BP	
FIGURE NO.		DATE		REV	
4.1		October 2012		0	

5.0 RESULTS

The following subsections provide a summary of the findings of the surveys conducted in each of the sites. A list of mammal species observed in the study area, along with a brief life history description for each, is provided in Appendix A. Representative photographs from the September surveys are provided in Appendix B. Details on the June and July field surveys by AMEC can be found in the Avian Baseline Survey Report (AMEC).

5.1 WABUSH 3 MINE SITE

Traps on the Wabush 3 site were deployed from September 12th to 15th, 2012. Two trap lines were placed in open shrub habitat north of the two small lakes in the western side of the site, and two in low alpine herb with some rocky outcroppings on the east of the site (Figure 4.1). Three red-backed voles were captured in the low alpine herb habitat, while in the open shrub habitat, only one rodent was captured, a meadow vole. In total, four rodents were captured over 360 trap-nights, for a catch per unit effort of 0.011 animals/trap-night. Black bear tracks were observed on the western side of the Wabush 3 site in September, between the two small lakes. Snowshoe hare and red squirrel were also observed in this area during the survey.

During June and July field investigations by AMEC personnel, red squirrels were heard at several locations throughout the property. Evidence of snowshoe hare was seen, and moose tracks were observed on the site. A woodchuck (*Marmota monax*) was observed on the site access road south of Wabush 3.

5.2 PROPOSED SKI HILL SITE

Traps on the proposed replacement ski hill site were deployed from September 11th to 14th, 2012. Three parallel trap lines were placed in conifer forest habitat near the eastern edge of the site (Figure 4.1). A total of eleven red-backed voles and one masked shrew were captured over 270 trap-nights, for a catch per unit effort of 0.044 animals/trap-night. On the last morning of the small mammal survey, it was discovered that a large animal had pulled four of the pitfall traps from the ground; based on the tooth marks left in one of the plastic cups, it is believed that this was likely the work of a black bear.

During June and July field surveys conducted on the site by AMEC personnel, red squirrels were frequently heard and snowshoe hare scat was seen in more than one location. Red fox scat was observed, and a dead hare was discovered in a snare. A woodchuck was seen near the southeast corner of the site close to Beverly Lake.

5.3 CEP3 SITE

Traps on the CEP3 site were deployed from September 11th to 14th, 2012. A single trap line was placed in young mixed (predominantly hardwood) forest habitat near the eastern edge of the site (Figure 4.1). Seven red-backed voles and one masked shrew were captured; most of the red-backed voles captured at CEP3 were of the dark grey colour phase which has been reported for this species (Banfield 1977). In total, eight small mammals were captured over 90 trap-nights for a catch per unit effort of 0.089 animals/trap-night. The catch per unit effort at

CEP3 was considerably higher than at the other two sites, likely because the habitat along the trap line provided plenty of dense cover and was highly suitable for small forest-dwelling mammal species such as red-backed voles. Red squirrels were also heard frequently during the September surveys.

During the June field survey conducted by AMEC personnel, particular effort was made to detect signs of mammal presence at CEP3, because the most recent project footprint was not covered during the April surveys. Abundant snowshoe hare scat was noted near the southeastern end of the site, and hare and red fox tracks were seen at more than one location. Moose tracks were noted around some of the existing site structures near the southern end of the CEP3 site. According to IOC personnel, black bears frequent the landfill situated just northeast of the site, so it is likely that they occur on the CEP3 site from time to time.

5.4 INCIDENTAL OBSERVATIONS

Observations of non-target species during the surveys included green frog (*Rana clamitans*) at the Wabush 3 site, and spring peeper (*Hyla crucifer*) at both the Wabush 3 and ski hill sites. Abundant small fish were seen feeding at the southernmost of the two small lakes on the Wabush 3, although the species could not be determined. Butterfly species identified during the June surveys included cabbage white (*Pieris rapae*), spring azure (*Celastrina argiolus*) and red admiral (*Vanessa atalanta*), the latter of which was abundant at both Wabush 3 and the ski hill site, consistent with a reported abnormal influx of the species throughout eastern North America (CBC 2012).

6.0 SUMMARY AND DISCUSSION

In addition to the mammal species identified in the study area during the April surveys, observations during the summer and fall field surveys, including the small mammal trapping program described herein, bring the total number of observed mammal species in the Wabush 3, ski hill and CEP3 project areas to fourteen. A list of species observed is provided in Table 6.1.

Table 6.1: Mammal Species Observed in Survey Sites

Species	Species Presence ¹		
	Wabush 3	Ski Hill	CEP3
Red fox <i>Vulpes vulpes</i>	xx	x	x
Wolf <i>Canis lupus</i>	x		
Snowshoe hare <i>Lepus americanus</i>	xx	xx	x
Marten <i>Martes americana</i>	x		
Short-tailed weasel <i>Mustela erminea</i>	x		

Species	Species Presence ¹		
	Wabush 3	Ski Hill	CEP3
Red squirrel <i>Tamiasciurus hudsonicus</i>	xx	xx	xx
Northern flying squirrel <i>Glaucomys sabrinus</i>	x	x	
Porcupine <i>Erethizon dorsatum</i>	x	x	
Red-backed vole <i>Myodes gapperi</i>	x	xx	xx
Meadow vole <i>Microtus pennsylvanicus</i>	x		
Masked shrew <i>Sorex cinereus</i>		x	x
Woodchuck <i>Marmota monax</i>	x	x	
Black bear <i>Ursus americanus</i>	x	x	
Moose <i>Alces alces</i>	x		x

Note: 1. An "x" indicates species was observed at least once in the study area; "xx" indicates species was relatively abundant in the study area (>5 sightings)

No mammalian species at risk or species of conservation concern were observed during the surveys. It must be noted that negative survey results do not definitively prove the absence of a species in the survey area; it is possible that individuals were in the study area but were not detected. The regionally sensitive rock vole may occur in appropriate habitat at the site, but was not captured during the trapping survey; this species tends to occur in small, isolated colonies (Banfield 1977). As well, no evidence of wolverine was observed during the field surveys. As previously stated, wolverines have extremely large territories, and are very sparsely populated. However, wolverines tend to occur in places with minimal human disturbance, and so it is considered unlikely that they would be present in the study areas.

Although no legally protected mammalian species at risk are considered likely to occur on the site, best management practices should be implemented to minimize negative project interactions with terrestrial fauna, in no small part to protect the health and safety of site workers. The risk of potentially dangerous wildlife encounters can be minimized by enforcing measures such as prohibiting site workers from feeding and approaching wild animals, and ensuring that all waste including food scraps is disposed of properly.

7.0 REFERENCES

- ACDC. 2012. Data report for Labrador City Mine Expansion Site. Email from Adam Durocher, dated 30 October 2012.
- AMEC. 2012. Winter Mammal Survey of Proposed Mine and Potential Ski Hill Locations, Labrador City, Newfoundland and Labrador. Report prepared for the Iron Ore Company of Canada, April 2012.
- Banfield, A.W.F. 1977. The Mammals of Canada. University of Toronto Press, Toronto. 438 pp.
- Burt, W.H. and Grossenheider, R.P. 1980. A Field Guide to the Mammals, North America North of Mexico. 3rd ed. The Peterson Field Guide Series no. 5. Houghton Mifflin Company, Boston, MA. 289 pp.
- CBC. 2012. Article: "Canada's butterfly migration is largest on record" Website: <http://www.cbc.ca/news/technology/story/2012/05/15/butterfly-migration-biggest-ever.html> Dated 16 May 2012
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2012. Website: http://www.cosewic.gc.ca/eng/sct5/index_e.cfm. Accessed 19 March 2012.
- Gibson, M and Bondrup-Nielsen, S. 2008. Winter Nature: Common Mammals, Birds, Trees and Shrubs of the Maritimes. Gaspereau Press, Kentville, NS. 222 pp.
- Golder, 2006. Tailings Biodiversity Enhancement - Small Mammal Experimental Translocation Project. Proposal prepared for the Iron Ore Company of Canada.
- Halfpenny, J. 1986. A Field Guide to Mammal Tracking in North America. Johnson Books, Boulder, CO. 161 pp.
- IEMR (Institute for Environmental Monitoring and Research). 2008. Newfoundland and Labrador Small Mammal Monitoring Network Small Mammal Monitoring Protocol. Version: August 29 2008.
- JWEL (Jacques Whitford Environment Limited). 2000. Waterfowl Surveys of Luce Lake, White Lake, and Hakim Lake. Project #1295, Report prepared for the Iron Ore Company Of Canada.
- JWEL (Jacques Whitford Environment Limited). 2001a. Draft Report - Furbearer Surveys of Wabush Lake, Luce Lake System and Other Waterbodies on the IOC Property. Project #1560, Report prepared for the Iron Ore Company Of Canada.
- JWEL (Jacques Whitford Environment Limited). 2001b. Wabush Lake Waterfowl Surveys. Project #1437-1679, Report prepared for the Iron Ore Company Of Canada.

LIM (Labrador Iron Mines Ltd.), 2009. Schefferville Area Iron Ore Mine, Western Labrador - Environmental Impact Statement. Report # 1045934. Available online at: http://www.env.gov.nl.ca/env/env_assessment/projects/Y2010/1379/index.html. Accessed 24 November 2011.

Linzey, A.V., Henttonen, H., Sheftel, B. & Batsaikhan, N. 2008. *Myodes rutilus*. In: IUCN 2011. IUCN Red List of Threatened Species. Version 2011.2. <www.iucnredlist.org>. Accessed 24 November 2011.

Linzey, A.V. & NatureServe (Hammerson, G., Whittaker, J.C. & Norris, S.J.) 2008. *Microtus chrotorrhinus*. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.2. <www.iucnredlist.org>. Downloaded on 07 November 2012.

NLDEC (Newfoundland and Labrador Department of Environment and Conservation), 2005. General Status of Species. Available online at: http://www.env.gov.nl.ca/env/wildlife/all_species/general_status.html. Accessed 03 November 2012.

NLDEC (Newfoundland and Labrador Department of Environment and Conservation), 2011a. Species At Risk Fact Sheet: Wolverine. Available online at: <http://www.env.gov.nl.ca/env/wildlife/endangeredspecies/wolverine.pdf>. Accessed 24 November 2011.

NLDEC (Newfoundland and Labrador Department of Environment and Conservation), 2011b. Species At Risk Fact Sheet: Polar Bear. Available online at: http://www.env.gov.nl.ca/env/wildlife/endangeredspecies/polar_bear.pdf. Accessed 24 November 2011.

Rodrigues, 2010. Newfoundland and Labrador Small Mammal Monitoring Network, 2009 Season Report. Available online at: http://www.iemr.org/pdfs/R_SmallMamm/Small_Mammal_Monitoring_2009e.pdf. Accessed 23 November 2011.

Species at Risk Act (SARA). 2010. Species at Risk Public Registry. Website (Environment Canada): http://www.sararegistry.gc.ca/default_e.cfm. Accessed 19 March, 2012.

APPENDIX A

MAMMAL SPECIES OBSERVED IN THE STUDY AREA

Further information on the mammal species found during the surveys is provided below. Information was obtained from Banfield (1977), Halfpenny (1986), Gibson and Bondrup-Neilsen (2008), Sheldon and Eder (2000) and Burt and Grossenheider (1980).

Canidae

The dog family, Canidae, is represented by two species in the wild in western Labrador, as well as the domestic dog.

Red fox (*Vulpes vulpes*) tends to be found in open woodlands, clearings, and brushy areas, and frequently occur near human settlement. They are fairly solitary animals, and may range more than five kilometres from their den in search of food. Their diet consists of fruit and berries, small birds and mammals, and insects.

Wolf (*Canis lupus*) is a large canid, typically found in forests and tundra in the northern part of the continent. They are bolder than other canines, but do not tend to be found in close association with human settlements. Wolves often travel in packs, and use scent posts and howling to communicate territory boundaries. They are most active in the night, and feed on a variety of prey items, including large animals such as moose and caribou.

Mustelidae

Two members of the mustelid or weasel family were found to occur in the study area. A fifth species, the wolverine, was not found during the surveys; however, as it is a species at risk (*ESA* and *SARA*: Endangered) with slight potential to occur in the study area, information on the species is presented here. In general, mustelids are fierce predators and may even take down prey larger than themselves, although the wolverine tends to be more of a scavenger.

Short-tailed weasel (*Mustela erminea*) is a small member of the mustelid family which is typically found in brushy or wooded areas, often close to water. A light brown colour in the summer months, weasels become white with a black tail tip in winter. The weasel will prey on small mammals, birds, and other small creatures, and is primarily a ground-dweller, often pursuing prey in the subnivean space (the space between the ground and the snow cover) in the wintertime.

Marten (*Martes americana*) is a fairly large mustelid found in coniferous and mixed forests, usually old-growth, but also in young forests. It is generally a tree-dweller, but spends a considerable amount of its time on the ground. It is a solitary animal, preying on tree squirrels, voles and mice.

Wolverine (*Gulo gulo*) is the largest member of the mustelid family, found in a variety of habitats where human disturbance is low and availability of food is high. Their home territories are very large, and the distribution of individuals is extremely scattered throughout their range. They are primarily scavengers of large animals (e.g., caribou and moose), and are extremely powerful; crushed large bones in carrion can be as telling a sign of wolverine presence as tracks.

Leporidae

Only one member of the rabbit and hare family, the snowshoe hare, occurs in the study area.

Snowshoe hare (*Lepus americanus*) is widespread in northern regions. Their fur is brownish in the summer and turns white during the snowy months. They are herbivores, feeding mainly on twigs and bark, and are usually found in shrubby thickets and forests. Many predators feed on snowshoe hares, including lynx, fox, wolf and raptors.

Rodentia

Six members of the rodent order were identified during the field surveys.

Red squirrel (*Tamiasciurus hudsonicus*) is common in coniferous and mixed forests. They are active year round, and distinctive in appearance and sound. Red squirrels are solitary and territorial. They feed on seeds, nuts, tree buds and other plant matter, and will store evergreen cones for winter in caches known as middens. Chief predators of the red squirrel include raptors, weasels and marten.

Northern flying squirrel (*Glaucomys sabrinus*) is a nocturnal resident of coniferous forests; flying squirrels sleep in hollow trees in the daytime and are therefore rarely seen. They glide from tree to tree for long distances, up to 45 metres, by stretching the loose skin between their legs. Flying squirrels feed on nuts, seeds, berries and mushrooms, as well as insects, small birds and mammals. Martens, weasels and owls will prey on the flying squirrel.

Woodchuck (*Marmota monax*) is a large, robust ground-dwelling rodent, widely distributed within North America. They are generally solitary herbivorous animals, and chiefly diurnal in habit. Woodchucks hibernate in winter, emerging from their extensive tunnel systems in early spring. Red fox and wolf are among the chief predators of woodchucks in Labrador.

Porcupine (*Erethizon dorsatum*) is most active at night, but may be seen in the daytime, often in trees. They may be colonial in winter, but are solitary in summer. Porcupines feed on buds, small twigs, and inner bark of trees; chewed bark (or "browse") on trees is a common sign of porcupine presence. Because of their protective quills, few predators will attack porcupines.

Southern (or Gapper's) red-backed vole (*Myodes gapperi*) and meadow vole (*Microtus pennsylvanicus*) are members of the family Cricetidae, which also includes mice and lemmings. They resemble mice and are similar in size, but tend to have stouter bodies, smaller eyes and ears, and shorter tails. Voles are herbivores, produce castings of undigested vegetation, and tend to have well-defined latrines where scat accumulates. In the winter, they tend to be found in the subnivean space, and will construct large nests of grass under the snow. Meadow voles, as the name suggests, are primarily found in open habitats such as meadows or grasslands. Red-backed voles prefer forested habitats, with brush and stumps providing cover. Voles are hunted by many species, including weasels, mink, foxes, and raptors.

Soricidae

Masked shrew (*Sorex cinereus*) tends to occur in forested habitat and is primarily insectivorous. Shrews are among the smallest of all mammals, have an extremely high metabolic rate and eat frequently. To save energy, they will readily enter a state of torpor. In the winter, shrews live and forage in the subnivean space where they are sheltered and insulated from temperature extremes, venturing to the surface only occasionally. Shrews are preyed upon by a variety of small predators, including hawks, owls and weasels.

Ursidae

In the 2012 surveys, the bear family was represented by one species, the black bear.

Black bear (*Ursus americanus*) is a large, primarily solitary species, with an average home range of approximately 78 square miles. Black bears enter a state of winter dormancy, beginning in early October at higher latitudes and lasting until early spring. Black bears have few natural enemies; they themselves are omnivorous, with a diet that may include fruits and berries, garbage, insects, fish, and small animals.

Cervidae

A single member of the deer family, the moose, was found in the 2012 surveys.

Moose (*Alces alces*) is a large and ungainly-looking member of the deer family, generally found in forests and in or near water. Moose are herbivorous, browsing on woody plants, twigs and bark in the winter, and on aquatic plants in summer. Wolves will prey on moose, particularly sick and vulnerable individuals.

APPENDIX B
PHOTOGRAPHS



Photo 1. Wabush 3 open shrub habitat.



Photo 2. Wabush 3 low alpine herb habitat.



Photo 3. Ski hill coniferous forest habitat.



Photo 4. CEP3 young mixed forest habitat.



Photo 5. Masked shrew. Scale used for photo is in centimetres.



Photo 6. Red-backed vole (typical colour morph). Scale used for photo is in centimetres.



Photo 7. Red-backed vole (dark grey morph). Scale used for photo is in centimetres.



Photo 8. Meadow vole. Scale used for photo is in centimetres.