

**ALDERON IRON ORE CORP.**



AMENDMENT TO THE ENVIRONMENTAL IMPACT STATEMENT  
VOLUME 3 APPENDICES – INFORMATION REQUEST RESPONSES

# **Appendix C**

Forest Songbird Survey Report







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## **Forest Songbird Survey Report**

## **Kami Iron Ore Mine and Rail Infrastructure Project**

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## EXECUTIVE SUMMARY

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In 2011, Stassinu Stantec Limited Partnership. (Stassinu Stantec) was contracted by Alderon Iron Ore Corp (Alderon) to conduct forest songbird surveys for an area encompassing the Kamistiatasset (Kami) Iron Ore Mine and Rail Infrastructure (the Project). The purpose of the survey is to provide environmental baseline information on songbirds and songbird habitat to be used in the environmental assessment of the Project, as well as ongoing Project planning and design work. The main objective of the survey was to determine species biodiversity, distribution, and relative abundance by habitat type at the Project area.

Forest songbird surveys were conducted in and around the Kami Iron Ore Property in western Labrador from June 27 through July 1, 2011, and from July 2 through July 8, 2012, by one field team comprised of an ornithologist and a field technician. Point count surveys of forest song birds conducted in 2011 were focused around four areas of interest: proposed Kami railway; tailing management facility; Rose Pit; and east of Rose South Waste Rock Disposal Area. In 2012, additional surveys were conducted in the proposed rail infrastructure corridor near Wabush, as well as in two potential protected area sites south of the Project features. A list of species observed / heard was generated for each surveyed site. Locations were recorded with a global positioning system (GPS) and photographs of representative habitat were taken.

Thirty songbird species were detected during the 2011 surveys, and 27 were detected during the 2012 surveys; 36 species were detected in total across both years. This includes one federally and provincially listed (threatened) species: Olive-sided Flycatcher. Olive-sided Flycatcher were detected in two forested ecotypes (Black Spruce-Lichen and Burn / Regeneration ecotypes), and in the non-forested wetland (fen) ecotypes.

Species diversity and an estimate of the relative density by habitat type were compiled from the data collected. During 2011 surveys, the Burn / Regeneration and Non-forested (fen) Wetland ecotypes had the richest forest songbird species diversity, with 26 and 16 species, respectively, although they were also the most intensively sampled ecotypes. The ecotypes with the highest densities of forest songbirds included Alpine Heath (12 birds per point count, though only one point count was completed), Burn / Regeneration (8.6 birds per point count) and Black Spruce-Labrador Tea-Feathermoss (7.9 birds per point count). During 2012 surveys, the Burn / Regeneration and Tamarack / Black Spruce Treed Fen ecotypes had the richest forest songbird species diversity, with 16 and 15 species, respectively. The ecotypes with the highest densities of forest songbirds included Hardwood Forest (16 birds per point count, though only one point count was completed), Tamarack / Black Spruce Treed Fen (16 birds per point count), and Mixedwood Forest (13 birds per point count).

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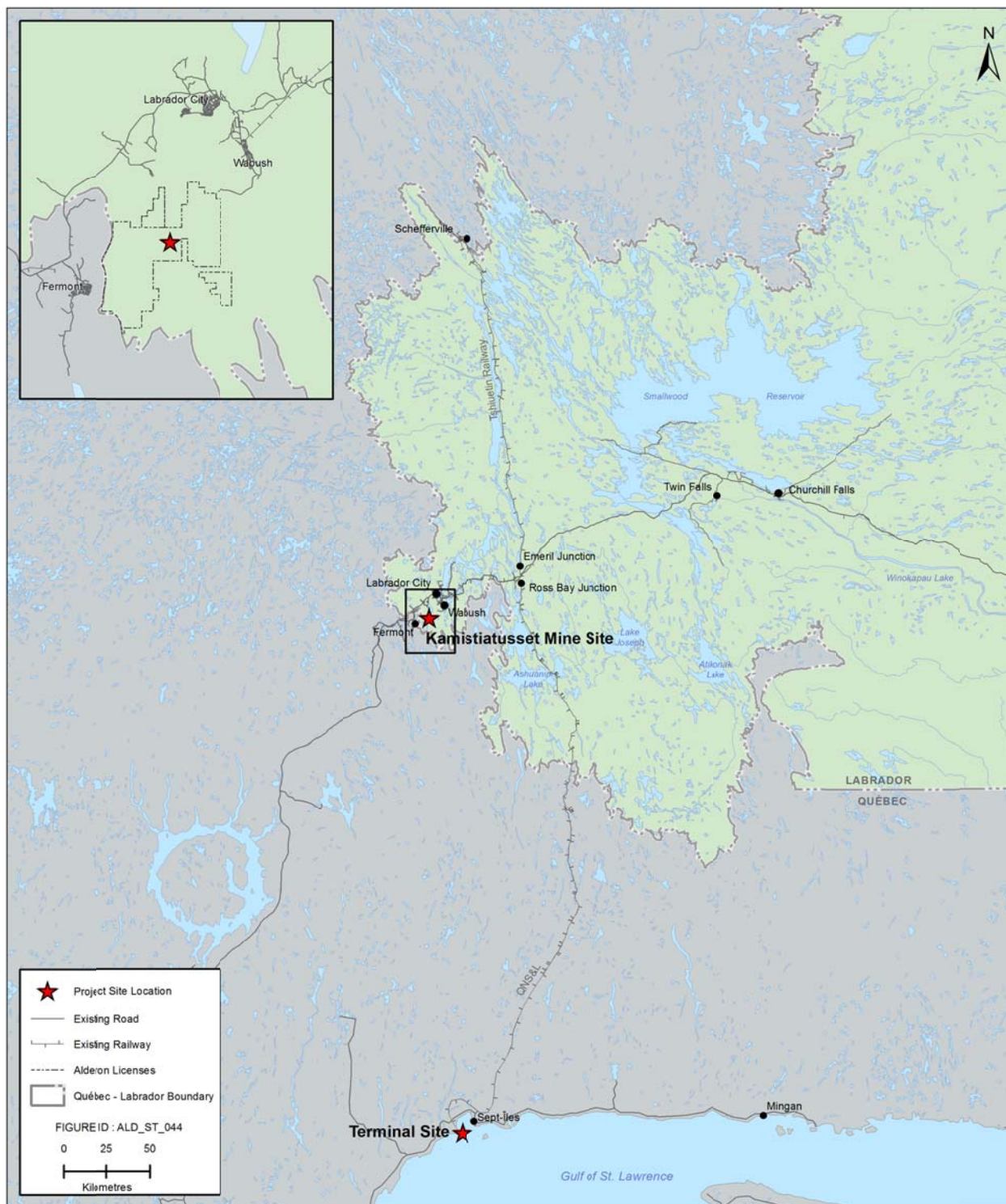
## **1.0 INTRODUCTION**

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Alderon Iron Ore Corp. (Alderon) is proposing to develop an iron ore mine in western Labrador, and build associated infrastructure at the Port of Sept-Îles, Québec. The mine Property is located in the vicinity of the towns of Wabush, Labrador City and Fermont (Figure 1.1). The Kamistatusset (Kami) Iron Ore Mine and Rail Infrastructure (the Project) is located entirely within Labrador, and includes construction, operation, and rehabilitation and closure of an open pit, waste rock disposal areas, processing infrastructure, a tailings management facility, ancillary infrastructure to support the mine and process plant, and a rail transportation component. The mine will produce up to 16 million metric tonnes of iron ore concentrate per year. Concentrate will be transported by existing rail to the Port of Sept-Îles, where Project-related components will be located on land within the jurisdiction of the Port Authority of Sept-Îles.

The Labrador Project components will require approvals from the Government of Newfoundland and Labrador and are subject to environmental assessment (EA) under the *Environmental Protection Act* (NLEPA) and associated *Environmental Assessment Regulations*. Federal approvals will also be required, which trigger the requirement for a federal EA under the *Canadian Environment Assessment Act* (CEAA), at the comprehensive study level. The Project was registered in accordance with the NLEPA and CEAA in October 2011. This environmental study was conducted in support of the EA process for the Kami Iron Ore Mine and Rail Infrastructure.

Figure 1.1 Project Location for the Kamistatusset (Kami) Iron Ore Mine Project





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### 1.1 Overview of Kami Iron Ore Project

The proposed Kami mine site is located wholly within Labrador; no activities associated with the mine will take place in Québec.

The Project in Labrador will include construction, operation, and closure / decommissioning of the following primary components:

- Open pit (Rose Pit);
- Waste rock disposal areas (Rose North and Rose South);
- Processing infrastructure includes crushing, grinding, spiral concentration, magnetic separation, and tailings thickening areas;
- Tailings management facility (TMF);
- Ancillary infrastructure to support the mine and process plant (gate and guardhouse, reclaim water pumphouse, truck wash bay and shop, electrical substation, explosives magazine storage, administration / office buildings, maintenance offices, warehouse area and employee facilities, conveyors, load-out silo, stockpiles, sewage and water treatment units, mobile equipment, and transmission lines);
- A rail transportation component including rail line construction to connect the mine site to the Québec North Shore & Labrador Railway; and
- Electrical transmission line to be located by Nalcor Energy.

### 1.2 Forest Songbird Survey

Songbirds are those birds classified as passerines (perching birds), making up more than half of all bird species. They are identifiable by their songs, particularly during the breeding season, identified in Canada as May through August in the *Migratory Birds Convention Act*; however they are most vocal in this region from May through early July. In western Labrador the season for completing surveys is limited to June and the first week of July. Most songbirds in North America are protected under the *Migratory Bird Convention Act*, and many have experienced declines in populations, with some also protected under the federal *Species at Risk Act (SARA)*. In spring, migratory songbirds travel from wintering grounds to the breeding grounds in the north where they can be found in a variety of habitats, including forests, shrub land, grassland, barrens, and wetlands.

The Project has the potential to affect songbirds and songbird habitat. Raptors and waterfowl were also documented during this field program, as well as other wildlife. This study will establish a baseline against which any changes can be evaluated. The Study Area for the forest songbird survey is consistent with the Terrestrial Baseline Study Area used in other studies conducted in support of the Project; the Study Area for the forest songbird survey was the proposed Kami railway, TMF, Rose Pit, proposed rail infrastructure corridor, and east of Rose South Waste Rock Disposal Area, as well as two proposed protected areas south of the Project features.

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The Habitat Conservation Plans for the Towns of Labrador City and Wabush (Town of Wabush 2009; Town of Labrador City 2010) list a combined total of 44 bird species found in the two community Stewardship Zones, 19 of which are forest songbirds. These zones partially fall within the Study Area. Data provided by the Atlantic Canada Conservation Data Centre (ACDC) identifies seven listed avian species (i.e., those that are listed in Schedule 1 of the *Species at Risk Act* [SARA] and/or under the Newfoundland and Labrador *Endangered Species Act* [NLESA]) recorded in the area proximate to Labrador City and the Town of Wabush in recent years (between 1999 and 2007) (ACDC 2011). One of the seven listed species, Rusty Blackbird (*Euphagus carolinus*), is a forest songbird. The other listed avian species are comprised of raptors, waterfowl, swifts, and shore birds. Another source of bird data for the Labrador City area is the North American Breeding Bird Survey (BBS), route 41, located more than 25 km northeast of Labrador City (USGS 2001). Data from this survey route include 36 bird species, with three listed species: Gray-cheeked Thrush (*Catharus minimus*); Olive-sided Flycatcher (*Contopus cooperi*); and Rusty Blackbird. Songbirds are members of the Order *Passeriformes* and are defined as 'perching birds' (Mowbray et al. 2002). Songbirds are important species in many regards, but as foragers of insects they serve to keep many insect species in check and are beneficial to forests and crops in this way. Songbirds have been in decline in recent years as a result of the decline in winter habitat as well as habitat fragmentation (USFWS 2002).

Transects for the 2011 breeding songbird surveys were placed in areas that were, at the time, identified to Stassinu Stantec as areas of current and future exploration: proposed Kami railway; TMF; Rose Pit; and east of Rose South Waste Rock Disposal Area. A total of 50 point count surveys were completed over five mornings by the two-person field team.

The 2012 breeding songbird surveys were completed in the proposed rail infrastructure corridor east of Wabush, as well as two proposed protected areas south of the Project features. A total of 29 point counts were completed over five mornings by the two-person field team.

Point count surveys entail an observer standing in a fixed location for a pre-determined amount of time and tallying all bird species observed or heard. The data collected can be used to determine the relative abundance of species. Songbird point count surveys were conducted June 27 through July 1, 2011, and July 2 through July 8, 2012. One Survey Team participated in the field program, comprised of a lead ornithologist and a field technician. National Topographic Series map sheets (1:50,000 scale), GPS, and compass were used for field navigation. Sites were accessed each morning by helicopter, truck and / or by foot. While the focus of these surveys was on forest songbirds, observations of all avifauna and other wildlife were recorded. The five species most commonly detected in 2011 surveys (in descending order) were White-throated Sparrow (*Zonotrichia albicollis*), Ruby-crowned Kinglet (*Regulus calendula*), American Robin (*Turdus migratorius*), Slate-colored Junco (*Junco hyemalis*), and Yellow-rumped Warbler (*Setophaga coronata*), and the five species most commonly detected in 2012 surveys (in descending order) were White-throated Sparrow, Slate-colored Junco, Fox Sparrow (*Passerella iliaca*), American Robin, and Yellow-rumped Warbler. One listed species (Olive-sided Flycatcher) was detected in both 2011, and 2012.

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### 1.3 Study Team

The Forest Songbird Survey was conducted by Stassinu Stantec. The Study Team included a study manager, a study lead, an advisor / senior reviewer, lead field observer, a data analyst / report author, and Geographic information System (GIS) support (Table 1.1). All team members have in-depth knowledge and experience in their fields of expertise and a broad general knowledge of the work conducted by other experts in related fields. Brief biographical statements, highlighting project roles and responsibilities, and relevant education and employment experience, are provided below.

**Table 1.1 Study Team – Forest Songbird Survey**

Role	Personnel
Study Manager and Lead	Perry Trimper
Senior Advisor / Reviewer	Greg Johnson
Field Lead and Field Team	Tina Newbury, Kelly Hopkins (2011) Michael Crowell, Dave Brown (2012)
Data Analysis and Report Preparation	Tina Newbury
Information Management / GIS	Amber Frickleton

**Perry Trimper, B.Sc.F.**, served as the Project Manager for the Forest Songbird Survey. He is a Principal with Stantec based in the Goose Bay Office in Labrador. His 27 years of experience is primarily in northern environments of both Canada and Russia where areas of specialization include boreal and Arctic wildlife research, northern indigenous peoples, environmental assessment, and sustainable resource development. He has been involved in every large environmental assessment in Labrador over the last two decades.

**Greg Johnson, B.Sc., M.Sc.**, has a background in terrestrial ecology, specializing in bird ecology. With nearly 15 years of environmental consulting experience, Mr. Johnson manages terrestrial ecological surveys, including wildlife, rare plants and wetlands, for habitat and environmental baseline assessments, environmental assessments, and environmental permitting in New Brunswick. He also manages federal and provincial environmental assessments for small to large-sized projects, with an emphasis on linear, energy, and mining projects. He has contributed to and/or managed environmental assessments and related studies for a range of developments. Experience in Northern Québec and Labrador includes managing a bird study on the effects of low-level jet aircraft on bird communities, and senior advisor / reviewer of a bird baseline study for a nickel mine. Mr. Johnson served as senior reviewer for this study.

**Tina Newbury, M.Sc.**, is a terrestrial ecologist with the Stantec office in Corner Brook, Newfoundland and has over 18 years of professional experience in the field. Ms. Newbury's experience includes various large-scale projects associated with military activities and proposed mining and hydroelectric development projects in the province. Her work in Labrador includes wildlife investigations of small mammals, forest songbirds, waterfowl, raptors, woodland caribou and other species in the region, as well as various habitat characterization studies. Ms. Newbury was field lead and ornithologist for this study.

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**Michael Crowell, M.Sc.**, is a senior terrestrial ecologist with over 27 years of experience with Stantec Consulting Ltd. He is a highly experienced botanist and plant ecologist having conducted numerous botanical surveys and plant community studies in a wide range of habitat types throughout Atlantic Canada. Michael is also an experienced wildlife ecologist. He has conducted breeding bird surveys, aerial raptor and waterfowl surveys, aerial large mammal surveys, small mammal trapping, general mammal surveys, reptile surveys and amphibian surveys for a wide variety of projects throughout Atlantic Canada. His terrestrial ecological skills are used mainly in environmental assessments to assess the effects of various anthropogenic activities on rare or endangered species and sensitive habitats. As part of this process Michael develops mitigative measures to eliminate or reduce the adverse effects of these activities. Michael has been responsible for designing and implementing a variety of environmental monitoring programs for rare or endangered species as well as terrestrial and wetland habitats. He is also experienced in conducting wetland evaluations and wetland functional analyses. Michael is also experienced in air photo interpretation and plant community mapping from air photos as well as the description of plant communities. He has used these skills to prepare ecological land classifications for various areas in Atlantic Canada.

**Dave Brown, B.A.**, is a contract employee who has participated in many research projects from Newfoundland and Labrador to the Rocky Mountains. He began working with Stantec in the spring of 2011, researching the impact of a wind farm on avian migration. In the year since, he has also participated on several other Stantec projects, surveying for bird abundance and diversity across Newfoundland and Labrador. Currently, his personal interests in birding are the identification of gulls, the pursuit of vagrant species that stray to Newfoundland, as well as the influence of weather patterns and other natural and anthropogenic phenomena on patterns of vagrancy in birds. He also teaches bird identification workshops and has written for several birding publications, most notably North American Birds.

**Kelly Hopkins** is a student studying Northern Natural Resources. In addition to working with Stantec in Labrador during 2011, she has worked with the Conservation Corps since 2006. Her experience has included: aerial and ground-based wildlife surveys as well as various forestry and conservation initiatives. Ms. Hopkins participated as field technician for the forest songbird surveys for this study.

**Amber L. Frickleton, Ad. Dip GIS, B.A. Environmental Studies**, is the GIS Coordinator for Stantec's St. John's office. She manages and maintains geographic and related attribute data for the creation of maps and datasets for internal staff and clients to support the implementation of environmental assessments. Her role includes map design and production, data manipulation and analysis and the maintenance of databases through editing and adding new features in accordance with standard formats and procedures. Ms. Frickleton's multifaceted educational experience includes relational database design and management, spatial and statistical analysis, quality assurance / quality control, data dissemination, data analysis and map creation and reporting.

## **2.0 SUMMARY OF STUDY OBJECTIVES AND RATIONALE**

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The Forest Songbird Survey is one aspect of Alderon's environmental study program for the Project. The purpose of this and other baseline studies has been to gather and present information on key aspects of the environment, and thus, provide an appropriate understanding of the existing environmental conditions within and near the Study Area for use in the EIS (Figure 2.1).

Objectives for the Forest Songbird Survey were to:

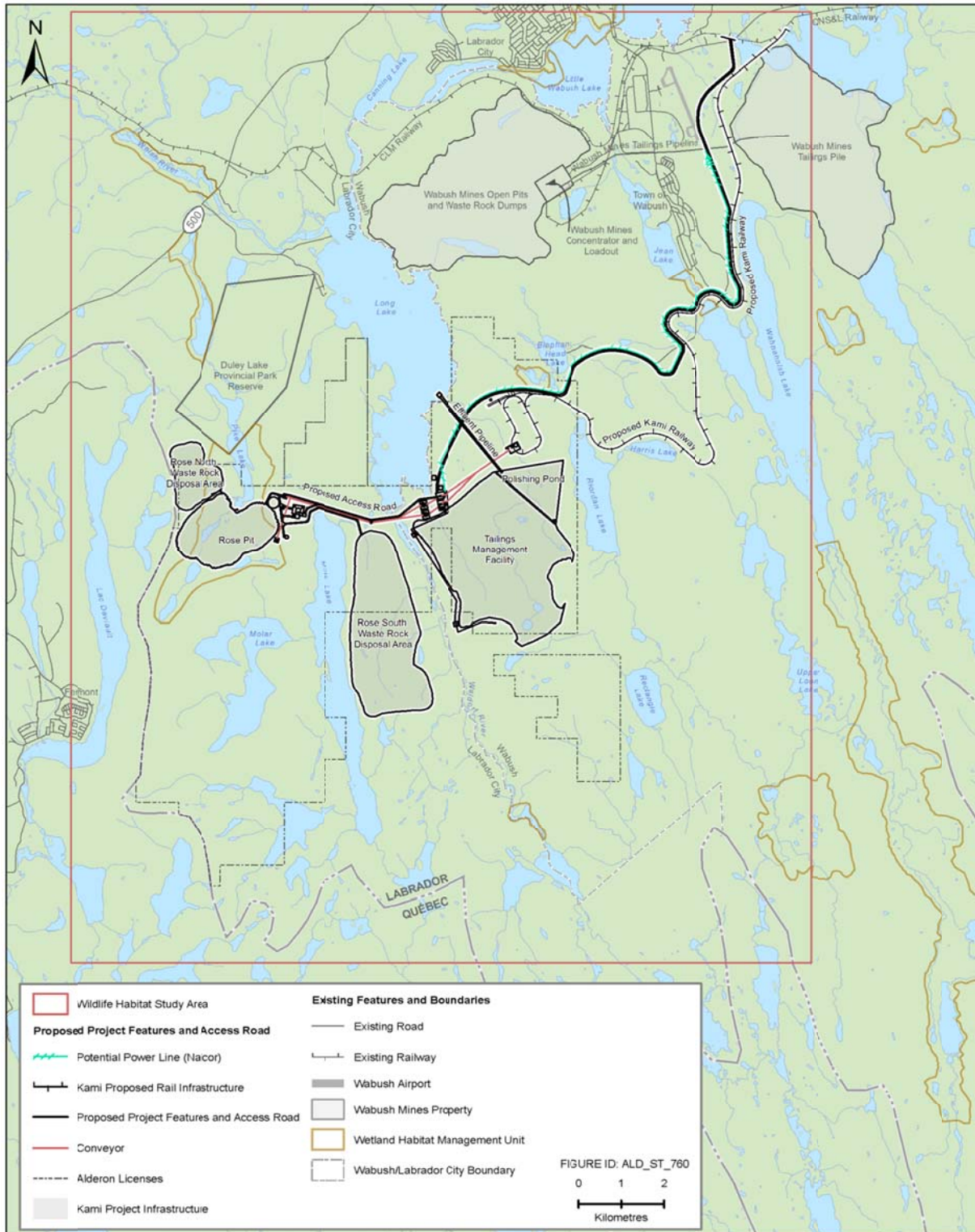
- determine species biodiversity, distribution, and relative abundance by habitat type in the Study Area.
- compile data collected on rare species and provide to the ACCDC.

Results of the songbird and other wildlife surveys were incorporated into the EIS and used to support and inform the EA for the Project.

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**Figure 2.1 Study Area for the Kami Iron Ore Mine Forest Songbird Surveys**



## **3.0 METHODS**

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### **3.1 Description of the Survey Area**

The Kami Iron Ore Mine is located in western Labrador near the Québec border, proximate to the communities of Wabush and Labrador City, Newfoundland and Labrador, and Fermont, Québec. The Project area falls within the Mid Subarctic Forest (Michikamau) Ecoregion. This ecoregion is characterized by open coniferous forests, with spruce as predominant tree species, bare rock outcroppings, and many lakes (Meades 1990).

Four areas were targeted for forest songbird surveys during field surveys conducted in 2011, and an additional three areas were targeted in 2012 field surveys. The areas surveyed in 2011 and 2012 are from 1 to 20 km southwest of the communities of Labrador City and Wabush. Ecotypes within these areas include Alpine Heath, Burn / Regeneration, Black Spruce-Lichen, Hardwood Forest, Mixedwood Forest, Black Spruce-Labrador Tea-Feathermoss, Black Spruce / Tamarack-Sphagnum Woodland, Tamarack / Black Spruce Treed Fen, and non-forested wetland ecotypes (including Patterned Shrub Fen, Non-patterned Shrub / Graminoid Fen).

### **3.2 Pre-Survey Planning**

Prior to commencing field surveys, regulatory agencies were contacted regarding permitting. No permits were required from regulatory agencies for this scope of work. Other preparation for the field work included:

- Arrangement of logistics such as helicopter transport.
- Preparation of field maps.
- Design of a field sampling plan that included sampling in a variety of habitat types, and sampling within areas of current and future exploration and development.

Internally, Stassinu Stantec completed a review of health and safety issues related to the project. A health and safety checklist was reviewed with field participants prior to the initiation of surveys in 2011 and 2012.

### **3.3 Field Sampling Methods**

Several field-based wildlife survey programs were completed during 2011 and 2012 to gain additional knowledge on the distribution and abundance of songbirds within the Study Area and surrounding area. The 2011 breeding songbird surveys occurred June 27 through July 1, at a time when all migrants had returned to the area, based on the presence of Yellow-bellied Flycatchers (*Empidonax flaviventris*), typically a late arriving migrant. Ms. Tina Newbury participated as lead ornithologist and Ms. Kelly Hopkins participated as field technician for the field program. The 2012 breeding songbird surveys occurred July 2 through July 8. Mr. Michael Crowell participated as lead ornithologist and Mr. Dave Brown participated as field technician.

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The field crew conducted a series of 10-minute point count surveys at four locations of interest spaced at least 300 m apart, recording each waypoint with a handheld GPS unit. Surveys commenced at dawn (approximately 0515 hours) and, with the exception of one day in 2012, no point counts were initiated after 0900 hours, due to documented declines in the frequency of song later in the morning (Ralph et al. 1993). All birds heard or seen during this period were recorded on a field data sheet (Appendix A) by the ornithologist in distance categories of less than 50 m, 50 to 100 m, and greater than 100 m. Vegetation data, including forest, shrub, and ground cover species, were recorded. Photos of habitat were taken at each point count. Data were organized by birds heard and / or seen during two consecutive 5-minute surveys at each point count. As these surveys rely on auditory cues, poor weather (i.e., precipitation and / or windy conditions) resulted in a delay (or postponement for that day) until conditions improved. High winds (winds ranking greater than 3 on Beaufort Scale [Appendix B]) and heavy rain adversely affect the observers' ability to detect avian species. Bibby et al. (2000) recommend the restriction of point counts to wind conditions of Beaufort 3 and below, with a preference for Beaufort 2 and below if possible, and to avoid counting in precipitation exceeding occasional light drizzle or brief showers.

### **3.4 Data Analysis**

Field data from the survey sites were entered electronically into a database (i.e., Microsoft Excel) for summary and analysis. The data were subjected to queries and analysis to generate numbers used in the calculation of species diversity (i.e., richness) and avifauna communities by ecotype.

### **3.5 Quality Assurance / Quality Control Procedures**

To ensure consistent delivery of high quality products and services, Stassinu Stantec has developed and implemented a Quality Management System (QMS) within its operations. The QMS is registered to International Organization for Standardization 9001:2000 (QMS - Requirements) by QMI Management Systems, Registration (CERT-0011312:026332).

An in-house technical review process was conducted by senior technical reviewers to confirm this report and the data within it adequately addresses the work scope and conforms to the quality requirements stipulated by Stassinu Stantec. In addition, the report was reviewed by Gord Parsons, a local naturalist with extensive knowledge of the area and its species.



## 4.0 RESULTS

During the 2011 surveys, a total of 30 breeding songbird species plus one unidentified passerine were detected during point count surveys, and during 2012 surveys, a total of 27 songbird species were detected during point count surveys. A list of observed bird species is provided in Appendix D. In total, 36 species were detected across both years. Additional avifauna species such as American Black Duck (*Anas rubripes*), American Crow (*Corvus brachyrhynchos*), Canada Goose (*Branta canadensis*), Common Goldeneye (*Bucephala clangula*), Common Loon (*Gavia immer*), Common Raven (*Corvus corax*), Greater Yellowlegs (*Tringa melanoleuca*), Herring Gull (*Larus argentatus*), Northern Harrier (*Circus cyaneus*), Osprey (*Pandion haliaetus*), Solitary Sandpiper (*Tringa solitaria*), Spruce Grouse (*Falcipennis canadensis*), and Wilson's Snipe (*Gallinago delicata*) were also detected but not included in the summary statistics as they are not forest songbirds (see Section 4.4).

### 4.1 Weather Conditions and Survey Timing

#### 4.1.1 2011 Surveys

A total of 50 point counts were conducted within the areas of interest at the Project during June 27 through July 1, 2011. During the surveys, weather conditions were favourable (i.e., no precipitation, and nil to light breeze conditions) except for the morning of June 28, 2011, during which there was light precipitation. Temperatures ranged from 9°C to 14°C (Table 4.1).

**Table 4.1 Weather Conditions during Forest Songbird Surveys at the Kami Iron Ore Mine from June 27 to July 1, 2011**

Date	Precipitation	Wind speed (Beaufort Scale) and direction	Cloud cover (%)	Temperature (°C)
June 27, 2011	fog*	0 NA	100	11
June 28, 2011	Intermittent mist	0 to 1 southeast	100	11
June 29, 2011	0	0 to 2 southeast	15 to 75	10 to 14
June 30, 2011	fog*	0 NA	100	14
July 1, 2011	0	0 to 2 north northwest	100	9
Note: NA = not applicable, corresponding to no wind at the time * visibility was still adequate				

Surveys began as early as 0519 hours and the latest point count was finished by 0909 hours. Species richness ranged between 4.64 and 5.75 and abundance ranged between 5.09 and 9.42 individuals per hour (Table 4.2). Lower richness and abundance was detected between 0631 to 0730 hours, although neither external noise nor adverse weather conditions can account for

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this. A variety of habitat types were sampled during this time period. Periodic helicopter activity during surveys may have contributed to the low number of species detected during the 0831 to 0930 hour time period.

**Table 4.2 2011 Hourly Species Richness and Relative Abundance Following Sunrise**

Survey Time	# points	Mean # of species	Mean # of individuals
0431 to 0530 h	3	5.33	8.33
0531 to 0630 h	12	5.75	9.42
0631 to 0730 h	11	4.64	5.09
0731 to 0830 h	16	5.25	7.38
0831 to 0930 h	8	4.88	6.34

Note: mean # of species and mean # of individuals calculated from first 5-minute sampling period at each point count

The 50 point counts were focused in areas where potential Project interactions with songbirds may occur. There were a total of 23 point counts in the proposed Kami railway area conducted over a two-day period. One transect was completed in each of three other areas of interest: TMF (n=5); the Rose Pit area (n=11); and east of the Rose South Waste Rock Disposal Area (n=11) (Table 4.3).

**Table 4.3 Area Surveyed and Number of Point Counts during Forest Songbird Survey from June 27 through July 1, 2011**

Date	Area surveyed	# point counts
June 27, 2011	Proposed Kami Railway	12
June 28, 2011	Proposed Kami Railway	11
June 29, 2011	Rose Pit	11
June 30, 2011	East of the Rose South Waste Rock Disposal Area	11
July 1, 2011	Tailings Management Facility (TMF)	5

The locations of the 2011 point counts in the Study Area are identified in black in Figure 4.1. The locations of the point counts in ecotypes are provided in Appendix C.

**4.1.2 2012 Surveys**

An additional 29 point counts were conducted within the areas of interest at the Project during July 2 through July 8, 2012. During the surveys, weather conditions were favourable (i.e., no or little precipitation, and nil to light breeze conditions) except for the morning of July 2, 2012, during which there was light precipitation. Temperatures ranged from 12°C to 18°C (Table 4.4).

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**Table 4.4 Weather Conditions during Forest Songbird Surveys from July 2 to July 8, 2012**

Date	Precipitation	Wind speed (Beaufort Scale)	Cloud cover (%)	Temperature (°C)
July 2, 2012	some light drizzle*	2	100	13 to 15
July 3, 2012	0	1	80 to 100	15 to 17
July 5, 2012	0	0 to 1	40 to 100	15 to 18
July 7, 2012	0	1	80 to 90	15
July 8, 2012	0	2	100	12 to 13

Note: \* visibility was still adequate

Surveys began as early as 0520 hours and the latest point count was finished by 1010 hours. Species richness ranged between 2 and 9 and abundance ranged between 4 and 20 individuals per hour (Table 4.5). Lower richness and abundance was detected between 0931 to 1030 hours, although neither external noise nor adverse weather conditions can account for this. A variety of habitat types were sampled during this time period.

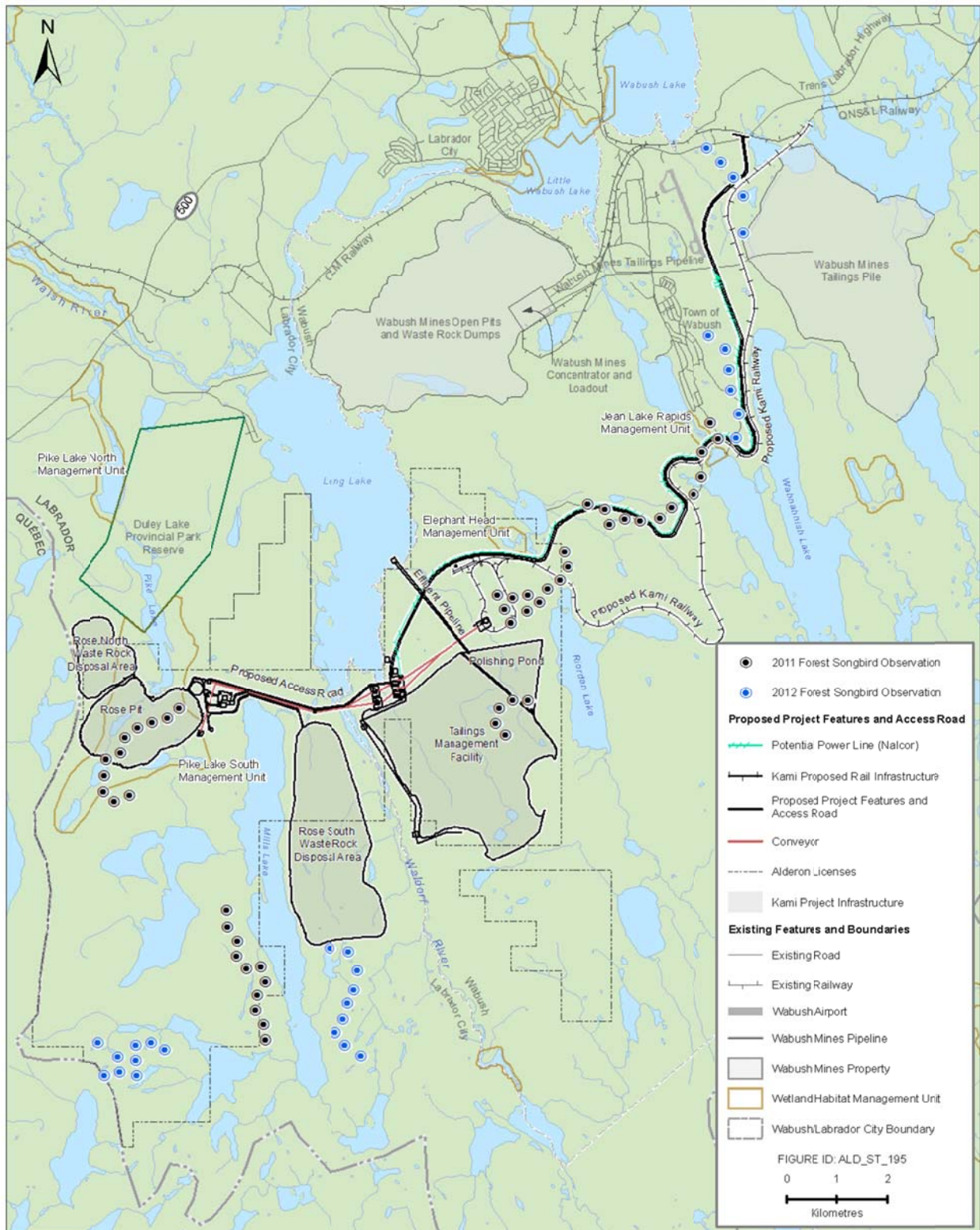
**Table 4.5 2012 Hourly Species Richness and Relative Abundance Following Sunrise**

Survey Time	# points	Mean # of species	Mean # of individuals
0431 to 0530 h	1	9.00	20.0
0531 to 0630 h	3	6.33	10.7
0631 to 0730 h	4	6.75	14.75
0731 to 0830 h	11	5.18	8.28
0831 to 0930 h	9	5.89	8.89
0931 to 1030	1	2.00	4.0

Note: mean # of species and mean # of individuals calculated from first 5-minute sampling period at each point count

The 29 point counts were located in three areas. The locations of the 2011 point counts in the Study Area are identified in blue in Figure 4.1. The locations of the point counts in ecotypes are provided in Appendix C.

**Figure 4.1 Forest Songbird Point Count Locations**



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**4.2 Birds by Ecotype**

**4.2.1 2011 Surveys**

Point counts were conducted in: Alpine Heath; Burn / Regeneration; Mixedwood Forest; Black Spruce-Labrador Tea-Feathermoss; Black Spruce-Lichen; and non-forested wetland ecotypes (including Patterned Shrub Fen, Non-patterned Shrub Fen, and Graminoid Fen). While all birds detected were recorded during the surveys, only those recorded within 100 m were included in richness and density calculations by habitat, as birds recorded more than 100 m from the surveyor may be located in other habitats, or duplicates of other point count surveys. The Burn / Regeneration ecotype had the greatest species diversity, with 26 species (Table 4.6). The Mixedwood Forest ecotype had a notably smaller avian community, with a total of two species, although with only two point counts completed. Alpine Heath, Black Spruce-Labrador Tea-Feathermoss, Black Spruce-Lichen, and non-forested wetland (fen) ecotypes had mid-range avian communities, with six (plus one unidentified passerine), 15, 15, and 16 species detected, respectively.

**Table 4.6 2011 Songbird Results by Ecotype**

Ecotype	Area within the Study Area (km <sup>2</sup> )	# Sites Sampled in this Ecotype	# Forest Songbird Species <sup>1</sup>	# Individuals <sup>2</sup>
Alpine Heath	1.0	1	6 plus unid songbird	12
Black Spruce-Labrador Tea-Feathermoss	91.5	8	15	63
Black Spruce-Lichen	19.7	8	15	48
Burn / Regeneration	76.8	19	26	163
Mixedwood Forest	17.5	2	2	6
Non-forested wetland ecotypes (fen)	12.4	12	16	67
Total	218.9	50	29	359

<sup>1</sup> Data from two 5-minutes point counts, combined; only species within 100 m. Observations of non-songbirds are excluded here and are included with incidental wildlife observations.  
<sup>2</sup> Data from maximum number of birds (by species) of two 5-minute point counts, detected within 100 m.

There were 29 forest songbird species detected within 100 m of the six ecotypes encountered during the June-July 2011 field surveys (Table 4.7). White-throated Sparrow was the most detected species (n=65) with nearly half of all occurrences (n=30) within the Burn / Regeneration ecotype. Ruby-crowned Kinglet (n=39) and American Robin (n=38) were detected in four of the six ecotypes surveyed (not found in Alpine Heath or Mixedwood ecotypes), with the greatest number of observations occurring in the Burn / Regeneration ecotype. Slate-colored Junco (n=30) were detected all of the ecotypes sampled except for the Mixedwood Ecotype. Yellow-rumped Warbler (n=25) was detected in each of the six ecotypes surveyed.

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**Table 4.7 2011 Songbird Detection by Ecotype in the Study Area**

Species	Ecotypes (n=7)						
	Alpine Heath	Black Spruce-Labrador Tea - Feathermoss	Black Spruce-Lichen	Burn / Regeneration	Mixedwood Forest	Non-forested Wetland Ecotypes <sup>1</sup>	Overall
<b>Percent of Study Area:</b>	<b>0.2%</b>	<b>23.1%</b>	<b>5.0%</b>	<b>19.4%</b>	<b>4.4%</b>	<b>3.1%</b>	<b>55.2%</b>
<b>Sample size (N):</b>	<b>1</b>	<b>8</b>	<b>8</b>	<b>19</b>	<b>2</b>	<b>12</b>	<b>50</b>
Alder Flycatcher				1			1
American Robin		3	2	20		13	38
Black-and-white Warbler				1			1
Blackpoll Warbler		1		3		1	5
Boreal Chickadee						1	1
Chipping Sparrow				1			1
Fox Sparrow		4	1	13		3	21
Gray Jay		3	2	4		2	11
Hermit Thrush		4	6	9		5	24
Lincoln's Sparrow	1			1		4	6
Northern Flicker		1		1		1	3
Northern Waterthrush		3		2			5
Olive-sided Flycatcher			1	4		2	7
Orange-crowned Warbler				2			2
Palm Warbler				1		1	2
Pine Grosbeak			2				2
Pine Siskin			5	7			12
Pine Warbler				1			1
Ruby-crowned Kinglet		7	10	15		7	39
Slate-colored Junco	1	10	6	10		3	30
Swainson's Thrush		1	1	6			8
Tennessee Warbler		2		4			6
Tree Swallow	2	2	3	1			8
White-crowned Sparrow				4			4
White-throated Sparrow	4	13	4	30		14	65
White-winged Crossbill					3		3
Wilson's Warbler	1		1	6		1	9
Yellow-bellied Flycatcher		2	1	9		4	16
Yellow-rumped Warbler	1	7	3	7	3	4	25
Unidentified Passerine	2						2
<b>Species Richness</b>	<b>6</b>	<b>15</b>	<b>15</b>	<b>30</b>	<b>2</b>	<b>16</b>	<b>29</b>
<b>Total Abundance<sup>2</sup></b>	<b>12</b>	<b>63</b>	<b>48</b>	<b>163</b>	<b>6</b>	<b>66</b>	<b>358</b>
<b>Average Abundance</b>	<b>12</b>	<b>7.9</b>	<b>6</b>	<b>8.6</b>	<b>3</b>	<b>6</b>	<b>7.2</b>

<sup>1</sup> Non-forested wetland ecotypes contains point counts in the Patterned Shrub Fen, and Non-Patterned Shrub / Graminoid Fen ecotypes

<sup>2</sup> Calculated from the maximum number recorded within 100 m of observer over the two 5-minute listening periods

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The ecotypes with the highest densities of forest songbirds included Alpine Heath (12 birds per point count, though only one point count was completed), Burn / Regeneration (8.6 birds per point count) and Black Spruce-Labrador Tea-Feathermoss (7.9 birds per point count).

Nashville Warblers (*Vermivora ruficapilla*) were detected during point counts but were outside the 100 m sampling radius and could not be associated with a particular ecotype. For this reason they have not been included in Table 4.7. No riparian habitats were surveyed. There was little riparian habitat, contiguous and large enough (i.e., 100 m or greater) to sample. The only riparian habitat encountered was around a series of ponds in the vicinity of the Rose Pit area.

**4.2.2 2012 Surveys**

Point counts were conducted in eight ecotypes: Burn / Regeneration; Mixedwood Forest; Hardwood Forest; Black Spruce-Labrador Tea-Feathermoss; Black Spruce/Tamarack-Sphagnum Woodland; Tamarack/Black Spruce Treed Fen; Non-patterned Shrub Graminoid Fen; and Exposed Earth/Anthropogenic. While all birds detected were recorded during the surveys, only those recorded within 100 m were included in richness and density calculations by habitat, as birds recorded more than 100 m from the surveyor may be located in other habitats, or duplicates of other point count surveys.

Burn / Regeneration, and Tamarack/Black Spruce Treed Fen ecotypes had the greatest species diversity with 16 and 15 species, respectively (Table 4.8). The Mixedwood Forest and Hardwood Forest ecotypes had notably smaller avian communities, with eight and nine species respectively in each, each although only one point count was conducted in each ecotype.

**Table 4.8 2012 Songbird Results by Ecotype**

Ecotype	Area within the Study Area (km <sup>2</sup> )	# Sites Sampled in this Ecotype	# Forest Songbird Species <sup>1</sup>	# Individuals <sup>2</sup>
Black Spruce / Tamarack-Sphagnum Woodland	49.6	2	6	8
Black Spruce-Labrador Tea-Feathermoss	91.5	6	10	21
Burn / Regeneration	76.8	10	16	53
Exposed Earth / Anthropogenic	22.4	3	13	21
Hardwood Forest	5.4	1	9	9
Mixedwood Forest	17.5	1	8	8
Tamarack / Black Spruce Treed Fen	30.1	4	15	34
Non-patterned Shrub / Graminoid Fen	9.3	2	9	14
Total	302.6	29	27	168

<sup>1</sup> Data from two 5-minute point counts, combined; only species within 100 m. Observations of non-songbirds are excluded here and are included with incidental wildlife observations.  
<sup>2</sup> Data from maximum number of birds (by species) of two 5-minute point counts, detected within 100 m.

There were 27 forest songbird species detected in the eight ecotypes encountered during the 2012 field surveys (Table 4.9). White-throated Sparrow was the most detected species (n=39)

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with occurrences in all surveyed ecotypes. Dark-eyed Junco was detected (n=33) in seven of the eight ecotypes surveyed (the only exception was Mixedwood Forest). Fox Sparrow (n=30) was detected in six ecotypes, having not been detected in Mixedwood Forest, and Non-Patterned Graminoid Fen.

**Table 4.9 2012 Songbird Detection by Ecotype in the Study Area**

Species	Ecotypes (n=8)								Overall
	Black Spruce / Tamarack -Sphagnum Woodland	Black Spruce-Labrador Tea-Feathermoss	Burn / Regeneration	Exposed Earth / Anthropogenic	Hardwood Forest	Mixedwood Forest	Tamarack / Black Spruce Treed Fen	Non-Patterned Shrub / Graminoid Fen	
<b>Percent of Study Area:</b>	12.5%	23.1%	19.4%	5.7%	1.4%	4.4%	7.6%	2.3%	76.4%
<b>Sample size (N):</b>	2	6	10	3	1	1	4	2	29
Alder Flycatcher				3	1		7	1	12
American Goldfinch			1						1
American Robin		3	7	5	1		9	3	28
Blackpoll Warbler			1						1
Boreal Chickadee				1					1
Cedar Waxwing	1								1
Fox Sparrow			9	7	2	1	7	4	30
Gray Jay	2	2	3				1	2	10
Hermit Thrush		1	7	2		1	5		16
Lincoln's Sparrow			7	1	2		8		18
Northern Flicker			1						1
Northern Waterthrush		1		1			1		3
Orange-crowned Warbler					2				2
Ruby-crowned Kinglet	4	2	2			2		1	11
Slate-colored Junco	2	7	13	4	1		3	3	33
Swainson's Thrush				1					1
Swamp Sparrow								2	2
Tennessee Warbler		4	6	2		1			13
Tree Swallow			1				3		4
White-crowned Sparrow					2				2
White-throated	1	3	22	4	1	1	5	2	39



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Species	Ecotypes (n=8)								Overall
	Black Spruce / Tamarack –Sphagnum Woodland	Black Spruce- Labrador Tea- Feathermoss	Burn / Regeneration	Exposed Earth / Anthropogenic	Hardwood Forest	Mixedwood Forest	Tamarack / Black Spruce Treed Fen	Non-Patterned Shrub / Graminoid Fen	
<b>Percent of Study Area:</b>	12.5%	23.1%	19.4%	5.7%	1.4%	4.4%	7.6%	2.3%	76.4%
<b>Sample size (N):</b>	2	6	10	3	1	1	4	2	29
Sparrow									
White-winged Crossbill						2			2
Wilson's Warbler			8	3	4		9		24
Winter Wren							1		1
Yellow Warbler							1		1
Yellow-bellied Flycatcher		1	3			1	2		7
Yellow-rumped Warbler	3	6	5	1		4	2	1	22
<b>Species Richness</b>	<b>6</b>	<b>10</b>	<b>16</b>	<b>13</b>	<b>9</b>	<b>8</b>	<b>15</b>	<b>9</b>	<b>27</b>
<b>Total Abundance<sup>1</sup></b>	<b>13</b>	<b>30</b>	<b>96</b>	<b>35</b>	<b>16</b>	<b>13</b>	<b>64</b>	<b>19</b>	<b>286</b>
<b>Average Abundance</b>	<b>6.5</b>	<b>5</b>	<b>9.6</b>	<b>11.6</b>	<b>16</b>	<b>13</b>	<b>16</b>	<b>9.5</b>	<b>9.9</b>

<sup>1</sup> Calculated from the maximum number recorded within 100 m of observer over the two 5-minute listening periods

The ecotypes with the highest densities of forest songbirds included Hardwood Forest (16 birds per point count, though only one point count was completed), Tamarack / Black Spruce Treed Fen (16 birds per point count), and Mixedwood Forest (13 birds per point count).

Olive-sided Flycatcher was detected at one point count during 2012 surveys, but was well outside of the 100 m sampling radius (estimated at 300 m) and could not be associated with a particular ecotype. For this reason, this species has not been included in Table 4.9.

**4.3 Listed Avifauna Species**

Listed avifauna include those bird species (here not restricted to songbirds) that are identified as “Endangered,” “Threatened,” or of “Special Concern” by SARA, or “Endangered,” “Threatened,” or “Vulnerable” by NLESA. Olive-sided Flycatcher was the only listed avifauna species identified within the Study Area during the forest songbird field surveys conducted in 2011 and 2012. Another listed species, Rusty Blackbird, was documented once during other surveys conducted in 2011. Other listed avian species documented or otherwise thought to potentially be found in western Labrador but not identified during the forest songbird or other surveys in the Study Area

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are Chimney Swift, Common Nighthawk (*Chordeiles minor*), Gray-cheeked Thrush, Harlequin Duck (*Histrionicus histrionicus*), Peregrine Falcon (*Falco peregrinus*), and Short-eared Owl (*Asio flammeus flammeus*) (Table 4.10). Habitat that may be suitable for a number of these listed species exists within the Study Area, although none but Olive-sided Flycatcher and Rusty Blackbird were documented during any surveys conducted in support of the Project.

**Table 4.10 Listed Avifauna Species that May Occur in Western Labrador**

Species	SARA Schedule 1 Listing (year)	NLESA Listing (year)	Sources of Records and Locations				
			2011 and 2012 Field Seasons at Kami Iron Ore Mine Property	ACCDC Data (Lab West Region)	BBS (Route 41)	IMBD Data (Lab West)	Priority Species: BCR 7 or BCR 8
Barrow's Goldeneye	Special Concern (2011)	Vulnerable (2000)	no	no	no	yes	yes (7)
Chimney Swift	Threatened (2009)	Threatened (2007)	no	yes	no	no	yes (8)
Common Nighthawk	Threatened (2009)	Threatened (2007)	no	no	no	no	yes (7/8)
Gray-cheeked Thrush	-	Threatened (2005)	no	no	yes	no	yes (7/8)
Harlequin Duck	Special Concern (2001)	Vulnerable (2001)	no	no	no	yes	yes (7/8)
Olive-sided Flycatcher	Threatened (2010)	Threatened (2009)	yes (2011 and 2012)	no	yes	no	yes (7/8)
Peregrine Falcon	Special Concern (2007)	Vulnerable (2007)	no	no	no	yes	yes (7/8)
Red Crossbill ( <i>percna</i> )	Endangered (2004)		no	no	no	no	yes (8)
Rusty Blackbird	Special Concern (2009)	Vulnerable (2007)	yes (2011)	yes	yes	yes	yes (7/8)
Short-eared Owl	- <sup>A</sup>	Vulnerable (2008)	no	yes	no	no	yes (7/8)

<sup>A</sup> Listed on SARA Schedule 3 as Special Concern

In addition to species protected under federal (SARA) and provincial (NLESA) legislation, Environment Canada has been developing long-term plans within the various Bird Conservation Regions (BCR) found across the country. Bird Conservation Regions (BCRs) are ecologically distinct regions in North America with similar bird communities, habitats, and resource management issues (NABCI Canada 2011). Environment Canada compiled a priority list of species based on their inclusion in research initiatives such as the Newfoundland Eastern Habitat Joint Venture (EHJV), SARA lists, and / or a species for which the region has a high proportion of the continental breeding population.

The Project and associated Study Area for this survey occurs at the interface of BCR 7 and BCR 8 (NABCI Canada 2011) (Figure 4.2). There are 36 priority species (landbirds, shorebirds, waterfowl, and waterbirds) listed in each of BCR 7 and BCR 8. SARA and/or NLESA-listed species are included in Table 4.10. Complete lists may be attained from the Canadian Wildlife Service-Environment Canada.

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Common Nighthawk, Gray-cheeked Thrush, Harlequin Duck, Olive-sided Flycatcher, Peregrine Falcon, Rusty Blackbird, and Short-eared Owl are identified on the priority list of species for both BCR 7 (Taiga Shield and Hudson Plains) and BCR 8 (Boreal Softwood Shield) (NABCI Canada 2011). Olive-sided Flycatcher and Rusty Blackbird were the only priority list species observed during 2011.

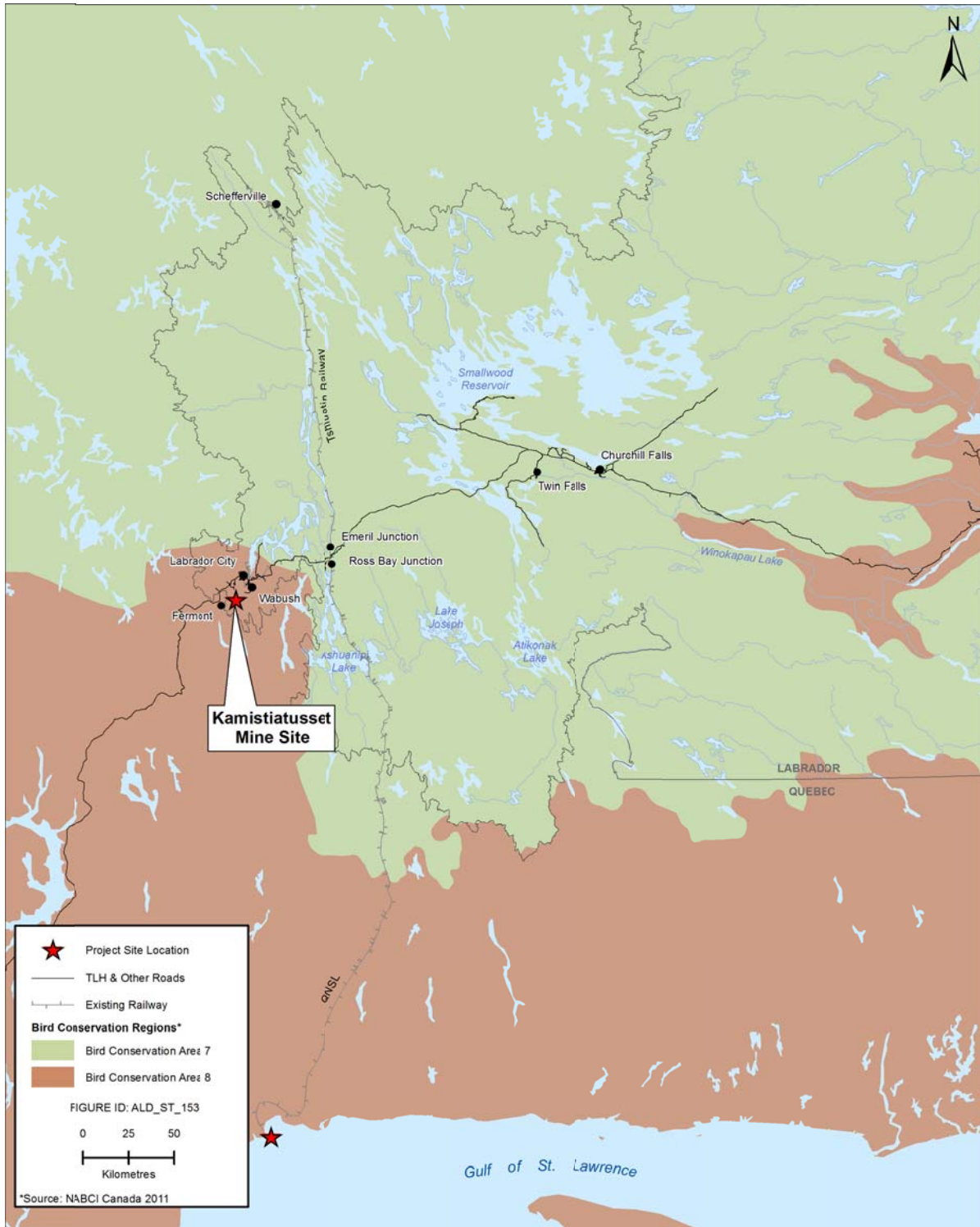
Olive-sided Flycatcher is a priority list species due to continued population declines throughout its range. Their inclusion on the list is a recovery objective (P. Thomas 2011, pers. comm). This species is listed both federally and provincially as threatened (COSEWIC 2007). Seven individuals were identified during the forest songbird surveys in 2011 in three ecotypes: Black Spruce-Lichen, non-forested wetland (fen) edges, and Burn / Regeneration. This species was detected in the proposed Kami railway, Rose Pit, and TMF, as well as in one of the potential protected areas, south of the Project features. Data provided by the ACCDC do not indicate any reported observations of this species in this local area. Regionally, four observations of Olive-sided Flycatcher were documented during surveys of the lower Churchill River watershed conducted in 2006 and 2007 (Minaskuat Inc. 2009). Breeding Bird Survey data collected for three routes (routes 37, 39 and 40) in west / central Labrador include Olive-sided Flycatcher on their lists of breeding species. There were 19 individuals documented during 12 surveys completed from 1975 through 2010 along these three routes (North American BBS data, accessed on 18 January, 2012).

Rusty Blackbird is listed both federally as of special concern (COSEWIC 2006) and provincially as vulnerable. Surveys conducted during the 2011 field season (i.e., during other field surveys conducted in July, 2011) resulted in the detection of a single Rusty Blackbird in a non-patterned Shrub Fen near the southwest end of Mills Lake (east of the Rose South Waste Rock Disposal Area). The primary habitat characteristics for this species exist throughout the Study Area. This species breeds throughout Labrador in wet habitats that provide insect and plant forage material. Habitat for this species was identified in the Patterned and Non-patterned Shrub Fen ecotypes, Graminoid Fen ecotype, and Riparian Thicket ecotype. Other ecotypes within the boreal forest with habitat characteristics such as slow-moving streams may also be identified as potential Rusty Blackbird habitat.

#### 4.4 Incidental Other Wildlife Observations

Five mammal species (red squirrel [*Tamiasciurus hudsonicus*], snowshoe hare [*Lepus americanus*], black bear [*Ursus americanus*], beaver [*Castor canadensis*], and moose [*Alces alces*]) and thirteen additional avian species (i.e., non-passerine) (Spruce Grouse, Common Loon, American Black Duck, Wilson's Snipe, Osprey, American Crow, Canada Goose, Common Goldeneye, Common Raven, Herring Gull, Northern Harrier, Solitary Sandpiper, and Greater Yellowlegs) were identified during the surveys in the Study Area in 2011 and 2012 (Appendix E).

**Figure 4.2** Location of the Project in Western Labrador in Relation to Bird Conservation Region 7 and Bird Conservation Region 8  
(Source NABCI Canada 2011)



## **5.0 SUMMARY**

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Forest songbird surveys conducted in the 2011 and 2012 field seasons in the Study Area provide baseline data for use in the environmental assessment. The field surveys resulted in a list of 36 forest songbird species; the most prevalent species were White-throated Sparrow, Ruby-crowned Kinglet, American Robin, Fox Sparrow, Hermit Thrush, Slate-colored Junco, and Yellow-rumped Warbler. The Olive-sided Flycatcher, a species listed both federally and provincially as “Threatened”, was also detected. Rusty Blackbird was observed during other surveys conducted in 2011.

The greatest diversity of songbird species was detected in the Burn / Regeneration ecotype.

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# **APPENDIX A**

Field Data Sheet

**STASSINU STANTEC LIMITED PARTNERSHIP**

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# **APPENDIX B**

Beaufort Wind Scale

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**Table B.1 Beaufort Wind Scale**

<b>Force</b>	<b>Winds (knots)</b>	<b>WMO* Classification</b>	<b>Appearance of Wind Effects on Land</b>
0	Less than 1	Calm	Calm, smoke rises vertically
1	1 to 3	Light Air	Smoke drift indicates wind direction, still wind vanes
2	4 to 6	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
3	7 to 10	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
4	11 to 16	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches move
5	17 to 21	Fresh Breeze	Small trees in leaf begin to sway
6	22 to 27	Strong Breeze	Larger tree branches moving, whistling in wires
7	28 to 33	Near Gale	Whole trees moving, resistance felt walking against wind
8	34 to 40	Gale	Twigs breaking off trees, generally impedes progress
9	41 to 47	Strong Gale	Slight structural damage occurs, slate blows off roofs
10	48 to 55	Storm	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	56 to 63	Violent Storm	
12	64+	Hurricane	

\*World Meteorological Organization.  
source: <http://www.stormfax.com/beaufort.htm>

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FOREST SONGBIRD SURVEY: KAMI IRON ORE MINE AND RAIL INFRASTRUCTURE PROJECT



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






















FOREST SONGBIRD SURVEY: KAMI IRON ORE MINE AND RAIL INFRASTRUCTURE PROJECT

# **APPENDIX C**

Map Book

**STASSINU STANTEC LIMITED PARTNERSHIP**

FOREST SONGBIRD SURVEY: KAMI IRON ORE MINE AND RAIL INFRASTRUCTURE PROJECT

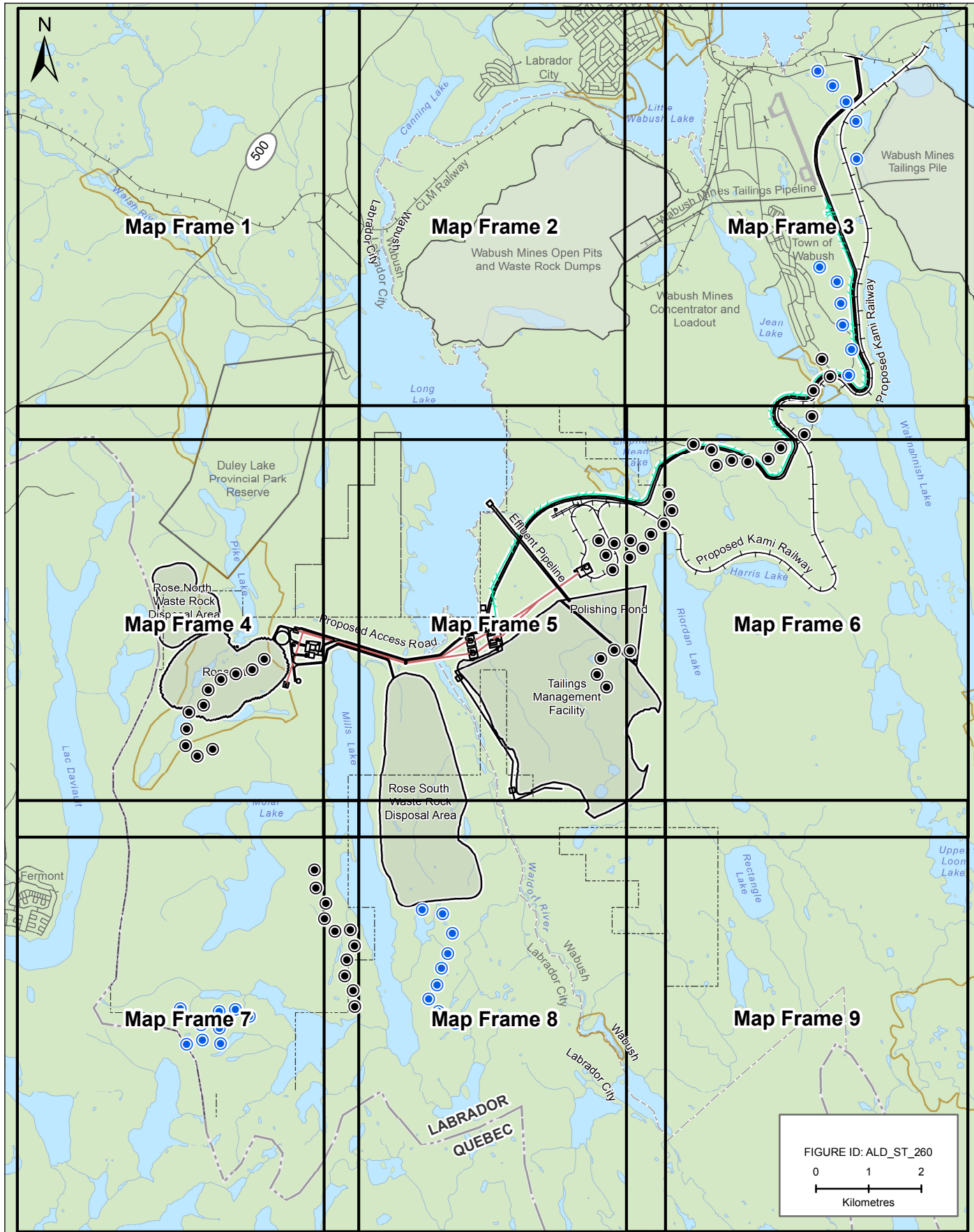
	2011 Forest Songbird Observation	<b>Ecological Land Classes (ELC)</b>
	2012 Forest Songbird Observation	 Exposed Earth/Anthropogenic
	Map Book Frame	 Open Water
<b>Proposed Project Features and Access Road</b>		 Shallow Open Water with Vegetation
	Potential Power Line (Nalcor)	 Cloud Cover
	Kami Proposed Rail Infrastructure	 Shadow from Cloud
	Proposed Project Features and Access Road	 Alpine Heath
	Conveyor	 Hardwood Forest
	Alderon Licenses	 Burn/Regeneration
	Kami Project Infrastructure	 Mixedwood Forest
<b>Existing Features and Boundaries</b>		 Black Spruce Lichen
	Existing Road	 Black Spruce/Tamarack –Sphagnum Woodland
	Existing Railway	 Black Spruce-Labrador Tea-Feathermoss
	Wabush Airport	 Tamarack/Black Spruce Treed Fen
	Wabush Mines Pipeline	 Riparian Thicket
	Wabush Mines Infrastructure	 Riparian Marsh/Fen
	Wetland Habitat Management Unit	 Non-Patterned Shrub/Graminoid Fen
	Duley Lake Provincial Park Reserve	 Patterned Shrub Fen
	Wabush/Labrador City Boundary	
	Québec - Labrador Boundary	

CLIENT:

**ALDERON IRON ORE CORP.**

PROJECT TITLE:

**Forest Songbird Observation / Ecological Land Classification - Map Book Index**



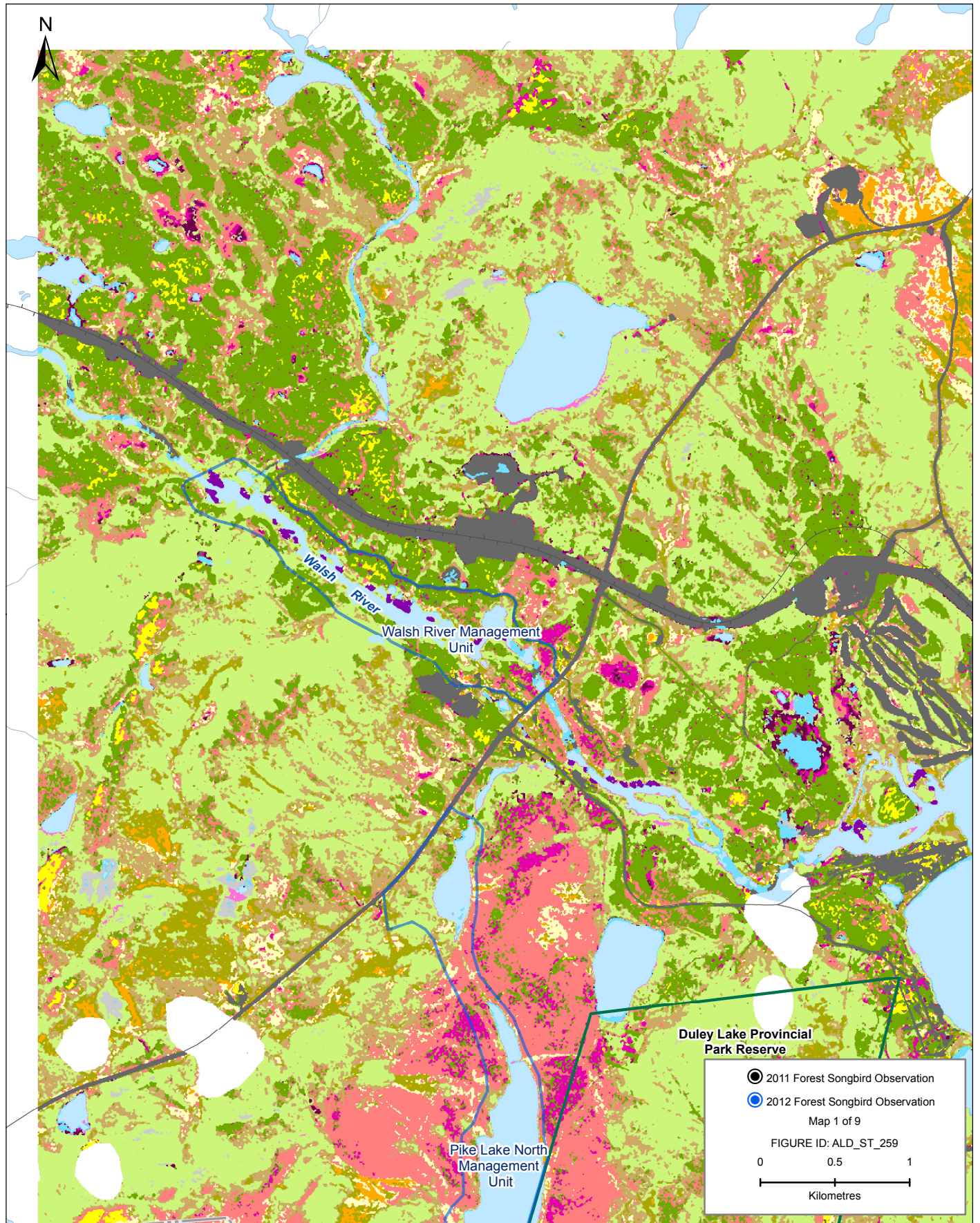
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PROJECT TITLE:

**Forest Songbird Observation / Ecological Land Classification - Map Book Index**





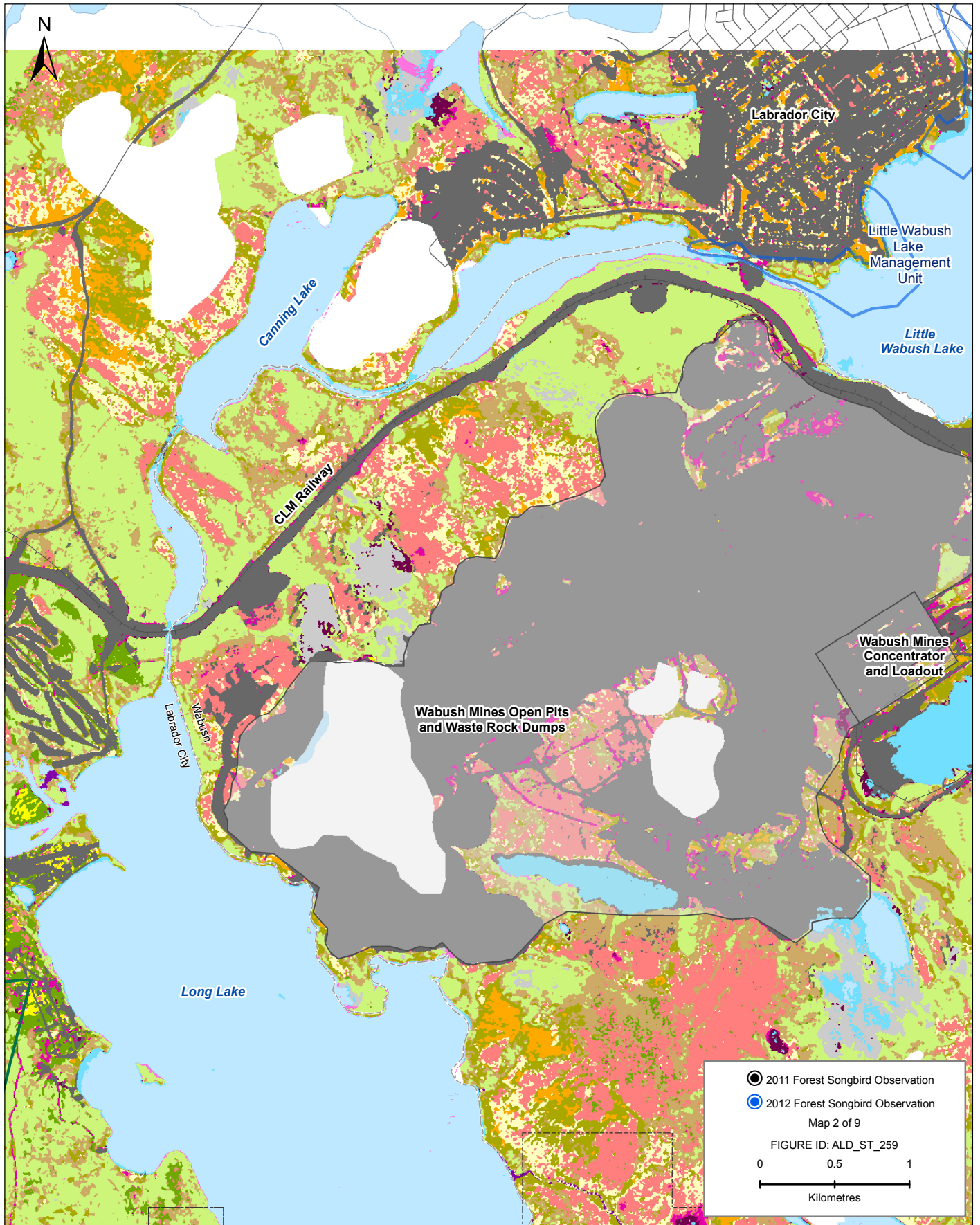
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PROJECT TITLE:

**Forest Songbird Observation / Ecological Land Classification (ELC) - Map 1**





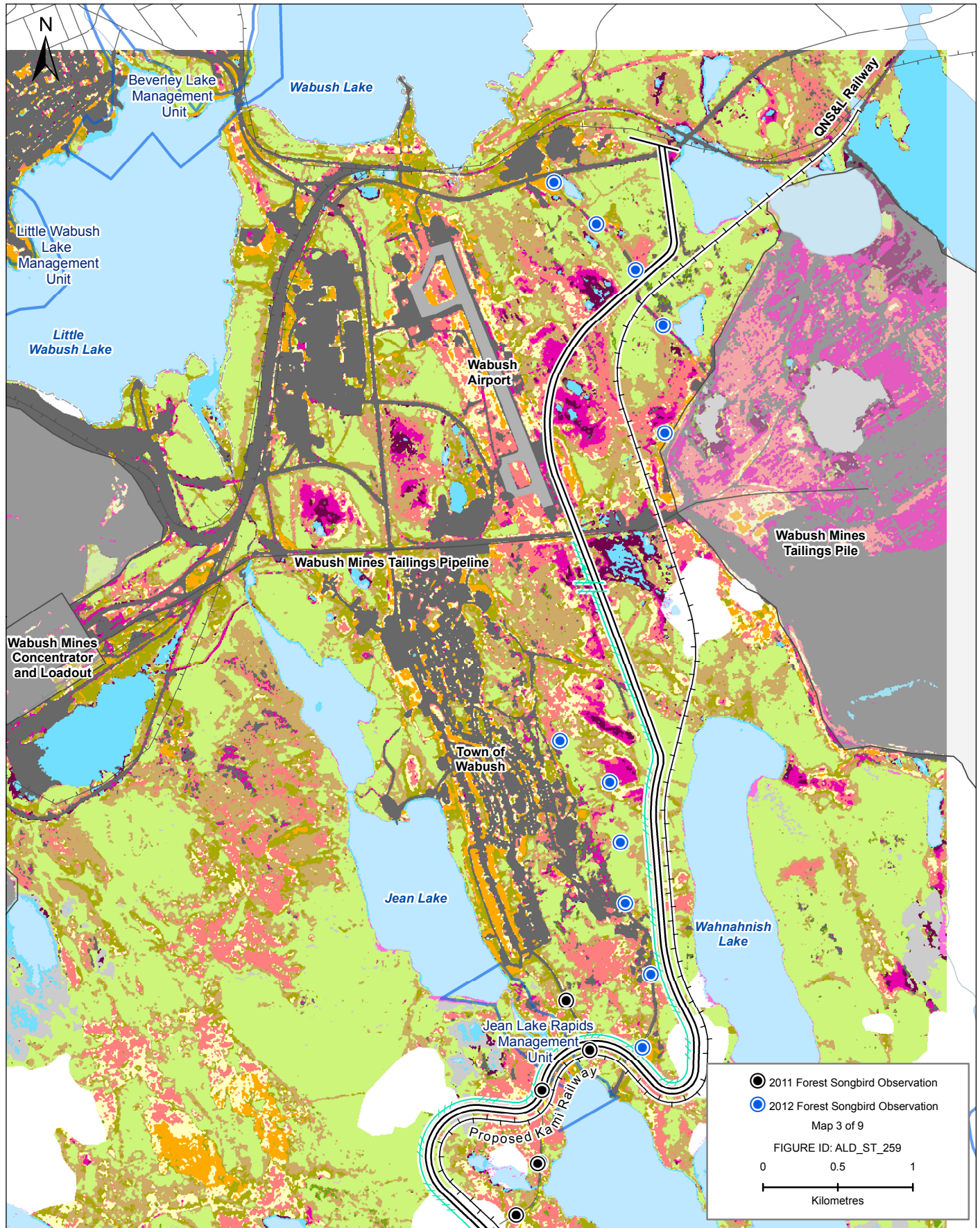
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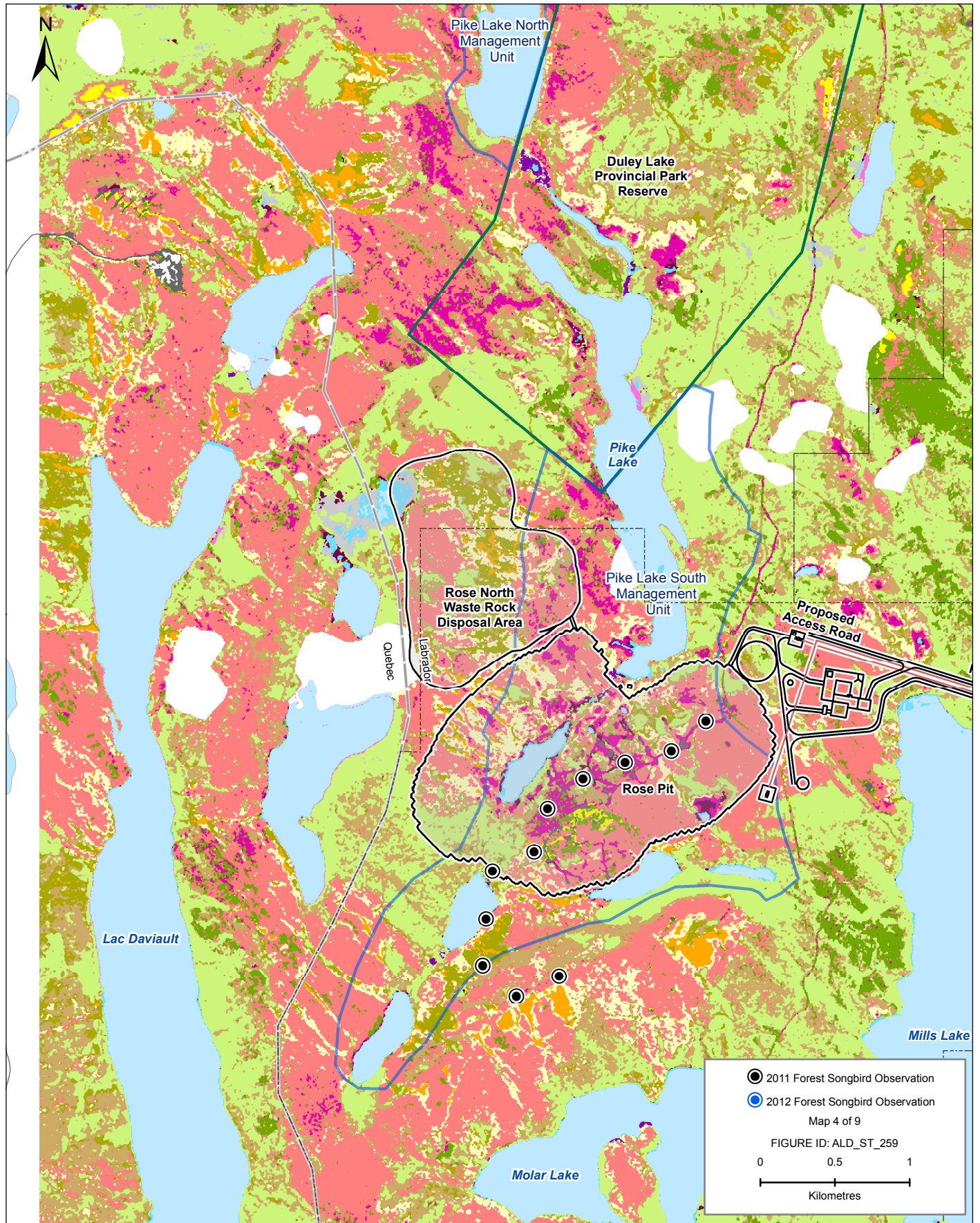
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PROJECT TITLE:

**Forest Songbird Observation / Ecological Land Classification (ELC) - Map 3**





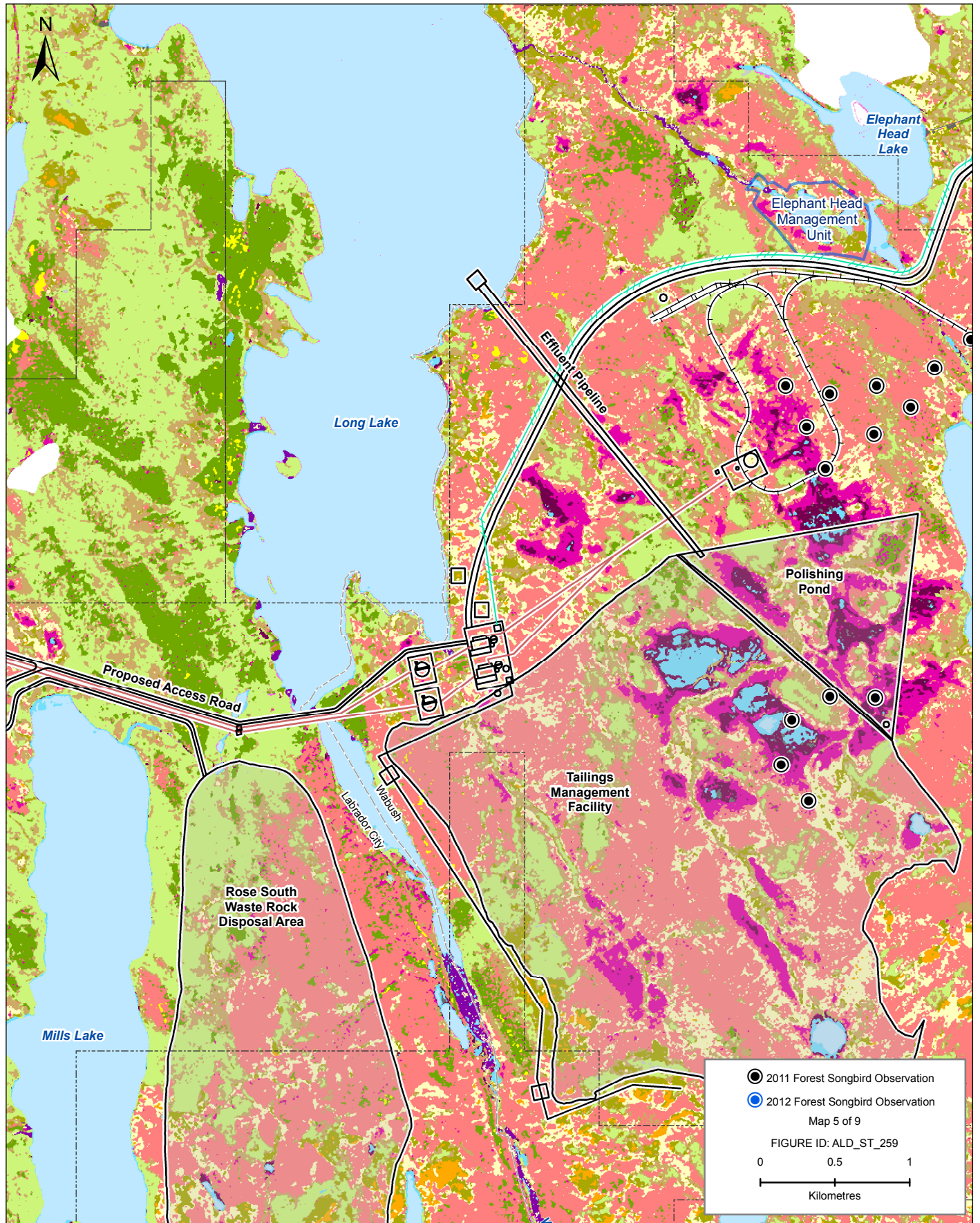
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**ALDERON IRON ORE CORP.**

PROJECT TITLE:

**Forest Songbird Observation / Ecological Land Classification (ELC) - Map 4**





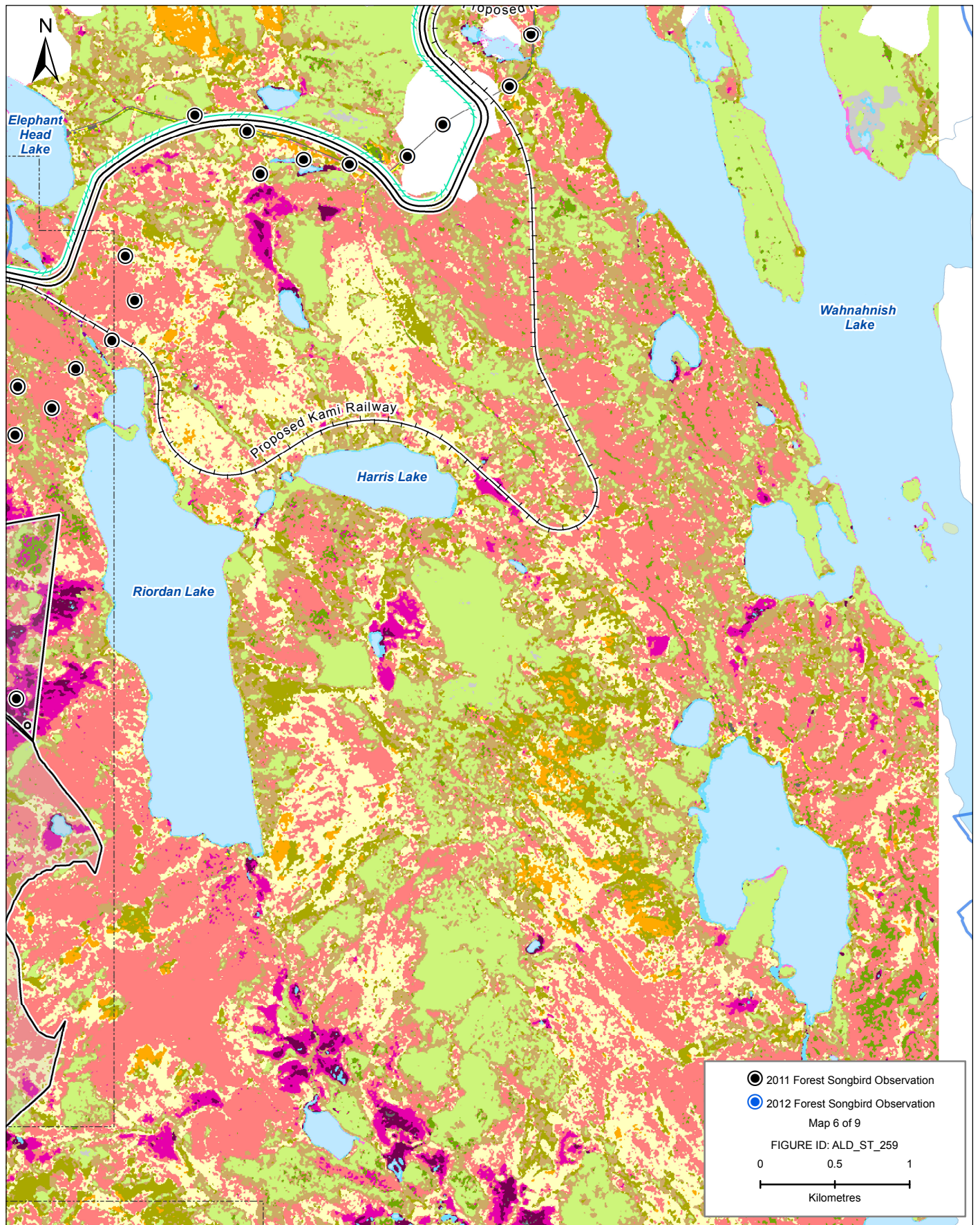
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PROJECT TITLE:

**Forest Songbird Observation / Ecological Land Classification (ELC) - Map 5**





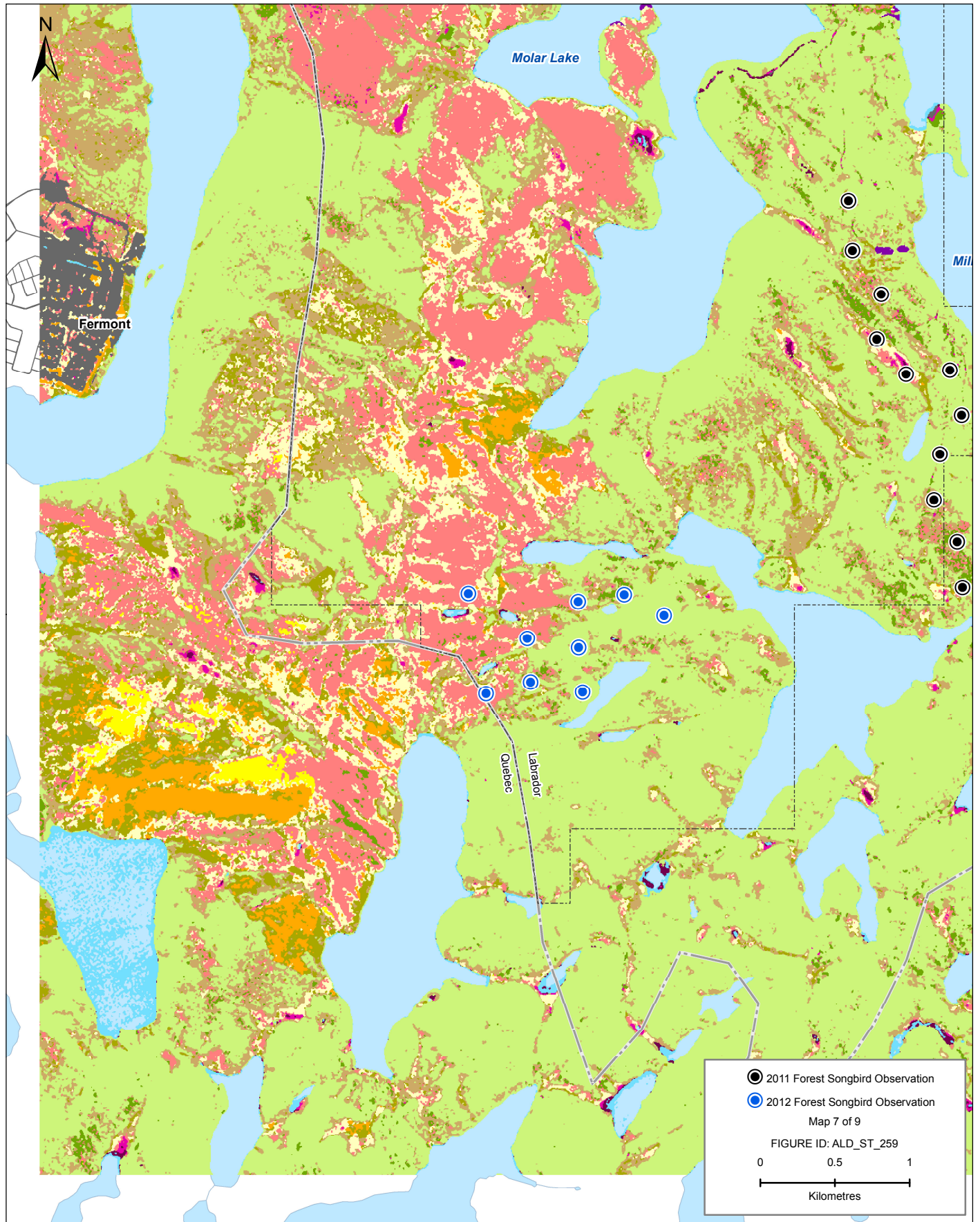
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PROJECT TITLE:

**Forest Songbird Observation / Ecological Land Classification (ELC) - Map 6**





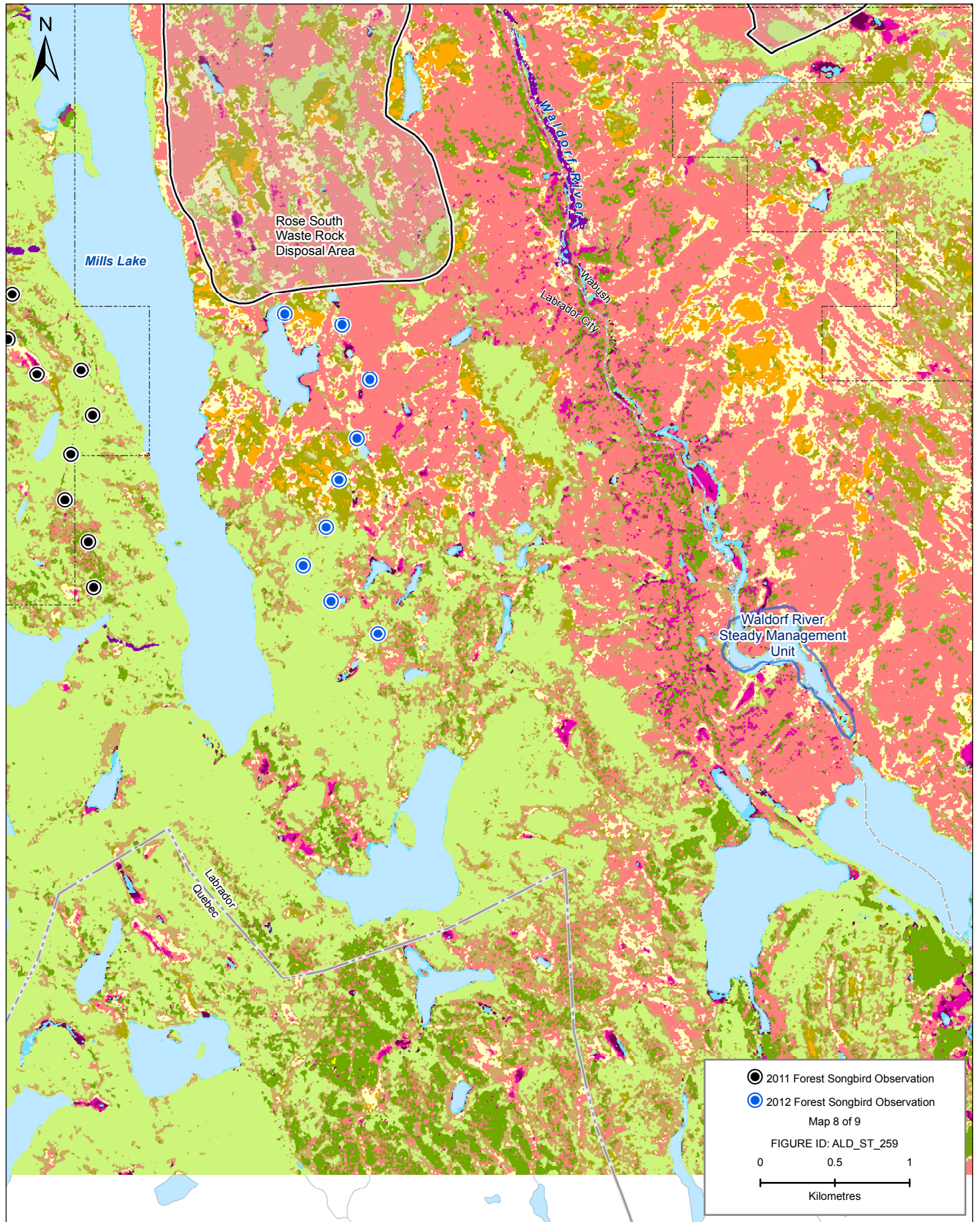
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PROJECT TITLE:

**Forest Songbird Observation / Ecological Land Classification (ELC) - Map 7**





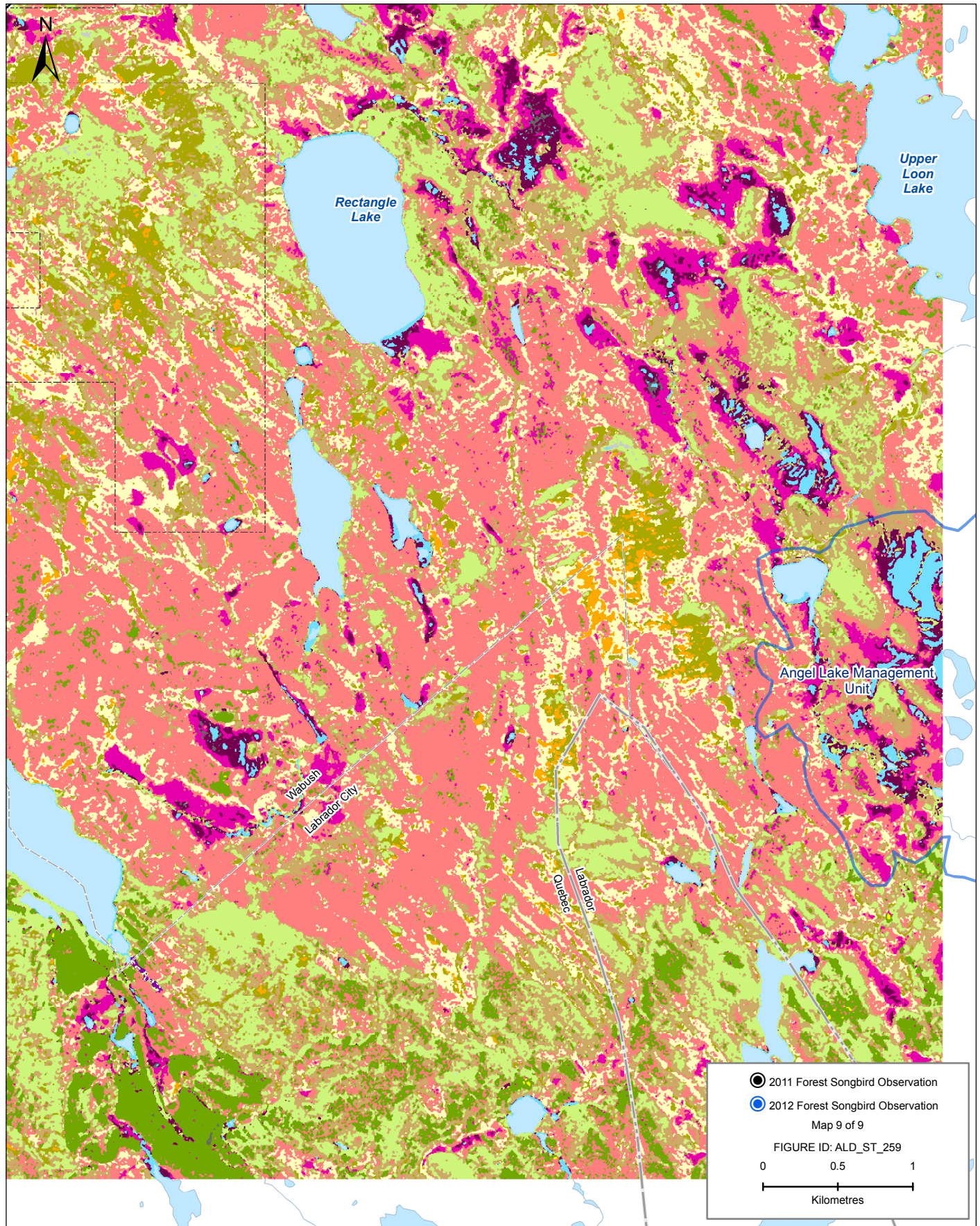
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**ALDERON IRON ORE CORP.**

PROJECT TITLE:

**Forest Songbird Observation / Ecological Land Classification (ELC) - Map 8**





CLIENT:

**ALDERON IRON ORE CORP.**

PROJECT TITLE:

**Forest Songbird Observation / Ecological Land Classification (ELC) - Map 9**

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# **APPENDIX D**

Common and Scientific Names of Detected Songbirds

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FOREST SONGBIRD SURVEY: KAMI IRON ORE MINE AND RAIL INFRASTRUCTURE PROJECT

**Table D.1 Common and Scientific Names of Forest Songbirds Detected during Field Surveys at the Kami Iron Ore Mine from June 27 to July 1, 2011, and July 2 to July 8, 2012**

Common Name	Scientific Name <sup>A</sup>	Observed During 2011 Surveys	Observed During 2012 Surveys
Alder Flycatcher	<i>Empidonax alnorum</i>	X	X
American Goldfinch	<i>Carduelis tristis</i>		X
American Robin	<i>Turdus migratorius</i>	X	X
American Three-toed Woodpecker	<i>Picoides dorsalis</i>		X
Black-and-White Warbler	<i>Mniotilta varia</i>	X	
Blackpoll Warbler	<i>Setophaga striata</i>	X	X
Boreal Chickadee	<i>Poecile hudsonicus</i>	X	X
Cedar Waxwing	<i>Bombycilla cedrorum</i>		X
Chipping Sparrow	<i>Spizella passerina</i>	X	
Fox Sparrow	<i>Passerella iliaca</i>	X	X
Gray Jay	<i>Perisoreus canadensis</i>	X	X
Hermit Thrush	<i>Catharus guttatus</i>	X	X
Lincoln's Sparrow	<i>Melospiza lincolni</i>	X	X
Nashville Warbler	<i>Vermivora ruficapilla</i>	X	
Northern Flicker	<i>Colaptes auratus</i>	X	X
Northern Waterthrush	<i>Seiurus noveboracensis</i>	X	X
Olive-sided Flycatcher	<i>Contopus cooperi</i>	X	X
Orange-crowned Warbler	<i>Vermivora celata</i>	X	X
Palm Warbler	<i>Setophaga palmarum</i>	X	
Pine Grosbeak	<i>Pinicola enucleator</i>	X	
Pine Siskin	<i>Carduelis pinus</i>	X	
Pine Warbler	<i>Setophaga pinus</i>	X	
Ruby-crowned Kinglet	<i>Regulus calendula</i>	X	X
Slate-colored Junco	<i>Junco hyemalis</i>	X	X
Swainson's thrush	<i>Catharus ustulatus</i>	X	X
Swamp Sparrow	<i>Melospiza georgiana</i>		
Tennessee Warbler	<i>Vermivora peregrina</i>	X	X
Tree Swallow	<i>Tachycineta bicolor</i>	X	X
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	X	X
White-throated Sparrow	<i>Zonotrichia albicollis</i>	X	X
White-winged Crossbill	<i>Loxia leucoptera</i>	X	X
Wilson's Warbler	<i>Wilsonia pusilla</i>	X	
Winter Wren	<i>Troglodytes troglodytes</i>		X
Yellow Warbler	<i>Setophaga petechia</i>		X
Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>	X	X
Yellow-rumped Warbler	<i>Setophaga coronata</i>	X	X

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# **APPENDIX E**

Incidental Wildlife Observations

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FOREST SONGBIRD SURVEY: KAMI IRON ORE MINE AND RAIL INFRASTRUCTURE PROJECT

**Table E.1 Species and Sign of Wildlife Observed on the Kami Iron Ore Mine Property during Forest Songbird Surveys, 2011 and 2012**

Species	Scientific Name	Sign
<b>Mammals</b>		
Beaver	<i>Castor canadensis</i>	Lodge and trail observed
Black Bear	<i>Ursus americanus</i>	Scat, trail, and tracks observed
Moose	<i>Alces alces</i>	Tracks observed
Red Squirrel	<i>Tamiasciurus hudsonicus</i>	Individuals observed and heard
Snowshoe Hare	<i>Lepus americanus</i>	Scat and trail observed
<b>Avifauna</b>		
American Black Duck	<i>Anas rubripes</i>	Individual observed
American Crow	<i>Corvus brachyrhynchos</i>	
Canada Goose	<i>Branta canadensis</i>	
Common Goldeneye	<i>Bucephala clangula</i>	Female with brood observed near Wabush
Common Loon	<i>Gavia immer</i>	Individual heard distantly during point count
Common Raven	<i>Corvus corax</i>	Individuals heard at distance
Greater Yellowlegs	<i>Tringa melanoleuca</i>	Individuals observed and heard
Herring Gull	<i>Larus argentatus</i>	Individual observed
Northern Harrier	<i>Circus cyaneus</i>	Nest found
Osprey	<i>Pandion haliaetus</i>	2 individuals observed at nest
Solitary Sandpiper	<i>Tringa solitaria</i>	
Spruce Grouse	<i>Falcapennis canadensis</i>	Individual and scat observed
Wilson's Snipe	<i>Gallinago delicata</i>	Individuals observed and heard

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FOREST SONGBIRD SURVEY: KAMI IRON ORE MINE AND RAIL INFRASTRUCTURE PROJECT