LABRADOR – ISLAND TRANSMISSION LINK ENVIRONMENTAL ASSESSMENT

Socioeconomic Environment: Communities, Land & Resource Use, Tourism & Recreation Component Study - Revised

March 2012

nalcor energy
LOWER CHURCHILL PROJECT

LABRADOR – ISLAND TRANSMISSION LINK ENVIRONMENTAL ASSESSMENT
Environmental Component Studies: Introduction and Overview

Nalcor Energy is proposing to develop the *Labrador – Island Transmission Link* (the Project), a High Voltage Direct Current (HVdc) electrical transmission system extending from Central Labrador to the Avalon Peninsula on the Island of Newfoundland.

The Project was registered under the Newfoundland and Labrador *Environmental Protection Act* (*NLEPA*) and the *Canadian Environmental Assessment Act* (*CEAA*) in January 2009 (with subsequent amendments and updates), in order to initiate the provincial and federal environmental assessment (EA) processes. Following public and governmental review of that submission, an Environmental Impact Statement (EIS) was required for the Project. The EIS is being developed by Nalcor Energy, in accordance with the requirements of both *NLEPA* and *CEAA* and the *EIS Guidelines and Scoping Document* issued by the provincial and federal governments.

In support of the Project's EIS, Nalcor Energy has undertaken a series of environmental studies to collect and/or compile information on the existing biophysical and socioeconomic environments and to identify and assess potential Project-environment interactions. This environmental study program has included field surveys, associated mapping and analysis, environmental modeling, and the compilation and analysis of existing and available information and datasets on key environmental components. This report comprises one of these supporting environmental studies.

A general guide to these Environmental Component Studies, some of which are comprised of multiple associated reports, is provided on the opposite page.

The information reported herein will be incorporated into the Project's EIS, along with any additional available information, to describe the existing (baseline) environmental conditions and/or for use in the assessment and evaluation of the Project's potential environmental effects and in the identification and development of mitigation.

This study focuses on the relevant aspects of the proposed Project – including the proposed and alternative HVdc transmission corridors, marine cable crossings, and/or other Project components and activities – as known and defined at the time that the EA process was initiated and/or when the study commenced. Project planning and design are ongoing, and as is the case for any proposed development, the Project description has and will continue to evolve as engineering and EA work continue. The EIS itself will describe and assess the specific Project components and activities for which EA approval is being sought, and will also identify and evaluate other, alternative means of carrying out the Project that are technically and economically feasible as is required by EA legislation.

The EIS and these Component Studies will be subject to review by governments, Aboriginal and stakeholder groups and the public as part of the EA process.

Nalcor Energy – Lower Churchill Project

LABRADOR-ISLAND TRANSMISSION LINK: ENVIRONMENTAL COMPONENT STUDIES (CSs)		
1) Vegetation CS	**Report 1a** **Ecological Land Classification**	**Report 1b** **Wetlands Inventory & Classification**
	Report 1c **Regionally Uncommon Plants Model**	**Report 1d** **Timber Resources**
	Report 1e **Vegetation Supplementary Report**	
2) Avifauna CS		
3) Caribou & Other Large Mammals CS	**Report 3a** **Caribou & Their Predators**	**Report 3b** **Moose & Black Bear**
4) Furbearers & Small Mammals CS		
5) Marine Environment: **Fish & Fish Habitat, Water Resources CS**	**Report 5a** **Marine Fish: Information Review**	**Report 5b** **Marine Flora, Fauna & Habitat Survey**
	Report 5c **Marine Habitats (Geophysical) Survey**	**Report 5d** **Water, Sediment & Benthic Surveys**
	Report 5e **Marine Surveys: Electrode Sites**	**Report 5f** **Marine Surveys: Supplementary**
6) Freshwater Environment: **Fish & Fish Habitat, Water Resources CS**		
7) Marine Environment: **Marine Mammals, Sea Turtles & Seabirds CS**	**Report 7a** **Marine Mammals, Sea Turtles & Seabirds: Information Review**	**Report 7b** **Marine Mammal & Seabird Surveys**
	Report 7c **Ambient Noise & Marine Mammal Surveys**	
8) Species of Special Conservation Concern CS		
9) Marine Environment & Effects Modelling CS	**Report 9a** **Strait of Belle Isle: Oceanographic Environment & Sediment Modelling**	**Report 9b** **Strait of Belle Isle: Marine Sound Modelling - Cable Construction**
	Report 9c **Electrodes: Environmental Modelling**	
10) Historic & Heritage Resources CS		
11) Socioeconomic Environment: **Communities, Land & Resource Use, Tourism & Recreation CS**	**Report 11a** **Communities, Land & Resource Use, Tourism & Recreation**	**Report 11b** **Current Levels of Accessibility Along the Transmission Corridor**
12) Socioeconomic Environment: **Aboriginal Communities & Land Use CS**		
13) Socioeconomic Environment: **Marine Fisheries in the Strait of Belle Isle CS**		
14) Viewscapes CS		

Environmental Component Study Required Under the EIS Guidelines: Comprising Reports (Shaded cells above)	
Avifauna: 2, 7a, 7b	Furbearers: 4
Caribou (and Predators): 3a	Timber Resources: 1d
Water (Quality and Quantity): 5a, 5d, 5e, 5f, 6	Marine and Freshwater Fish and Fish Habitat: 5, 6, 7, 13
Species at Risk: 8	Historic Resources: 10
Viewscapes: 14	Socioeconomics: 11, 12, 13
Environmental study reports submitted as additional background information: 1a, 1b, 1c, 1e, 3b, 9	

Labrador – Island Transmission Link

Socioeconomic Environment: Communities, Land and Resource Use, Tourism and Recreation Component Study - Revised

Preface

The *Socioeconomic Environment: Communities, Land and Resource Use, Tourism and Recreation Component Study* (May 2011) was submitted as part of the Environmental Assessment (EA) of the proposed Labrador-Island Transmission Link (the Project).

Following review of the *Socioeconomic Environment: Communities, Land and Resource Use, Tourism and Recreation Component Study* by the public, Aboriginal, and government as required by the *Environmental Protection Act*, Nalcor Energy (Nalcor) was advised that the *Socioeconomic Environment: Communities, Land and Resource Use, Tourism and Recreation Component Study* required additional work.

To address this requirement, Nalcor has prepared a revised version of the *Socioeconomic Environment: Communities, Land and Resource Use, Tourism and Recreation Component Study*, which includes grey highlighting of all new text that was added to address the comments received from the public, Aboriginal, and government review.

This *Socioeconomic Environment: Communities, Land and Resource Use, Tourism and Recreation Component Study – Revised* (March 2012) is comprised of two (2) associated study reports:

a) **Socioeconomic Environment: Communities, Land and Resource Use, Tourism and Recreation – Revised** (February 2012)
A study to identify, compile, review, document and map information on various key aspects of the existing human environment in and near the Project area, specifically: communities, land and resource use, and outdoor tourism and recreation related activities.

The report presents information for the originally defined transmission corridors from Gull Island (Labrador) to Soldiers Pond (Newfoundland), with a revised and updated supplement (February 2012) providing similar information for an additional transmission corridor option from Muskrat Falls in Labrador.

Please note that relevant Aboriginal communities and their land use activities are addressed in detail in a separate Component Study prepared for the Project's EA.

b) Analysis of Current Levels of Accessibility Along the Transmission Corridor (March 2011)
A study which analyzes and describes existing levels of human access to and within the transmission corridor, as additional socioeconomic baseline information and for use in the environmental effects assessment being conducted for the EA.

The environmental information presented in this *Socioeconomic Environment: Communities, Land and Resource Use, Tourism and Recreation Component Study – Revised* (March 2012) will be incorporated and used in the Project's eventual Environmental Impact Statement (EIS), which will provide a summary description of the existing environment and an environmental effects assessment for the Project.

Labrador – Island Transmission Link

Socioeconomic Environment:

Communities, Land and Resource Use, Tourism and Recreation – Revised Component Study

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EXECUTIVE SUMMARY

Background

Nalcor Energy is proposing to develop the *Labrador – Island Transmission Link* (the Project), a High Voltage Direct Current (HVdc) transmission system extending from Central Labrador to the Island of Newfoundland's Avalon Peninsula. The environmental assessment process for the Project was initiated in January 2009 and is in progress. Nalcor Energy is preparing an Environmental Impact Statement (EIS), which will be submitted for review by governments, Aboriginal and stakeholder groups and the public.

Nalcor Energy contracted AMEC Earth & Environmental (AMEC) to conduct this *Socioeconomic Environment Study*, to identify, gather, review and document information on various aspects of the existing human environment in and near the Project area, for use in the EIS and on-going Project design and planning.

This baseline study focuses on key and relevant components of the socioeconomic environment, as defined by the environmental assessment process and associated consultations to date. These include: communities, land and resource use, and outdoor tourism and recreation related activities. Other relevant aspects of the existing socioeconomic environment are addressed in other study reports and / or in the existing environment sections of the EIS itself.

The Project

The proposed Project involves the construction and operation of transmission infrastructure within and between Labrador and the Island of Newfoundland. At the time that this study was prepared, Project planning and design activities had identified a proposed 2 km wide corridor for the on-land portions of the proposed HVdc transmission line and 500 m wide corridors for the proposed Strait of Belle Isle submarine cable crossings. Alternative corridor segments have also been identified in particular areas. This socioeconomic baseline characterization focuses upon the identified HVdc transmission corridor from the lower Churchill River in Central Labrador to Soldiers Pond on the Island of Newfoundland's Avalon Peninsula.

Regional Context

The proposed HVdc transmission corridor crosses a number of socioeconomic "Study Regions" in Newfoundland and Labrador, which been generally defined as: 1) *Central and Southeastern Labrador*, 2) the *Northern Peninsula*, 3) *Central and Eastern Newfoundland* and 4) the *Avalon Peninsula*. The information and analysis provided in this study are generally structured in terms of these geographic areas.

These regions encompass a number of economic development zones, many of which are rural areas with economies traditionally based on natural resource industries and more recently, tourism and other activities. The transmission corridor also overlaps with regions and zones where economic activities and populations are more heavily concentrated, particularly in Eastern Newfoundland and on the Avalon Peninsula. This study also generally considers marine activities and associated infrastructure in the Strait of Belle Isle, although marine fisheries are addressed in a separate study and report.

Study Approach

This study identifies and describes key aspects of the socioeconomic environment that are relevant to the Project and its potential environmental interactions. These include the general socioeconomic regions and communities which are crossed by or adjacent to the transmission corridor, as well as land and resource uses

and other outdoor tourism and recreational activities in these general areas, including commercial, recreational and subsistence pursuits.

Land and resource use includes consideration of commercial natural resource-based industries such as forestry, mining, outfitting and agriculture, as well as various other recreational / subsistence activities such as angling, hunting, berry-picking and domestic firewood harvesting which local people (and some visitors) participate in. Some of these land uses are also undertaken in conjunction with and / or supported by other activities such as cabin development, snowmobiling, boating and using motorized land vehicles, although these may also be "stand-alone" recreational activities. Residents and visitors also participate in other outdoor recreation activities such as hiking, kayaking and bird watching. Therefore, these are also included in this baseline study.

In terms of Study Area, the socioeconomic environment within the transmission corridor itself (2 km wide) is the key focus. The proposed transmission corridor therefore comprises the primary Study Area for this baseline study (unless otherwise indicated). The study has also sought to provide an appropriate regional context by generally describing socioeconomic components and activities within a larger "regional area" (referred to as Regional Study Area) surrounding the immediate Project area (generally defined as a 15 km or 30 km wide area surrounding the transmission corridor, depending on the specific socioeconomic component).

Again, given the extensive geographic area involved, the study results are organized and presented by region where possible and appropriate: namely, Central and Southeastern Labrador, the Northern Peninsula, Central and Eastern Newfoundland and the Avalon Peninsula.

Existing Socioeconomic Conditions

The study analyzes and characterizes the existing socioeconomic environment in the Study Areas with respect to the following key components:

- Communities
- Transportation
- Hunting and Trapping
- Angling and Other Fishing
- Hunting and Fishing Outfitters
- Motorized Recreational Vehicles
- Cabins and Cottage Development Areas
- Other Outdoor Recreational Activities
- Parks, Reserves and Other Protected and Special Areas
- Forestry
- Mining and Energy
- Agriculture, and
- Other Harvesting Activities

The following provides a general overview of the nature and key findings of the study:

Communities: Communities and / or drinking water supplies overlap with the proposed transmission corridor in each identified Study Region. Many of these areas are rural. The corridor also crosses through regions where communities and populations are more heavily concentrated. These tend to be in Eastern Newfoundland and on the Avalon Peninsula. Portions of 22 communities and 17 drinking water supplies (and in most cases for the same communities) are crossed by the proposed transmission corridor.

A number of Aboriginal groups reside in, and / or claim rights and / or title to areas within or adjacent to the transmission corridor in Central and Southeastern Labrador. These groups include: Labrador Innu, Quebec Innu and Naskapi, Labrador Inuit (Nunatsiavut) and NunatuKavut Community Council (NCC) (formerly the Labrador Métis Nation). Specific land use activities by the members of these groups are addressed in other studies prepared as part of the Project's EA. Other Aboriginal organizations, including those on the Island of Newfoundland, are considered integrally within the overall focus and results of this study.

Transportation: In Central and Southeastern Labrador (Labrador Straits portion), on the Northern Peninsula, in Central and Eastern Newfoundland and on the Avalon Peninsula, TCH, Route 1 and approximately 15 other highways and roads are crossed by the proposed transmission corridor. These include Route 510 in the Labrador Straits; Route 430 the main highway on the Northern Peninsula; Route 432 which crosses the Northern Peninsula in an east-west direction; Route 420 Hampden; the TCH, Route 1; Route 370 Buchans; Route 360 Bay d'Espoir; Route 210 Goobies; Route 203 Fairhaven; Route 201 Bellevue; Route 100 Argentia; Route 80 Blaketown; Route 81 Whitbourne; Route 90 Salmonier Line; Route 13 Witless Bay Line; and Route 63 Avondale.

No air facilities are located within the proposed transmission corridor. Three air facilities, in Central and Southeastern Labrador and Central and Eastern Newfoundland, are located within the Regional Study Area or alternative transmission corridor segments. These include a landing strip at L'Anse Amour, a heliport at Grand Falls-Windsor and a water aerodrome on Thorburn Lake. A portion of the Designated Flight Training Area at 5 Wing Goose Bay is also within the Regional Study Area near the Churchill River.

For the most part, the proposed transmission corridor is located inland in both Labrador and on the Island of Newfoundland. However, the corridor crosses the Strait of Belle Isle which is an ocean shipping route between the Atlantic Ocean and the St. Lawrence Seaway, a busy commercial and recreational marine area and the location of a ferry between Labrador and the Island of Newfoundland.

Hunting and Trapping: The proposed transmission corridor crosses six moose and one black bear management area in Labrador. It crosses 22 moose / black bear management areas and 10 caribou management areas on the Island of Newfoundland. The corridor overlaps with one small game management area in Labrador and four small game management areas on the Island of Newfoundland (all except for the Burin Management Area). It also crosses six migratory game bird management zones and one murre management zone. The corridor crosses nine fur zones in the province.

Angling and Other Fishing: The proposed transmission corridor intersects with 17 scheduled salmon rivers in the various Study Regions. Of these salmon rivers, those on the Northern Peninsula have the highest salmon angling success rates. Salmon angling success rates are also high in Central and Southeastern Labrador and in Central Newfoundland. Success rates are generally lower in Eastern Newfoundland and on the Avalon Peninsula.

Hunting and Fishing Outfitters: Three existing outfitting camps are located in the proposed transmission corridor and these are all on the Northern Peninsula. The 51 camps in the Regional Study Area are located in all Study Regions, except the Avalon Peninsula which has no outfitters.

Motorized Recreational Vehicles: The proposed transmission corridor intersects with snowmobile trails in the Labrador Straits and in several parts of the Northern Peninsula including the Main River area. It also crosses snowmobile trails, particularly the Newfoundland T'Railway, near populated areas (e.g., Badger, Grand Falls-Windsor, Clarenville, the Isthmus and around Holyrood) of Central and Eastern Newfoundland and the Avalon Peninsula. This pattern is similar for ATV trails. The corridor crosses the Strait of Belle Isle, and lakes, ponds and rivers where boating activity occurs on the Northern Peninsula, Central and Eastern Newfoundland and on the Avalon Peninsula.

Cabins and Cottage Development Areas: The proposed transmission corridor overlaps with a portion of a total 559,000 ha that have been designated as cottage planning areas. A total of 462 cottages and 146 remote cottages are located in the corridor. Cottage and remote cottage development is most extensive on the Northern Peninsula and in Central and Eastern Newfoundland. Cottages are much more common than remote cottages on the Avalon Peninsula where cottage development is most intensive.

Other Outdoor Recreational Activities: Outdoor recreation generally occurs in areas that are accessible by road where participants can place their vehicles and equipment as close as possible to the activity site. Bicycling occurs within communities, on major highways and the Newfoundland T'Railway which is within the proposed transmission corridor or Regional Study Area depending on the location. Most bird watching occurs in identified birding areas or protected areas. Camping occurs within designated protected areas and at private campgrounds. Fourteen campgrounds with a total of 1,238 campsites are within the larger Regional Study Area.

Canoeing, kayaking and rafting take place on the many ponds, lakes and rivers throughout the province, but generally at ones accessible by road and a number of these are crossed by the proposed transmission corridor. Most hiking is undertaken on purpose built or community based trails. The proposed transmission corridor intersects with The International Appalachian Trail on the Northern Peninsula and the T'Railway in Central and Eastern Newfoundland and on the Avalon Peninsula. The White Hills Ski Resort, which has downhill and cross country ski facilities is within the Regional Study Area. Three golf courses, located at Grand Falls-Windsor, Terra Nova and Holyrood, are within the Regional Study Area. Riverfront Chalets (a river rafting outfitter on the Exploits River) is also located in the Regional Study Area.

The proposed transmission corridor and the Regional Study Area generally overlap with the above activities most frequently near larger population areas (e.g., the Labrador Straits, Grand Falls-Windsor, Clarenville, the Isthmus of the Avalon and on Conception Bay) and near parks and reserves, in particular the Newfoundland T'Railway.

Parks, Reserves and Other Protected and Special Areas: Protected areas are a significant reason why residents travel around this province and non-residents visit the province. The proposed transmission corridor crosses two ecological reserves (West Brook and Hawke Hill), one provincial park (Butter Pot), one provincial park reserve (Jack's Pond), one waterway park and special management area (Main River) and the T'Railway which are all under provincial jurisdiction. Other protected areas are within the larger Regional Study Area.

Forestry: The proposed transmission corridor crosses portions of 13 active forestry management districts: two in Central and Southeastern Labrador, three on the Northern Peninsula, seven in Central and Eastern Newfoundland and one on the Avalon Peninsula. The corridor overlaps with the greatest amount of planned forestry activity on the Northern Peninsula. Intense commercial forestry activity in central Newfoundland will not likely proceed as planned due to the recent closure of the Abitibi-Consolidated paper mill in Grand Falls-Windsor. This will affect Districts 4, 6, 10, 11 and 12. However, forestry will likely remain active around Birchy

Lake and Southwest Gander River.

Mines and Energy: There are no producing or developing mines within the proposed transmission corridor in any of the Study Regions. Gravel quarries are located in all Study Regions. In Central and Southeastern Labrador, the only activity in the proposed transmission corridor is gravel extraction. The Northern Peninsula has quarries and staked claims and on-land oil and gas exploration projects located in the proposed transmission corridor. In Central and Eastern Newfoundland and on the Avalon Peninsula, there are quarries, staked claims and mineral tenure located within the proposed transmission corridor.

Agriculture: Agricultural activity is limited in Central and Southeastern Labrador and on the Northern Peninsula. The only activity located in the proposed transmission corridor in either of these Study Regions is bakeapple areas on the Labrador side of the Strait of Belle Isle. One commercial farm is located in the proposed transmission corridor in Central and Eastern Newfoundland. On the Avalon Peninsula the proposed transmission corridor intersects with five farms and two agriculture areas. The latter are located in the Whitbourne area and near Colinet. Blueberry management units near Brigus Junction are located in the proposed transmission corridor.

Other Harvesting Activities: People throughout the province participate in a variety of harvesting activities including berry picking; mushroom gathering; wood harvesting for domestic use; plant gathering and roadside gardening as well as fishing, hunting and trapping. Subsistence activities still form a part of seasonal rural activities and food consumption. For residents of urban areas, these activities are often considered recreational. Little specific information is available about the locations and frequency of activity. Many activities are undertaken near road access points. However, with increasing use of both snowmobiles and ATVs, people travel further and penetrate deeper into the interior of both Labrador and the Island of Newfoundland to undertake these activities. Thus, areas of greater population and transportation access are most likely to experience the greatest level of harvesting activity.

Summary and Conclusions

As a result of the rather extensive geographic area involved, the Project will extend across a considerable portion of Newfoundland and Labrador. The presence and characteristics of socioeconomic conditions and features vary greatly along and adjacent to the transmission corridor. The information on the existing socioeconomic environment provided through this Component Study will be adequate for the Project's EA and useful in informing the ongoing planning and design, and eventual transmission line routing.

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1.0 INTRODUCTION

Nalcor Energy is proposing to develop the *Labrador – Island Transmission Link*, a High Voltage Direct Current (HVdc) transmission system extending from Central Labrador to the Island of Newfoundland's Avalon Peninsula.

The environmental assessment process for the Project was initiated in January 2009 and is in progress. As part of the process, Nalcor Energy is preparing an Environmental Impact Statement (EIS), which will be submitted for review by governments, Aboriginal and stakeholder groups and the public.

Nalcor Energy contracted AMEC Earth & Environmental (AMEC) to conduct this *Socioeconomic Environment Study* to identify, gather, review and document information related to select aspects of the existing human environment, in and near the Project area, for use in the EIS and on-going Project design and planning.

1.1 Project Overview

The proposed *Labrador – Island Transmission Link* (the Project) involves construction and operation of transmission infrastructure within and between Labrador and the Island of Newfoundland. Nalcor Energy is proposing to establish an HVdc transmission system extending from Gull Island in Central Labrador to Soldiers Pond on the Island's Avalon Peninsula (Figure 1.1-1).

The proposed transmission system, as currently planned, will include the following key components:

- an ac-dc converter station at Gull Island in Central Labrador, on the north side of the Churchill River adjacent to the switchyard for the Lower Churchill Hydroelectric Generation Project;
- an HVdc transmission line extending from Gull Island across Southeastern Labrador to the Strait of Belle Isle. This overhead transmission line will be approximately 400 km in length with a cleared right-of-way averaging approximately 60 m wide, and will consist of single galvanized steel lattice towers with an average height of 43 m;
- cable crossings of the Strait of Belle Isle with associated infrastructure, including cables placed under the seafloor through various means to provide the required cable protection;
- an HVdc transmission line (similar to that described above) extending from the Strait of Belle Isle across the Island of Newfoundland to the Avalon Peninsula, for a distance of approximately 700 km;
- a dc-ac converter station at Soldiers Pond on the Island of Newfoundland's Avalon Peninsula; and
- electrodes in Labrador and on the Island, with overhead lines connecting them to their respective converter stations.

Project planning and design are currently at a stage of having identified a 2 km wide corridor for the on-land portions of the proposed HVdc transmission line and 500 m wide corridors for the proposed Strait of Belle Isle cable crossings, as well as various alternative corridor segments in particular areas. The nature, type and location of the electrode components of the Project are also the subject of ongoing analysis and engineering.

The transmission corridors and components described above were the subject of Nalcor Energy's environmental

baseline study program. Project planning is in progress, and it is anticipated that the Project description will continue to evolve as engineering and design work continue. The environmental assessment of the Project will also identify and evaluate other alternative means of carrying out the Project that are technically and economically feasible.

In conjunction and concurrent with the environmental assessment process, Nalcor will continue with its technical and environmental analyses of the transmission corridors, in order to identify and select a specific routing for the proposed transmission line (which will average approximately 60 m wide). The final transmission line route and locations will be selected with consideration of technical, environmental and socioeconomic factors.

Figure 1.1-1

Labrador - Island Transmission Link: Project Overview

1.2 Study Rationale, Purpose and Objectives

Project components and activities have the potential to interact with various aspects of the existing socioeconomic environment along the transmission corridor. These include local regions and communities, existing land and resource uses, and other tourism and recreational activities and infrastructure. The EIS for the Project will include a thorough and comprehensive analysis of these potential socioeconomic issues and interactions, including measures to avoid or reduce any such adverse effects and optimize benefits. To do so, an appropriate understanding of the nature and condition of the existing (baseline) socioeconomic environment is required. A great deal of applicable and useful information is available for this purpose, but it currently exists in varying forms and resides in various and often widespread sources.

The purpose of this study is to understand and describe the existing socioeconomic environment in the Project area (HVdc transmission corridor) and larger associated Regional Study Areas that have been established for the study, through the collection, review, analysis and documentation of information on key and relevant aspects of that environment. The objective is to provide adequate and appropriate information on these aspects of the socioeconomic environment in the area of the proposed Labrador - Island Transmission Link, for use in the Project's environmental assessment and its on-going design and planning.

This baseline study focuses on key and relevant components of the socioeconomic environment, as defined by the environmental assessment process and associated consultations to date – specifically: communities, land and resource use and various relevant aspects of tourism and recreation, particularly those that pertain to outdoor activities. Other relevant aspects of the existing socioeconomic environment are addressed in separate study reports.

2.0 APPROACH AND METHODS

The following sections describe the general approach to and focus of this *Socioeconomic Environment Component Study*, including the study areas used, information collection and analysis, and the study team involved.

2.1 Study Focus and Study Areas

The proposed *Labrador - Island Transmission Link* will comprise an HVdc transmission system extending from Central Labrador to the Island of Newfoundland's Avalon Peninsula. As a result of the rather extensive geographic area involved, the Project will extend across a considerable portion of Newfoundland and Labrador, and thus, through a range of natural and human environments.

The study identifies and describes key aspects of the socioeconomic environment that are relevant to the nature of the Project and its potential environmental interactions, as defined by the results of the environmental assessment process and associated consultations to date. These include the general socioeconomic regions and communities that are crossed by or adjacent to the proposed transmission corridor, as well as land and resource uses and other tourism and recreational activities (particularly, those that pertain to outdoor recreation) in these general areas, including commercial, recreational and subsistence pursuits.

In terms of Study Areas, the socioeconomic environment within or immediately adjacent to the transmission corridor itself (2 km wide) is the key focus. However, the study has also sought to provide an appropriate larger "regional context" by generally describing socioeconomic components and activities within a larger geographic area surrounding this immediate transmission corridor. Therefore, in addition to the Study Area (i.e., the proposed 2 km wide transmission corridor), larger Regional Study Areas have also been generally defined for each of the socioeconomic components under consideration.

The various Study Areas upon which the study is focussed are summarized below, with these terms used throughout the report for clarity and consistency:

Proposed Transmission Corridor (2 km wide, primary Study Area): The currently identified corridor for the HVdc transmission line;

Alternative Transmission Corridor Segments (2 km wide): Nalcor Energy has identified several alternative corridor segments in particular areas;

Regional Study Area (15 km wide): An approximately 15 km wide regional area extending about 7.5 km on either side of the centre of the above noted proposed transmission corridor. This regional area is used primarily for socioeconomic components that are somewhat "stationary" and "footprint" based, such as those that involve land uses or infrastructure with specific locations; and

Regional Study Area (30 km wide): An approximately 30 km wide regional area extending about 15 km on either side of the centre of the above noted proposed transmission corridor. This regional area is used primarily for socioeconomic components such as resource harvesting activities that are more wide-ranging and less geographically defined. The 30 km Regional Study Area encompasses all of the alternative transmission corridor segments.

An overview of the Study Areas applied to each of the various socioeconomic components and the underlying rationale for each is presented in Table 2.1-1.

Table 2.1-1: Study Area Overview

Components or Activities	**Primary Study Area (With a focus on components and activities that overlap with this Area)**	**Regional Study Area**	
		Delineation	**Nature and Rationale**
Communities Aboriginal Communities and Organizations	Transmission Corridor (2 km)	Regional Study Area (15 km)	Stationary features within the landscape
		Central and Southeastern Labrador	Aboriginal communities / organizations, interests / activities / land claims extending over large areas
Transportation	Transmission Corridor (2 km)	Regional Study Area (15 km) (For marine transportation: Strait of Belle Isle only)	Stationary infrastructure within the landscape (Marine transportation facilities and activities potentially interacting with the Project are limited to the Strait of Belle Isle)
Hunting and Trapping	Transmission Corridor (2 km)	Regional Study Area (30 km)	General and wide ranging activities
Angling and Other Fishing	Transmission Corridor (2 km)	Regional Study Area (30 km)	General and wide ranging activities
Hunting and Fishing Outfitters	Transmission Corridor (2 km)	Regional Study Area (30 km)	General and wide ranging activities
Motorized Recreational Vehicles	Transmission Corridor (2 km)	Regional Study Area (30 km)	General and wide ranging activities
Cabins and Cottage Development Areas	Transmission Corridor (2 km)	Regional Study Area (15 km)	Stationary features within the landscape
Other Outdoor Recreational Activities	Transmission Corridor (2 km)	Regional Study Area (30 km)	General and wide ranging activities

Components or Activities	Primary Study Area (With a focus on components and activities that overlap with this Area)	Regional Study Area	
		Delineation	Nature and Rationale
Parks, Reserves and Other Protected and Special Areas	Transmission Corridor (2 km)	Regional Study Area (30 km)	Sensitive and protected areas often associated with wide ranging (recreational) activities
Forestry	Transmission Corridor (2 km)	Regional Study Area (15 km)	Defined activities within the landscape
Mining and Energy	Transmission Corridor (2 km)	Regional Study Area (15 km)	Defined activities within the landscape
Agriculture	Transmission Corridor (2 km)	Regional Study Area (15 km)	Defined activities within the landscape
Other Harvesting Activities	Transmission Corridor (2 km)	Regional Study Area (30 km)	General and wide ranging activities

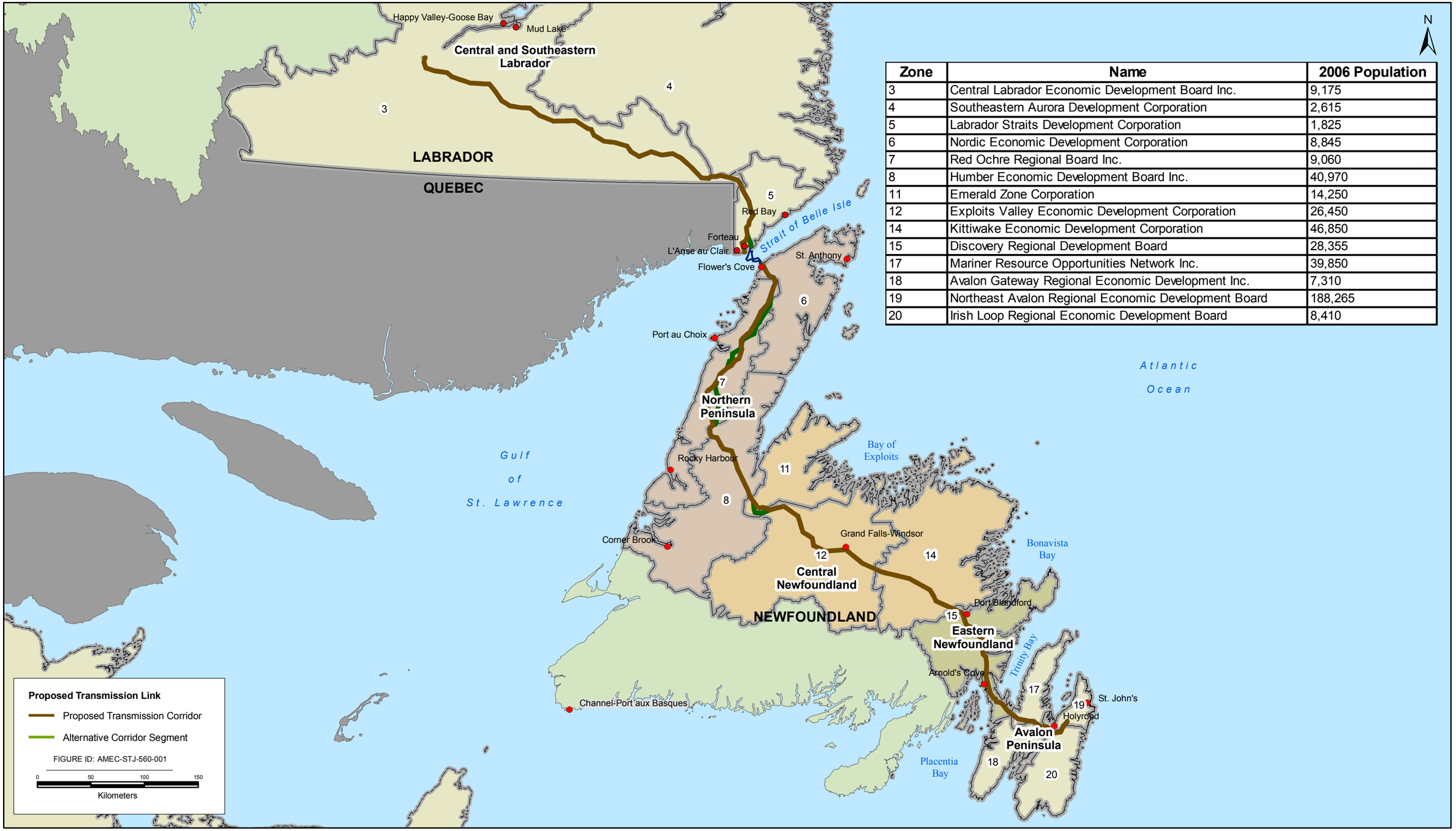
Given the extensive geographic area involved, the study results are also generally presented by "Study Region" where possible and appropriate (Figures 2.1-1 to 2.1-5), specifically:

1) *Central and Southeastern Labrador*,
2) *Northern Peninsula*,
3) *Central and Eastern Newfoundland*, and the
4) *Avalon Peninsula*.

This study also considers general marine activities and associated infrastructure in the Strait of Belle Isle, although marine fisheries are addressed entirely in a separate study and report.

Again, as an environmental baseline study for the Project's EA, the focus of this report is on the currently defined transmission corridor (2 km wide) and associated Regional Study Areas. It is important to note that, as described in Section 1.1, the eventual transmission line itself will comprise an approximately 60 m wide right-of-way, which will eventually be selected from within this larger study corridor.

As a result, any identified overlap between the transmission corridor and a particular aspect of the existing socioeconomic environment does not necessarily mean that the eventual transmission line itself will interact with that component of the environment. The EIS will assess any such potential interactions, as well as possible means of avoiding or reducing potential effects, including through the eventual transmission line route selection process and/or other possible mitigation measures.



Zone	Name	2006 Population
3	Central Labrador Economic Development Board Inc.	9,175
4	Southeastern Aurora Development Corporation	2,615
5	Labrador Straits Development Corporation	1,825
6	Nordic Economic Development Corporation	8,845
7	Red Ochre Regional Board Inc.	9,060
8	Humber Economic Development Board Inc.	40,970
11	Emerald Zone Corporation	14,250
12	Exploits Valley Economic Development Corporation	26,450
14	Kittiwake Economic Development Corporation	46,850
15	Discovery Regional Development Board	28,355
17	Mariner Resource Opportunities Network Inc.	39,850
18	Avalon Gateway Regional Economic Development Inc.	7,310
19	Northeast Avalon Regional Economic Development Board	188,265
20	Irish Loop Regional Economic Development Board	8,410

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Figure 2.1-1

Study Regions and Associated Economic Development Zones

Zone	Name	2006 Population
3	Central Labrador Economic Development Board Inc.	9,175
4	Southeastern Aurora Development Corporation	2,615
5	Labrador Straits Development Corporation	1,825

N

Lake Melville

Grand Lake

Sheshatshiu

North West River

Happy Valley-Goose Bay

Mud Lake

Cartwright

Central and Southeastern Labrador

4

3

1

LABRADOR

QUEBEC

5

Red Bay

Strait of Belle Isle

Forteau

L'Anse au Clair

St. Anthony

Proposed Transmission Corridor

Alternative Corridor Segment

FIGURE ID: AMEC-STJ-560-001

0 20 40 60

Kilometers

nalcor energy

Figure 2.1-2

Economic Zones - Central and Southeastern Labrador

Zone	Name	2006 Population
6	Nordic Economic Development Corporation	8,845
7	Red Ochre Regional Board Inc.	9,060
8	Humber Economic Development Board Inc.	40,970

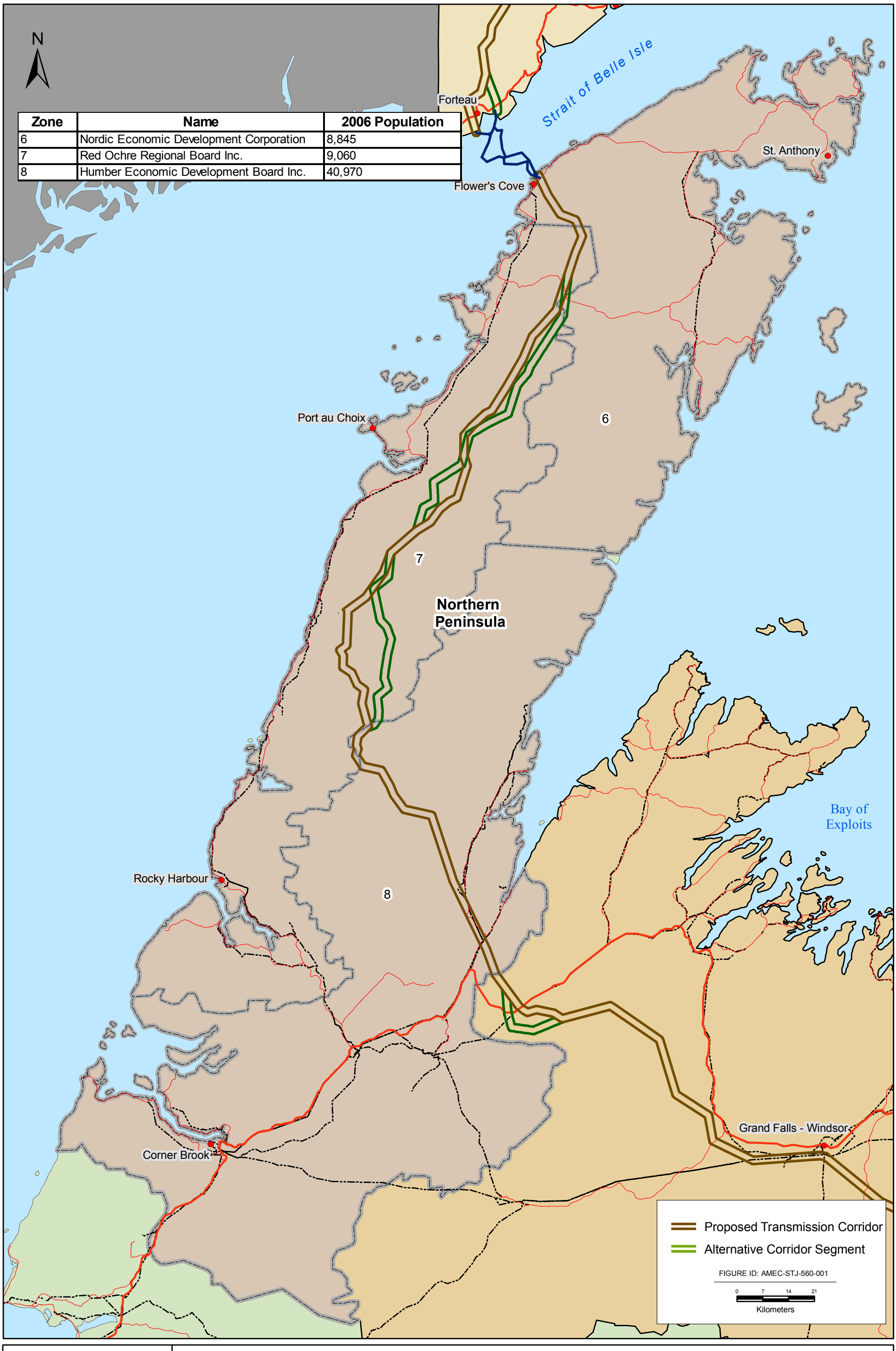
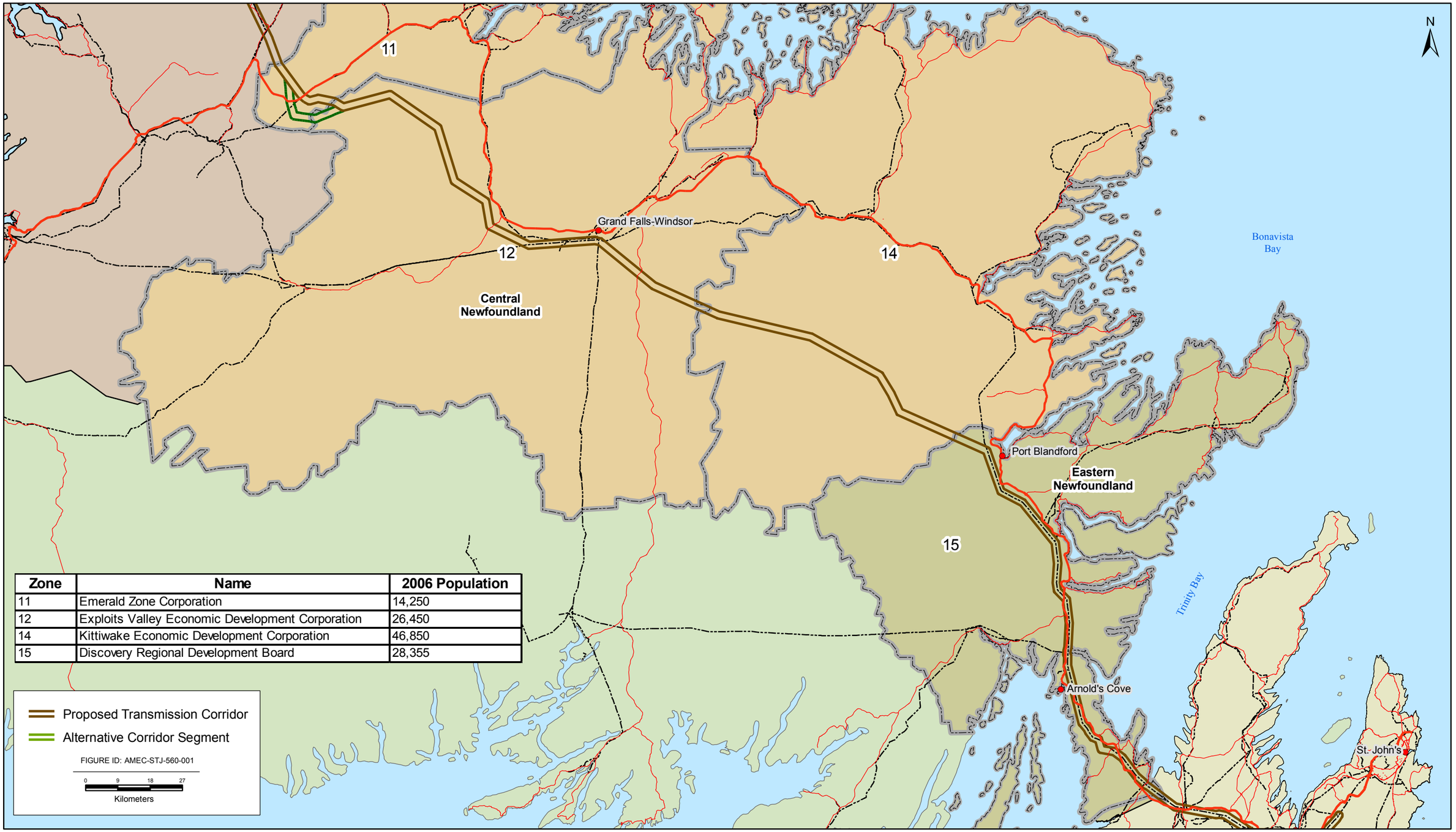


Figure 2.1-3

Economic Zones - Northern Peninsula



Zone	Name	2006 Population
11	Emerald Zone Corporation	14,250
12	Exploits Valley Economic Development Corporation	26,450
14	Kittiwake Economic Development Corporation	46,850
15	Discovery Regional Development Board	28,355

Figure 2.1-4

Economic Zones - Central and Eastern Newfoundland

Zone	Name	2006 Population
17	Mariner Resource Opportunities Network Inc.	39,850
18	Avalon Gateway Regional Economic Development Inc.	7,310
19	Northeast Avalon Regional Economic Development Board	188,265
20	Irish Loop Regional Economic Development Board	8,410

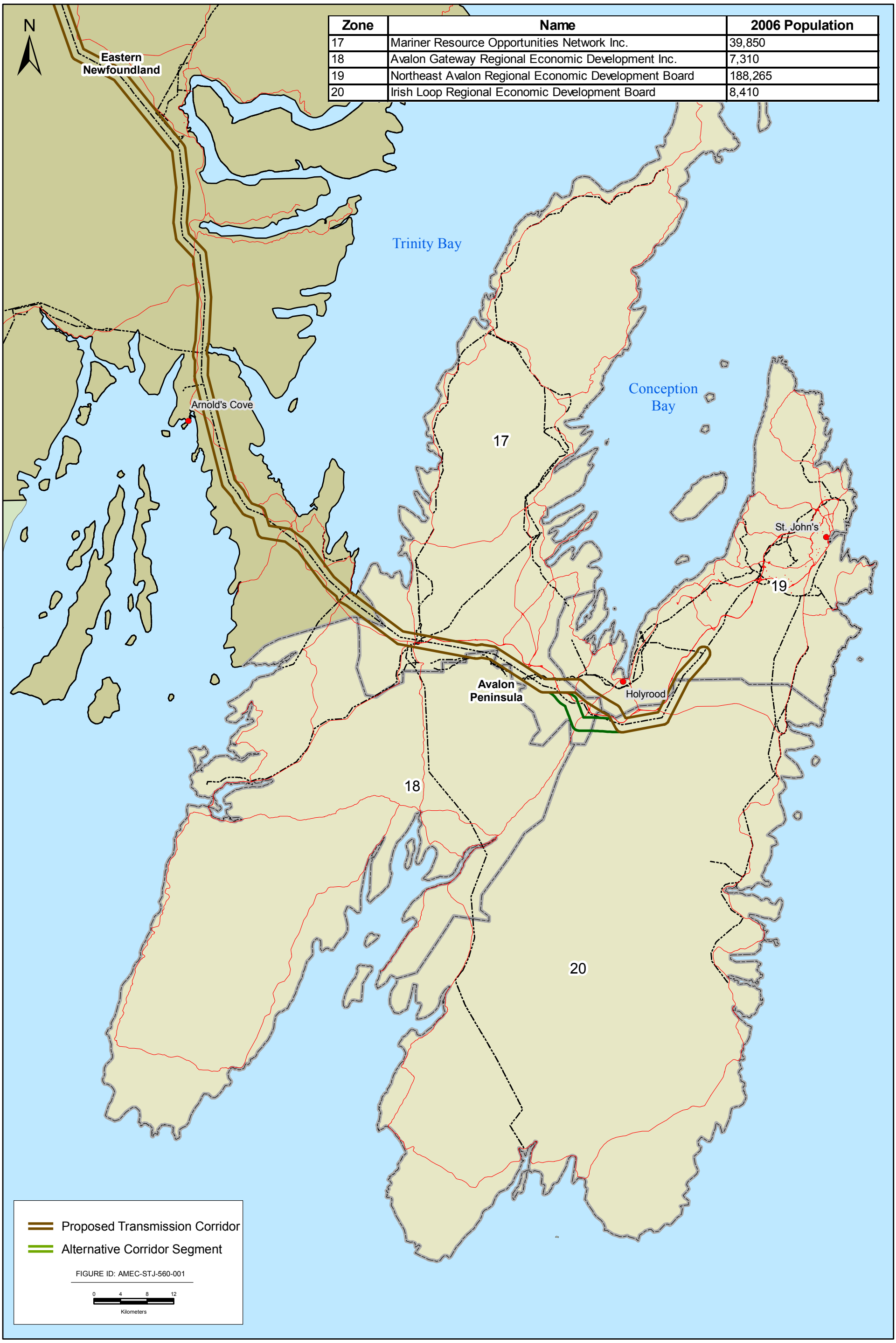


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Figure 2.1-5

Economic Zones - Avalon Peninsula

2.2 Information Collection and Data Sources

This study has identified and made use of a wide and varied range of information sources to describe the existing socioeconomic environment in and adjacent to the Project area. This has included general literature (published and unpublished sources), government reports and datasets, and other existing and available sources. An overview of the key information sources accessed and used is provided at the beginning of each section that follows in Chapter 4 of this report, and a comprehensive list of references is included in Chapter 6.

2.3 Study Team

This *Socioeconomic Environment Component Study* was conducted on behalf of Nalcor Energy by AMEC Earth & Environmental (AMEC). The study team included environmental planners, a senior social scientist, an intermediate social scientist, an intermediate scientist and a GIS specialist (Table 2.3-1). Further information on the study team is included in Appendix A.

Table 2.3-1: Study Team

Roles	Personnel
Project Manager, Environmental Planner	Nancy Griffiths, AMEC
Senior Social Scientist	Susan Sherk, AMEC
GIS Specialist	Juanita Abbott, AMEC
Senior Environmental Planner, Reviewer	Uwe Wittkugel, AMEC
Intermediate Social Scientist	Peter Miles, AMEC
Intermediate Scientist	Suzanne Mullowney, AMEC

2.4 Report Organization

An overview of the proposed Project and the nature and rationale for the *Socioeconomic Environment St*udy are provided in *Chapter 1.0: Introduction*.

The approach to data collection and analysis, including the definition of the Study Areas used is discussed in *Chapter 2.0: Approach and Methods*. This section also introduces the Study Team involved in data collection, analysis and report generation.

Chapter 3.0: Regional Context generally describes the various socioeconomic regions that are crossed by the transmission corridor. The chapter also introduces the Economic Development Zones along the corridor and presents their economic and population profiles. It aims at providing background information to the various socioeconomic components that the baseline study focuses on, as general context for the study.

In *Chapter 4.0: Results and Analysis*, the various socioeconomic components are discussed in a series of sections. Each section includes an introduction to the component-specific Study Areas, the administrative framework, and

the key information sources accessed and used. Following this introductory information, the characteristics and features of the component are discussed. Where possible and appropriate, the discussion is structured by the Study Regions crossed by the transmission corridor. Maps illustrating the location of these components are included at the end of individual chapters and in Appendices B and C.

A summary of the findings of the baseline study is presented in *Chapter 5.0: Summary and Conclusions*.

3.0 REGIONAL CONTEXT

As discussed previously, the proposed transmission corridor traverses a number of Newfoundland and Labrador Study Regions which are referred to in this report as: 1) Central and Southeastern Labrador, 2) the Northern Peninsula, 3) Central and Eastern Newfoundland and 4) the Avalon Peninsula.

The following sections briefly characterize these regions, with a focus on their population and social and economic characteristics. The intent is to provide a general understanding of the overall regional context as background information for the detailed study results reported in Chapter 4.

3.1 Regions and Associated Economic Zones

The proposed transmission corridor extends from Central Labrador to the Island of Newfoundland's Avalon Peninsula and overlaps with a number of regions and regional economic development zones throughout the province. Table 3.1-1 lists those zones by region, and presents information on their current (2006) population and recent population trends.

Table 3.1-1: Study Regions and Economic Zones

Study Regions	Regional Economic Development Zones (# and Name) [1]		Population		
			2006[2]	Change 2001-2006 (%)	% of total in all Zones [4]
Central and Southeastern Labrador	3	Central Labrador Economic Development Board Inc.	9,175	-4.8%	**3.3%**
	4	Southeastern Aurora Development Corporation	2,615	-3.9%	
	5	Labrador Straits Development Corporation	1,825	-8.8%	
	Subtotal		**13,615**	**-**	
Northern Peninsula	6	Nordic Economic Development Corporation	8,845	-12.2%	**14.1%**
	7	Red Ochre Regional Board Inc.	9,060	-7.7%	
	8	Humber Economic Development Board Inc.	40,970	+0.8%	
	Subtotal		**58,875**	**-**	
Central and Eastern Newfoundland	11	Emerald Zone Corporation	14,250	-9.8%	**27.8%**
	12	Exploits Valley Economic Development Corporation	26,450	-1.8%	
	14	Kittiwake Economic Development Corporation	46,850	-3.6%	
	15	Discovery Regional Development Board	28,355	-5.2%	
	Subtotal		**156,875**	**-**	
Avalon Peninsula	17	Mariner Resource Opportunities Network Inc.	39,850	-2.7%	**54.8%**
	19	North East Avalon Regional Economic Development Board	188,265	+4.5%	
	Subtotal		228,115	-	
Total 2006 Population (Economic Zones that are Associated with the Study Area)			**416,510**		
Total Newfoundland and Labrador Population 2006			**505,470**[3]	-1.5%	**-**

Source: DF-ES, 2010

Notes: [1] Listed are those zones that overlap with the proposed transmission corridor.
[2] Numbers refer to the total population of those economic zones that overlap with the transmission corridor.
[3] Total 2006 population of Newfoundland and Labrador.
[4] Refers to % of total population in all zones that overlap with the transmission corridor.

The regional economic development zones of the Central and Eastern Newfoundland and Avalon Peninsula Study Regions have the largest populations and highest population growth among the Study Regions, and consequently the highest overall intensity of land use. Conversely, some outdoor tourism, recreation and subsistence land uses are often more prevalent in the less populated rural areas of the province.

The following sections present brief overviews of the various regional economic development zones in Newfoundland and Labrador that are crossed by the proposed transmission corridor. The data presented was gathered from Community Accounts and is based on Statistics Canada's 2006 Census. Information about the various zones was gathered from their individual websites and strategic plans. Note that data from the regional economic development boards is used to describe the regional economic development zones.

3.1.1 Central and Southeastern Labrador

The Central and Southeastern Labrador Study Region includes three regional economic development zones:

Central Labrador Economic Development Board Inc. (Zone 3), Southeastern Aurora Development Corporation (Zone 4) and Labrador Straits Development Corporation (Zone 5) that are crossed by the proposed transmission corridor (Figure 2.1-2).

Economic Zone 3 - Central Labrador Economic Development Board Inc.

Central Labrador includes the Town of Happy Valley-Goose Bay, the Town of Northwest River, the Innu reserve community of Sheshatshiu and the smaller remote settlement of Mud Lake. The economy of Central Labrador has evolved from primarily supporting military flight training to providing a range of services. Increasingly, it is also based on government services particularly in Happy Valley-Goose Bay. Economic opportunities by primarily large-scale developments such as the Voisey's Bay project have resulted in the establishment of a number of Aboriginal companies and joint ventures.

Economic Zone 4 - Southeastern Aurora Development Corporation

The southeastern coast currently has 11 permanent communities: Cartwright, Paradise River, Charlottetown, Port Hope Simpson, St. Lewis, Mary's Harbour, Lodge Bay, Black Tickle-Domino, Pinsent's Arm, William's Harbour and Norman Bay. The Trans Labrador Highway (TLH) - Phase II, Red Bay to Cartwright extends through the region, connecting communities to one another and to the Labrador Straits, from which the Island of Newfoundland can be accessed by ferry. Additionally, now that the TLH Phase III connects the region to Central Labrador, residents can also travel to that area and on to Labrador West and beyond to other parts of Canada. Those communities without road connection are accessed by ferry in summer and snowmobile in winter between coastal ice freeze-up and break-up. Air service is also available.

The area has a mixed history of Aboriginal, European and Newfoundland settlements based primarily on fishing and forestry. Currently, the fishery employs a high proportion of the local population. The Labrador Fishermen's Union Shrimp Company has plants in Cartwright, Charlottetown and Mary's Harbour. A snow crab processing facility is located in St. Lewis (SEADC, 2008).

Economic Zone 5 - Labrador Straits Development Corporation

The Labrador Straits is the southernmost part of Labrador, and is located directly across the Strait of Belle Isle from the Island of Newfoundland. Labrador Straits communities are connected to one another and to the Quebec North Shore by Route 510. The L'Anse au Clair to Red Bay portion, which was constructed in increments, began in 1954 and reached Red Bay in 1966 (Gibbons, C., 2010; Letto, S., 2010). The Red Bay to Cartwright highway was opened in 2003 and the Cartwright to Happy Valley-Goose Bay section was completed in December 2009.

A provincial ferry service between Lourdes-de-Blanc Sablon, Quebec (Blanc Sablon) and St. Barbe connects Labrador to Newfoundland. Since completion of the TLH - Phases II and III, it is possible to travel from the Island to Labrador and on to Quebec and points west and vice-versa. With the pilot introduction of bi-weekly 2009-10 winter ferry service between Blanc-Sablon and Corner Brook, it was possible to take this route year round.

The Labrador Straits area, which has a diverse history of Aboriginal presence and European inhabitance (Basques and French), includes the communities of Red Bay, Pinware, West St. Modeste, Capstan Island, L'Anse au Loup, L'Anse Amour, Forteau and L'Anse au Clair. The fishery dominates the economy with 256 people employed in 2007-2008. The area has a small manufacturing industry that produces furniture, crafts and wild berry products.

Several businesses distribute a variety of goods to the communities of southeastern Labrador, the Labrador Straits and Quebec's Lower North Shore (LSDC, 2008).

Aboriginal Communities and Organizations

A number of Aboriginal groups reside in and / or claim rights and / or title to areas along or adjacent to the transmission corridor in Central and Southeastern Labrador, including the: Labrador Innu, Quebec Innu and Naskapi, Labrador Inuit (Nunatsiavut) and NunatuKavut Community Council (NCC) (formerly the Labrador Métis Nation) (Figure 3.1-1). The Labrador Inuit land claim was settled in 2005 when the *Labrador Inuit Land Claims Agreement* came into effect. The following section generally describes these Aboriginal communities and organizations. Other Aboriginal organizations, including those on the Island of Newfoundland, are considered integrally within the overall focus and results of this study.

Labrador Innu

The approximately 2,500 Labrador Innu reside primarily in two communities - Sheshatshiu in south-central Labrador and Natuashish on the Labrador north coast (Figure 3.1-2). The Mushuau Innu resettled from Davis Inlet to Natuashish in 2002-2003. Small numbers of Innu also reside in Happy Valley-Goose Bay and elsewhere.

The Labrador Innu are registered and recognized under the Indian Act of Canada. The Sheshatshiu Innu (2006) and the Mushuau Innu of Natuashish (2002) are separate Innu Bands; each community is currently a Reserve with an elected Chief and Council. Both communities are represented by Innu Nation in land claims negotiations and on other matters of common interest. The Labrador Innu claim Aboriginal rights and title to much of Labrador. The land claim area overlaps the proposed transmission corridor, and is the only such claim in the region that has been accepted for negotiation by both the federal and provincial governments. Negotiations are ongoing between Innu Nation and the Governments of Newfoundland and Labrador and Canada.

On September 26, 2008, the Government of Newfoundland and Labrador and Innu Nation announced the signing of the *Tshash Petapen Agreement* (*New Dawn Agreement*), which resolved key issues relating to matters between the Province and Innu Nation surrounding Innu Land Claims Agreement, Lower Churchill Impacts and Benefits Agreement (IBA) and Innu redress for the Upper Churchill Hydroelectric Development. Individual agreements based on the *Tshash Petapen Agreement* were subsequently negotiated and initialed by Innu Nation, the First Nations, Nalcor Energy and the Province in early 2010. These agreements will be subject to an eventual ratification vote by the Innu people.

As illustrated in Figure 3.1-2, the proposed transmission corridor does not overlap with the land areas selected by the Labrador Innu as part of the land claims component of the *Tshash Petapen Agreement,* The Lower Churchill IBA covers both the Lower Churchill Hydroelectric Generation Project and the Labrador-Island Transmission Link, and once effective, will provide benefits and address any adverse effects to the Labrador Innu as a result of these projects, including any potential effects on Innu communities and their land and resource use and other activities.

Quebec Innu and Naskapi

Québec Innu and Naskapi groups include those that reside on the Lower North Shore and in the Schefferville area, respectively (Figure 3.1-1). The land claim areas of several of these First Nations extend into Labrador, including: Pakua Shipi (St. Augustine), Unamen Shipu (La Romaine), Nutashkuan (Nastashquan), Ekuanitshit

(Mingan), Uashat mak Mani-Utenam (Sept-Îles), Matimekush - Lac John (Schefferville)and Kawawachikamach (Innu Place Names, 2009). This includes several communities whose land claims are understood to extend into the general area of the proposed transmission corridor. The land claims asserted by Québec First Nations for territory in Labrador have not been accepted for negotiation by the Government of Newfoundland and Labrador. Québec Innu and Naskapi people are known to undertake land use and harvesting (particularly hunting) in certain parts of Labrador (CBC News, 2009).

Labrador Inuit

The Labrador Inuit are an Arctic-adapted people who migrated across the Canadian Arctic from Alaska and reached Labrador approximately AD 1300 (Fitzhugh, 1994). The Labrador Inuit are culturally and linguistically related to Inuit occupying other regions of the Canadian Arctic. Labrador Inuit currently reside in communities on the Labrador North coast (i.e., Rigolet, Hopedale, Postville, Makkovik and Nain) and in Central Labrador (i.e., Mud Lake, North West River and Happy Valley-Goose Bay). Inuit also reside in parts of southern and western Labrador, St. John's and elsewhere.

In 2005, the Labrador Inuit and the federal and provincial governments signed the *Labrador Inuit Land Claims Agreement* which establishes land ownership, resource sharing and self-government in Nunatsiavut (Our Beautiful Land). There are more than 7,000 beneficiaries of the Agreement. The proposed transmission corridor does not cross the land areas covered by *The Agreement*.

NunatuKavut Community Council (formerly the Labrador Métis Nation)

The Labrador Métis Association was established in 1985, and renamed the Labrador Métis Nation (LMN) in 1998 and the NCC in 2010. The organization reports a membership of over 6,000, who reside primarily in central Labrador and along the southeastern coast. The organization has asserted a land claim that covers much of Labrador, but has not been accepted for negotiation by the federal or provincial governments.

Contemporary land use activities by the members of these groups are addressed in detail in other studies prepared for the Project's EA.

3.1.2 Northern Peninsula

The Northern Peninsula Study Region includes three regional economic zones: Nordic Economic Development Corporation (Zone 6), Red Ochre Regional Board Inc. (Zone 7) and Humber Economic Development Board Inc. (Zone 8). Zones 6, 7 and 8 include nearly 100 small to medium sized communities from the northern points of Cook's Harbour and Straitsview to Hampden in the southeast and Corner Brook in the southwest (Figure 2.1-3).

Economic Zone 6 - Nordic Economic Development Corporation

Zone 6 includes 36 communities on the Northern Peninsula from the northern points of Cook's Harbour and Straitsview south to Roddickton-Bide Arm on the east side of the Peninsula and Anchor Point on the west side. The area boasts the first European settlement in the New World at L'Anse aux Meadows, on Newfoundland's northern tip. Traditionally, most of the communities were based on the fishery, with the exception of Roddickton and some of the smaller inland communities such as Main Brook, which focused on forestry. Currently, five seafood processors operate in Zone 6 – four between Cook's Harbour and St. Anthony, one in Main Brook and one in Anchor Point (DFA, 2010; Barry Group, 2010). St. Anthony continues to be the service centre of the area with Roddickton serving as a sub-regional centre (NEDC, 2009).

Economic Zone 7 - Red Ochre Regional Board Inc.

The Red Ochre Regional Board (Zone 7) includes 36 communities on the Gulf of St. Lawrence side of the Northern Peninsula, from St. Barbe in the north to Glenburnie on Bonne Bay in the south. Communities to the north focus on tourism as well as the fishery (RORB, 2009). Six seafood processors operate in the zone at Port-au-Choix, River of Ponds, Cow Head and three in Bonne Bay (DFA, 2010; Barry Group, 2010; OCI, 2010). The terminal for the Strait of Belle Isle ferry is located at St. Barbe.

Communities in the southern part of Zone 7 are surrounded by Gros Morne National Park. While the economy has traditionally been based on natural resource industries, Gros Morne has become a major tourism industry generator. In 2009, the Park attracted 174,000 visitors, 72 percent of which came from outside of the province. Tourists to the area spent $38 million in 2009 and tourism-related spending accounted for 28 percent of total employment and 42 percent of seasonal employment (Western Star, 2010a). Main River Waterway Provincial Park is also growing as an important tourism destination for outdoor enthusiasts interested in hiking, canoeing, kayaking and white-water rafting.

Economic Zone 8 - Humber Economic Development Board Inc.

The 26 communities served by the Humber Economic Development Board (Zone 8) cover an area from Lark Harbour at the mouth of the Bay of Islands on the Gulf of St. Lawrence through Corner Brook and Deer Lake, north to Wiltondale at the southern boundary of Gros Morne National Park and northeast to Hampden (HEDB, 2009). The coastal areas around the Bay of Islands are rooted in the fishery but have also focused on forestry since the early 1920s when a pulp and paper mill was established in Corner Brook. Today, Corner Brook's economy still depends on the paper mill but has also grown into a regional service centre. Four seafood processers are located in Zone 8 – three in the Bay of Islands and one in Jackson's Arm (Barry Group, 2010; OCI, 2010).

As the gateway to Gros Morne National Park, the area also has a strong year-round tourism industry that offers winter sports such as skiing and snowmobiling and outdoor adventures in summer. The regional airport is located at Deer Lake. The inland communities to the east are focused on agriculture and some of the province's largest dairy farms are located near Deer Lake. Forests supply Corner Brook Pulp and Paper (CBPP) and employ a number of people in communities north of Deer Lake (HEDB, 2009).

3.1.3 Central and Eastern Newfoundland

In the Central and Eastern Newfoundland Study Region, the proposed transmission corridor crosses four economic development zones: Emerald Zone Corporation (Zone 11), Exploits Valley Development Corporation (Zone 12), Kittiwake Economic Development Corporation (Zone 14) and Discovery Regional Development Board (Zone 15) (Figure 2.1-4).

Economic Zone 11 - Emerald Zone Corporation

The Emerald Zone Corporation (Zone 11) includes 42 communities of the Baie Verte Peninsula and the coastal bays to the east. The zone begins at Westport and continues north to Fleur de Lys and La Scie. Zone 11 also includes coastal communities along the coast of Green Bay to Triton, Notre Dame Bay. The local economies are traditionally based in forestry, fisheries and mining and have suffered from the cycles of natural resource-based industries. Forestry and fishing are still important as are the manufacturing and services sectors (EZC, 2009).

Economic Zone 12 - Exploits Valley Economic Development Corporation

The Exploits Valley zone spreads from Leading Tickles in the west, Cottrel's Cove in the north, Buchans in the south and Norris Arm in the east. The 16 communities of Exploits Valley are located either on the coast of Notre Dame Bay, in the urban service centre around Grand Falls-Windsor or to the interior of the island as far south as Buchans. To some extent the traditional economies of Zone 12 (fishing, forestry and mining) are reflected in these areas respectively (EVEDC, 2009). Natural resource industries in Zone 12 have suffered as in other areas and generally populations have declined except for some of the larger towns. Grand Falls-Windsor experienced modest population growth between 2001 and 2006 (Statistics Canada 2010).

In 2009, the Abitibi-Consolidated paper mill in Grand Falls-Windsor closed after more than 100 years leaving approximately 450 mill workers and 250 foresters out of work. The economy is now based mainly on the town being a regional centre for government (e.g., health care, social services and education) and commercial / retail services. Like other mid-sized Newfoundland towns, Grand Falls-Windsor is attracting people (including seniors) from smaller communities who wish to remain in the region but access services offered in larger centres (e.g., health, social, education, recreation and retail). Despite the recent closure of the town's largest employer, housing starts in the first half of 2010 have increased nearly four times over the same period in 2009. The economy is also affected by strong regional industries such as aquaculture in Bay d'Espoir and Duck Pond Mine near Buchans (CBC News, 2010; Saunders, J., 2010).

Economic Zone 14 - Kittiwake Economic Development Corporation

The 119 communities of the Kittiwake Zone (Zone 14) are anchored by Lewisporte in the west and Eastport in the east. The southern communities of Zone 14 are those along the Trans Canada Highway or TCH, Route 1 (e.g., Gander, Glenwood and Appleton). Most communities are located along the coastline and include Change Islands, Fogo Island and St. Brendan's which are all accessed by ferry. Zone 14 also includes the traditional tourism destinations of Terra Nova National Park, the Eastport Peninsula and the Twillingate Islands. Change Islands and Fogo Island are now emerging as significant provincial tourism areas.

Like most coastal areas of Newfoundland, the economy was originally based on the fishery and to some extent still is, but other activities are present. Government and private sector services are important economic contributors throughout Zone 14. Gander, which has the largest and most diversified economy, has the strongest concentration of public and commercial services along with an international airport, military base, search and rescue headquarters and an aerospace industry. The area also remains active in the forestry and mining sectors (KEDC, 2009).

Economic Zone 15 - Discovery Regional Development Board

The Discovery Zone (Zone 15) includes approximately 100 communities including Port Blandford and Clarenville, those located on Random Island and the Bonavista Peninsula and east to Chapel Arm, Trinity Bay. The fishery continues to be an economic generator particularly on the seaward part of the Bonavista Peninsula. Agriculture is well developed on the inland portion of the Bonavista Peninsula and Clarenville is the public and commercial service centre of the region. The Port Blandford area is increasingly becoming a year-round vacation and recreation destination particularly for families from the St. John's area. The remainder of Zone 15 includes the Isthmus of the Avalon Peninsula. Here the economy includes traditional industries such as the fishery but is dominated by large scale oil industry activity such as offshore fabrication at Bull Arm, oil refining at Come by

Chance and oil transshipment at Whiffen Head. The Vale NL nickel processing facility (a large scale industrial project) is under construction at Long Harbour (DRDC, 2009).

3.1.4 Avalon Peninsula

The Avalon Peninsula Study Region includes Mariner Resource Opportunities Network (Zone 17) and the Northeast Avalon Regional Economic Development Board (Zone 19) (Figure 2.1-5).

Economic Zone 17 - Mariner Resource Opportunities Network

Zone 17, the Conception Bay North area includes 68 communities from Old Shop, Trinity Bay to Grates Cove in the north and east to Brigus, Conception Bay. The greatest concentration of development is from Carbonear to Bay Roberts and this area also provides the majority of services to this general region (e.g., health, education, recreation and commercial / retail). Like other areas of the province, the economy is still somewhat reliant on the fishery but also includes agriculture, manufacturing and tourism (MRON, 2009).

Economic Zone 19 - Northeast Avalon Regional Economic Development Board

The Northeast Avalon Peninsula (Zone 19) includes approximately 20 communities from Marysvale to Holyrood (both on Conception Bay) to Petty Harbour-Maddox Cove (on the Atlantic coast south of St. John's) to Pouch Cove (in the north) and Bell Island (in Conception Bay). It also includes the provincial capital of St. John's. This area has the greatest population concentration in the province and the most diversified economy. It is home to the provincial government, a number of federal government departments and Memorial University, the largest university in Atlantic Canada. The region provides a wide variety of commercial and retail services, public and private educational institutions and manufacturers. Various public institutions provide the base of the province's research and development capacity. Most businesses engaged in the provincial offshore oil and gas industry are located in St. John's, Mount Pearl or Bay Bulls (NAREDB, 2009).

3.1.5 Summary

Information on the Study Regions (and associated economic development zones) is summarized in Table 3.1-2. The Table illustrates that many of these areas' economies are traditionally based on natural resource industries and more currently, tourism. However, the Study Regions also overlap with economic development zones that have more diversified economies.

Table 3.1-2: Characteristics of Economic Zones - Summary

Study Regions	Zones	Number of Communities	Key Economic Activities
Central and Southeastern Labrador	3	4	• Services to military training / mining industry • Aboriginal organizations and companies • Public and commercial services • Tourism
	4	11	• Fishery • Forestry • Natural resources • Tourism

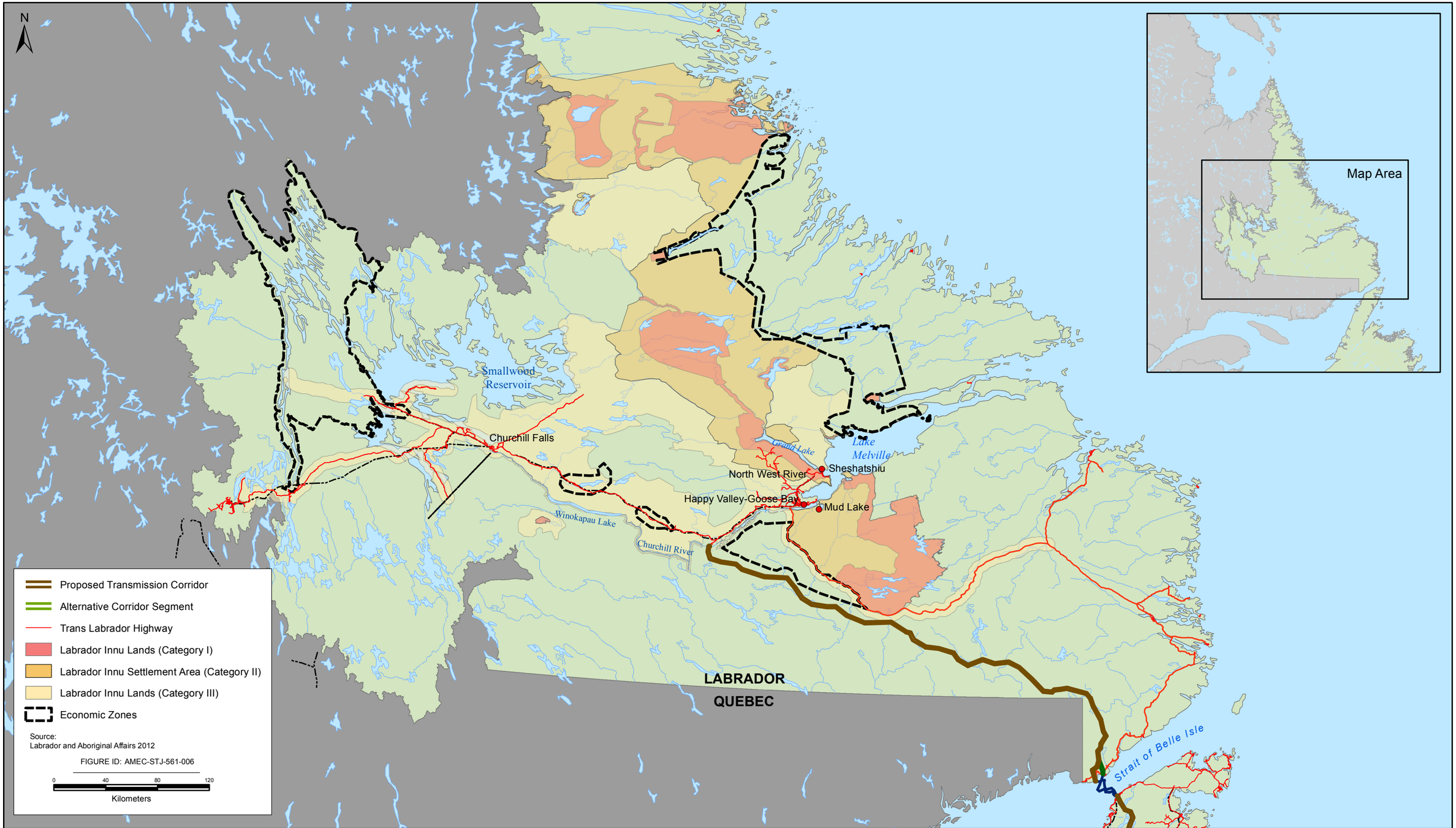
Study Regions	Zones	Number of Communities	Key Economic Activities
	5	8	• Fishery • Transportation / distribution • Public and commercial services • Agricultural (wild berry) products • Tourism
Northern Peninsula	6	36	• Fishery • Forestry • Public and commercial services • Natural resources • Tourism • Value-added forest products
	7	36	• Fishery • Tourism • Agriculture
	8	26	• Forestry • Tourism • Agriculture • Public and commercial services
Central and Eastern Newfoundland	11	42	• Forestry • Fishery • Mining • Public and commercial services • Manufacturing • Agriculture • Tourism
	12	16	• Forestry • Fishery • Mining • Public and commercial services • Aquaculture • Manufacturing • Agriculture • Tourism
	14	119	• Fishery • Manufacturing • Aerospace • Public and commercial services
	15	Approximately 100	• Fishery • Agriculture • Tourism • Manufacturing • Public and commercial services • Oil and gas (construction, refining, transportation)

Study Regions	Zones	Number of Communities	Key Economic Activities
Avalon Peninsula	17	68	• Fishery • Agriculture • Manufacturing • Tourism
	19	Approximately 20	• Public and commercial services • Government • Educational institutions • Oil and gas

nalcor energy

Figure 3.1-1

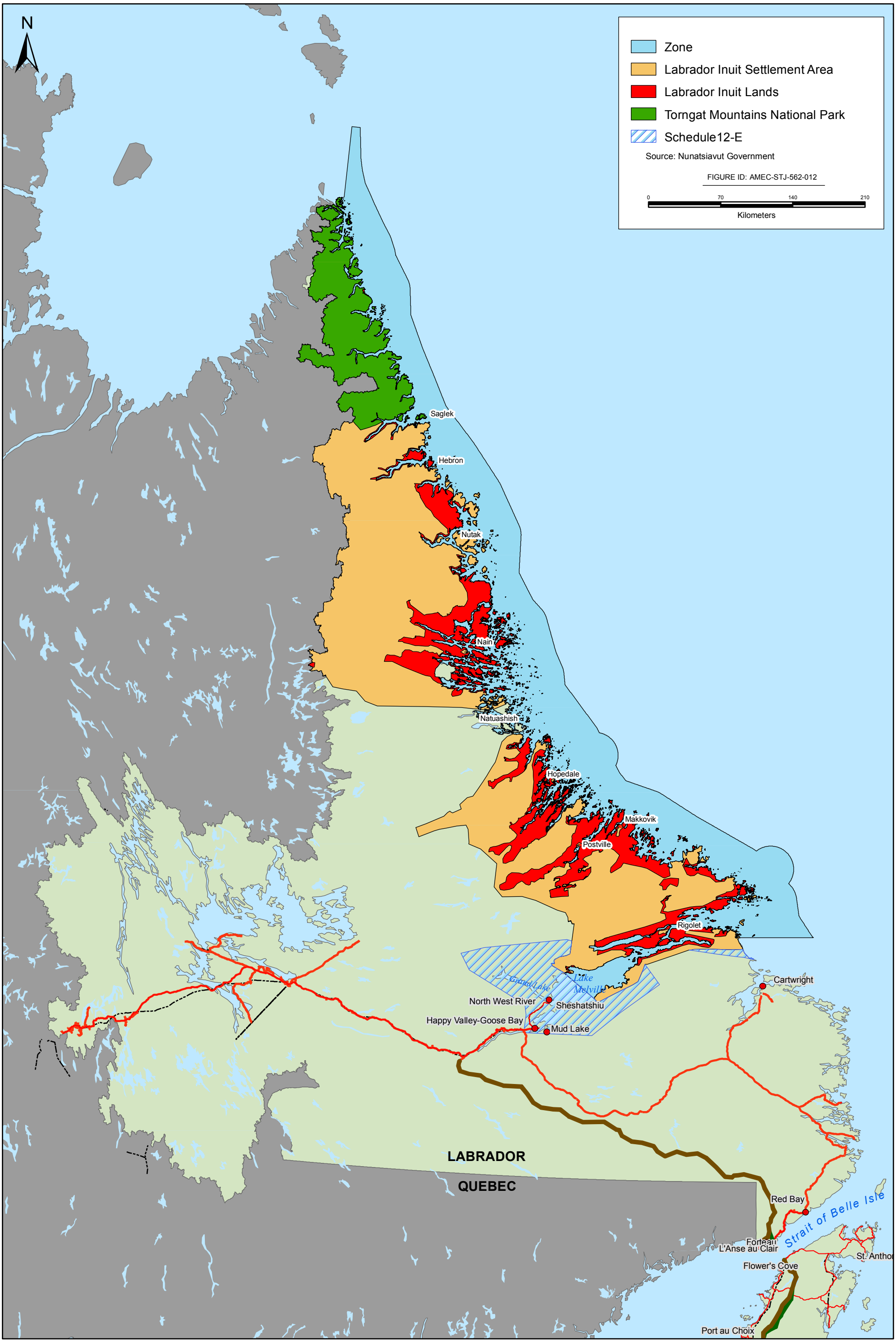
Aboriginal Communities in Labrador and Eastern Quebec



nalcor energy

Figure 3.1-2

Labrador Innu Land Claims: Selected Land Areas



nalcor energy

Figure 3.1-3

Area Covered by the Labrador Inuit Land Claims Agreement

4.0 RESULTS AND ANALYSIS

The following sections provide the detailed results of the study, including information and data for each of the various socioeconomic components and activities. Report sections, sub-sections and maps are organized by Study Region.

4.1 Communities

Newfoundland and Labrador communities have long experienced population shifts as residents seek opportunities beyond rural areas and outside of the province. However, the groundfish moratorium of the early 1990s accelerated outmigration and residents are now less likely than ever to pursue careers in the fishery. The population is also declining and ageing as a result of a dramatic reduction in birthrate since the 1960s. The strongest rate of outmigration is among those beginning careers or pursuing post secondary education. Young people who relocate for employment or higher education often do not return to small rural communities.

People of working age sometimes relocate their families out of rural areas. However, many residents continue the practice of maintaining families at home while working out-of-province in seafaring trades and more recently in commute work to oil and gas developments in northern Alberta.

Most individuals working in provincial oil and gas and spinoff industries are likely to live in the St. John's area. As a result, this sector has caused a high rate of development in the Northeast Avalon as well as smaller developments in Marystown, the head of Placentia Bay and Sunnyside, Trinity Bay. Thus, the populations of the Avalon Peninsula and Eastern Newfoundland are experiencing some population growth.

The province is also experiencing internal migration as people choose to live in larger centres for access to more comprehensive services (e.g., health, social, education, recreation and retail) or to be closer to other family members. Mid-sided towns are also experiencing growth resulting from centralization of government, commercial and retail services and corresponding employment opportunities. Also, many former residents that return to the province as retirees choose to live in regional and sub-regional service centres rather than smaller communities.

4.1.1 Study Area

The proposed transmission corridor extends over a distance of approximately 1,100 km, including various populated areas of Labrador and the Island of Newfoundland. The study focuses primarily on those communities and associated areas and infrastructure (e.g., drinking water supplies) that overlap with the proposed transmission corridor. Other communities located in alternative corridor segments and / or Regional Study Areas are also identified in the associated mapping and in Table 4.1-1.

4.1.2 Administrative Framework

In Newfoundland and Labrador, communities are managed in a variety of ways. The method of development control is primarily related to whether or not the community is an incorporated municipality under the *Municipalities Act, 1999*. There are approximately 282 incorporated municipalities (cities and towns) and 180 Local Service Districts (LSDs) organized to offer basic services. Additionally, a number of unorganized communities exist, which are defined as those that have no formal local government or public services but may

provide services informally.

The following paragraphs describe the various types of community boundaries but the subsequent analysis groups them together as "communities". This section uses the term drinking water supply to refer to identified protected and unprotected surface water supplies that are connected to communities but outside of designated community boundaries. It does not identify drinking water supplies (surface or groundwater sources) that are contained within municipal boundaries or municipal planning areas.

Municipal Boundaries and Municipal Planning Areas

Planning for and managing growth and development is mainly conducted by municipalities. Municipal plans and development regulations are legal documents prepared, adopted, implemented, enforced and amended by municipalities The Land Use Planning Section of Municipal Affairs has an administrative role in reviewing and registering planning documents prepared by, or on behalf of, municipalities in accordance with the *Urban and Rural Planning Act, 2000* (DMA, 2009).

Incorporated communities are defined by "municipal boundaries". Larger "municipal planning areas" may be designated to include land outside of, but controlled by, a municipality. Typically this protects amenities such as drinking water supplies. Development permits are required within the municipal boundary or municipal planning area as defined by the municipal plan. Areas inside municipal boundaries and planning areas are often Crown Land but the municipality must approve applications to occupy Crown Land.

Infilling Limits

Local Service Districts (LSDs) are not municipalities but designated areas outside of incorporated cities and towns. LSDs are established by the Department of Municipal Affairs (under the *Municipalities Act, 1999*, *Local Service District Regulations*) if desirable and proven by petition of the majority of householders in a community. LSDs are given the authority to elect a committee to administer services such as water supply, sewage management, garbage collection, street lighting, fire protection or animal control. All proposals by LSDs must be approved by the Department of Municipal Affairs.

Infilling limits are established by Land Management Division (LMD) of the Department of Environment and Conservation, in areas where there are no formal land use planning controls. This policy tool provides direction on the physical limits of community development growth. Municipal Affairs is consulted on proposals to establish or alter infill limits and provides non-binding recommendations to LMD on the basis of planning and local governance principles including availability of water and sewer services and waste management. LSDs do not have development control authority. However, Municipal Affairs may apply *Protected Road Zoning Regulations* (under the *Urban and Rural Planning Act, 2000*) which control development along roadways and access off of roadways.

Protected Road Zoning Regulations

Development in local service districts and unorganized communities may be controlled through the *Protected Road Zoning Regulations*. The area within the building control lines of a protected road can be designated as a protected road zoning area with a zoning plan. The purpose of the zoning plan is systematic and orderly development of the protected road zoning area, with an emphasis on public convenience and general welfare, economic use of land, traffic facility, transportation, sewage disposal, water supply, recreation or other public

requirements. As with municipal plans, protected road zoning plans are subject to review every five years and plans may be amended.

A permit is required for any development along a protected road and can be obtained from the local Government Service Centre of the provincial Department of Government Services. The development application is reviewed to ensure that it complies with the requirements of the *Protected Road Zoning Regulations* and any protected road zoning plan. Relevant government departments, agencies, officials and persons are consulted about proposed development.

Drinking Water Supplies

In Newfoundland and Labrador, drinking water supplies may be designated and protected under the authority of the *Water Resources Act, 2002* and relevant municipalities apply for the designation. The majority of surface water supplies in the province have been designated as protected, and most of the population receives its drinking water from protected sources. Other drinking water supplies are pending protected designation.

Under the *Act*, water sources are designated and protected as either: "protected public water supply areas", also known as surface water supplies, or "protected wellheads", also known as ground water supplies. An area around a drinking water supply can be designated as a protected area and use of the water body and the protected land area may be regulated. In designated areas, buffer zones (between 30 and 150 m) must be maintained around such drinking water supplies (DEC, 2002a).

Any existing or proposed development within a protected water supply area is subject to the *Policy for Land and Water Related Developments in Protected Public Water Supply Areas*. The policy identifies activities that are not permitted in protected water supply areas and activities that may be permitted by the Department of Environment and Conservation. Subject to approval of the Department, development activities (including stream crossings and power and telecommunication transmission lines) may be permitted in protected water supply areas. Proponents must submit a detailed development plan to the Department for any proposed activity within a protected water supply area. If issued a certificate of approval contains specific terms and conditions.

4.1.3 Information Sources

Information on communities was gathered from provincial legislation and associated information sources. Information on municipal planning was found on the Department of Municipal Affairs' website. The Provincial Land Use Atlas is an important source of information on communities and other land use in the province. The Atlas was obtained from the Province in electronic format and used to identify municipal boundaries, municipal planning areas, infilling limits and protected road buffers. The Land Use Atlas is continuously being updated, but is not always up-to-date. For this reason, relevant departments were also asked to provide current data that might not yet be included in the Atlas.

For this report section, the Department of Municipal Affairs provided October 2009 data on communities and this included points and polygons to identify community locations, municipal boundaries, municipal planning areas, infilling limits and protected roads boundaries. Most communities have one or more of these boundaries and all communities are also represented by a point that shows general location. Both types of data are shown in the accompanying figures. When viewing these maps, it is important to note that while part of a community boundary may be within the proposed transmission corridor, alternative corridor segment or Regional Study Area, the location point may not. Therefore, the tables provide the clearest information regarding those

communities for which a portion of the boundary is within a Study Area.

Statistics Canada conducts Census counts of each home in Canada every five years. It is sometimes difficult to determine the exact population of small communities as these statistics may be amalgamated for privacy purposes. However, Statistics Canada is still the best source of information on population and 2006 Census data is used in this study.

Information on drinking water supplies came from the Department of Environment and Conservation, Water Resources Division. The daily updated data, which is provided in GIS ready format on the Department's website, identifies water supplies that are or may be used by communities for drinking water. This data (extracted in October 2009) was used to identify drinking water supplies that are outside of community boundaries but within the proposed transmission corridor.

4.1.4 Communities

In this report, the term "community" refers to areas within various types of boundaries established by provincial government (i.e., municipal boundary, municipal planning area, infilling limits and protected roads). The following sections focus mainly on communities and drinking water supplies (that extend outside of community boundaries) - that are crossed by the proposed transmission corridor (Figures 4.1-1 to 4.1-4). However, Table 4.1-1 also provides an overview of the number of communities and public watersheds that are within the various other Study Areas.

Table 4.1-1: Communities and Public Water Supplies in Study Areas

Study Regions	Number of Communities			Number of Drinking Water Supplies		
	Proposed Transmission Corridor	**Alternative Corridor Segments**	**Regional Study Area (15 km)**	**Proposed Transmission Corridor**	**Alternative Corridor Segments**	**Regional Study Area (15 km)**
Central and Southeastern Labrador	2	3	4	2	1	3
Northern Peninsula	3	0	8	4	1	9
Central and Eastern Newfoundland	11	0	21	7	0	19
Avalon Peninsula	6	2	13	4	3	8
Total	**22**	**5**	**46**	**17**	**5**	**39**

Source: DF-ES, 2010; DMA, 2009a; DEC-WR, 2009

Central and Southeastern Labrador

In Central and Southeastern Labrador, the proposed transmission corridor passes through the Labrador Straits where a cluster of communities exists near the Quebec border. The corridor crosses portions of the Towns of Forteau and L'Anse au Loup and the drinking water supplies of L'Anse Amour and L'Anse au Loup (Figure 4.1-1).

Table 4.1-2 identifies those communities on the Labrador side of the Strait of Belle Isle where a portion of the community boundary or drinking water supplies (where it is located outside of the community boundary) are located within the proposed transmission corridor.

Table 4.1-2: Central and Southeastern Labrador Communities in the Proposed Transmission Corridor

Central and Southeastern Labrador Communities	Type	2006 Population	Communities in the Proposed Transmission Corridor	Drinking Water Supplies in Proposed Transmission Corridor
L'Anse au Loup	Municipality (Town)	593	●	●
Forteau	Municipality (Town)	448	●	–
L'Anse Amour	Unorganized Community	8	–	●

Legend: ● Means element exists within proposed transmission corridor, - Means it does not.
Source: DF-ES, 2010; DMA, 2009a; DEC-WR, 2009

Northern Peninsula

The proposed transmission corridor crosses the Strait of Belle Isle and makes landfall on the northwestern side of the Island's Northern Peninsula. A cluster of communities exists in this area. Portions of both the community boundaries and drinking water supplies of Savage Cove-Sandy Cove, Flower's Cove and Nameless Cove are located within the proposed transmission corridor (Figure 4.1-2). Portions of the drinking water supply of the Town of Hawke's Bay are also within the corridor.

Table 4.1-3 shows Northern Peninsula communities where a portion of the community boundary or drinking water supply overlaps with the proposed transmission corridor.

Table 4.1-3: Northern Peninsula Communities in the Proposed Transmission Corridor

Northern Peninsula Communities	Type	2006 Population	Communities in the Proposed Transmission Corridor	Drinking Water Supplies in the Proposed Transmission Corridor
Savage Cove-Sandy Cove	Unorganized Community	>663	●	●

Northern Peninsula Communities	Type	2006 Population	Communities in the Proposed Transmission Corridor	Drinking Water Supplies in the Proposed Transmission Corridor
Nameless Cove	Local Service District	80	●	●
Flower's Cove	Municipality (Town)	270	●	●
Hawke's Bay	Municipality (Town)	391	–	●

Legend: ● Means element exists within the proposed transmission corridor, - Means it does not.
*Sandy Cove and Savage Cove are included in Unorganized CSD 9C, Savage Cove to Green Island Cove which has a total population of 663.
Source: DF-ES, 2010; DMA, 2009a; DEC-WR, 2009

Central and Eastern Newfoundland

The proposed transmission corridor crosses portions of the community boundaries of Grand Falls-Windsor, Port Blandford, Clarenville, Goobies, Chance Cove, Come by Chance, Sunnyside, Arnold's Cove, Southern Harbour, Norman's Cove-Long Cove and Chapel Arm (Figure 4.1-3). The corridor also crosses the drinking water supplies of Gander, Clarenville, Port Blandford, Arnold's Cove, Chapel Arm, Southern Harbour and Norman's Cove-Long Cove. A higher number of communities exist in Eastern Newfoundland and it is for this reason and the narrowness of the Isthmus of the Avalon Peninsula that a larger number of communities and drinking water supplies fall within the proposed transmission corridor. Beginning in the Clarenville area, the corridor follows the existing transmission line, the TCH, Route 1 and the T'Railway meaning that these areas are already crossed by linear corridors.

Table 4.1-4 illustrates those Central and Eastern Newfoundland communities where portions of the community boundary or drinking water supplies are within the proposed transmission corridor.

Table 4.1-4: Central and Eastern Newfoundland Communities in the Proposed Transmission Corridor

Central and Eastern Newfoundland Communities	Type	2006 Population	Communities in the Proposed Transmission Corridor	Drinking Water Supplies in the Proposed Transmission Corridor
Grand Falls-Windsor	Municipality (Town)	13,558	●	–
Gander	Municipality (Town)	9,951	–	●
Port Blandford	Municipality (Town)	521	●	●

Central and Eastern Newfoundland Communities	Type	2006 Population	Communities in the Proposed Transmission Corridor	Drinking Water Supplies in the Proposed Transmission Corridor
Clarenville	Municipality (Town)	5,274	●	●
Goobies	Local Service District	97	●	–
Chance Cove	Municipality (Town)	310	●	–
Come By Chance	Municipality (Town)	260	●	–
Sunnyside	Municipality (Town)	470	●	–
Arnold's Cove	Municipality (Town)	1,003	●	●
Southern Harbour	Municipality (Town)	474	●	●
Norman's Cove-Long Cove	Municipality (Town)	773	●	●
Chapel Arm	Municipality (Town)	451	●	●

Legend: ● Means element exists within the proposed transmission corridor, – Means it does not.
Source: DF-ES, 2010; DMA, 2009a; DEC-WR, 2009

Avalon Peninsula

The Avalon Peninsula is the most populous area of the province and has a large number of communities in close proximity to one another. The proposed transmission corridor is close to the TCH, the T'Railway and the existing transmission line and near the coastlines of Trinity Bay and Conception Bay North. Portions of the community boundaries of six communities (Whitbourne, Blaketown, Brigus Junction, Avondale, Holyrood and Harbour Main-Chapel's Cove-Lakeview) are crossed by the proposed transmission corridor (Figure 4.1-4). The corridor also crosses the drinking water supplies of the communities of Whitbourne, Avondale, Harbour Main-Chapel's Cove-Lakeview and St. John's (Table 4.1-5).

Table 4.1-5: Avalon Peninsula Communities in the Proposed Transmission Corridor

Avalon Peninsula Communities	Type	2006 Population	Communities in Proposed Transmission Corridor	Drinking Water Supplies in Proposed Transmission Corridor
Whitbourne	Municipality (Town)	855	●	●
Blaketown	Local Service District	547	●	–
Brigus Junction	Unorganized Community	142	●	–
Avondale	Municipality (Town)	667	●	●
Harbour Main-Chapel's Cove-Lakeview	Municipality (Town)	1,090	●	●
Holyrood	Municipality (Town)	2,005	●	–
St. John's	Municipality (City)	100,646	–	●

Legend: ● Means element exists within proposed transmission corridor, – Means it does not.
Source: DF-ES, 2010; DMA, 2009a; DEC-WR, 2009

4.1.5 Summary

Portions of 22 communities and 17 drinking water supplies (and in most cases for the same communities) crossed by the proposed transmission corridor are located in all Study Regions. Many of these areas are rural but the corridor also crosses through regions where populations are more heavily concentrated. These tend to be in Eastern Newfoundland and on the Avalon Peninsula.

ID	Community
1	L'Anse au Loup
2	L'Anse Amour
3	Forteau
4	L'Anse au Clair

N

Pinware
West St. Modeste
Capstan Island
Strait of Belle Isle
1
2
3
4
Grand Lake
Lake Melville
Sheshatshiu
North West River
Happy Valley-Goose Bay
Mud Lake
Cartwright
Black Tickle - Domino
Norman Bay
Charlottetown
Port Hope Simpson
Mary's Harbour
Red Bay
West St. Modeste
L'Anse Amour
L'Anse au Loup
Forteau
L'Anse au Clair
St. Anthony
Strait of Belle Isle
Trans Labrador Highway
Central and Southeastern Labrador
LABRADOR
QUEBEC

Proposed Transmission Corridor
Alternative Corridor Segment
Communities within Regional Study Area
Other Select Communities
Community Boundary within Transmission Corridor
Community Boundary within Regional Study Area
Drinking Water Supply intersecting with Corridor
Drinking Water Supply within Regional Study Area
Highways and Other Roads
Existing Transmission Line(s)

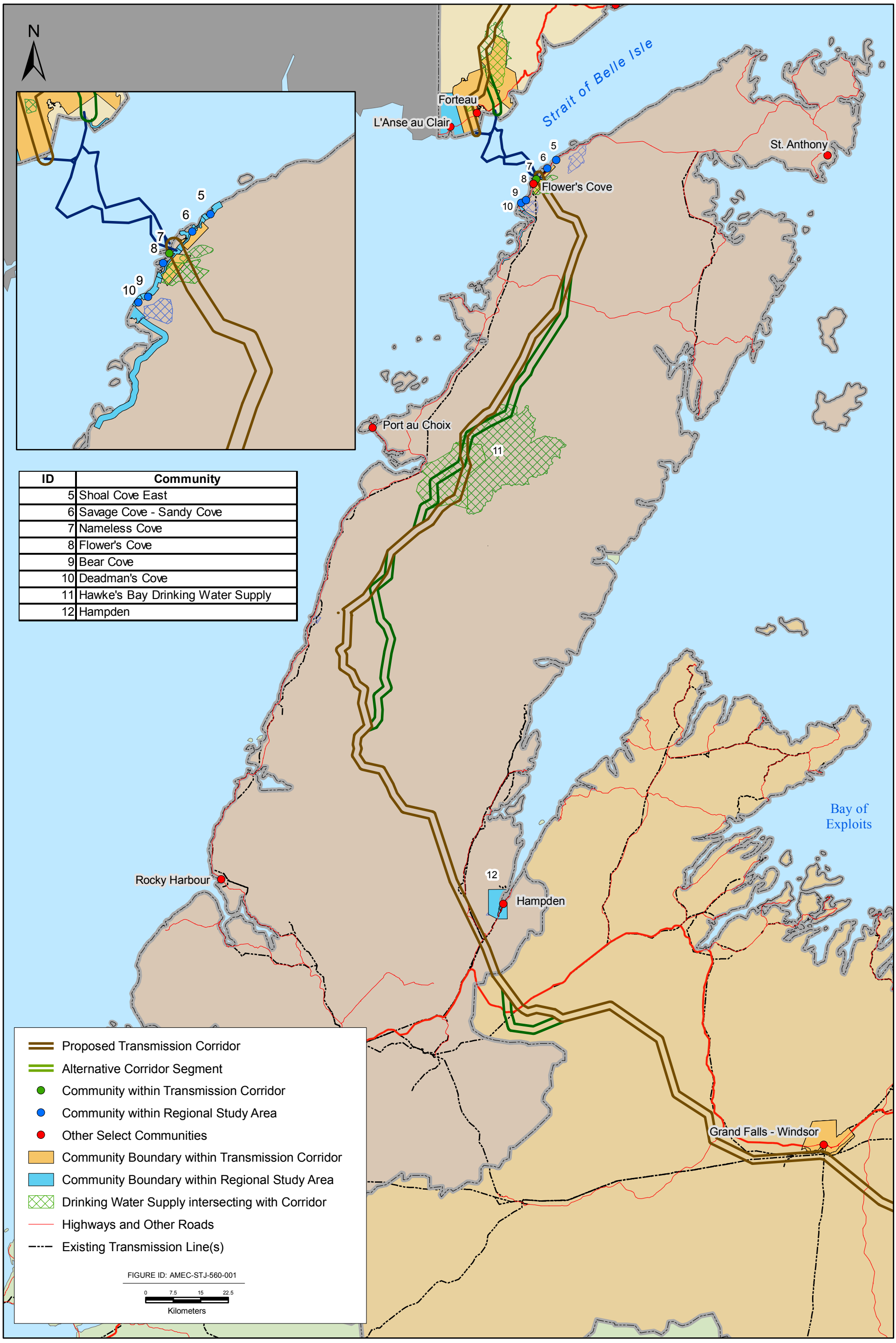
AMEC-STJ-561-002

0 25 50 75
Kilometers

nalcor energy

Figure 4.1-1

Communities - Central and Southeastern Labrador

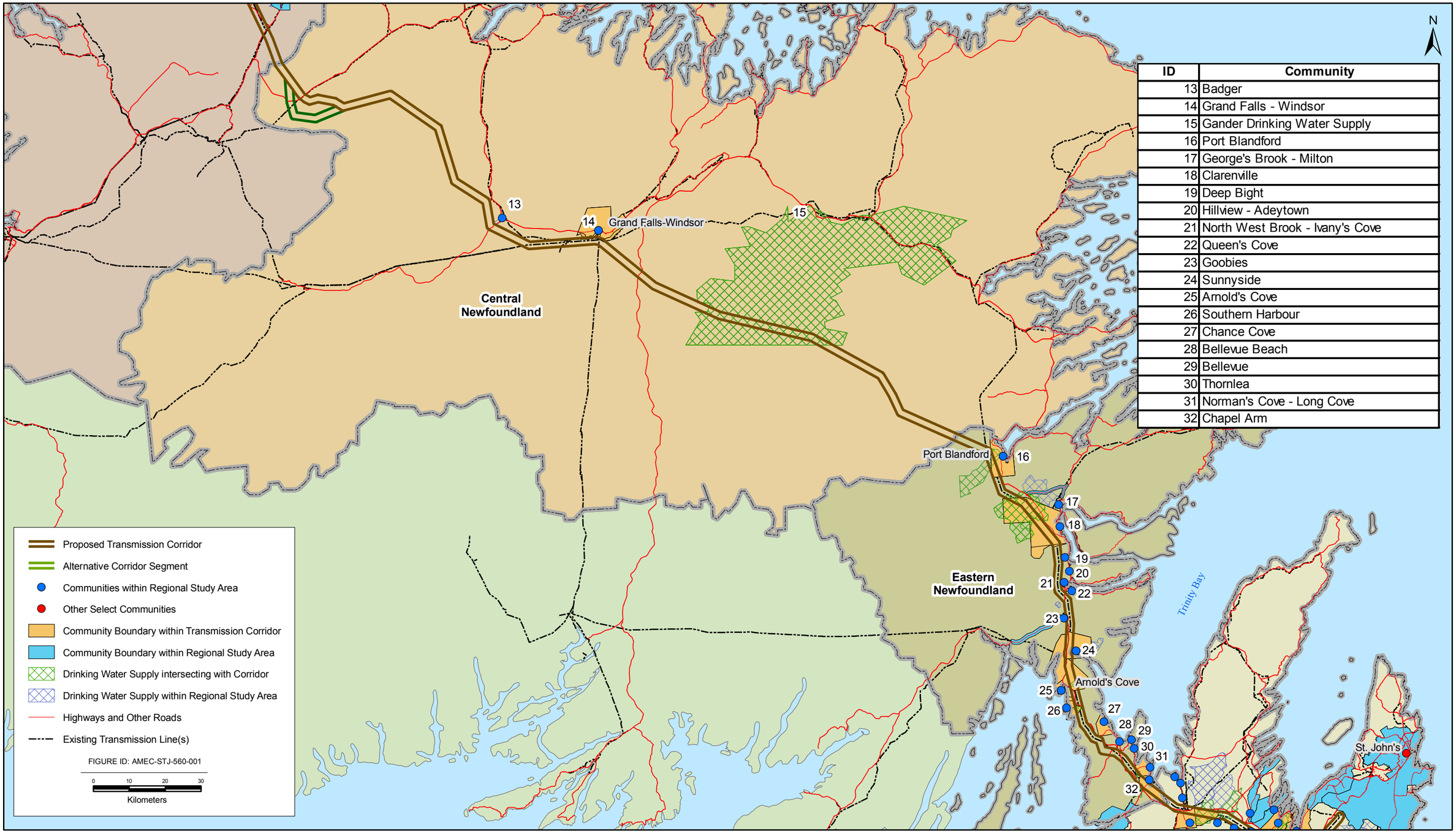


ID	Community
5	Shoal Cove East
6	Savage Cove - Sandy Cove
7	Nameless Cove
8	Flower's Cove
9	Bear Cove
10	Deadman's Cove
11	Hawke's Bay Drinking Water Supply
12	Hampden

nalcor energy

Figure 4.1-2

Communities - Northern Peninsula



ID	Community
13	Badger
14	Grand Falls - Windsor
15	Gander Drinking Water Supply
16	Port Blandford
17	George's Brook - Milton
18	Clarenville
19	Deep Bight
20	Hillview - Adeytown
21	North West Brook - Ivany's Cove
22	Queen's Cove
23	Goobies
24	Sunnyside
25	Arnold's Cove
26	Southern Harbour
27	Chance Cove
28	Bellevue Beach
29	Bellevue
30	Thornlea
31	Norman's Cove - Long Cove
32	Chapel Arm

nalcor energy

Figure 4.1-3

Communities - Central and Eastern Newfoundland

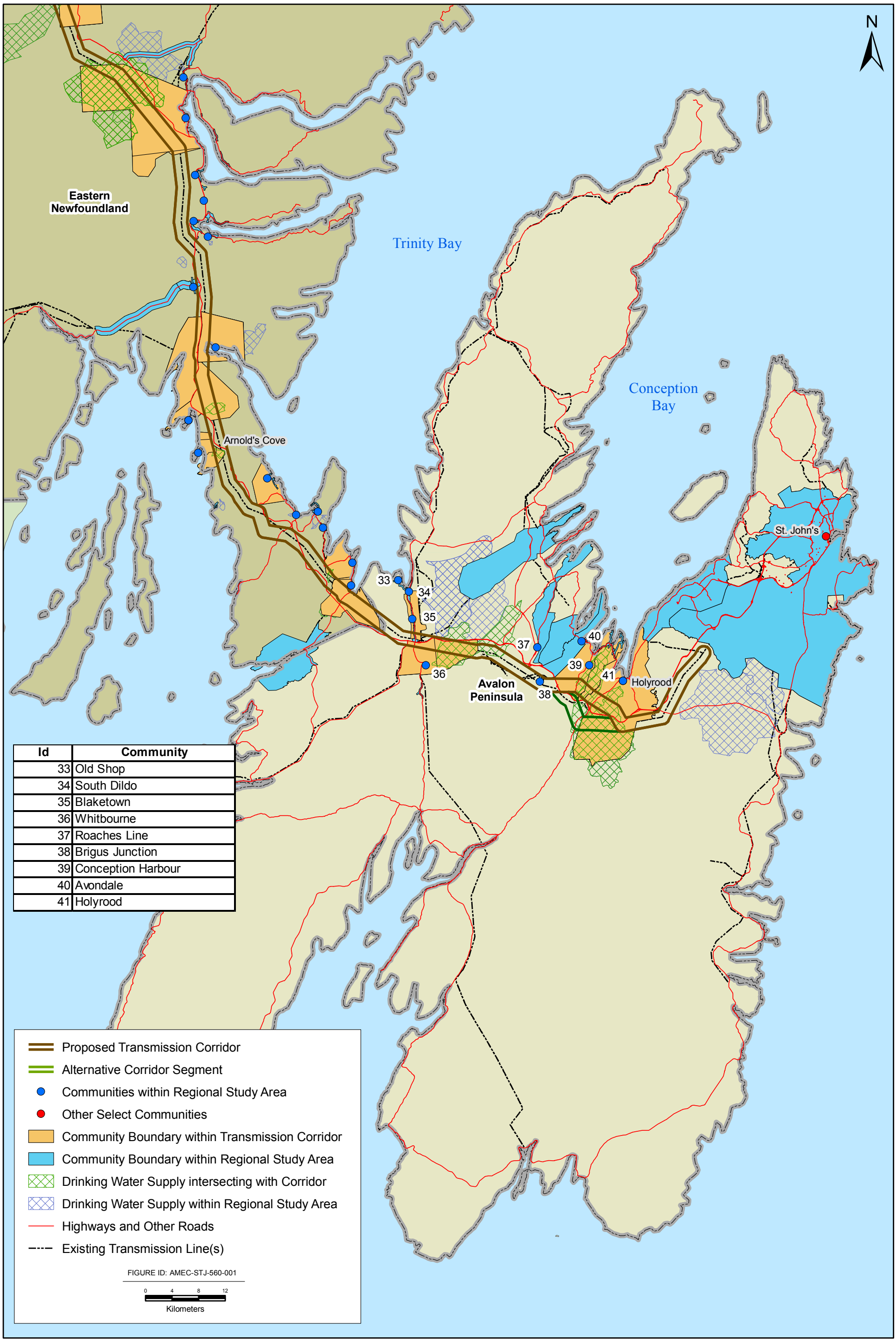


Figure 4.1-4

Communities - Avalon Peninsula

4.2 Transportation

The proposed transmission corridor intersects with existing transportation infrastructure and activities - roads, air facilities, a military flight training area in Central Labrador and marine traffic areas in the Strait of Belle Isle between southern Labrador and northern Newfoundland. These are discussed and illustrated in this section.

4.2.1 Study Area

The Study Area for roads focuses on those that cross the proposed transmission corridor. While no air facilities are located directly within the corridor, air facilities are located within the Regional Study Area (15 km wide). The marine transportation Study Area is limited to the Strait of Belle Isle. The associated maps identify roads that are crossed by the proposed transmission corridor or in the Regional Study Area; air facilities in the Regional Study Area and marine traffic features in the Strait of Belle Isle.

4.2.2 Administrative Framework

Through the *Works, Services and Transportation Act*, the Department of Transportation and Works manages the provincial road system. The province has over 9,000 km of primary and secondary highways and community access roads. The Road and Air Transportation Branch manages the provincial road system including design, construction, signage, maintenance, snow clearing and ice control (DTW, 2009). Transport Canada provides funding to assist provincial and territorial governments to improve the safety and efficiency of the national highway system (Transport Canada, 2010).

Airports, heliports and aerodromes are regulated under the *Canadian Aviation Regulations Part III*. Regulations include safety systems, as well as emergency planning and response. Under Canada's *National Airports Policy*, the National Airport System (NAS) includes all airports in national, provincial and territorial capitals as well as airports that have annual passenger traffic exceeding 200,000. Gander and St. John's International Airports are included in Transport Canada's National Airport System (NAS) meaning that they are nationally significant. As part of the NAS, these airports are owned by Transport Canada and operated by local airport authorities. Churchill Falls, Deer Lake, Goose Bay, Stephenville, St. Anthony and Wabush airports are classified as Regional / Local airports meaning that they serve local areas and provide connections to larger airports and systems (Transport Canada, 1994; Transport Canada, 2009).

Most of the remaining airports in the province are operated by the provincial government, airport authorities or federal government agencies. However, several are operated by other agencies such as private companies, a municipality and a provincial crown corporation. All but two offer public landing services (DTW, 2010a; DTW, 2009b).

Harbours in the province are under federal jurisdiction through Canada's *Navigable Waters Protection Act* and *Fishing and Recreational Harbours Act* (DFO, 1977-78; Transport Canada, 1985). Fisheries and Oceans Canada (DFO), through Canadian Coast Guard Marine Communications and Traffic Services (MCTS) provides communications and traffic management services in Canadian ports.

Under the *Canada Shipping Act*, the federal government is responsible for establishing, monitoring and enforcing marine traffic and vessel regulations and procedures (Transport Canada, 2001). Associated regulations govern all vessel activities in Vessel Traffic Services (VTS) Zones. The Canadian Coast Guard (CCG) has established a voluntary VTS Zone in the Strait of Belle Isle. CCG's MCTS at St. Anthony monitors vessel traffic in the Strait of

Belle Isle through visual surveillance and direct VHF radio communications. The MCTS also transfers information to and from remote sites at St. Anthony, Conche, Comfort Cove, L'Anse aux Meadows, Fox Harbour (Labrador) and Twillingate (CCG, 2010).

4.2.3 Information Sources

Information on provincial roads was gathered from Department of Transportation and Works and Transport Canada websites.

Regulations governing Canadian airports were obtained from Transport Canada's policies and regulations. Locations, ownership and management of airports, heliports and aerodromes were confirmed by the Department of Transportation and Works. Strait Air provided the latitude and longitude data for the locations of two private airstrips: one in Southeastern Labrador and one on the Northern Peninsula. Commercial passenger services information was confirmed using the various air carriers' websites.

Information on ports in the province was obtained from Transport Canada, CCG and the relevant acts listed above. DFO's website also provided information on MCTS and harbour authorities. Specific information on the vessel traffic services zone in the Strait of Belle Isle was obtained from Canadian Hydrographic Service.

4.2.4 Roads

The province of Newfoundland and Labrador has an extensive road and highway network. Route 1, the TCH, runs approximately 900 km from Port aux Basques to St. John's. Route 1 and all highways on the Island of Newfoundland are paved with the exception of some short gravel roads in rural areas.

In Labrador, Route 510 is paved from L'Anse au Clair to Red Bay and maintenance grade gravel surface from Red Bay to Cartwright and on to Happy Valley-Goose Bay. Route 500 from Happy Valley-Goose Bay to Labrador West is currently being surfaced with an estimated completion date of 2013 (DTW, 2009).

The transmission corridor crosses land already dissected by roads in both Labrador and on the Island of Newfoundland. Table 4.2-1 shows roads crossed by the proposed transmission corridor, alternative corridor segments and the Regional Study Area (15 km wide). These include Route 510 in Central and Southeastern Labrador, the TCH (Route 1) from western to eastern Newfoundland and various secondary and municipal roads (Figures 4.2-1 to 4.2-4). The following sections highlight those roads crossed by the proposed transmission corridor, alternative corridor segments and Regional Study Areas.

Table 4.2-1: Roads in Study Areas

Study Regions	Roads		
	Proposed Transmission Corridor	**Alternative Corridor Segments**	**Regional Study Area (15 km)**
Central and Southeastern Labrador	Route 510	Route 510	Routes 500, 510
Northern Peninsula	Routes 420, 430, 432	Route 432	Routes 1, 420,

Study Regions	Roads		
	Proposed Transmission Corridor	**Alternative Corridor Segments**	**Regional Study Area (15 km)**
			421, 430, 432
Central and Eastern Newfoundland	Routes 1, 201, 203, 210, 360, 370	Route 1	Routes 1, 201, 202, 203, 204, 205, 210, 230, 230-A, 231, 233, 360, 370
Avalon Peninsula	Routes 1, 13, 63, 80, 81, 90, 100	Routes 1 and 90	Routes 1, 13, 60, 61, 62, 63, 70, 71, 80, 81, 90, 100

Source: DEC-L, 2009a

Central and Southeastern Labrador

Route 510 begins in the Labrador Straits, and the TLH now connects to Cartwright and on to Happy Valley-Goose Bay. The proposed transmission corridor begins southwest of Happy Valley-Goose Bay and heads in a southeastward direction (Figure 4.2-1). The two intersect in the Straits area near Forteau.

Northern Peninsula

The proposed transmission corridor crosses the Strait of Belle Isle and makes landfall on the Northern Peninsula (Figure 4.2-2). Route 430 is the main highway between St. Anthony / Goose Cove and Deer Lake. Route 432 runs east to west across the Peninsula from Plum Point to Main Brook and connects to St. Anthony, Roddickton and Englee. Both these paved two-lane highways are crossed by the proposed transmission corridor. Route 420 (south of White Bay) is also crossed by it.

Central and Eastern Newfoundland

The proposed transmission corridor heads east through Central and Eastern Newfoundland, crossing the TCH, Route 1 in the Sandy Lake / Birchy Lake area (Figure 4.2-3). Route 370 (Badger to Buchans) and Route 360 (Bay d'Espoir Highway) southeast of Bishop's Falls are also crossed by the transmission corridor. The corridor follows the TCH, Route 1 and crosses it in various places from Port Blandford to Goobies. The corridor crosses Route 210 near Goobies. In the narrow Isthmus of the Avalon (approximately 3 km at its narrowest), Route 201 at Bellevue and Chapel Arm, Trinity Bay as well as Route 203 at Fair Haven, Placentia Bay are crossed by the corridor.

Avalon Peninsula

The Avalon Peninsula is the most populated area of the province and has many communities and roads (Figure 4.2-4). The proposed transmission corridor crosses the following roads: Route 1, Route 100 (Argentia) Route 80

(Blaketown) and Route 81 (Whitbourne) near their confluence at Whitbourne; TCH, Route 1 near Brigus Junction; Route 63 at Avondale; Route 90 near Holyrood; TCH, Route 1 between Holyrood and Witless Bay Line; and Route 13, Witless Bay Line.

4.2.5 Other Access and Resource Roads

Forestry access roads (sub-base material grade) exist throughout the province but are most extensive on the Northern Peninsula and in Central and Eastern Newfoundland where the economies have been based on forestry, lumber and paper industries. Forest access roads are also used for mineral exploration and non-industrial activities such as hunting, fishing, domestic wood cutting, berry picking and operating motorized recreational vehicles. Forest access roads are described and shown in Section 4.10 and illustrated in detail in Appendix C.

4.2.6 Air Facilities

The province has eight airports located at Wabush, Churchill Falls, Goose Bay, St. Anthony, Stephenville, Deer Lake, Gander and St. John's. Residents of the Labrador Straits are also served by an airport in Blanc Sablon, Quebec. The province maintains a series of 13 air strips that provide commercial landings in coastal Labrador communities. Eight landing strips, with no scheduled services, are also maintained by the provincial government on the Island of Newfoundland. In addition, the province has five heliports and seven aerodromes. A Designated Flight Training Area (international military flight training) is located near Happy Valley-Goose Bay. (Letto, R., 2009; DTW 2010a; DTW 2009b; Provincial Airlines, 2010; Air Labrador, 2010; Air Canada, 2010).

Table 4.2-2 shows air facilities in the Study Areas – none are located within the proposed transmission corridor and none are located in the Regional Study Area on the Northern Peninsula or on the Avalon Peninsula. The following sections describe air facilities located in an alternative corridor segment and the Regional Study Area (15 km) in Central and Southeastern Labrador and in Central and Eastern Newfoundland. These are illustrated in Figures 4.2-1 to 4.2-4.

Table 4.2-2: Air Facilities in Study Areas

Study Region	**Air Facilities**		
	Proposed Transmission Corridor	**Alternative Corridor Segments**	**Regional Study Area (15 km)**
Central and Southeastern Labrador	–	Straits Air, L'Anse Amour	Straits Air, L'Anse Amour
Northern Peninsula	–	–	–
Central and Eastern Newfoundland	–	–	Grand Falls-Windsor Heliport, Thorburn Lake Aerodrome

Study Region	Air Facilities		
	Proposed Transmission Corridor	**Alternative Corridor Segments**	**Regional Study Area (15 km)**
Avalon Peninsula	_	_	_

Source: DTW, 2010a, DTW, 2009b

Central and Southeastern Labrador

No air facilities are within the proposed transmission corridor but a private air strip near L'Anse Amour (owned by Strait Air of Sandy Cove on the Northern Peninsula) is located within the alternative corridor segment and therefore the Regional Study Area (Figure 4.2-1 and Appendix B).

Northern Peninsula

There are several air facilities on the Northern Peninsula but none are within the proposed transmission corridor, alternative corridor segments or Regional Study Area (Figure 4.2-2).

Central and Eastern Newfoundland

The Grand Falls-Windsor Heliport and the Thorburn Lake Aerodrome are located within the Regional Study Area (Figure 4.2-3).

Table 4.2-3 provides information on the Central and Eastern Newfoundland air facilities.

Table 4.2-3: Central and Eastern Newfoundland Air Facilities in the Regional Study Area

Location	Facilities	Usage	Owner / Operator
Grand Falls-Windsor	Grand Falls-Windsor Heliport	Public	Town of Grand Falls - Windsor
Thorburn Lake	Thorburn Lake Water Aerodrome	Private	Clarenville Aviation Limited and Thorburn Aviation Limited

Source: DTW, 2010a, DTW, 2009b

Avalon Peninsula

No air facilities are located within the proposed transmission corridor, alternative corridor segment or Regional Study Area on the Avalon Peninsula (Figure 4.2-4).

4.2.7 Military Flight Training in Labrador

CFB Goose Bay has been home to foreign military flight training since the 1950s when the British Royal Air Force (RAF) began training Vulcan bomber crews at the facility. Since then, Allied military units including the German Air Force (GAF), Royal Netherlands Air Force (RNLAF), US Air Force (USAF), and the Italian Air Force (IAF) have worked with the Canadian government to train personnel at Goose Bay.

Allied activity has decreased significantly since 2001. In 2002, the RAF reduced the number of rotating personnel. The IAF reduced flying schedules during the 2004 and 2005 seasons. The RNLAF ceased operations at Goose Bay in 2004. The GAF announced in 2004 that it would be divesting itself of all foreign military assets, including its interests in Goose Bay. Also in 2004, the RAF discontinued its permanent detachment and did not train at Goose Bay during the 2005 season. While the IAF and the GAF continued to train at Goose Bay in the 2005 season, their flying schedules were considerably reduced and operations closed completely by 2006 (Gardner Pinfold, 2009). Activity has continued to decrease and though upgrades to the facility are ongoing, no military flight training occurred at Goose Bay in 2010 (Labradorian, 2010).

The designated flight training area (DFTA) begins at Happy Valley-Goose Bay and covers an area that extends south, west and north and into the province of Quebec (Figure 4.2-5). DND Flying Orders include minimum altitudes of between 100’ and 500’ for this area. Where the proposed transmission corridor crosses the DFTA, minimum altitudes are 100’. However, DND maintains a minimum altitude of 500’ around existing power structures at Churchill Falls (DND, 2010).

4.2.8 Strait of Belle Isle Marine Traffic

Through its Small Craft Harbours program, DFO and 208 volunteer harbour authorities operate approximately 227 ports in Newfoundland and Labrador. On the Labrador side of the Strait of Belle Isle, volunteer authorities operate harbour facilities at L'Anse au Loup, Forteau and L'Anse au Clair (Figure 4.2-6). On the Northern Peninsula, similar authorities manage activities at Eddie's Cove East, Green Island Brook, Green Island Cove, Sandy Cove, Savage Cove, Flower's Cove, Anchor Point and Forrester's Point (DFO, 2010).

Canadian Coast Guard’s (CCG) Marine Communications and Traffic Services (MCTS) regulates vessel traffic, provides broadcasts to mariners (e.g., weather or navigational hazards) and manages marine distress and safety communications. In Newfoundland and Labrador, regulated Vessel Traffic Service (VTS) zones have been established in St. John’s, Placentia Bay, Port aux Basques and the Strait of Belle Isle. Vessel reporting is mandatory in all of these VTS zones with the exception of the Strait of Belle Isle where mariners may, but are not required to, report to St. Anthony MCTS (CCG, 2010). The Strait of Belle Isle VTS zone is shown in Figure 4.2-6 (CHS, 2009).

During ice-free periods (April to January), shipping vessels (i.e., bulk carriers, container ships and tankers) traveling to and from the Atlantic Ocean and the St. Lawrence River and Seaway, fishing vessels from ports on both sides of the Strait of Belle Isle and recreational craft (motor and sail) from within and outside of the province use the Strait of Belle Isle. These vessels pass through designated shipping lanes monitored by the CCG at St. Anthony. As vessel operators are not required to report, existing data only partially represents current traffic (Warren, L., 2010).

Table 4.2-4 shows annual reported Strait of Belle Isle vessel traffic for 2008, 2009 and part of 2010. The majority of vessels that report to MCTS St. Anthony are cargo and container ships (CCG, 2010a). Note that the data record tankers as being either under or over 50,000 tons deadweight (DWT).

Table 4.2-4: Annual Vessel Traffic in the Strait of Belle Isle (2008-2010)

Year (Month)	Vessel Types	Inbound	Out Bound	Transiting	In / Out Zone	Total
2008 (January –December)	Tanker <50,000 DWT	6	6	79	5	96
	Tanker >50,000 DWT	0	0	0	0	0
	Chemical Tanker	0	0	0	0	0
	Cargo - General	0	2	155	0	157
	Cargo - Bulk	1	2	227	0	230
	Container	1	0	190	0	191
	Tug	0	0	9	0	9
	Tug with Tow	0	1	26	10	37
	Government	5	7	29	13	52
	Fishing	1	1	37	0	39
	Passenger	3	7	10	3	23
	Other Vessels (>20 m)	1	0	3	1	5
	Vessels (<20 m)	0	0	1	0	1
	Total	**18**	**26**	**766**	**32**	**842**
2009 (January –December)	Tanker <50,000 DWT	1	1	89	4	95
	Tanker >50,000 DWT	0	0	3	0	3
	Chemical Tanker	0	0	1	0	1
	Cargo - General	1	0	105	0	106
	Cargo - Bulk	1	1	214	0	216
	Container	1	1	148	0	150
	Tug	0	1	5	0	6
	Tug with Tow	0	1	29	2	32
	Government	5	5	21	8	39
	Fishing	0	0	39	0	39
	Passenger	5	5	11	3	24
	Other Vessels (>20 m)	1	0	8	0	9
	Vessels (<20 m)	0	0	0	0	0
	Total	**15**	**15**	**673**	**17**	**720**
2010 (January-April)	Tanker <50,000 DWT	0	0	8	0	8
	Tanker >50,000 DWT	0	0	0	0	0
	Chemical Tanker	0	0	0	0	0
	Cargo - General	0	0	9	0	9
	Cargo - Bulk	0	0	25	0	25
	Container	0	0	45	0	45
	Tug	0	0	0	0	0
	Tug with Tow	0	0	0	0	0
	Government	2	3	7	5	17
	Fishing	0	0	12	0	12
	Passenger	0	0	0	0	0
	Other Vessels (>20 m)	0	0	0	0	0
	Vessels (<20 m)	0	0	0	0	0
	Total	**2**	**3**	**106**	**5**	**116**

Source: CCG, 2010a

Table 4.2-5 shows monthly reported Strait of Belle Isle vessel traffic for 2008, 2009 and part of 2010. June to

December is the busiest time of the year in the Strait of Belle Isle.

Table 4.2-5: Monthly Vessel Traffic in the Strait of Belle Isle (2008-2010)

Year	Month	In / Out Bound	Transiting	In / Out Zone	Total
2008	January	1	10	2	13
	February	0	4	0	4
	March	0	3	0	3
	April	2	1	0	3
	May	3	26	0	29
	June	6	73	1	80
	July	3	97	1	101
	August	4	136	19	159
	September	9	133	3	142
	October	5	125	1	131
	November	4	110	5	119
	December	7	48	0	55
	Total	**44**	**766**	**32**	**842**
2009	January	4	56	1	61
	February	0	4	0	4
	March	0	4	0	4
	April	0	3	0	3
	May	0	4	4	8
	June	3	28	1	32
	July	3	68	1	72
	August	2	89	4	95
	September	5	93	0	98
	October	4	111	2	117
	November	4	113	0	117
	December	5	100	5	110
	Total	**15**	**673**	**17**	**721**
2010	January	0	47	0	47
	February	0	20	1	21
	March	2	27	4	33
	April	3	15	0	18
	Total	**5**	**109**	**5**	**119**

Source: CCG, 2010a

Ferry Traffic

The MV Apollo provides daily passenger and freight service between St. Barbe, on the Island of Newfoundland and Blanc Sablon, Quebec from April to January (pending ice conditions). Depending on the season, the MV Apollo makes the 1 hr 30 min trip across the Strait of Belle Isle between one and three times a day in each direction. The vessel has a capacity of 240 passengers and 75 vehicles. In the winter of 2009-10, this ferry service operated from Corner Brook to Blanc Sablon as a pilot project (DTW, 2009a).

Ferry traffic is not included in the CCG data as the ferry route is outside of the VTS zone (Figure 4.2-6). Table 4.2-6 shows monthly ferry traffic on the Strait of Belle Isle. Vehicles are measured in twenty foot equivalent units

(TEUs) and one passenger vehicle is one TEU. Data from 2006 to 2009 is comparable because the ferry crossed the Strait in the same months (January and April to December). On average, August has the most passenger vehicle traffic. It is important to note that January and April data represent the ice-free part of the month when the ferry crossed.

Transportation systems are evolving in Labrador and two important changes occurred in the winter of 2009-10. The Strait ferry service was offered throughout the winter (via Corner Brook) and this is why vehicular traffic is recorded in February and March. Since the completion of the TLH, vehicle traffic has increased on Route 510 and demand for the ferry has increased service which accounts for the strong increase in vehicle traffic in spring and summer of 2010. In August 2010, the Department of Transportation and Works added a fourth daily crossing in each direction on Fridays and Mondays for the rest of the summer schedule - until September 12 (DTW, 2010). There should also be an increase of vehicular traffic on Route 510 as a result of year-round service and new road connections. However, increases will remain strongest in summer when road conditions are more conducive to travel.

Table 4.2-6: Monthly Ferry Traffic in the Strait of Belle Isle (2006-2010)

Months	Passenger Vehicle (TEU)					Year to Date Change in 2010		
	2006	2007	2008	2009	Average	January to July	Additional Vehicles	Increase over Average
January	NA	709	448	688	615	1,367	752	122%
February	0	0	0	0	0	NA	NA	NA
March	0	0	0	0	0	NA	NA	NA
April	1,027	1058	587	522	798	2,195	1,396	175%
May	2,565	1,887	2,516	2,755	2,430	3,369	939	39%
June	3,341	3,220	3,224	3,734	3,379	4,301	922	27%
July	5,469	5,984	5,695	5,484	5,658	6,988	1,330	24%
August	5,365	5,789	6,145	5,971	5,817	NA	NA	NA
September	3,255	3,706	3,577	4,097	3,659	NA	NA	NA
October	2,632	2,907	2,932	3,124	2,899	NA	NA	NA
November	2,184	2,373	2,497	2,384	2,359	NA	NA	NA
December	1,758	1,841	1,987	2,332	1,979	NA	NA	NA
Total	27,594	29,471	29,608	31,090	29,954	12,881	5,339	41%

Source: DTW, 2010b

Ferry use is highly seasonal, with the peak months being June to September. On average, nearly 60 percent of total annual ferry demand occurs during this period. Based on comparing the average number of vehicles per month (in months for which comparable data is available), since the TLH opened in December 2009, passenger vehicle demand on the ferry has increased by 41 percent.

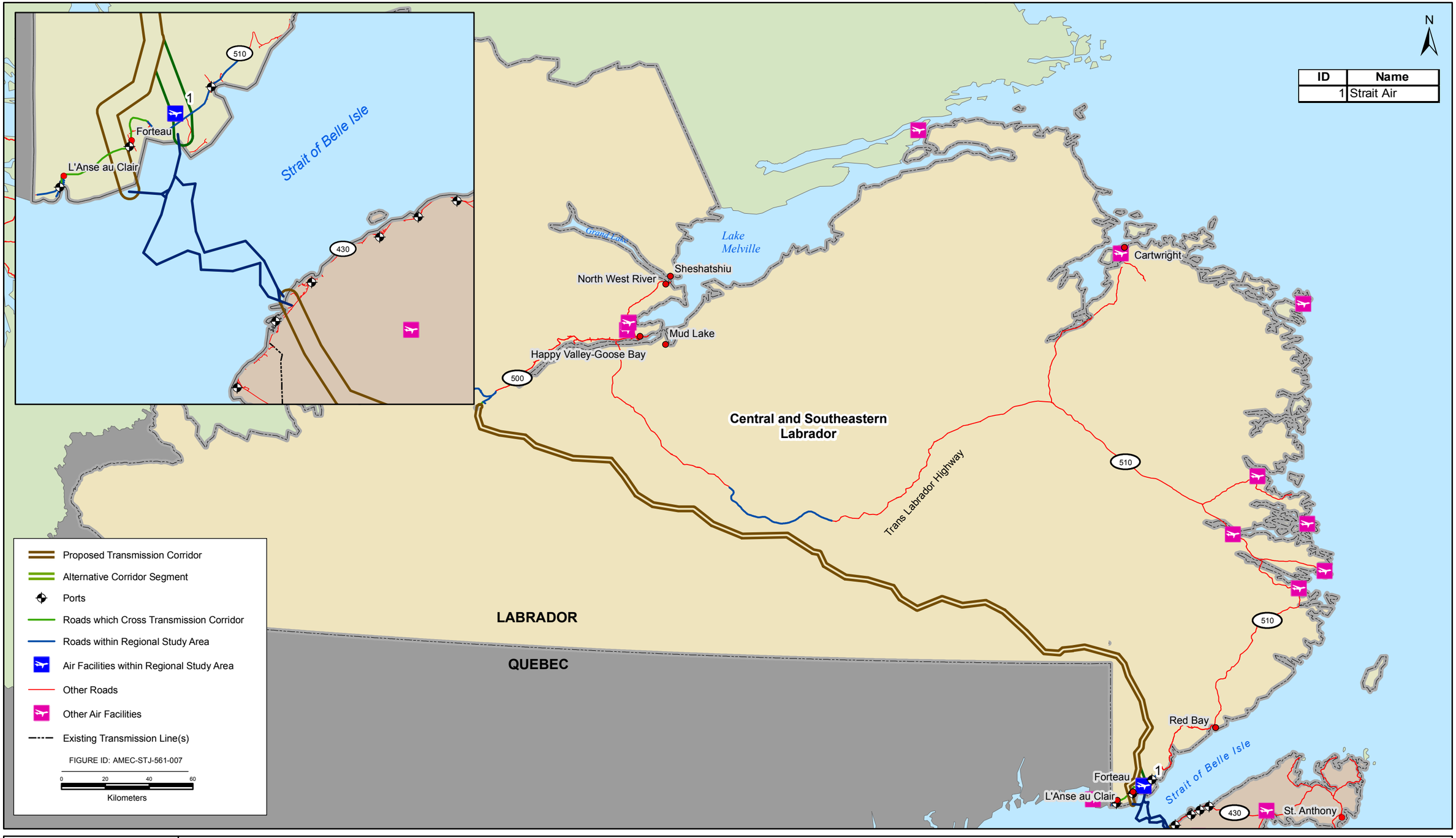
4.2.9 Summary

In Central and Southeastern Labrador (Labrador Straits area), on the Northern Peninsula, in Central and Eastern Newfoundland and on the Avalon Peninsula, TCH, Route 1 and approximately 15 other highways and roads are crossed by the proposed transmission corridor. These include Route 510 in the Labrador Straits; Route 430 the main highway on the Northern Peninsula; Route 432 which crosses the Northern Peninsula in an east-west direction; Route 420 Hampden; the TCH, Route 1; Route 370 Buchans; Route 360 Bay d'Espoir; Route 210

Goobies; Route 203 Fairhaven; Route 201 Bellevue; Route 100 Argentia; Route 80 Blaketown; Route 81 Whitbourne; Route 90 Salmonier Line; Route 13 Witless Bay Line; and Route 63 Avondale.

No air facilities are located with the proposed transmission corridor. Three air facilities, in Central and Southeastern Labrador and Central and Eastern Newfoundland, are located within the Regional Study Area or alternative corridor segments. These include a landing strip at L'Anse Amour, a heliport at Grand Falls-Windsor and a water aerodrome on Thorburn Lake. A portion of the Designated Flight Training Area at 5 Wing Goose Bay is also within the Regional Study Area near the Churchill River.

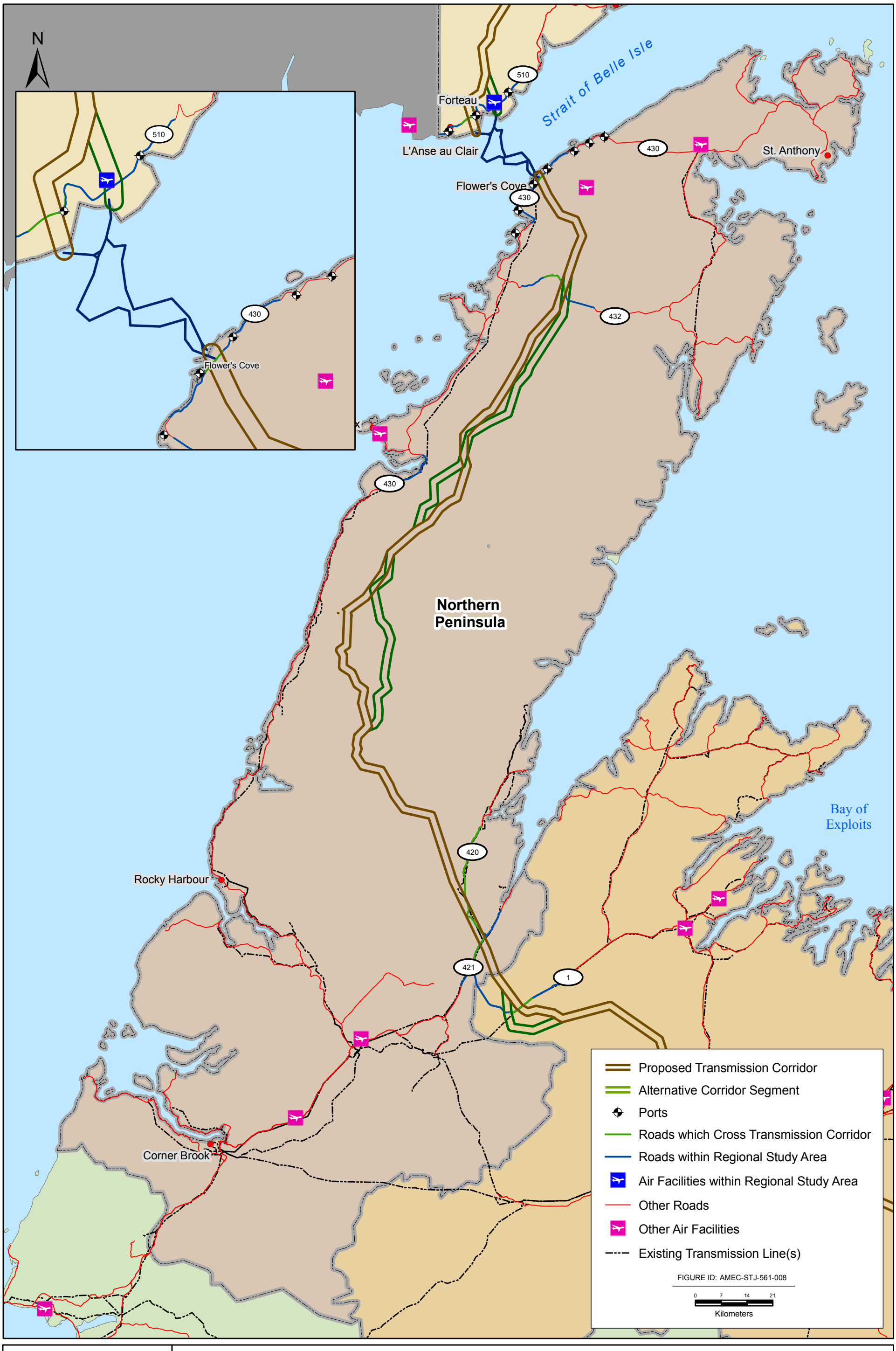
For the most part the proposed transmission corridor is located inland in both Labrador and on the Island of Newfoundland. However, the corridor crosses the Strait of Belle Isle which is an ocean shipping route between the Atlantic Ocean and the St. Lawrence Seaway, a busy commercial and recreational marine area and the location of a ferry between Labrador and the Island of Newfoundland.



nalcor energy

Figure 4.2-1

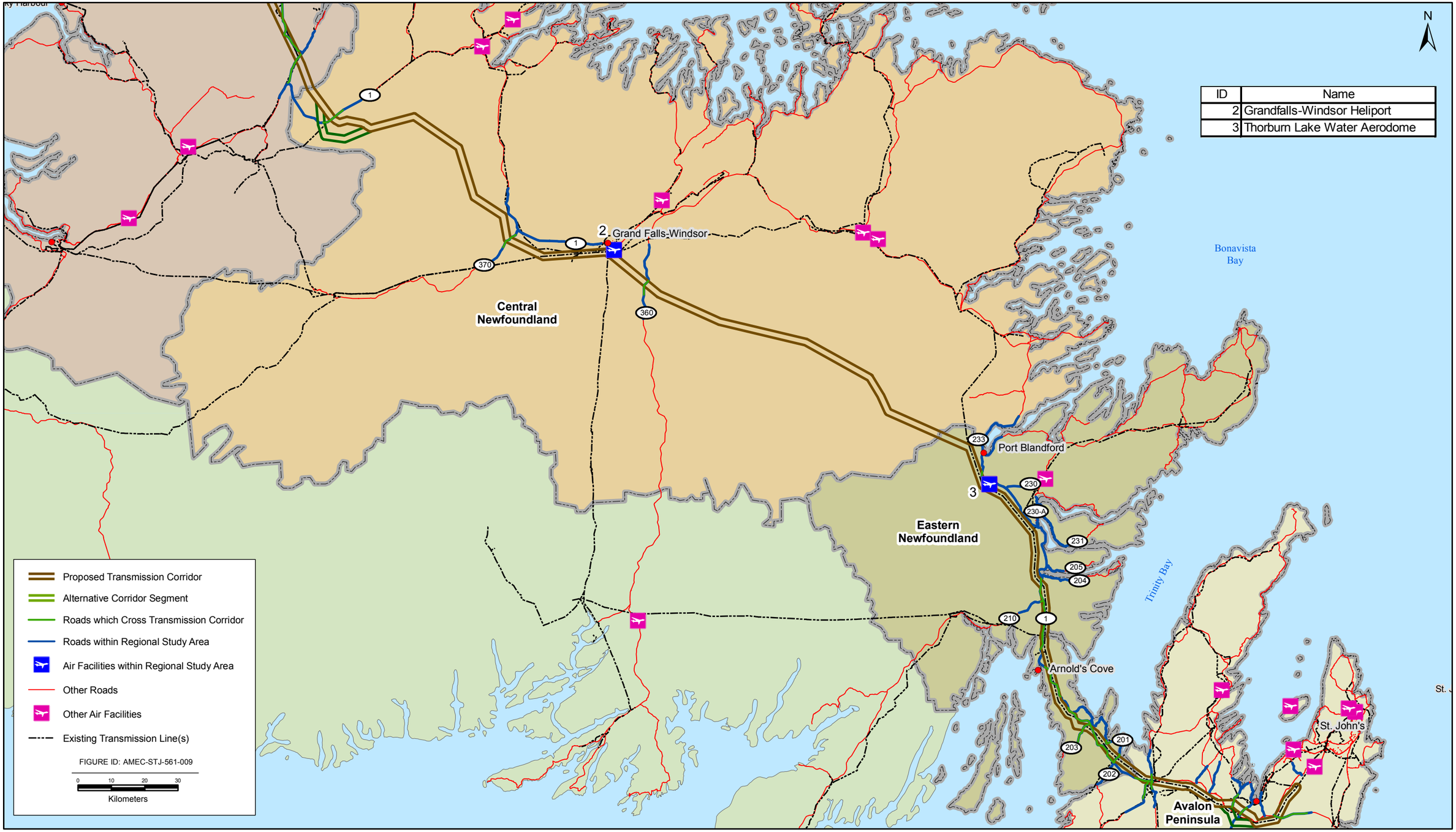
Transportation - Central and Southeastern Labrador



nalcor energy

Figure 4.2-2

Transportation - Northern Peninsula



nalcor energy

Figure 4.2-3

Transportation - Central and Eastern Newfoundland

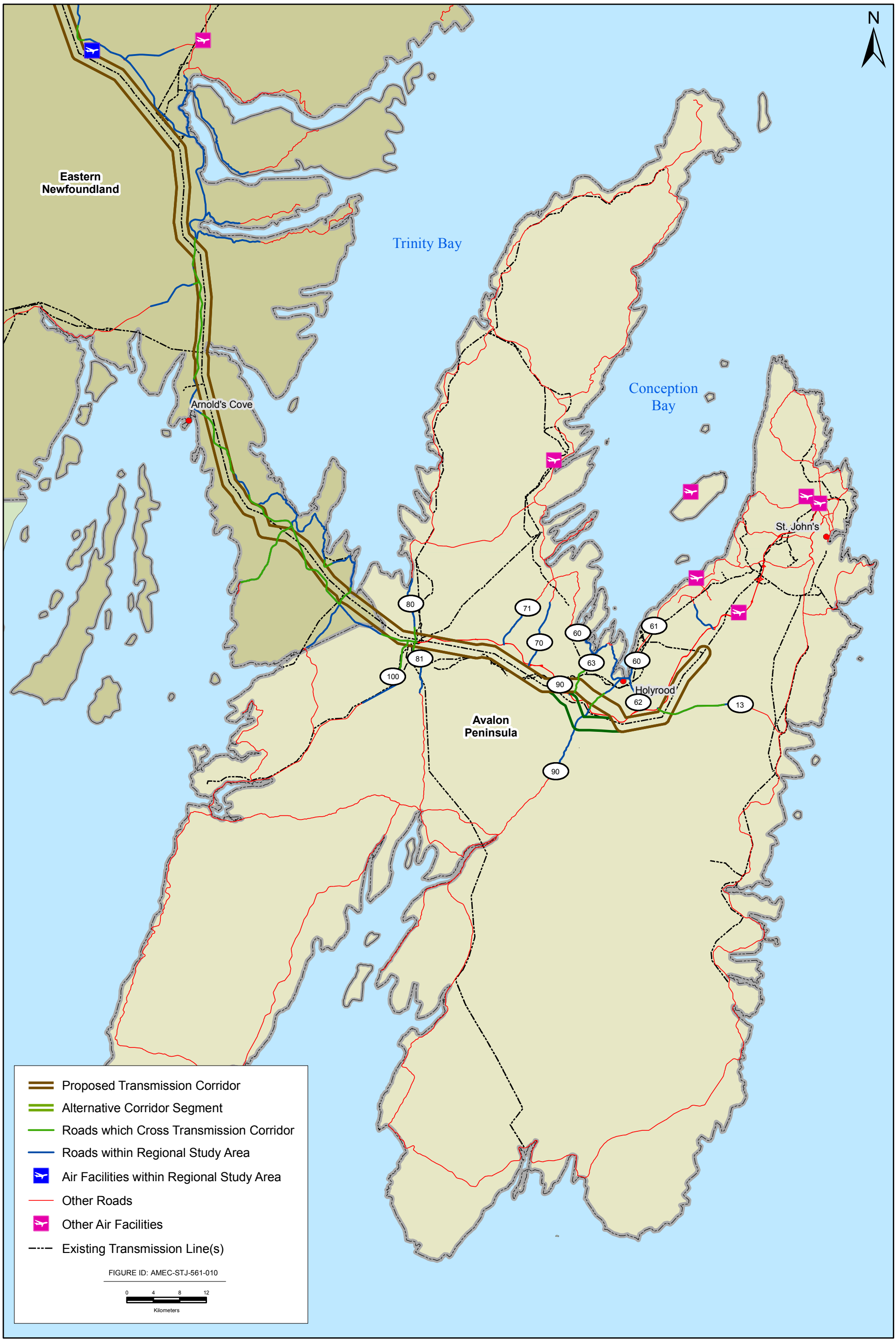


Figure 4.2-4

Transportation - Avalon Peninsula

Figure 4.2-5

Designated Flight Training Area

Figure 4.2-6

Strait of Belle Isle - Vessel Traffic

4.3 Hunting and Trapping

The lifestyles of Newfoundland and Labrador residents have been shaped by a history of connection to the land. Wildlife harvesting is widely pursued for recreational, subsistence and sometimes commercial purposes (Dicks, G., 2010).

4.3.1 Study Area

The study focuses on those hunting and trapping areas crossed by the proposed transmission corridor from Central Labrador to the Island of Newfoundland's Avalon Peninsula. Hunting and trapping management areas and zones are large and the Regional Study Area is 30 km wide.

4.3.2 Administrative Framework

In Newfoundland and Labrador, hunting (big game, small game) and trapping are regulated by the Department of Environment and Conservation, under the *Wild Life Act*. Each year the Department publishes the *Hunting and Trapping Guide* which outlines changes to programs, licence requirements, hunting areas, seasons and quotas. To hunt game with firearms, a resident is required to possess a valid hunting licence and an Outdoor Identification Card from the Wildlife Division (DEC, 1990a; DEC-W, 2009).

The province is divided into three types of big game management areas (moose, black bear and caribou). Small game management areas and zones apply to a variety of species. Migratory game birds and murre are hunted mainly in coastal areas (DEC-W, 2009). Management areas and zones are listed in Table 4.3-1 together with information on area-specific and species-specific hunting seasons and quotas.

Table 4.3-1: Wildlife Management Areas in Newfoundland and Labrador (2011-2012)

Management Areas	Regions and Zones	Spring / Summer 2011 Season	Fall 2011 / Winter 2012 Season	Quota
Labrador				
Moose Management Area (MA)	20 MA (most in Central)	No season	September 10 - March 11	205 moose
Black Bear Management Area (MA)	George River	April 1 - July 13	August 10 - November 30	Black bears: all residents 2 bears per year in all open hunting areas
	Labrador South	April 1 - July 13	September 1 - November 30	
Caribou Management Area (MA)	18 MA (no caribou hunting in Southern Labrador)	No season	August 10 - April 30; note: 15 MA have variable seasons	1 caribou per licence
Small Game Management Areas	Northern Zone	Species specific - Tables 4.3-5 and 4.3-6		
	Southern Zone			
Migratory Game Bird Hunting Zone	Northern			
	Western			
	Central			
	Southern			
Murre (Turr) Hunting Zone	Zone 1	No season	Sept 1 - Dec 16	Daily bag limit: 20 Murre / hunter / day
	Zone 2	No season	Oct 6 - Jan 20	

Management Areas	Regions and Zones	Spring / Summer 2011 Season	Fall 2011 / Winter 2012 Season	Quota
				Possession limit: 40 Murre per hunter any one time
Island of Newfoundland				
Moose and Black Bear Management Area (MA)	53Moose MA 46 Black bear MA (nine currently closed)	No season May 7 – July 9, 2011, May 5 – July 7, 2012 (all MA)	Sept 10 - Jan 8 (most MA) Sept 10 - Nov 6 (most MA)	33,440 moose; 2 black bears per licence
Caribou Management Area (MA)	19 MA (five currently closed)	No season	Sept 10 - Dec 11 (most MA)	740 caribou
Small Game Management Areas[1)]	Avalon / Swift Current	Species specific - Tables 4.3-5 and 4.3-6		
	Burin			
	The Topsails			
	Fairhaven			
	Remainder of Island			
Migratory Game Bird Hunting Zone	Northern Coastal			
	Northern Inland			
	Western Coastal			
	Southern Coastal			
	Southern Inland			
	Avalon-Burin Coastal			
	Avalon-Burin Inland			
	Northeastern Coastal			
Murre (Turr) Hunting Zone	Zone 2	No season	Oct 6 - Jan 20	Daily bag limit: 20 Murre / hunter / day Possession limit: 40 Murre / hunter any one time
	Zone 3	No season	Nov 25 - Mar 10	
	Zone 4	No season	Nov 3 - Jan 10 Feb 2 - Mar 10	

Source: DEC-W 2011

Note: 1) For snowshoe hare the following islands also represent management areas: Great Island, Little Bay Island, Bell Island

The Wildlife Division manages hunting and trapping in the province through annual management plans for big game, small game and furbearers. These plans are informed by the results of wildlife population surveys, trend data from hunting and trapping licence returns, data from returned moose jawbones and input from hunters, Conservation Officers, Department staff, non-government organizations and the general public. Collectively, this information is used to set quotas and establish seasons depending on the health and abundance of populations (DEC-W, 2010).

Wildlife science research is managed by the Department of Environment and Conservation. However, enforcing the Province's wildlife regulations (and enforcement of federal legislation where empowered) lies with the Department of Justice, Fish and Wildlife Enforcement Division(DJ, 2011).

The following sections discuss hunting and trapping including big game, small game, migratory game birds, murre and furbearers in areas crossed by the proposed transmission corridor.

Big Game (Moose, Black Bear and Caribou)

Moose

Moose are fairly abundant throughout the province, hunting is a popular recreational activity and moose meat is often part of the traditional diet. The province is divided into 73 moose management areas. In the 2011-12 hunting season, the total moose hunting quota for Labrador was 205 animals. The total Island of Newfoundland quota was 33,440 animals (29,515 for residents and 3,925 for non-residents). Quotas were reduced in three areas and increased in 48 management areas.

Black Bear

The province has 48 black bear management areas (which on the Island also correspond with moose management areas). All management areas on the Avalon Peninsula, one in western Newfoundland and one eastern Newfoundland, are closed to hunting. Black bear hunting licences are available to all residents of Newfoundland and Labrador who wish to obtain them and each licence holder may capture two bears annually in open hunting areas. However, the availability of black bears province-wide typically exceeds demand (DEC-W, 2009).

Caribou

The province has 37 caribou management areas (CMA). Labrador has 18 CMA with fixed or variable hunting seasons. Each licence may take one caribou of either sex. Hunters must purchase an annual Resident Labrador Caribou Licence. Residents of the Torngat Mountain Electoral District must purchase a Special Labrador Caribou Licence for that area. Non-beneficiaries of the Labrador Inuit Land Claim Agreement must get permission to hunt on Labrador Inuit Lands (DEC-W, 2011).

There is no quota cap on barren-ground caribou for Labrador residents. Several areas with undetermined dates are opened once the Department confirms the presence of sufficient numbers (for hunting) of the migrating George River Caribou herd (DEC-W, 2009). This herd was estimated to have a population of 785,000 in 1993 and 385,000 in 2001 (DEC-DNR, 2009). A population and health census was conducted in 2010 (Telegram, 2010a).

The Province of Newfoundland and Labrador has prepared a recovery strategy for three Labrador woodland caribou herds. Conservation measures are in effect in Labrador which has 18 CMAs. Upon confirmation of the presence of the protected woodland caribou – boreal population in areas with fixed season dates, the Department of Environment and Conservation may immediately close hunting. The “Southern Labrador Region” (most of the Central and Southeastern Labrador Study Region) is closed to hunting (DEC-W, 2009).

The Department has completed year two of a five-year caribou strategy to research and monitor Newfoundland woodland caribou herds which continue to decline. This project aims to better understand population status, animal health, habitat, calf survival and predator (black bear and coyote) ecology. A related harvest management strategy is designed to minimize the contribution of hunting to the decline of herds whose natural adult mortality exceeds recruitment rates. Some CMAs are closed to hunting and quota reductions have been imposed in others. Caribou may be hunted in 14 of the 19 management areas on the island - 5 others are closed (DEC-W, 2009).

Table 4.3-2 shows Study Region CMAs that are crossed by the proposed transmission corridor and have 2009-10 quota reductions or closures. Quotas for all management areas crossed by the corridor are reported in Table 4.3-4.

Table 4.3-2: Caribou Management Areas Crossed by the Proposed Transmission Corridor with Quota Reductions or Closures (2009-10)

Study Regions	CMAs	2008 Quota	2009 Quota	2010 Quota	2011 Quota	Status
Central and Southeastern Labrador	Southern Labrador	0	0	0	0	Closed
Northern Peninsula	76 - St. Anthony	200	90	60	60	Quota Reduced by 140 (70%)
	79 - Adies Lake	75	20	10	10	Quota Reduced by 65 (87%)
Central and Eastern Newfoundland	63 - Grey River	0	0	0	0	Closed
	64 - Middle Ridge	150	140	140	140	Quota Reduced by 10 (7%)
	66 - Gaff Topsails	45	40	40	40	Quota Reduced by 5 (11%)
	67 - Pot Hill	60	50	50	50	Quota Reduced by 10 (17%)
	78 - Hampden Downs	50	25	5	5	Quota Reduced by 45 (90%)
Avalon Peninsula	65 - Avalon Peninsula	0	0	0	0	Closed
All Study Regions	Total Change (average)	580	365	305	305	Quota Reduced by 275 (47%)

Source: DEC-W, 2009; DEC-W, 2010; DEC-W, 2011

Moose and Caribou Success Rates

While black bears are not widely hunted, moose and caribou licence demand exceeds availability. A draw for the 2010-11 moose and caribou hunting seasons received a combined total of approximately 73,000 applications for 28,505 moose licences and 740 caribou licences (Telegram, 2010). Approximately 40 percent of applicants received licences.

Hunting success rates for moose and caribou on the Island of Newfoundland are published and hunters may select a desirable area for annual random licence draws (DEC-W, 2009).

Success rates for moose and caribou management areas in Study Regions crossed by the proposed transmission corridor on the Island of Newfoundland are shown in Table 4.3-3. This information is only available for hunting areas on the Island of Newfoundland and not for Labrador.

Table 4.3-3: Hunting Success Rates for Island Moose and Caribou Management Areas Crossed by the Proposed Transmission Corridor (2009)

Species	Study Regions	Management Areas	Success Rates %	Management Areas	Success Rates %

Species	Study Regions	Management Areas	Success Rates %	Management Areas	Success Rates %
Moose (2007-08)	Northern Peninsula	2	65.1%	39	47.8%
		3	51.7%	40	73.4%
		4	65.0%	45	62.4%
	Central and Eastern Newfoundland	13	80.0%	28	71.6%
		15	82.4%	29	83.4%
		16	83.6%	41	72.1%
		21	72.5%	42	77.5%
		24	63.6%	44	79.5%
		27	75.2%	-	
	Avalon Peninsula	31	63.1%	35	65.4%
		33	65.3%	36	73.1%
		34	72.4%	-	
Caribou (2007)	Northern Peninsula	69	86.4%	79	46.7%
		76	70.5%	-	
	Central and Eastern Newfoundland	63 (Closed)	0%	67	65.9%
		64	70.5%	68	81.0%
		66	74.4%	78	48.1%
	Avalon Peninsula	65 (Closed)	0%	-	

Source: DEC-W, 2011

Moose populations are generally abundant and quotas were increased in 42 MMAs in the 2011-12 hunting season. The only Island MMAs where quotas were reduced were Portland Creek (200 animals or 14%) and Ten Mile Brook on the Northern Peninsula (300 animals or 24%). Quotas were increased in six Labrador MMAs (total of 40 animals) and decreased in one MMA (20 animals) (DEC-W, 2011).

Caribou hunting has had sustainability issues in Central and Southeastern Labrador, Northern Peninsula, Central and Eastern Newfoundland and the Avalon Peninsula in MAs crossed by the proposed transmission corridor. During the 2009-10 hunting season, the Department reduced the number of caribou licences on the Island by 355 or 40 percent. The quota was reduced by 215 animals (average of 37 percent) in Study Regions (Table 4.3-2). There were no quota changes for the 2011-12 season.

Small Game

Labrador is divided into two zones for small game hunting, the Northern Zone and Southern Zone (Table 4.3-1). Newfoundland is divided into five small game hunting zones. These include Avalon / Swift Current, Burin, The Topsails, Fairhaven and Remainder of Island (DEC-W, 2009). Small game hunting is regulated by the Department of Environment and Conservation under the *Wild Life Act*. Also see Trapping below.

Game Birds

Game birds include migratory game birds (i.e., ducks, geese and snipe) and murre. Newfoundland and Labrador

is divided into various migratory game bird hunting zones. In Labrador there are four, Northern, Western, Central and Southern. In Newfoundland there are eight, Northern Coastal, Northern Inland, Western Coastal, Southern Coastal, Southern Inland, Avalon-Burin Coastal, Avalon-Burin Inland and Northeastern Coastal. Coastal areas refer to the portion of the coast lying within 100 m of the mean ordinary high-water mark (DEC-W, 2009).

The province is also divided into murre (often called turr) coastal hunting zones (Table 4.3-1). Zone 1 is Northern Labrador, Zone 2 is the Northern Peninsula and Labrador Straits, Zone 3 is southwestern and southern Newfoundland, and Zone 4 is eastern Newfoundland (DEC-W, 2009).

Migratory game bird hunting is governed by the Migratory Birds Regulations of the *Migratory Birds Convention Act*. Hunters must possess a valid Migratory Game Bird Hunting Permit which is available from Canadian Wildlife Service offices in Mount Pearl, Lewisporte or Happy Valley-Goose Bay. *Migratory Game Bird Regulations* also apply to murre hunting. To hunt game with firearms, a resident is required to possess a valid hunting licence and an Outdoor Identification Card from the Wildlife Division (DEC-W, 2009).

Trapping

Trapping is regulated by the Department of Environment and Conservation, under the *Wild Life Act*. Each year the Department publishes the *Hunting and Trapping Guide* which provides annual updates on changes to programs, licence requirements, hunting areas and trapping strategies. Trapping licences include Small Game, Trapping, Outdoor Identification Cards, Replacement Licences, Firearms Transport Permits, and Guide Licences (DEC-W, 2009).

In the province, an agreement on International Humane Trapping Standards sets performance standards for traps used for harvesting furbearing species. Trappers must also apply to the Wildlife Division for licences following completion of a Trapper Education Course (DEC-W, 2009).

A General Trapper's Licence, which authorizes trapping for all species (except beaver on the Island), anywhere in the province during open seasons and in accordance with regulations is the only requirement for trapping in Labrador (DEC-W, 2009).

Trappers on the Island of Newfoundland require a General Trapper's Licence. They also require a Beaver Trapline Licence to trap beaver. This licence authorizes trappers to trap in and over a trapline area described on a map provided to them. Each trapline must be renewed by October 15 each year. Also on the Island of Newfoundland, trappers are permitted to shoot fox, lynx and coyotes during open season (DEC-W, 2009).

4.3.3 Information Sources

Information for this section was primarily obtained from the Department of Environment and Conservation, specifically the *Hunting and Trapping Guide* and other department publications. Additional information was also obtained through personal communications with Conservation Officers.

4.3.4 Big Game (Moose, Black Bear and Caribou) Hunting

The following sections describe big game management areas in the proposed transmission corridor. Big game hunting is also illustrated in Figures 4.3-1 to 4.3-11

Central and Southeastern Labrador

Big game management areas are shown in Figures 4.3-1 and 4.3-11. Associated hunting seasons and quotas are listed in Table 4.3-4. The proposed transmission corridor crosses portions of Moose Management Areas 53, 58, 59, 84, 86 and 87 and "Labrador South" Black Bear Management Area. Southern Labrador is closed to caribou hunting.

Table 4.3-4: Big Game Hunting Management in Study Regions

Species	Management Areas Crossed by the Proposed Transmission Corridor	Spring / Summer Season (2011)	Fall / Winter Season (2011 / 12)	Quotas (2011 / 12)
Labrador				
Central and Southeastern Labrador				
Moose	Area # 53	No Season	September 10, 2011 - March 11, 2012	25
	Area # 58	No Season	September 10, 2011 - March 11, 2012	5
	Area # 59	No Season	September 10, 2011 - March 11 2012	15
	Area # 84 (formerly 53a)	No Season	September 10, 2011 - March 11 2012	5
	Area # 86	No Season	September 10, 2011 – March 11, 2012	5
	Area # 87	No Season	September 10, 2011 – March 11, 2012	5
Black Bear	Labrador South	April 1 - July 13, 2011 April 1 - July 13, 2012	September 1 - November 30, 2011	2 Black Bears per year per resident / non-resident
Island of Newfoundland				
Northern Peninsula				
Moose and Black Bear	Area # 2 Area # 3 Area # 4 (extends into Central and Eastern Newfoundland) Area # 39 Area # 40 Area # 45	Black bear - May 7 to July 9, 2011 and May 5 to July 7, 2012	Moose - Sept. 10, 2011 - Jan. 8, 2012 (Black bear - September 10, 2011 - November 6, 2011	1,450[1)] 1,250[1)] 1000[1)] 500[1)] 1,350[1)] 1,300[1)]

Species	Management Areas Crossed by the Proposed Transmission Corridor	Spring / Summer Season (2011)	Fall / Winter Season (2011 / 12)	Quotas (2011 / 12)
				Black bear (two per licence)
Caribou	Area # 69 Area # 76 Area # 79	No season	September 10, 2011 - December 11, 2011	140 60 10
Central and Eastern Newfoundland				
Moose and Black Bear	Area # 4 Area # 13 Area # 15 Area # 16 Area # 21 Area # 24 Area # 27 Area # 28 Area # 29 Area # 41 Area # 42 Area # 44	Black bear (May 7 to July 9, 2011 and May 5 to July 7, 2012)	Moose - September 10, 2011 - January 8, 2012 (areas # 28, # 41 and # 44 October 1, 2011 - January 29, 2012) Black bear - Sept. 10 to Nov. 6, 2011 (# 44 closed)	1000[1)] 550[1)] 1100[1)] 350[1)] 500[1)] 250[1)] 300[1)] 550[1)] 1200[1)] 400[1)] 200[1)] 450[1)] Black bear (two per licence)
Caribou	Area # 63 Area # 64 Area # 66 Area # 67 Area # 68 Area # 78	No season	September 10, 2011 - December 11, 2011	Closed 140 40 50 15 5
Avalon Peninsula				
Moose and Black Bear	Area # 31 Area # 33 Area # 34 Area # 35 Area # 36	No season	Moose - October 1, 2011 - January 29, 2012) Black bear - all closed	700[2)] 550[2)] 650[2)] 575[2)] 1,400[2)]
Caribou	Area # 65	No season	No season	Closed

Source: DEC-W, 2011

Note: 1) Quotas refer to moose only

2) Quotas refer to moose only; listed areas are all closed for bear hunting

Northern Peninsula

Northern Peninsula big game hunting areas are shown in Figures 4.3-2, 4.3-6 and to 4.3-9. The proposed transmission corridor crosses portions of Moose and Black Bear Management Areas 2, 3, 4, 39, 40 and 45 and Caribou Management Areas 69, 76 and 79. Associated hunting seasons and quotas are listed in Table 4.3-4. Success rates for moose and caribou are included in Table 4.3-3.

Central and Eastern Newfoundland

Big game management areas are presented in Figures 4.3-3, 4.3-7 and 4.3-10. The proposed transmission corridor crosses portions of Moose and Black Bear Management Areas 13, 15, 16, 21, 24, 27, 28, 29, 41, 42 and 44. A portion of Moose and Black Bear Management Area 4 (also on Northern Peninsula) is also in Central and Eastern Newfoundland. The corridor also crosses Caribou Management Areas 63, 64, 66, 67, 68 and 78. CMA 63 is closed to hunting. Hunting seasons and quotas are listed in Table 4.3-4. Success rates for moose and caribou are included in Table 4.3-3.

Avalon Peninsula

The proposed transmission corridor is shown in relation to the various relevant big game management areas in Figures 4.3-4, 4.3-8 and 4.3-11. The transmission corridor crosses portions of Moose Management Areas 31, 33, 34, 35 and 36 and Caribou Management Area 65 which is currently closed to hunting. Black bear hunting is also closed on the Avalon Peninsula. Hunting seasons and quotas are listed in Table 4.3-4. Success rates for moose and caribou are included in Table 4.3-3.

4.3.5 Small Game Hunting

Small game hunting is also common in the province and includes setting snares and using firearms for harvesting. Commonly harvested species are hare, ptarmigan and grouse. Porcupine is hunted in Labrador. Small game hunting is divided into several management areas and zones which are presented in Figures 4.3-12 to 4.3-17. Table 4.3-5 shows small game hunting management areas with area and species-specific bag limits.

Table 4.3-5: Small Game Hunting Management in Newfoundland and Labrador

Management Areas	Species	Shooting (2011 / 2012)	Snaring (2011 / 2012)	Bag Limits: Daily / Possessions
Labrador				
All Labrador (Northern And Southern Zones)	Ptarmigan	Oct 1 - Apr 20	Oct 1 - Mar 31	25 / 50
	Grouse (Spruce and Ruffed)	Oct 1 - Apr 20	Oct 1 - Mar 31	No limit in Northern Zone; 25 / 50 in Southern Zone (spruce and ruffed grouse in combination)
	Snowshoe Hare	Oct 1 - Apr 20	Oct 1 - Mar 31	No limit
	Arctic Hare	Oct 1 - Apr 20	Oct 1 - Mar 31	No limit
	Porcupine	Oct 1 - Mar 31	NA	1 / 1
Island of Newfoundland				
Island of Newfoundland	Grouse (Spruce and Ruffed)	Sept 17 - Dec 25	Oct 8 - Feb 26	20 / 40
Avalon / Swift Current	Ptarmigan	Sept 17 - Nov 13	Oct 8 - Feb 26	6 / 12
The Topsails	Ptarmigan	Sept 17 - Nov 27	Oct 8- Feb 26	6 / 12
Remainder of Island	Ptarmigan	Sept 17 - Dec 11	Oct 8 - Feb 26	12 / 24
	Snowshoe Hare	Oct 8 - Feb 26	Oct 8 - Feb 26	40 (possession)

Source: DEC-W, 2011

Central and Southeastern Labrador

In Labrador, the proposed transmission corridor overlaps with the "Southern Zone" Small Game Management Area (Figure 4.3-12). Success rates are not available for small game hunting for Labrador or Newfoundland.

Northern Peninsula

The proposed transmission corridor crosses portions of "Remainder of Island" Small Game Management Area. Success rates are not available for small game. Gros Morne National Park and the Main River area are closed to snaring to prevent accidental mortality of the threatened Newfoundland marten (Figure 4.3-13, 4.3-16 and 4.3-17).

Central and Eastern Newfoundland

The proposed transmission corridor crosses portions of "The Topsails", "Remainder of Island", "Avalon / Swift Current" and "Fairhaven" Small Game Management Areas (Figure 4.3-14, 4.3-16 and 4.3-17). Success rates are not available.

Avalon Peninsula

The proposed transmission corridor crosses portions of "Avalon / Swift Current" Small Game Management Area (Figure 4.3-15, 4.3-16 and 4.3-17). Success rates are not available.

4.3.6 Game Bird Hunting

Game bird hunting, which is common throughout the fall, is primarily focused on migratory game birds (waterfowl such as ducks, geese and snipe) and murre. The province is divided into 12 migratory game bird hunting zones and four murre hunting zones (Table 4.3-1).

Results and discussion are organized by geographic region, focusing on current activity in those areas crossed by the proposed transmission corridor (Figures 4.3-18, 4.3-19 and 4.3-20). Information on migratory game bird hunting zones and murre hunting zones, including species-specific seasons and bag limits, are included in Table 4.3-6.

Table 4.3-6: Migratory Game Bird and Murre Hunting Management in Study Regions

Hunting Zones	Species	Hunting Seasons	Bag Limits (Daily / Possession)
Labrador			
Central Labrador Zone	Ducks (including mergansers and scoters), Geese and Snipe	First Saturday in September to second Saturday in December	6 / 12 (Ducks) 5 / 10 (Geese) 10 / 20 (Snipe)
	Eiders	Last Saturday in October to last Saturday in November and first Saturday in January to last day of February	6 / 12
Southern Labrador (Straits)	Ducks (including mergansers and scoters)[1)], Geese	Second Saturday in September to third Saturday in December	6 / 12 (Ducks) 5 / 10 (Geese) 10 / 20 (Snipe)

Hunting Zones	Species	Hunting Seasons	Bag Limits (Daily / Possession)
	and Snipe		
	Eiders	Fourth Saturday in November to last day of February	6 / 12
Murre Hunting Zone 2	Murre (Turr)	October 6 to January 20	20 / 40
Island of Newfoundland			
Northern Coastal	Ducks[2)], Geese and Snipe	Third Saturday in September to last Saturday of December	6 / 12 (Ducks) 5 / 10 (Geese) 10 / 20 (Snipe)
	Long-tailed Ducks, Eiders and Scoters	Fourth Saturday in November to last day of February	6 / 12
Northern Inland	Ducks[2)], Geese and Snipe	Third Saturday in September to last Saturday in December	6 / 12 (Ducks) 5 / 10 (Geese) 10 / 20 (Snipe)
	Long-tailed Ducks, Eiders and Scoters	No open Season	NA
Southern Inland	Ducks[2)], Geese and Snipe	Third Saturday in September to last Saturday of December	6 / 12 (Ducks) 5 / 10 (Geese) 10 / 20 (Snipe)
	Long-tailed Ducks, Eiders and Scoters	No open season	NA
Avalon-Burin Inland	Ducks[2)], Geese and Snipe	Third Saturday in September to last Saturday in December	6 / 12 (Ducks) 5 / 10 (Geese) 10 / 20 (Snipe)
	Long-tailed Ducks, Eiders and Scoters	No open season	NA

Source: DEC-W, 2011

Note: 1) Other than Harlequin Ducks, Eiders and Scoters
2) Other than Long-tailed Ducks, Harlequin Ducks, Eiders and Scoters

Central and Southeastern Labrador

The proposed transmission corridor crosses portions of "Central Labrador" and "Southern Labrador (Straits)" Migratory Game Bird Hunting Zones and Murre Hunting Zone 2 (Figures 4.3-18 and 4.3-20). Seasons, bag limits and possession limits are shown in Table 4.3-6. Success rates are not available for migratory game bird hunting for Labrador or Newfoundland.

Island of Newfoundland

The proposed transmission corridor crosses portions of "Northern Coastal", "Northern Inland", "Southern Inland" and "Avalon-Burin Inland" Migratory Game Bird Hunting Zones and Murre Hunting Zone 2 (Table 4.3-6). See Figures 4.3-19 and 4.3-20. Success rates are not available for migratory game birds or murre.

4.3.7 Trapping

The province is divided into 13 furbearer management zones. Labrador has two zones ("Labrador North" and "Labrador South"). Newfoundland has 11 zones identified by numbers 1-11. Trapping seasons are species-specific and vary between the two Labrador zones, but are currently the same for the 11 fur zones in Newfoundland. In the 2011-12 season, Lynx trapping was opened in an area of Newfoundland identified at Zone A. Applicable 2011 / 2012 season dates are listed in Table 4.3-7. "Labrador North" is not included since the Project does not extend into that zone.

Table 4.3-7: Trapping Seasons in Newfoundland and Labrador

<table>
<tr><th rowspan="2">Species</th><th colspan="2">Labrador South</th><th colspan="2">Newfoundland</th></tr>
<tr><th>From (2011)</th><th>To (2012)</th><th>From (2011)</th><th>To (2012)</th></tr>
<tr><td>Beaver</td><td rowspan="2">October 15</td><td rowspan="2">May 31</td><td rowspan="3">October 20</td><td rowspan="3">March 15</td></tr>
<tr><td>Muskrat</td></tr>
<tr><td>Otter</td><td>October 15</td><td>March 20</td></tr>
<tr><td>Mink</td><td rowspan="6">November 1</td><td rowspan="6">March 20</td><td>November 1</td><td>February 28</td></tr>
<tr><td>Coyote</td><td rowspan="3">October 20</td><td rowspan="3">February 1</td></tr>
<tr><td>Fox (white and coloured)</td></tr>
<tr><td>Lynx (Zone A only)</td><td>November 5</td><td>December 4</td></tr>
<tr><td>Ermine</td><td rowspan="2">October 20</td><td rowspan="2">February 28</td></tr>
<tr><td>Squirrel</td></tr>
<tr><td>Marten</td><td colspan="2">No open season</td></tr>
<tr><td>Wolf</td><td>November 1</td><td>April 30</td><td colspan="2" rowspan="3">NA</td></tr>
<tr><td>Fisher</td><td colspan="2" rowspan="2">Closed</td></tr>
<tr><td>Wolverine</td></tr>
</table>

Source: DEC-W, 2011

Trapping information is presented in the following sections and is organized by geographic region, focusing on current activity. Table 4.3-8 provides an overview of species-specific fur harvest levels (17 year totals) for individual fur zones.

Table 4.3-8: Fur Harvests by Zone (Totals for 17-Year Record Period - 1990 / 91 to 2007 / 08)

Fur Zone / Species	**Island of Newfoundland**											**Labrador (All)**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Beaver	561	3,512	1,841	1,498	2,695	5,953	2,823	3,576	1,985	5,150	2,178	1,246
Weasel	152	1,481	951	966	819	3,143	1,076	1,925	1,627	2,683	6,360	8,491
Coloured Fox	562	4,535	1,793	3,605	3,801	7,237	3,405	5,696	2,044	5,550	6,234	9,493
Arctic Fox	3	25	1	0	24	16	11	15	6	4	19	94
Lynx	30	264	139	60	232	842	313	310	69	233	177	705
Marten	59	25	0	24	16	21	0	11	3	122	90	31,984
Mink	1,137	5,919	1,653	3,362	2,651	10,133	2,087	5,395	2,990	4,175	4,249	5,334
Muskrat	91	2,289	314	47	886	4,532	469	245	71	1,748	2,822	5,546
Otter	211	1,390	1,684	1,845	1,597	1,945	453	850	389	544	1,706	1,714
Red Squirrel	235	812	315	546	2,997	3,788	1,445	2,919	281	1,203	5,119	1,782
Wolf	4	0	0	0	0	10	38	18	0	7	2	448
Coyote	13	105	191	299	165	241	89	116	122	85	156	14
Total (17 Years)	**3,058**	**20,357**	**8,882**	**12,252**	**15,883**	**37,861**	**12,209**	**21,076**	**9,587**	**21,504**	**29,112**	**67,751**

Source: DEC-W, 2009b

The following sections present fur zones crossed by the proposed transmission corridor by Study Region.

Central and Southeastern Labrador

The proposed transmission corridor crosses portions of "Labrador South" Fur Zone. See Figure 4.3-21. Harvest data for "Labrador South" are not available but Table 4.3-8 shows the fur harvest levels (17-year totals) for all of Labrador. These harvest numbers are the highest of all fur zones in the province. Trapper success rates are not available for trapping for Labrador or Newfoundland.

Northern Peninsula

In the Northern Peninsula Study Region, the proposed transmission corridor overlaps with two fur zones (10 and 11) (Figure 4.3-22). Fur harvest levels (17-year totals) for these zones, presented in Table 4.3-8, reflect relatively high harvest levels. Higher levels have only been recorded for all of Labrador and Fur Management Zone 6. Trapper success rates are not available.

Central and Eastern Newfoundland

In this Study Region, the proposed transmission corridor overlaps with portions of five fur zones, namely Zones 3, 5, 6, 7 and 8 (Figure 4.3-23). This includes zones with relatively low harvest levels (e.g., Zones 3 and 5) and those with high harvest levels (e.g., Zones 6 and 8) (Table 4.3-8). Trapper success rates are not available.

Avalon Peninsula

The Avalon Peninsula has two fur zones: Zones 1 and 2. Zone 1 has the lowest harvest records of all fur zones in the province, while Zone 2 exhibits relatively high levels (Table 4.3-8 and Figure 4.3-24). The transmission corridor crosses Zone 2. Trapper success rates are not available.

4.3.8 Summary

The proposed transmission corridor crosses five moose and one black bear management area in Labrador. It crosses 22 moose / black bear management areas and 10 caribou management areas on the Island of Newfoundland. The corridor overlaps with one small game management area in Labrador and four small game management areas on the Island of Newfoundland (all except for the Burin Management Area). It also crosses six migratory game bird management zones and one murre management zone. The corridor crosses nine fur zones in the province.

Table 4.3-9 summarizes hunting and trapping management areas and zones crossed by the proposed transmission corridor by Study Region.

Table 4.3-9: Summary of Hunting and Trapping Areas Crossed by the Proposed Transmission Corridor

Study Regions	Hunting and Trapping by Species	Management Areas and Zones
Central and Southeastern Labrador	Moose	58, 59, 84, 86, 87
	Black Bear	Labrador South
	Small Game	Southern Zone

Study Regions	Hunting and Trapping by Species	Management Areas and Zones
	Migratory Game Birds	Central Labrador, Southern Labrador (Straits)
	Murre	2
	Furbearers	Labrador South
Northern Peninsula	Moose and Black Bear	2, 3, 4, 39, 40 and 45
	Caribou	69, 76, 79
	Small Game	Remainder of Island
	Migratory Game Birds	Northern Coastal, Northern Inland
	Murre	2
	Furbearers	10 and 11, Zone A (Lynx)
Central and Eastern Newfoundland	Moose and Black Bear	4, 13, 15, 16, 21, 24, 27, 28, 29, 41, 42 and 44
	Caribou	63, 64, 66, 67, 68 and 78
	Small Game	The Topsails, Remainder of Island, Avalon / Swift Current and Fairhaven
	Migratory Game Birds	Southern Inland
	Furbearers	3, 5, 6, 7 and 8, Zone A (Lynx)
Avalon Peninsula	Moose and Black Bear	31, 33, 34, 35 and 36
	Caribou	65
	Small Game	Avalon / Swift Current
	Migratory Game Birds	Avalon-Burin Inland
	Furbearers	2

Moose Management Areas		
ID	Name	Total Quota 2011-2012
58	Alexis River	5
86	St. Augustin	5
87	Eagle Plateau	5
59	Upper Kenamu	15
84	Traverspine	5
53	Muskrat Falls	25

N

Trans Labrador Highway

Grand Lake

Lake Melville

Sheshatshiu

North West River

Happy Valley-Goose Bay

Mud Lake

Cartwright

53

87

84

59

Central and Southeastern Labrador

Trans Labrador Highway

86

58

LABRADOR

QUEBEC

Red Bay

Strait of Belle Isle

Forteau

L'Anse au Clair

St. Anthony

Proposed Transmission Corridor

Alternative Corridor Segment

Moose Management Area

Existing Highways and Roads

Existing Transmission Line(s)

FIGURE ID: AMEC-STJ-561-011

0 20 40 60

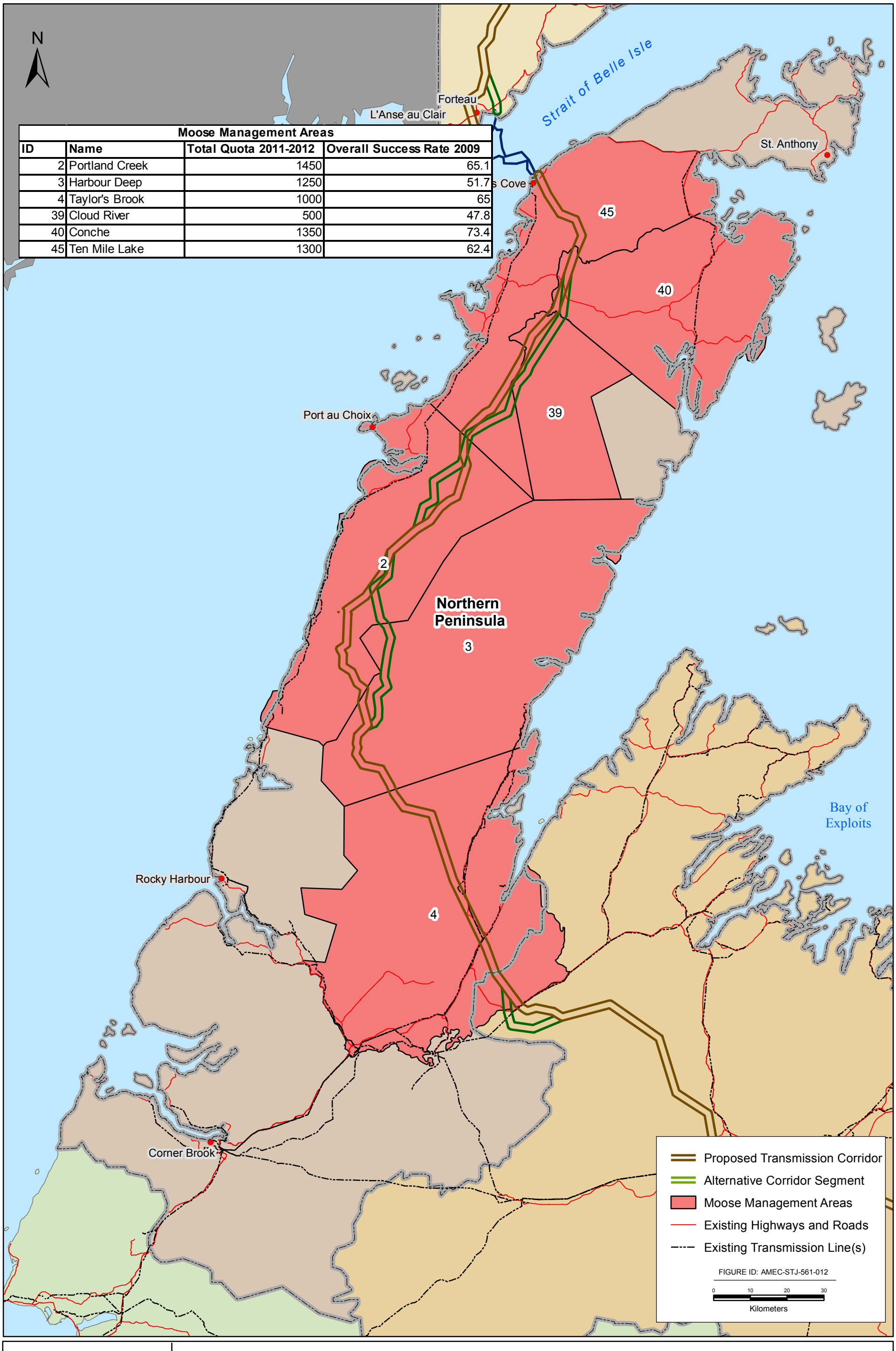
Kilometers

nalcor energy

Figure 4.3-1

Moose Hunting - Central and Southeastern Labrador

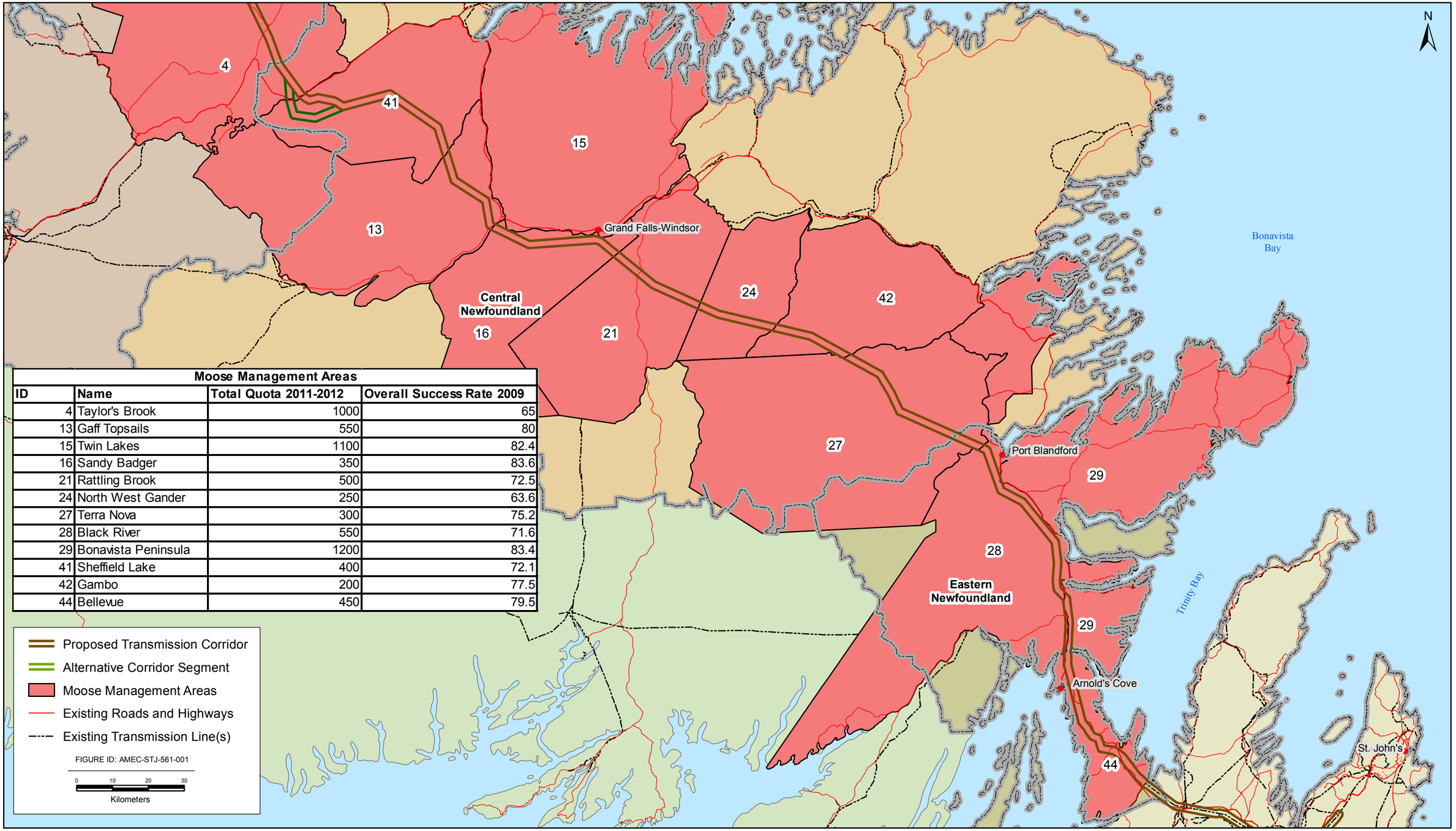
Moose Management Areas			
ID	Name	Total Quota 2011-2012	Overall Success Rate 2009
2	Portland Creek	1450	65.1
3	Harbour Deep	1250	51.7
4	Taylor's Brook	1000	65
39	Cloud River	500	47.8
40	Conche	1350	73.4
45	Ten Mile Lake	1300	62.4



nalcor energy

Figure 4.3-2

Moose Hunting - Northern Peninsula

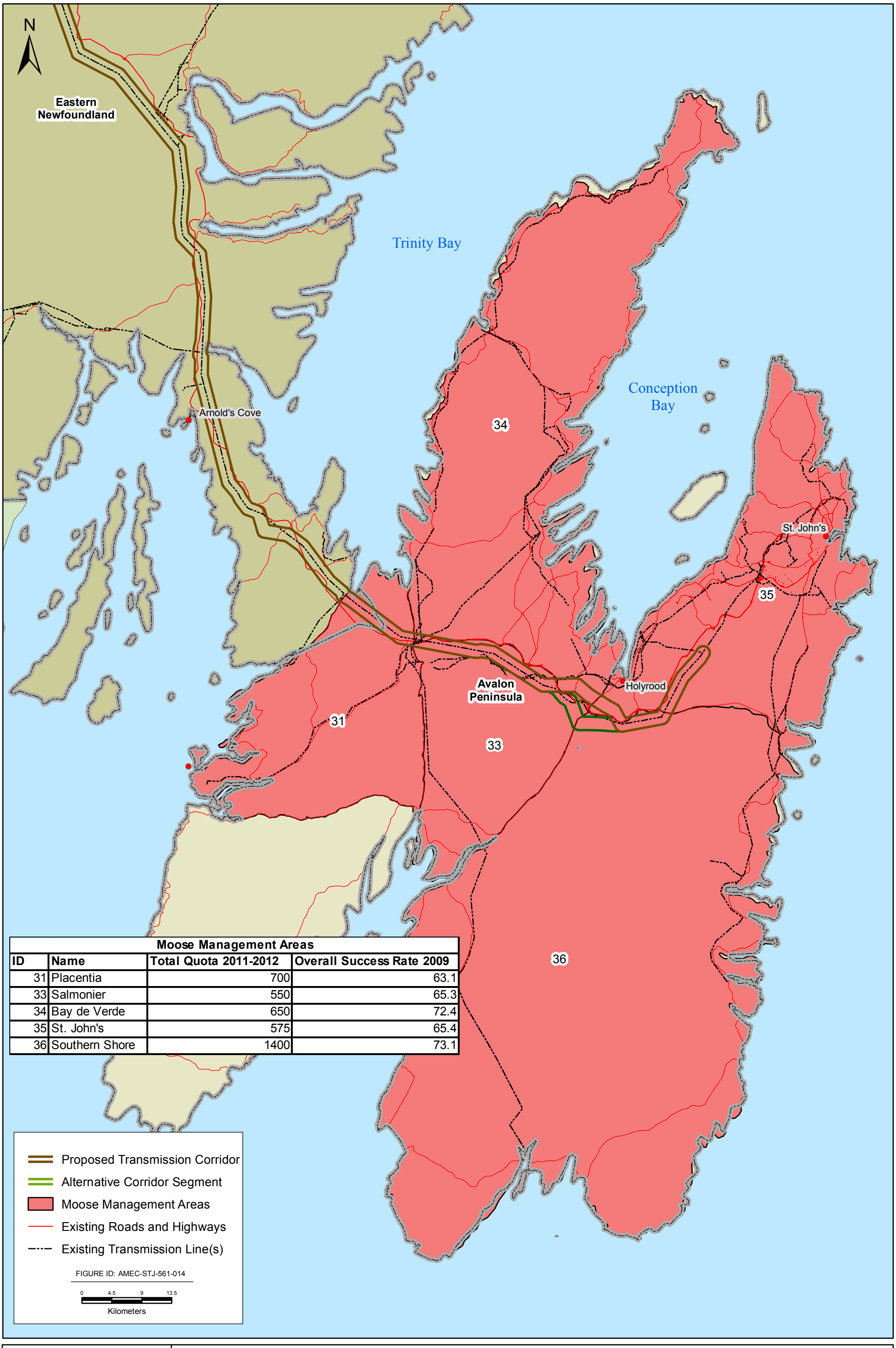


Moose Management Areas			
ID	Name	Total Quota 2011-2012	Overall Success Rate 2009
4	Taylor's Brook	1000	65
13	Gaff Topsails	550	80
15	Twin Lakes	1100	82.4
16	Sandy Badger	350	83.6
21	Rattling Brook	500	72.5
24	North West Gander	250	63.6
27	Terra Nova	300	75.2
28	Black River	550	71.6
29	Bonavista Peninsula	1200	83.4
41	Sheffield Lake	400	72.1
42	Gambo	200	77.5
44	Bellevue	450	79.5

nalcor energy

Figure 4.3-3

Moose Hunting - Central and Eastern Newfoundland



Moose Management Areas

ID	Name	Total Quota 2011-2012	Overall Success Rate 2009
31	Placentia	700	63.1
33	Salmonier	550	65.3
34	Bay de Verde	650	72.4
35	St. John's	575	65.4
36	Southern Shore	1400	73.1

nalcor energy

Figure 4.3-4

Moose Hunting - Avalon Peninsula

nalcor energy

Figure 4.3-5

Black Bear Hunting - Central and Southeastern Labrador

N

Black Bear Management Zones	
ID	**Name**
2	Portland Creek
3	Harbour Deep
4	Taylor`s Brook
39	Cloud River
40	Conche
45	Ten Mile Lake

Strait of Belle Isle

Forteau

L'Anse au Clair

St. Anthony

Flower's Cove

45

40

39

Port au Choix

2

Northern Peninsula

3

Rocky Harbour

4

Bay of Exploits

Grand Falls - Windsor

Central Newfoundland

Proposed Transmission Corridor

Alternative Corridor Segment

Black Bear Management Zones

Trans Canada Highway

Existing Transmission Line(s)

FIGURE ID: AMEC-STJ-561-016

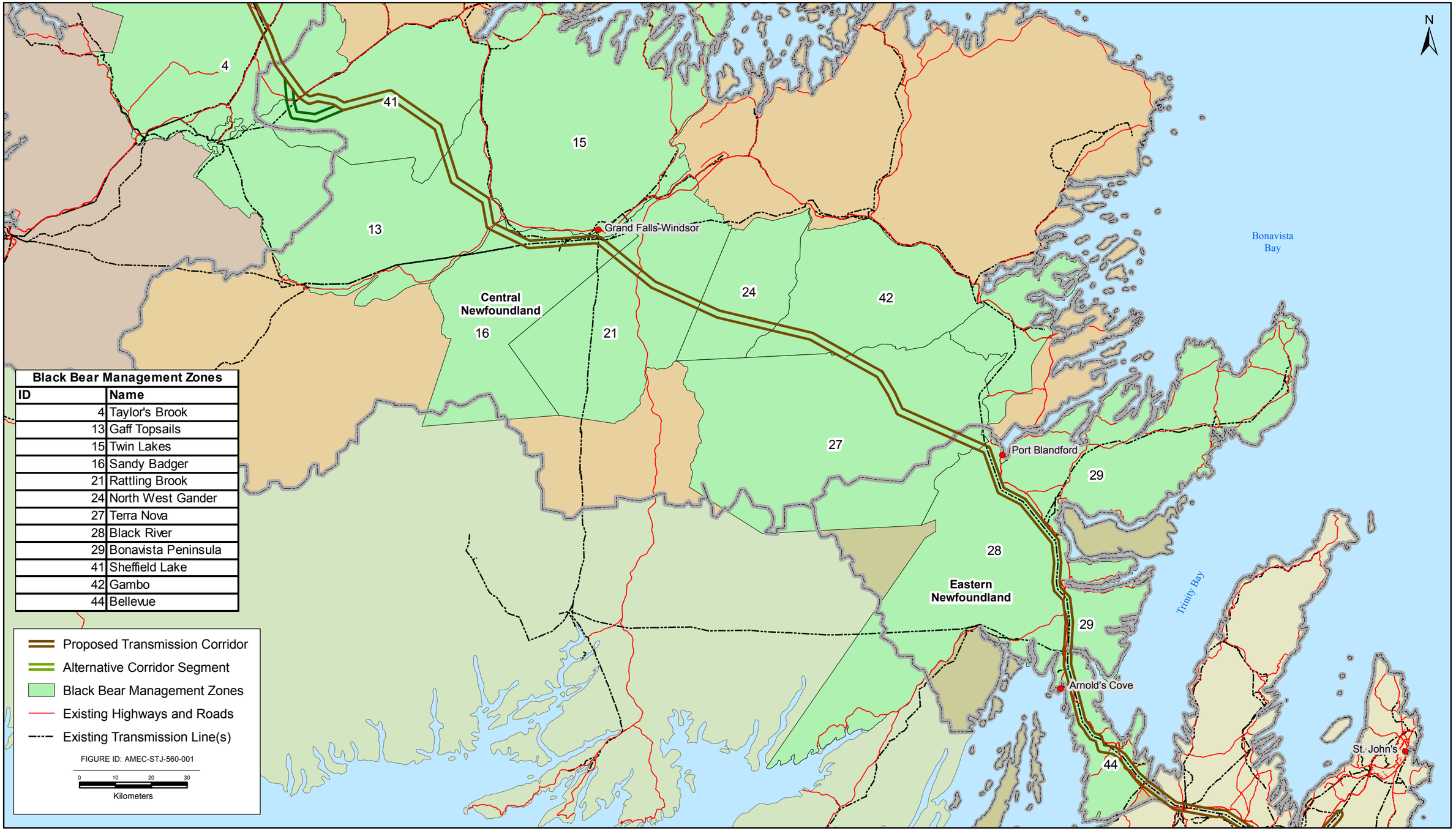
0 10 20 30

Kilometers

nalcor energy

Figure 4.3-6

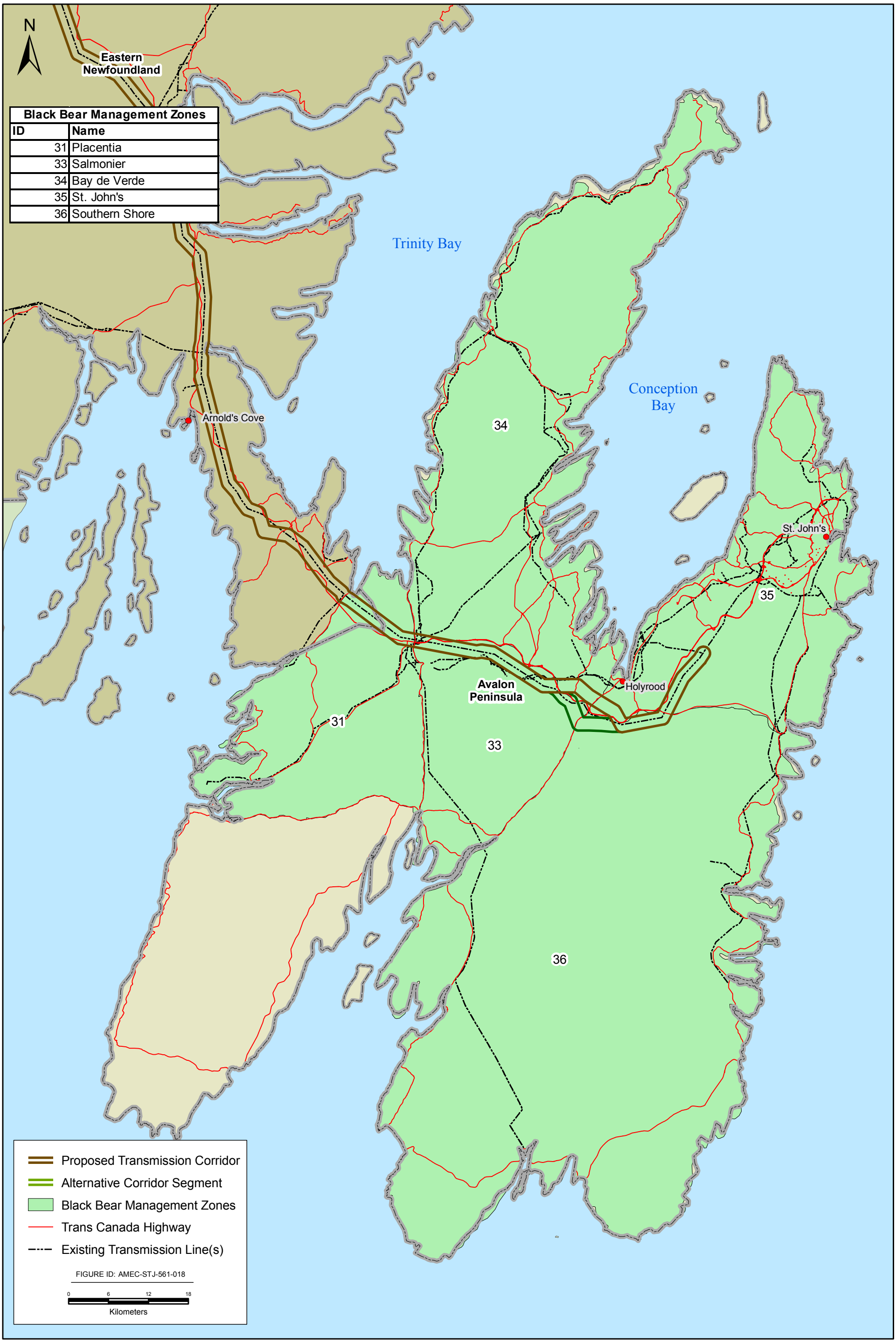
Black Bear Hunting - Northern Peninsula



nalcor energy

Figure 4.3-7

Black Bear Hunting - Central and Eastern Newfoundland



nalcor energy

Figure 4.3-8

Black Bear Hunting - Avalon Peninsula

Caribou Management Areas			
ID	**Name**	**Total Quota 2011-2012**	**Overall Success Rate 2009**
69	Northern Peninsula	140	86.4
76	St. Anthony	60	70.5
79	Adies Lake	10	46.7

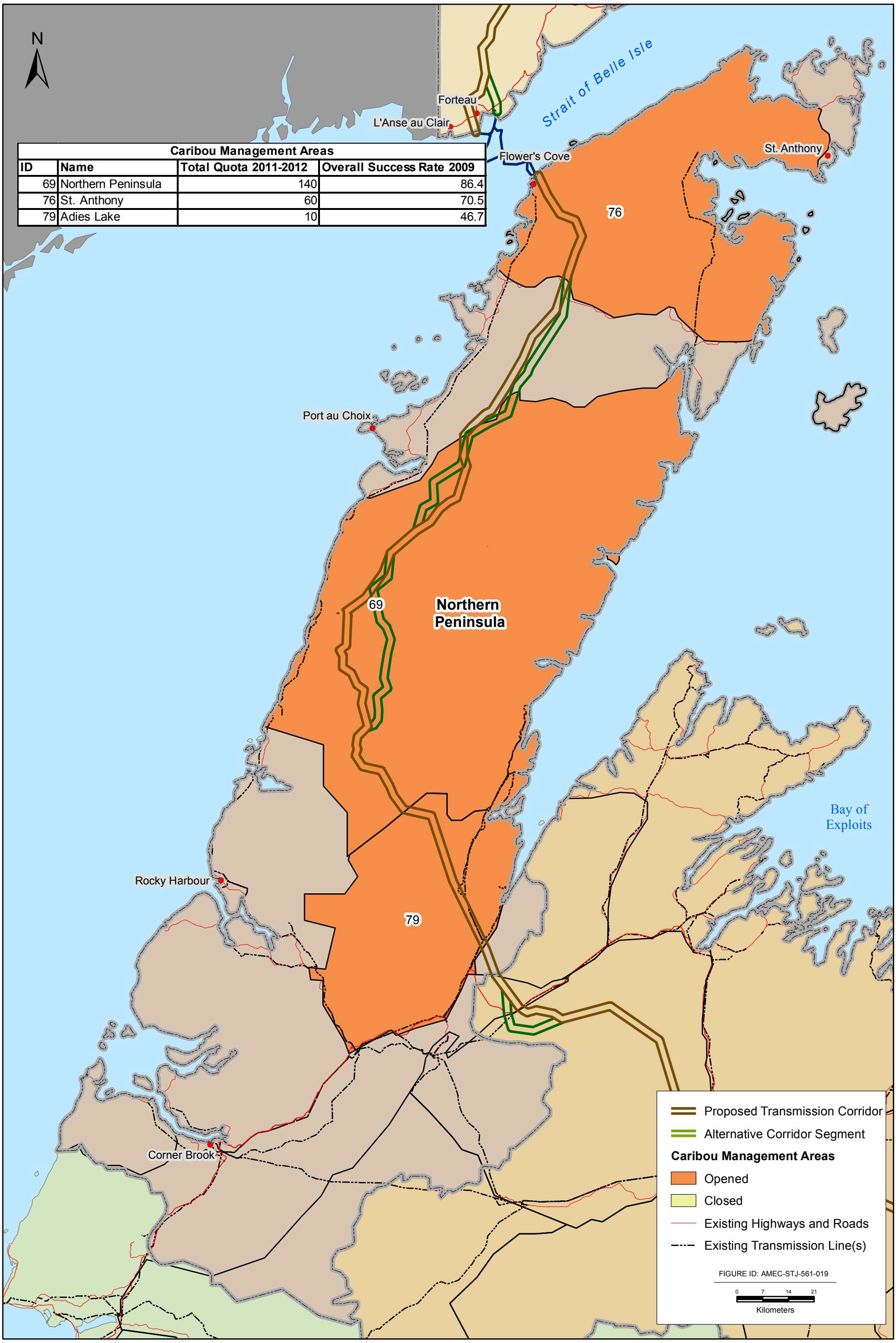
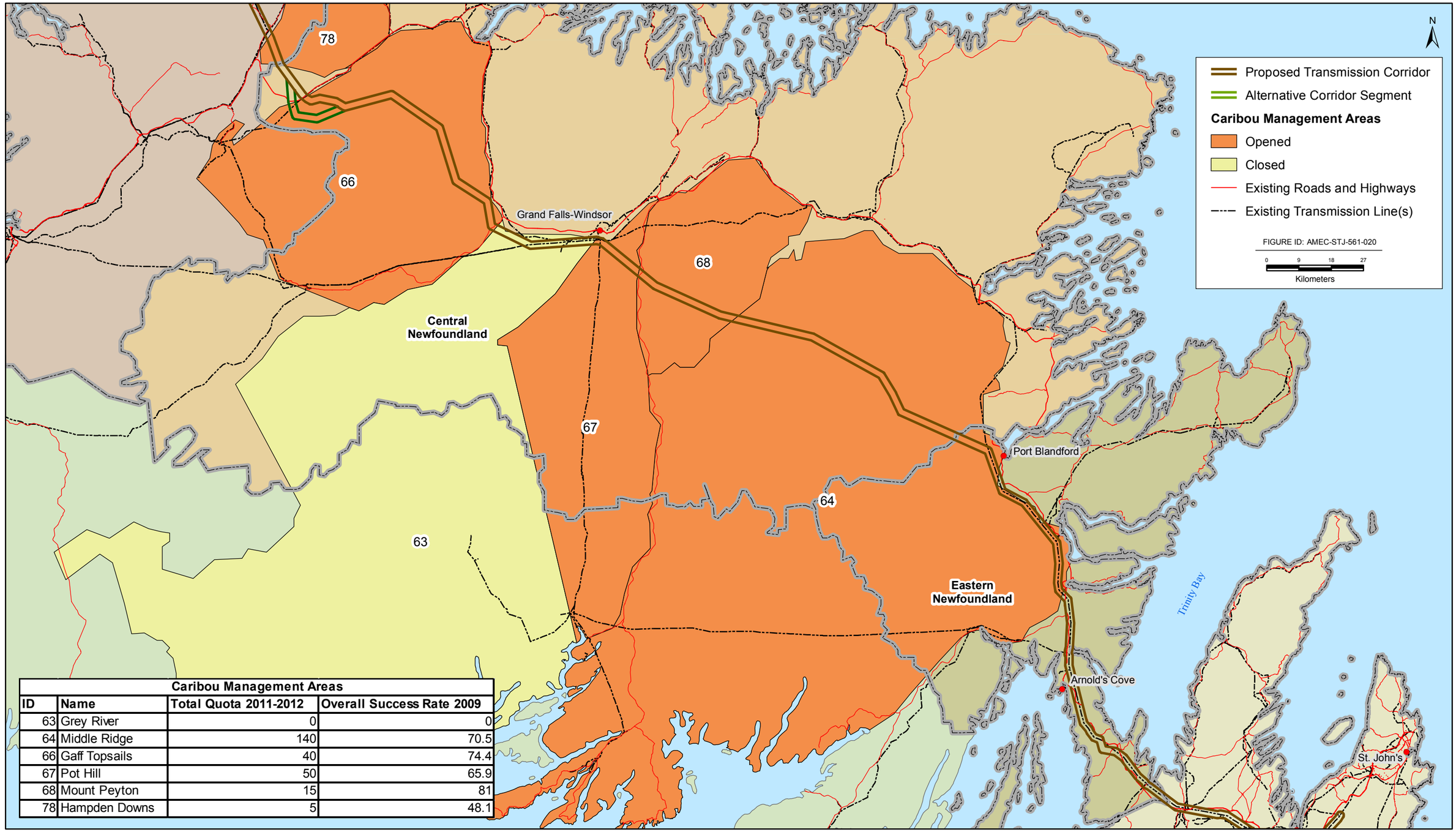


Figure 4.3-9

Caribou Hunting - Northern Peninsula

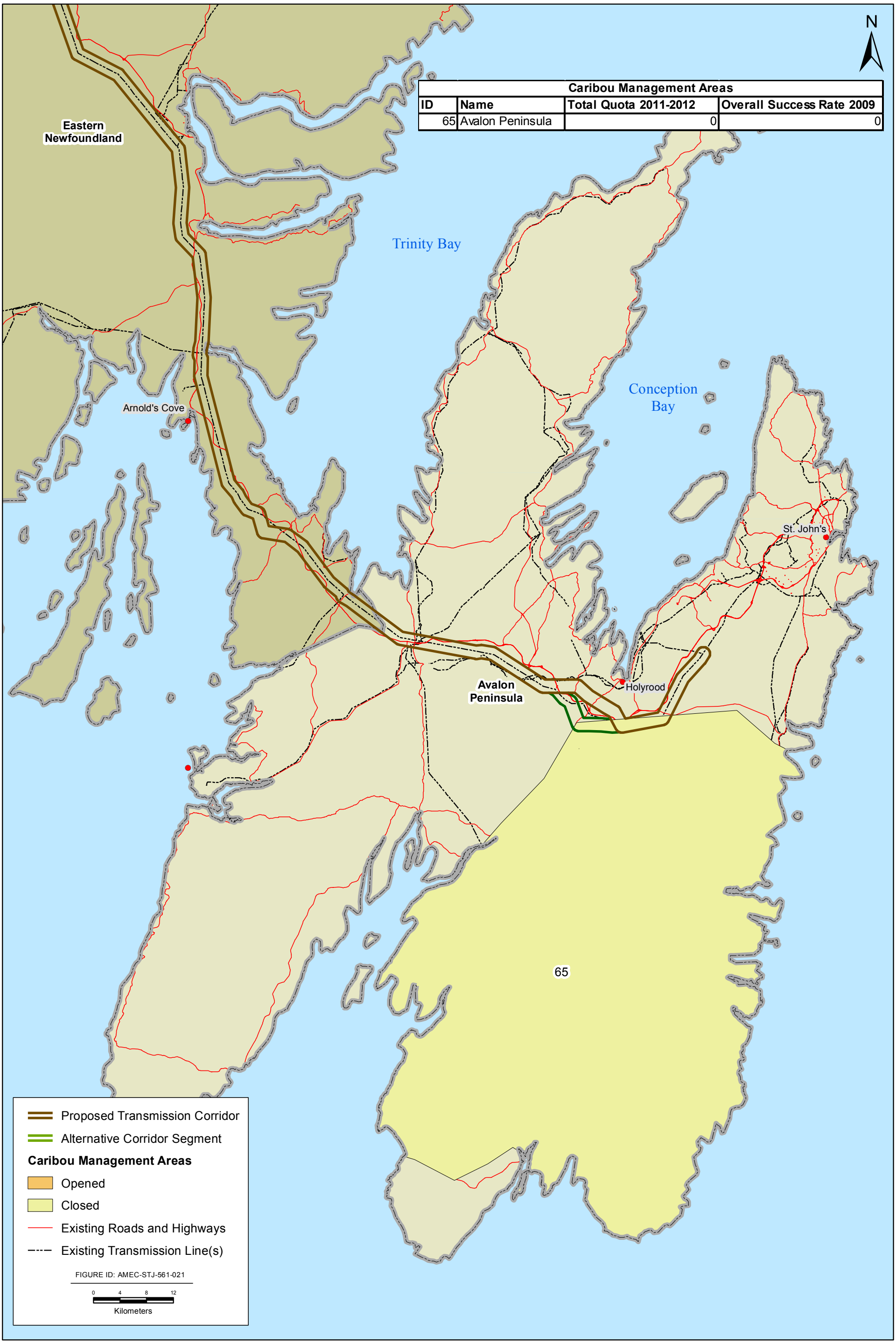


Caribou Management Areas			
ID	Name	Total Quota 2011-2012	Overall Success Rate 2009
63	Grey River	0	0
64	Middle Ridge	140	70.5
66	Gaff Topsails	40	74.4
67	Pot Hill	50	65.9
68	Mount Peyton	15	81
78	Hampden Downs	5	48.1

nalcor energy

Figure 4.3-10

Caribou Hunting - Central and Eastern Newfoundland



nalcor energy

Figure 4.3-11

Caribou Hunting - Avalon Peninsula

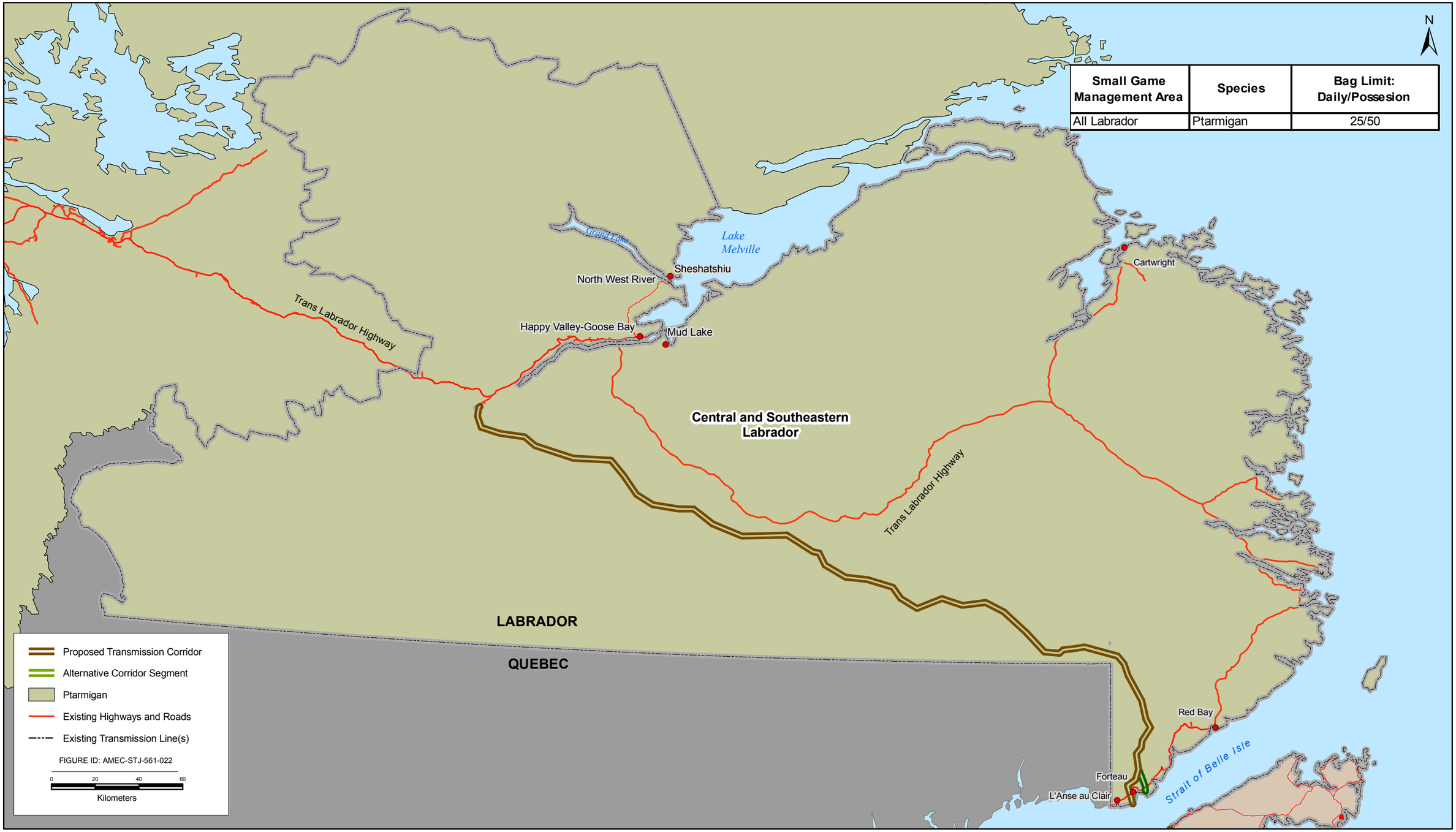


Figure 4.3-12

Small Game Hunting (Ptarmigan) - Central and Southeastern Labrador

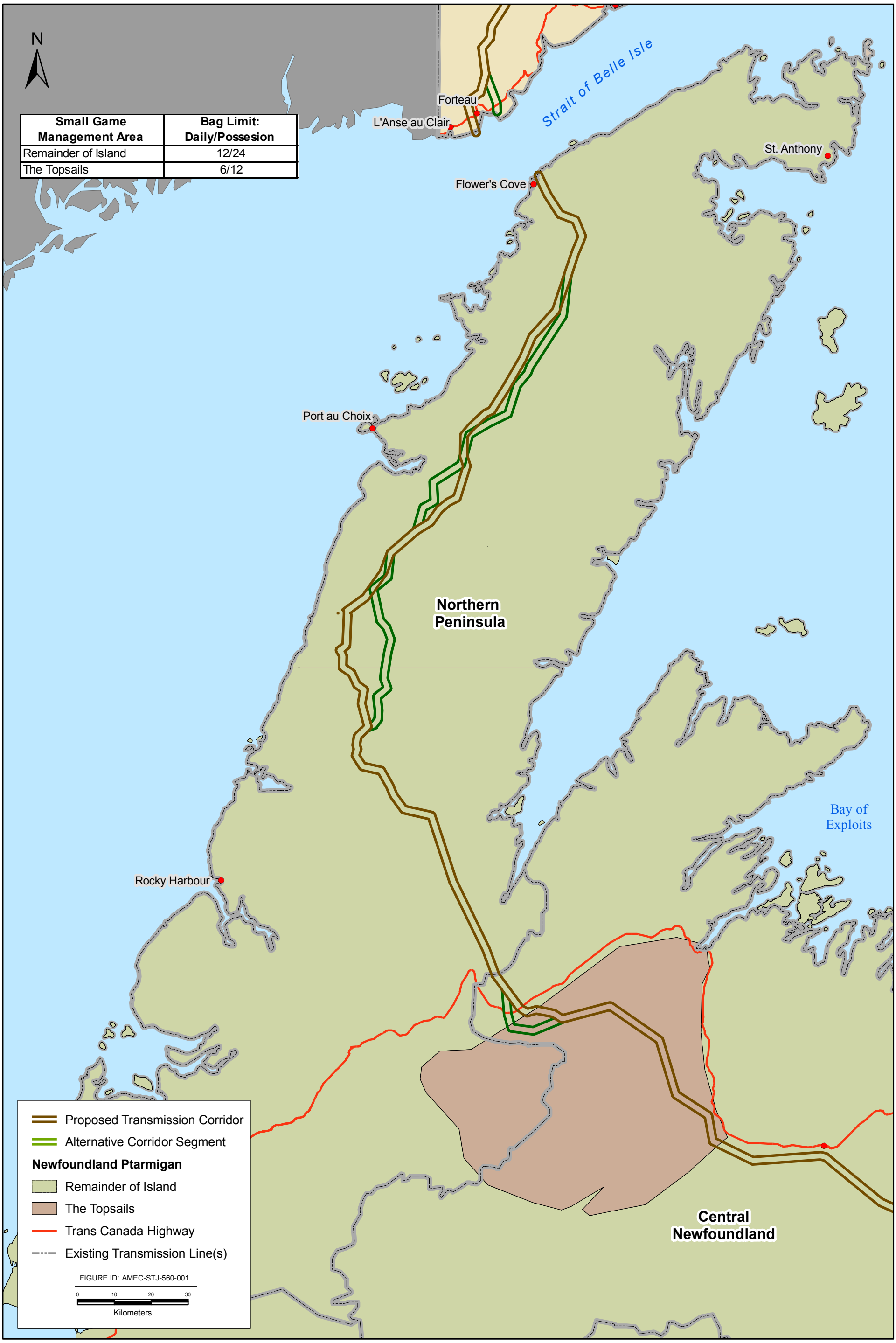


Figure 4.3-13

Small Game Hunting (Ptarmigan) - Northern Peninsula

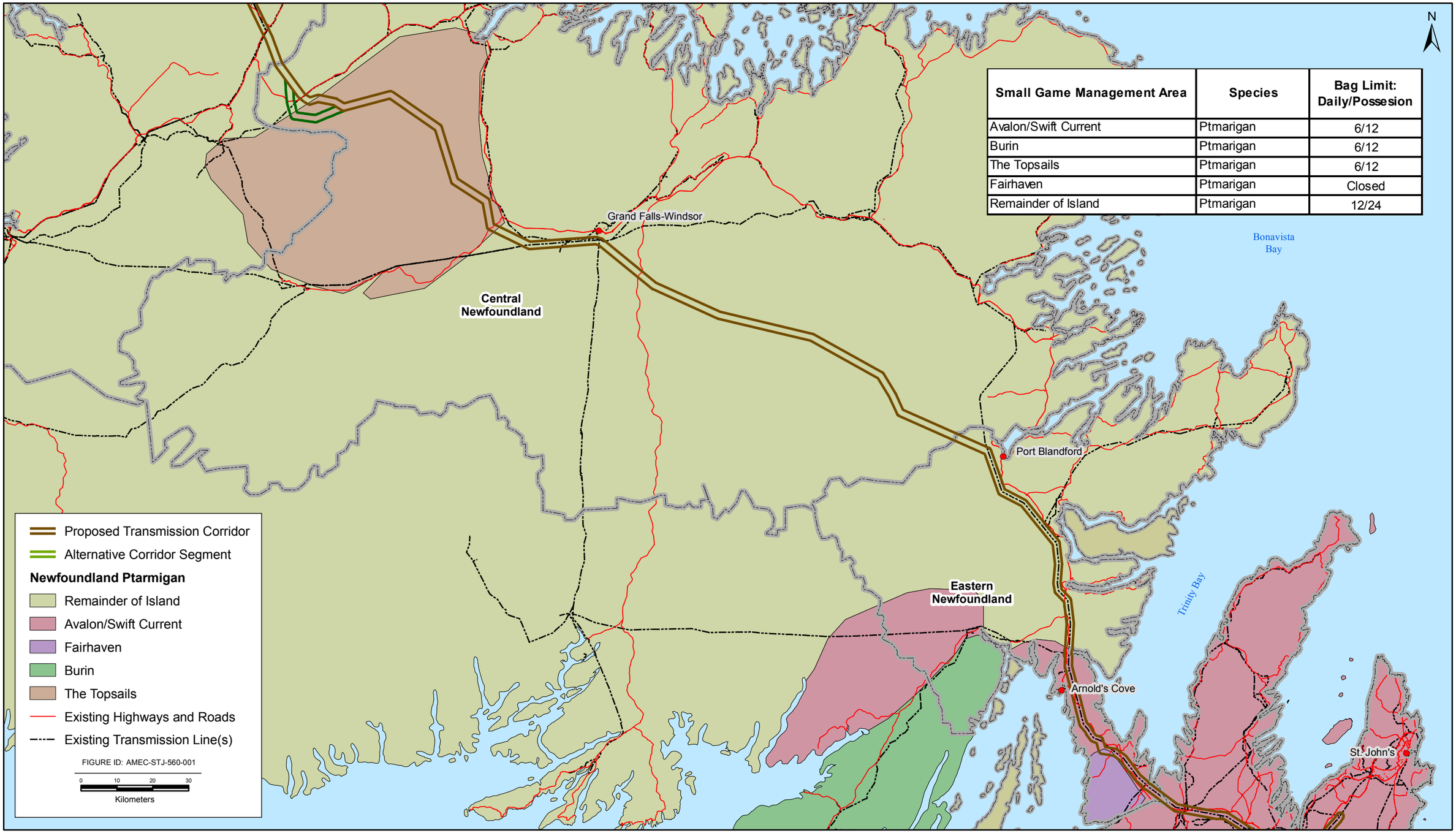


Figure 4.3-14

Small Game Hunting (Ptmarigan) - Central and Eastern Newfoundland

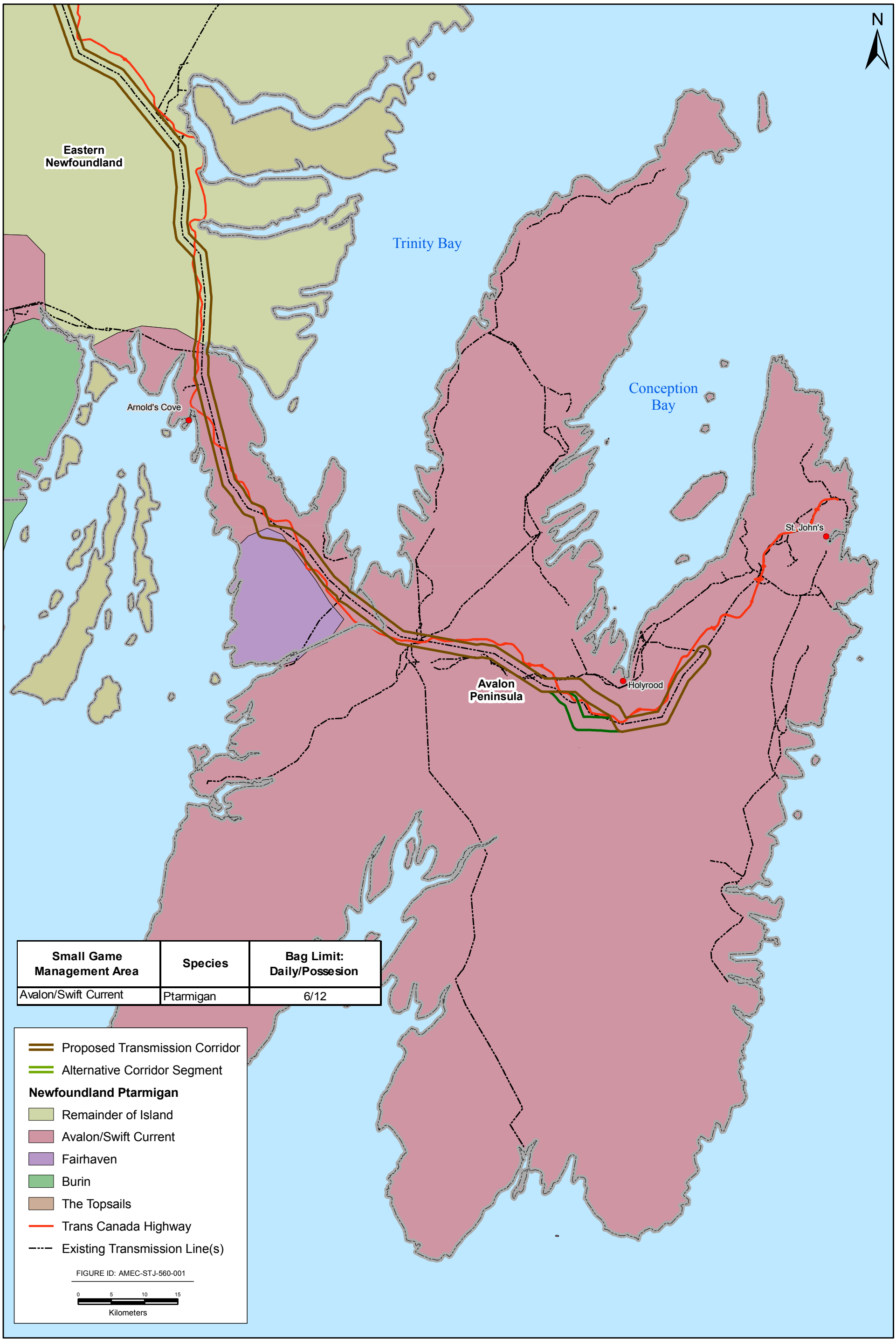
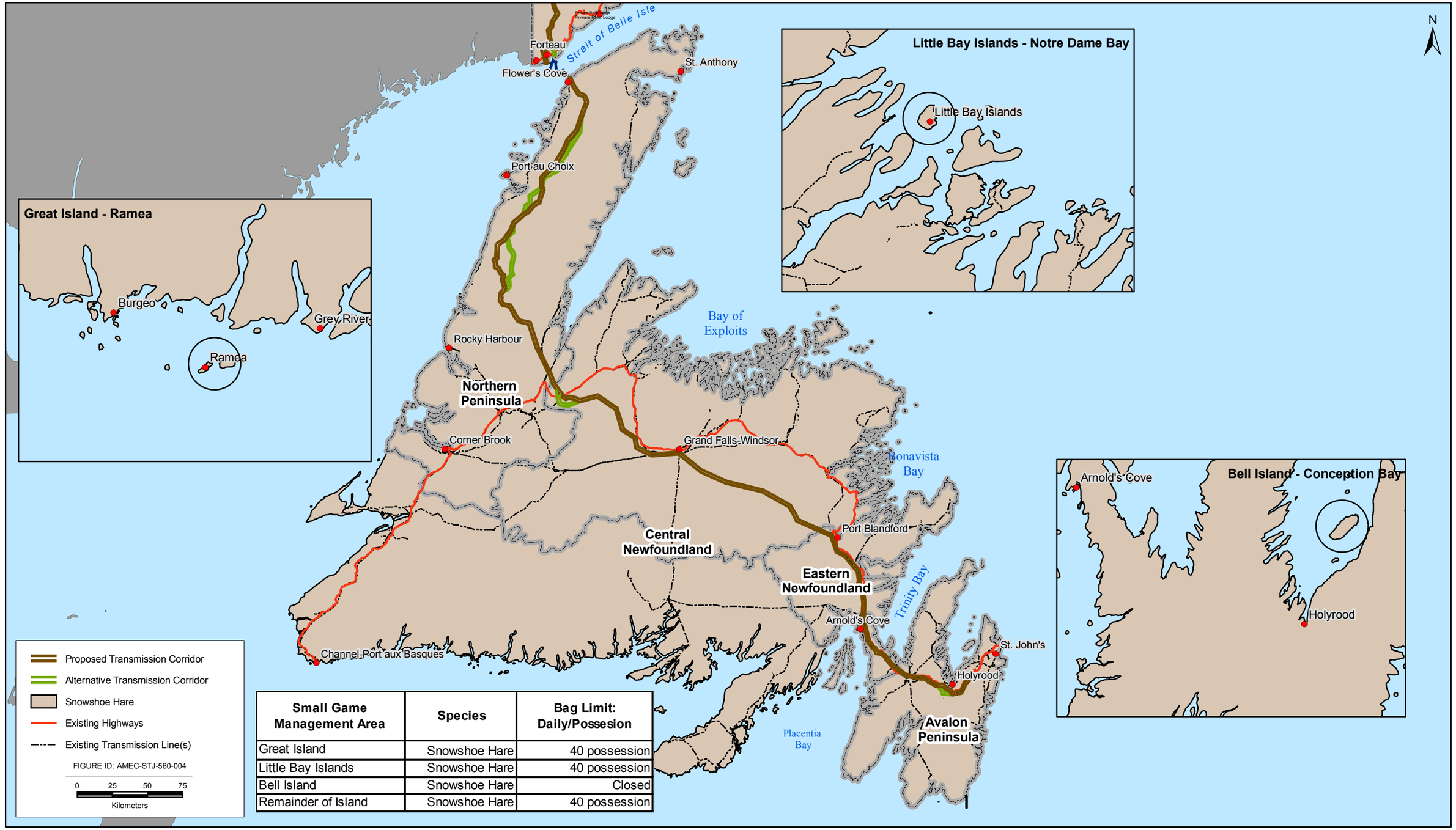


Figure 4.3-15

Small Game Hunting (Ptarmigan) - Avalon Peninsula

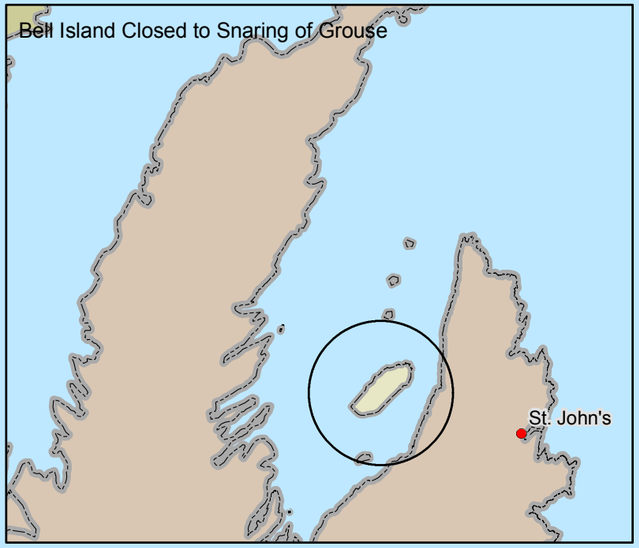


Small Game Management Area	Species	Bag Limit: Daily/Possesion
Great Island	Snowshoe Hare	40 possession
Little Bay Islands	Snowshoe Hare	40 possession
Bell Island	Snowshoe Hare	Closed
Remainder of Island	Snowshoe Hare	40 possession

Figure 4.3-16

Small Game Hunting (Snowshoe Hare) - Newfoundland

Small Game Management Area	Species	Bag Limit: Daily/Possesion
Island	Grouse (Spruce and Ruffed)	20/40
NOTE: Bell Island Closed to Snaring of Gouse		



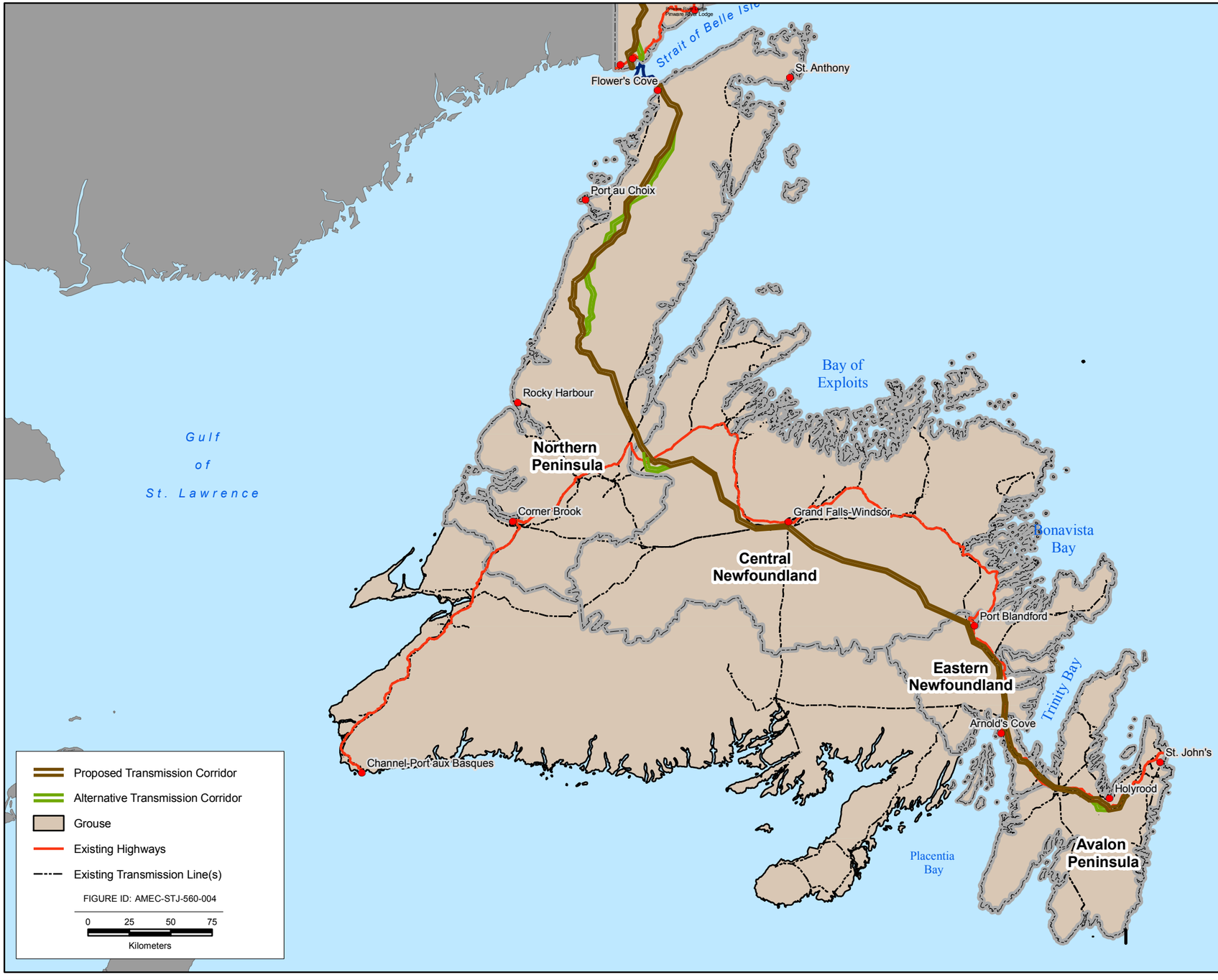


Figure 4.3-17

Small Game Hunting (Grouse) - Newfoundland

Migratory Game Bird Hunting Zones	Species	Bag Limit (Daily/Possession)
Central Labrador Zone	Ducks, Geese and Snipe	6/12 (Ducks) 5/10 (Geese) 10/20 (Snipe)
	Eiders	6/12 Eider
Southern Labrador (Straits)	Ducks, Geese and Snipe	6/12 (Ducks) 5/10 (Geese) 10/20 (Snipe)
	Eiders	6/12 Eider

N

Smallwood Reservoir

Trans Labrador Highway

Grand Lake

Lake Melville

North West River

Sheshatshiu

Happy Valley-Goose Bay

Mud Lake

Central and Southeastern Labrador

Trans Labrador Highway

CENTRAL LABRADOR

SOUTHERN LABRADOR

LABRADOR

QUEBEC

Atlantic Ocean

Red Bay

Strait of Belle Isle

Forteau

L'Anse au Clair

St. Anthony

Flower's Cove

Proposed Transmission Corridor

Alternative Transmission Corridor

Migratory Game Bird Hunting Zones

Existing Highway

Existing Transmission Line(s)

AMEC-STJ-561-002

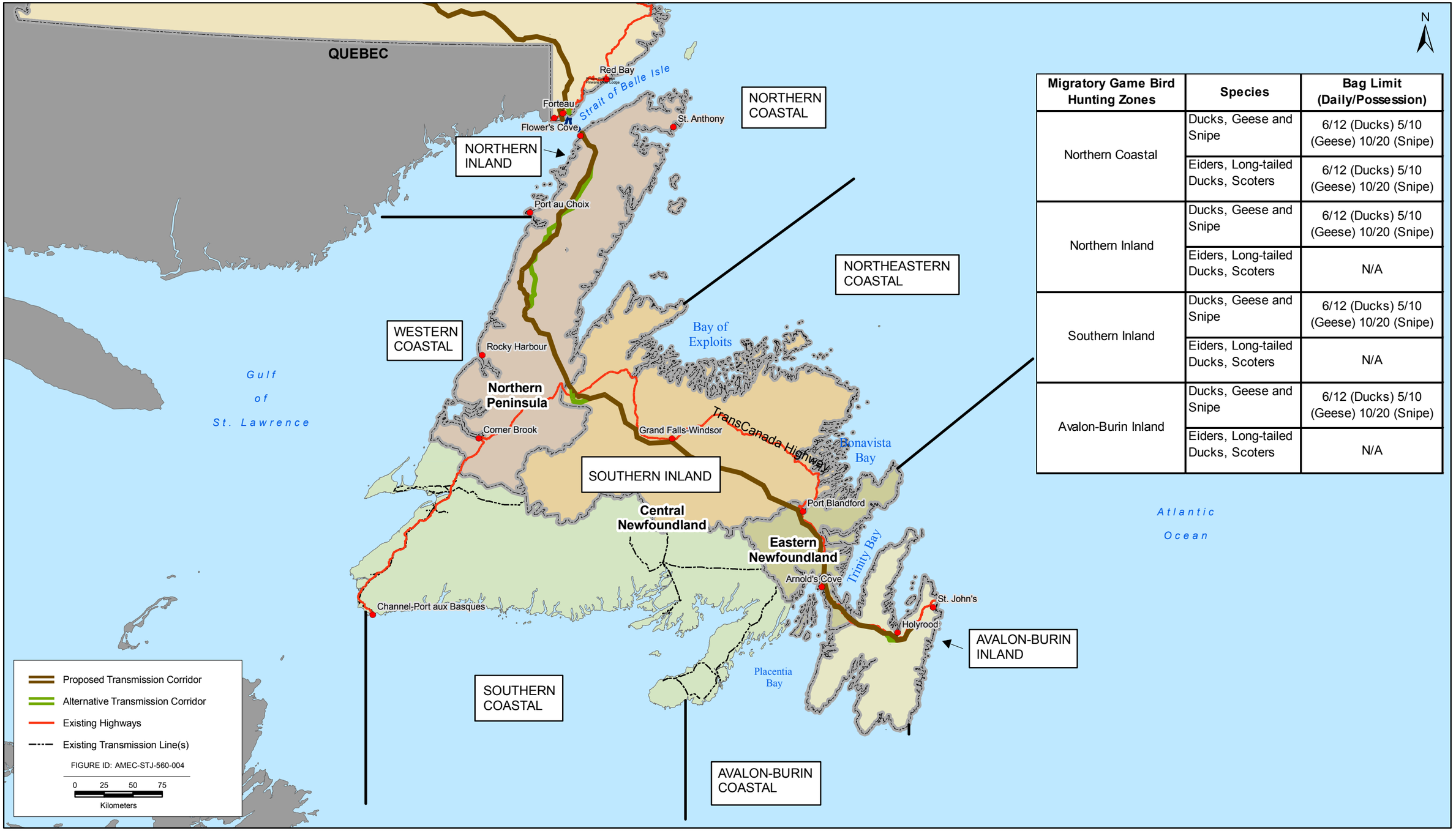
0 30 60 90

Kilometers

nalcor energy

Figure 4.3-18

Migratory Game Bird Hunting - Central and Southeastern Labrador



Migratory Game Bird Hunting Zones	Species	Bag Limit (Daily/Possession)
Northern Coastal	Ducks, Geese and Snipe	6/12 (Ducks) 5/10 (Geese) 10/20 (Snipe)
	Eiders, Long-tailed Ducks, Scoters	6/12 (Ducks) 5/10 (Geese) 10/20 (Snipe)
Northern Inland	Ducks, Geese and Snipe	6/12 (Ducks) 5/10 (Geese) 10/20 (Snipe)
	Eiders, Long-tailed Ducks, Scoters	N/A
Southern Inland	Ducks, Geese and Snipe	6/12 (Ducks) 5/10 (Geese) 10/20 (Snipe)
	Eiders, Long-tailed Ducks, Scoters	N/A
Avalon-Burin Inland	Ducks, Geese and Snipe	6/12 (Ducks) 5/10 (Geese) 10/20 (Snipe)
	Eiders, Long-tailed Ducks, Scoters	N/A

nalcor energy

Figure 4.3-19

Migratory Game Bird Hunting - Newfoundland

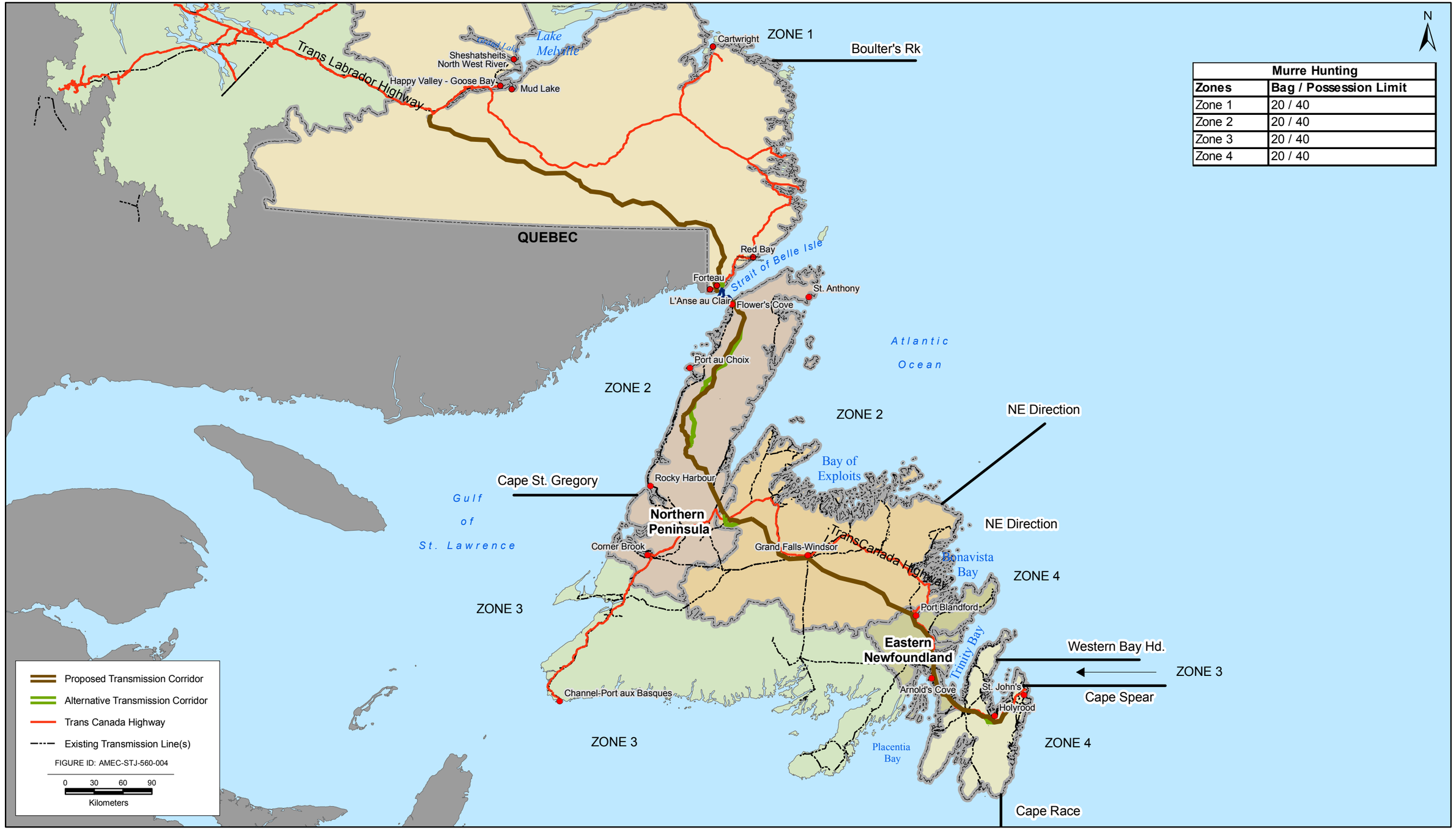


Figure 4.3-20

Murre Hunting - Newfoundland and Labrador

Fur Zones	
Species	**Labrador South**
Beaver	1246
Weasel	8491
Coloured Fox	9493
Arctic Fox	94
Lynx	705
Marten	31984
Mink	5334
Muskrat	5546
Otter	1714
Red Squirrel	1782
Wolf	448
Coyote	14
Total (over 17 years)	**67751**

N

Lake Melville
Grand Lake
Sheshatshiu
North West River
Happy Valley-Goose Bay
Mud Lake
Cartwright
Trans Labrador Highway
Central and Southeastern Labrador
Trans Labrador Highway
LABRADOR
QUEBEC
Red Bay
Strait of Belle Isle
Forteau
L'Anse au Clair
St. Anthony

Proposed Transmission Corridor
Alternative Corridor Segment
Fur Zones
Existing Highways and Roads
Existing Transmission Line(s)

FIGURE ID: AMEC-STJ-560-001

0 20 40 60
Kilometers

nalcor energy

Figure 4.3-21

Fur Trapping - Central and Southeastern Labrador

Species	Fur Zones	
	10	11
Beaver	5150	2178
Weasel	2683	6360
Coloured Fox	5550	6234
Arctic Fox	4	19
Lynx	233	177
Marten	122	90
Mink	4175	4249
Muskrat	1748	2822
Otter	544	1706
Red Squirrel	1203	5119
Wolf	7	2
Coyote	85	156
Total (over 17 years)	**21504**	**29112**

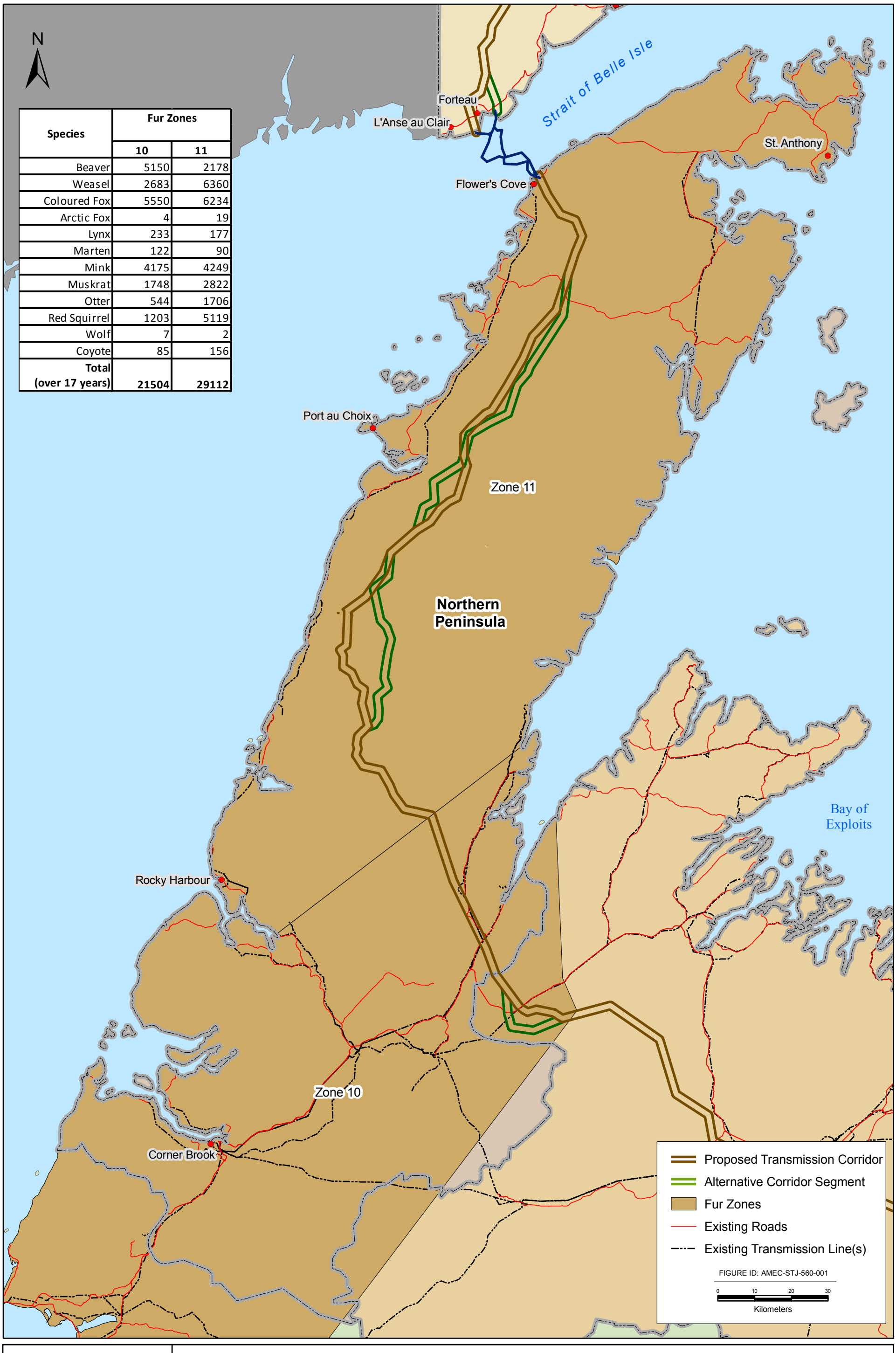


Figure 4.3-22

Fur Trapping - Northern Peninsula

Species	Fur Zones				
	3	5	6	7	8
Beaver	1841	2695	5953	2823	3576
Weasel	951	819	3143	1076	1925
Coloured Fox	1793	3801	7237	3405	5696
Arctic Fox	1	24	16	11	15
Lynx	139	232	842	313	310
Marten	0	16	21	0	11
Mink	1653	2651	10133	2087	5395
Muskrat	314	886	4532	469	245
Otter	1684	1597	1945	453	850
Red Squirrel	315	2997	3788	1445	2919
Wolf	0	0	10	38	18
Coyote	191	165	241	89	116
Total (over 17 years)	**8882**	**15883**	**37861**	**12209**	**21076**

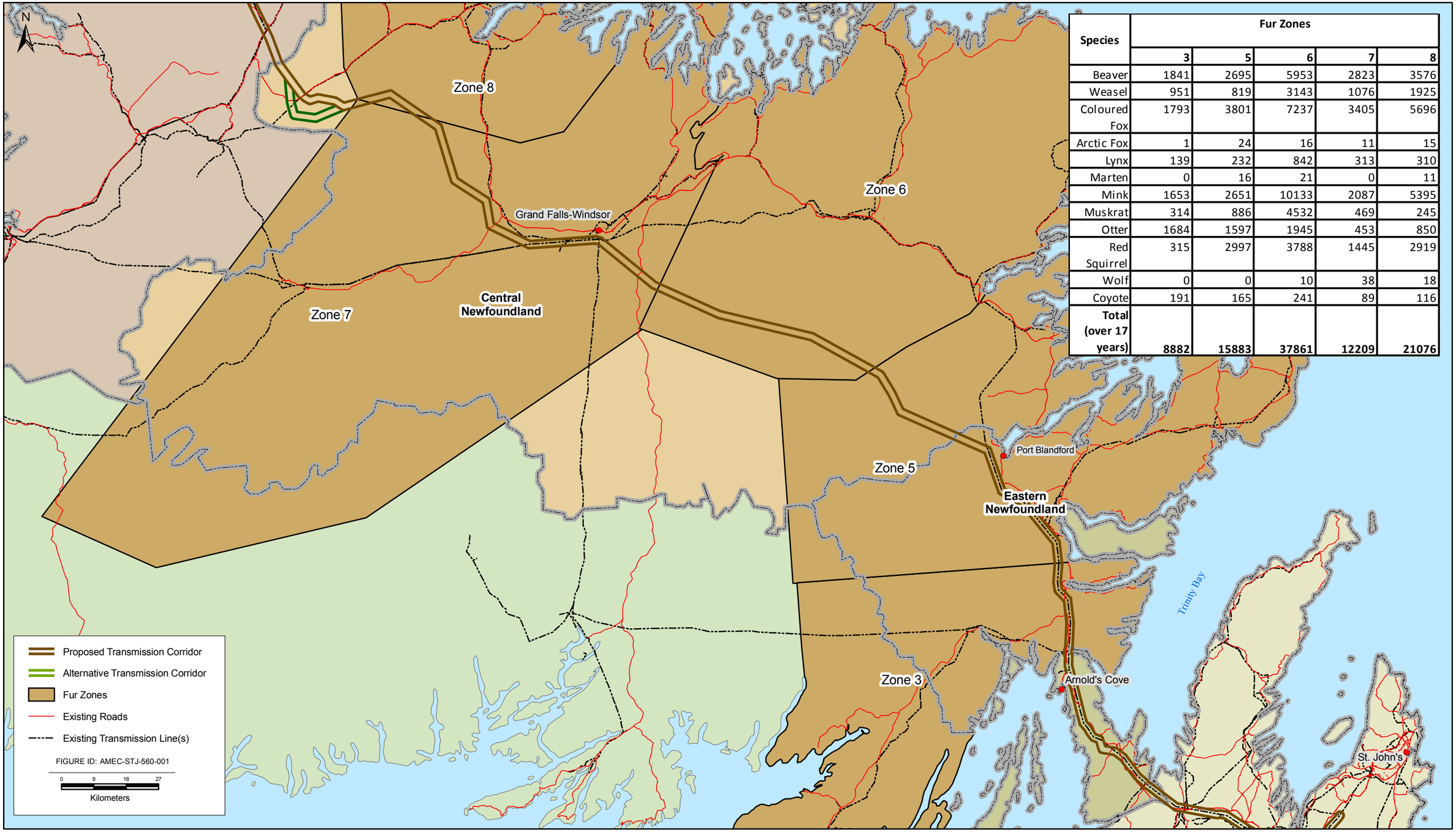
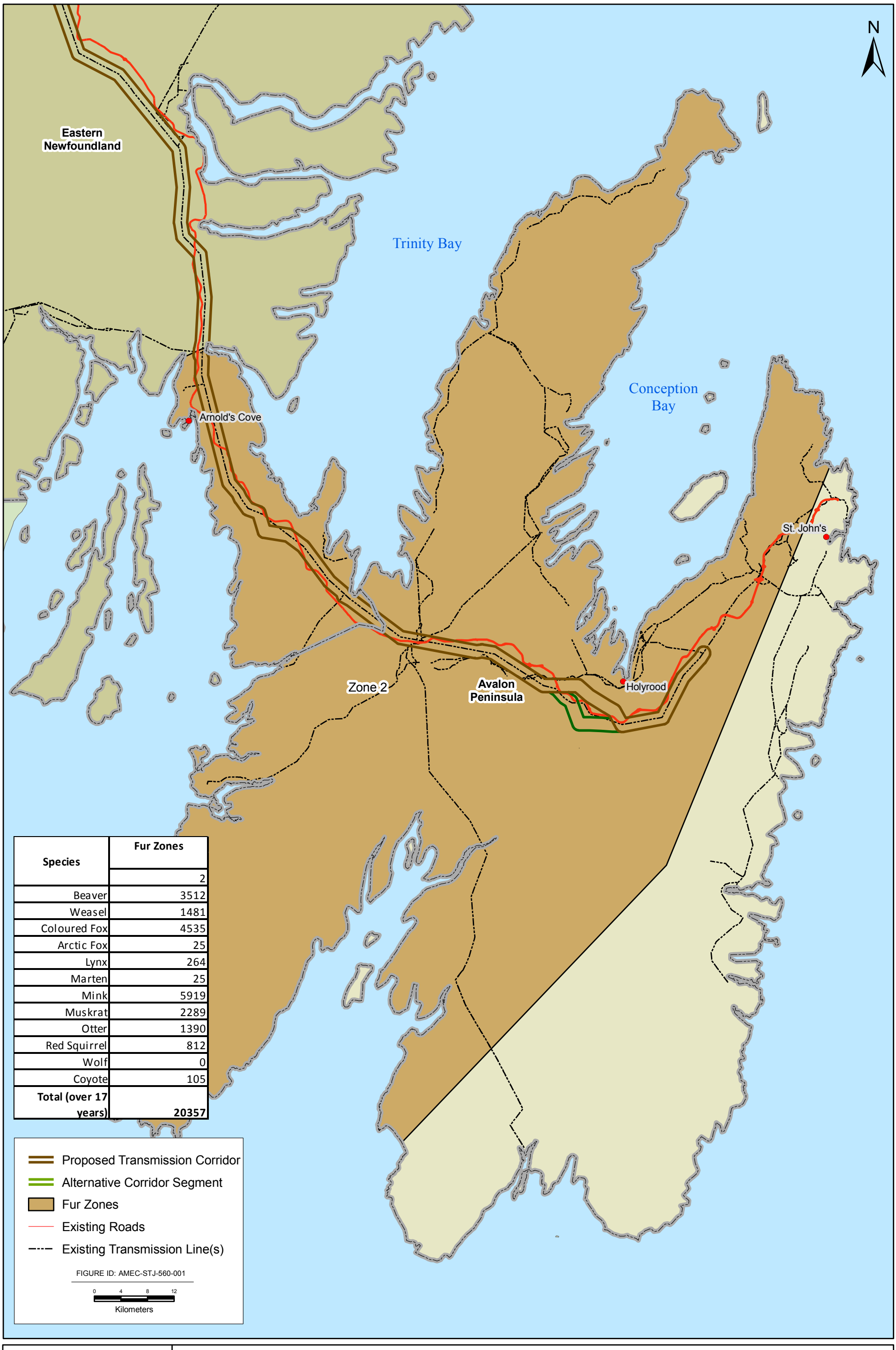


Figure 4.3-23

Fur Trapping - Central and Eastern Newfoundland



Species	Fur Zones
	2
Beaver	3512
Weasel	1481
Coloured Fox	4535
Arctic Fox	25
Lynx	264
Marten	25
Mink	5919
Muskrat	2289
Otter	1390
Red Squirrel	812
Wolf	0
Coyote	105
Total (over 17 years)	**20357**

nalcor energy

Figure 4.3-24

Fur Trapping - Avalon Peninsula

4.4 Angling and Other Fishing

An abundance of fish of various species inhabits the rivers, lakes and ponds of Newfoundland and Labrador. Recreational sport and subsistence fishing includes both freshwater (rivers, lakes and ponds) and marine (mostly inshore) activities. Freshwater species of fishing interest include Atlantic salmon, ouananiche (land locked Atlantic salmon), brook trout, rainbow trout, brown trout, Arctic char, Northern pike, whitefish, and smelt. With the exception of Northern pike, all of these species can occupy both freshwater and marine waters. All can be fished in both environments, though the retention of Atlantic salmon in marine waters is not permitted. Recreational sport species fished in marine environments generally include Atlantic cod, squid, mackerel and capelin.

Newfoundland and Labrador has 186 scheduled salmon rivers. Ouananiche (land locked Atlantic salmon), brook trout, rainbow trout, brown trout, sea-run trout and smelt are fished throughout the province. Arctic char are found primarily in Labrador and in limited locations on the Island. Northern pike, whitefish and lake trout are found in Labrador but not on the Island (DTCR, 2010).

Ice fishing occurs mostly on stream fed ponds and lakes throughout the province and brook trout is the most sought after species.

4.4.1 Study Area

The Study Area for angling and fishing includes all scheduled salmon rivers and other fished waterways crossed by the proposed transmission corridor from Central Labrador to the Avalon Peninsula. To provide context, those within the Regional Study Area (30 km) are also shown in Figures 4.4-1 to 4.4-4.

4.4.2 Administrative Framework

Within the province, Fisheries and Oceans Canada (DFO) divides fishing areas into Coastal and Inland waters. Coastal recreational fishing includes marine / salt water fishing outside the spring tide low water mark, with the exception of areas within closed estuary signs (estuaries closed to commercial fisheries with caution signs located on the shore of the river's estuary). Although they are marine waters, these closed areas are classified as non-scheduled inland waters and are regulated by seasonal dates for non-scheduled inland fishing. Inland waters open to fishing include all scheduled rivers (scheduled salmon and rainbow trout waters) and non-scheduled inland waters. Inland fishing refers to fishing in waters above low water spring tide or inland of a line marked by notices or in the vicinity of the mouth of a river stream flowing to the sea (DFO, 1978).

DFO is responsible for regulating and managing coastal and inland fisheries through the *Newfoundland and Labrador Fishery Regulations* under the *Fisheries Act.* The purpose of the regulations is to provide sustainable recreational angling opportunities for the people of the province. Legislation is enforced by DFO Fishery Officers and the provincial Department of Justice, Fish and Wildlife, Enforcement Division along with Fishery Guardians and Aboriginal Fishery Guardians. The province is responsible for inland fish resources and is mandated to license anglers.

DFO Fisheries Officers patrol water courses (rivers / streams) and water bodies (lakes / ponds) to enforce the *Newfoundland and Labrador Fishery Regulations*. The *Newfoundland and Labrador Angler's Guide* lists applicable regulations, seasons, locations, retention and possession limits and catch and release limits. DFO has ten Detachment Offices in the Province that can advise on regulations, season dates, bag limits and closed areas. They also work with Crime Stoppers to address poaching issues (DFO, 2009).

Salmon angling is permitted in both inland and coastal waters, but salmon retention is not permitted. Residents and non-residents require salmon licences and tags to fish in scheduled waters. On the Island of Newfoundland, non-residents are restricted to fishing, accompanied by a licensed guide or resident who is a direct relative, on scheduled salmon rivers, non-scheduled rivers, and other waterbodies beyond 800 m of a provincial highway (no accompaniment is required within 800 m of the highway). With some exceptions, non-residents must engage the services of an outfitter when fishing in Labrador (DFO, 2009).

Inland watercourses are classified as Class I, II, III, IV or Unclassified rivers. Classification designates bag and possession limits ranging from maximum bag limit of six fish (Class I rivers) to a minimum of two fish (Class III) with one classification designated as catch-and-release angling only (Class IV). All non-scheduled rivers are classified as Class III, with a two-fish retention limit. The possession limit for salmon is twice the daily bag limit. In both Labrador and Insular Newfoundland, all salmon greater than 63 cm must be released and on all scheduled and non-scheduled rivers and young salmon (referred to as fry, parr and smolt) less than 30 cm must be released. Similarly, all ouananiche and rainbow trout less than 20 cm (8 inches) must be released. Non-residents require a trout license to fish inland waters for brook trout, brown trout and rainbow trout, while residents do not (DFO, 2011).

Licences are issued by the Department of Environment and Conservation, Wildlife Division and can be obtained from commercial vendors such as sporting good shops, service stations or from one of the ten provincial Government Service Centres. Non-resident anglers can also obtain licences through licensed outfitters (DFO, 2009).

Several management plans including the Atlantic Salmon Management Plan, the Trout Management Plan and various watershed management plans establish season dates and catch limits. These plans are developed in consultation with user-groups and stakeholders including anglers, outfitters, conservationists, Aboriginal groups and the provincial government. The plans are generally reviewed annually and renewed every four to five years. The current Atlantic Salmon Management Plan is for 2007-2011 and the Trout Plan is a multi-year (2005-2009) management plan subject to change (DFO, 2009). Where watershed management plans apply to specific watersheds, these are discussed below in the appropriate Study Region sections.

DFO establishes annual seasonal fishing dates and catch limits (for both Labrador and the Island) for salmon, Arctic char, and trout (including brook trout, brown trout, rainbow trout and ouananiche). In addition to these species, a bag limit is also set and enforced in Labrador for Northern pike. In both parts of the province no limit is placed on catching smelt and in Labrador no limit is placed on catching whitefish (DFO, 2009).

Within the Study Regions from Labrador to the Avalon Peninsula no special restrictions apply to trout fishing other than bag and possession limits except for a Special Trout Management Area on the Northern Peninsula at Ten Mile Lake / Round Lake and all tributaries flowing in and out of 10 Mile Lake and Round Lake and the St. Genevieve River system where the season runs from June 1 to July 15 with a bag limit of two trout, combined weight of no more than 2.25 kg. Fish greater than 58 cm must be released. In the Eagle Plateau Management Zone in Labrador, the 2009-10 season extended from February 1 to September 15. The bag limit for brook trout was six fish or 1.13 kg plus one fish, whichever is reached first (DFO, 2009).

For winter trout angling (i.e., ice fishing), a maximum of three separate lines each equipped with one hook per various fishing method are permitted and must be closely and constantly attended by the angler (DFO, 2009).

4.4.3 Information Sources

Almost all of the information presented below comes from the *Newfoundland and Labrador Angler's Guide 2009 / 10* produced by DFO, the Provincial tourism information website and the *Hunting / Fishing* lure booklet published by the Department of Tourism, Culture and Recreation in 2009. Information was also obtained from a 2005 DFO survey of recreational anglers.

4.4.4 Angling and Fishing

DFO has primary responsibility for managing coastal and inland fisheries. Much of the enforcement work is conducted through the ten DFO detachment offices throughout Newfoundland and Labrador. Although only two are located in the Study Regions (i.e., Happy Valley-Goose Bay and Clarenville), two others are located nearby (i.e., Rocky Harbour and Springdale). The province's Department of Justice, Fish and Wildlife Division shares enforcement responsibility. The following sections discuss salmon and trout fishing in general and in the Study Regions.

Salmon

DFO's current multi-year Salmon Management Plan (2007-2011) sets annual season dates and retention limits for salmon angling. DFO collects various data sets related to scheduled salmon rivers in the province. Angler data is used to describe fishing activity and catch rate. In order to compare angling success among rivers, the number of fish caught relative to the time spent angling is calculated. A rod day is defined as being any period of time fished during a day on a particular river. Catch is the total number of salmon caught and retained or caught and released on a river. Catch per unit effort (CPUE) is calculated by dividing the catch by the effort (effort in rod days). Thus, a higher CPUE indicates more successful fishing effort. A CPUE of over 1.0 is rare and anglers consider rivers with a CPUE of 0.25 (one fish per four days of angling) to be desirable fishing areas (McCarthy, J., 2010).

The following sections describe scheduled salmon rivers and salmon fishing by Study Region. In total, 186 scheduled salmon rivers have been identified in Newfoundland and Labrador. The accompanying Tables 4.4-3 to 4.4-6 provide information on scheduled salmon rivers crossed by the proposed transmission corridor including angling zone, class, daily bag limit, rods, catch and CPUE. The accompanying maps (Figures 4.4-1 to 4.4-4) show scheduled salmon rivers in the Regional Study Area (30 km) which encompasses any alternative corridor segments.

Trout

Federal / provincial trout management plans are used to maintain sustainable fishing. Season dates may be adjusted for any species in any geographic area. Trout angling zones and seasons within areas relevant to this study (i.e., excluding Zone 4-Western Labrador and Zone 6-Northern Labrador) are included in Table 4.4-1. As resident anglers are not required to report on trout fishing, success rates are not available (non-residents report on trout fishing as a license requirement).

Table 4.4-1: Relevant Newfoundland and Labrador Trout Angling Zones and Seasons (2011-12)

Zones	Winter Open	Winter Close	Summer Open	Summer Close
1 - Insular Newfoundland	February 1	April 15	May 15	September 7
2 - Labrador, Strait of Belle Isle area (Quebec-Labrador border to Cape Charles)	March 1	-	-	September 7
3 - Southeastern Labrador, north of latitude to 52° to Groswater Bay and bounded inland by west longitude 58°	March 1	-	-	September 7
5 - Central Labrador	February 1	-	-	September 15

Source: DFO, 2011

Trout angling is permitted generally from the winter season to early fall.

Season dates, bag limits and possession limits may vary by area, by species or in special trout management areas. Where conservation measures are warranted, bag limits, possession limits and season dates may be adjusted for any species in any geographic area. Daily bag and possession limits are shown in Table 4.4-2.

Table 4.4-2: Newfoundland and Labrador Trout Bag and Possession Limits (2011-12)

Areas	Species	Daily Bag Limits	Possession Limits
Labrador	Trout (includes speckled trout and ouananiche)	12 trout or 2.25 kg round weight + 1 fish, whichever is reached first of the two species combined. No ouananiche less than 20 cm can be retained	Twice daily bag limit
	Lake trout	Zone 2 – 2 fish	Zone 2 – 4 fish Zone 3-6 – 3 fish
	Speckled trout in Eagle Plateau Management Zone, Chateau Pond and Gilbert's Lake	6 fish or 1.13 kg + 1 fish whichever is reached first	Equal to daily bag limit
	Northern pike	2 fish	Twice daily bag limit
	Arctic char	2 fish	Twice daily bag limit
	Whitefish	No limit	No limit
	Smelt	No limit	No limit
Insular Newfoundland	Trout (speckled trout, brown trout, rainbow trout and ouananiche)	12 fish or 2.25 kg round weight + 1 fish, whichever is reached first, of all species combined. No rainbow or ouananiche less than 20 cm can be retained	Twice daily bag limit
	Trout in 10 Mile Lake and Round Lake	2 trout – weight (or combined weight) of any fish cannot be greater than 2.25 kg. Trout greater than 58 cm must be released	Equal to daily bag limit

Areas	Species	Daily Bag Limits	Possession Limits
	Arctic char	12 fish or 2.25 kg round weight + 1 fish whichever is reached first	Twice daily bag limit
	Smelt	No limit	No limit

Source: DFO, 2011

The *Newfoundland and Labrador Fishery Regulations* do not impose a daily bag limit or possession limit on smelt or whitefish (whitefish are only found in Labrador). Daily bag and possession limits for trout are generally similar in Labrador and on the Island except for brook trout which has lower limits in Insular Newfoundland and in parts of Labrador. Arctic char, Lake trout and Northern pike (of which the latter two are found only in Labrador) have lower bag and possession limits that most other species in Labrador (DFO, 1999).

Central and Southeastern Labrador

Within the Central and Southeastern Labrador Study Region there are 20 scheduled salmon rivers, of which one, the Forteau River, is crossed by the proposed transmission corridor (Table 4.4-3). Two other salmon rivers are located in the 30 km wide Regional Study Area (Figure 4.4-1).

Table 4.4-3: Scheduled Salmon Rivers Crossed by the Proposed Transmission Corridor - Central and Southeastern Labrador

Scheduled Salmon Rivers and Tributaries	Angling Zones	Classes	Daily Bag Limits	Rods (2008)	Catch (2008)	CPUE (2008)
175 - Forteau River including First, Second and Third Lakes	14B	III	Two fish / two per day. Tags 1-4, four per day catch and release	516	174	0.34

Source: DFO, 2009

Labrador has five trout angling zones. Zones 2, 3, and 5 are in Central and Southeastern Labrador. Zone 5 includes the Eagle Plateau Management Zone, a recently established large conservation area for trout angling, which is crossed by the proposed transmission corridor. DFO has set conservation measures for lake trout, Northern pike, brook trout and arctic char in Labrador. Bag and possession limits are shown in Table 4.4-2.

Northern Peninsula

Thirty-one scheduled salmon rivers are located on the Northern Peninsula (DFO, 2009). Table 4.4-4 shows the three scheduled salmon rivers (159, 163 and 164) that are crossed by the proposed transmission corridor. These and salmon rivers in alternative corridor segments and the Regional Study Area (30 km) are illustrated in Figure 4.4-2. Portions of one of these are closed to salmon angling. The Main River Watershed Management Plan applies to part of the Northern Peninsula.

Table 4.4-4: Scheduled Salmon Rivers Crossed by the Proposed Transmission Corridor - Northern Peninsula

Scheduled Salmon Rivers and Tributaries	Angling Zones	Classes	Daily Bag Limits	Rods (2008)	Catch (2008)	CPUE (2008)
159 - Portland Creek Feeder and tributary streams	14A	II	Two fish / two per day. Tags 1-2 (red), four per day catch and release	Not available	Not available	Not available
163 - East River, Hawke's Bay*	14A	III	Same as above	821	498	0.61 (Big East River)
164 - Castor River including southwest feeder	14A	II	Same as above	1,722	1,521	0.88

Source: DFO, 2009

*Currently all, or portions of, closed to salmon angling

Northern Peninsula scheduled salmon rivers have high CPUEs. Castor River has a CPUE of 0.88.

Central and Eastern Newfoundland

In Central and Eastern Newfoundland Study Region, 11 scheduled salmon rivers (36, 37, 46, 50, 60, 62, 63, 65, 69, 71 and 91) intersect with the proposed transmission corridor. These are described in Table 4.4-5. Figure 4.4-3 shows these along with scheduled salmon rivers in the alternative corridor segment and Regional Study Area.

Individual watershed management plans result in sections of various rivers having different classifications and sometimes various seasons and limits. This includes Exploits River, Gander River, Terra Nova River, Shoal Harbour River and Bellevue River and their tributary streams, of which portions are currently closed to salmon angling.

Table 4.4-5: Scheduled Salmon Rivers Crossed by the Proposed Transmission Corridor - Central and Eastern Newfoundland

Scheduled Salmon Rivers and Tributaries	Angling Zones	Classes	Daily Bag Limits	Rods (2008)	Catch (2008)	CPUE (2008)
36 - Indian River, Hall's Bay including Burnt Berry Brook below falls	4	II	Four fish / two per day. Tags 1-4 (red, green). Four per day catch and release	2,255	809	0.36
37 - West River, Hall's Bay including Rowsell's Brook and Barney's Brook	3	III	Two fish / two per day. Tags 1-4, four per day catch and release	534	252	0.47
46 - Exploit's River and tributary streams*	4	I-IV	Varies depending on location	13,898	6,641	0.48

Scheduled Salmon Rivers and Tributaries	Angling Zones	Classes	Daily Bag Limits	Rods (2008)	Catch (2008)	CPUE (2008)
50 - Gander River and tributary streams*	4	I-IV	Varies depending on location	7,305	2,227	0.30
60 - Gambo Brook and tributary streams including Mint Brook, Narrows, Triton Brook, Riverhead Brook and Parsons Brook	5	II	Four fish / two per day. Tags 1-4 (red, green). Four per day catch and release	1,481	436	0.29
62 - Terra Nova River and tributary streams including Maccles Brook, Georges Brook and Butts Brook*	5	III	Two fish / two per day. Tags 1-4, four per day catch and release	1,349	312	0.23
63 - Northwest Brook, Port Blandford and tributary streams	5	-	-	109	30	0.28
65 - Southwest Brook, Port Blandford and tributary streams	5	-	-	46	8	0.17
69 - Shoal Harbour River, Trinity Bay and tributaries*	6	III	Two fish / two per day. Tags 1-4, four per day catch and release	298	70	0.23
71 - Bellevue River, Trinity Bay*	6	III	Same as above	92	6	0.07
91 - Come By Chance River	10	III	Same as above	430	64	0.15

Source: DFO, 2009

*Currently all, or portions of, closed to salmon angling

Anglers enjoy successful fishing (measured in CPUE) in several rivers in Central and Eastern Newfoundland. Although portions of the Exploits River are closed, this River and its tributary streams (e.g., Great Rattling Brook) measured the highest CPUE of those rivers listed. Lower CPUEs are more common in Eastern Newfoundland.

Avalon Peninsula

The proposed transmission corridor crosses North Arm River, Holyrood and Northeast River, Placentia which empties into Placentia Bay at Northeast Arm (Dunville). Figure 4.4-4 illustrates these and other scheduled salmon rivers in the Regional Study Area. Table 4.4-6 shows CPUE for North Arm River and Northeast River.

Table 4.4-6: Scheduled Salmon Rivers Crossed by the Proposed Transmission Corridor - Avalon Peninsula

Scheduled Salmon Rivers and Tributaries	Angling Zones	Classes	Daily Bag Limits	Rods (2008)	Catch (2008)	CPUE (2008)
75 - North Arm River, Holyrood	7	IV	No fish may be retained. Tags 1-6 may be used for catch-and-release angling (two per day catch-and-release)	143	8	0.06
90 – Northeast River, Placentia*	10	III	Two fish / two per day. Tags 1-2 (red), four per day catch and release	895	200	0.22

Source: DFO, 2009
*Currently all, or portions of, closed to angling

CPUE on the Avalon Peninsula is lower than rivers in Southeastern Labrador, Northern Peninsula and Central Newfoundland and similar to those found in Eastern Newfoundland. Lower CPUE rates in Eastern Newfoundland and on the Avalon Peninsula may relate to higher population density and extensive road access.

4.4.5 Ice Fishing

Ice fishing occurs on ponds and lakes that are stream fed rather than spring fed. It also occurs on salt water areas that freeze up. Brook trout is the most commonly caught species. According to provincial Conservation Officers, since the opening of the TLH, Route 510, ice fishing increased on ponds and lakes near the highway, although Labrador residents still use Lake Melville as their primary ice fishing location (Conservation Officers, 2010). Because of the large population concentration on the Avalon Peninsula, the stream fed ponds and lakes near road access on the Avalon Peninsula generally experience the heaviest use. Table 4.4-7 shows trout and smelt ice fishing seasons. There is no salmon winter angling season.

Table 4.4-7: Winter Fishing Seasons for Southern Labrador and Newfoundland (2011-12)[1)]

Species	Area	Angling Dates
Trout	Insular Newfoundland – Zone 1	February 1 to April 15
	Labrador: Strait of Belle Isle Region – Zone 2	March 1 to September 7
	Southeast Labrador – Zone 3	March 1 to September 7
	Central Labrador – Zone 5	February 1 to September 15
	10 Mile Lake / Round Lake Special Trout Management Area	No winter angling
	Eagle Plateau Special Trout Management Area	February 1 to September 15

Species	Area	Angling Dates
Smelt	Insular Newfoundland	January 15 to September 7
	Labrador	January 15 to September 15

Note: 1) Daily Bag Limit and Possession Limit for Trout and Smelt remain the same as stated in Table 4.4-2
Source: DFO, 2011

4.4.6 Summary

The proposed transmission corridor intersects with 17 scheduled salmon rivers in the various Study Regions. Of these scheduled salmon rivers, those on the Northern Peninsula have the highest measures of CPUEs. Salmon angling success rates are also high in Central and Southeastern Labrador and in Central Newfoundland. Success rates are generally lower in Eastern Newfoundland and on the Avalon Peninsula.

Scheduled Salmon Rivers	
ID	Name
175	Forteau River
176	L'anse au Loup Brook
177	Pinware River

N

Strait of Belle Isle
Forteau
L'Anse au Clair
176
175
Grand Lake
Lake Melville
North West River
Sheshatshiu
Happy Valley-Goose Bay
Mud Lake
Cartwright
Labrador Highway
Central and Southeastern Labrador
Trans Labrador Highway
LABRADOR
QUEBEC
177
Red Bay
St. Anthony

Proposed Transmission Corridor
Alternative Corridor Segment
Eagle River Plateau
Rivers and Streams
Scheduled Salmon River Intersecting Transmission Corridor
Scheduled Salmon Rivers within Regional Study Area
Existing Highways and Roads
Existing Transmission Line(s)

FIGURE ID: AMEC-STJ-562-001

0 20 40 60
Kilometers

nalcor energy

Figure 4.4-1

Angling - Central and Southeastern Labrador

N

Scheduled Salmon Rivers	
ID	**Name**
18	Ariege or Salmon River
27	Sops Arm River
b	Sops Arm River b
c	Sops Arm River c
28	Hampden River
150	Humber River
157	Parsons Pond River
158	Portland Creek River
159	Portland Creek Feeder
160	River of Ponds
161	Little Brook Ponds
162	Torrent River
163	East River, Hawke's Bay
164	Castor River
165	St. Genevieve River
166	West River, St. Barbe
167	East River, St. Barbe
168	Big Brook, St. Barbe

Strait of Belle Isle
Forteau
L'Anse au Clair
Flower's Cove
St. Anthony
Port au Choix
Northern Peninsula
Rocky Harbour
Corner Brook
Bay of Exploits
168
167
166
165
164
163
162
161
160
159
158
157
150
28
27
c
b
18
36
37
38

10 Mile Lake / Round Lake Special Trout Management Area
Proposed Transmission Corridor
Alternative Corridor Segment
Rivers and Streams
Scheduled Salmon Rivers Intersecting Transmission Corridor
Scheduled Salmon Rivers within Regional Study Area
Existing Highways and Roads
Existing Transmission Line(s)

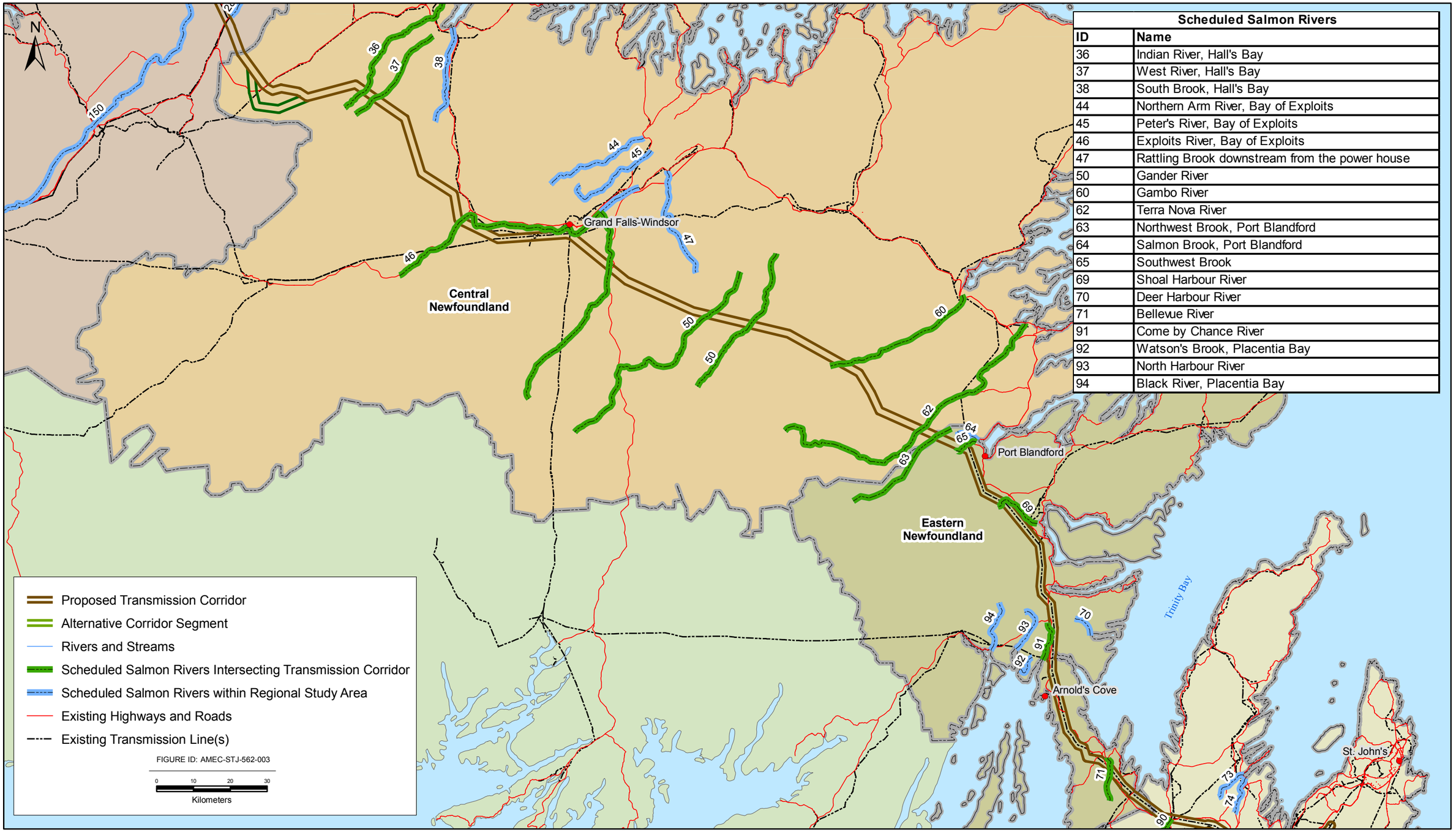
FIGURE ID: AMEC-STJ-562-002

0 10 20 30
Kilometers

nalcor energy

Figure 4.4-2

Angling - Northern Peninsula



Scheduled Salmon Rivers	
ID	**Name**
36	Indian River, Hall's Bay
37	West River, Hall's Bay
38	South Brook, Hall's Bay
44	Northern Arm River, Bay of Exploits
45	Peter's River, Bay of Exploits
46	Exploits River, Bay of Exploits
47	Rattling Brook downstream from the power house
50	Gander River
60	Gambo River
62	Terra Nova River
63	Northwest Brook, Port Blandford
64	Salmon Brook, Port Blandford
65	Southwest Brook
69	Shoal Harbour River
70	Deer Harbour River
71	Bellevue River
91	Come by Chance River
92	Watson's Brook, Placentia Bay
93	North Harbour River
94	Black River, Placentia Bay

nalcor energy

Figure 4.4-3

Angling - Central and Eastern Newfoundland

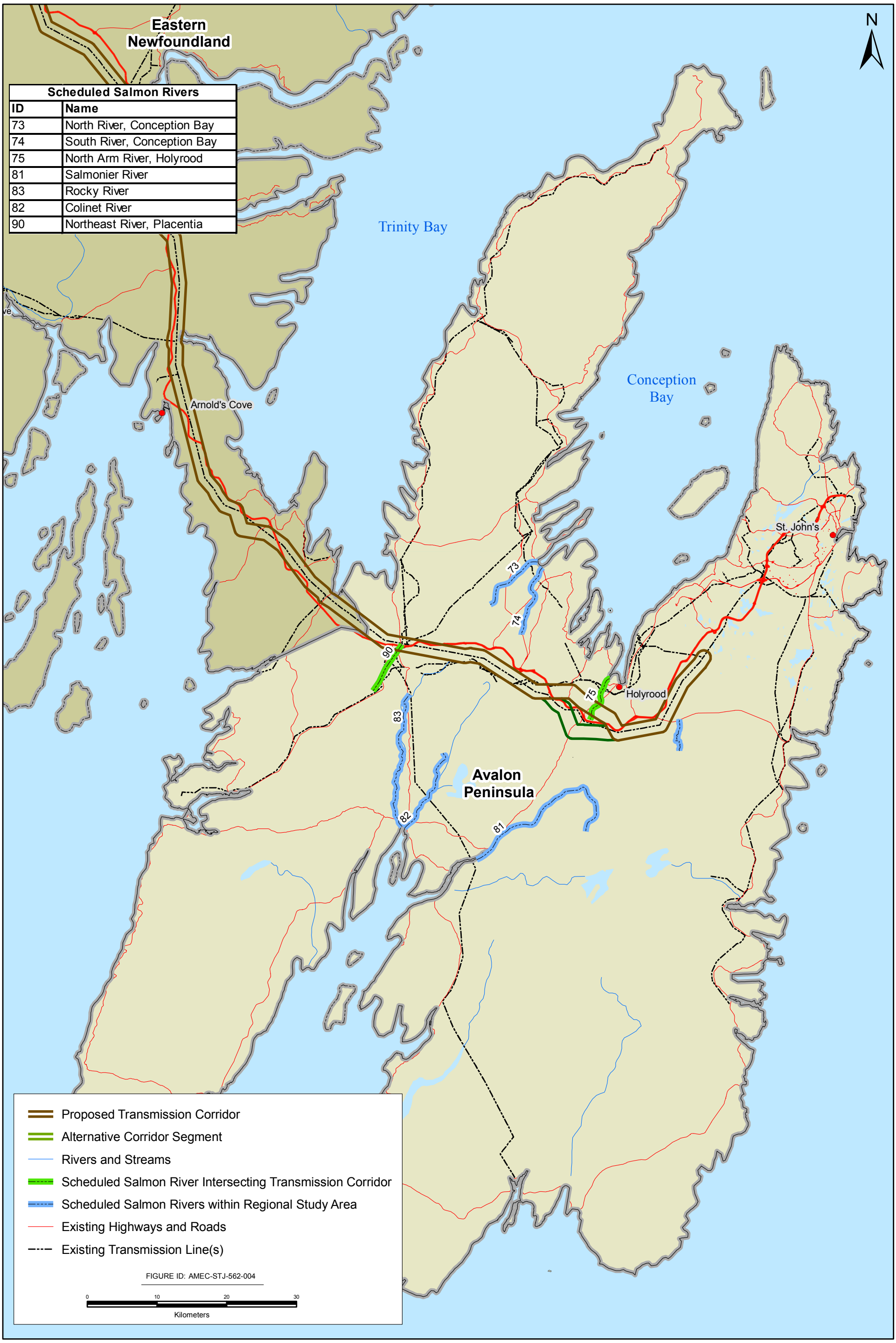


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Figure 4.4-4

Angling - Avalon Peninsula

4.5 Hunting and Fishing Outfitters

Tourism is a key component of the economy of the province, including in several of the Study Regions crossed by the proposed transmission corridor. The province's tourism industry contributed 1.8 percent of the provincial GDP in 2004 (the last year for which such figures are available). The outfitting industry contributed approximately $41 million of direct and indirect revenues to the province and 12.5 percent to the tourism sector in 2005 (Intervale Inc., 2006). The Department of Tourism, Culture and Recreation suggests that this is now closer to $37 million. The outfitting industry has been identified by the province as a key focus area for making Newfoundland and Labrador a year-round tourism destination (GNL, 2009).

The term "outfitter" refers to the owner / operator of a camp site, lodge, cabin or related facilities constructed and used solely as a base for sport angling / fishing, hunting or other commercial recreational activities, and licensed by the Department of Tourism, Culture and Recreation. Outfitting is typically seasonal in nature: fishing is available during the summer months and hunting is offered during the big game hunting seasons (typically early September to mid December).

Newfoundland and Labrador is widely known for its outdoors and the abundance of fish and wildlife that inhabit it. The province has almost 200 Atlantic salmon rivers, the highest number of any state or province in North America. These rivers are inhabited by large salmon (growing up to 30 pounds) that can form part of a large salmon run (up to 30,000 fish). The rivers and lakes are also home to brook trout (as large as 10 lbs), brown trout, lake trout, rainbow trout, ouananiche, Arctic char, Northern pike, whitefish and smelt (DTCR, 2009) (also refer to Section 4.4).

Wildlife is equally abundant with more than 120,000 moose and a reported 85 percent success rate for non-resident moose hunters. The province is also the only place in the world where woodland caribou can be hunted with the added advantage of a 90 percent success rate. Approximately 10,000 of the largest black bears in North America inhabit the province. Small game (e.g., hare, ptarmigan, grouse) is also available (DTCR, 2009). See also Section 4.3.

The above facts along with a short travel distance from major North American centres are some of the reasons why non-residents wish to hunt and / or fish in this province and, as a result, 154 outfitters have established 278 camps in the province (DTCR, 2009a). Some outfitters operate from one camp while others operate several camps in neighbouring or more distant locations. The 278 hunting and fishing camps, of which 45 are located in Labrador and 233 are on the Island of Newfoundland, are mostly located on the Northern Peninsula and in Central Newfoundland (DTCR, 2009).

The location of an outfitter's camp is determined by a number of factors: health and population of herds / fish stock, local guide knowledge of an area, opportunity for non-residents to experience a wilderness environment and degree of remoteness which generally results in less accessibility by other hunters and fishermen, thereby enhancing the backwoods experience and likelihood of a catch or kill (Chaisson, D., 2010).

Although outfitters may serve clients pursuing any permitted species, the most common activities are salmon angling and big game hunting. Outfitting operations are typically seasonal in nature. Table 4.5-1 shows relevant seasons in Labrador and on the Island.

Salmon fishing seasons are set annually. In 2009, the Labrador season was from June to September. On the Island of Newfoundland, the 2009 season was from June to September in most areas and from September to

October on select rivers (Section 4.4).

Labrador has general spring / summer and fall black bear hunting seasons that include Labrador South. Moose hunting season is open in fall / winter throughout Labrador. Currently, no caribou hunting is permitted in Southeastern Labrador. Big game (moose, black bear and caribou) hunting is available in fall / winter on the Island of Newfoundland (see Section 4.3).

Table 4.5-1: Salmon Fishing and Big Game Hunting Seasons in Newfoundland and Labrador (2009-10)

Species	Labrador	Newfoundland
Salmon	Set annually (2009: June to September)	Set annually (2009: June to September in most areas, September to October on Gander, Exploits and Humber Rivers)
Moose	September to January / March	September / October to December / January
Black Bear	April to July, August / September to November	September / October to December / January
Caribou	No caribou hunting in Southeastern Labrador	September / October to December / January

Sources: DFO, 2009, DEC-W, 2009

Government and outfitters have been concerned about the sustainability of the industry. In 1998, the Province placed a moratorium on new entrants. Currently, only the sale of existing licences is permitted. Increasing the number of operators at this time could dilute the customer base and therefore the viability of individual operators. Current concerns also relate to the decline of the caribou population and the economic recession in the United States from where most clients originate (Deveraux, P., 2010).

While outfitters' licences are attached to a specific management area, these are large geographic regions which may not be entirely reflective of the way in which outfitters use the resources around them. Outfitters are usually engaged in fishing and hunting (bow or shot gun hunting mainly for black bear, moose and caribou) but some may offer other services such as hiking or snowmobiling. They may guide clients in any region where appropriate licences are held and these areas are not always based on designated wildlife management areas. To better understand and support the outfitting industry, the Department of Tourism, Culture and Recreation is currently interviewing outfitters to develop operation plans that outline how each uses natural and recreation assets for their business. The results of this process may not be available for several years (Deveraux, P., 2010).

4.5.1 Study Area

The following sections focus primarily on those hunting and fishing outfitting camps that are within the proposed transmission corridor. Because guides and / or their clients sometimes travel a distance from their cabins in search of game or fish, cabins that are located within the Regional Study Area (30 km) are also shown in Table 4.5-3, Figures 4.5-1 to 4.5-3 and Appendix B.

4.5.2 Administrative Framework

Outfitting activities in Newfoundland and Labrador are governed by the *Guides Regulations* under the *Wild Life Act*. All hunting and fishing outfitters are licenced by the Department of Tourism, Culture and Recreation. Outfitters must comply with several other Acts aimed at protecting natural areas and wildlife. Acts that may apply include: *Endangered Species Act, National Parks Act, Provincial Parks Act, Wilderness and Ecological*

Reserve Act and *the Wild Life Act* (DEC, 2001; DEC, 1990; DEC, 1998; Parks Canada, 2000, DEC, 1990a).

In order to apply for registration as a guide, a person must provide proof of successful completion of a recognized guide training program or equivalent qualifications from a firearm safety and hunter education course, a recognized boating safety course and a valid emergency first aid certificate (DEC, 2004). Guiding without a licence or acting as a guide to any un-licenced hunter or angler is an offence under both the provincial *Wild Life Act* and / or the federal *Newfoundland and Labrador Fishery Regulations*.

If camps or lodges are built for overnight guests, the National Building code also applies. The provincial Department of Government Services issues permits, licences and approvals and conducts investigations including building inspections, septic system approvals, food establishment licences, fire inspections and signage regulations (DGS, 2010).

The Department of Tourism, Culture and Recreation administers the provincial *Tourist Establishment Act* and *Regulations* which apply to overnight guest infrastructure (e.g., tents, camps, boats) for outfitters as well as other tourism operators (CBSC, 2010). The Act indicates tourist registration procedures, duties of an operator, sanitary conditions of hunter camps, inspections, rates and statistical reporting (DTCR, 1996).

In order to hunt and fish in Newfoundland and Labrador, non-residents must obtain big game hunting licences as well as salmon and trout fishing licences, which are generally available from licenced outfitters as part of a tour package. Some exceptions exist (e.g., fishing with a direct relative in certain non-scheduled waters within 800 metres of a provincial highway). Also see Sections 4.3 and 4.4.

Section 4.3 discusses hunting management. This section discusses hunting licences issued to residents versus non-residents as the outfitting industry is dependent on the latter. The province's Big Game Management Plan considers resident / non-resident demand based on licence returns. Currently the caribou stock is in decline, but historically it has been in less demand by non-residents than moose, which are still a healthy species. Fewer black bear exist than both moose and caribou. Therefore, fewer licences are issued (Chaisson, D., 2010).

Between 2000 and 2010 the total number of moose licences allocated on the Island of Newfoundland was reduced by 715. The number of licences allocated to non-residents was increased by 988 and those issued to residents were reduced by 1,703 during that same time period. In Labrador the number of non-resident moose licences is zero and 185 for residents (Chaisson, D., 2010).

During this same ten year time period, the number of caribou licences on the Island of Newfoundland was reduced from a maximum of 7,730 (2001-02 and 2001-03) continually to its current 880 (2009-10). Non-resident caribou licences on the Island were reduced from a maximum of 1,970 (between the 2001-02 and 2007-08 season) to 282 (2009-10). Resident caribou licences have been reduced from a high of 5,808 (2001-02) to the current low of 598. In Labrador no cap exists for the number of resident caribou licences and the number of non-resident licences has been maintained at 5,800 for the last ten years.

Table 4.5-2 shows the number of moose and caribou licences that have been issued to both non-residents and residents between 2000 and 2010 for Labrador and the Island of Newfoundland.

Table 4.5-2: Moose and Caribou Licences (2000 - 2010)

Years	Newfoundland						Labrador					
	Issued Moose Licences			Issued Caribou Licences			Issued Moose Licences			Issued Barren Ground Caribou Licences		
	Total	Non-resident	Resident	Total	Non-resident	Resident	Total	Non-resident	Resident	Total	Non-resident	Resident
2009-10	27,855	3,939	23,916	880	282	598	185	0	185	No Cap	5,800	No Cap
2008-09	27,235	3,842	23,393	1,235	396	839	185	0	185	No Cap	5,800	No Cap
2007-08	26,725	3,413	23,312	2,760	820	1,940	185	0	185	No Cap	5,800	No Cap
2006-07	26,255	2,936	23,319	4,635	1,970	2,665	185	0	185	No Cap	5,800	No Cap
2005-06	26,060	2,936	23,124	5,605	1,970	3,635	185	0	185	No Cap	5,800	No Cap
2004-05	27,220	2,936	24,284	6,590	1,970	4,620	185	0	185	No Cap	5,800	No Cap
2003-04	27,220	2,936	24,284	7,680	1,970	5,710	185	0	185	No Cap	5,800	No Cap
2002-03	27,820	2,936	24,884	7,730	1,970	5,760	185	0	185	No Cap	5,800	No Cap
2001-02	27,990	2,936	25,054	7,730	1,970	5,760	185	0	185	No Cap	5,800	No Cap
2000-01	28,570	2,951	25,619	7,460	1,652	5,808	175	0	175	No Cap	5,800	No Cap

Source: DEC-W, 2009b

4.5.3 Information Sources

The majority of the information provided below relating to hunting and fishing outfitters comes from the *2009-10 Hunting / Fishing* lure brochure, published by the Department of Tourism, Culture and Recreation and discussions with representatives of that Department. Locations of registered outfitting camps were accessed

from a 2009 dataset (including latitude and longitude for each camp) obtained from the provincial Department of Tourism, Culture and Recreation – Outdoor Product Development Division.

4.5.4 Outfitters

The following sections discuss outfitting camps and their specific locations. Table 4.5-3 shows the number of outfitting camps in the proposed transmission corridor and the Regional Study Area (30 km) (which encompasses the alternative corridor segments). Figures 4.5-1 to 4.5-3 and Appendix B show outfitting camps. Although these camps may not be located within the proposed transmission corridor, guides and / or their clients may sometimes travel through or use an area crossed by the corridor.

Table 4.5-3: Outfitting Camps in Study Areas

Study Region	Number of Outfitting Camps	
	Proposed Transmission Corridor	Regional Study Area (30 km)
Central and Southeastern Labrador	0	5
Northern Peninsula	3	35
Central and Eastern Newfoundland	0	11
Avalon Peninsula	0	0
Total	**3**	**51**

Source: DTCR, 2009a

Central and Southeastern Labrador

No outfitting camps are located within the proposed transmission corridor. Five camps are located in the Regional Study Area (Figure 4.5-1 and Appendix B). Two of these are southwest of the corridor in Central Labrador – one offers fishing and the other hunting and fishing. Of the three camps located in the coastal area of the Labrador Straits, one offers fishing only and two offer hunting and fishing.

Northern Peninsula

Outfitting camps are located mainly in the Long Range Mountains with a concentration around Main River in the southern part of the Peninsula, although several camps are located near Main Brook and Roddickton in the north. Three outfitting camps are located within the proposed transmission corridor and 35 are located in the Regional Study Area which includes the alternative corridor segments. These are all located in the southern part of the Peninsula. Figure 4.5-2, Figure 4.5-3 and Appendix B show outfitters on the Northern Peninsula.

Central and Eastern Newfoundland

There are a number of outfitting camps in Central Newfoundland but most are located in the southern part of the region away from communities, the T'Railway, TCH, Route 1 and the proposed transmission corridor (Figure 4.5-4 and Appendix B). Few outfitters operate in Eastern Newfoundland. Therefore, no outfitting camps are located within the proposed transmission corridor and only 11 are located in the Regional Study Area.

Avalon Peninsula

No hunting or fishing camps are located on the Avalon Peninsula.

4.5.5 Summary

Three existing Northern Peninsula outfitting camps are located in the proposed transmission corridor. The 51 camps in the Regional Study Area are located in all Study Regions, except the Avalon Peninsula which has no outfitters.

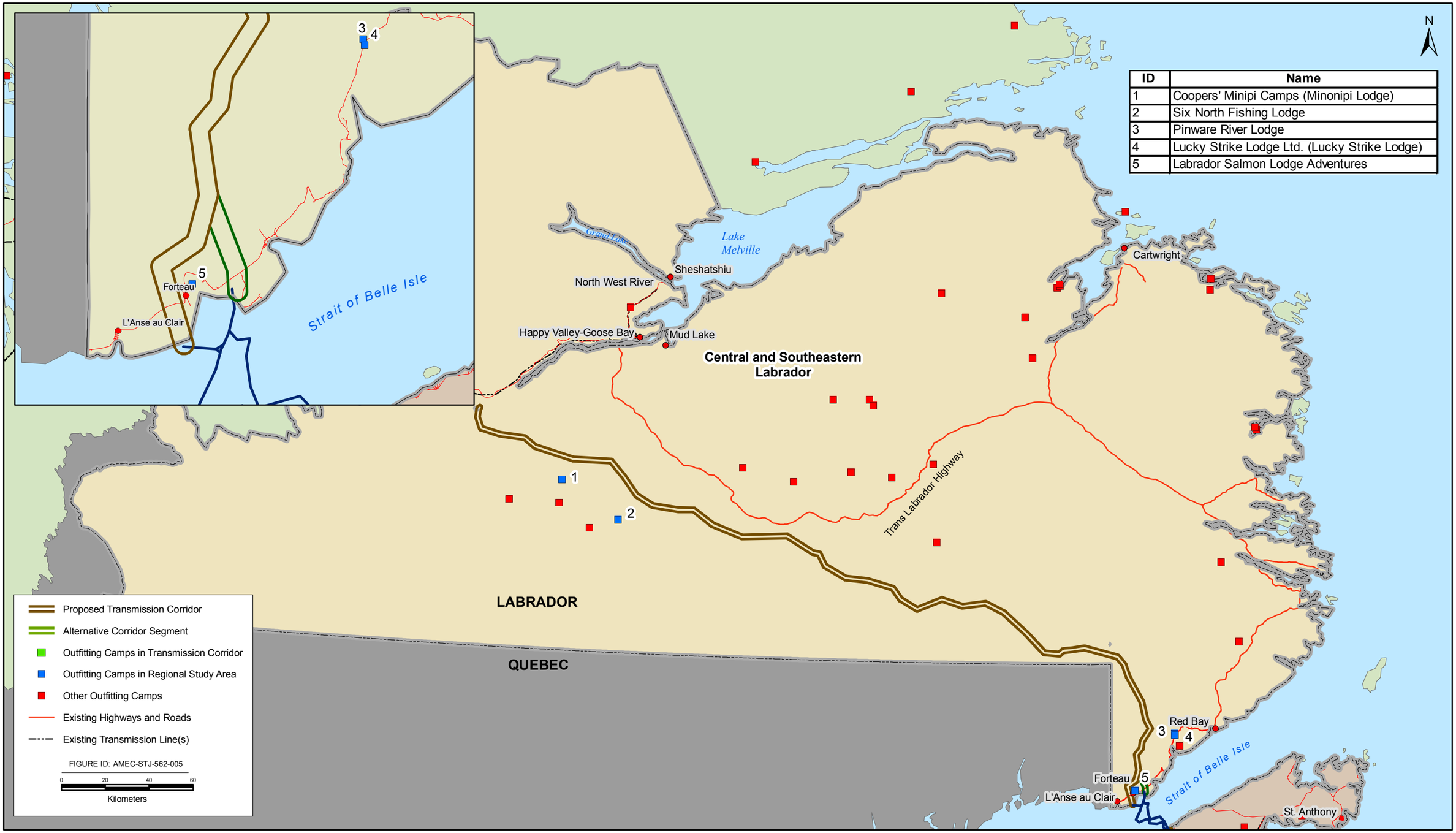

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Figure 4.5-1

Hunting and Fishing Outfitters - Central and Southeastern Labrador

ID	NAME
6	Ten Mile Lake Lodge
7	Portland Creek Hunting and Fishing Ltd. (Belvy Pond Camp)
8	Cloud River Outfitters Ltd. (Double Pond Lodge)
9	Cloud River Outfitters Ltd. (Blue Pond Lodge)
10	Patey & Sons Ltd. (DJ's Pond Lodge)
11	Portland Creek Outfitters Limited (Guy's Pond Camp)
12	Patey & Sons Ltd. (Jamie's Lake Lodge)
13	Patey & Sons Ltd. (Terry's Pond Camp)
14	Patey & Sons Ltd. (Gemic Lake Camp)
15	Portland Creek Hunting and Fishing Ltd. (Brians Pond Lodge)
16	Seapool Cabins
17	Hynes Hunting & Fishing Lodge
18	Rack Lake Hunting Lodge
19	Stag Hill Lodge
20	Hynes Hunting & Fishing Outfitters (Gordon's Pond Camp)
21	Parsons Pond Outfitters (Partridge Pond Lodge)
22	Portland Creek Outfitters Limited (Rattling Brook Lodge)
23	Portland Creek Hunting and Fishing Ltd. (Moose Head Lodge)
24	Patey & Sons Ltd. (Leander Lake Lodge)
25	Sam's Hunting & Fishing (Trophy Lake Camp)
26	Sam's Hunting & Fishing (High Pond Camp)
27	Main River Safari (Arluk Tilt Lodge)
28	Four Ponds Outfitting Limited
29	Patey & Sons Ltd. (5-Island Pond Camp)
30	Blue Mountain Outfitters (Long Pond Lodge)
31	Sam's Hunting & Fishing (St. Pauls Big Pond Camp)
32	Main River Safari (1st Goose Hole Lodge)
33	Main River Lodge
34	Eagle Mountain Lodge
35	Cow Head Outfitters (Woody Lake Lodge)
36	Heritage River Outfitters Inc.
37	Parsons Pond Outfitters (Leslie Lake Lodge)
38	Parsons Pond Outfitters (Snowy Lake Lodge)
39	Mobile Outfitters Ltd. (Silver Mountain Lodge)
40	Wilderness Horizons Inc. (Strattons Pond Camp)

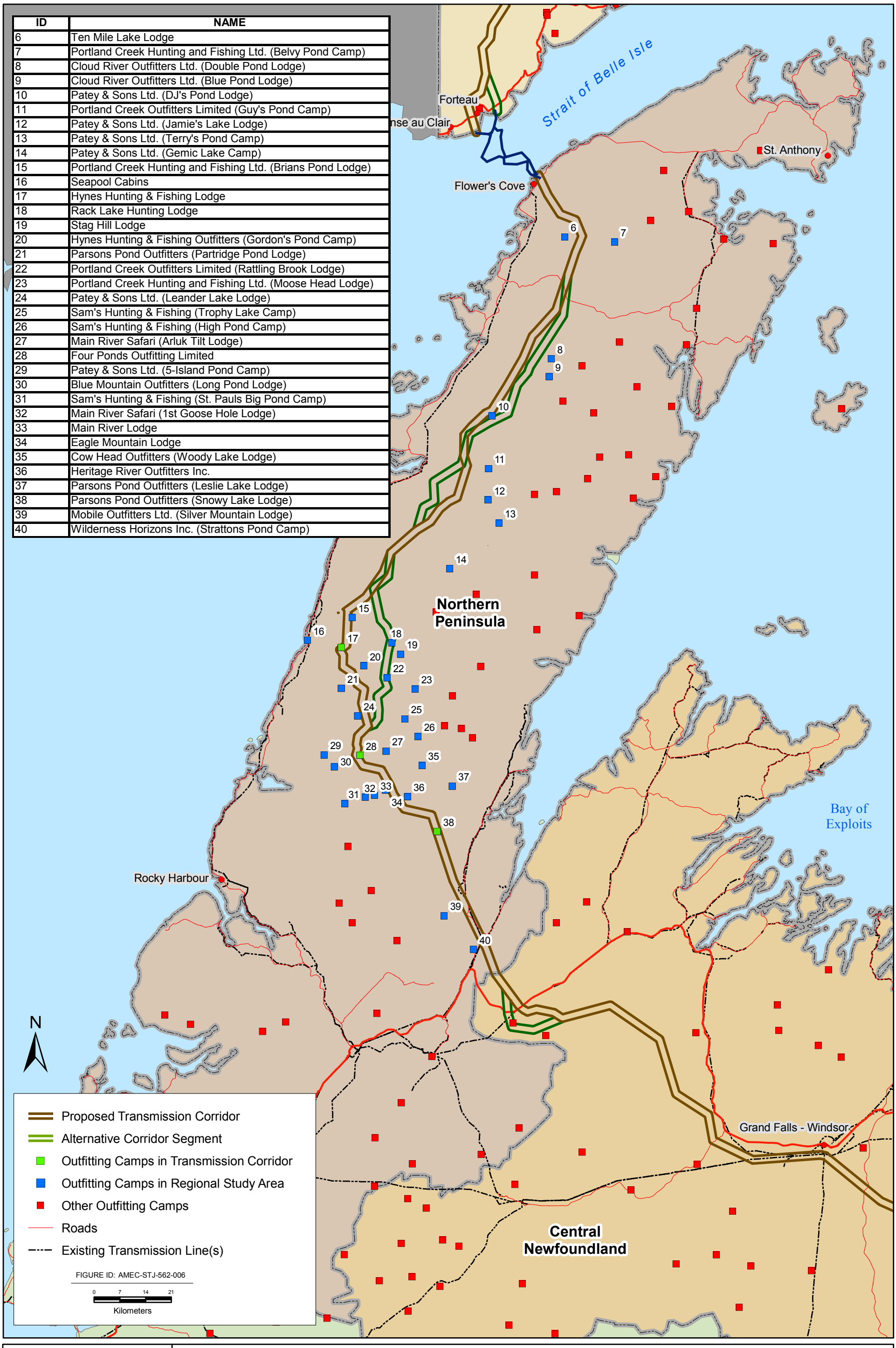
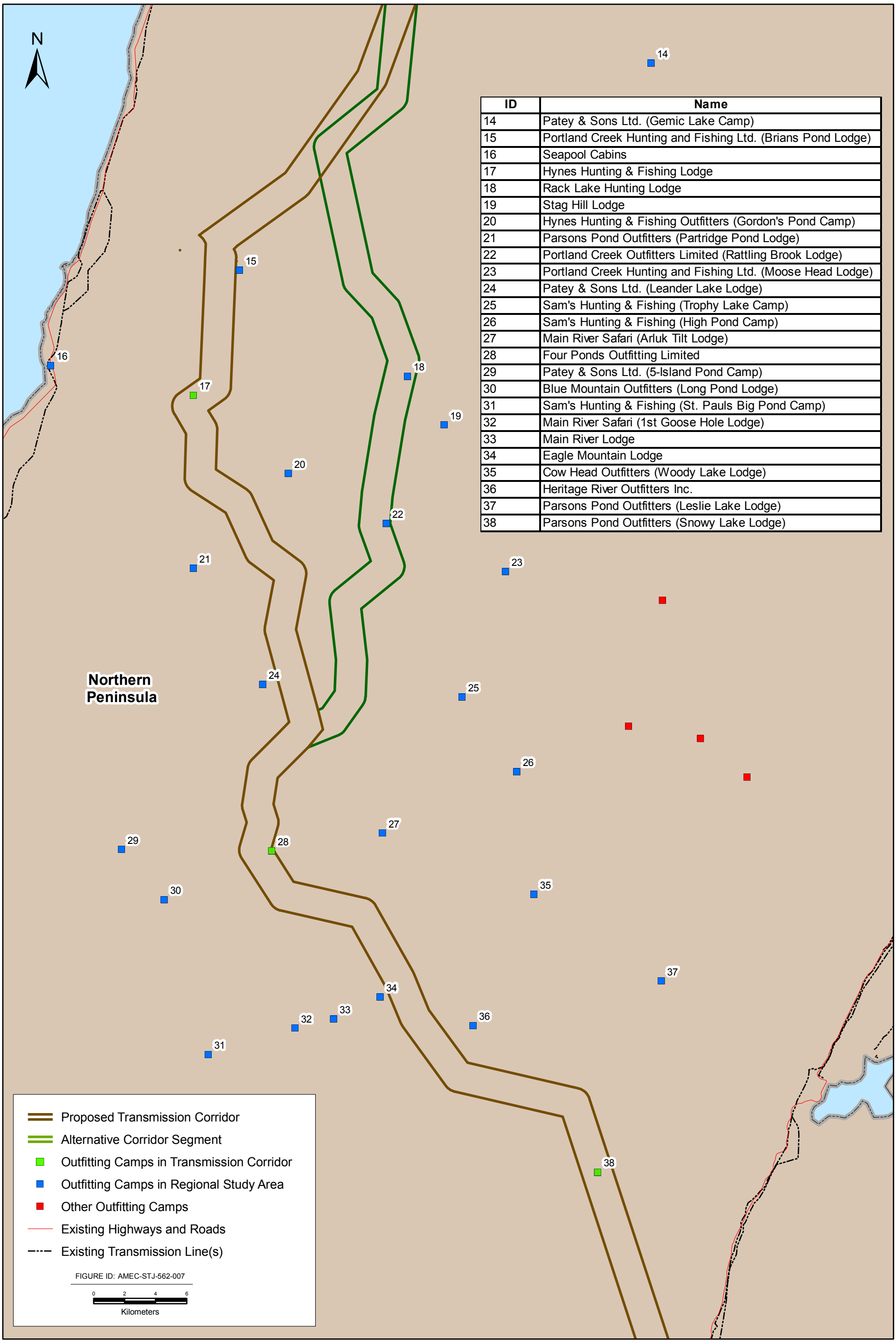


Figure 4.5-2

Hunting and Fishing Outfitters - Northern Peninsula



ID	Name
14	Patey & Sons Ltd. (Gemic Lake Camp)
15	Portland Creek Hunting and Fishing Ltd. (Brians Pond Lodge)
16	Seapool Cabins
17	Hynes Hunting & Fishing Lodge
18	Rack Lake Hunting Lodge
19	Stag Hill Lodge
20	Hynes Hunting & Fishing Outfitters (Gordon's Pond Camp)
21	Parsons Pond Outfitters (Partridge Pond Lodge)
22	Portland Creek Outfitters Limited (Rattling Brook Lodge)
23	Portland Creek Hunting and Fishing Ltd. (Moose Head Lodge)
24	Patey & Sons Ltd. (Leander Lake Lodge)
25	Sam's Hunting & Fishing (Trophy Lake Camp)
26	Sam's Hunting & Fishing (High Pond Camp)
27	Main River Safari (Arluk Tilt Lodge)
28	Four Ponds Outfitting Limited
29	Patey & Sons Ltd. (5-Island Pond Camp)
30	Blue Mountain Outfitters (Long Pond Lodge)
31	Sam's Hunting & Fishing (St. Pauls Big Pond Camp)
32	Main River Safari (1st Goose Hole Lodge)
33	Main River Lodge
34	Eagle Mountain Lodge
35	Cow Head Outfitters (Woody Lake Lodge)
36	Heritage River Outfitters Inc.
37	Parsons Pond Outfitters (Leslie Lake Lodge)
38	Parsons Pond Outfitters (Snowy Lake Lodge)

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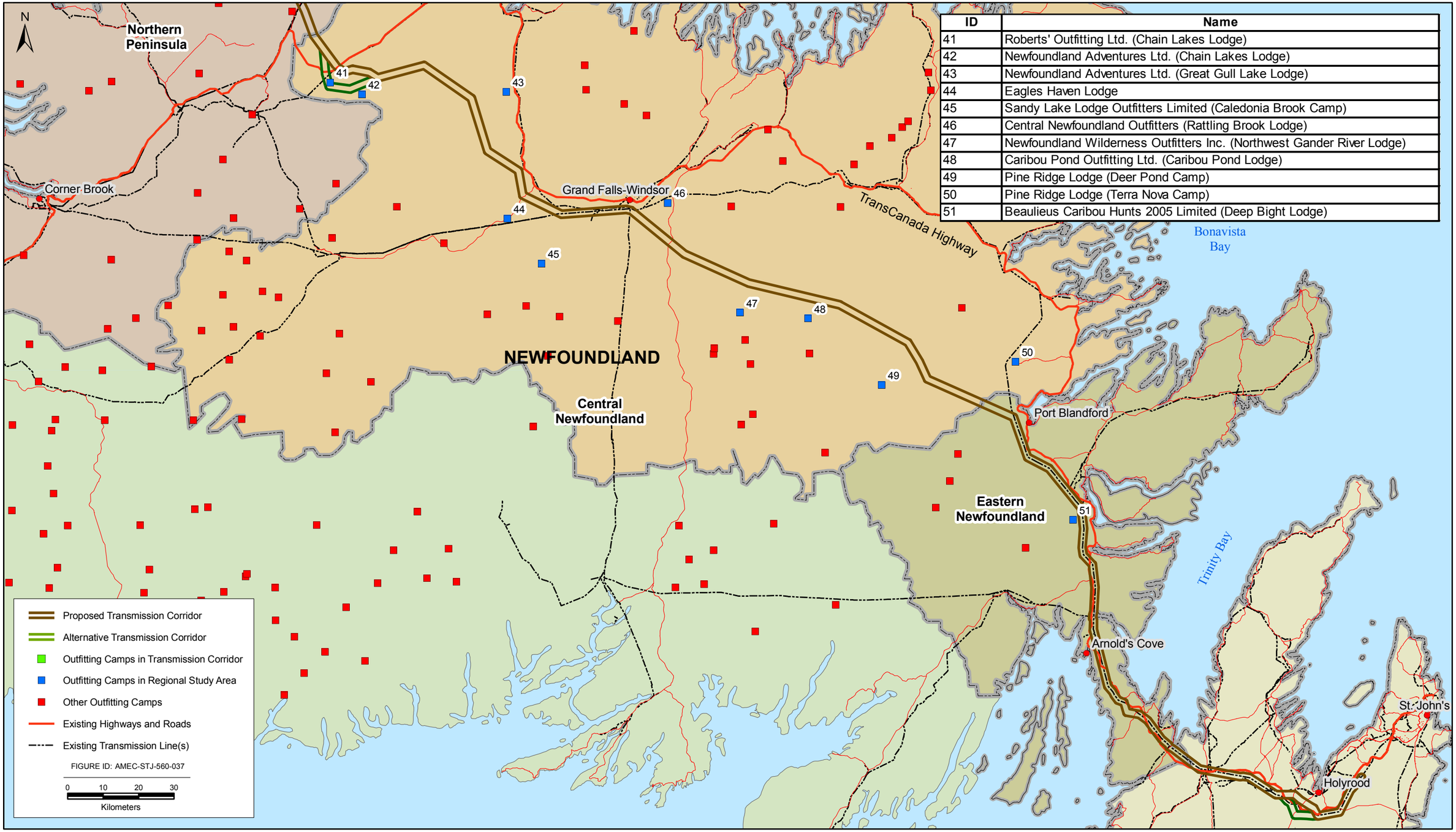
Figure 4.5-3

Hunting and Fishing Outfitters - Northern Peninsula, Detail of Southern Area



ID	Name
41	Roberts' Outfitting Ltd. (Chain Lakes Lodge)
42	Newfoundland Adventures Ltd. (Chain Lakes Lodge)
43	Newfoundland Adventures Ltd. (Great Gull Lake Lodge)
44	Eagles Haven Lodge
45	Sandy Lake Lodge Outfitters Limited (Caledonia Brook Camp)
46	Central Newfoundland Outfitters (Rattling Brook Lodge)
47	Newfoundland Wilderness Outfitters Inc. (Northwest Gander River Lodge)
48	Caribou Pond Outfitting Ltd. (Caribou Pond Lodge)
49	Pine Ridge Lodge (Deer Pond Camp)
50	Pine Ridge Lodge (Terra Nova Camp)
51	Beaulieus Caribou Hunts 2005 Limited (Deep Bight Lodge)

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Figure 4.5-4

Hunting and Fishing Outfitters - Central and Eastern Newfoundland

4.6 Motorized Recreational Vehicles

This discussion of motorized recreational activities includes riding snowmobiles and off-road utility vehicles (e.g., all terrain vehicles [ATVs], jeeps, dune buggies, dirt bikes). It also includes motorized boats.

Motorized vehicles are used for recreation but also to provide a means of accessing and undertaking other activities (e.g., hunting, fishing, trapping, subsistence food gathering and wood harvesting) and for transportation within and between communities. Snowmobiling occurs during the winter season on groomed and un-groomed trails, open ground and forestry access roads as well as on ponds, lakes and the ocean when they are frozen. Off-road utility vehicles are used on off-highway roads, trails and open areas primarily outside of the winter season. Boating occurs on many ponds, lakes, rivers and the ocean and mostly in the summer months.

Available data was used to map areas and routes that are used for snowmobiles and off-road utility vehicles (e.g., snowmobile trails, T'Railway, forestry access roads). Figures 4.6-1 to 4.6-4 show major snowmobile trails including the Newfoundland T'Railway. Forestry access roads, which are also used for this type of recreation, are shown in Appendix C.

4.6.1 Study Area

This section focuses on areas where snowmobiles, ATVs and motorized boats are used on trails, lakes, ponds, rivers and the ocean within the proposed transmission corridor. Intersections with alternative corridor segments and the Regional Study Area are shown in the maps and noted where appropriate (Figures 4.6-1 to 4.6-4). Motorized boating activity is described in terms of the Regional Study Area or lakes, ponds, rivers and harbours that are intersected by the proposed transmission corridor.

4.6.2 Administrative Framework

Use of motorized snow vehicles and all-terrain vehicles (ATVs) is regulated by the *Motorized Snow Vehicles and All-Terrain Vehicles Act* and the *Motorized Snow Vehicles and All-Terrain Vehicles Regulations*. The Act states: "all-terrain vehicle" means a wheeled or tracked motorized vehicle, excluding a two-wheeled vehicle, designed or adapted for off-road use (Breon, M., 2009). Therefore, ATV is a catch-all term that refers to all off-road vehicles including jeeps, dune buggies and Rhino RTVs as well as forest harvesting equipment (Frampton, B., 2009). Dirt bikes are covered by most of the same regulations governing ATVs with the exception of recent ATV changes governing age of users and increased fines.

The Newfoundland and Labrador Snowmobile Federation Inc. and Labrador Winter Trails Inc. have been mandated with the responsibility to receive and process applications for managed trail permits and to issue trail permits, the revenue of which is directed to the management (operations and maintenance) of the trail system including winter grooming.

On the Island, the Newfoundland and Labrador Snowmobile Federation has been issued a licence for occupancy for a number of trails for which they must adhere to regulations as established under the *Motorized Snow Vehicles and All-Terrain Vehicles Act*.

Several Acts and Regulations apply to users of motorized boats including the *Canada Shipping Act* and *Small Vessels Regulations*, the *Pleasure Craft Operator Card* and the *Wilderness and Ecological Reserves Act*.

All motorized recreational boats powered by engines of 10 horsepower (7.5 kilowatts) or more, regardless of where they are operated in Canada, are required by Transport Canada to be licenced as required under the *Small Vessel Regulations* of the *Canada Shipping Act, 2001*. The licence number is used to assist law enforcement and search and rescue organizations in identifying individual pleasure crafts and is valid for a ten year period. The *Small Vessel Regulations* are the principal means by which the Government of Canada regulates safety of these vessels (DFO, 2001; Transport Canada, 2009a).

As of September 15, 2009, all operators of powered watercraft used for recreational purposes within Canada are also required to obtain a Pleasure Craft Operator Card in order to operate a powered watercraft. The federal laws governing the Pleasure Craft Operator Card apply in and can be transferred to all provinces (DFO, 2001).

Under the *Wilderness and Ecological Reserves Act*, a person shall not, within a wilderness reserve, provisional wilderness reserve or emergency wilderness reserve or within an ecological reserve, provisional ecological reserve or emergency ecological reserve use motorized vehicles or equipment. Motorized boats can be used on all other ponds and lakes within the province except those that are privately owned (DEC, 1990b).

4.6.3 Information Sources

The majority of information came from various websites relating to applicable federal and provincial acts and regulations including the provincial Department of Justice and the Department of Environment and Conservation as well as various snowmobiling and ATV touring companies. Information relating to trails, clubs, usage and accommodations comes primarily from Destination Labrador, Newfoundland Snowmobile Federation, Labrador Winter Trails and the Newfoundland T'Railway Council as well as the provincial Land Use Atlas. Georeferenced data on the location of ATV trails was obtained from the Department of Environment and Conservation, Lands Branch (DEC-L, 2010).

4.6.4 Snowmobiling

Snowmobiling is popular with residents of all areas of the province as well as tourists as a standalone activity. It is also undertaken in support of other activities (e.g., hunting, fishing, trapping, subsistence food gathering and wood harvesting and hauling), and as a means of transportation in and between communities. It occurs during the winter season on groomed and ungroomed trails, open ground, woods roads, and frozen ponds, lakes and oceans.

Snowmobiles have been widely used as long as they have been available but a significant increase in use occurred since the groomed trail system was introduced in 1998 (O'Keefe, D., 2010). Both the T'Railway Council and Department of Natural Resources Conservation Officers report that snowmobiling is the most popular land recreational sport on the Island followed by ATV use. Generally speaking hiking, biking and cross country skiing come third in popularity and use depends on conditions and location (Morrison, T., 2009; O'Keefe, D., 2009; Ward, R., 2009).

Approximately 76,540 snowmobile users are registered in the province, with the most popular snowmobiling area being in the western portion of the Island because of its longer season. However, the greatest population concentration and number of users are on the Avalon Peninsula. When snow conditions are suitable, all areas of the province participate in the sport (O'Keefe, D., 2009).

During winter in Labrador, snowmobiles are the primary method of transportation between communities

without connecting roads. Since the TLH has only recently (December 16, 2009) become a continuous intercommunity road link between western, central, southern and the Straits areas of Labrador, snowmobile trails have long been an economic, recreational and social necessity. This is still the case in the northern portion of Labrador which does not have a connecting road link with the rest of Labrador.

The Labrador Winter Trails system covers more than 345 km between Labrador West at the Québec border to Makkovik in Labrador north and to the Straits in Labrador south. Partnerships for maintaining this trail system include Labrador tourism associations, at least eight tour companies, and 13 local accommodations providers. The infrastructure of the Labrador Winter Trails consists of eight designated and groomed trails as well as signage and emergency shelters. Each of these eight trails is sponsored by an associated snowmobile club. Shorter branch trails have also been established to connect to the main Labrador Winter Trail (Labrador Winter Trails, 2009).

On the Island of Newfoundland, snowmobile trails are managed by the Newfoundland Snowmobile Federation (NSF). Sixteen individual clubs are currently members of the Federation. As of the winter 2009-2010 season, all trails on the Island are maintained by the NSF including the cost of grooming and trail management, but with input from each of the local clubs (NSF, 2009; O'Keefe, D., 2009).

One of the major snowmobile trails on the Island is the Newfoundland T'Railway Provincial Park, which converts to a snowmobile and cross country ski trail in winter. In areas where trails are not managed or groomed, some of the existing power lines and forestry access roads are also used for snowmobiling.

Central and Southeastern Labrador

Despite the presence of a road linking central and western Labrador and beyond since 1992 (and as of 2009 a road linking western and central Labrador to southern Labrador and by ferry to the Island of Newfoundland), Central Labrador residents still consider snowmobiles an important transportation mode for recreation, hunting and secondary transport.

The Grand River Snowmobile Trail and the Basques Whalers Trail (Figure 4.6-1) are the two key trails in Central and Southeastern Labrador. The Grand River Trail, which connects the towns of North West River, Sheshatshiu and Happy Valley-Goose Bay, is located on the north side of the Churchill River and not within the Regional Study Area. The trail consists of approximately 150 km of groomed routes. The Grand River Snowmobile Club based in Happy Valley-Goose Bay helps to maintain the trail (Destination Labrador, 2009a). At least two accommodation providers in Happy Valley-Goose Bay cater to snowmobile users. More than 300 km^2 of countryside within and adjacent to the municipality of Happy Valley-Goose Bay can be immediately accessed by snowmobile trails that wind throughout the town and the surrounding landscape (Our Labrador, 2009).

The Basques Whalers Trail, which is part of Labrador Winter Trails, begins at the Québec-Labrador border and extends to Red Bay. Approximately 155 km in length, it passes through eight coastal communities and is maintained by the Basque Whalers Club headquartered in L'Anse au Clair. A hotel in the Straits caters to snowmobile users (Destination Labrador, 2009). Parts of the Basque Whalers Trail are within the proposed transmission corridor. This trail also crosses the alternative corridor segment (which is also within the Regional Study Area) in the Straits area (Figure 4.6-1).

Northern Peninsula

On the Northern Peninsula, which has a long snow season, snowmobile trails are located near most communities. Two long distance trails cross the Peninsula one from New Ferolle to Englee and Conche. The other crosses from Portland Creek to Jackson's Arm. Extensive trails exist around St. Anthony, in the Main River area, from White Bay to Deer Lake and around the Bay of Islands (Figure 4.6-2).

Snowmobile trails are maintained by the Long Range Snowmobile Club in Plum Point and the Northwest Trackers in Port Saunders. At least one accommodations provider is focused on snowmobile users. Deer Lake and surrounding area is also considered a western destination for snowmobile activities because of its airport, location near the scenic Long Range Mountains and lengthy snow season.

The Junction Trail Blazers manage Deer Lake area trails and three accommodation providers, located in the town, cater particularly to snowmobilers and another three within relatively easy snowmobiling distance. The Main River watershed is another popular western snowmobile area. A snowmobile trail heads west from Sop's Arm leads to Four Ponds, with diversions along six of the river's tributaries.

The proposed transmission corridor and alternative corridor segments (which are within the Regional Study Area) cross identified snowmobile trails about 15 times on the Northern Peninsula (Figure 4.6-2). These are mainly located in six areas: in the communities that are crossed by the corridor near the cable landing site; adjacent to Route 432 which crosses the Peninsula; southeast of Hawke's Bay; east of Bellburns, near Main River and near Hampden, White Bay.

Central and Eastern Newfoundland

Much of the snowmobiling in the Central and Eastern Newfoundland Study Region occurs on trails around Springdale, Badger and Grand Falls-Windsor to Gander and on the T'Railway from Howley to the Isthmus of the Avalon. In the Badger / Grand Falls-Windsor area, the Exploits Snowmobile Association and other snowmobilers use the T'Railway for most of their activities (Ward, R., 2009; Morrison, T., 2009). Of the protected areas in this region, the Bay du Nord Wilderness Reserve receives the most use by snowmobilers (Ward, R., 2009). In Eastern Newfoundland, snowmobile clubs are located in Glovertown (Terra Nova Trail Riders) and Clarenville (East Coast Snowmobile Club). The T'Railway is used by both these clubs and independent snowmobilers extensively during the winter months, particularly from Glovertown to Long Harbour (Figure 4.6-3).

The proposed transmission corridor intersects with the T'Railway and snowmobile trails in six areas (around Birchy Lake, Badger, Grand Falls-Windsor, Shoal Harbour, Sunnyside and from Arnold's Cove to Bellevue). Three accommodations providers within the Regional Study Area accept snowmobile users.

Avalon Peninsula

According to Conservation Officers, snowmobile usage on the Avalon Peninsula ranks the highest of all motorized recreational activities described in this section. Because snow cover is unpredictable, the intense level of use may be due to the larger population in this area rather than consistent suitable snow conditions (Ward, R., 2009). Eastern Trailriders Club is headquartered in Paradise (NSF, 2009).

Due to inadequate snow cover during many winters, the T'Railway receives only sporadic snowmobile use. Activity occurs along the T'Railway from Long Harbour to Holyrood. The proposed transmission corridor crosses the T'Railway near Brigus Junction. Other snowmobile trails intersect with the corridor and the alternative

corridor segment several times in the Brigus Junction to Holyrood area (Figure 4.6-4).

4.6.5 Off Road Motorized Vehicles

In the past, ATVs were mainly used for subsistence purposes (wood gathering) and both intra-community and inter-community travel. However, in recent years, use of ATVs and off-road sport utility vehicles and dirt bikes has developed as a family activity and for other recreational purposes. As is the case with snowmobiles, ATVs and other off-road sport utility vehicles are used for both recreational and work purposes. In general, ATV use increases in the more rural areas and decreases closer to urban areas.

On the Island, more than ten companies provide ATV tours mostly along the Newfoundland T'Railway, but also on back woods and forestry access roads. The increasing popularity of off-road vehicles has given rise to its own association. The Newfoundland Off-road Vehicle Association, Nova 4X4, now has more than 1,000 members (Nova 4X4, 2009).

Central and Southeastern Labrador

ATVs are used primarily for subsistence purposes (wood gathering) or to travel both within and between communities. They are used extensively in Central and Southeastern Labrador, particularly in the Straits on back woods roads, forestry access roads, snowmobile trails and within communities. ATVs are used extensively in and north of the Forteau area and other Labrador Straits communities. Three sections of ATV trails are within the proposed transmission corridor (Figure 4.6-1).

Northern Peninsula

ATV use occurs in communities and along forestry access roads and other trails throughout the Northern Peninsula. ATV trails cross the proposed transmission corridor east of St. Barbe, east of Brig Bay and near Blue Mountain (Figure 4.6-2).

Central and Eastern Newfoundland

ATV use is considered to be low to moderate in Central Newfoundland but activity increases in Eastern Newfoundland. The most popular ATV areas are the T'Railway Provincial Park (particularly along the upgraded portions) and forestry access roads. Activity occurs in the Deer Lake area, Badger to Grand Falls-Windsor, Glovertown to Long Harbour particularly from Port Blandford to Clarenville. A few hotels located near the T'Railway, such as St. Jude's in Clarenville, cater to ATV users (Ward, R., 2009; Morrison, T., 2009). The proposed transmission corridor crosses the T'Railway and other ATV trails approximately eight times from Port Blandford to Long Harbour on the Isthmus of the Avalon (Figure 4.6-3).

Avalon Peninsula

On the Avalon Peninsula and away from St. John's, use of ATVs is considered higher than any other outdoor recreational activity encountered by Conservation Officers, most likely because of the population density and uncertainty of suitable snow conditions for other activities. ATV use is a common recreational activity, especially outside of St. John's. Forestry access roads and the T'Railway from Avondale to Soldiers Pond are popular ATV routes (Ward, R., 2009). ATV trails cross the proposed transmission corridor and the alternative corridor segment near Route 90, Salmonier (Figure 4.6-4).

4.6.6 Motorized Recreational Boating

Motorized boating, including speed boats and sea-doos, occurs on ponds, lakes, large rivers and coastal waters particularly where road access exists, and except, as previously noted, within the boundaries of specified reserves and parks. These boats are used for transporting goods and people between communities, for recreation purposes and for hunting, fishing, camping, berry picking and firewood collecting.

Central and Southeastern Labrador

Motorized boats may be used at some of the fishing camps within the Regional Study Area (see Section 4.5). In the Labrador Straits area, most people who operate boats are fishermen who sometimes use their boats for recreational purposes. However, purely recreational boats are also located along the Straits and recreational boats, (both motor and sail boats) from elsewhere use the Straits during the summer season and stop at various communities. See Figure 4.2-6 for locations of harbour authorities on the Strait of Belle Isle.

Approximately 25-30 recreational motorized boats are based in Forteau, 15 or so in L'Anse au Loup and between 15 and 20 in L'Anse au Clair. There are no sail boats based in these communities. Intercommunity recreational boat traffic is common as is using boats for recreational fishing along the coast. The number of recreational boats from the Straits area and elsewhere has gradually increased over the last ten years (Fowler, W., 2010).

Northern Peninsula

Intercommunity recreational boat traffic is common as is using boats for recreational fishing along the coast. Motorized boating occurs on some of the larger lakes and ponds with road access. The proposed transmission corridor crosses Ten Mile Lake and Portland Creek Pond which are used for boating (Appendix B).

Central and Eastern Newfoundland

Motorized boating occurs on some of the larger lakes with road access. The proposed transmission corridor crosses Birchy Lake, Terra Nova Lake and Thorburn Lake which are boating areas (Appendix B).

Avalon Peninsula

Motorized boating occurs on some of the larger ponds and lakes between Route 81 and 90 on the Avalon Peninsula (e.g., Ocean Pond, Middle Gull Pond, Southwest Pond) which are used extensively by boaters (Appendix B).

4.6.7 Summary

The proposed transmission corridor intersects with snowmobile trails in the Labrador Straits and in several parts of the Northern Peninsula including the Main River area. It also crosses snowmobile trails, particularly the Newfoundland T'Railway, near populated areas (e.g., Badger, Grand Falls-Windsor, Clarenville, the Isthmus and around Holyrood) of Central and Eastern Newfoundland and the Avalon Peninsula. This pattern is similar for ATV trails. The transmission corridor crosses the Strait of Belle Isle, and lakes, ponds and rivers where boating activity occurs on the Northern Peninsula, Central and Eastern Newfoundland and on the Avalon Peninsula.

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Figure 4.6-1

Motorized Recreational Vehicles - Central and Southeastern Labrador

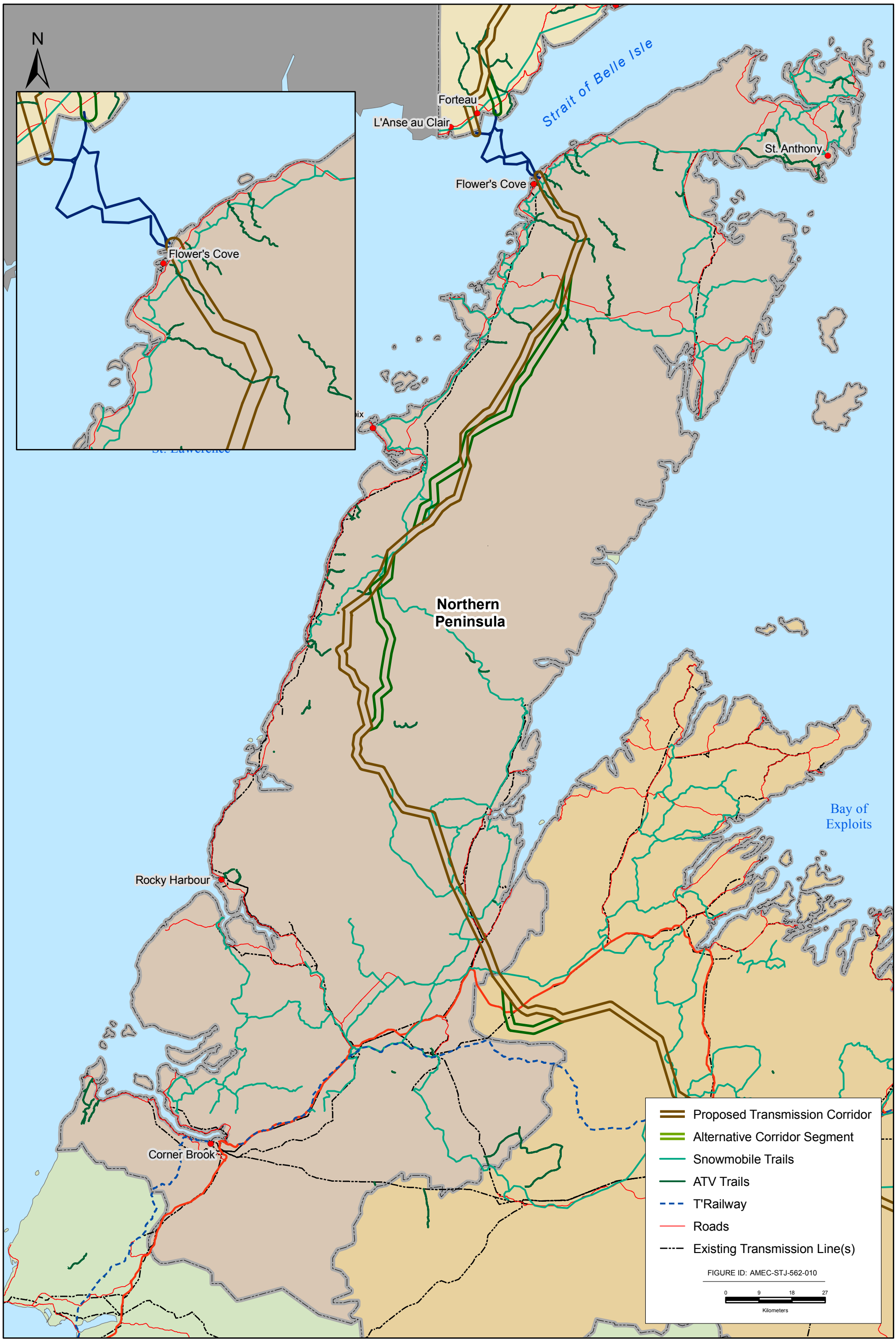

Figure 4.6-2

Motorized Recreational Vehicles - Northern Peninsula

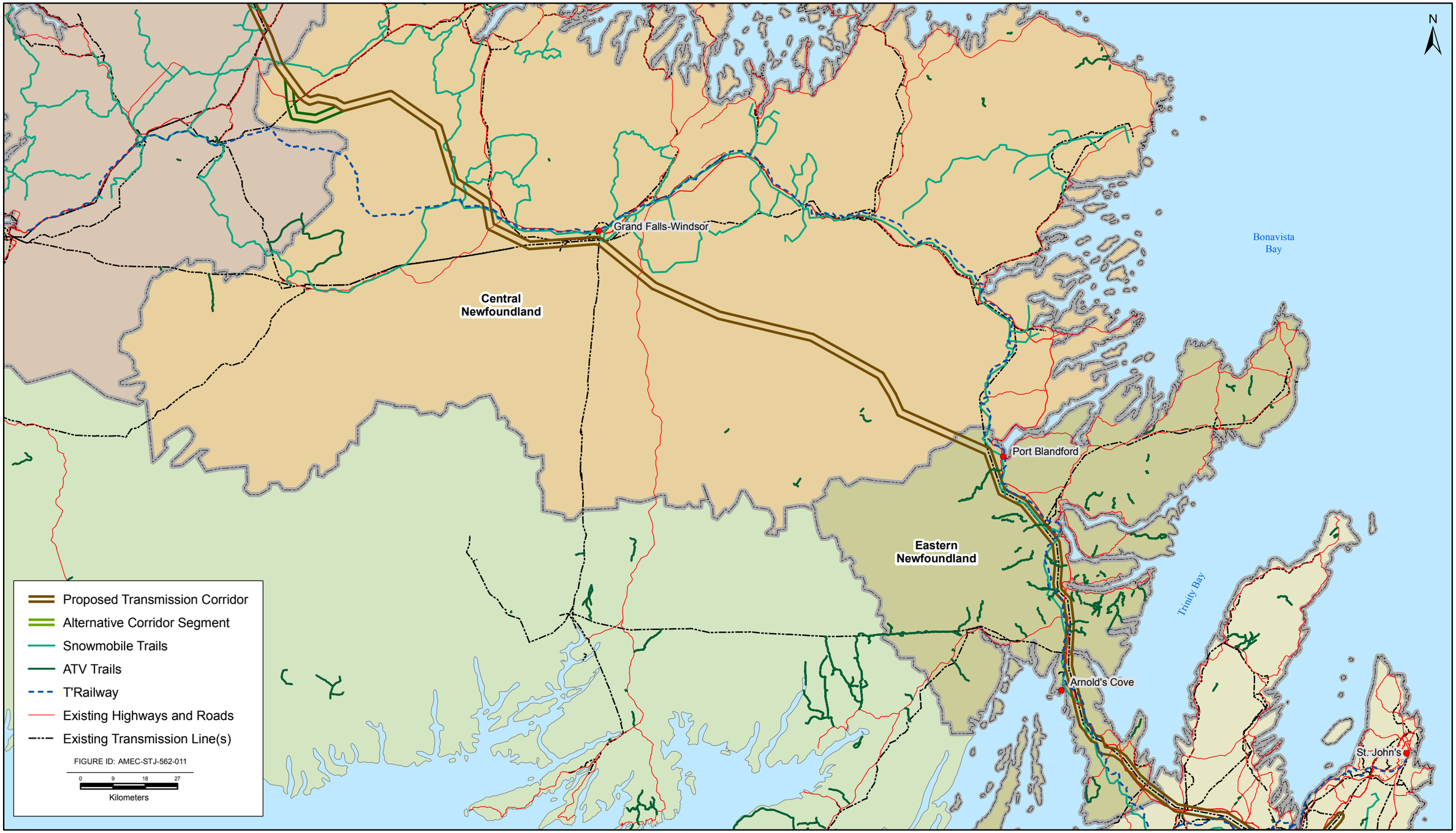

Figure 4.6-3

Motorized Recreational Vehicles - Central and Eastern Newfoundland

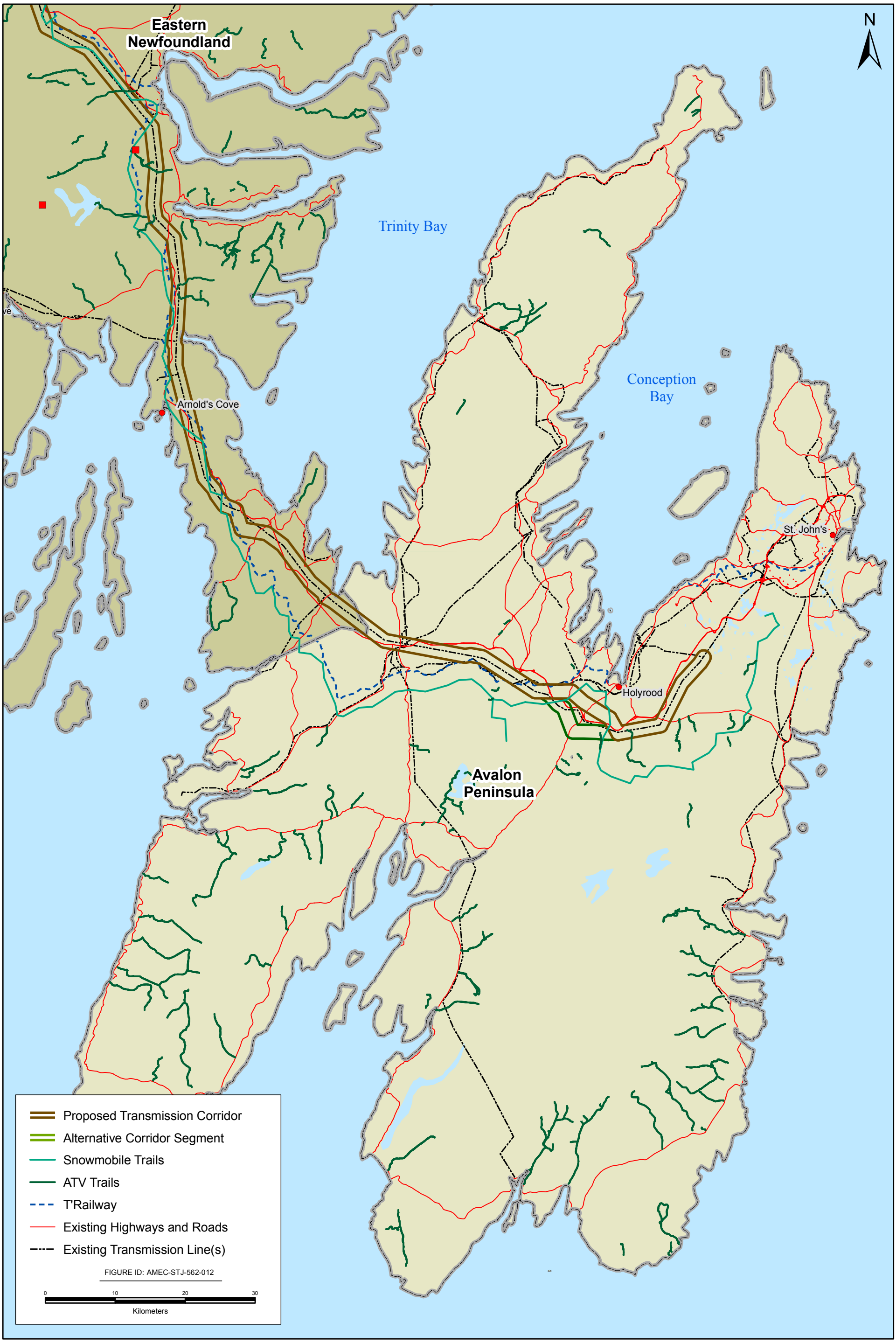

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Figure 4.6-4

Motorized Recreational Vehicles - Avalon Peninsula

4.7 Cabins and Cottage Development Areas

Newfoundland and Labrador has a long and rich history of cabin use. Traditionally many people spent summer and fall on the coast living in cabins close to fishing grounds where they fished and processed (salted and dried) fish. In winter and spring, they lived in the bays and inlets hunting, trapping and cutting wood for fuel and building materials. By the 1950s the fishery has changed from individual entrepreneurs to production line fish plants supplied by fishermen. This, plus resettlement during the mid 1960s to mid 1970s and construction of the TCH resulted in many families moving inland to resettlement hubs, service (health, education) centres or locations of large industries. For many, former outport homes became summer residences from where they fished and vacationed when children were out of school. Others took advantage of the new road system and began looking inland to rivers, lakes and ponds for hunting and fishing, often traveling to and around the area by boat, snowmobile or ATV.

Today the province is dotted with cottages, cabins and RV trailers; some in cottage development areas or private campsites; some in outports and others located on numerous ponds. Several areas, known for their extensive activity, become small communities of their own during the peak summer cottage season. Use is high in summer, particularly on long holiday weekends, and other special times of the year such as hunting, fishing and snowmobiling seasons.

This section identifies cottages, remote cottages and cottage planning areas (i.e., dwellings that are legally permitted and locations that have been designated by the Provincial government for recreational cottage development) within the proposed transmission corridor and Regional Study Area. Cottages are defined as being accessible by road and remote cottages as not accessible by conventional motor vehicle.

4.7.1 Study Area

This discussion about cabins and cottage development areas focuses on all Crown Titles for cottages, remote cottages and designated Cottage Planning Areas that are crossed by the proposed transmission corridor from Central Labrador to the Avalon Peninsula. Cottage development activity within the Regional Study Area (15 km) is shown in Figures 4.7-1 to 4.7-4 and discussed in the text to provide regional context.

4.7.2 Administrative Framework

Crown Land is defined under the *Lands Act* as any land, including land which is underwater and, has not been lawfully obtained from the Crown for private or public use. Crown Land is managed by the Department of Environment and Conservation, Crown Lands Division, under the *Lands Act*. The Crown Lands Division is responsible for administering approximately 95 percent of the provincial land mass. Land is made available for industry, settlement recreation and conservation uses and is to be used in an environmentally responsible manner. A Crown Title conveys surface rights only (DEC, 1991).

Cottage Planning Areas refer to locations that have been designated for recreational cottage development. Typically, the Crown Lands Division identifies plans and develops these areas. For cottage development to occur in any area, no land use conflicts can exist (DEC-L, 2009). The head office of the Crown Lands Division is located in St. John's. Regional Offices are also located in Happy Valley-Goose Bay, Corner Brook, Gander and St. John's. A satellite office in Clarenville reports to St. John's.

Remote recreational cottages (remote cottages) are required to have a *Licence to Occupy* issued by the Regional

Office nearest to the land applied for. Licences are available where no land use conflicts exist in remote areas that are not accessible by conventional motor vehicle or areas that are subject to a Crown Timber Licence. Lot sizes are not specific and no survey is required. However, a cottage must be at least 45 metres from the nearest neighbouring cottage (DEC-L, 2009).

Recreational cottage (cottage) grants are available in areas accessible by road and where no land use conflicts exist. Cottages in Crown Timber Licence areas are available under a licence to occupy and are not eligible for purchase. Grant applications are filed with the Regional Office nearest to the land applied for and are accepted on a first come first serve basis. In high demand areas, applications are invited through a public draw process. Lots are required to be between 3,000 and 4,000 m^2 with between 30 and 45 m of frontage respectively. Grants are also available in communities where land is zoned for residential use under an approved municipal plan. Where no municipal plan exists, grants are available where the land is located within community boundaries and no land use conflicts exist (DEC-L, 2009).

4.7.3 Information Sources

Information gathered on cabins and cottage development areas primarily originates from the Department of Environment and Conservation, Crown Lands Division. Additional information was extracted from the provincial Land Use Atlas. Media articles and real estate information were also used.

4.7.4 Cabins and Cottage Planning Areas

The Province grants land tenure for construction of cottages (accessible by road) and remote cottages (not accessible by conventional motor vehicle) in designated cottage planning areas. Table 4.7-1 shows the area of cottage planning areas in each Study Region, the number of cottages and remote cottages in the proposed transmission corridor, alternative corridor segments and the Regional Study Area (15 km).

Table 4.7-1: Cottages and Cottage Planning Areas in Study Areas

Study Regions	Cottage Planning Areas (nearest 1,000 ha)	Cottages			Remote Cottages		
		Proposed Transmission Corridor	Alternative Corridor Segments	Regional Study Area (15 km)	Proposed Transmission Corridor	Alternative Corridor Segments	Regional Study Area (15 km)
Central and Southeastern Labrador	0	1	0	2	6	0	27
Northern Peninsula	139,000	59	0	231	65	0	309
Central and Eastern Newfoundland	330,000	93	0	702	75	0	632
Avalon Peninsula	90,000	309	0	1,451	0	0	58
Total	**559,000**	**462**	**0**	**2,386**	**146**	**0**	**1,026**

Source: DEC-L, 2009

Cottage planning areas have been designated on the Island of Newfoundland but not in Labrador. The most

extensive cottage planning areas (hectares) in the province are located in Central and Eastern Newfoundland. The highest concentration of cottages is on the Avalon Peninsula where the population is most dense and convenient road access exists. The highest numbers of remote cottages are found on the Northern Peninsula and in Central and Eastern Newfoundland. These areas are less densely populated and in particular areas, less accessible by road.

Central and Southeastern Labrador

There are currently no designated cottage planning areas in Labrador. One cottage and six remote cottages are located in the proposed transmission corridor (Figure 4.7-1 and Appendix B). No cottages or remote cottages are located in the alternative corridor segment. There are two cottages and 27 remote cottages in the Regional Study Area (for an explanation of cottages and remote cottages, see Section 4.7.2 and Section 4.7.4).

Northern Peninsula

Three Northern Peninsula cottage planning areas are overlapped by the proposed transmission corridor. In this Study Region, 59 cottages and 65 remote cottages are located in the proposed transmission corridor (Figure 4.7-2 and Appendix B). No cottages or remote cottages are located in alternative corridor segments. For context, there are 231 cottages and 309 remote cottages in the Regional Study Area. The areas, which total approximately 138,600 ha, are located near Flower's Cove and Hawke's Bay.

Cottage development is in demand in the Gros Morne area. The Rocky Harbour Cottage Development Plan, which was first approved by the Department of Environment and Conservation in 1996 with 25 remote cottage lots, has been amended several times and currently includes 41 lots. In May 2010, the Department approved an additional 50 lots for the area (Western Star, 2010). Remote cottages are only accessible on foot or by ATV or snowmobile.

Central and Eastern Newfoundland

The Central and Eastern Newfoundland Study Region has approximately 330,400 ha of cottage planning areas (Figure 4.7-3). In this Study Region, 93 cottages and 75 remote cottages are located in the proposed transmission corridor (Figure 4.7-3 and Appendix B). No cottages or remote cottages are located in the alternative corridor segment. The Regional Study Area encompasses 702 cottages and 632 remote cottages. Cottage development is growing around the Terra Nova and Port Blandford area which is less than a two-hour drive from St. John's and near a golf course, a ski hill and a national park.

Avalon Peninsula

The number of cottages is significant on the Avalon Peninsula and several areas from the Isthmus to Holyrood have been designated for cottage development. Most cottages are along ponds and lakes with road access unlike Central Newfoundland and the Northern Peninsula where remote cottages are more typical. The most extensive cottage developments are at Snow's Pond, Grand Pond, Makinsons, Nine Island Pond, Ocean Pond, Deer Park, Mahers and Brigus Junction (Figure 4.7-4 and Appendix B). The Regional Study Area includes 1,451 cottages and 58 remote cottages. No cottages are located in the alternative corridor segment.

Cottage demand is currently high on the Avalon. In the first three months of 2010, cottages sales were three times that of the same period in 2009. Cottage prices in this area have also risen by more than 10 percent since 2008. Entry-level cottages on the Avalon now sell for $105,000 and three bedroom cottages may sell for more

than $300,000. Demand is mostly from Newfoundlanders who live in the province and elsewhere (CBC News, 2010a). The 2010 average cottages price in Newfoundland and Labrador is $110,000 is still among the lowest in the country (Royal LePage, 2010). Cottage development demand is likely to continue increasing on the Avalon Peninsula as the region is experiencing both economic and population growth.

Two cottage planning areas with a total of approximately 90,000 ha are crossed by the proposed transmission corridor. The largest of these is located in the centre of the Avalon. This cottage planning area is both north and south of the transmission corridor and encompasses areas such as Hodgewater Pond, Makinsons, Ocean Pond, Mahers, Brigus Junction, Middle Gull Pond and Deer Park. In this Study Region, 309 cottages but no remote cottages are located within the corridor. The cottages in the proposed transmission corridor are located at Ocean Pond, Hodgewater Pond, Colliers Big Pond, Second Junction Pond, Brigus Junction and Witless Bay Line.

4.7.5 Summary

The proposed transmission corridor overlaps with a portion of a total 559,000 ha that have been designated as cottage planning areas. A total of 462 cottages and 146 remote cottages are located in the corridor. Cottage and remote cottage development is most extensive on the Northern Peninsula and in Central and Eastern Newfoundland. Cottages are much more common than remote cottages on the Avalon Peninsula where cottage development is most intensive.

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Figure 4.7-1

Cabins and Cottage Development Areas - Central and Southeastern Labrador

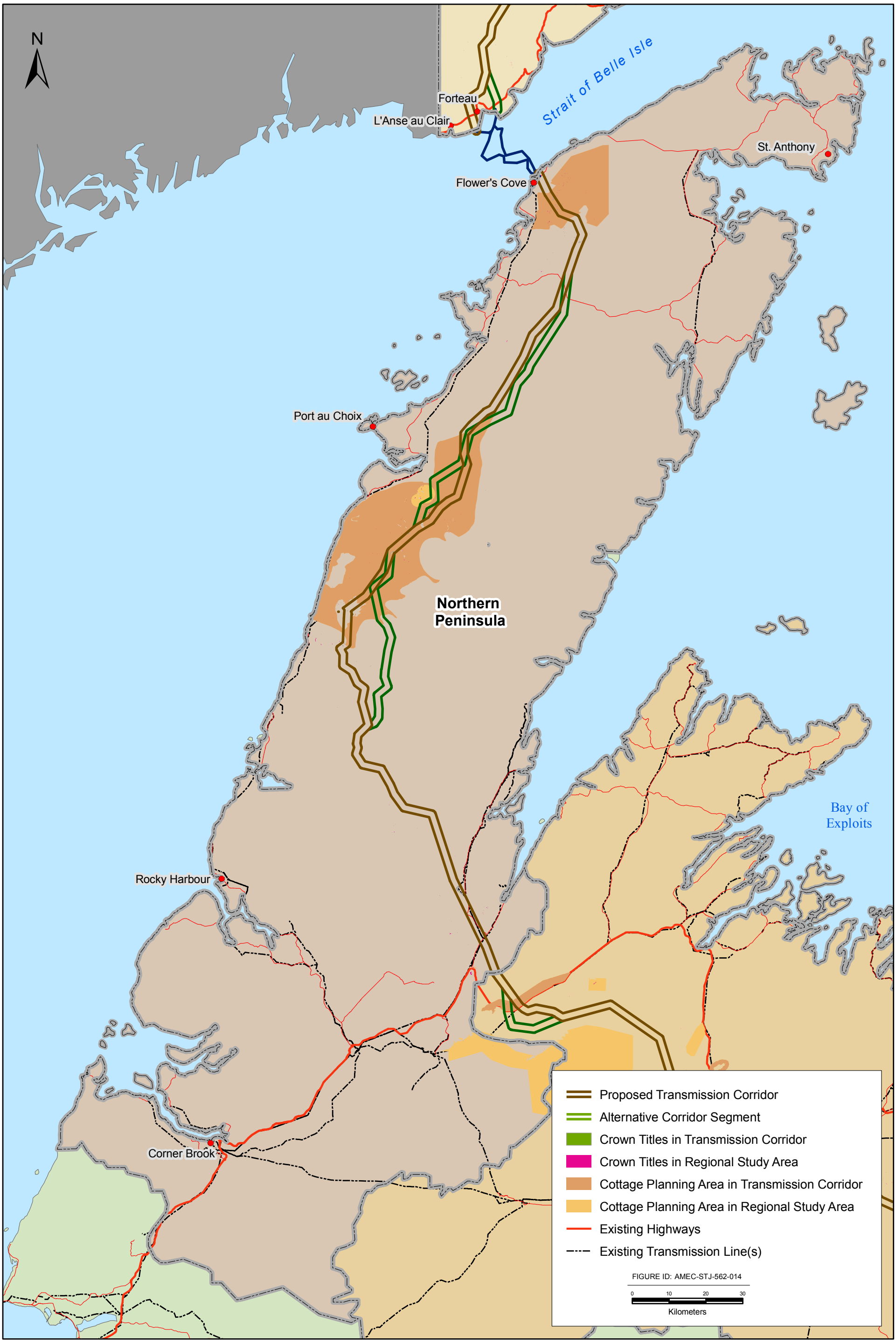

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Figure 4.7-2

Cabins and Cottage Development Areas - Northern Peninsula

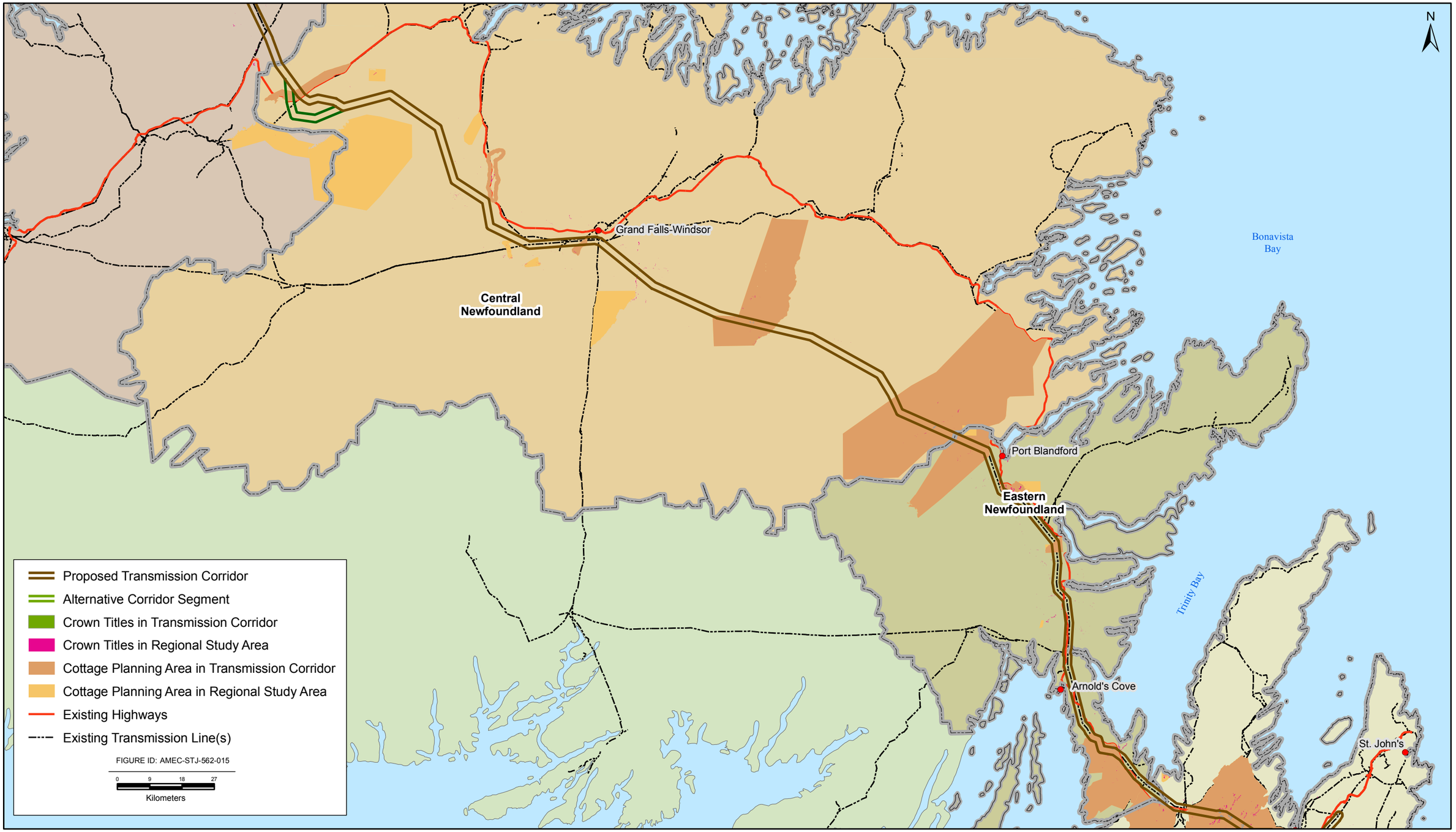

Figure 4.7-3

Cabins and Cottage Development Areas - Central and Eastern Newfoundland

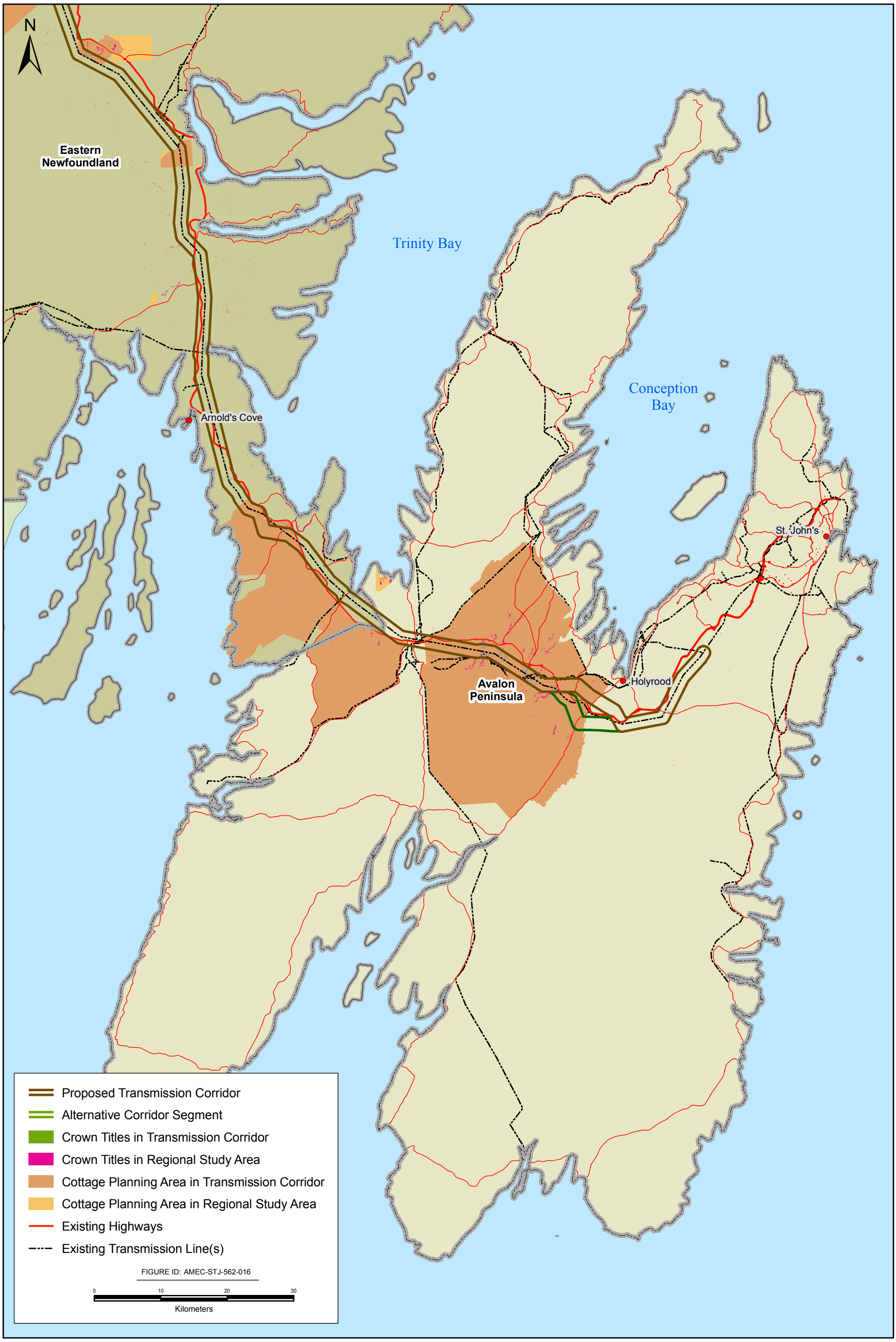

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Figure 4.7-4

Cabins and Cottage Development Areas - Avalon Peninsula

4.8 Other Outdoor Recreational Activities

Recreational activities occur on land and / or adjacent coastal areas throughout the province. They include bicycling, bird watching, camping, canoeing, kayaking, white water rafting, golfing and skiing - cross country and downhill. Recreational hunting and fishing are discussed in Sections 4.3 and 4.4 respectively. The use of motorized vehicles - recreational and non-recreational - is discussed in Section 4.6.

Some recreation activities are conducted independently in unregulated areas and thus are challenging to describe or quantify. Where data are not available, it is somewhat difficult to determine where a particular activity occurs. For example, while trail heads are identified, many trail routes are not available in a georeferenced format that can be mapped or located in relation to other features.

The proposed transmission corridor crosses areas where people participate in activities, which occur most frequently near populated areas (e.g., the Labrador Straits, Grand Falls-Windsor, Clarenville, Isthmus of the Avalon and Conception Bay Centre and South) and near existing parks and protected areas, in particular, the T'Railway. Some activities that may be undertaken for fitness (e.g., hiking, bicycling) include viewing landscapes as an integral part of the activity. The following sections describe tourism and recreational activities and their associated infrastructure that are within the proposed transmission corridor or in the general area.

4.8.1 Study Area

This discussion includes outdoor recreational activities and their associated infrastructure that overlap with the proposed transmission corridor. Where appropriate, activities in the Regional Study Area (30 km) are described to provide further context.

4.8.2 Administrative Framework

The following paragraphs outline regulations that govern the outdoor recreational activities discussed in this section.

According to the *Highway Traffic Act,* a bicycle is a vehicle and, therefore, while on public roads cyclists have the same rights and obligations as motorists (e.g., signaling; obeying signs; staying in the proper lane) and must abide by the same laws as motorists (DGS, 1990). In many municipalities (e.g., Grand Falls-Windsor and Holyrood), cyclists of all ages are also required to wear an approved bicycle helmet (Canada Trails, 2009).

Anyone who bird watches within a provincial park, reserve or protected area must abide by the rules and regulations of the *Wilderness and Ecological Reserves Act, Provincial Parks* and in national parks, the *Canadian National Parks Act* (See Section 3.10) as well as the *Migratory Birds Convention Act*, which is administered by the Canadian Wildlife Service of Environment Canada (Parks Canada, 2000; DEC, 1990b; DEC, 1990). Included are regulations pertaining to migratory birds, migratory bird sanctuaries and migratory bird hunting (Environment Canada, 1994).

In Newfoundland and Labrador, camping occurs in specially designated areas of 14 provincial parks, two national parks, 10 municipal parks and 67 privately owned parks. Camping is also allowed with a permit in two wilderness reserves. The administrative framework for camping in provincial and national parks is outlined in Section 4.10. General guidelines for low-impact visiting or camping such as that allowed in wilderness reserves or waterway provincial parks / heritage river areas can be viewed in greater detail in Section 4.9. Prohibited activities

generally include destroying habitat, mining, use of motorized vehicles and leaving trash (DEC-PNA 2009d).

Many private campgrounds address the needs of people with recreational vehicles (RVs) or trailers. These campgrounds are administered by their owners who, in developing the campground, must abide by local zoning regulations as well as the National Building Code for construction and maintenance of any infrastructure. Environmental permits must be obtained where required. Campgrounds located outside of a municipality are obligated to contact a Government Service Centre for permits, licences, approvals, inspections and investigations (e.g., building inspections, septic system approvals, food establishment licences, fire inspections and signage regulations) (CBSC, 2010).

Canoeing, kayaking and rafting occur on many rivers, lakes and ponds of the province. Kayaks and canoes fall under Transport Canada's *Small Boats' Regulations* that identify the type of safety equipment required on board (DFO, 2001). Most recreational boaters operate craft at their own risk, but many belong to provincial organizations that provide ongoing safety and skill training at a variety of levels.

Golfing occurs on courses belonging to golf clubs that are publicly owned by a government (municipality, provincial government or Crown Corporation) or privately owned (by members, shareholders or businesspeople). Within municipalities, golf courses and their infrastructure are required to meet zoning regulations and the National Building Code. The same regulations apply to golfing infrastructure (e.g., clubs, cart storage areas).

Hiking is not overseen by an administrative framework. People can walk anywhere in the province as long as they are not trespassing on private property without permission or not walking in off limit areas (e.g., some areas of 5 Wing Goose Bay). Larger trail systems (e.g., International Appalachian Trail, East Coast Trail, Newfoundland T'Railway) are established entities governed by provincial legislation or voluntary organizations.

The International Appalachian Trail Newfoundland and Labrador (IATNL), formed in 2003, is a not-for-profit organization, incorporated within the Province of Newfoundland and Labrador and affiliated with the International Appalachian Trail which is a confederation of organizations in Maine, eastern Canadian provinces and some European countries. It receives funding from both the federal and provincial governments (Wylezol, P., 2009).

The Newfoundland T'Railway Provincial Park is administered under the *Provincial Parks Act* and its *Regulations*. The T'Railway Council, a not-for-profit organization governed by a constitution, by-laws and a Board of Directors, partners with the Department of Environment and Conservation, Parks and Natural Areas Division to develop policies and provide programs to the public (Morrison, T., 2009; DEC, 1990).

Skiing (cross country and downhill) occurs throughout the province. Cross country skiing takes place primarily on established tracks such as those prepared by a cross country ski or snowmobile club. Since cross country skiing is a non-motorized sport, it is permitted in most areas and is encouraged within established parks and recreation areas as long as skiers abide by the general rules of the park.

4.8.3 Information Sources

Information on outdoor recreational activities was obtained from the websites of the provincial Departments of Tourism, Culture and Recreation, Government Services, Environment and Conservation and department representatives. Information was also gathered from other websites such as the Newfoundland T'Railway

Provincial Park, Canada Trails, International Appalachian Trail Newfoundland and Labrador, Golf Newfoundland and Labrador, White Hills Ski Resort, Terra Nova National Park and other recreational activity clubs, associations and private operators. Personal communications were used to supplement this information where necessary.

4.8.4 Activities in Parks and Protected Areas

Some areas of the province that are used for recreation are designated as important because they represent types of provincial ecosystems, provide a variety of recreation activities and / or allow for an integrated approach to a wilderness or outdoor experience (e.g., camping, boating, hiking, bird watching, wildflower viewing). These areas include provincial and federal parks and protected areas. The following sections discuss general recreational activities within parks and protected areas where relevant in the various Study Regions. Subsequent sections describe various activities in terms of the Study Regions.

Main River, a Waterway Provincial Park and Canadian Heritage River, is well known for its variety of quality experiences including canoeing, kayaking, white-water rafting, angling, hunting, wilderness camping, hiking, swimming, nature photography, bird watching, wildlife viewing, winter camping and snowmobiling (DEC-PNA, 2009b).

The Bay du Nord Wilderness Reserve is considered an excellent location for canoeing or kayaking, wilderness camping, angling and hunting, bird and wildlife watching and outdoor photography (entry permits required). It is also a popular snowmobiling destination although snowmobiling is not permitted in the caribou winter range from December 15 to March 15 (DEC-PNA 2009d).

Terra Nova National Park is recognized for its wildlife, scenery and array of recreational activities. It offers biking, boat tours, boating, canoeing and kayaking, fishing, hiking, scuba diving, swimming, winter activities and camping (Parks Canada 2009c).

Butter Pot Provincial Park is known for individual and group camping, picnicking, fishing, hiking, swimming, non-motorized boating and winter recreation.

The Newfoundland T'Railway Provincial Park (see Section 4.9 for more detail) accommodates six core user groups: snowmobilers, all-terrain vehicle (ATV) users, hikers, horseback riders, dog sledders and snowshoers. Generally, the T'Railway is used most heavily by those who partake in snowmobiling and ATV riding. The greatest variety of use occurs in and near more populated centres such as Deer Lake, Grand Falls-Windsor, Gander, Clarenville and St. John's. This use includes walking, long-distance hiking, cycling, dirt bike riding and a limited amount of horseback riding. Cross-country skiing is popular in the winter months (Morrison, T., 2009). According to both the T'Railway Council and Conservation Officers, snowmobiling and ATV use are the most popular activities (DEC-PNA, 2009c; Morrison, T., 2009; Ward, R., 2009).

Adventure tourism companies operate throughout the province and offer a variety of wilderness experiences including canoeing, kayaking, hiking and camping, both within and outside of protected areas. In western Newfoundland, at least seven companies provide these services; in Central Newfoundland, there are at least four companies; in Eastern Newfoundland within the Bay du Nord Wilderness Reserve at least one company offers snowmobiling, canoeing, hiking, wilderness camping, hunting and fishing. At least four companies offer a variety of outdoor experiences on the Avalon and in other parts of the province (DTCR, 2010).

4.8.5 Specific Activities

The following sections describe various outdoor recreational activities and the Study Regions in which they occur. These activities include bicycling, bird watching, camping, canoeing, kayaking, white-water rafting, golfing, hiking and skiing (Figures 4.8-1 to 4.8-4).

Bicycling

Most bicycling occurs on highways and other major roads. Mountain biking frequently occurs off major roads. The TCH, Route 1 is a popular route for recreational cyclists from within and outside of the province. Some portions of the T'Railway that cross the proposed transmission corridor are used by off-road cyclists and cycling tourists, particularly those portions of the T'Railway that have been upgraded and are near populated areas (e.g., Badger to Grand Falls-Windsor, Port Blandford to Soldiers Pond). Mountain biking occurs in areas along the T'Railway from Port Blandford to the Isthmus of the Avalon.

Central and Southeastern Labrador

Recreational bicycling occurs on the paved portion of Route 510 along the Labrador Straits from L'Anse au Clair to Red Bay and within the eight communities along the Straits including Forteau, which is crossed by the proposed transmission corridor.

Northern Peninsula

No identified bicycling routes occur within the proposed transmission corridor on the Northern Peninsula. Within a regional context, some bicycling tours operate within Gros Morne National Park and occasionally their routes extend beyond the boundaries of the Park (Baldwin, K., 2009).

Central and Eastern Newfoundland

Bicycle touring activity is focused primarily on the TCH, Route 1 around Sandy Lake and from Badger to Grand Falls-Windsor. A bicycle tour operator is located in Terra Nova National Park. Some portions of the T'Railway that intersect with the proposed transmission corridor are used for bicycling by off-road cyclists and cycle tourists, particularly those portions of the T'Railway that have been upgraded and are near larger towns (e.g., Badger to Grand Falls-Windsor) (Baldwin, K., 2009).

The proposed transmission corridor runs parallel to the T'Railway from Port Blandford, where good mountain biking opportunities exist from Eagle Creek Trail (Port Blandford) to the Isthmus. The T'Railway between Port Blandford to near Soldiers Pond has been upgraded and is used extensively by off-road cyclists and cycle tourists (Baldwin, K., 2009).

Avalon Peninsula

On the Avalon Peninsula, the most popular recreational cycling routes include the TCH, Route 1, Manuels Bypass Highway (Route 2), Topsail Road / Conception Bay Highway (Route 60), Foxtrap Access Road (Route 61), Holyrood Access Road (Route 62), Witless Bay Line (Route 13) and Salmonier Line (Route 90). Cycle tourists also use Route 1, and the secondary roads that branch from it including Routes 75, 80 and 100. Off-road cyclists also use the T-Railway extensively, where it intersects with the proposed transmission corridor twice along the section between Holyrood and Whitbourne. Much of the mountain biking on the Avalon is done on trails in and around St. John's and in Butter Pot Provincial Park (Baldwin, K., 2009).

Bird Watching

Numerous bird watching locations are found throughout Newfoundland and Labrador. Parks and reserves offer secluded areas from which to observe birds. Nearly 40 common woodland birds can be seen in many of the provincial parks and reserves which are mainly outside of the proposed transmission corridor but may be within the Regional Study Area (see Section 4.9). A variety of waterfowl are routinely documented during annual spring waterfowl surveys in Labrador and on the Island (e.g., black ducks, Canada geese, red-breasted mergansers, common mergansers, hooded mergansers, common goldeneye, ring neck ducks, green-winged teal, greater and lesser scaup) (Pardy, S., 2009).

Some sites where Harlequin and Barrow's Goldeneye can be observed in the Central and Southeastern Labrador Study Region are possibly within the proposed transmission corridor. On the Strait of Belle Isle, birdwatchers can view a variety of species of seabirds, shorebirds and others such as passerines and birds of prey at different times of the year. Many species migrate through the area, but few stop for long. Other species breed along the Strait of Belle Isle and some species are found year-round (Trimper, P., 2010).

More than 70 species of birds can be seen in the Main River area. Commonly occurring waterfowl include Canada geese, several species of duck (black, green and blue-winged teal, red-breasted merganser, common goldeneye) and osprey. Bald eagles and greater yellowlegs are often spotted near the River. In the barrens area rough-legged hawk, savannah sparrow, rock ptarmigan and snowy owl may be seen; northern harrier, short-eared owl, and swamp and Lincoln's sparrow can be found in the wetland areas (DEC-PNA, 2009).

In Central and Eastern Newfoundland and on the Avalon Peninsula, nearly 30 sites of birding interest have been identified (DTCR, 2010). None are located within the proposed transmission corridor. The nearest site of birding interest in the Regional Study Area is located within Terra Nova National Park, where the following species can be found: spruce grouse, gray jay, boreal chickadee, black-backed woodpecker, white winged crossbill, pine grosbeak, palm warbler, Lincoln's sparrow, northern goshawk and shorebirds. Three other areas of birding interest are found at Clarenville, Arnold's Cove and Bellevue Beach Provincial Park Reserve. None of these areas are within the proposed transmission corridor but are within the Regional Study Area.

Although Butter Pot Provincial Park has not been officially identified as a key birding site, more than 200 species of birds have been recorded there. These include the pine grosbeak, common loon, willow ptarmigan and ruffed grouse (DEC-PNA, 2009). A portion of the Park near the TCH, Route 1 is crossed by the proposed corridor but this area is at the TCH, Route 1 where the activity and nature areas of the Park are not located.

Camping

Camping occurs throughout the province and may be associated with other activities such as hunting, fishing, berry picking, bicycling, hiking, bird watching, canoeing and kayaking. Table 4.8-1 shows the number of public and private campgrounds and the number of campsites in the province.

Table 4.8-1: Public and Private Campgrounds and Sites in Newfoundland and Labrador

Entities	Number of Campgrounds	Number of Sites
Public		
Municipal Parks	10	528

Entities	Number of Campgrounds	Number of Sites
Provincial Parks	14	1,014
Pippy Park (Provincial Crown Corporation)	1	96
Parks Canada	7 in 2 parks	820
Sub-total	**32**	**2,458**
Private		
Companies or Non-profit Organizations	67, many of which are RV parks with serviced sites	**3,522**
Total	**99**	**5,980**

Source: Pippy Park Commission, 2009; Parks Canada, 2009a; Parks Canada, 2009c; DTCR, 2010; Dawe, M., 2010

In total, 2,458 campsites in 32 municipal, provincial and federal campgrounds along with 3,522 campsites in 67 private campgrounds are available within the province for a total of 99 campgrounds and 5,980 campsites (DTCR, 2010; Pippy Park Commission, 2009; Parks Canada, 2009a; Parks Canada, 2009c; Dawe, M., 2010).

No campgrounds are located in the proposed transmission corridor or alternative corridor segments. Table 4.8-2 shows campgrounds located in the Regional Study Area.

Table 4.8-2: Campgrounds in Regional Study Area

Study Regions	Campgrounds in Regional Study Area (30 km)
Central and Southeastern Labrador	Northern Light Inn Campground, L'Anse au Clair
Northern Peninsula	St. Barbe RV Park, St. Barbe Mountain Waters Resort Park, Portland Creek River
Central and Eastern Newfoundland	Catamaran Park, Badger Beothuck Family Park, Grand Falls-Windsor Sanger Memorial RV Park, Grand Falls-Windsor Lakeside at Thorburn Campground, near Clarenville Putt-N-Paddle Camp Grounds, Arnold's Cove Bellevue Beach Campground, Bellevue
Avalon Peninsula	Butter Pot Provincial Park, TCH, Route 1 near Holyrood Droghedea R.V. Park, Route 71, Makinsons

Study Regions	Campgrounds in Regional Study Area (30 km)
	Roaches Line RV Park, Route 70 - Roaches Line Irish Loop Resort Trailer Park, Route 90 - Salmonier Line Bluefin Trailer Park, TCH, Route 1 near Holyrood

Source: DTCR, 2009a

Central and Southeastern Labrador

One public and three private campgrounds are located in Central and Southeastern Labrador. No campgrounds are located within the proposed transmission corridor but a private RV campground (10 campsites) at L'Anse au Clair is located within the Regional Study Area (Figure 4.8-1).

Northern Peninsula

The Northern Peninsula Region has more than 20 public and private campgrounds. None are located in the proposed transmission corridor (Figure 4.8-2). Two private campgrounds (at St. Barbe and Portland Creek Pond) with a combined total of 98 campsites are located in the Regional Study Area.

Central and Eastern Newfoundland

Central and Eastern Newfoundland has approximately 40 public and private campgrounds. Most in Eastern Newfoundland areas are located distant from the transmission corridor in coastal areas of the Bonavista and Burin Peninsulas or on the Isthmus of the Avalon. No campgrounds are located within the proposed transmission corridor but six campgrounds with a total of 680 campsites are located in the Regional Study Area (Figure 4.8-3).

Avalon Peninsula

The Avalon Peninsula has nearly 20 campgrounds located near Trinity Bay, Placentia Bay and Conception Bay, along the Southern Shore and in the St. John's area. No campgrounds are within the proposed transmission corridor but one public (Butter Pot Provincial Park) and four private campgrounds (Droghedea R.V. Park, Roaches Line RV Park, Irish Loop Resort Trailer Park, and Bluefin Trailer Park) with a combined total of 450 campsites are located within the Regional Study Area (Figure 4.8-4).

Canoeing, Kayaking and White-Water Rafting

Canoeing and kayaking occur on ponds, lakes, rivers and marine coastal areas. A number of kayaking companies are located in the province, particularly near national parks and sheltered coastal bays and inlets as well as in St. John's where some operate province-wide. Because these can be singular recreational activities with no registration, it is impossible to determine the number of canoeists, kayakers and white-water rafters in the province or the number of individuals that undertake any of these activities within the proposed corridor. The following sections generally describe activity in the Study Regions.

Central and Southeastern Labrador

Canoeing occurs throughout Labrador as it has been a traditional method of travel for Aboriginal people and other Labrador residents. Within a regional context, canoeing occurs on the Churchill River and possibly in

proximity to some of the outfitting lodges located in the Regional Study Area (Section 4.5, Figure 4.5-1). Lack of road access to suitable areas has limited kayaking in Labrador. However, the TLH has improved access to rivers in Southeastern Labrador. Sea kayaking occurs on an infrequent basis along the coast.

Northern Peninsula

Canoeing, kayaking and white-water rafting occur on water bodies (with road access points) such as River of Ponds, Portland Creek, and Sop's Arm from which the Main River, a Provincial Waterway Park and Canadian Heritage River, can be accessed (DEC-PNA, 2009b). The following lakes, ponds and rivers, which are crossed by the proposed transmission corridor, are considered suitable for canoeing: Green Island Brook, Western Brook Pond (Flower's Cove), Round Lake, Ten Mile Lake, Leg Pond, Western Brook Pond (Hawke's Bay), Middle Pond, Torrent River, River of Ponds, Eastern Blue Pond and Portland Creek Pond / Inner Pond (Dykeman, M., 2009).

Central and Eastern Newfoundland

Canoeing, kayaking and white-water rafting occur from Badger to Grand Falls-Windsor on the Exploits River. This river appeals to local populations, individuals and groups from other parts of the province, particularly the Avalon Peninsula and adventure seekers from outside of the province. Riverfront Chalets, located on the Exploits River approximately 20 km west of Grand Falls-Windsor, is within the Regional Study Area (Figure 4.8-3). This private business offers packaged canoeing and river rafting adventures and winter snowmobiling packages (Riverfront Chalets, 2010).

The area from Clarenville to Chapel Arm is a sea kayaking destination because of the combination of proximity of a large population, scenic beauty, and perhaps the most important factor, the ability to paddle in Placentia Bay, Trinity Bay or Conception Bay depending on prevailing winds. The coastal area between Bull Arm and Chance Cove is popular for both individual and group kayaking and near and around the community of Fairhaven in Placentia Bay is a good access point to marine coastal areas (Dwyer, A., 2009).

Several waterways which are suitable for canoeing and kayaking (Dykeman, M., 2009) are crossed by the proposed transmission corridor. These include Birchy Lake, South Brook, Exploits River (near Badger), Northwest Gander River and Terra Nova River. Some of these are currently crossed by the existing transmission line as the two power lines share the same corridor from near Port Blandford heading east.

Avalon Peninsula

The area around Avondale at the bottom of Conception Bay is known for its Level 4 (most difficult) sea kayaking conditions (Dwyer, A., 2009). Inland canoeing and kayaking occurs on the Avalon Peninsula where ponds and lakes are linked (e.g., Middle Gull Pond, Peak Pond), thereby avoiding long portages. The proposed transmission corridor and the existing transmission line overlap with some of these ponds.

Golfing

Two golf clubs are located in Labrador: one in Labrador West and the other in Happy Valley-Goose Bay. Eighteen golf courses have been established on the Island of Newfoundland. No golf courses are located in the proposed transmission corridor. Table 4.8-3 and Figures 4.8-3 and 4.8-4 show golf courses in the 30 km Regional Study Area.

Table 4.8-3: Golf Courses in the Regional Study Area

Golf Courses	Locations	Descriptions
Grand Falls Golf Club	Grand Falls-Windsor on Exploits River	18 hole, member owned
Terra Nova Golf Resort - Twin Rivers and Eagle Creek Golf Courses	Port Blandford near Terra Nova National Park on Terra Nova River	18 and 9 holes respectively, privately owned
The Willows at Holyrood	Holyrood Access Road	9 holes, privately owned

Source: Golf Newfoundland and Labrador, 2010

Grand Falls Golf Club and the Terra Nova Golf Resort are located within the Central and Eastern Newfoundland Regional Study Area. The Willows at Holyrood is located within the Avalon Peninsula Regional Study Area (Golf Newfoundland and Labrador, 2010).

Hiking

More than 300 hiking trails are found in Newfoundland and Labrador. Some have been used for hundreds of years as coastal transportation routes between communities; others have been purpose built as recreational and tourism amenities. The Department of Tourism, Culture and Recreation has reviewed these trails against a list of safety criteria and has listed approximately 180 as being open to the public. Selected trails are currently undergoing further review and the Department anticipates that the number will be reduced to approximately 100 (Hennebury, A., 2009).

The most extensive walking trail systems in the province are the multi-use T'Railway Provincial Park, an 883 km converted railway bed, that meanders from coast to coast on the Island; the 540 km East Coast trail (of which 230 km are fully developed) that hugs the Avalon Peninsula coastline from Topsail Beach to Trepassey and the International Appalachian Trail that begins in Port aux Basques and ends at Crow Head just east of L'Anse aux Meadows (IATNL, 2009).

Hiking and walking trails located in the Regional Study Area are described below.

Central and Southeastern Labrador

In the Labrador Straits, the Overfall Brook Trail follows the shoreline of Forteau Bay and the Schooner Cove Trail. In nearby Point Amour, the Raleigh Trail takes hikers to the wreck sites of the HMS Raleigh and HMS Lily (DTCR, 2010). Portions of these hiking trails are within the Regional Study Area.

Northern Peninsula

The International Appalachian Trail (IAT) system extends through the Northeastern United States and Eastern Canada, and is continuously under development with a view to establishing a trail network extending across the entire Appalachian region of North America. On the Island of Newfoundland, the current IAT routes extend north from Port aux Basques to Crow Head at the tip of the Northern Peninsula.

The IAT formed its Newfoundland and Labrador Chapter (IATNL) in 2003, with the objective of developing

approximately 1,200 km of hiking trails from southwestern to northern Newfoundland. This currently includes an extensive network of existing and proposed trails in the south-central portion of the Northern Peninsula (Figure 4.8-2), which connect existing trails and resource roads to create a network of backcountry trails in this area, and which continues to expand each year. Within the Study Region, trails have been developed from south of River of Ponds to Gros Morne National Park. The most extensive development is the Indian Lookout Trail south of Portland Creek, Inner Pond. The Indian Lookout Trail is a 40 km loop around Southwest Feeder Gulch and Gros Pate that is also connected to Devil's Bite Trail to the south. New trail connections are proposed from Eastern Blue Pond in the north to the Main River area in the south.

Given the overall size and geographic extent of this extensive web of existing and proposed trails across the Island's Northern Peninsula, a degree of interaction between the proposed transmission corridor and alternative corridor segments and the IATNL's existing and / or future trail network is inevitable. Indeed, based on the most recent mapping information provided by the IATNL (Figure 4.8-2) the existing trail system crosses the proposed transmission corridor along parts of the existing Indian Lookout Trail and proposed trails in that area and near the Main River. The alternative transmission corridor segment on the Long Range Mountains crosses proposed trails east of Brian's Pond in the North and proposed trails east of Portland Creek, Inner Pond.

Other community walking trails In the Study Region are identified in Table 4.8-4.

Table 4.8-4: Northern Peninsula Community Walking / Hiking Trails in Regional Study Area

Hiking Trails	**Location**
Major Bridge and Thrombolites Walking Trail	Flower's Cove
Indian Lookout Trail	Portland Creek
Bill Woods Hiking Trail	Between Daniels Harbour and Portland Creek
Big Steady (provides hiking opportunities when water level is low)	Main River Area

Source: DTCR, 2010; DEC-PNA 2009b

Central and Eastern Newfoundland

The Port Blandford area of Eastern Newfoundland is increasingly used as a recreation destination due to its proximity to a large population base, the existence of recreation amenities such as a golf course, ski hill and a national park (with hiking trails) and more consistent snow cover than the Avalon Peninsula for winter sports such as skiing and snowmobiling.

Table 4.8-5 shows community walking / hiking trails located in communities in the Regional Study Area. These are found near Badger, Grand Falls-Windsor, Terra Nova National Park, Clarenville and Sunnyside.

Table 4.8-5: Central and Eastern Newfoundland Community Walking / Hiking Trails in Regional Study Area

Hiking Trails	**Location**
Exploits Valley Trail	Between Badger and Grand Falls-Windsor (also part of the T'Railway Provincial Park); Transmission corridor crosses T'Railway northwest of Badger
Corduroy Brook Nature Trail	Grand Falls-Windsor
Grand Falls-Windsor Walking Trail	Grand Falls-Windsor
Blue Hill Pond Trail	Terra Nova National Park
Blue Hill West Trail	Terra Nova National Park
Buckley Cove Trail	Terra Nova National Park
Campground Trail	Terra Nova National Park
Coastal Trail	Terra Nova National Park
Dunphy's Pond Trail	Terra Nova National Park
Louill Hill Trail	Terra Nova National Park
Malady Head Trail	Terra Nova National Park
Ochre Hill Trail	Terra Nova National Park
Outport Trail	Terra Nova National Park
Platters Beach Trail	Terra Nova National Park
Sandy Pond Trail	Terra Nova National Park
Southwest Brook Trail	Terra Nova National Park

Hiking Trails	Location
Bare Mountain Trail	Clarenville
Centre Hill Trail	Sunnyside

Source: DTCR, 2010

Avalon Peninsula

Hiking occurs on the T'Railway which is regularly crossed by the proposed transmission corridor. Hiking trails are also located in Butter Pot Provincial Park. A small portion of the park (near the TCH) is crossed by the proposed transmission corridor (see Section 4.9). However, the hiking trails are not located in that area. Table 4.8-6 shows walking / hiking trails in the Regional Study Area.

Table 4.8-6: Avalon Peninsula Community Walking / Hiking Trails in Regional Study Area

Hiking Trails	Location
Butter Pot Hill Trail	Butter Pot Provincial Park
Pegwood Pond Trail	Butter Pot Provincial Park

Source: DTCR, 2010

Skiing - Cross Country and Downhill

Eighteen cross country ski areas and clubs and five downhill skiing / snowboarding slopes are located in the province (Figures 4.8-3). None are located in the proposed transmission corridor. Table 4.8-7 shows ski trails and hills in the Regional Study Areas.

Table 4.8-7: Ski Hills and Trails in Regional Study Area

Study Regions	Ski Hills and Trails
Central and Southeastern Labrador	None
Northern Peninsula	Mt. St. Margaret Ski Club, Plum Point Deep Cove Ski Club, Anchor Point
Central and Eastern Newfoundland	Newfoundland T'Railway Provincial Park Exploits Valley Ski Club, Grand Falls-Windsor Terra Nova National Park Clarenville Ski Club, Clarenville

Study Regions	Ski Hills and Trails
	White Hills Ski Resort, Clarenville Glenview Nordic Ski Club, Come By Chance
Avalon Peninsula	Newfoundland T'Railway Provincial Park Butter Pot Provincial Park

Source: DTCR, 2010; White Hills Ski Resort, 2009

Central and Southeastern Labrador

There are no identified cross country ski or downhill ski areas in the proposed transmission corridor or Regional Study Area in Central and Southeastern Labrador.

Northern Peninsula

Four cross country ski clubs are located on the Northern Peninsula, two of which have trails that are within the Regional Study Area: Mt. St. Margaret Ski Club in Plum Point has 5 km of trails and Deep Cove Ski Club just south of Anchor Point has more than 10 km of trails that are used by the approximately 100 members from 13 neighbouring communities (Ski NL, 2009).

Central and Eastern Newfoundland

Cross country skiing also occurs on the Newfoundland T'Railway which is crossed by the proposed transmission corridor. The Exploits Valley Ski Club in Grand Falls-Windsor has 7.5 km of groomed trails and Terra Nova National Park has 25 km of cross country skiing trails which are within the Regional Study Area (Ski NL, 2009).

White Hills Ski Resort is within the Regional Study Area which is also the general location of the existing transmission corridor in Eastern Newfoundland. White Hills is owned by the Town of Clarenville and operated as a not-for-profit corporation by Alpine Development Alliance Corporation. It has 55 acres of ski and snowboard terrain and 19 groomed trails (White Hills Ski Resort, 2009).

The Clarenville Ski Club maintains 40 km of groomed cross-country ski trails that spread out from the base of White Hills Ski Resort. The Club caters to visitors, primarily from Central and Eastern Newfoundland and the Avalon Peninsula. Cross country skiing also occurs on the T'Railway which is crossed by the proposed transmission corridor and within the Regional Study Area. In addition, the Glenview Nordic Ski Club in Come By Chance has 10 km of cross country trails in the Regional Study Area.

Avalon Peninsula

Seven kilometres of cross country ski trails are located at Butter Pot Provincial Park (DEC-PNA 2009a). Cross country skiing also occurs on the Newfoundland T'Railway which is crossed by the proposed transmission corridor and also within the Regional Study Area. The corridor also crosses a small portion of Butter Pot but not where facilities are located.

4.8.6 Summary

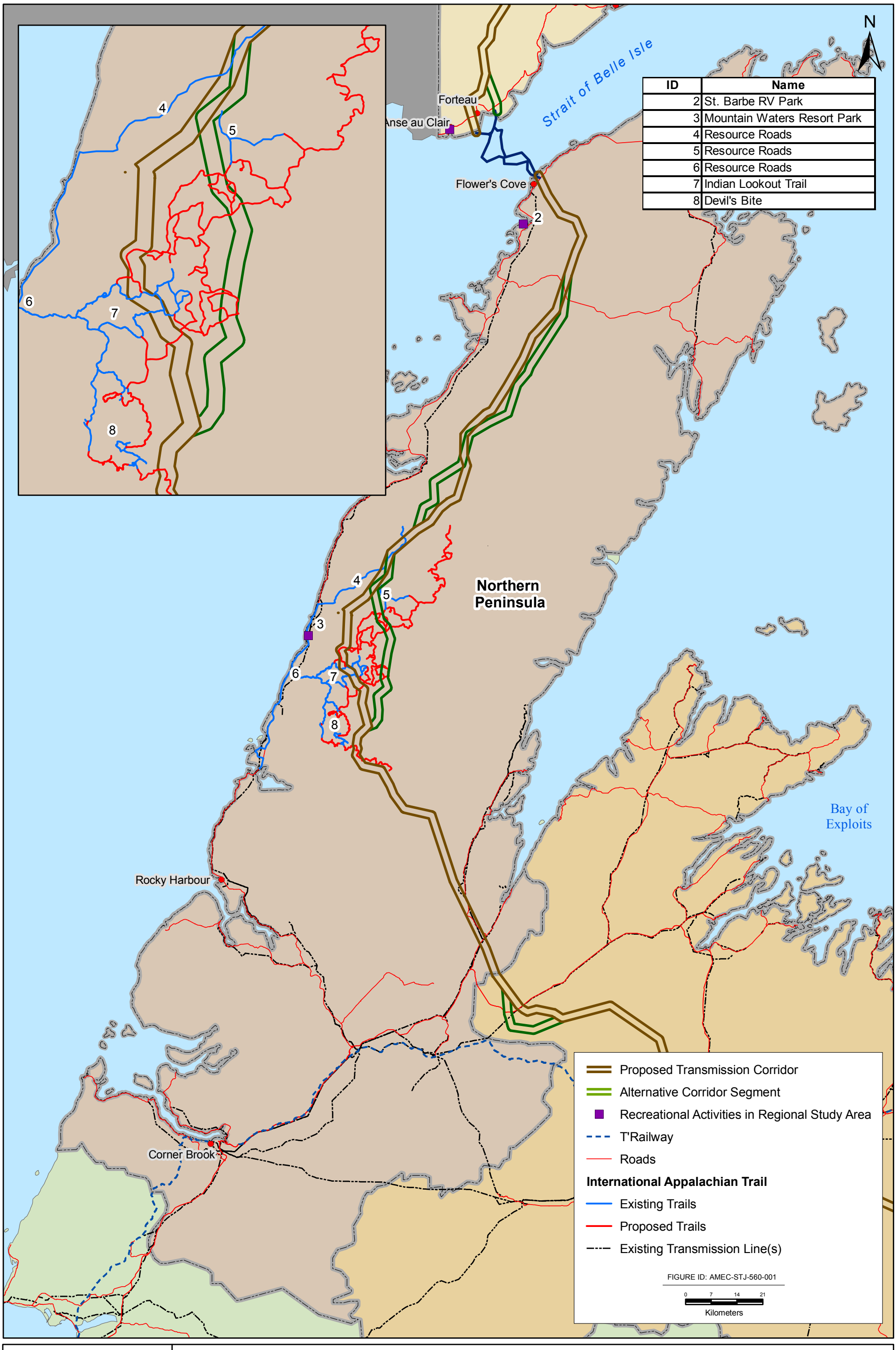
Outdoor recreation generally occurs in areas that are accessible by road where participants can place their vehicles and equipment as close as possible to the activity site. Bicycling occurs within communities, on major highways and the Newfoundland T'Railway which is within the proposed transmission corridor or Regional Study Area depending on the location. Most bird watching occurs in identified birding areas or protected areas. Camping occurs within designated protected areas and at private campgrounds. Fourteen campgrounds are located within the Regional Study Area.

Canoeing, kayaking and rafting takes place on many ponds, lakes and rivers throughout the province, but generally at ones accessible by road and a number of these are crossed by the proposed transmission corridor. Most hiking is undertaken on purpose built or community based trails. The proposed transmission corridor intersects with existing and proposed sections of the International Appalachian Trail on the Northern Peninsula and the T'Railway in Central and Eastern Newfoundland and on the Avalon Peninsula. The White Hills Ski Resort, which has downhill and cross country ski facilities, is within the Regional Study Area. Golf courses, located at Grand Falls-Windsor, Terra Nova (two courses) and Holyrood, are within the Regional Study Area. Riverfront Chalets (a river rafting outfitter on the Exploits River) is also located in the Regional Study Area.

The proposed transmission corridor and the Regional Study Area generally overlap with the above activities most frequently near major population areas (e.g., the Labrador Straits, Grand Falls-Windsor, Clarenville, the Isthmus of the Avalon and on Conception Bay) and in protected areas (e.g., parks and reserves), in particular the Newfoundland T'Railway.

Figure 4.8-1

Tourism and Recreational Areas - Central and Southeastern Labrador



nalcor energy

Figure 4.8-2

Tourism and Recreational Areas - Northern Peninsula

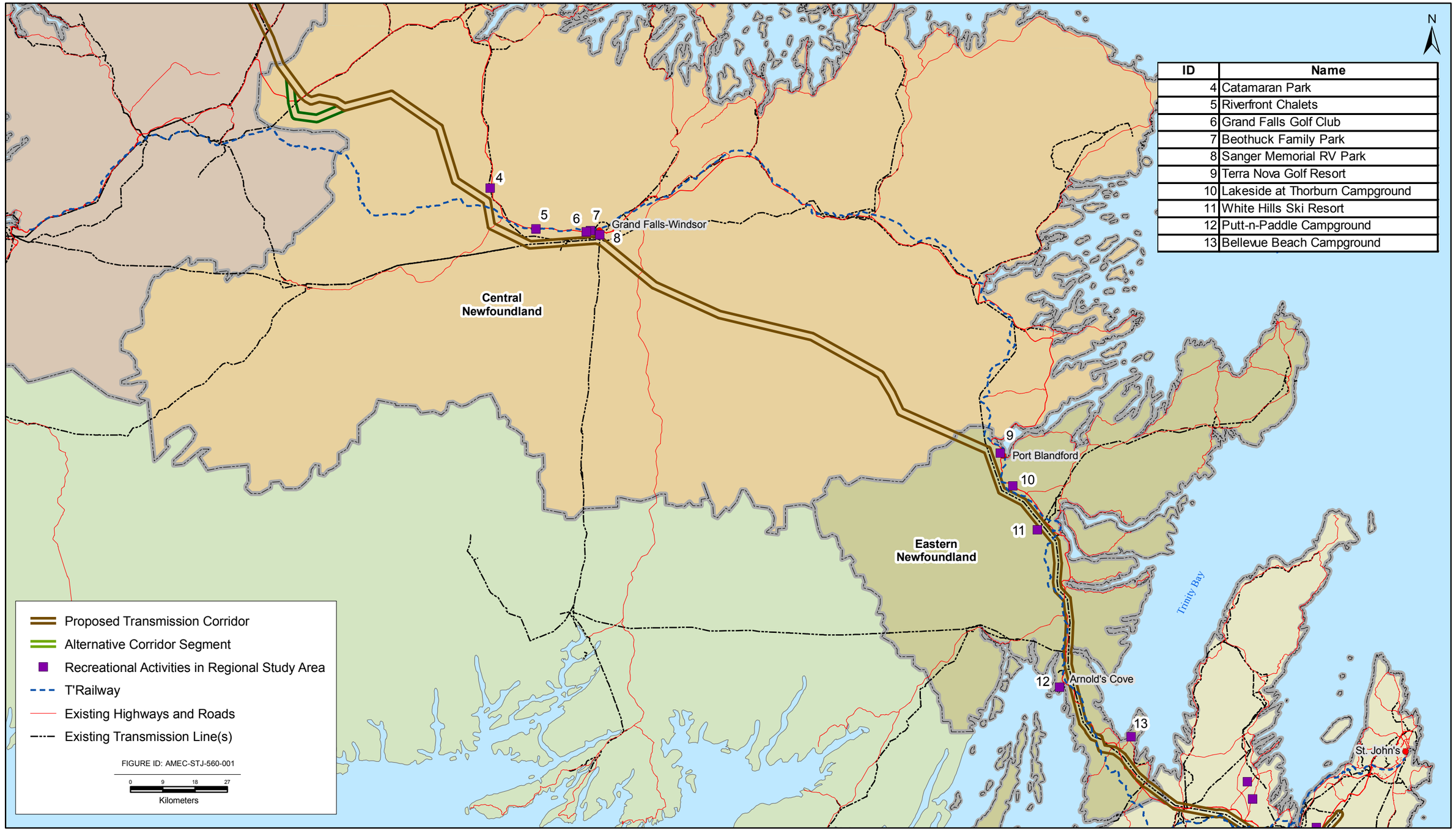


Figure 4.8-3

Tourism and Recreational Areas - Central and Eastern Newfoundland

ID	Name
14	Droghedea RV Park
15	Roaches Line RV Park
16	Irish Loop Resort Trailer Park
17	Bluefin Trailer Park
18	Willows at Holyrood Golf Course
19	Butter Pot Provincial Park Campground

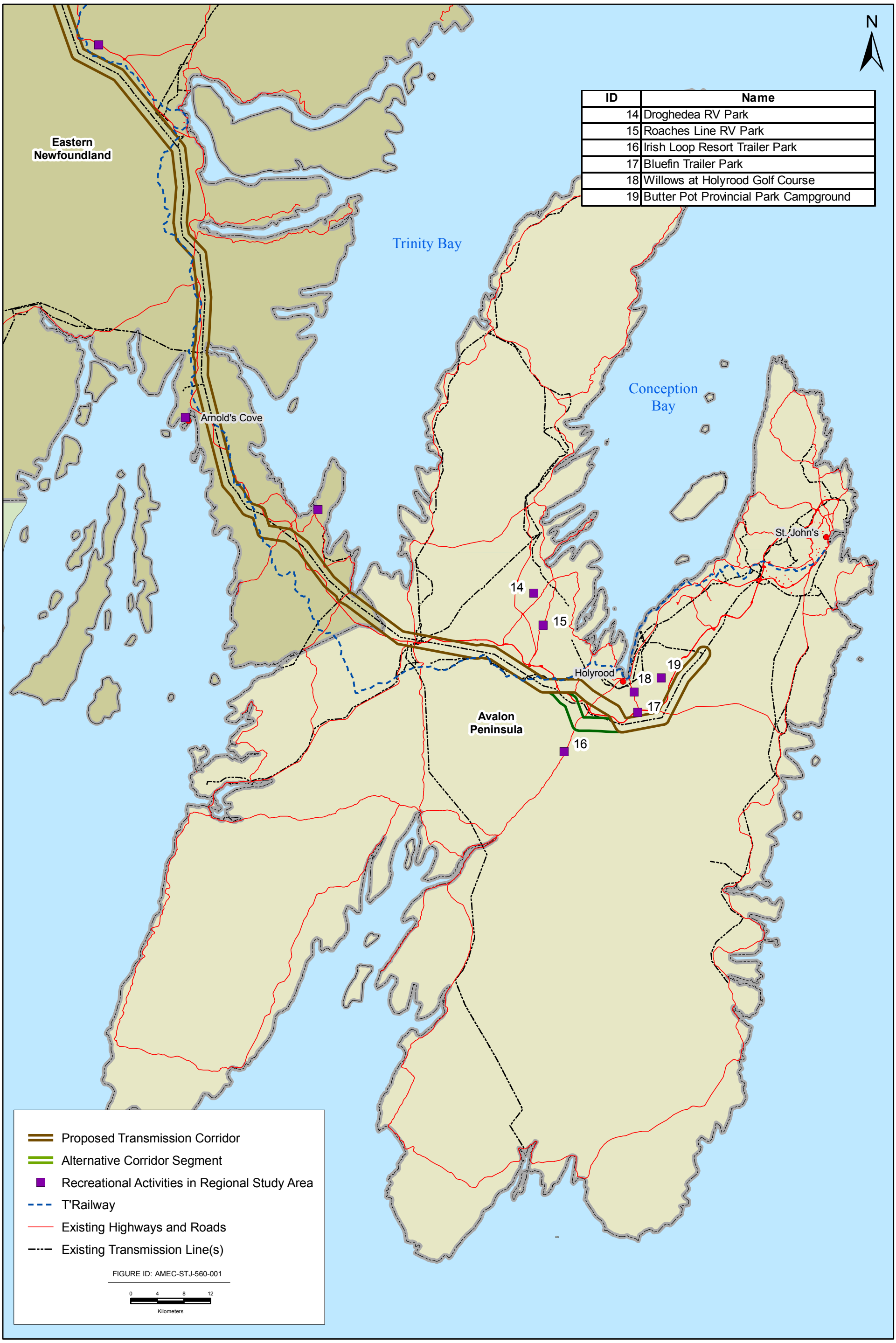


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Figure 4.8-4

Tourism and Recreational Areas - Avalon Peninsula

4.9 Parks, Reserves and Other Protected and Special Areas

All three levels of government administer various parks, reserves and / or protected and special areas. These include all provincial and federal lands that are designated, protected and managed for conservation and / or recreation. For purposes of this discussion, parks, reserves and other protected and special areas, which will be referred to as protected areas, include all provincial and federal lands that are designated, protected and managed for conservation and / or recreation purposes that are along or near the proposed transmission corridor. Municipal parks and protected areas are contained within community boundaries.

The Government of Newfoundland and Labrador through its Department of Environment and Conservation establishes and administers six types of protected areas. Each type is designed to fulfill different conservation and recreation purposes. The Department's Parks and Natural Areas Division is responsible for wilderness reserves, ecological reserves and provincial parks, as well as the management of some Crown reserves and special management areas. The Department's Wildlife Division is responsible for wildlife reserves and the Lands Branch is largely responsible for Crown reserves and special management areas. The Federal Government's Crown Corporation, Parks Canada, administers the country's national parks, national historic sites and marine conservation areas. Migratory bird sanctuaries are the responsibility of Environment Canada through the Canadian Wildlife Service.

4.9.1 Study Area

The focus of this section is protected areas that are crossed by the proposed transmission corridor and those that are within the Regional Study Area (30 km wide). Those protected areas are described in the text and shown in Figures 4.9-1 to 4.9.4. Other significant sites are discussed and also shown in the maps where appropriate.

4.9.2 Administrative Framework

Both the provincial and federal governments apply a natural areas system approach to identifying, establishing and managing areas for conservation due to sensitivity or to represent a range of the province's and country's biodiversity and natural heritage. Currently, the total combined area of provincial and federal protected areas in this province represents 4.5 percent of the total geographic extent of the province, well below the national average of 8.34 percent.

To increase the percentage of protected land, the province has developed a protected areas strategy using a three-component framework based on scientific research, sound conservation practices and a solid understanding of processes of ecological systems (DEC-PNA, 2009). In 2000, the government released a public consultation policy document entitled *Protecting Our Natural Habitat* that would be the basis of a new Natural Areas Systems Plan. The Plan has been prepared and is currently undergoing internal review. No date has yet been established for its public release (French, S., 2009).

In the early 1970s, Parks Canada created a national park system plan to provide a framework for a systematic approach to identifying, establishing and managing new national parks. To create the plan, scientists divided the country into 39 distinct natural regions based on landscape and vegetation. The goal of the plan was to create at least one national park in each natural region, ensuring that a representative sample of each region is conserved. Parks Canada continues working towards ensuring that all 39 regions will eventually contain at least one national park. Currently, there are 41 parks, representing 29 regions (Parks Canada, 2009). Of these, one

national park is located in Labrador and two are on the Island of Newfoundland.

These two natural areas systems plans will govern protected areas in the future in this province. The following paragraphs detail how each type of protected area is currently administered.

Wilderness and Ecological Reserves

Sensitive areas such as ecological and wilderness reserves are administered under the provincial *Wilderness and Ecological Reserves Act*. Under the Act each wilderness area and ecological reserve operates under its own set of regulations that state the area of the reserve, its management or operating plan and the regulations that apply. In all wilderness and ecological reserves, several activities are prohibited including introducing new or removing existing elements and habitat, undertaking natural resource activities and driving off-road vehicles on existing roads. Some exemptions from the rules apply for pre-existing structures and traditional activities. All wilderness reserves require entry permits (DEC-PNA, 2009d).

Waterway Provincial Parks

Main River (a Canadian Heritage River), managed by Parks and Natural Areas Division, was designated as the province's first Waterway Provincial Park in July 2009 under the *Provincial Parks Act*. The Main River Special Management Area was also established in July 2009 and designated under the Lands Act. Regulations for the Waterway Provincial Park and the Special Management Area can be found under regulations for both the Provincial Parks and the Special Management Area. To maintain Canadian Heritage River status, regulations and guidelines must be followed. These prohibit or promote certain activities along the river or inside the river's boundary that generally relate to issues of habitat destruction and wilderness conservation (DEC-PNA, 2009b). A second waterway provincial park is proposed at Eagle River in southern Labrador.

Provincial Parks and Newfoundland T'Railway

Provincial parks, including the Newfoundland T'Railway, are administered under the *Provincial Parks Act*. The regulations outline prohibited and permitted activities. Generally, prohibited activities are those that affect safety, may harm the environment or can cause a public nuisance. All visitors are required to purchase daily or seasonal vehicle permits, which provide access to all provincial parks for the season in which they are purchased. To camp in any provincial park a valid permit must be purchased (DEC-PNA, 2009c).

Natural and Scenic Attraction Provincial Parks

Natural and scenic attraction provincial parks protect and provide access to areas with significant natural features and / or with high quality scenic attributes. Located near highways or scenic routes, they also provide rest stops for motorists.

Wildlife Reserves

Wildlife reserves are administered under the *Wild Life Act* and species within the wildlife reserve or park may be protected by the *Endangered Species Act*. Using the Act and with the approval of Lieutenant-Governor in Council, the Minister of Environment and Conservation can develop regulations that designate areas as wildlife reserves. Permitted activities vary depending on the species being protected.

Nature Parks

Salmonier Nature Park (the province's only nature park) is administered by the Stewardship and Education Section of the Wildlife Division, Department of Environment and Conservation. It operates under the *Wild Life Act* and its *Order in Council*. The Park is governed by a number of regulations that are enforced by Conservation Officers. These regulations are similar to other parks and reserves in the province with some additional activities prohibited that might affect wildlife (DEC-W, 2009b).

Crown Reserves

Crown reserves are created under Section 8 of the *Lands Act*; each has its purpose and duration specified in the Order. The *Lands Act* allows departments other than Environment and Conservation to be vested with the administration of the special management area, and enables the implementation of regulations controlling activities, land use, and land disposition within the designated area (DEC-PNA, 2009).

Special Management Areas

Special management areas are established under Section 57 of the *Lands Act* and require approval of the Lieutenant-Governor in Council. As with Crown reserves, the legislation can be used to grant temporary protection to an area of land through the lead agency, the Lands Branch, but with authority for site management designated to other Ministers.

National Parks, Historic Sites, Marine Conservation Areas

The *Canadian National Park Lands Act* provides for the acquisition of lands for the purposes of national parks and for the transfer lands acquired for such purposes (Parks Canada, 2009). National parks are administered under the *Canada National Parks Act* and the *Parks Canada Agency Act*, which also has the authority to provide leadership and support to the *Canadian Heritage Rivers System*, as well as the *Canada National Marine Conservation Areas Act*; the *Historic Sites and Monuments Act*; and the *Species at Risk Act*.

Each national park has its own rules and regulations to suit the individual nature of a park. Generally, these rules and regulations are focused on visitor safety (e.g., in Gros Morne firearms, fires, litter, pet control, removal of habitat; and in Terra Nova wildlife, driving and firearm safety) (Parks Canada, 2009a; Parks Canada, 2009c).

Migratory Bird Sanctuaries

Migratory bird sanctuaries (MBS) are protected under the *Migratory Birds Convention Act* (1916), which provides regulations prohibiting the taking, injuring, destruction, or molestation of migratory birds, their nests, or eggs within established sanctuaries. Hunting of listed species is not permitted in any MBS (DEC-W, 2009).

Table 4.9-1 shows the various governments, departments and agencies that administer protected areas that have relevance to this study particularly those that are within the proposed transmission corridor and other important sites that are located within the larger Regional Study Area (30 km).

Table 4.9-1: Protected Areas in Study Areas

Government	Department	Division / Branch	Type	Proposed Transmission Corridor	Regional Study Area (30 km)
Provincial	Environment and Conservation	Parks and Natural Areas	Wilderness Reserve	–	Bay du Nord, Avalon
			Ecological Reserve	West Brook (Southern Parcel), Hawke Hill	Sandy Cove, Table Point
			Provincial Park	Butter Pot	Pinware River
			Provincial Park Reserve	Jack's Pond	Bellevue Beach
			Waterway Provincial Park	Main River	Eagle River (proposed)
			Newfoundland T'Railway	Various points in Central and Eastern Newfoundland and the Avalon Peninsula	Various points in Central and Eastern Newfoundland and the Avalon Peninsula
			Natural and Scenic Attraction	–	The Arches
		Wildlife	Wildlife Reserve	–	–
		Stewardship and Education	Nature Park	–	Salmonier
		Lands Branch	Crown Reserve - Protected Area	–	–
			Special Management Area	Main River	–
Canada	Parks Canada	Parks	National Park	–	Gros Morne, Terra Nova
		Historic Sites	–	–	–
		Marine Conservation Areas	–	–	–
	Environment Canada	Canadian Wildlife Service	Migratory Bird Sanctuary	–	–

Source: DEC-PNA website 2009a

4.9.3 Information Sources

As the provincial draft Natural Areas Systems Plan has not yet been released, this study focuses on existing protected areas and only that have been formally proposed. The provincial Land Use Atlas provided the locations of these existing sites (some information was provided as point data and others as polygons). Other information came primarily from websites, publications and staff members of both the Parks and Natural Areas Division and the Wildlife Division of the Department of Environment and Conservation. User information was provided by the Newfoundland T'Railway Council.

National parks information came from Parks Canada's website. Parks Canada also provided unpublished information on the proposed Mealy Mountains National Park. Some information was provided by the Canadian Wildlife Service.

4.9.4 Protected Areas

The following sections describe those protected areas that overlap with the proposed transmission corridor. Protected areas in the Regional Study Area are also outlined where appropriate.

Central and Southeastern Labrador

No protected areas are within in the proposed transmission corridor in Central and Southeastern Labrador. The Eagle River Waterway Provincial Park (proposed) and Pinware River Provincial Park are within the Regional Study Area. The proposed Mealy Mountains National Park is not within either of these study areas but is within the Study Region - Central and Southeastern Labrador - and is also discussed due to its regional significance.

Discussions about establishing a national park in the Mealy Mountains area date back to the early 1970s, when research identified it as a natural area of Canadian significance for its Arctic tundra and woodland caribou. Public consultations in the late 1970s concluded that, although strong public interest was expressed for the creation of a national park, further discussions should be put on hold until Aboriginal people could address the proposal in the context of land claims negotiations (Parks Canada, 2009b). The current proposed boundary for the park reserve is not within the proposed transmission corridor or the Regional Study Area.

The Provincial Government also announced its intent to establish the Eagle River Waterway Provincial Park (adjacent to the proposed Mealy Mountains National Park). The new park will protect 3,000 km^2 of boreal ecosystems, related wildlife and culturally significant landscapes in the Eagle River watershed. It will include almost the entire length of the Eagle River from the headwaters to the Atlantic Ocean (DEC, 2010).

Pinware River Provincial Park, which opened in 1974, is located on Route 510 approximately 32 km southwest of Red Bay. The park was established to protect unique deformed and very old granite. Samples have been dated 1,466 million years old. Pinware Park has 68 ha of boreal forests, wetlands, lakes, ponds, rivers and streams. The area is home to salmon and trout, and a variety of birds, and mammals. Whales and seabirds can be found along the Strait of Belle Isle. Visitors can camp, fish, hike and picnic at the facility (DEC-PNA, 2010).

Northern Peninsula

A portion of the Main River Waterway Provincial Park and Main River Special Management Area are overlapped by the proposed transmission corridor. Other protected areas - Sandy Cove Ecological Reserve, Table Point Ecological Reserve, The Arches Natural and Scenic Attraction Provincial Park and Gros Morne National Park are

within the Regional Study Area.

Main River, designated as a Canadian Heritage River in 2001, is a 152 km^2 Waterway Provincial Park with a surrounding Special Management Area of 49 km^2 (Figure 4.9-2), within the river's 1,048 km^2 watershed area. The proposed transmission corridor crosses the Park at its most western point (Figure 4.9-3). However, the eventual transmission line itself is planned to be routed as to avoid this area.

Consisting of a virgin boreal forest and many lakes, the Main River area is home to Atlantic salmon and 70 species of wildlife including the threatened American marten (Newfoundland population). The Main River begins in the Long Range Mountains of the southern portion of the Northern Peninsula and empties into White Bay near Sop's Arm (DEC-PNA 2009b). It is primarily known for its varied and demanding canoeing, kayaking and white-water rafting as well as angling and bird watching. Main River is a popular wilderness destination for both locals and tourists. No permit is required to visit the Waterway Park area, thus it is difficult to determine how many people use it, but it is a top listed site for most serious recreational kayakers, canoeists and white-water rafters from within or visiting the province (Dykeman, M., 2009).

Sandy Cove Provisional Ecological Reserve (Botanical) (Figure 4.9-2), located near Sandy Cove on the Northern Peninsula, protects 15 ha of limestone barrens along the Strait of Belle Isle. On a 10 km stretch near the community of Sandy Cove is found Long's braya, a small plant that grows nowhere else in the world. Because of the unique flora, the area is often the subject of intensive research. The Reserve was created to protect the plants and provide for scientific research and educational tourism purposes (DEC-PNA, 2006).

Table Point Ecological Reserve (fossils) (Figure 4.9-2), located two km north of Bellburns is approximately 1.16 km^2 in size. The reserve protects fossils and rocks that document changes to the continental shelf of an ancient ocean. Many ancient fossils can be found there including trilobites, ostracodes, brachiopods, bryozoa, crinoids, sponges, gastropods and the nautiloid cephalopods whose removal spurred the reserve's creation (DEC-PNA, 2006).

The Arches Natural and Scenic Attraction Provincial Park (Figure 4.9-2), located midway between Portland Creek and Parsons Pond, features a natural limestone archway created by tidal action and is a popular picnic destination for users of Gros Morne National Park and elsewhere (DCTR, 2010).

Gros Morne National Park, which was established in 1973 and designated a national park in 2005, is one of 42 national parks within the Parks Canada system. Because of its outstanding beauty and unique geological formations, the Park was designated a UNESCO World Heritage Site in 1987 (one of eight national parks to be so designated). The Park encompasses 1,805 km^2 of mountainous and coastal areas characteristic of western Newfoundland. Gros Morne National Park is within the Regional Study Area but is not crossed by the proposed transmission corridor (Figure 4.9-3).

Central and Eastern Newfoundland

The proposed transmission corridor crosses portions of the Newfoundland T'Railway, West Brook Ecological Reserve (Southern Parcel) and Jack's Pond Provincial Park Reserve (Figure 4.9-4). The T'Railway, Bay du Nord Wilderness Reserve, Terra Nova National Park and Bellevue Beach Provincial Park Reserve are also within the Regional Study Area (30 km).

The proposed transmission corridor intersects with portions of the T'Railway a number of times including areas around Badger, Grand Falls-Windsor, Port Blandford, Clarenville, through the Isthmus of the Avalon (Figure 4.9-

4). Along the T'Railway from Deer Lake to Hampden turn-off, winter snowmobiling and spring / summer / fall ATV use are the most popular of the six core T'Railway activities with hiking a distant third. From Badger to Grand Falls-Windsor activities are similar to those of the Deer Lake to Hampden turnoff. Pedestrian and bicycle use is concentrated in the Grand Falls-Windsor to Bishop's Falls section of the T'Railway with a smaller amount of use around Badger. Dirt bikes are also common on this section of the T'Railway (Morrison, T., 2009; Ward, R., 2009).

The proposed transmission corridor intersects with the T'Railway twice about four kilometres southeast of Port Blandford and then parallels it until Clarenville when it intersects with the T'Railway again and then parallels it until North West Brook (Figure 4.9-4). At that point the proposed transmission corridor and the T'Railway overlap with each other every few kilometres until Bellevue Beach where the T'Railway veers south near Route 203. The Glovertown to Long Harbour / Chapel Arm stretch of the T'Railway is a popular snowmobile and ATV route. Some use of the T'Railway occurs for logging activity in the Terra Nova region. Non-motorized use (e.g., hiking) in this area is minimal and restricted largely to the communities themselves (Morrison, T., 2009; Ward, R., 2009).

The proposed transmission corridor crosses a portion of West Brook Ecological Reserve (Southern Parcel) (Figure 4.9-3). This Reserve, located about 14 km southwest of Springdale, is approximately 11 km^2 in size. It was created to protect some of the largest natural stands of red pine remaining in Newfoundland. Once prolific throughout the southern half of Newfoundland, these pines were significantly reduced many years ago due to large forest fires and commercial cutting (DEC-PNA, 2006).

Jack's Pond Provincial Park Reserve, located on the TCH, Route 1 approximately 8 km from Arnold's Cove, is a former provincial park (Figure 4.9-4). This Reserve protects rare plants and contains a high habitat diversity of barren vegetation, wetlands and forested valley streams (DEC-PNA, 2008). The proposed transmission corridor overlaps with a small portion of this Reserve.

Bay du Nord Wilderness Reserve, the province's largest protected area (2,895 km^2), is within the Regional Study Area (Figure 4.9-4). Home to approximately 15,000 woodland caribou, this Reserve protects a representative example of the maritime barrens and is home to Canadian geese, many wildlife species and evidence of glacial action. Outstanding features include several high peaks and expanses of barrens, peat land and forest. This wilderness area is designed for low impact activities including canoeing / kayaking, hiking, wilderness camping, hunting, trapping, snaring, motorized boating in designated areas, scientific research and educational tours. The northeast corner of the Reserve contains most of the North West River watershed, which empties into Clode Sound (DEC-P, 2006).

Terra Nova National Park, which became Newfoundland's first national park in 1957, is within the 30 km Regional Study Area (Figure 4.9-4). Located on either side of the Trans-Canada Highway between Glovertown and Port Blandford, it is recognized for its abundant natural resources, such as fish and sea mammals. Inhabitants of the Island have been attracted to the region for approximately 5,000 years because of these resources. Today, people continue to visit the area because of its abundant wildlife, exceptional scenery and array of recreational activities (Parks Canada, 2009c).

Bellevue Beach Provincial Park Reserve, located three miles off the TCH, Route 1 on Route 201, is a former provincial park (Figure 4.9-4). Bellevue Beach is located in the 30 km Regional Study Area. This reserve consists of a lengthy sand and beach rock bar that separates the sea from a barachois, thereby protecting a complex of

beach, salt marsh and habitat for migrating shore birds (DEC-PNA, 2008).

Avalon Peninsula

Portions of Hawke Hill Ecological Reserve and Butter Pot Provincial Park are crossed by the proposed transmission corridor. In addition, Salmonier Nature Park and Avalon Wilderness Reserve are within the 30 km Regional Study Area which includes an alternative corridor segment. The T'Railway also crosses the proposed transmission corridor and the Regional Study Area on the Avalon Peninsula (Figure 4.9-5).

Hawke Hill Ecological Reserve (Figure 4.9-5), located approximately 50 km from St. John's, is 2.1 km^2 in size and protects a variety of Arctic-alpine plants that are rarely encountered in North America this far east and south (DEC-PNA, 2006). A small portion of Hawke Hill Reserve is crossed by the proposed transmission corridor.

Butter Pot Provincial Park is located approximately 36 km southwest of St. John's along the TCH, Route 1. Butter Pot consists of 2,833 ha of varied terrain and vegetation and important viewscapes. Butter Pot is the most highly visited of all provincial parks (average of nearly 59,000 visitors per year) in part due to its location near the largest cluster of the province's population and the high number of campsites. Key activities in the Park are camping, fishing, picnicking, canoeing, kayaking, sailing, rowing, hiking and cross-country skiing. Butter Pot is a popular camping and recreational area for residents of the Avalon Peninsula (DEC-PNA, 2009a). The proposed transmission corridor also overlaps slightly with Butter Pot Provincial Park at its most southeastern edge and is adjacent to its eastern border (Figure 4.9-5).

Salmonier Nature Park, which consists of 40 ha of nature trails and animal displays and 1,415 ha of undeveloped land, is located in the Regional Study Area (Figure 4.9-5). It is adjacent to the Avalon Wilderness Reserve and includes mature boreal forest, barrens, peat lands and the headwaters of the Salmonier River. The Park's role is to help visitors gain an understanding and appreciation of wildlife and their habitat including plants, insect life and landscapes. Eighty-four species of birds, 15 species of mammals and more than 170 species of vascular plants have been recorded at the Park. Approximately 40,000 people visit the Park annually, including 5,000 youth who are part of an on-site school program. The Park is also the centre for the provincial wildlife rehabilitation program where injured or orphaned animals are brought for care and returned to the wild. Where this is not possible animals are incorporated into the on-site educational program (DEC-W, 2009b).

The Avalon Wilderness Reserve, which is located about 50 km south of St. John's, is within the Regional Study Area (Figure 4.9-5). Approximately 1,070 km^2 in size, it protects one of North America's southern-most and most accessible caribou herds. In the 1960s the herd once numbered about 7,000, but currently it has less than 600 animals. Pitcher plants (Newfoundland's floral emblem) and lichens (an important source of caribou food in winter) are found throughout the wilderness reserve. The many lakes, ponds and connecting shallow streams make this area suitable for hiking, canoeing, angling, photography and wilderness camping (DEC-PNA, 2006).

The proposed transmission corridor is adjacent to the T'Railway almost continually from Ocean Pond (east of Whitbourne) to Brigus Junction. The corridor overlaps briefly with the T'Railway just west of and at Brigus Junction. Of the six core uses of the T'Railway, ATV use dominates from Route 202 to Brigus Junction. Snowmobiling is sporadic due to the lack of adequate snow cover during many winters. Most people who use the T'Railway are operating motorized recreational vehicles. Other recreational use (mostly hiking) is limited on the T'Railway (Morrison, T., 2009).

4.9.5 Summary

Protected areas are a significant reason why residents travel around this province and non-residents visit the province. The proposed transmission corridor overlaps with portions of two ecological reserves (West Brook and Hawke Hill), one provincial park (Butter Pot), one provincial park reserve (Jack's Pond), one waterway park and special management area (Main River) and the T'Railway which are all under provincial jurisdiction. Other protected areas are within the Regional Study Area. The eventual transmission line itself will be planned and routed within the 2 km wide transmission corridor so as to avoid crossing all such existing protected areas.

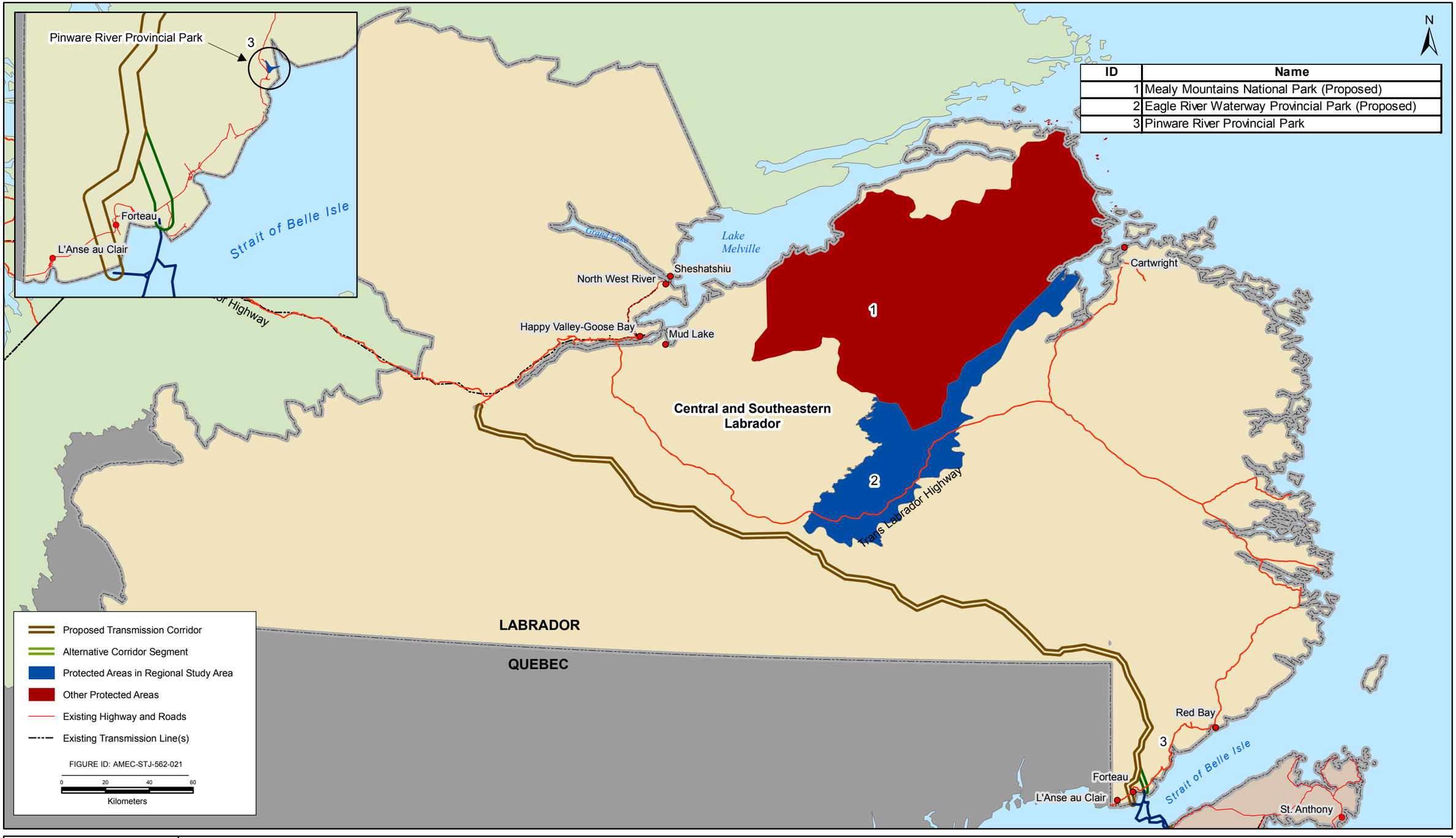
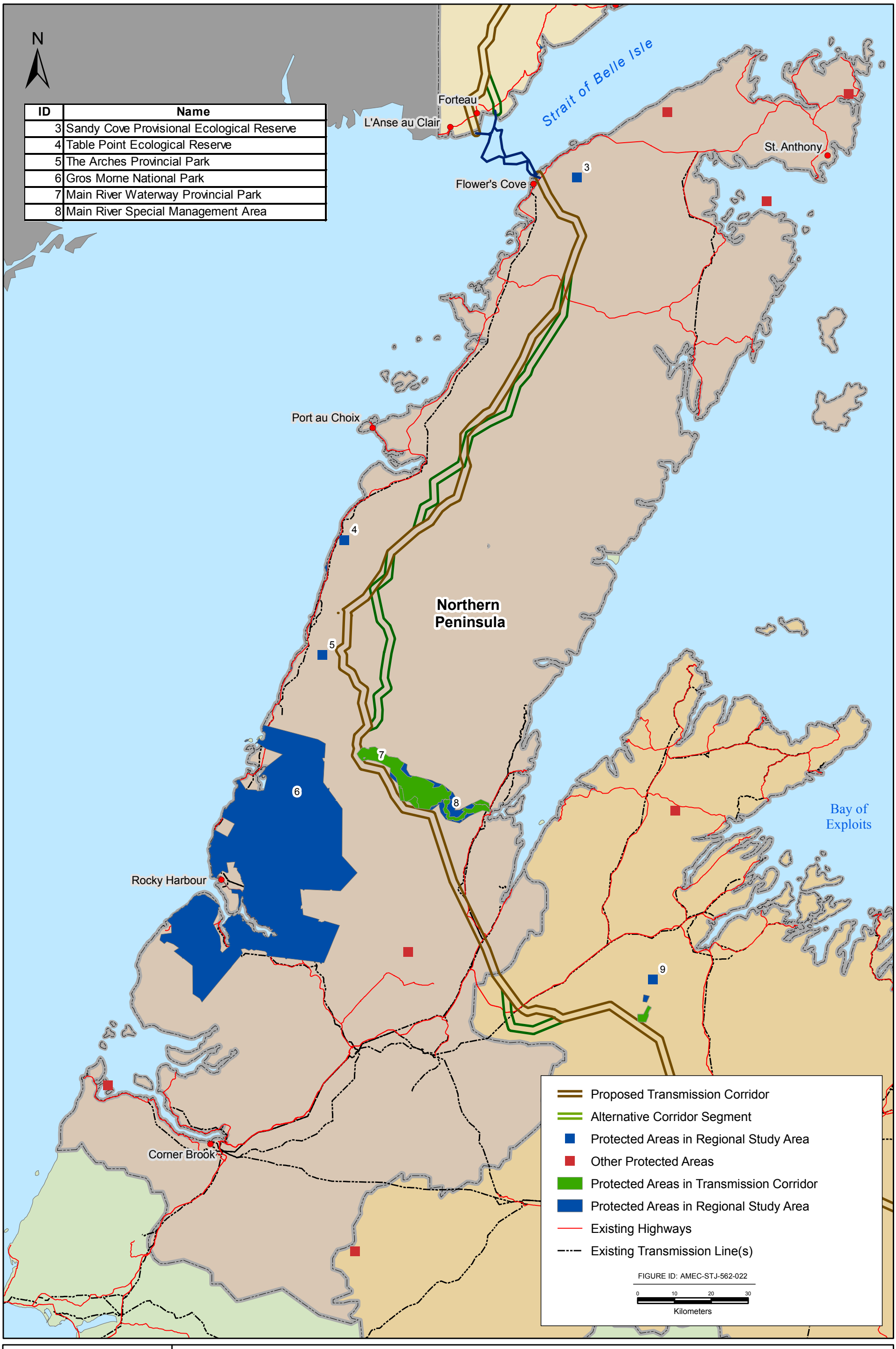


Figure 4.9-1

Parks, Reserves and Protected and Special Areas - Central and Southeastern Labrador

ID	Name
3	Sandy Cove Provisional Ecological Reserve
4	Table Point Ecological Reserve
5	The Arches Provincial Park
6	Gros Morne National Park
7	Main River Waterway Provincial Park
8	Main River Special Management Area



nalcor energy

Figure 4.9-2

Parks, Reserves and Protected and Special Areas - Northern Peninsula

ID	Name
5	The Arches Provincial Park
6	Gros Morne National Park
7	Main River Waterway Provincial Park
8	Main River Special Management Area

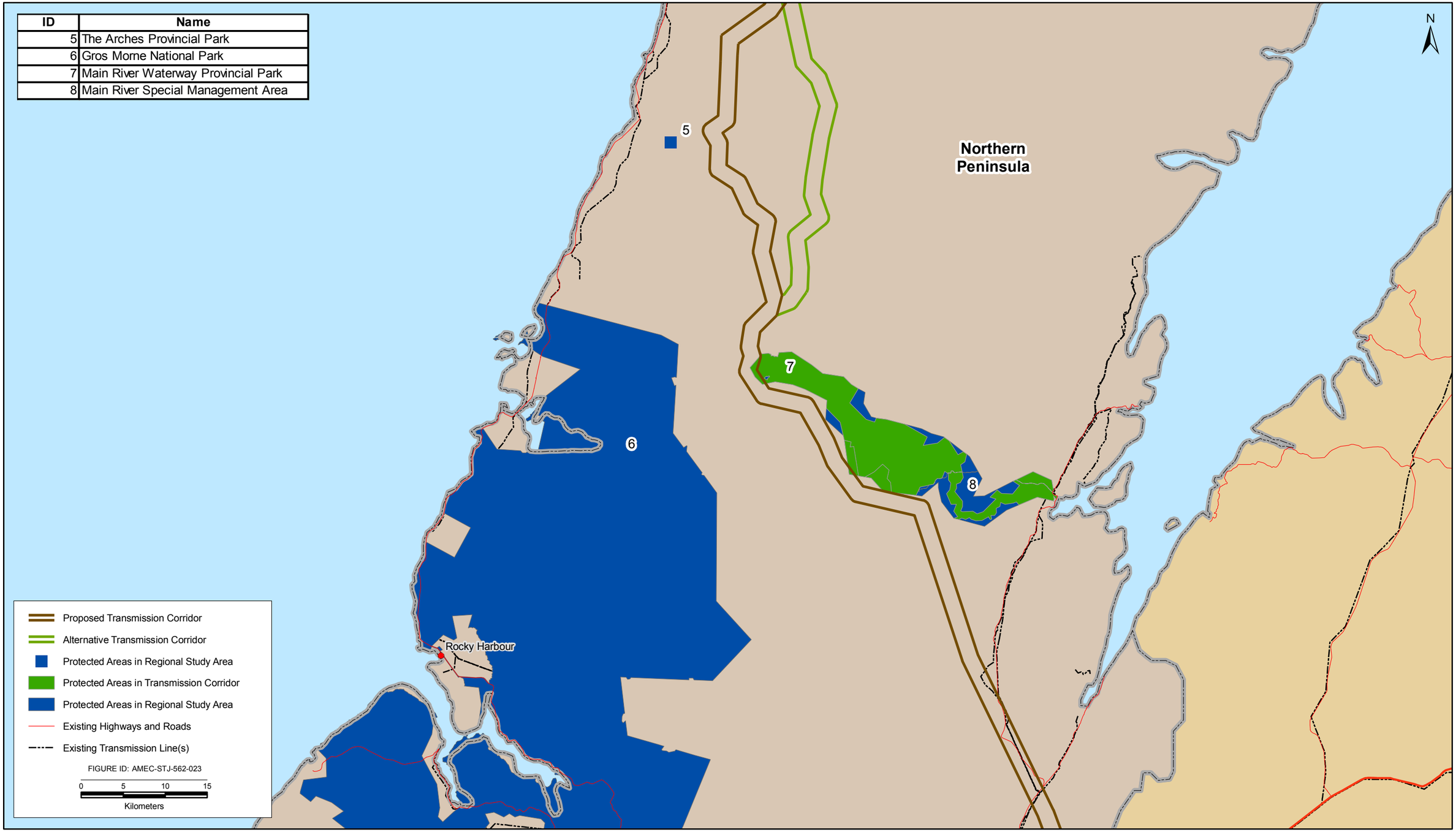


Figure 4.9-3

Parks, Reserves and Protected and Special Areas - Gros Morne and Main River

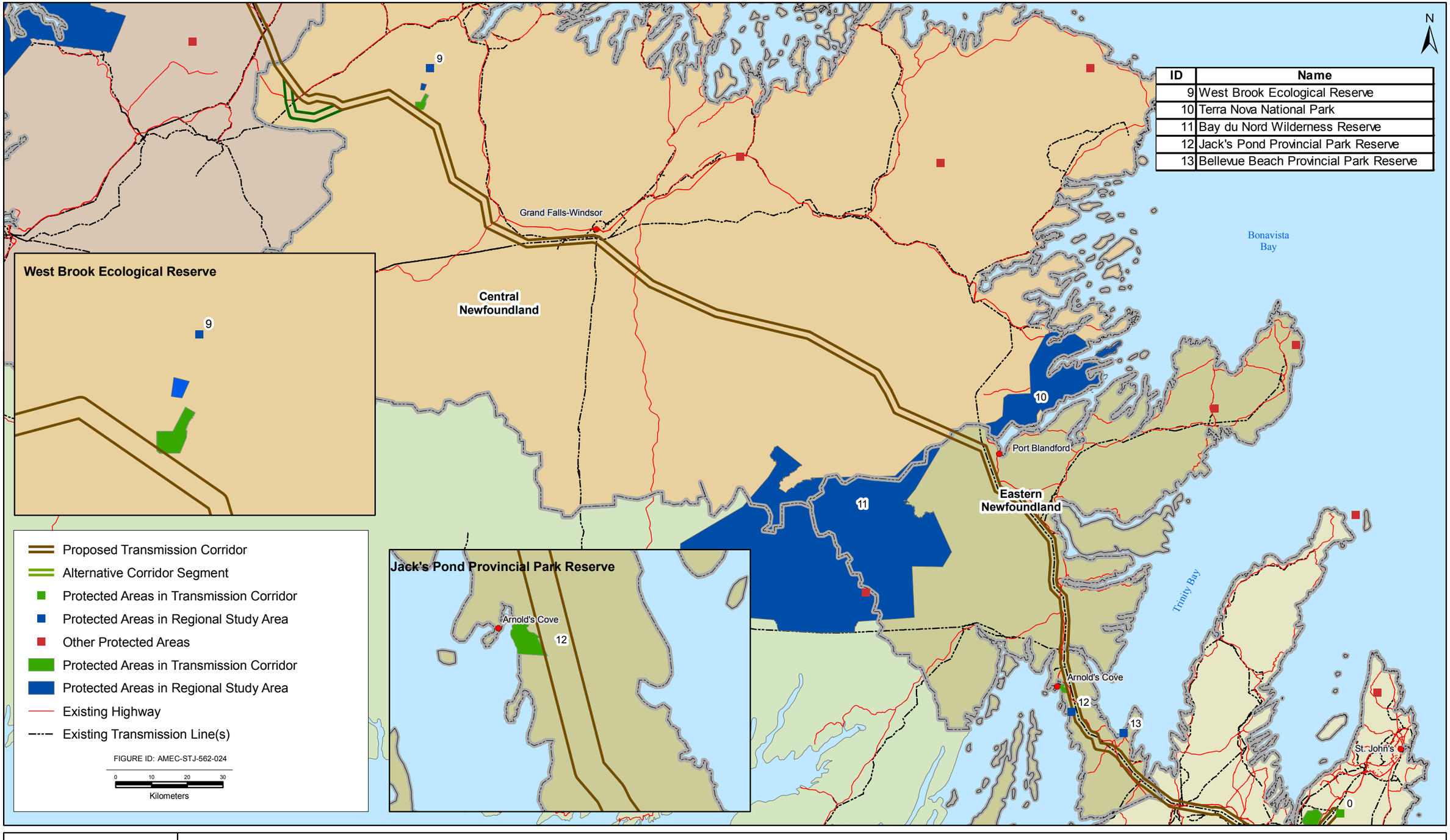


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Figure 4.9-4

Parks, Reserves and Protected and Special Areas - Central and Eastern Newfoundland

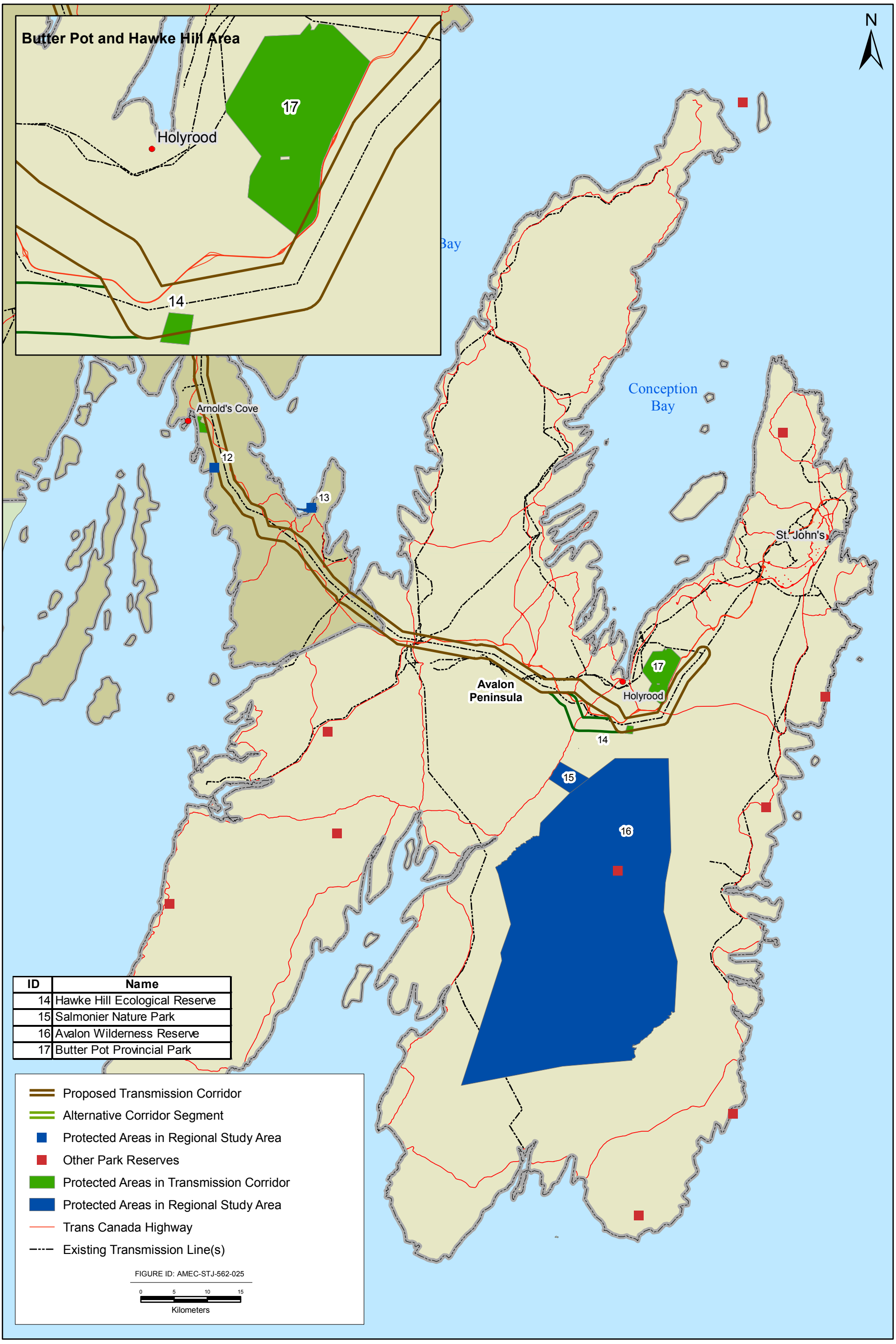

Figure 4.9-5

Parks, Reserves and Protected and Special Areas - Avalon Peninsula

4.10 Forestry

Newfoundland and Labrador's forests are part of the *Boreal Forest Region* of North America, classified as having relatively small trees, being primarily coniferous (softwood), and with a limited variety of species (DNR-FS 2009). Forests are important for recreation, hunting, cutting domestic wood, and as a source of raw materials for manufacturing paper and building materials. This section describes the provincial forestry industry and management system and activities in the various forest management districts that overlap with the proposed transmission corridor.

In 2007, the forestry industry contributed $126.5 million to the provincial Gross Domestic Product, representing 0.5 percent of the total. Additionally, the industry provided 700 person years of employment, representing 0.3 percent of the provincial total (GNL, 2009).

The paper industry has been subject to the effects of the global recession. The volume of provincial newsprint shipments decreased by 4.4 percent in 2008 to 525,372 tonnes. Conversely, the value of shipments increased by 12.0 percent to an estimated $390 million as a result of higher transaction prices (GNL, 2009). However, the December 2009 closure of the Abitibi-Consolidated (Abitibi) paper mill in Grand Falls-Windsor has also resulted in a decrease in forestry activity in Central Newfoundland.

Similarly, due to a continued global decline in lumber prices many local producers are finding it unprofitable to operate sawmills. Therefore, the volume of provincial lumber production was estimated to have decreased by 40 percent in 2008 (GNL, 2009).

4.10.1 Study Area

The Study Area for forestry includes those forestry management districts that are crossed by the proposed transmission corridor. Because of size and extent of many forestry management districts, they also encompass the alternative corridor segments and much of the Regional Study Area (15 km).

4.10.2 Administrative Framework

In 1974, the provincial government established forest management districts and the *Forest Land (Management and Taxation) Act* (1974). This Act established the administrative management structure and the concept of forest management plans which required each district to produce a five year operating plan, developed through a consensus-based multi-stakeholder process (DNR-F, 2006). The Act also provided the authority to declare higher tax rates for those with unmanaged tree cutting rights (DNR-FS, 2009).

Currently, the Forestry Services Branch of the provincial Department of Natural Resources focuses on managing the province's forest resources in an ecologically sustainable manner through four planning documents produced at various levels. Every ten years the Forestry Services Branch produces the Provincial Sustainability Forest Management Strategy that analyzes the current state of the forest including growth and yield rates as well as management strategies that are applied throughout the province. The current Provincial Sustainable Forest Management Strategy was published in 2003 (DNR-F, 2006).

The province of Newfoundland and Labrador is divided into 24 Forest Management Districts (District 19 in Central Labrador has three areas, A, B and C). Five Year Operating Plans are created by the Forestry Services Branch and District landholders for each. These operating plans include: forest management objectives; activities planned for the district; proposed harvest areas; locations and types of silviculture activities; and plans

for construction, upgrades and removal of access roads.

Programs and services are delivered through regional and satellite offices, which are used mainly for forest fire protection and enforcement. Local offices produce an Annual Operating Plan and Annual Report identifying specific forest management activities that have and will occur including harvest yields, road construction completed and amount of re-vegetated and silvicultured areas (DNR-FS, 2009).

Forestry management practices have evolved considerably over time. Up until the 1990s, forest management was focused almost exclusively on timber management. It currently includes sustainable ecosystem conservation and resource management. Improved principles of sustainable development are enforced through the new *Forestry Act*. As a result, the former District Strategy Management plans are now divided between the Provincial Sustainable Forest Management Strategy and the Five Year Operating Plans. Additionally, the Province has created eight planning zones, which are loosely based on ecoregions - regions that share common ecological characteristics (DNR-FS, 2006).

Permits and licences to control the use of forest resources are the responsibility of the Department of Natural Resources. Conservation Officers ensure compliance with permits and licences, which can be obtained from local district forest offices (DNR-FS, 2009). Forestry permits and licence types include: Commercial Cutting Permit, Commercial Mill Licence, Domestic Cutting Permit, Domestic Mill Licence, Operating Permit, Permit to Burn, Permit to Export Timber, Timber Scaling Licence and Timber Purchase Licence (DNR-FS, 2009).

Silviculture programs, which were introduced in 1980, are used to maintain a sustainable supply of viable timber. The Province continues to maintain forest stands in this way and in 2007 it treated 15,231.73 ha of forest land through silviculture practices (DNR-FS, 2009).

4.10.3 Information Sources

Forestry information came from the Department of Natural Resources, Forestry Services Branch and the Provincial Land Use Atlas, Corner Brook Pulp and Paper, Abitibi-Consolidated, the Provincial Sustainable Forest Management Strategy and Five Year Operating Plans of specific forest management districts. GIS data for forestry access roads were provided by the Forest Services Division.

4.10.4 Forest Management Districts and Activities

Forestry uses vary among forest management districts in the province. The following information is organized by Study Regions and focuses on current and proposed activities.

Central and Southeastern Labrador

The southern part of Labrador is divided into Forest Management Districts 19A, 19C and 21. Currently, forestry activity is planned to occur in Districts 19A and 21 (Figure 4.10-1). Forest Management District 19A is divided into two areas, north and south, separated by the Churchill River. The proposed transmission corridor crosses portions of Districts 19A (North and South), 19C and 21. Currently, no forestry activity occurs in 19C.Table 4.10-1 shows forestry activity in this Study Region. Forestry access roads are shown in detail in Appendix C.

District 19A has a Five Year Operating Plan for the period 2008-2012 during which 1,000,000 m^3 of timber is scheduled to be harvested. Of this total, 260,000 m^3 is scheduled for commercial harvesting on the north side and 690,000 m^3 on the south side of the Churchill River. The remaining volume is allocated for smaller selective

harvests and domestic cutting. The productive forest of District 19 is dominated by black spruce (91 percent) with stands generally greater than 140 years old and between 10-15 m in height. In this District a total of 73 km of forestry access roads are to be constructed from 2008-2012, with 37 km on the south side of the Churchill River. Forest access roads on the south side will all branch off the recently completed TLH Phase III (DNR-FS, 2008a).

The Innu of Labrador have asserted land claims within District 19 (DFRA, 2001). On January 30, 2001, the Government of Newfoundland and Labrador and the Innu Nation signed a *Forest Process Agreement* (FPA) for District 19. The FPA facilitates communication, information sharing and resolution of issues between the Province and the Innu Nation concerning interim planning and management of forest resources in the District (DNR-FS, 2008a). Members of the Innu Nation are designated as Forest Guardians with input into design, layout and monitoring of harvesting activities (Innes and Moores, 2009).

A result of the FPA was an ecosystem-based planning approach developed and presented in the 20 year Forest Ecosystem Strategy Plan for District 19 2003-2023 (DNR-FS, 2008a). The Department of Natural Resources, Forestry Services Branch developed this Plan with participation from the Innu Nation and local communities. The Plan represents ecological, cultural and economic values within the District and a new ecosystem-based forest management approach. The average annual volume to be harvested each year within District 19 is 200,000 m^3, a reduction of 50 percent from the previous annual allowable cut (AAC) of 400,000 m^3 (DNR-FS, 2008a). This resulted from the Forest Process Agreement which incorporates ecological and cultural priorities of the public and Innu Nation.

The Provincial Government and Innu Nation's co-operative approach is managed by a Forest Management Committee comprised of two members of the Innu Nation and two representatives of the Department of Natural Resources (Forest Planners and Senior Policy advisors) and facilitated by the General Manager of Western Newfoundland and Labrador's Canadian Model Forest.

District 21 incorporates the southeastern portion of Labrador and currently has a Five Year Operating Plan for the period 2007-2011 and an average annual volume of 48,700 m^3. Both commercial and domestic harvesting will require 18.9 km of forestry access roads to be constructed by both the Crown and commercial operators. Commercial activities include harvesting approximately 40,000 m^3 of an insect-infested area of 285 ha concentrated near the Towns of Charlottetown, Port Hope Simpson and Mary's Harbour.

Table 4.10-1: Forest Management Districts and On-Going and Planned Forestry Activity

District Numbers	District Names	Operators	Tenure	Current 5 year Plan (As of Writing)	Commercial / Domestic	Allowable cut for 5 year period	Total to be harvested (m^3)	Average volume to be harvested / year (m^3)	Length of roads to be built (km)
1	Avalon	Crown	Crown	2007-2011	commercial	77,087	64,561	12,912	11
Total							**64,561**	**12,912**	**11**
2	Bonavista	Crown	Crown	(2007-2011) amendment	commercial				1
		Crown	Crown	(2007-2011) amendment	commercial		3,000	600	3.1
		Crown	Crown	(2007-2011) amendment	commercial				13.5
		Crown	Crown	2007-2011	commercial	398,450	252,565	50,513	93
					domestic	398,450	140,000	28,000	
					commercial	64,500	25,000	5,000	
					domestic	64,500	30,000	6,000	
					commercial	15,600	15,000	3,000	
Total							**465,565**	**93,113**	**110.6**
4	Eastern / Central	Crown	Abitibi	2007-2011	commercial	202,500	202,500	40,500	87.6
					commercial	56,000	55,000	11,000	
					domestic		1,000	200	
					commercial	2,605	2,605	521	
					domestic	2,605	2,605	521	
					domestic	550	550	110	
Total							**264,260**	**52,852**	**87.6**
6	Central / Eastern	Crown	Abitibi	2007-2011	commercial		44,500	8,900	11
					domestic	2,900	2,900	580	
					commercial	1,150	1,150	230	
					domestic	1,150	1,150	230	
					domestic	100	100	20	

District Numbers	District Names	Operators	Tenure	Current 5 year Plan (As of Writing)	Commercial / Domestic	Allowable cut for 5 year period	Total to be harvested (m^3)	Average volume to be harvested / year (m^3)	Length of roads to be built (km)
		CBPPL	CBPPL	2007-2011	commercial	639,500	635,000	127,000	275
Total							**684,800**	**136,960**	**286**
9	White Bay	Crown	Crown	(2007-2011) amendment	commercial		45,000	9,000	
		Crown	CBPPL	(2007-2011) amendment	domestic		20,000	4,000	
		Crown	Crown	2007-2011	commercial	126,500	91,500	18,300	
					commercial	13,050			
					commercial	53,500	53,500	10,700	
					domestic	127,000	127,000	25,400	
					domestic	34,200	6,275	1,255	86.2
		Crown	CBPPL		commercial		170,000	34,000	
					commercial		3,000	600	
		Crown	Linerboard Licences		commercial	3,200	3,200	640	
					commercial	300	300	60	
		CBPPL	CBPPL	2007-2011	commercial		646,800	129,360	257.5
Total							**1,166,575**	**233,315**	**343.7**
10	Central	Abitibi	Abitibi	2008-2012	commercial		535,400	107,080	10.3
Total							**535,400**	**107,080**	**10.3**
11	Grand Falls-Windsor	Abitibi	Abitibi	2008-2012	commercial		1,360,100	272,020	71.6
Total							**1,360,100**	**272,020**	**71.6**
12	Grand Falls-Windsor	Abitibi	Abitibi	2008-2012	commercial		1,472,764	294,553	106.9
Total							**1,472,764**	**294,553**	**106.9**
16	King's Brook	Crown	Crown	amendment	commercial		5,000	1,000	
		Crown	Crown	2007-2011	commercial	52,000	36,300	7,260	
					domestic		15,700	3,140	
					commercial	71,500	52,500	10,500	

District Numbers	District Names	Operators	Tenure	Current 5 year Plan (As of Writing)	Commercial / Domestic	Allowable cut for 5 year period	Total to be harvested (m^3)	Average volume to be harvested / year (m^3)	Length of roads to be built (km)
					domestic		19,000	3,800	
					domestic	12,300	5,875	1,175	
		Crown	CBPPL		commercial		171,000	34,200	
					commercial		10,000	2,000	
		Crown	Linerboard Licences		commercial	60,500	60,500	12,100	
					commercial	41,000	41,000	8,200	
		CBPPL	CBPPL	2007-2011	commercial		476,000	95,200	67
Total							**892,875**	**178,575**	**67**
17	Northern Peninsula	Crown	Crown	2008-2012	commercial	233,500	145,000	29,000	
					domestic		88,500	17,700	
					commercial	42,000	13,958	2,792	
					domestic		7,373	1,475	
					commercial	40,000	10,515	2,103	
					domestic		7,668	1,534	
		CBPPL	CBPPL	2008-2012	commercial	357,500	224,225	44,845	64
					domestic		133,275	26,655	
Total							**630,514**	**126,103**	**64**
18	Straits	Crown	Crown	2008-2012	commercial	527,000	347,694	69,539	
					domestic		178,806	35,761	
					commercial	77,500	58,815	11,763	
					domestic		12,323	2,465	
					commercial	58,500	37,050	7,410	
					domestic		16,216	3,243	
Total							**650,904**	**130,181**	**0**
19A	Goose Bay	Crown	Crown	2008-2012	commercial	1,000,000	1,000,000	200,000	73
Total							**1,000,000**	**200,000**	**73**

District Numbers	District Names	Operators	Tenure	Current 5 year Plan (As of Writing)	Commercial / Domestic	Allowable cut for 5 year period	Total to be harvested (m^3)	Average volume to be harvested / year (m^3)	Length of roads to be built (km)
21	Southeastern Labrador			(2009) amendment	commercial		40,000		2.4
		Crown	Crown	2007-2011	commercial	243,500	182,000	36,400	16.5
					domestic		61,500	12,300	
Total							**283,500**	**48,700**	**18.9**

Source: DNR-FS, 2006, DNR, 2007; DNR-FS, 2007a; DNR-FS, 2007; DNR-FS, 2008; DNR-FS, 2008a

Linerboard Licences were issued to Abitibi-Consolidated when the company bought the linerboard mill in Stephenville but expired in 2005.

Northern Peninsula

The proposed transmission corridor crosses portions of Forest Management Districts 16, 17 and 18 and a small portion of District 9 (Figure 4.10-2). The extensive forestry access road system creates a high level of existing access for industries, commercial activity, recreation and subsistence on the Northern Peninsula. Table 4.10-1 shows forestry activity in this Study Region. Forestry access roads are illustrated in detail in Appendix C.

Forest Management Districts 9 and 16, which encompass land from Deer Lake to Cat Arm including all of the Baie Verte Peninsula, combined their five year operating plans for 2007-2011. District 16 planned to harvest 892,875 m^3 of timber. Ninety percent of forest resources in the District are harvested for commercial purposes, mostly by Corner Brook Pulp and Paper (CBPP), and an average of 178,575 m^3 of timber is scheduled to be harvested annually. Sixty-seven km of new access road construction is planned from 2007-2011. The proposed transmission corridor overlaps with forest land tenured to CBPP in District 16, in areas both northwest and east of Sandy Lake.

Forest Management Districts 17 and 18, which encompass most of the Northern Peninsula, combined their five year operating plans for 2008-2012. In District 17, operators plan to harvest 630,514 m^3 of timber and to construct about 64 km of access roads. An average annual harvest of 126,103 m^3 is planned. Approximately 357,500 m^3 is scheduled to be harvested by CBPP within the five year operating plan. The proposed transmission corridor overlaps with forest land currently tenured to CBPP for commercial harvesting.

Within District 18 a total of 650,904 m^3 of timber is planned to be harvested at an average annual rate of 130,181 m^3. No new access road construction is planned as road infrastructure is well established. The proposed transmission corridor overlaps with forest land currently tenured to CBPP.

Central and Eastern Newfoundland

The proposed transmission corridor overlaps with portions of Forest Management Districts 2, 4, 6, 9, 10, 11 and 12 and a small portion of District 16 which is mainly located in the Northern Peninsula Study Region (Figure 4.10-3). Forestry access roads are shown in Appendix C. Portions of Districts 6 and 9 are tenured to CBPP. Abitibi had been active in central Newfoundland for over a century and held tenure in Districts 4, 6, 10, 11 and 12. As a result of the 2009 closure of the Abitibi paper mill at Grand Falls-Windsor, forestry activity will not proceed as planned in those Districts. Table 4.10-1 shows forestry activity in this Study Region.

District 2, Bonavista Peninsula contains a land-base totaling 420,104 ha of productive forest, scrub forest and un-forested land. Forty percent of the total land base (170,219 ha) is categorized as productive forest land and a total of 465,565 m^3 is scheduled to be harvested in the five year plan. Average annual harvest is 93,113 m^3. A total of 110.6 km of roads are planned for construction.

District 4 incorporates the watersheds of both the Terra Nova and Gambo Rivers extending south to the Bay du Nord Wilderness Reserve and is tenured by Abitibi. District 4 has a total area of 297,147 ha of which 98 percent is dominated by commercial harvesting. A total of 264,260 m^3 at an average annual rate of 52,852 m^3 is scheduled for harvest in the current five year operating plan. Totals 260,105 m^3 and 4,155 m^3 of timber will be harvested for commercial and domestic use respectively. A total of 87.6 km of forestry access roads are planned for construction during the current five year operational period.

The five year operating plan for District 6 is combined with Districts 4, 5 and 8, which form Planning Zone 3

under the new planning framework by the Forestry Services Branch. For 2007-2011, 382 ha of land are scheduled for commercial harvest, a total allowable cut of 684,800 m^3 over five years and an average annual cut of 136,960 m^3. Operators plan to construct 286 km of new forest access roads from 2007-2011 (DNR-FS, 2007). The proposed transmission corridor passes through an area of CBPP tenured forest land in District 6 where a total of 635,000 m^3 is scheduled to be harvested. Some domestic cutting occurs along the T'Railway between Terra Nova and Glovertown (Morrison, T., 2009).

As discussed, the Five Year Operating Plans for District 9 and 16 are combined. District 9 has divided ownership between the Crown, CBPP and Abitibi in separate AAC calculations. Within District 9 a total of 1,166,575 m^3 of timber is scheduled to be harvested for commercial and domestic purposes at an average annual rate of 233,315 m^3. Commercial harvesting by CBPP accounts for 70 percent of the total harvest. In District 9, 343.7 km of forest access road are scheduled to be built within the five year plan (DNR-FS, 2007a). The proposed transmission corridor overlaps with CBPP tenured forest land in the southwest and southeast sections of District 9.

Districts 10, 11, and 12 have a combined Five Year Operating Plan for 2008-2012. Abitibi's harvesting limits total 905,670 ha within Districts 10, 11 and 12. Forested land within all three Districts totals 629,908 ha (Abitibi, 2007). Over the plan's five years, a volume of 3,368,264 m^3 is scheduled to be harvested with 44 percent to occur in District 12, 40 percent in District 11 and 16 percent in District 10. Road construction plans for 2008-2012 include 188.8 km of new roads. Upgrades will occur along 68.8 km of existing road throughout the three districts.

District 10 has a total land area of 200,629 ha from which 535,400 m^3 will be harvested at an average annual rate of 107,080 m^3. Operators plan 10.3 km of road construction. The total area of District 11 is 296,054 ha from which 1,360,100 m^3 is scheduled to be harvested at an average annual rate of 272,020 m^3. A total of 71.6 km of forestry access road construction is planned. District 12 has a total area of 408,987 ha from which 1,472,764 m^3 is scheduled to be harvested. The annual average harvest is planned to be 294,553 m^3 and 106.9 km of access roads are planned to be constructed.

Avalon Peninsula

On the Avalon Peninsula, the proposed transmission corridor crosses Forest Management District 1, which includes the entire Avalon Peninsula and areas of the Isthmus east of Come By Chance (Figure 4.10-4). Table 4.10-1 shows forestry activity in this Study Region. Forestry access roads are shown in Appendix C. The land area is approximately 969,000 ha, with 628,000 ha of Crown Land. Productive forested area covers less than 20 percent and forest operations occur on less than two percent of the productive forest land base annually. Only 11 km of new forestry access road construction is planned. A total of 64,561 m^3 of productive forest is scheduled to be harvested at an average of 12,912 m^3 per year. As approximately half of the population of the province lives on the Avalon Peninsula, loss of productive forest land to competing land uses (e.g., housing, roadways, commercial and industrial development, quarries, cottages, agriculture) is the greatest threat to forestry in the District (DNR-FS, 2006).

4.10.5 Summary

The proposed transmission corridor crosses portions of 13 active forestry management districts: two in Central and Southeastern Labrador, three on the Northern Peninsula, seven in Central and Eastern Newfoundland and one on the Avalon Peninsula. The corridor overlaps with the greatest amount of planned forestry activity on the

Northern Peninsula and in Central and Eastern Newfoundland (Table 4.10-2). However, intense commercial forestry activity in central Newfoundland will not proceed as planned due to the closure of the Abitibi paper mill. This will affect Districts 4, 6, 10, 11 and 12. Forestry will likely remain active around Birchy Lake and Southwest Gander River.

Table 4.10-2: Forest Management Districts and Planned Activity in Study Regions

Study Regions	Districts Crossed by the Proposed Transmission Corridor	Planned 5 Year Harvest (m^3)	Average Annual Harvest (m^3)	Roads to be Constructed (km)
Central and Southeastern Labrador	19A	1,000,000	200,000	73
	21	283,500	48,700	19
	Total	**1,283,500**	**248,700**	**92**
Northern Peninsula	16	892,875	178,575	67
	17	630,514	126,103	64
	18	650,904	130,181	0
	Total	**2,174,293**	**434,859**	**131**
Central and Eastern Newfoundland	2	465,565	93,113	111
	4	264,260	52,852	88
	6	684,800	136,960	286
	9	1,166,575	233,315	344
	10	535,400	107,080	10
	11	1,360,100	272,020	71.6
	12	1,472,764	294,553	107
	Total	**4,589,364**	**917,873**	**946**
Avalon Peninsula	1	64,561	12,912	11
	Total	**64,561**	**12,912**	**11**

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Figure 4.10-1

Forestry - Central and Southeastern Labrador

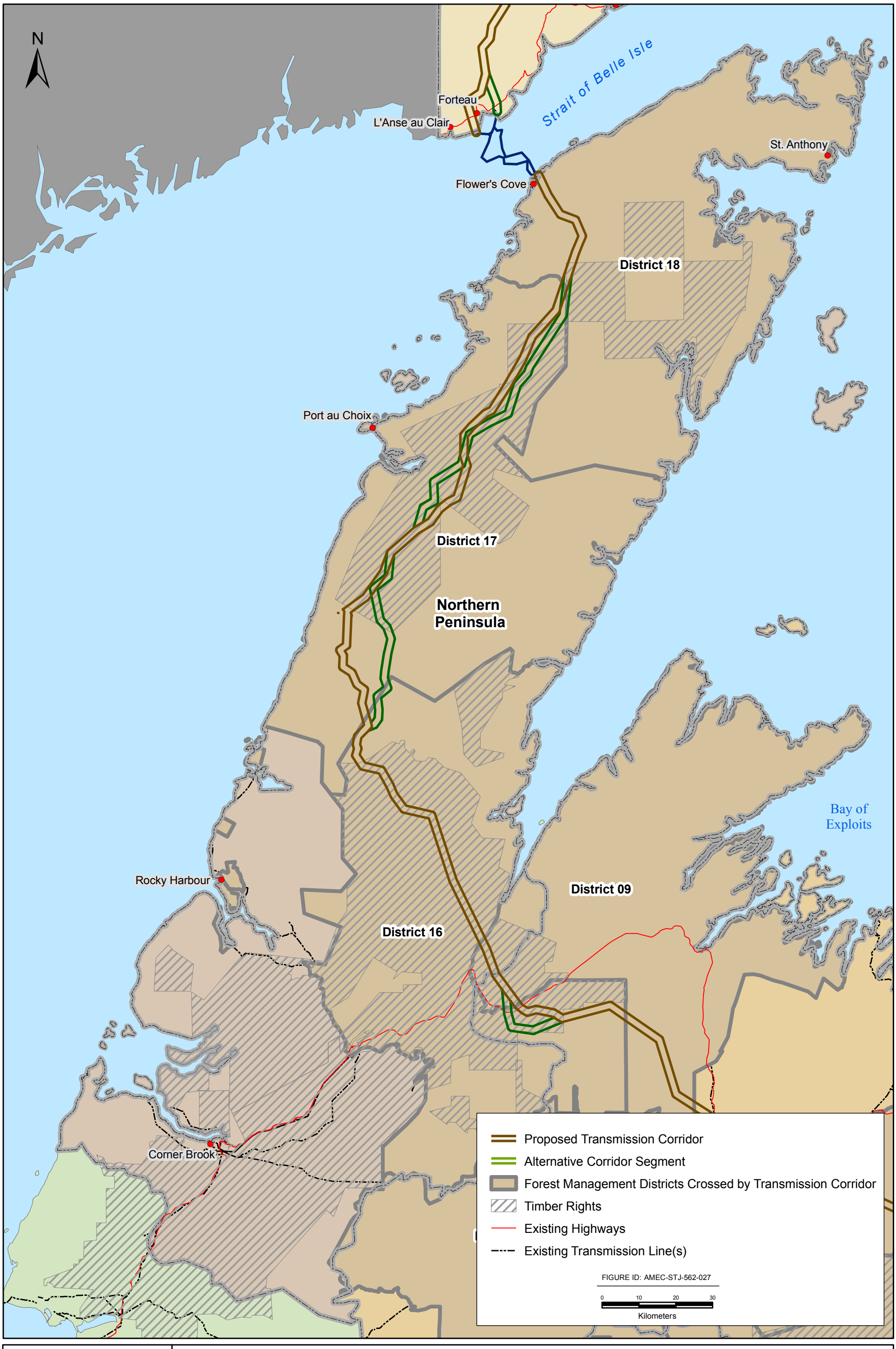
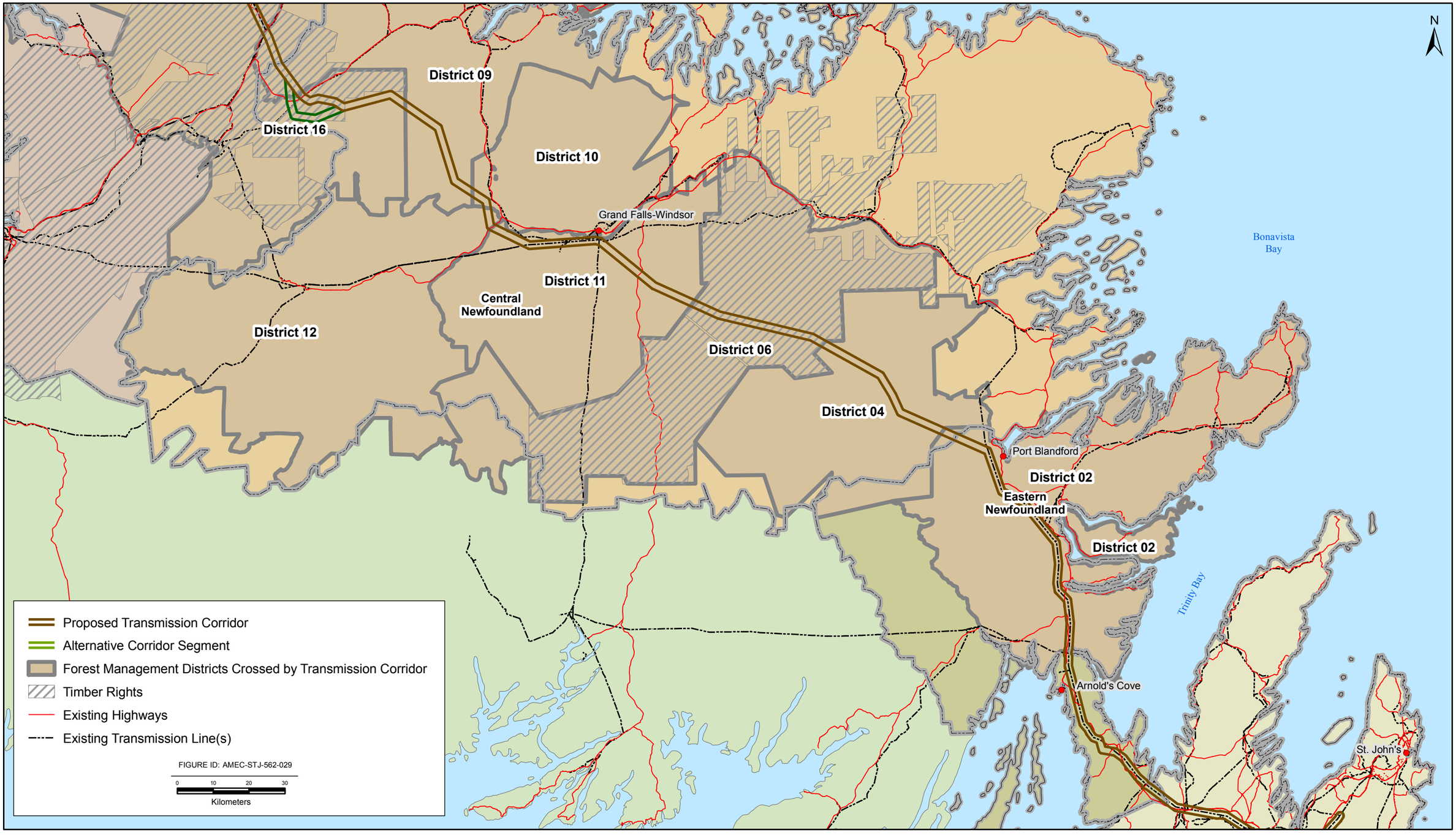


Figure 4.10-2

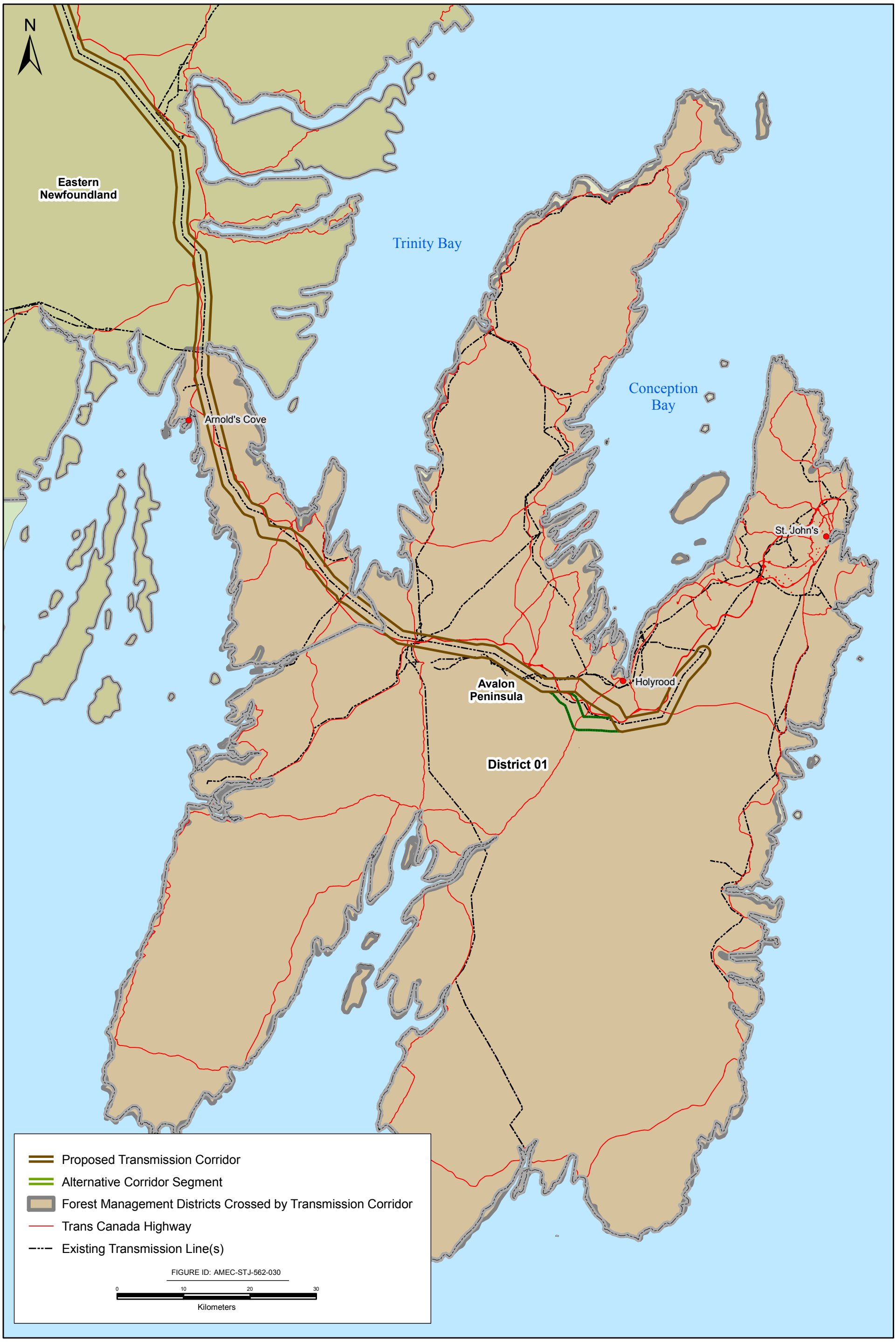
Forestry - Northern Peninsula



nalcor energy

Figure 4.10-3

Forestry - Central and Eastern Newfoundland



nalcor energy

Figure 4.10-4

Forestry - Avalon Peninsula

4.11 Mines and Energy

The provincial mining industry produces more than a dozen commodities, ranging from aggregate for road construction to iron used in structural steel (DNR-ME, 2009b). In 2008, $4.66 billion worth of mineral products was shipped out of the province. From 2004 to 2008, the total value of Newfoundland and Labrador shipments increased by almost 600 percent. However, the value of mineral shipments decreased in recent years, due primarily to global economic issues. An estimated 4,000 person hours of employment were supported by the industry in 2008. Mineral exploration has also increased. Total exploration expenditures rose from $48 million in 2005 to $148 million in 2007 and remained steady at $146 million in 2008 (DNR-ME, 2009b).

The provincial Department of Natural Resources has issued permits for approximately 0.28 million ha for onshore oil and gas exploration under the *Petroleum and Natural Gas Act*. Up until February 2008 more than $3 million had been bid for onshore licences in western Newfoundland. Beginning in February 2010, $20 million is expected to be spent on three oil and gas exploration permits near Parsons Pond on the Northern Peninsula (DNR-ME, 2010).

4.11.1 Study Area

This section addresses mining and land based oil and gas exploration (quarries, mineral tenure, staked claims and land based oil and gas permits) within the proposed transmission corridor from Central Labrador to the Avalon Peninsula. To better understand the context, those activities that occur within the Regional Study Area (15 km) are also discussed where appropriate. Mining activity is illustrated in Figures 4.11-1 to 4.11-4 and quarries are also shown in more detail in Appendix B.

4.11.2 Administrative Framework

Geological activity in the province is managed by the Department of Natural Resources, Mines and Energy Branch. Specifically, mining is regulated by the *Mining Act* and the Mines and Energy Branch is responsible for administering 12 different pieces of legislation under powers granted from the *Executive Council Act.* Other relevant acts include the: *Minerals Act*; *Mining Act*; *Mineral Holdings Impost Act;* and *Quarry Materials Act*, *1998* (DNR-ME, 2009a).

The *Mining Act* governs mine and mill operations. Quarry activity is managed by the Department of Natural Resources, Quarry Materials Administration under the authority of the *Quarry Materials Act*. The Administration is responsible for permitting, assessing quarry materials, managing the resource and administering and implementing the *Quarry Materials Act*. Exploration for quarry materials requires a Quarry Material Exploration Licence from the Department of Natural Resources. This licence, which is valid for one year and for an area normally not exceeding 5 ha, is required for digging, excavation, removal and disposal of any Crown quarry material (DNR-ME, 2009b).

The Mines and Energy Branch maintains an online mineral claim-staking system, up-to-date claims maps and a list of new staked claims using the Province's Mineral Rights Administration System-Miriad. A mineral exploration licence is issued for a term of five years, but can be held for a maximum of 20 years if renewed and proper assessment goals have been maintained (DNR-ME, 2009c).

Mineral Tenure includes modern mining leases and impost land. Impost land is an early form of mining lease that was granted in perpetuity without a rental fee after a certain amount of money was expended in a

prescribed period of time. Four areas of impost land are located within Study Regions.

Oil and gas exploration activity is governed by the *Petroleum and Natural Gas Act* (DNR-ME, 2009).

4.11.3 Information Sources

Information pertaining to mining, mineral exploration and quarrying was gathered from the Department of Natural Resource website, communications with Department representatives, the Newfoundland and Labrador GeoScience Resource Atlas and the provincial Land Use Atlas. Information on Impost Land was obtained from a local mining geologist.

4.11.4 Mining Activities

In the initial stages of mining activity, mining companies stake claims and gain tenure for areas of interest. This is followed by exploration programs. If feasible, mines are then developed in order to eventually produce a commodity. Mining activity varies throughout the province and the industry has a long history in some parts of Labrador and central Newfoundland. Other areas of the province have emerging mineral prospects. The number of quarries tends to fluctuate each year, depending on local construction activity in any area. Quarried materials include rock, gravel and sand.

Table 4.11-1 shows current mining and energy activity in the proposed transmission corridor, alternative corridor segments and Regional Study Areas. There are no developing or producing mines in any of the Study Regions.

Table 4.11-1: Mining and Energy Activity in Study Areas

Study Region	Mining and Energy			
	Activity	**Proposed Transmission Corridor**	**Alternative Corridor Segments**	**Regional Study Area (15 km)**
Central and Southeastern Labrador	Quarries	3	2	10
	Staked Claims	0	0	0
	Mineral Tenures	0	0	0
	Oil and Gas Parcels	0	0	0
Northern Peninsula	Quarries	1	0	11
	Staked Claims	17	3	40
	Mineral Tenures	0	0	0
	Oil and Gas Parcels	1	0	3
Central and Eastern Newfoundland	Quarries	25	1	122
	Staked Claims	41	2	121
	Mineral Tenures	3	0	3
	Oil and Gas Parcels	0	0	0
Avalon Peninsula	Quarries	3	1	45
	Staked Claims	6	1	25
	Mineral Tenures	1	0	2
	Oil and Gas Parcels	0	0	0

Source: DNR-ME, 2009c

Results and discussions are organized below by geographic region focusing on current activity (Figures 4.11-1 to 4.11-4).

Central and Southeastern Labrador

Three quarries are located within the proposed transmission corridor and two are in the alternative corridor segment near the Labrador Straits (Figure 4.11-1). Ten other quarries are located in the Regional Study Area, mainly in the Straits area with one located along the TLH. Appendix B illustrates quarry locations in greater detail.

Northern Peninsula

Mining operations are mostly limited to small quarries associated with road construction. Some exploration activity for hydrocarbons, dimension stone and base metals has occurred sporadically throughout the region. Currently there are no mineral tenures within the Study Region.

A number of quarries have been established to service the construction sector (Figure 4.11-2). One gravel quarry is located within the proposed transmission corridor. Eleven quarries are located in the larger Regional Study Area. Appendix B also shows quarries.

Staked mineral claims are located to the northeast of Hawke's Bay, to the east of Bellburns, on the east side of Portland Creek Pond and to the northwest, west and southwest of Hampden (Figure 4.11-2). The proposed transmission corridor crosses 17 staked mineral claims located to the northeast of Hawke's Bay. Three are in alternative corridor segments and there are 40 in the larger Regional Study Area.

Currently, the only energy related project that exists in any Study Region is a land based Nalcor Energy oil and gas exploration project near Parson's Pond. Three other oil and gas exploration sites (located nearby) are within the Regional Study Area.

Central and Eastern Newfoundland

Twenty-five quarries are located in the proposed transmission corridor in Central and Eastern Newfoundland. One is located in the alternative corridor segment and 122 are within the Regional Study Area (Figure 4.11-3). The main concentrations are from Badger to Grand Falls-Windsor and in and around major towns along the TCH, Route 1 from Port Blandford to the Isthmus of the Avalon. This mix of commercial and non-commercial sites serves the construction sector of the region. Gravel quarries are also illustrated in Appendix B.

Forty-one staked claims are located in the proposed transmission corridor, two are in the alternative corridor segment and 121 in the Regional Study Area. These are located to the east of Birchy Lake, east of Sheffield Lake, west, northwest and southeast of Badger, east and southeast of Grand Falls-Windsor, in the Southwest Gander River area, east of Deer Pond, south of Thorburn Lake, south of Clarenville, in the Ivany's Cove area, north of Goobies, northeast and southeast of Arnold's Cove and southeast of Chapel Arm.

Three areas of mineral tenure are within the proposed transmission corridor. This includes impost land issued to the Reid Newfoundland Company near Badger. The Reid Newfoundland Company was given 5,000 acres for every mile of railway installed and operated on the island. Many "Reid Lots" still exist but only a fraction of what was originally granted (Churchill, R., 2010).

Avalon Peninsula

Three gravel quarries are located within the proposed transmission corridor and one is within the alternative corridor segment on the Avalon Peninsula (Figure 4.11-4). Forty-five other quarries are located within the larger

Regional Study Area. These gravel quarries, mostly serving the construction sector, are generally dispersed throughout the Region, but with small clusters around Whitbourne, Holyrood and Foxtrap (Conception Bay South) areas. Appendix B shows gravel quarries in more detail.

One area of impost land, to the east of Whitbourne is crossed by the proposed transmission corridor. This property was awarded to Sir Robert Bond who built his estate on the shores of Dildo Pond and is currently maintained by Bond's descendants. Another area of impost land in the Regional Study Area is currently held by Trinity Resources & Energy Ltd. which operates a pyrophyllite quarry on Minerals Road in Manuals and a series of parcels on Red Bridge Road in Kelligrews is currently held by Greenslades Construction (Churchill, R., 2010).

Six staked claims are located within the proposed transmission corridor to the west and southwest of Holyrood, east and southeast of Salmonier Line (Route 90) and in the area surrounding Route 62, Holyrood and Route 60, Conception Bay South. One staked claim is located in the alternative corridor segment and 25 are within the Regional Study Area.

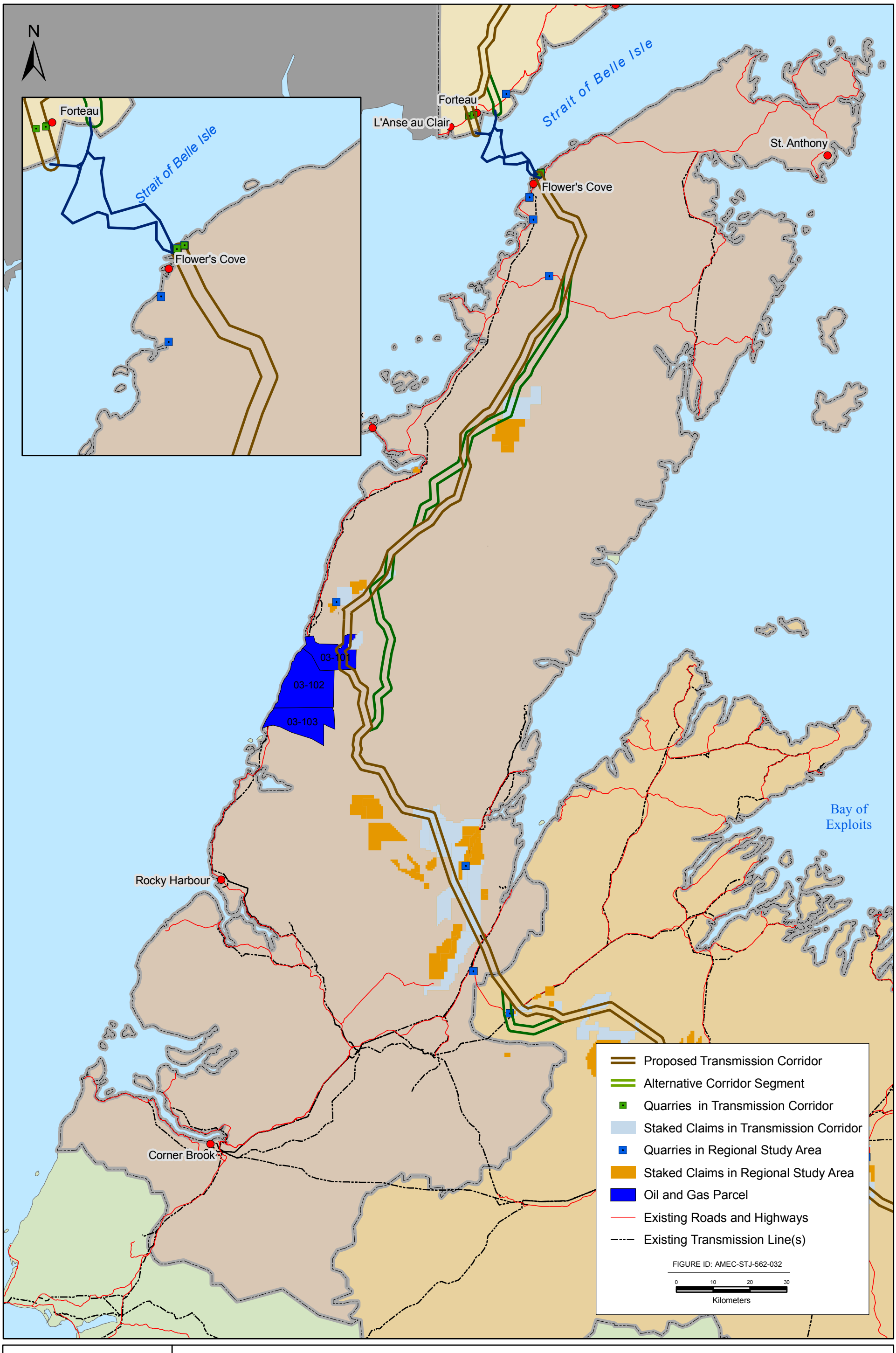
4.11.5 Summary

There are no producing or developing mines in any of the Study Regions. Gravel quarries are located in all Study Regions. In Central and Southeastern Labrador, the only existing activity in the proposed transmission corridor is gravel extraction. The Northern Peninsula has quarries and staked claims and on-land oil and gas exploration projects located in the proposed transmission corridor. In Central and Eastern Newfoundland and on the Avalon Peninsula, quarries, staked claims and mineral tenures are located within the proposed transmission corridor.

nalcor energy

Figure 4.11-1

Mining Activities and Energy Exploration - Central and Southeastern Labrador



nalcor energy

Figure 4.11-2

Mining Activities and Energy Exploration - Northern Peninsula

nalcor energy

Figure 4.11-3

Mining Activities and Energy Exploration - Central and Eastern Newfoundland

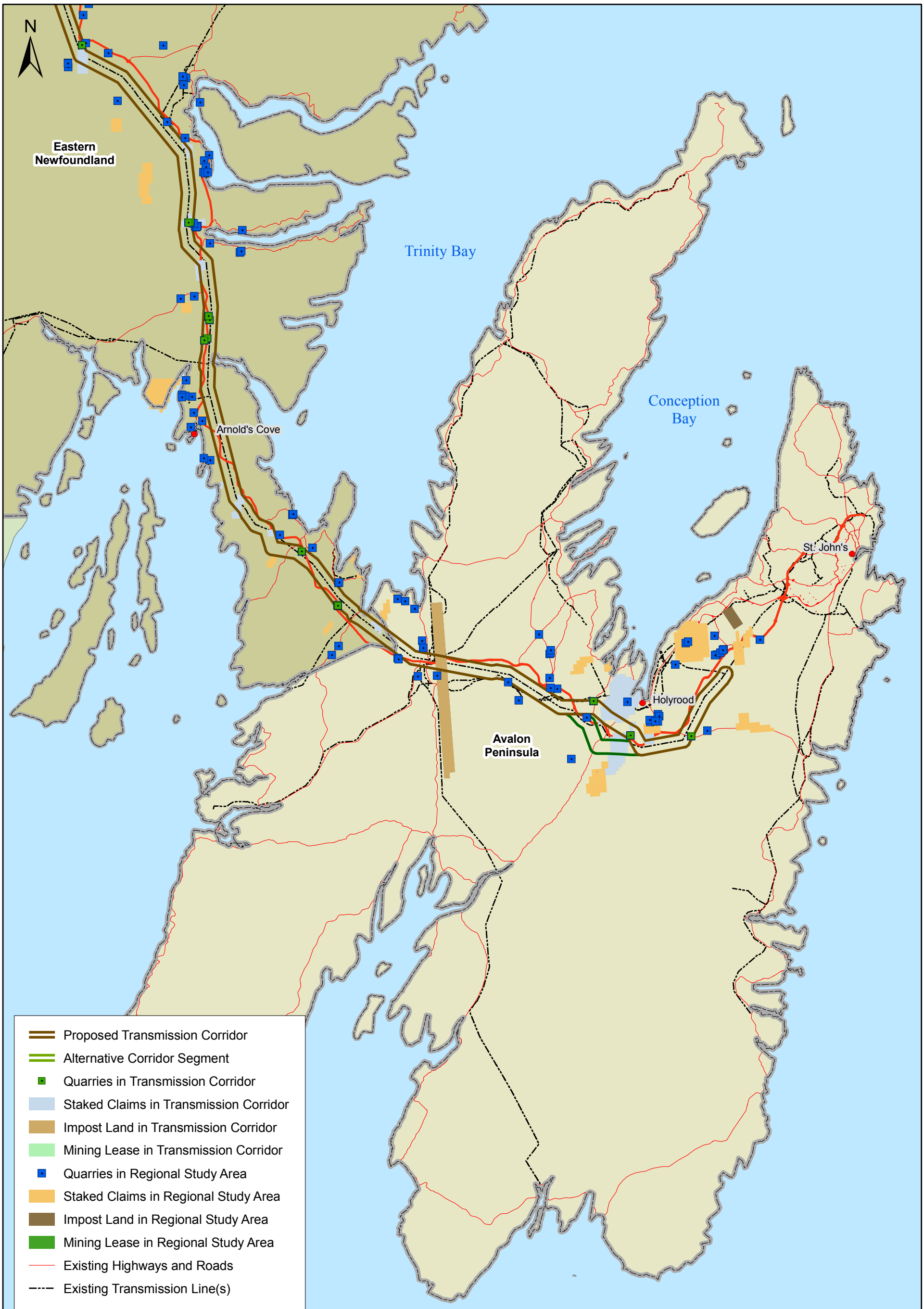


Figure 4.11-4

Mining Activities and Energy Exploration - Avalon Peninsula

4.12 Agriculture

The Newfoundland and Labrador agriculture industry is valued at approximately $500 million annually. It provides direct and indirect employment for more than 5,000 people mostly in rural areas (DNR-A, 2009). The agriculture and agrifoods industry consists of 558 farms and more than 100 food and beverage producers (DNR-A, 2010). However, due to having a relatively small proportion of arable land, the province is large and less than 0.1 percent (362 km2) of its (405,720 km2) is developed for agriculture (Statistics Canada, 2010).

The fur industry has been active and growing since the 1990s and interest in mink farming began after 2000. Currently, fox and mink are the most commonly farmed furs although there is some production of lynx, marten and chinchilla on mixed fur farms. In 2009, three fox farms, 22 mink farms and nine mixed fur farms were located in the province (DNR-A, 2009a).

The agriculture industry reported positive growth in 2008 with total farm cash receipts nine percent above 2007. Overall, the greatest increases were seen in dairy, egg and fur production. Increased funding has focused on cranberry production and research and development activities for producing new and improved crops and livestock. Additionally, further investment is expected in the mink sector and for implementation of bio-security measures following an outbreak of Aleutian Disease (GNL, 2009).

The agriculture industry is evolving. The number of farms (558) in 2006 was 13.2 percent fewer than in 2001. The number of 2006 operators (710) had decreased by nine percent over the 2001 Census of Agriculture (Statistics Canada, 2010). Between the 2001 and 2006 Census, the number of farms and farmers in Newfoundland and Labrador decreased but the size of farms and the total area planted for cropland increased. Blueberry growing areas increased by 60 percent in size and represented the highest growth in Atlantic Canada during the Census period. Among Canadian mink farms, those in Newfoundland and Labrador rank 4th in having the highest average number of animals. The fox industry is the largest in Atlantic Canada and farms in the province have the highest average number of foxes in the country (Statistics Canada, 2010).

4.12.1 Study Area

The Study Area for agriculture encompasses farms (including fur farms), pastures, wild berry management areas, areas of interest for growing cranberries and agricultural areas (Crown reserves, areas of interest and agricultural development areas) that overlap with the proposed transmission corridor from Central Labrador to the Avalon Peninsula (Figures 4.12-1 to 4.12-4). Because of the connectivity of farm lands and pastures, agriculture within the 15 km wide Regional Study Area are also general discussed where relevant and appropriate.

4.12.2 Administrative Framework

Agricultural land is divided into three provincially mandated regions and a number of zoned areas based on soil type. The Department of Natural Resources administers a land use program so that the relatively limited amount of arable land in the province is carefully developed and protected to ensure its availability for agricultural use over the long term.

Crown Land agriculture leases are issued for a period of 50 years and are eligible for renewal. Lease conditions, including environmental requirements and rates of development are tailored to each production commodity and can be adjusted depending on the status of the development of specific sites (DNR-A, 2009b).

4.12.3 Information Sources

Information on agricultural activity was obtained from the Department of Natural Resources, Agrifoods and Land Resource Stewardship Division as well as the provincial Land Use Atlas. The Land Use Atlas provided details on regional pasture land, development areas, Crown reserves, commercial lands and wildberry management units. Farmgates, which are identified by point data in the Land Use Atlas but do not provide the outline of farm areas, are used to show the general location of commercial farms. Additional information on fur farming was gathered from the Land Resource Stewardship Division of the Department of Natural Resources.

4.12.4 Agricultural Areas and Activities

To simplify mapping and analysis, information from the provincial Land Use Atlas and the Department of Natural Resources was grouped in the following ways. Farmgates, which are used to show the general locations of commercial farms are also outlined in Table 4.12-1. The term pasture is used for both pastures and regional pastures. The term agricultural area refers to agricultural development areas, Crown reserves and agricultural areas of interest. Results and discussion on agriculture are organized by Study Region.

Table 4.12-1: Farmgates in Study Areas

Study Region	Study Areas		
	Proposed Transmission Corridor	**Alternative Corridor Segments**	**Regional Study Area (15 km)**
Central and Southeastern Labrador	0	1	0
Northern Peninsula	0	0	0
Central and Eastern Newfoundland	1	0	19
Avalon Peninsula	5	0	50

Source: DNR-A, 2010a

Central and Southeastern Labrador

No farmgates are located in the proposed transmission corridor. One is located in the alternative corridor segment near the Strait of Belle Isle but no others are within the Regional Study Area.

A large number of areas (26 in the proposed transmission corridor and 149 within the Regional Study Area) are reserved for commercial and subsistence bakeapple picking (Figure 4.12-1).

Northern Peninsula

There is no existing commercial agriculture activity within the proposed transmission corridor, alternative corridor segments or Regional Study Area on the Northern Peninsula (Figure 4.12-2).

Central and Eastern Newfoundland

Agricultural development exists from Badger to Grand Falls-Windsor, southwest of Gander and north of Clarenville (Figure 4.12-3 and Appendix B).

The Department of Natural Resources has identified three potential sites of interest within this region. These include an area to the west of Sandy Lake called Lynx Pond with an estimated workable area of 45 ha, an area called Birchy Narrows (east of Sandy Lake) with an estimated workable area of 70 ha and Red Cliff (west of Grand Falls-Windsor) with an estimated workable area of 40 ha. Potential sites of interest for cranberry farming are located east and west of Sandy Lake and to the west of Grand Falls-Windsor.

One farm near Badger is within the proposed transmission corridor. Nineteen farms are within the Regional Study Area. These are located near Badger, Grand Falls-Windsor, Port Blandford, Clarenville and Bellevue. Agricultural areas southwest of Gander and on the Bonavista Peninsula near Clarenville are within the Regional Study Area.

Avalon Peninsula

Five farms are located within the proposed transmission corridor on the Avalon Peninsula (Figure 4.12-4 and Appendix B). Fifty others are located in the 15 km Regional Study Area. The proposed transmission corridor also crosses two agriculture areas (Whitbourne and Brigus Junction), and several others are within the larger Regional Study Area (Colinet and the Goulds). Blueberry management units (areas reserved for commercial and subsistence blueberry harvesting) are within the proposed transmission corridor between Brigus Junction and Holyrood.

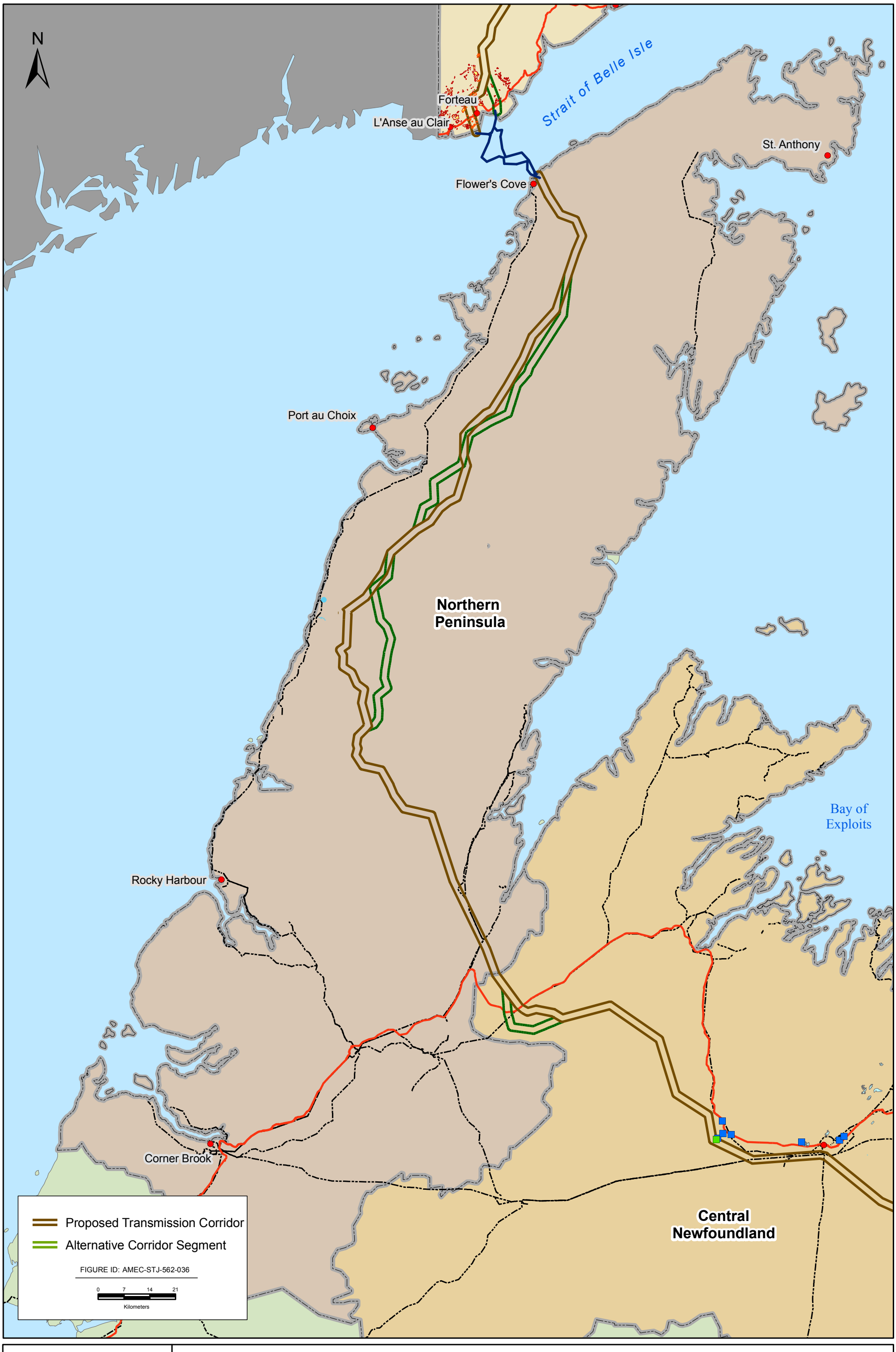
4.12.5 Summary

At present agricultural activity is relatively limited in Central and Southeastern Labrador and on the Northern Peninsula. The only activity located in the proposed transmission corridor in either of these Study Regions is bakeapple areas on the Labrador side of the Strait of Belle Isle. One commercial farm is located in the corridor in Central and Eastern Newfoundland. On the Avalon Peninsula the corridor intersects with five farms and two agriculture areas. The latter are located in the Whitbourne area and near Colinet. Blueberry management units near Brigus Junction are also crossed by the proposed transmission corridor.

nalcor energy

Figure 4.12-1

Agriculture - Central and Southeastern Labrador



nalcor energy

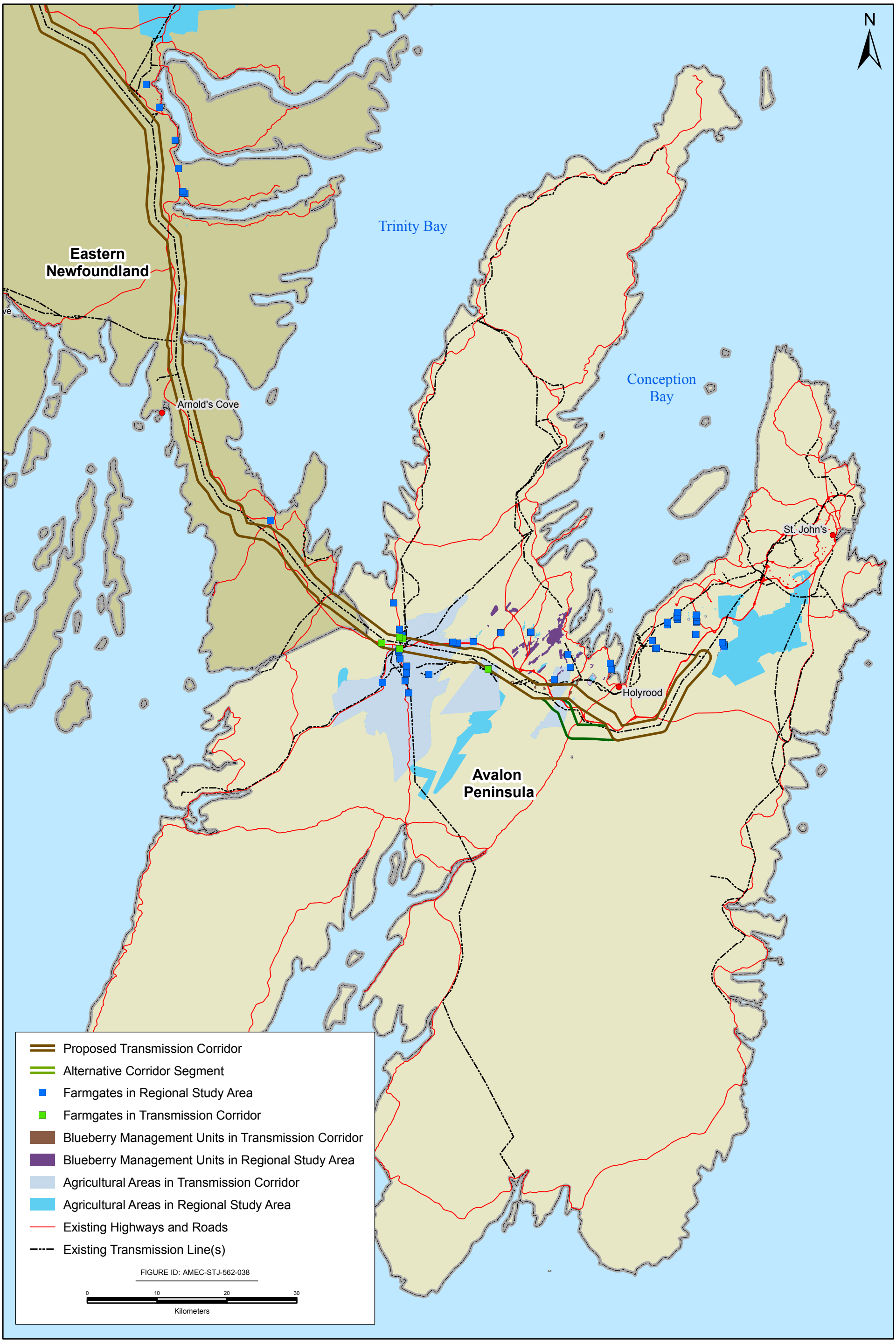
Figure 4.12-2

Agriculture - Northern Peninsula

nalcor energy

Figure 4.12-3

Agriculture - Central and Eastern Newfoundland



nalcor energy

Figure 4.12-4

Agriculture - Avalon Peninsula

4.13 Other Harvesting Activities

Residents of the province participate in a variety of harvesting activities including wood cutting, roadside gardening and gathering wild berries, fruits, flowers, plants, lichens and mushrooms (fishing and hunting are discussed / Sections 4.3 and 4.4). These activities have been an integral part of traditional subsistence and more recently, recreational activities.

Previously, harvesting activities occurred primarily near one's home or cabin. The areas were accessed by walking or using a boat or dog team. With the current high level of use of both snowmobiles and ATVs, individuals and families travel further and penetrate deeper into the interior of both Labrador and the Island of Newfoundland to undertake these activities.

Because these are individual and often sporadic pursuits, it is not possible to define precisely when and where they occur except through general and often anecdotal information. Limited data are available to describe these activities, with the exception of licensed activities such as hunting and some fishing which have been described previously. Activities typically occur in season where the resource is found and near access routes (e.g., Newfoundland T'Railway and forestry access roads). Berry picking and wood cutting occur throughout the province near access routes. Mushroom gathering occurs mostly on the Island of Newfoundland, and roadside gardening is most prevalent on the Northern Peninsula.

Today, in rural parts of the province, subsistence activities continue to form a part of the seasonal economic contribution to households. For residents of urban areas, these activities are often considered as part of a larger recreational activity (e.g., at their cabin). Again, little information is available about the locations and frequency of activity. Some subsistence activities are almost universal throughout the province (e.g., berry picking) whereas other activities are more specific to a locale (e.g., vegetable gardens along the northern section of Route 430 on the Northern Peninsula).

Below are some examples of relevant subsistence activities undertaken in various parts of the province that are crossed by the proposed transmission corridor.

4.13.1 Study Area

The Study Area is defined as the proposed transmission corridor from Central Labrador to the Avalon Peninsula. However, there is no data on harvesting activities that allows the extent of areas or level of activity to be defined for any Study Region. Therefore, such harvesting is described in relatively general terms only.

4.13.2 Information Sources

Most information provided in this section comes from general knowledge and experience of individuals, from associations and government departments. Some anecdotal information was provided by individuals involved with related activities (e.g., Department of Natural Resources Conservation Officers).

4.13.3 Harvesting Activities

Because of the lack of data regarding specific locations of subsistence activities, the following sections discuss activities in regions where they are known to occur.

Berry Picking

Berry picking is an important and province-wide activity. The primary berries taken are raspberries, bakeapples, blueberries, partridgeberries, blackberries, black crowberries and squashberries. Berries are either frozen for later use or preserved as jams, sauces or fruit wine. Some areas of the province are known for particularly good growth of a particular species.

Bakeapples grow in boggy, marshy areas, making harvesting a labour intensive activity. Although bakeapples grow in many areas around the province, they are particularly prolific on the Labrador side of the Strait of Belle Isle and on the Northern Peninsula. Bakeapples are consumed fresh or preserved by freezing or being processed into jams and sauces.

Blueberries grow on shrubs generally found in Newfoundland's forests, coastal headlands, on exposed rocky outcrops and in burnt-over areas. They are particularly prolific in Eastern Newfoundland and on the Avalon Peninsula. Blueberries are often used fresh with surplus frozen for baking or preserved as jam or sauce.

Partridgeberries (or red berries in Labrador), are relatives of the cranberry family that grow on low evergreen shrubs. They grow in dry, acidic soils on barrens and coastal headlands. As partridgeberries are tart like cranberries, they are usually preserved as jams or sauces or used for baking.

Raspberries are found in woods and clearings. They grow in poor soil on high shrubs and can be challenging to pick as they thrive in forest cutovers. Raspberries are often eaten fresh or made into jam.

In some cases the abundance of berries supports cottage industries (e.g., *Labrador Preserves Company* in Forteau, *Dark Tickle Company* on the Northern Peninsula and *Rodrigues Winery* in Whitbourne) or full scale berry product facilities (*Indian Bay Frozen Foods* in Bonavista Bay or *Natural Newfoundland Nutraceuticals* in Whitbourne). Larger companies depend on local berry pickers, many of whom undertake the task to supplement their income.

Mushroom Gathering

A variety of edible wild mushrooms grow in Newfoundland and Labrador. The most popular is the chanterelle, which grows throughout the Island of Newfoundland, in deciduous and coniferous forests and sometimes in former pastures. Chanterelle mushrooms, which fruit from July to September, are picked for personal use, sold fresh to consumers and restaurants or dried and packaged for sale.

Other Plant Gathering

Craft makers sometimes gather plants, berries, flowers or lichens to make dyes for crafts or clothing that is usually sold at craft stores, art galleries and craft fairs. Plants are also used for medicinal and traditional purposes.

Wood Cutting

Wood cutting occurs throughout the province and is a regulated activity that requires a domestic cutting permit (DNR-FS, 2001). Wood cutting also requires suitable access. According to Conservation Officers with the Department of Natural Resources, the most extensive wood cutting occurs near the proposed transmission corridor in areas near population centres along the Labrador Straits, on the Northern Peninsula and along the T'Railway, particularly from Glovertown to the Port Blandford Area.

Roadside Gardening

In some areas, particularly on the Northern Peninsula, residents use suitable Crown land along roadsides for growing traditional vegetables such as beets, cabbages, carrots, potatoes and turnips for personal consumption.

4.13.4 Summary

People throughout the province participate in a variety of harvesting activities including berry picking; mushroom gathering; wood harvesting for domestic use; plant gathering and roadside gardening as well as fishing and hunting. Subsistence activities still form a part of seasonal rural activities and food consumption. For residents of urban areas, these activities are often considered recreational.

Little specific information is available about the locations and frequency of activity. Many activities are undertaken near road access points. Areas of greater population and transportation routes are most likely to experience the greatest level of harvesting activity. However, with increasing use of both snowmobiles and ATVs, people travel further and penetrate deeper into the interior of both Labrador and the Island of Newfoundland to undertake these activities.

5.0 SUMMARY AND CONCLUSION

Nalcor Energy is proposing to develop the *Labrador – Island Transmission Link* (the Project), a High Voltage Direct Current (HVdc) transmission system extending from Central Labrador to the Island of Newfoundland's Avalon Peninsula. The environmental assessment process for the Project is in progress, with an EIS currently being prepared.

This *Socioeconomic Environment Component Study* has been undertaken in order to identify, gather, review and document information on various aspects of the existing human environment in and near the Project area, for use in the EIS and on-going Project design and planning.

The study identifies and describes key aspects of the socioeconomic environment which are relevant to the nature of the Project and its potential environmental interactions. These include the general socioeconomic regions and communities which are crossed by or adjacent to the proposed transmission corridor, as well as land and resource uses and other tourism and recreational activities in these general areas, including commercial, recreational and subsistence pursuits, and specifically:

- Communities
- Transportation
- Hunting and Trapping
- Angling and Other Fishing
- Hunting and Fishing Outfitters
- Motorized Recreational Vehicles
- Cabins and Cottage Development Areas
- Other Outdoor Recreational Activities
- Parks, Reserves and Other Protected and Special Areas
- Forestry
- Mining and Energy
- Agriculture, and
- Other Harvesting Activities

The proposed HVdc transmission corridor crosses a number of general socioeconomic regions in Newfoundland and Labrador, which have been generally defined as: 1) Central and Southeastern Labrador, 2) the Northern Peninsula, 3) Central and Eastern Newfoundland and 4) the Avalon Peninsula. The information and analysis provided in this study are generally structured around a number of socioeconomic components in terms of these general geographic areas. Many of these areas are rural with economies traditionally based on natural resource industries and more currently, tourism. However, the proposed transmission corridor also overlaps with regions and economic development zones where communities and populations are more heavily concentrated.

Communities: Communities and / or drinking water supplies overlap with the proposed transmission corridor in each identified Study Region. Many of these areas are rural. The corridor also crosses through regions where communities and populations are more heavily concentrated. These tend to be in Eastern Newfoundland and on the Avalon Peninsula. Portions of 22 communities and 17 drinking water supplies (and in most cases for the same communities) are crossed by the proposed transmission corridor.

A number of Aboriginal groups reside in, and / or claim rights and / or title to areas within or adjacent to the transmission corridor in Central and Southeastern Labrador. These groups include: Labrador Innu, Quebec Innu and Naskapi, Labrador Inuit (Nunatsiavut) and NCC (formerly the Labrador Métis Nation). The Labrador Inuit Land Claims Agreement was settled in 2005 when the Labrador Inuit Land Claims Agreement came into effect. Specific land use and harvesting activities by the members of these groups is addressed in other studies prepared as part of the Project's EA. Other Aboriginal organizations, including those on the Island of Newfoundland, are considered integrally within the overall focus and results of the study.

Transportation: In Central and Southeastern Labrador (Labrador Straits area), on the Northern Peninsula, in Central and Eastern Newfoundland and on the Avalon Peninsula, TCH, Route 1 and approximately 15 other highways and roads are crossed by the proposed transmission corridor. These include Route 510 in the Labrador Straits; Route 430 the main highway on the Northern Peninsula; Route 432 which crosses the Northern Peninsula in an east-west direction; Route 420 Hampden; the TCH, Route 1; Route 370 Buchans; Route 360 Bay d'Espoir; Route 210 Goobies; Route 203 Fairhaven; Route 201 Bellevue; Route 100 Argentia; Route 80 Blaketown; Route 81 Whitbourne; Route 90 Salmonier Line; Route 13 Witless Bay Line; and Route 63 Avondale.

No air facilities are located within the proposed transmission corridor. Three air facilities, in Central and Southeastern Labrador and Central and Eastern Newfoundland, are located within the Regional Study Area or alternative corridor segments. These include a landing strip at L'Anse Amour, a heliport at Grand Falls-Windsor and a water aerodrome on Thorburn Lake. A part of the Designated Flight Training Area at 5 Wing Goose Bay is also within the Regional Study Area near the Churchill River.

For the most part, the proposed transmission corridor is located inland in both Labrador and on the Island of Newfoundland. However, the corridor crosses the Strait of Belle Isle which is an ocean shipping route between the Atlantic Ocean and the St. Lawrence Seaway, a busy commercial and recreational marine area and the location of a ferry between Labrador and the Island of Newfoundland.

Hunting and Trapping: The proposed transmission corridor crosses three moose and one black bear management area in Labrador. It crosses 22 moose / black bear management areas and 10 caribou management areas on the Island of Newfoundland. The corridor overlaps with one small game management area in Labrador and four small game management areas on the Island of Newfoundland (all except for the Burin Management Area). It also crosses six migratory game bird management zones and one murre management zone. The corridor crosses nine fur zones in the province.

Angling and Other Fishing: The proposed transmission corridor intersects with 17 scheduled salmon rivers in the various Study Regions. Of these salmon rivers, those on the Northern Peninsula have the highest measures of CPUEs. Salmon angling success rates are also high in Central and Southeastern Labrador and in Central Newfoundland. Success rates are generally lower in Eastern Newfoundland and on the Avalon Peninsula.

Hunting and Fishing Outfitters: Three existing outfitting camps are located in the proposed transmission

corridor and these are all on the Northern Peninsula. The 51 camps in the Regional Study Area are located in all Study Regions, except the Avalon Peninsula which has no outfitters.

Motorized Recreational Vehicles: The proposed transmission corridor intersects with snowmobile trails in the Labrador Straits and in several parts of the Northern Peninsula including the Main River area. It also crosses snowmobile trails, particularly the Newfoundland T'Railway, near populated areas (e.g., Badger, Grand Falls-Windsor, Clarenville, the Isthmus and around Holyrood) of Central and Eastern Newfoundland and the Avalon Peninsula. This pattern is similar for ATV trails. The corridor crosses the Strait of Belle Isle, and lakes, ponds and rivers where boating activity occurs on the Northern Peninsula, Central and Eastern Newfoundland and on the Avalon Peninsula.

Cabins and Cottage Development Areas: The proposed transmission corridor overlaps with a portion of a total 559,000 ha that have been designated as cottage planning areas. A total of 462 cottages and 146 remote cottages are located in the corridor. Cottage and remote cottage development is most extensive on the Northern Peninsula and in Central and Eastern Newfoundland. Cottages are much more common than remote cottages on the Avalon Peninsula where cottage development is most intensive.

Other Outdoor Recreational Activities: Outdoor recreation generally occurs in areas that are accessible by road where participants can place their vehicles and equipment as close as possible to the activity site. Bicycling occurs within communities, on major highways and the Newfoundland T'Railway which is within the proposed transmission corridor or Regional Study Area depending on the location. Most bird watching occurs in identified birding areas or protected areas. Camping occurs within designated protected areas and at private campgrounds. Fourteen campgrounds with a total of 1,238 campsites are within the larger Regional Study Area.

Canoeing, kayaking and rafting takes place on the many ponds, lakes and rivers throughout the province, but generally at ones accessible by road and a number of these are crossed by the proposed transmission corridor. Most hiking is undertaken on purpose built or community based trails. The proposed transmission corridor intersects with the International Appalachian Trail on the Northern Peninsula and the T'Railway in Central and Eastern Newfoundland and on the Avalon Peninsula. The White Hills Ski Resort, which has downhill and cross country ski facilities, is within the Regional Study Area. Three golf courses, located at Grand Falls-Windsor, Terra Nova and Holyrood, are within the Regional Study Area. Riverfront Chalets (a river rafting outfitter on the Exploits River) is also located in the Regional Study Area.

The proposed transmission corridor and the Regional Study Area generally intersect with the above activities most frequently near major population areas (e.g., the Labrador Straits, Grand Falls Windsor, Clarenville, the Isthmus of the Avalon and Conception Bay) and near parks and reserves, particularly the Newfoundland T'Railway.

Parks, Reserves and Other Protected and Special Areas: Protected areas are a significant reason why residents travel around this province and non-residents visit the province. The proposed transmission corridor crosses two ecological reserves (West Brook and Hawke Hill), one provincial park (Butter Pot), one provincial park reserve (Jack's Pond), one waterway park and special management area (Main River) and the T'Railway which are all under provincial jurisdiction. Other protected areas are within the larger Regional Study Area.

Forestry: The proposed transmission corridor crosses portions of 13 active forestry management districts: two in Central and Southeastern Labrador, three on the Northern Peninsula, seven in Central and Eastern

Newfoundland and one on the Avalon Peninsula. The corridor overlaps with the greatest amount of forestry activity on the Northern Peninsula. Intense commercial forestry activity in central Newfoundland will not proceed as planned due to the closure of the Abitibi-Consolidated paper mill in Grand Falls-Windsor. This will affect Districts 4, 6, 10, 11 and 12. However, forestry will remain active around Birchy Lake and Southwest Gander River.

Mines and Energy: There are no producing or developing mines within the proposed transmission corridor in any of the Study Regions. Gravel quarries are located in all Study Regions. In Central and Southeastern Labrador, the only activity in the proposed transmission corridor is gravel extraction. The Northern Peninsula has quarries and staked claims and on-land oil and gas exploration projects located in the proposed transmission corridor. In Central and Eastern Newfoundland and on the Avalon Peninsula, there are quarries, staked claims and mineral tenure located within the proposed transmission corridor.

Agriculture: Agricultural activity is limited in Central and Southeastern Labrador and on the Northern Peninsula. The only activity located in the proposed transmission corridor in either of these Study Regions is bakeapple areas on the Labrador side of the Strait of Belle Isle. One commercial farm is located in the proposed transmission corridor in Central and Eastern Newfoundland. On the Avalon Peninsula the proposed transmission corridor intersects with five farms and two agriculture areas. The latter are located in the Whitbourne area and near Colinet. Blueberry management units near Brigus Junction are located in the proposed transmission corridor.

Other Harvesting Activities: People throughout the province participate in a variety of harvesting activities including berry picking; mushroom gathering; wood harvesting for domestic use; plant gathering and roadside gardening as well as fishing, hunting and trapping. Subsistence activities still form a part of seasonal rural activities and food consumption. For residents of urban areas, these activities are often considered recreational. Little information is available about the specific locations and frequency of such activities though many are undertaken near road access points. However, with increasing use of both snowmobiles and ATVs, people travel further and penetrate deeper into the interior of both Labrador and the Island of Newfoundland to undertake these activities. Thus, rural areas of greater population and transportation access are most likely to experience the greatest level of harvesting activity.

Due to the rather extensive geographic area involved, the Project will extend across a considerable portion of Newfoundland and Labrador. The presence and characteristics of socioeconomic conditions and features vary greatly along and adjacent to the transmission corridor. The information on the existing socioeconomic environment provided through this Component Study will be adequate for the Project's EA and useful in informing the ongoing planning and design, and eventual transmission line routing.

Again, as an environmental baseline study for the Project's EA, the focus of this report is on the currently defined transmission corridor (2 km wide) and associated Regional Study Areas. It is important to note that, as described in Section 1.1, the eventual transmission line itself will comprise an approximately 60 m wide right-of-way, which will eventually be selected from within this larger study corridor.

As a result, any identified overlap between the proposed transmission corridor and a particular aspect of the existing socioeconomic environment does not necessarily mean that the eventual transmission line itself will interact with that component of the environment. The EIS will assess any such potential interactions, as well as possible means of avoiding or reducing potential effects, including through the eventual transmission line route

selection process and / or other possible mitigation measures.

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APPENDIX A

Study Team

The Study Team for this *Socioeconomic Environment Component Study* included the following individuals.

Nancy Griffiths

Nancy is a social scientist with more than 15 years experience in environmental planning, public consultation, community planning, economic development, tourism planning as well as waste water and solid waste management. She holds a Bachelor of Design in Environmental Planning from NSCAD University and a certificate in publication participation from the International Association of Public Participation, and has also completed university education and professional development programs in social science surveying and statistical data sources.

Susan Sherk

Susan is a socio-economist with over thirty years of experience. As former head of AMEC's Human Environment Group in St. John's, she has been involved in a wide range of projects throughout Canada and in more than ten other countries for private organizations and government agencies. Her efforts have focused on identifying and managing sensitive issues related to development. Susan is trained in project management, statistics and surveys, Traditional Ecological Knowledge and community economic development. She holds a BA in anthropology and a certificate from the International Association for Public Participation.

Juanita Abbott

Juanita has 10 years experience in Geographic Information Systems (GIS). She is experienced in completing GIS projects requiring conceptual planning, digitizing, managing databases, performing geographical analysis and presentation of results in layout and tabular form. She provides GIS support for various projects spanning many disciplines including biology, geology and engineering. Juanita has a BA in Geography from Memorial University, a Post-Graduate Certificate in Geographic Information Systems from Nortech College, Mount Pearl and AutoCad Certification in Levels I, II & III from the College of the North Atlantic.

Uwe Wittkugel

Uwe has 26 years of experience in environmental planning. He has specialized in impact assessments, site and route selection studies, conservation strategies, and landscape / urban planning. Uwe has been project manager and principal author of numerous environmental studies for a wide variety of projects related to pipeline planning, power generating plants, transmission line projects, waste management and urban development. His project work has included effects assessments for socioeconomic and biophysical environment components. He is very familiar with provincial and the federal environmental assessment processes.

Peter A. Miles

Peter holds a BA in Archaeology from Memorial University and is currently completing a Master's of Science in environmental impact assessment through Concordia University. He is a certified public consultation practitioner having successfully completed the International Association for Public Participation's certificate course and is registered as a Canadian Environmental Practitioner-In Training by the Canadian Environmental Certification Approvals Board, with core competencies in Human and Environmental Health and Safety and Communications and Public Awareness.

Suzanne Mullowney

Suzanne is a biologist with eight years of experience directly relating to fisheries research, environmental studies and assessment. She graduated from Lakehead University with a BA in Environmental Studies and Forest Conservation and has since been involved in research projects in Ontario and Washington State (USA) as part of her honours thesis. In these projects, Suzanne has focused on collection, consolidation and analysis of data pertaining to fisheries and forest environment. Her field efforts include field sampling for both long term data sets and baseline studies specific to freshwater fish and invertebrates, and vegetation pertaining to ecosystem classification. Suzanne is also experienced with CEAA Screenings of various types throughout Newfoundland and Labrador.

APPENDIX B

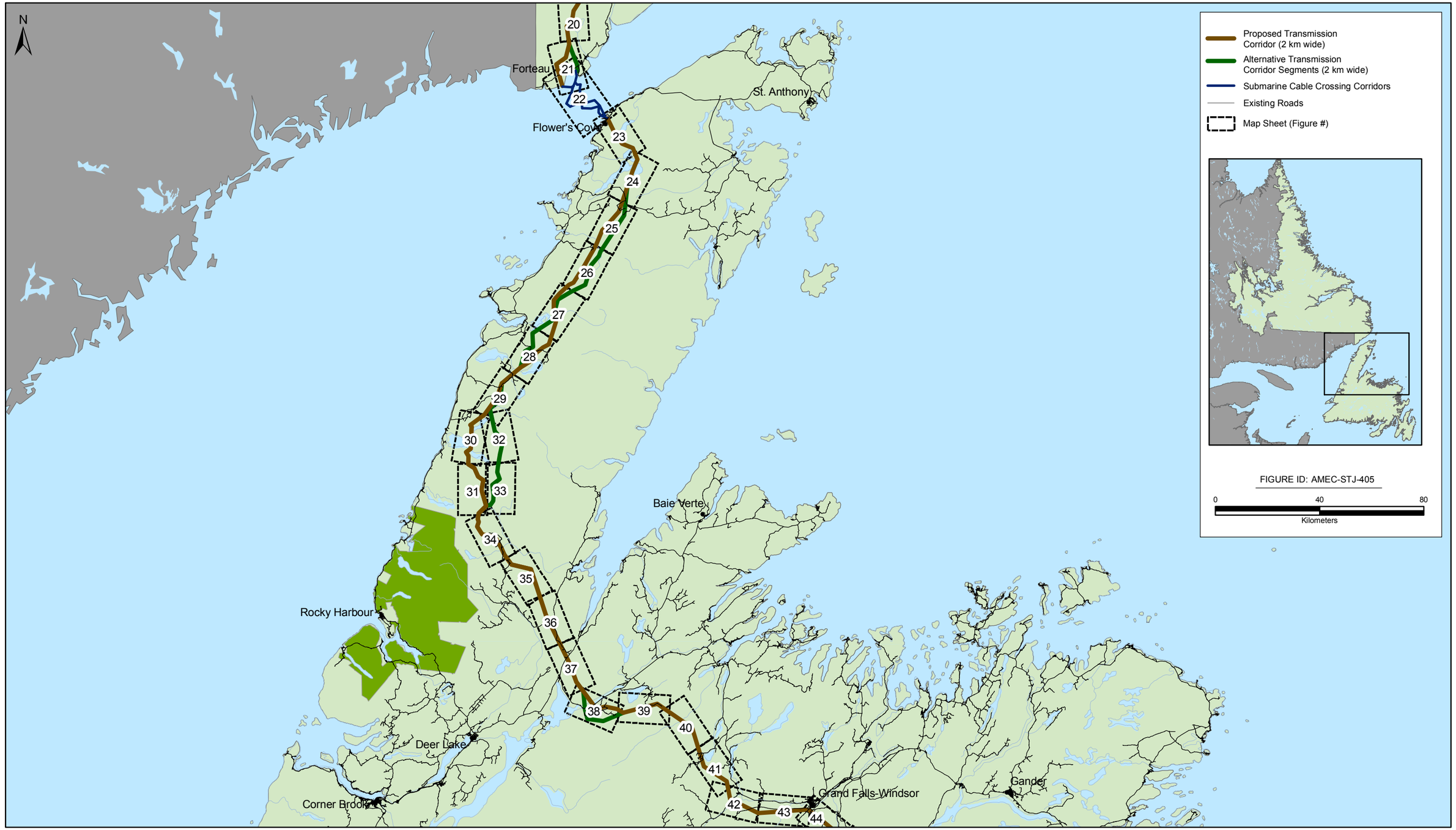
Map Atlas: Select Land Uses

The following presents a map atlas illustrating the proposed Labrador-Island Transmission Link in further detail, as well as a number of land uses which - although included in the main report and associated figures - are also presented here at this scale for further illustration. These include select land uses which are relatively small in size and / or occupy specific and relatively small land areas, including: Crown titles (cottages and remote cottages), outfitting camps, quarries, farmgates and existing forest access roads and other linear infrastructure such as transmission lines.

The Index Maps provide a guide to the various map sheets, which together extend across the area of the proposed and alternative transmission corridors. The numbered Index Maps correspond to the numbering of the detailed maps that follow. Please note, that for efficiency and brevity, only those map sheets (areas) that contain one or more of the select land uses in question have been produced in this atlas.

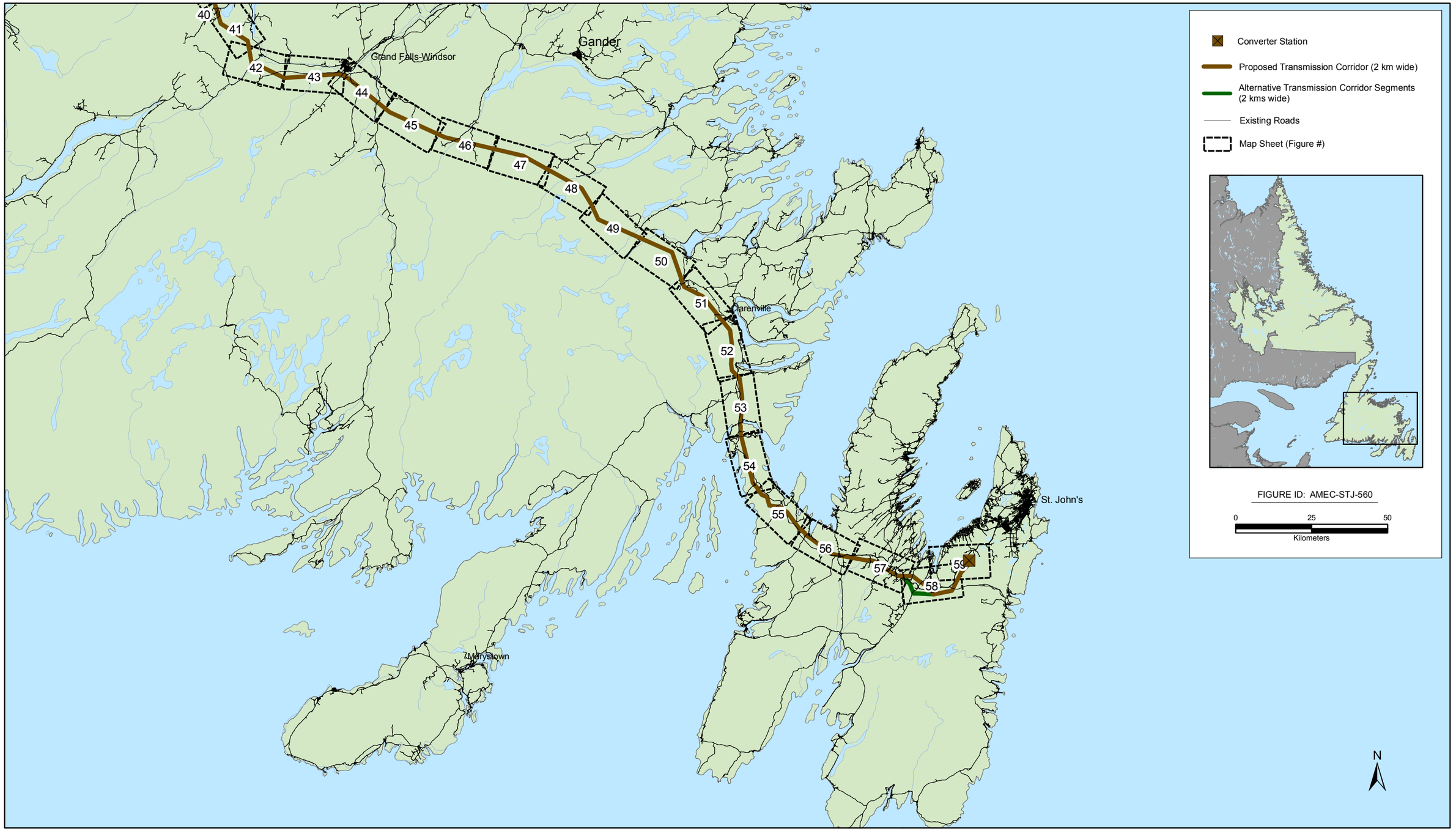
INDEX B

Labrador - Island Transmission Link: Gull Island to Strait of Belle Isle
Select Land Uses



INDEX B

Labrador - Island Transmission Link: Strait of Belle Isle to Central Newfoundland
Select Land Uses



INDEX C

Labrador - Island Transmission Link: Central Newfoundland to Soldiers Pond
Select Land Uses

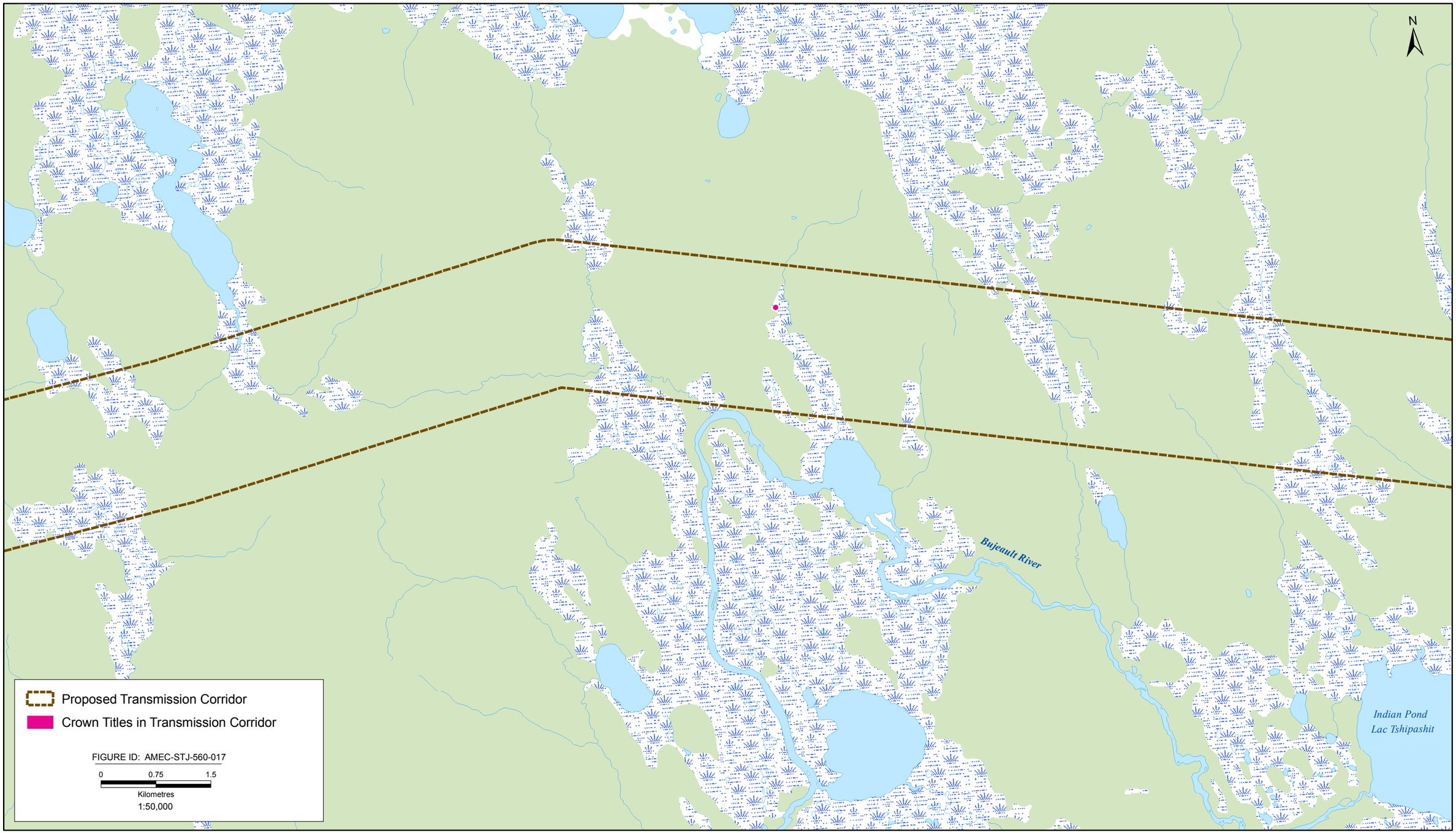
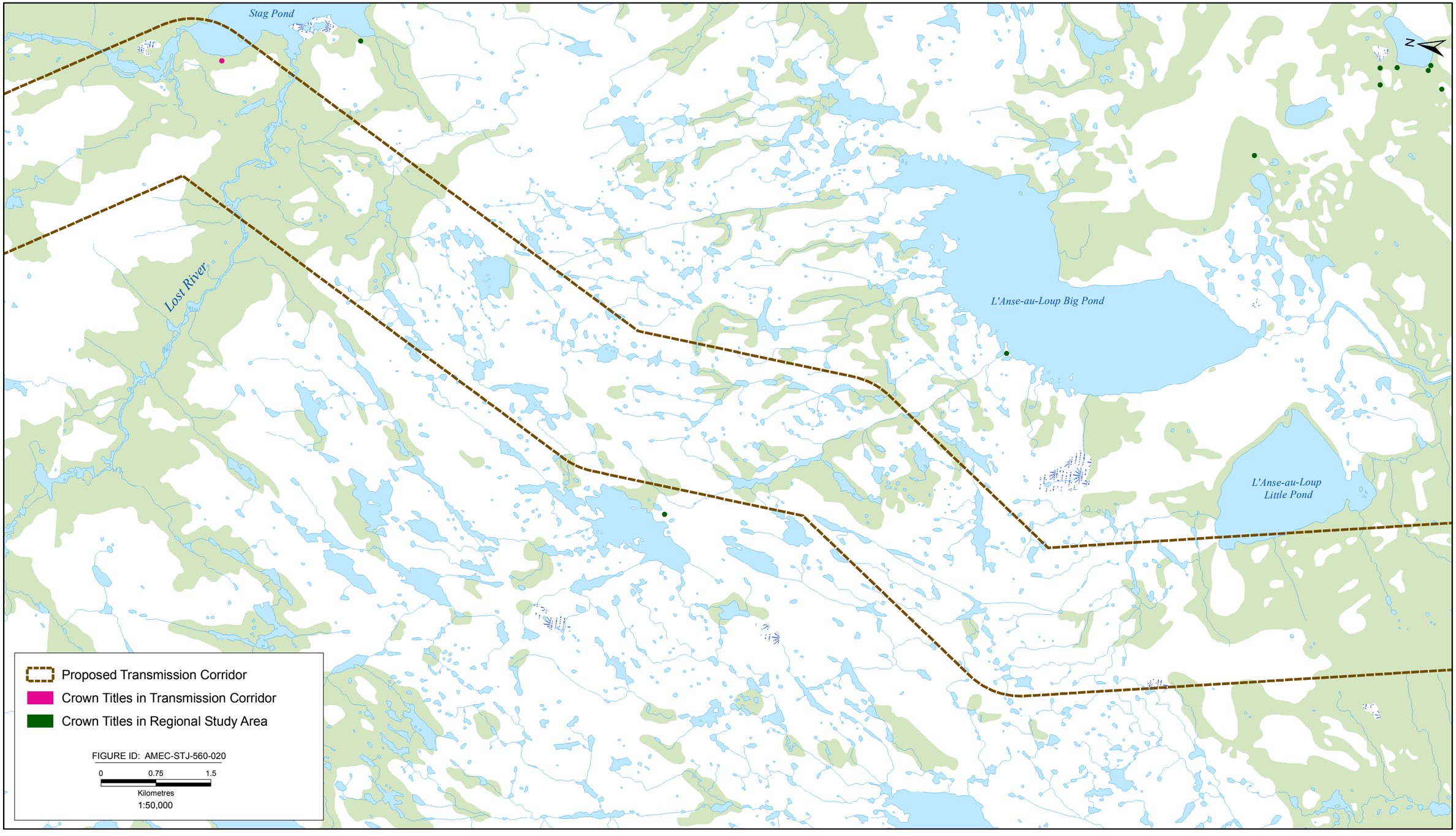


FIGURE 17

Labrador - Island Transmission Link: Select Land Uses



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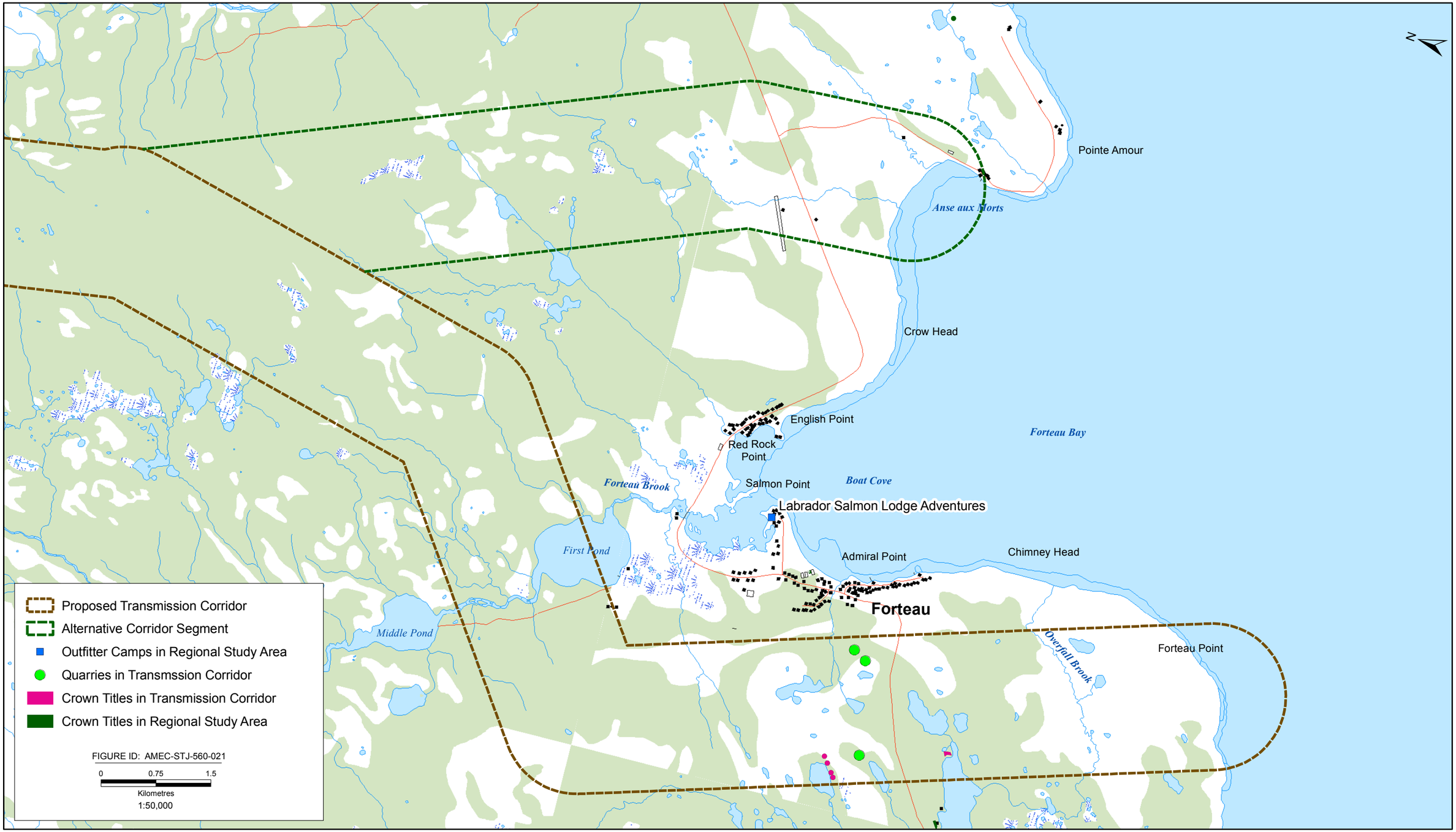

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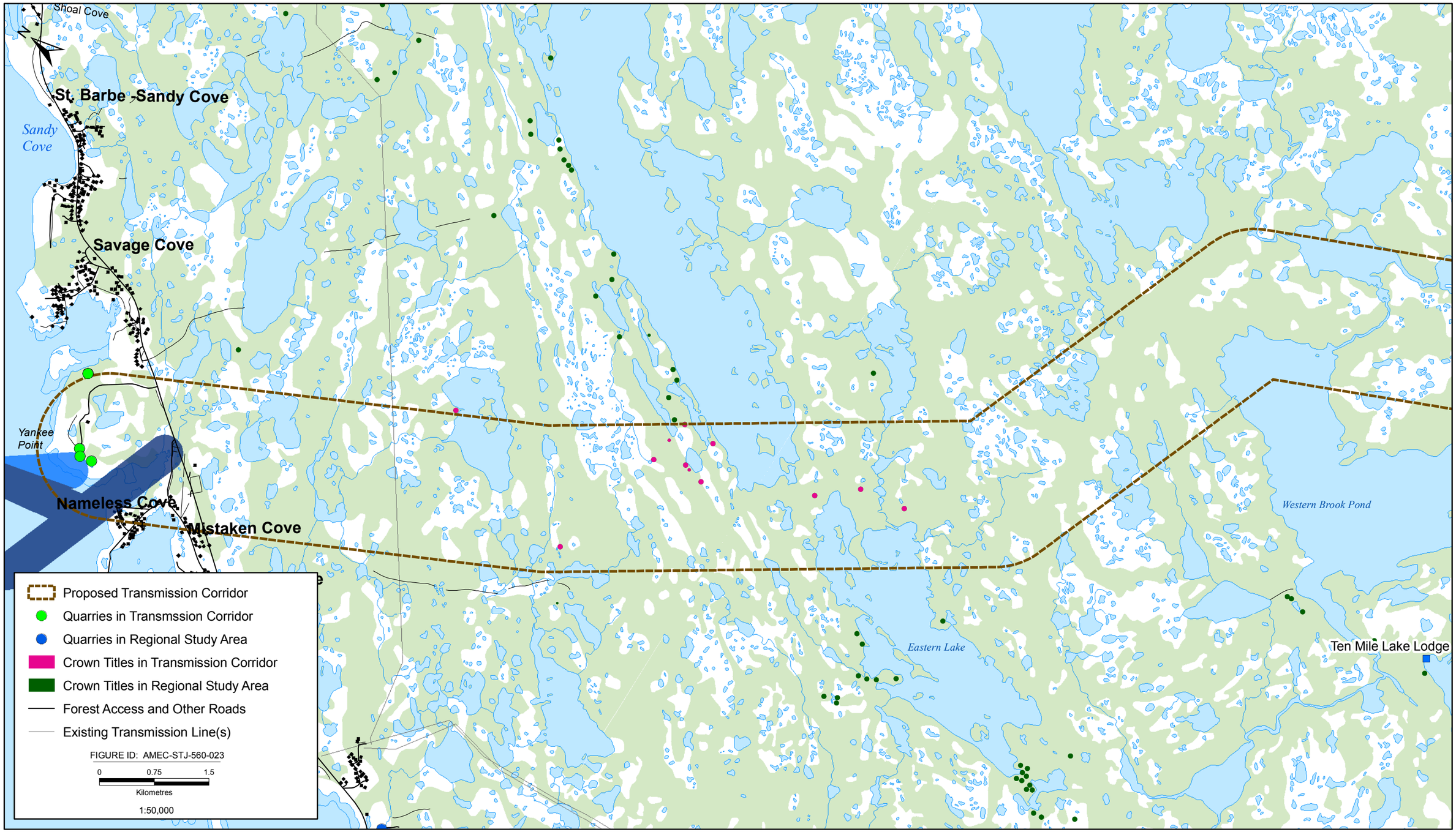

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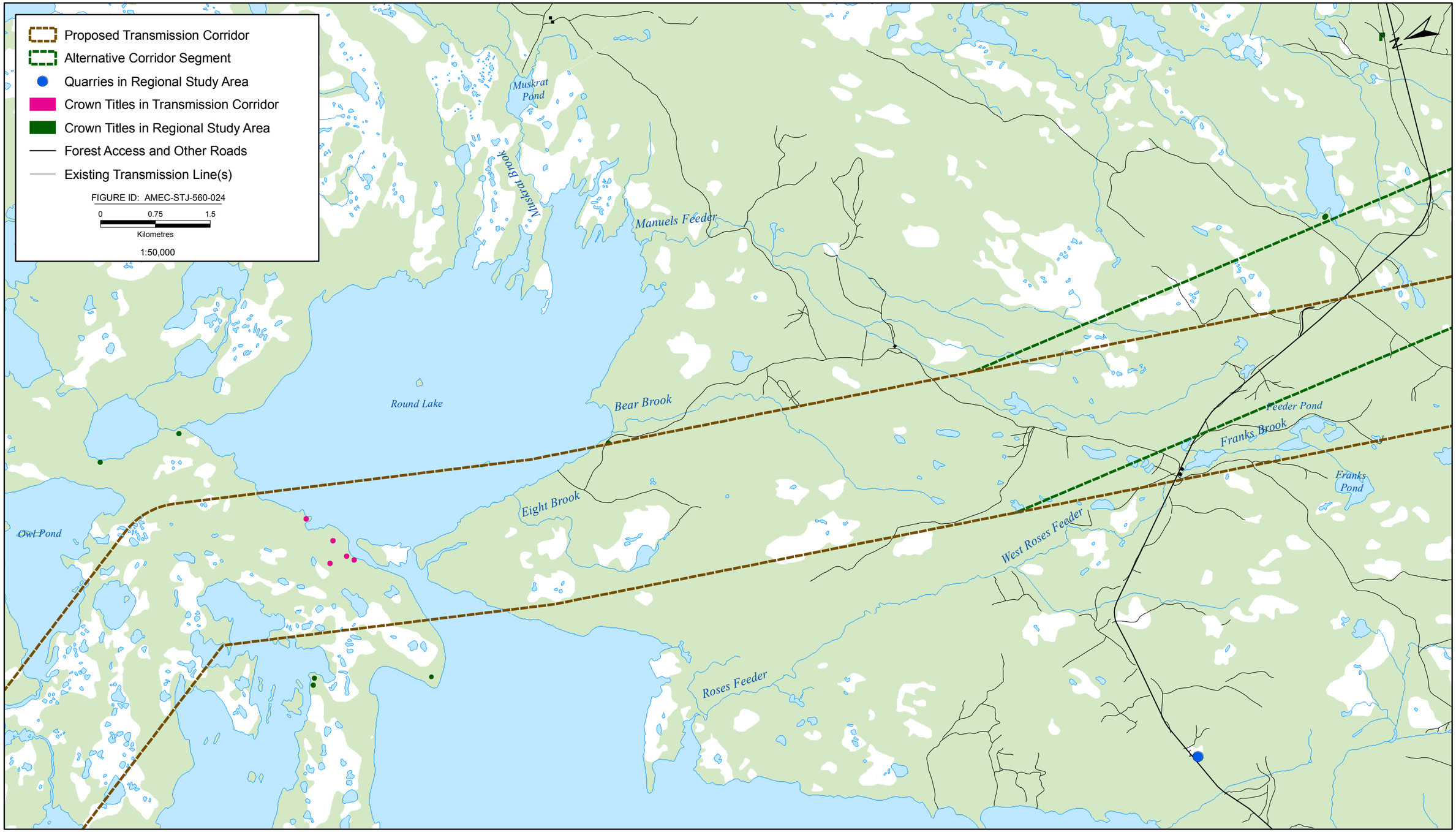

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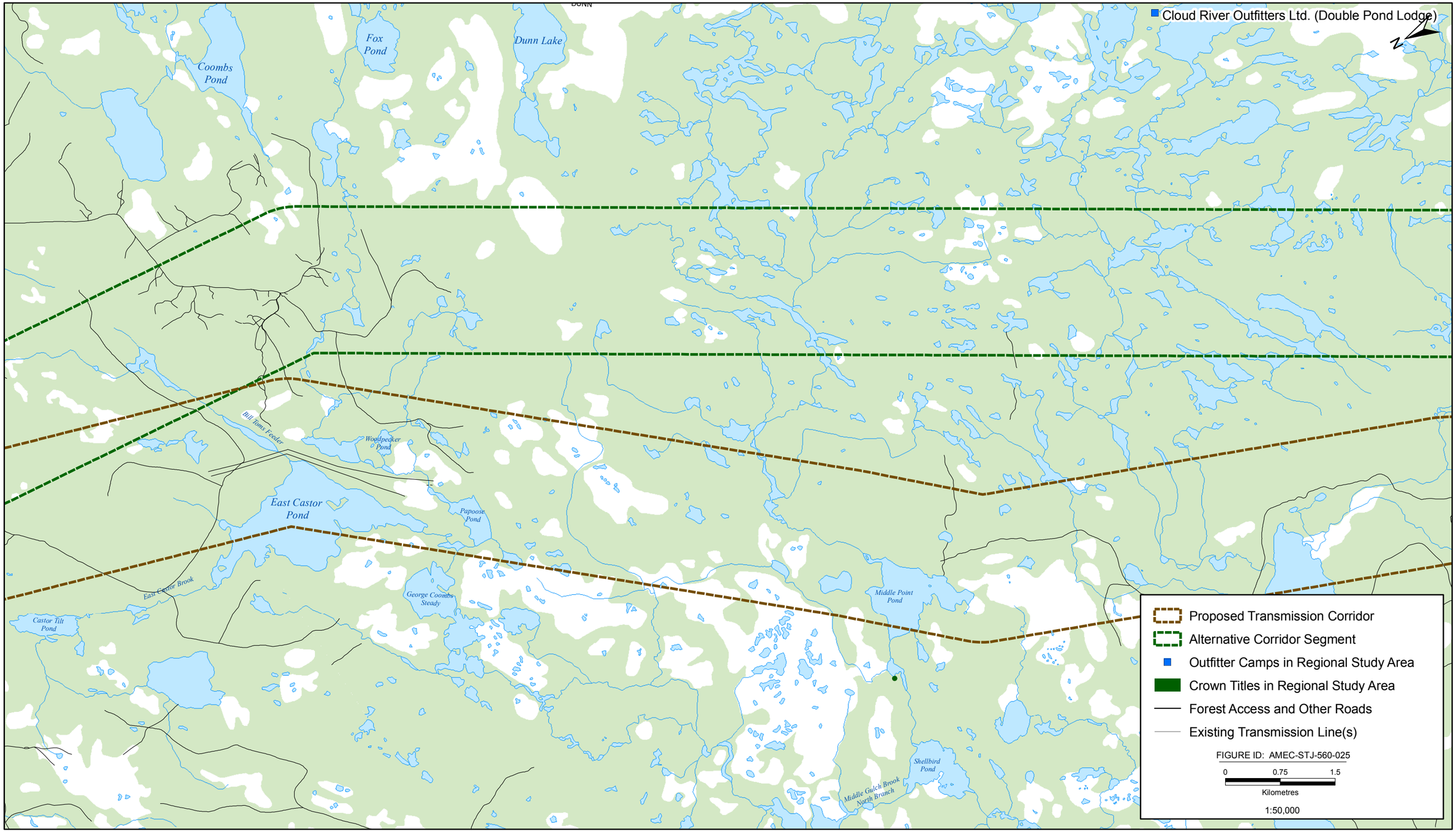

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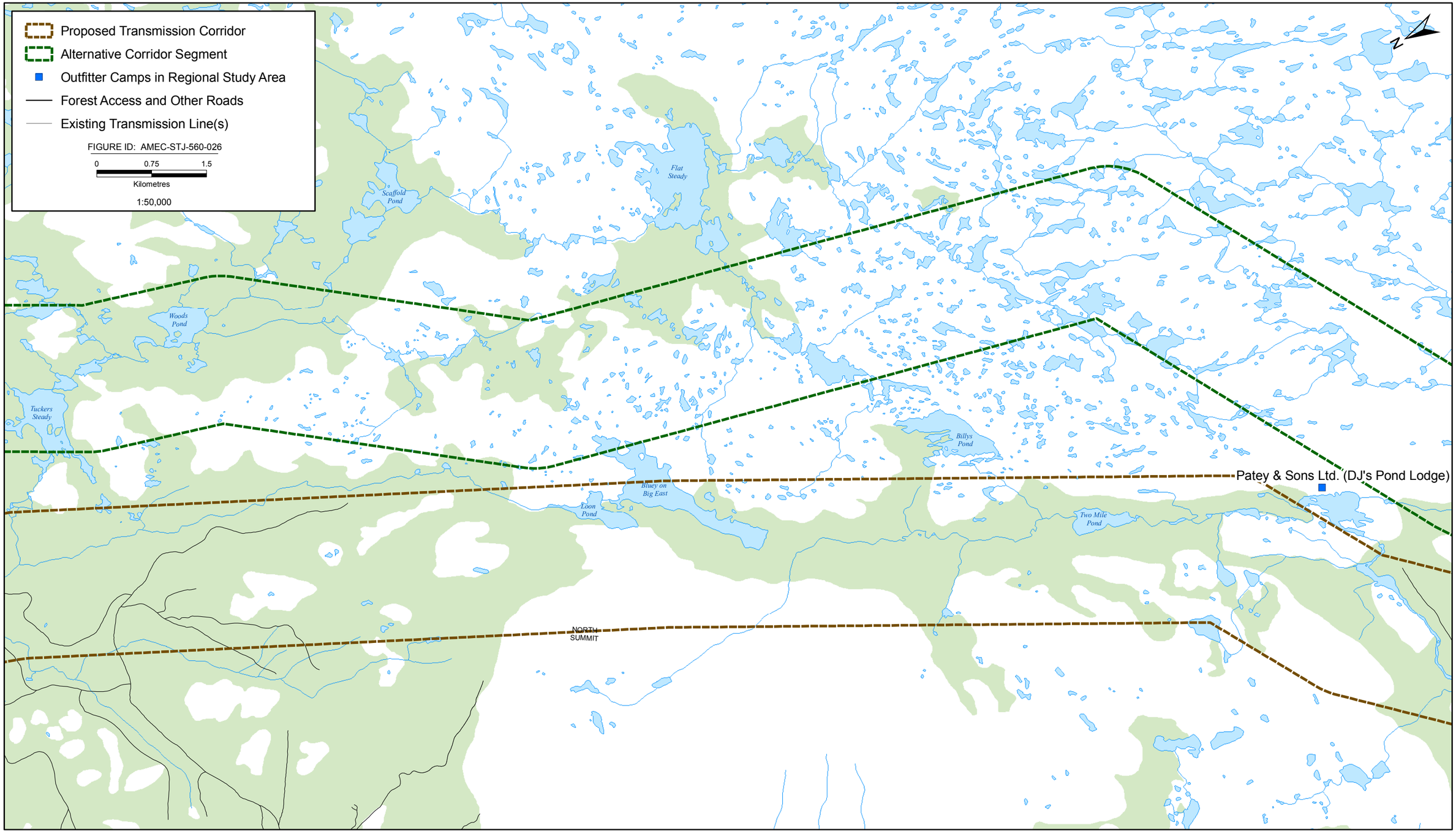

FIGURE 26

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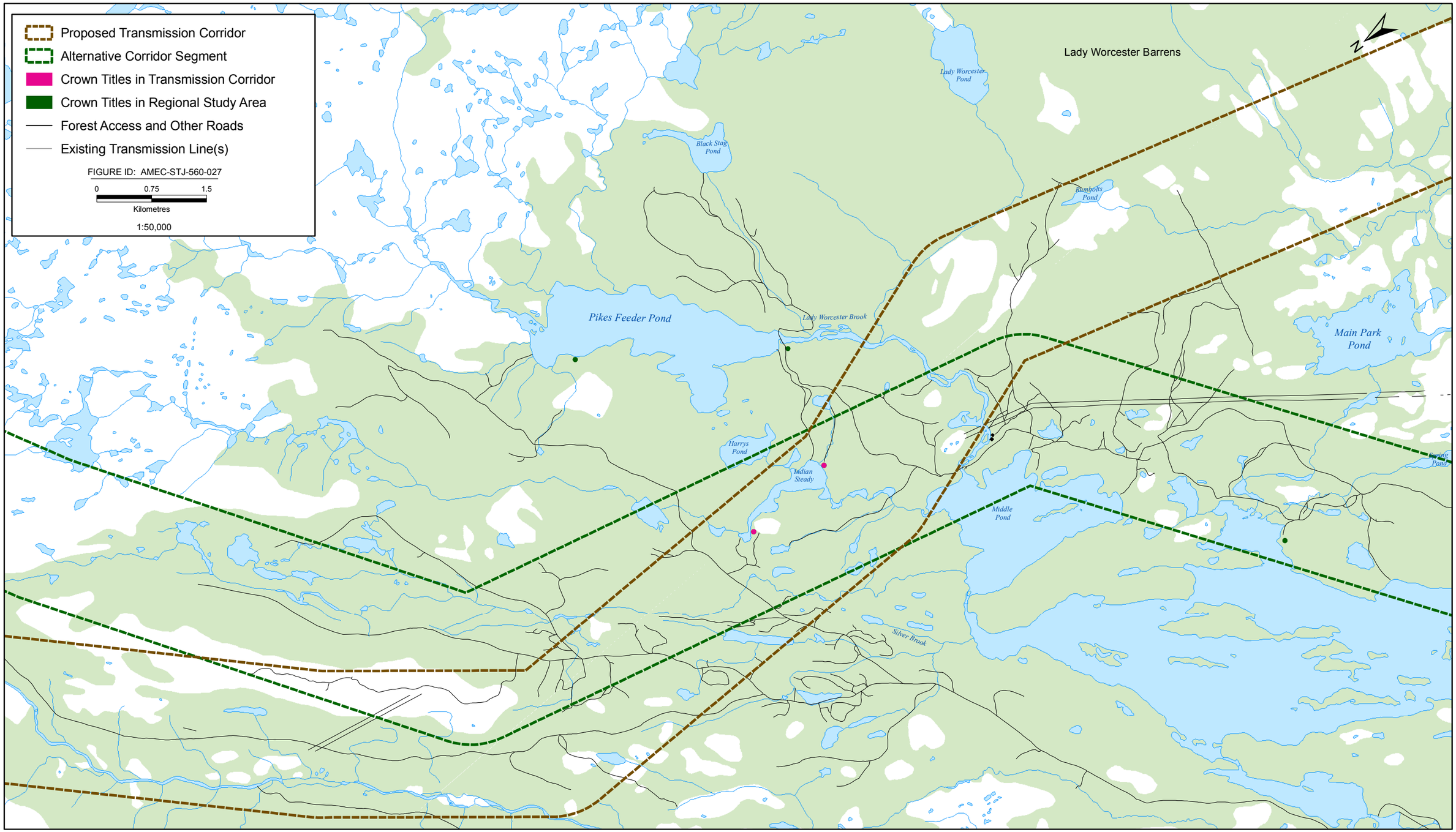

nalcor energy	**FIGURE 27**
	Labrador - Island Transmission Link: Select Land Uses

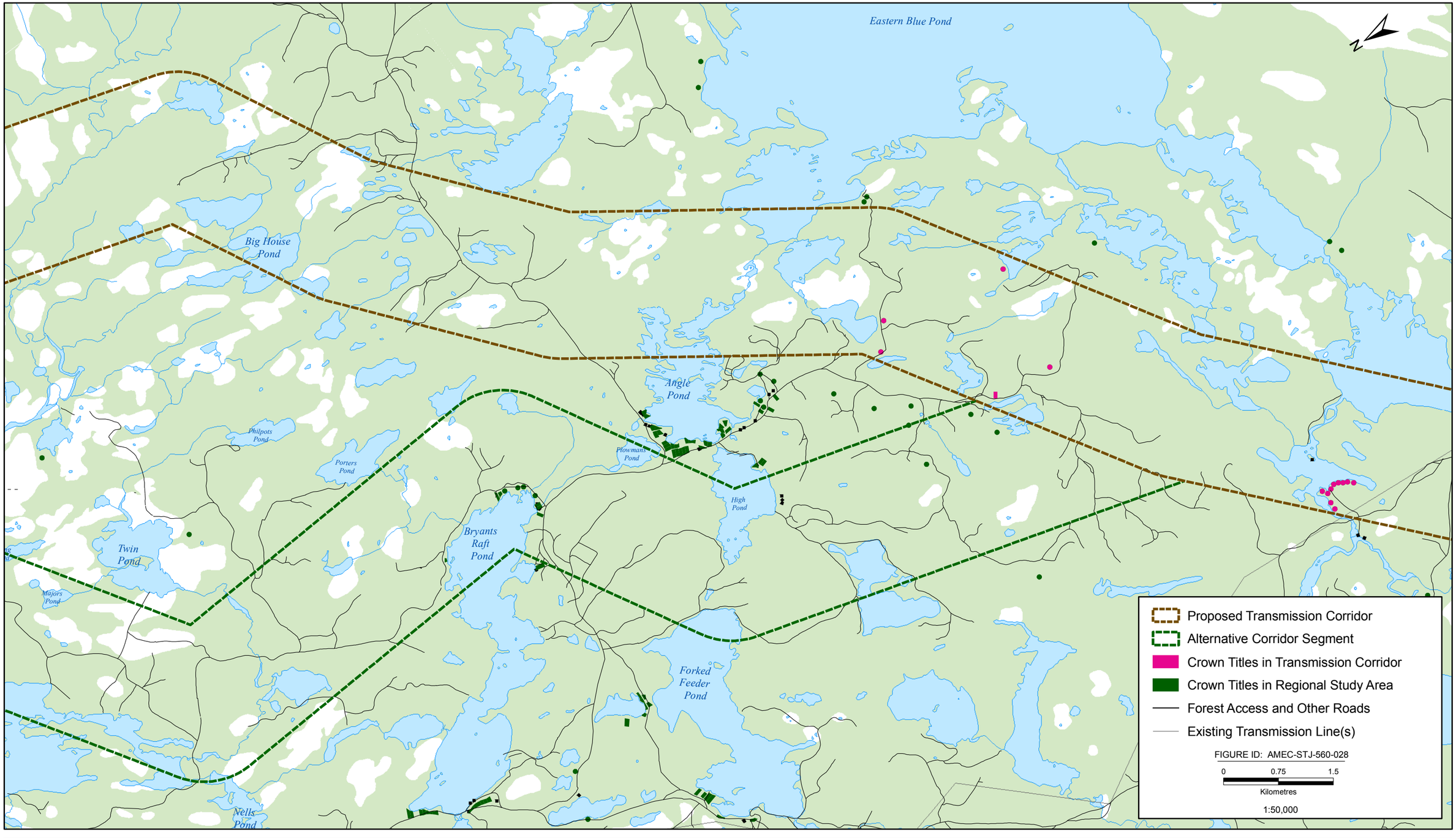

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FIGURE 28

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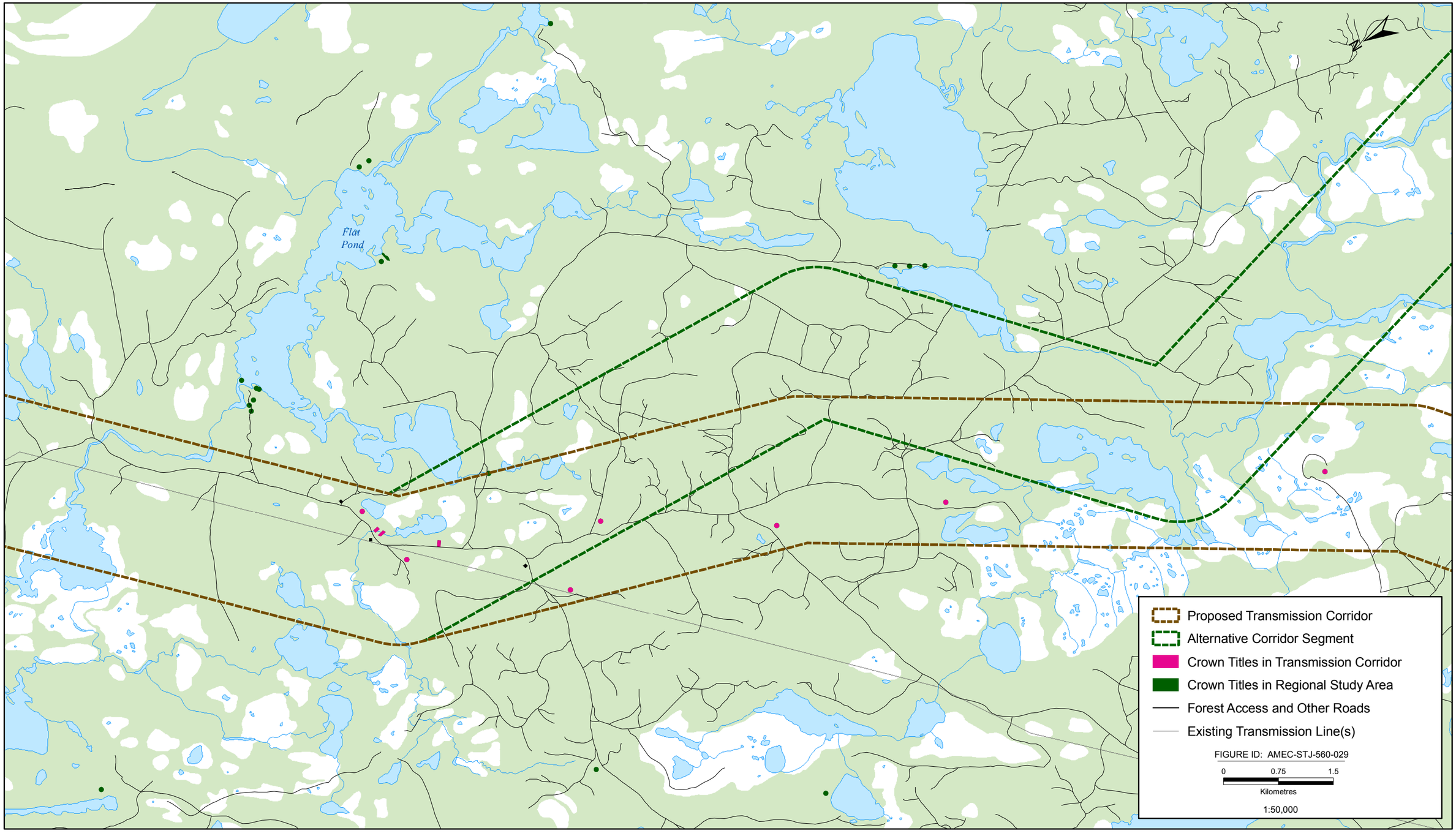

FIGURE 29

Labrador - Island Transmission Link: Select Land Uses

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FIGURE 30

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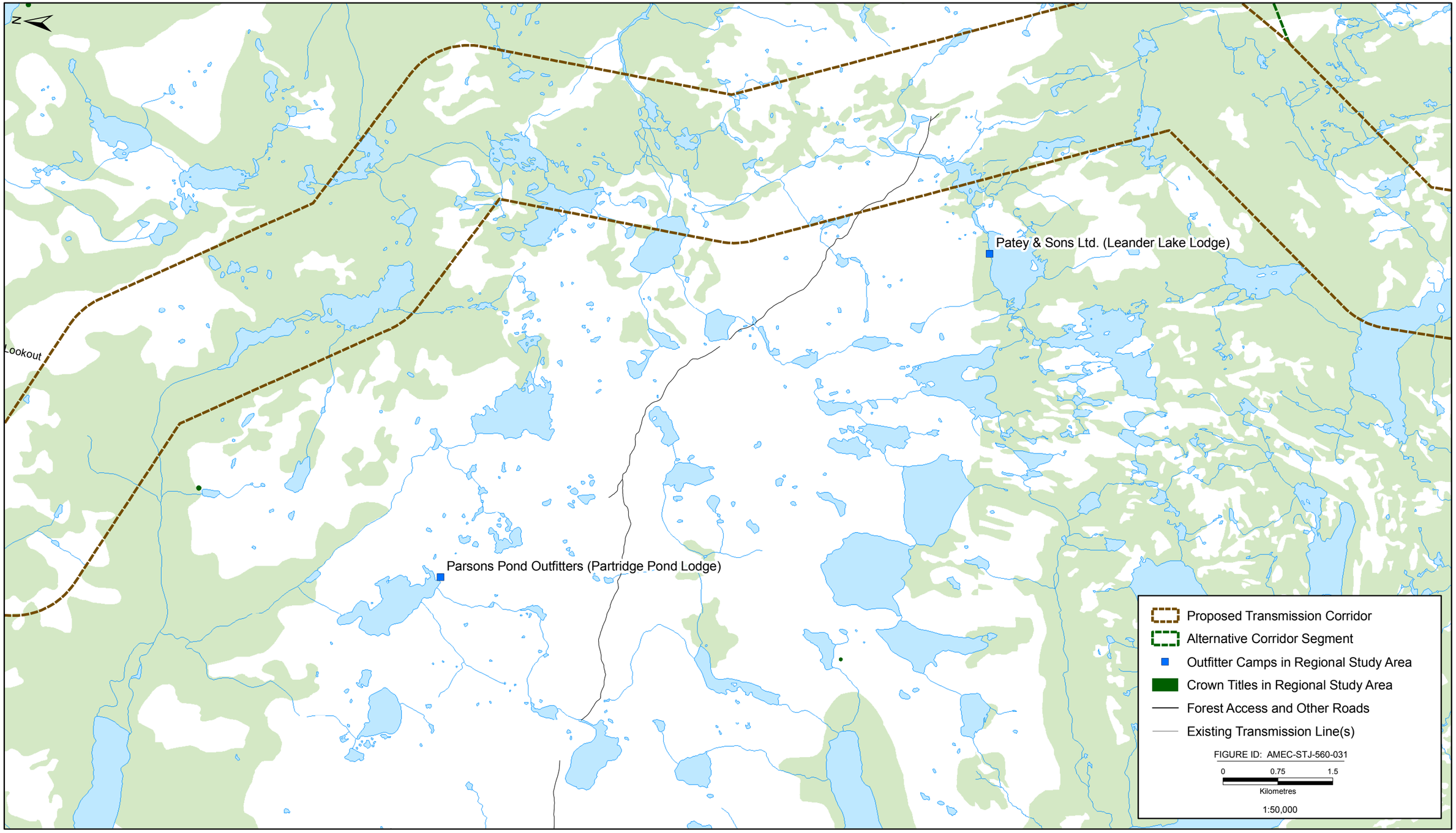

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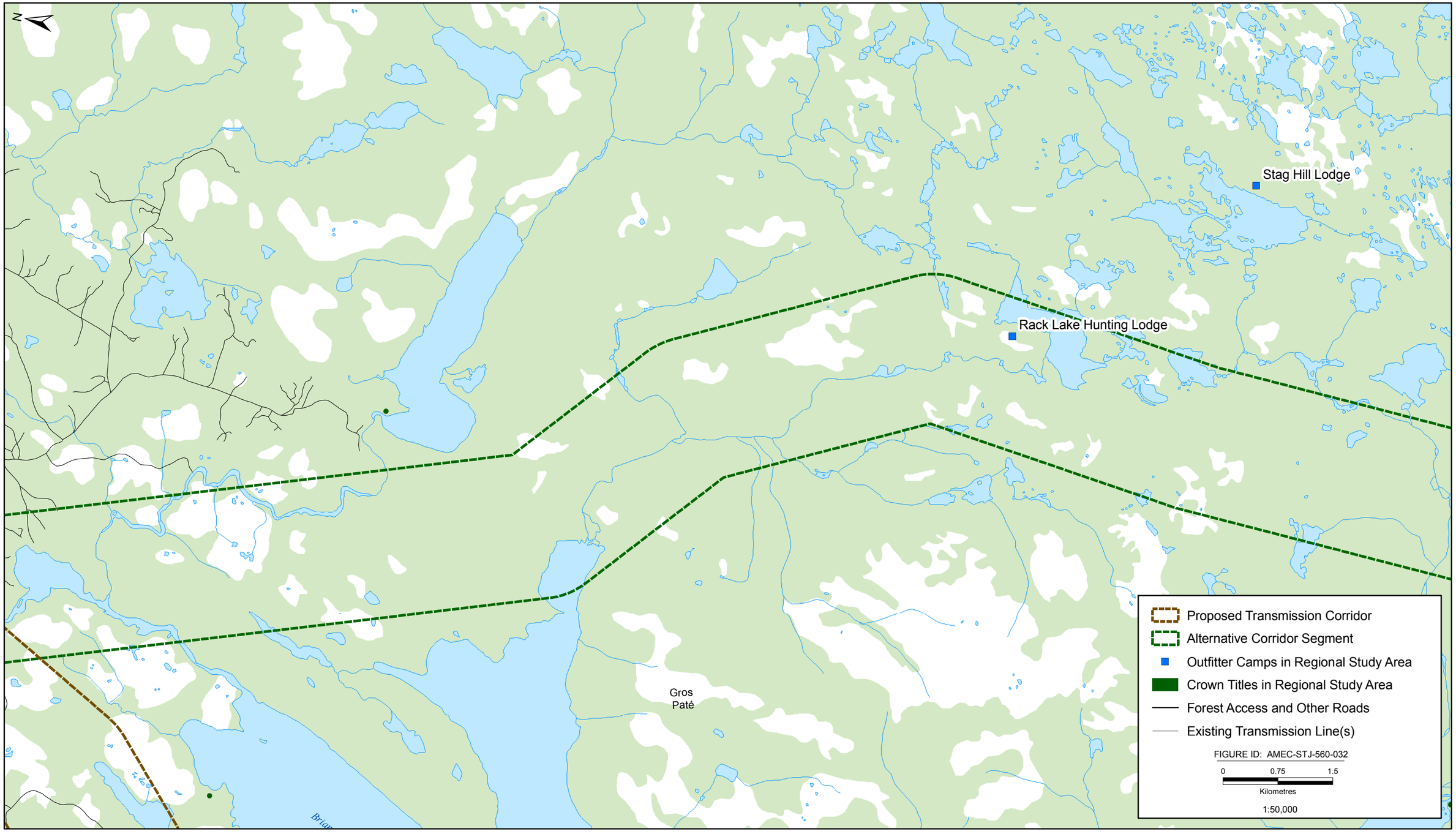

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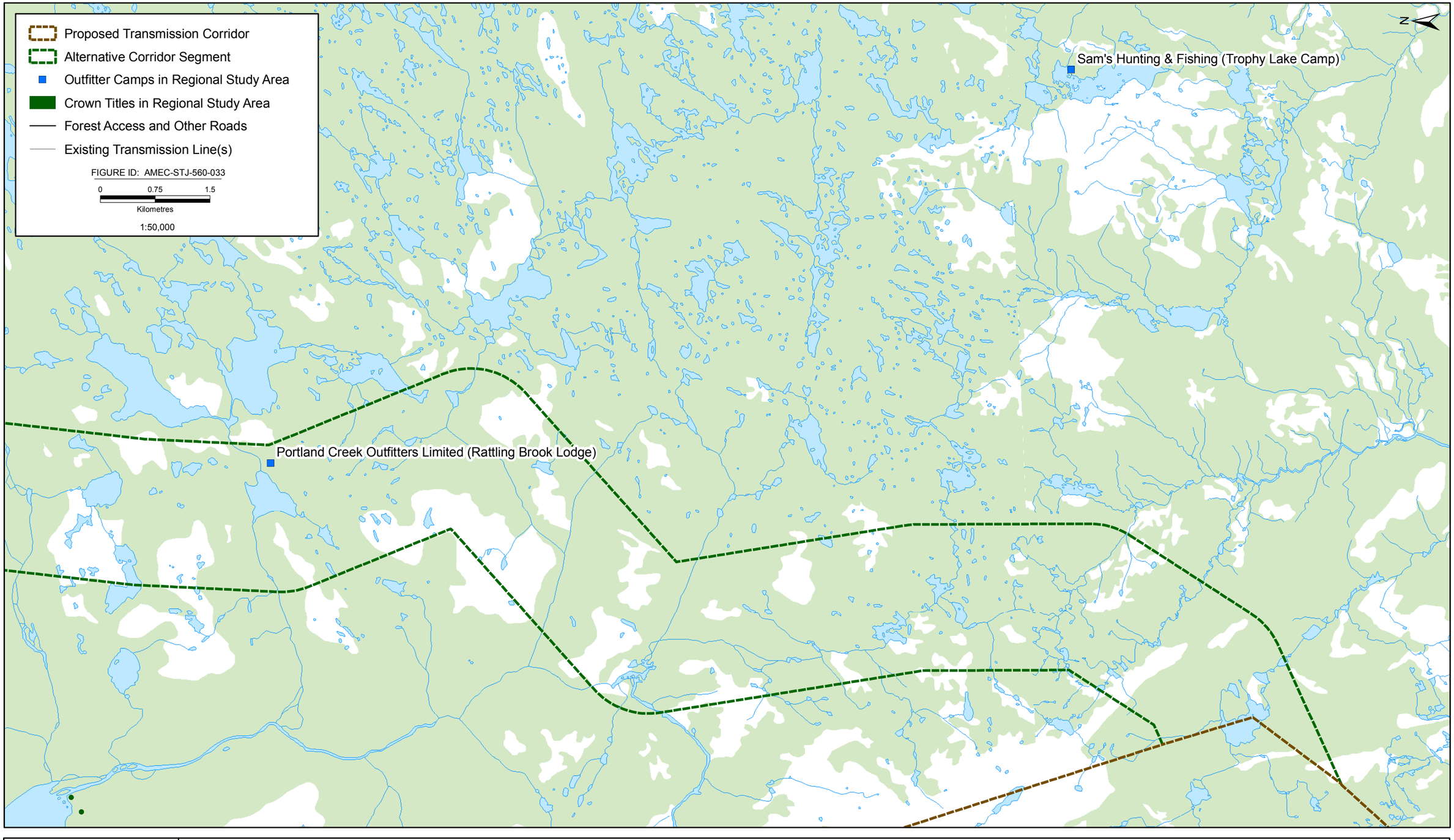

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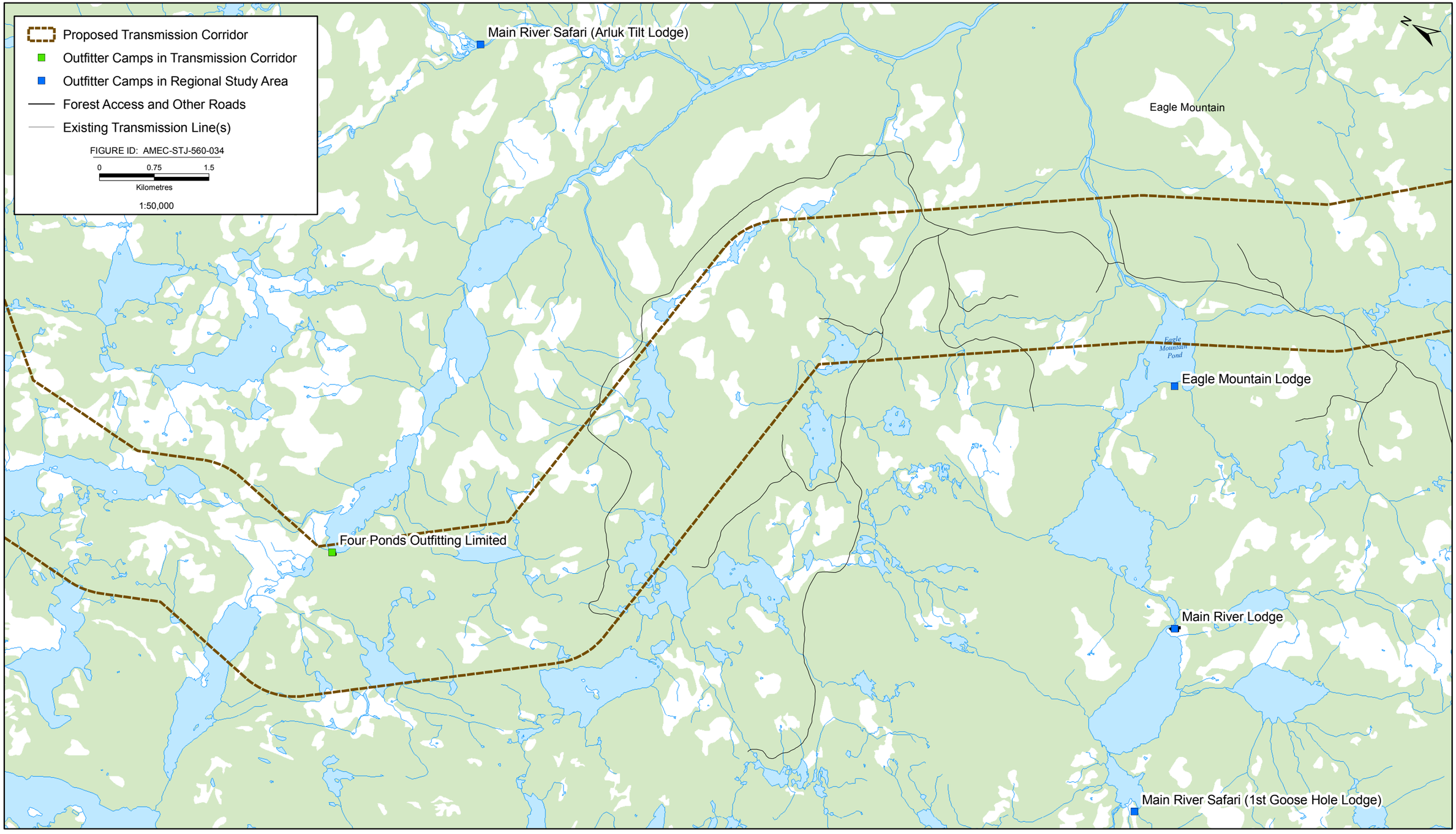

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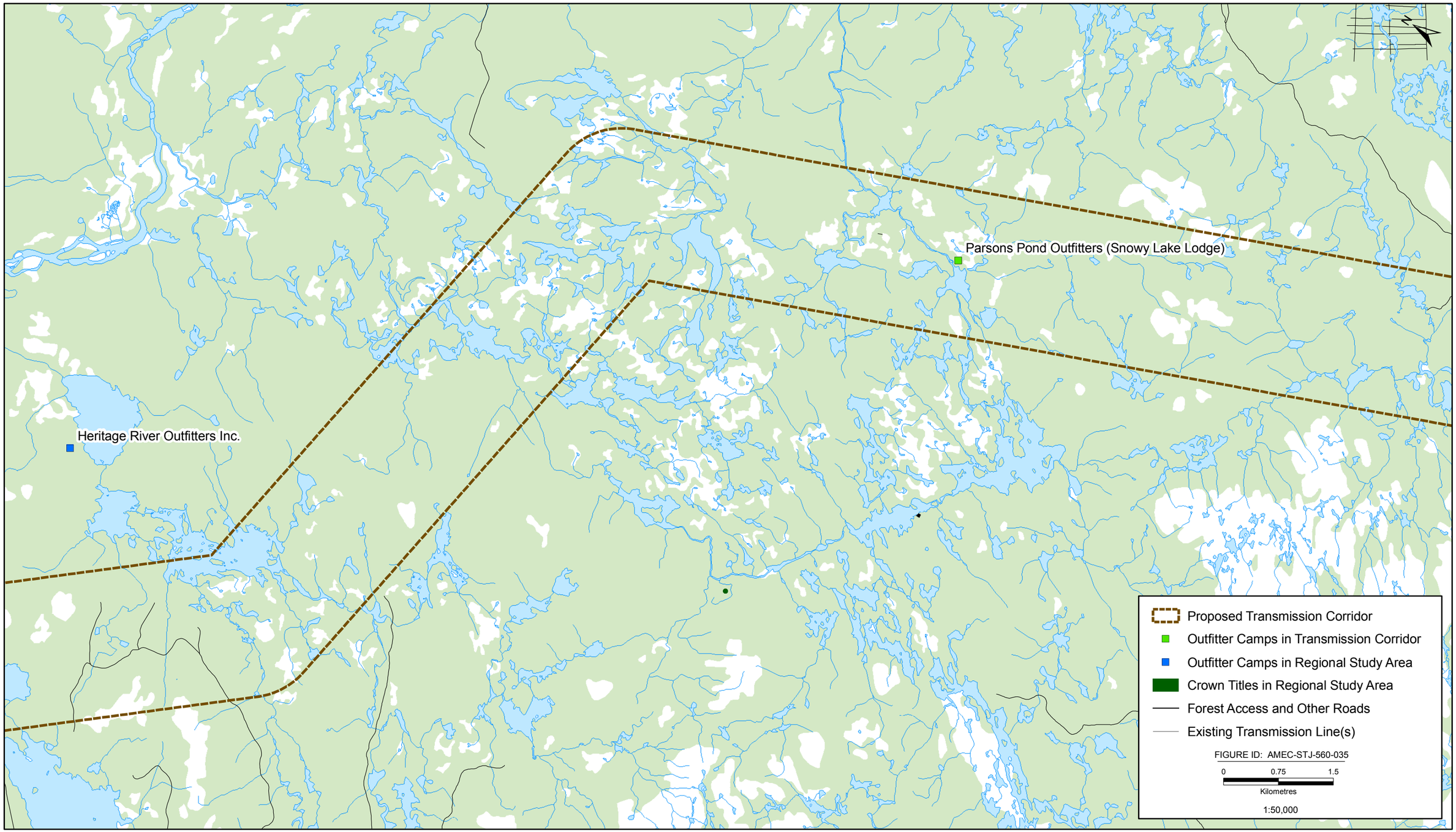

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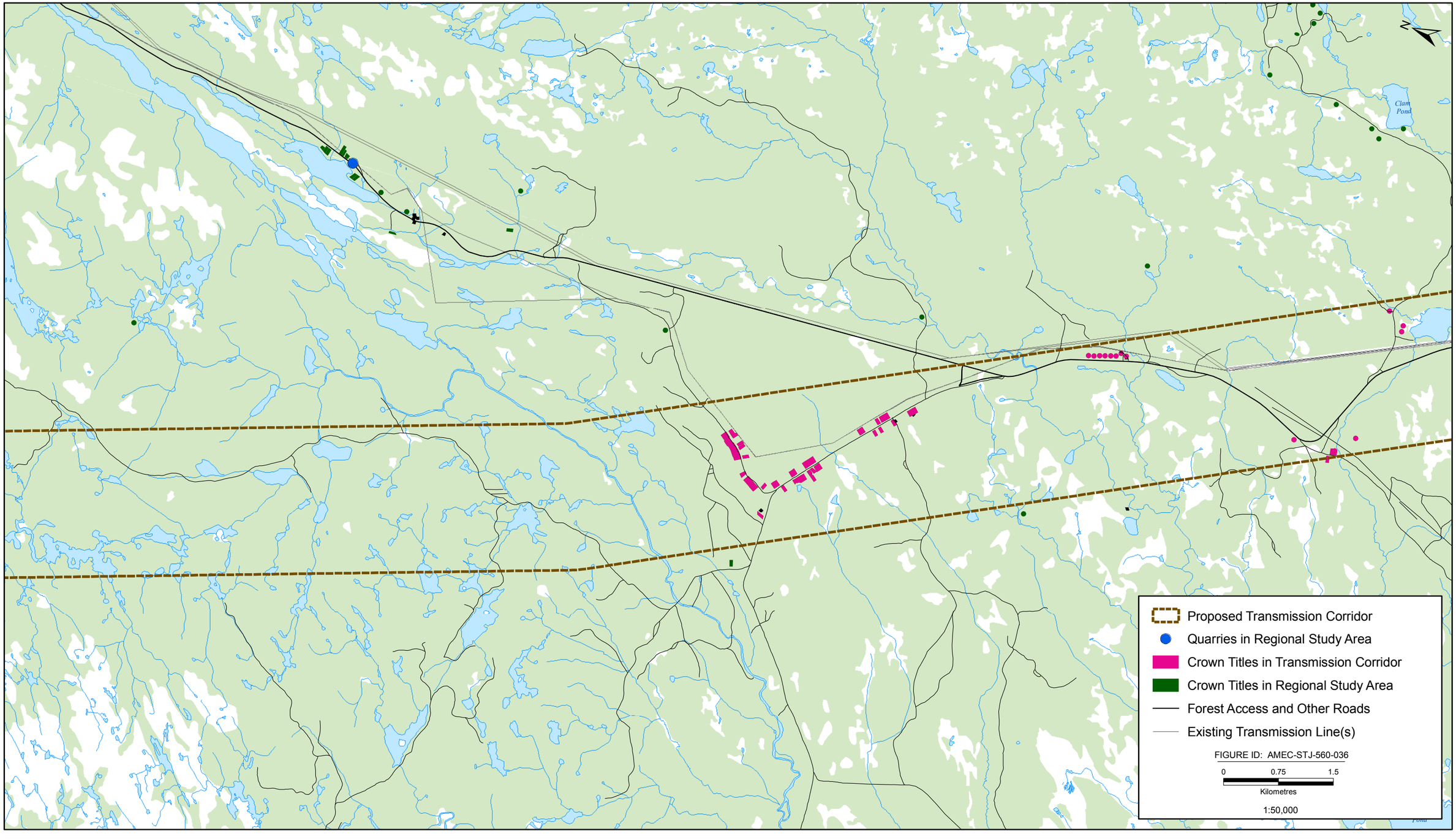

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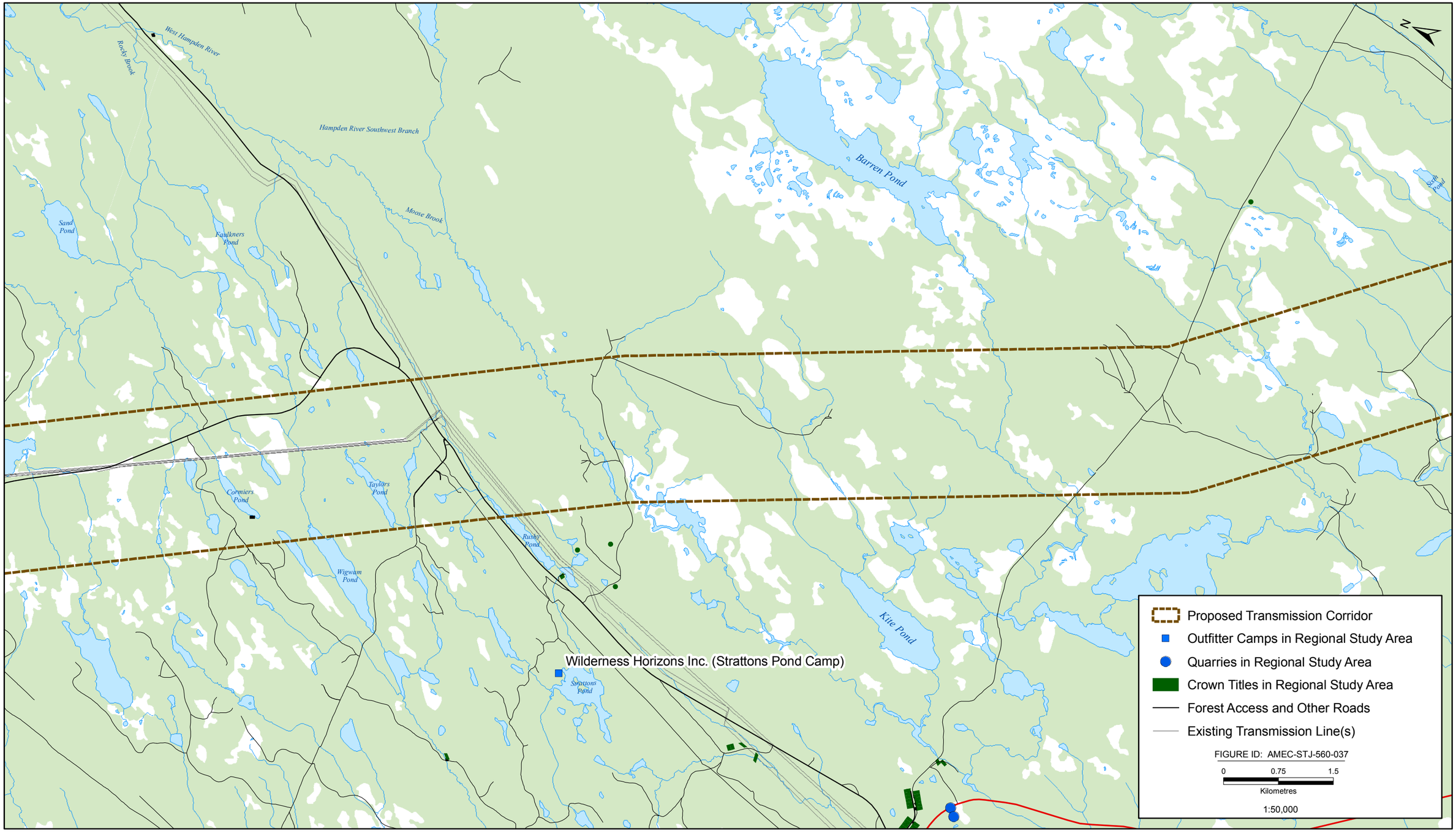

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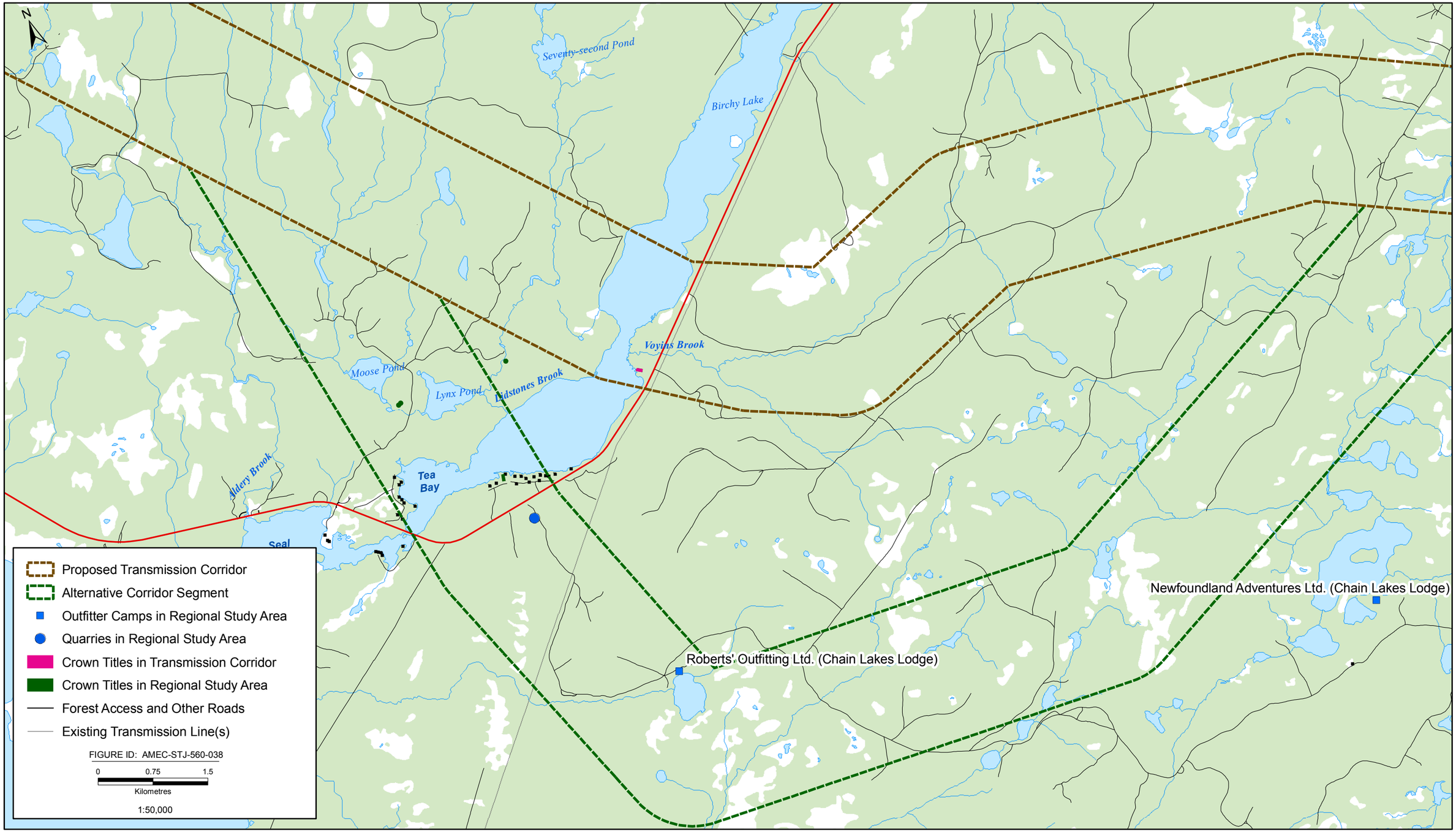

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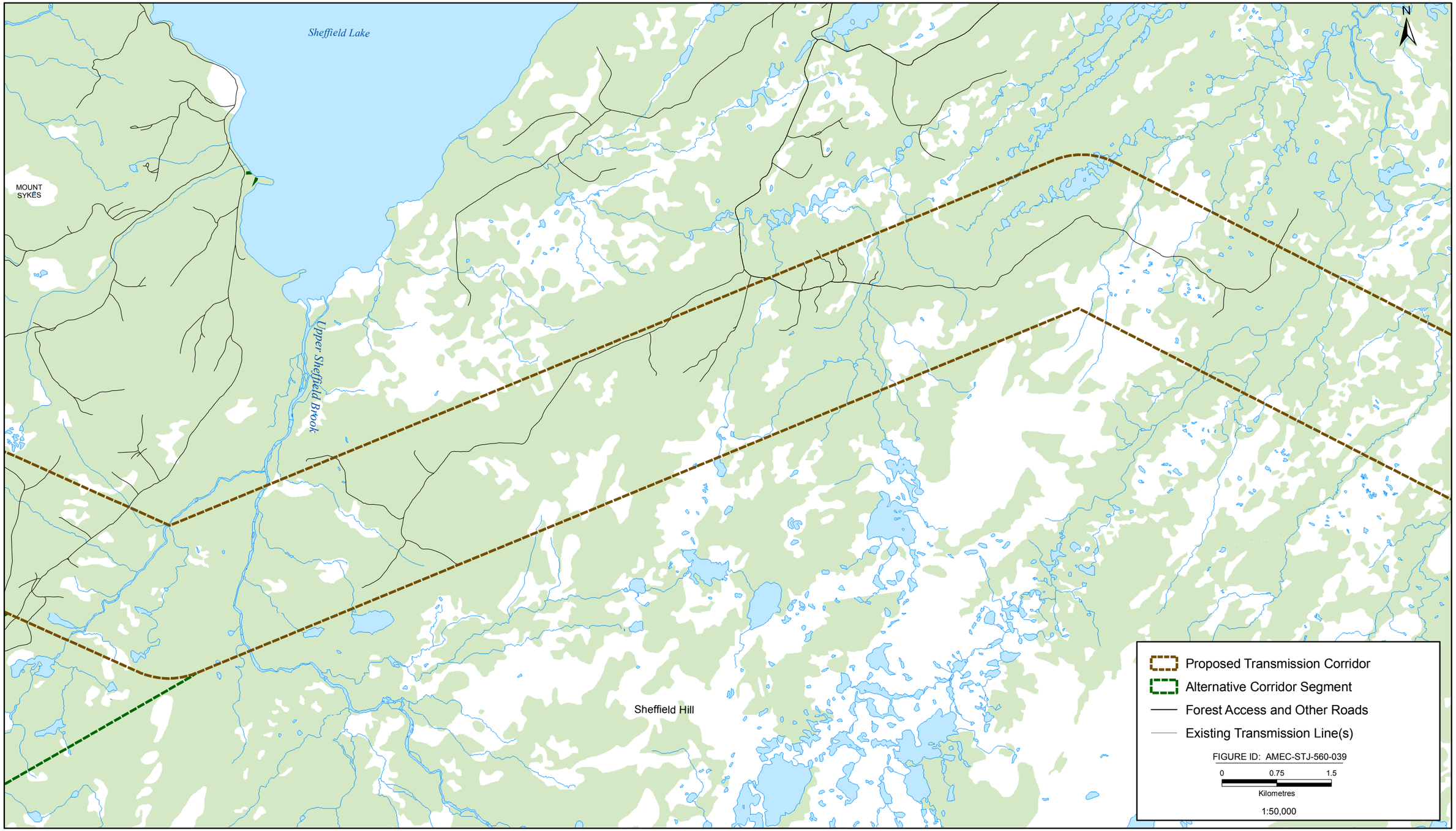

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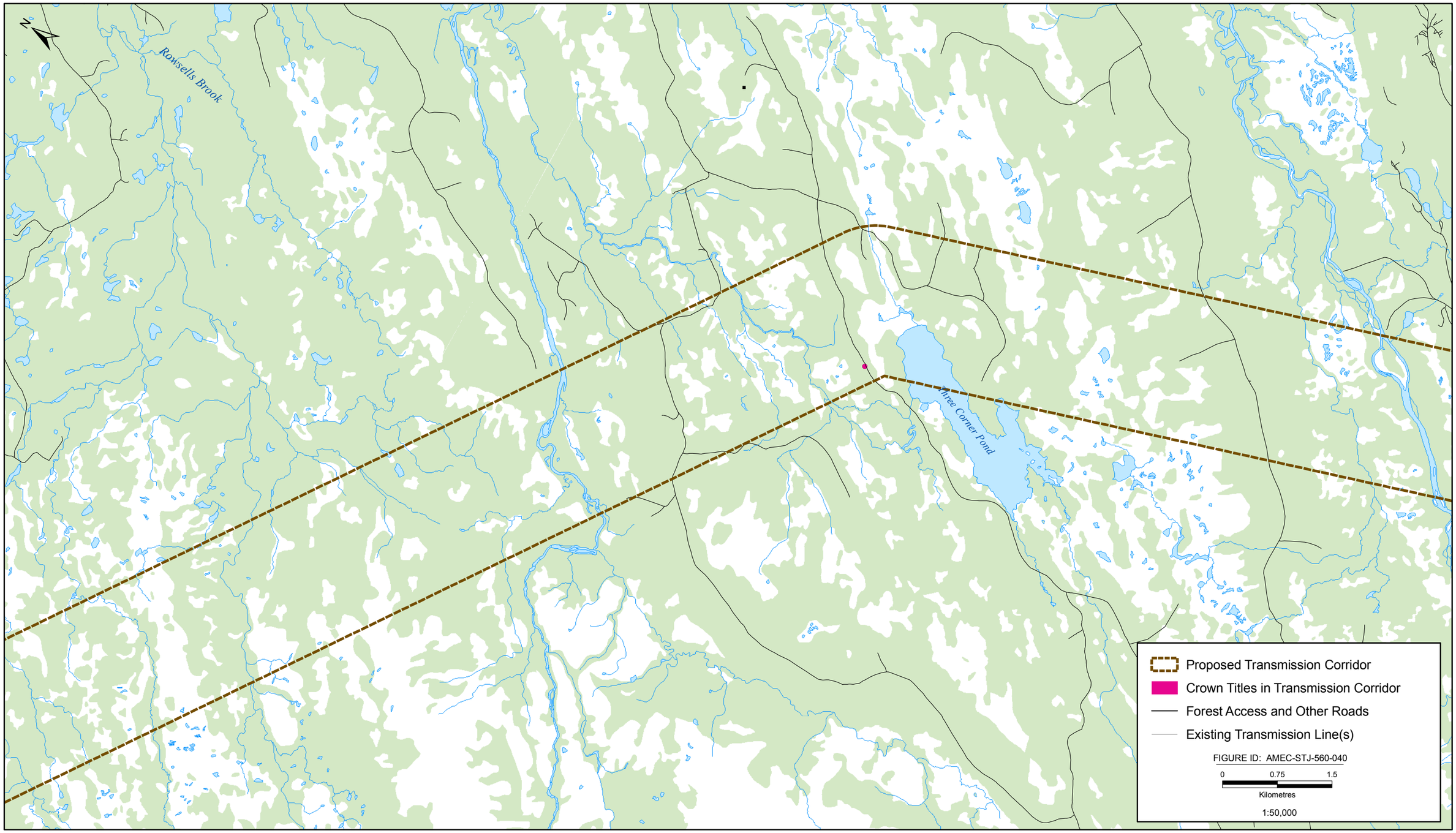

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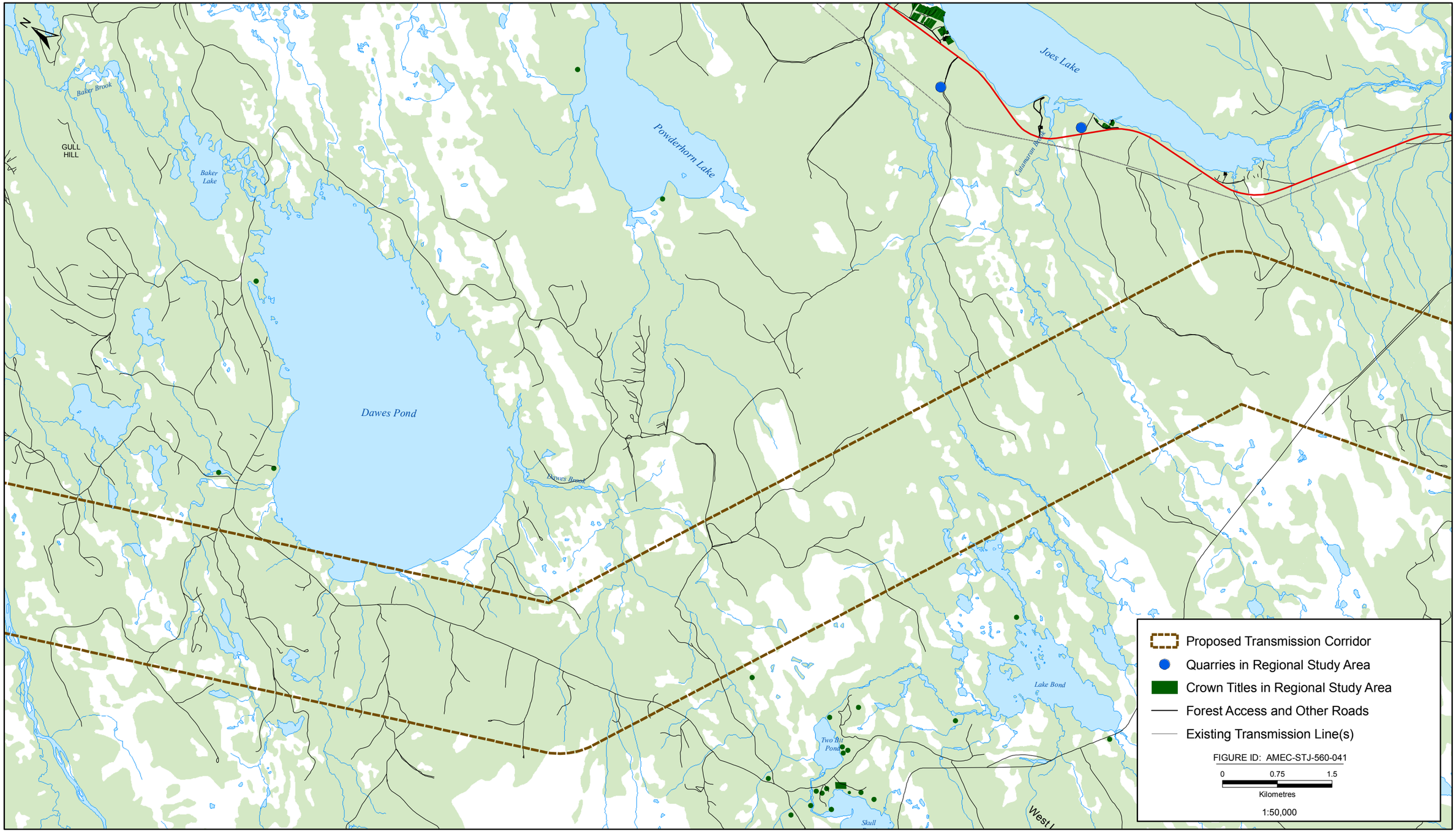

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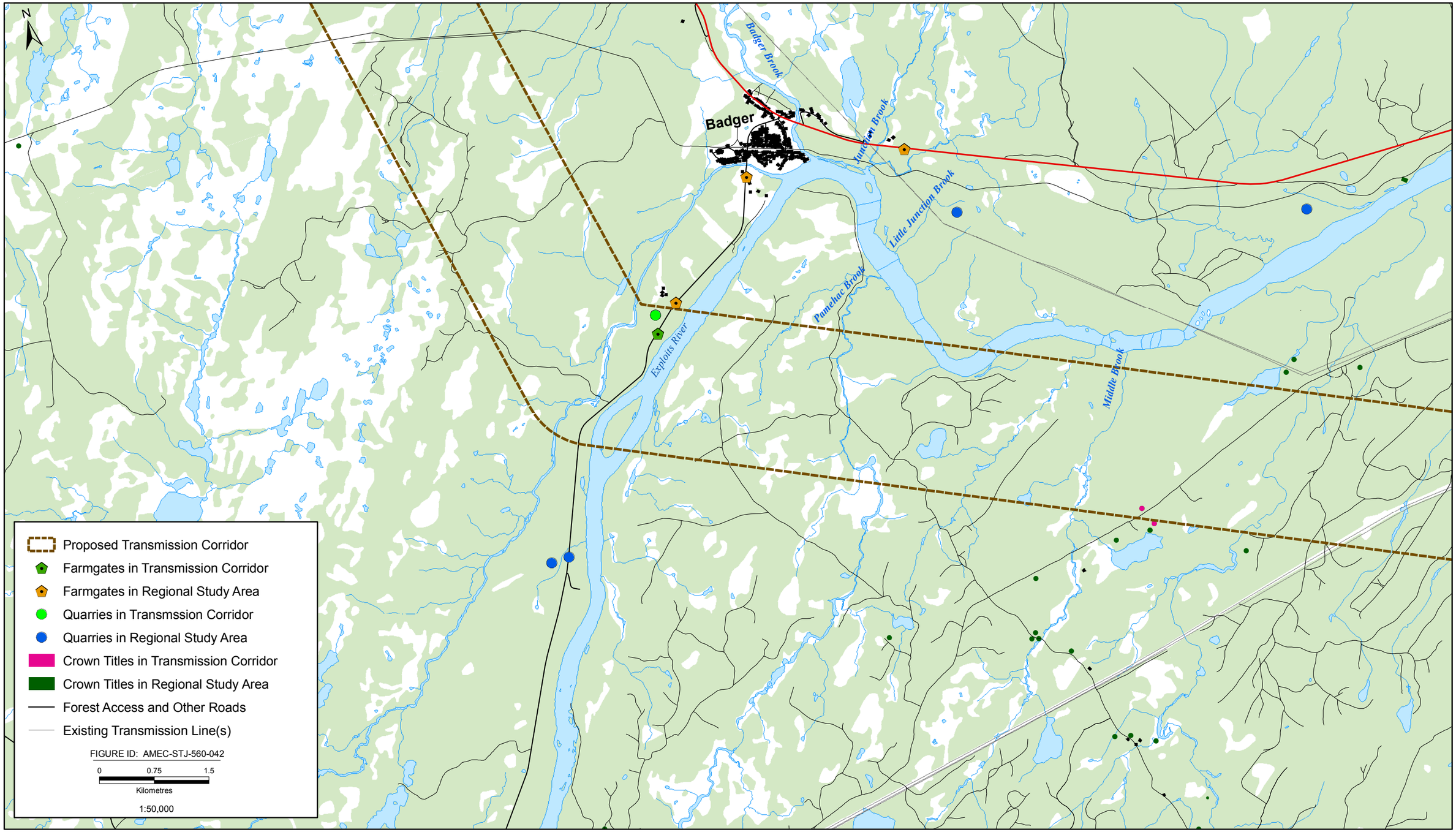

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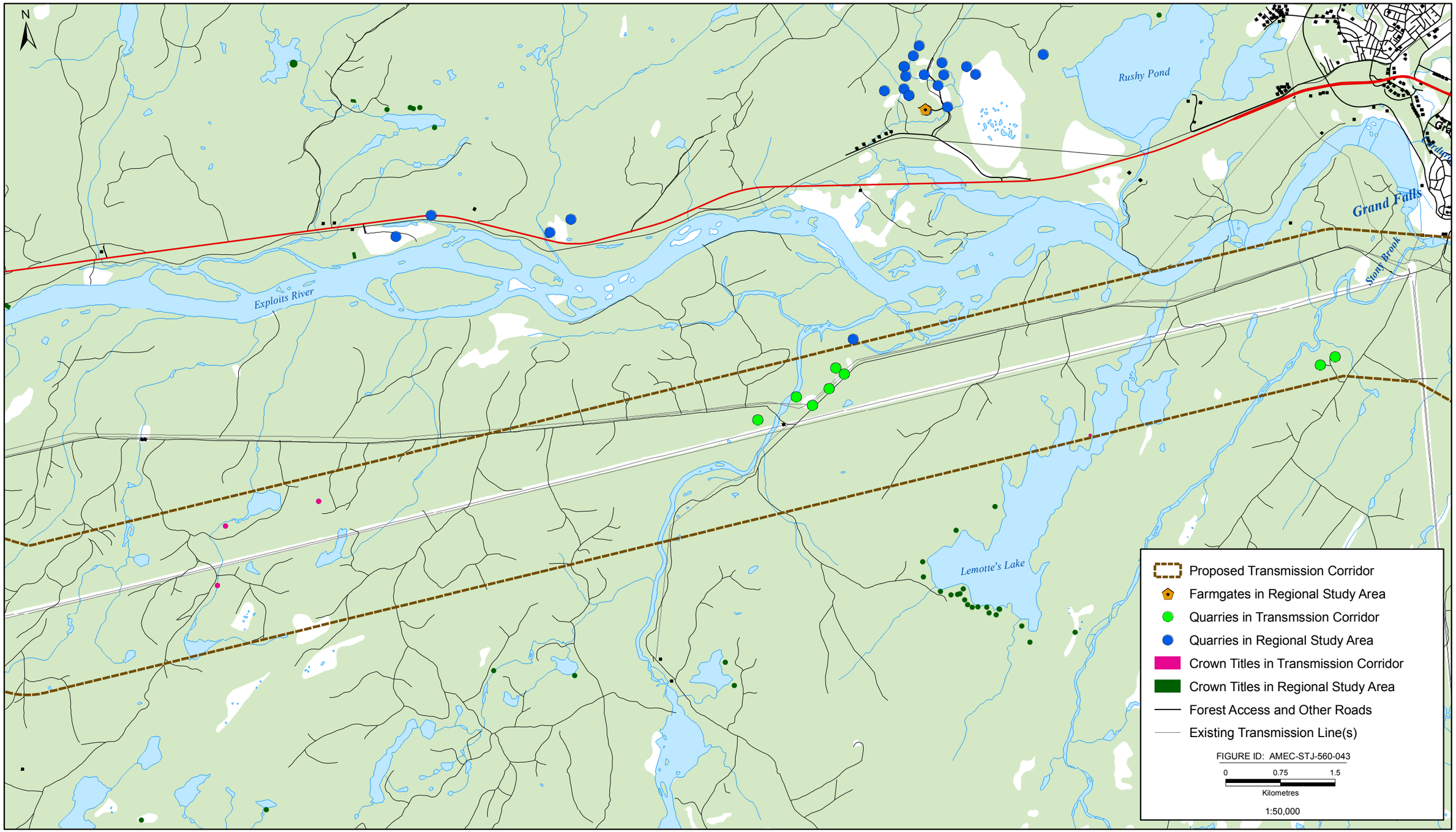

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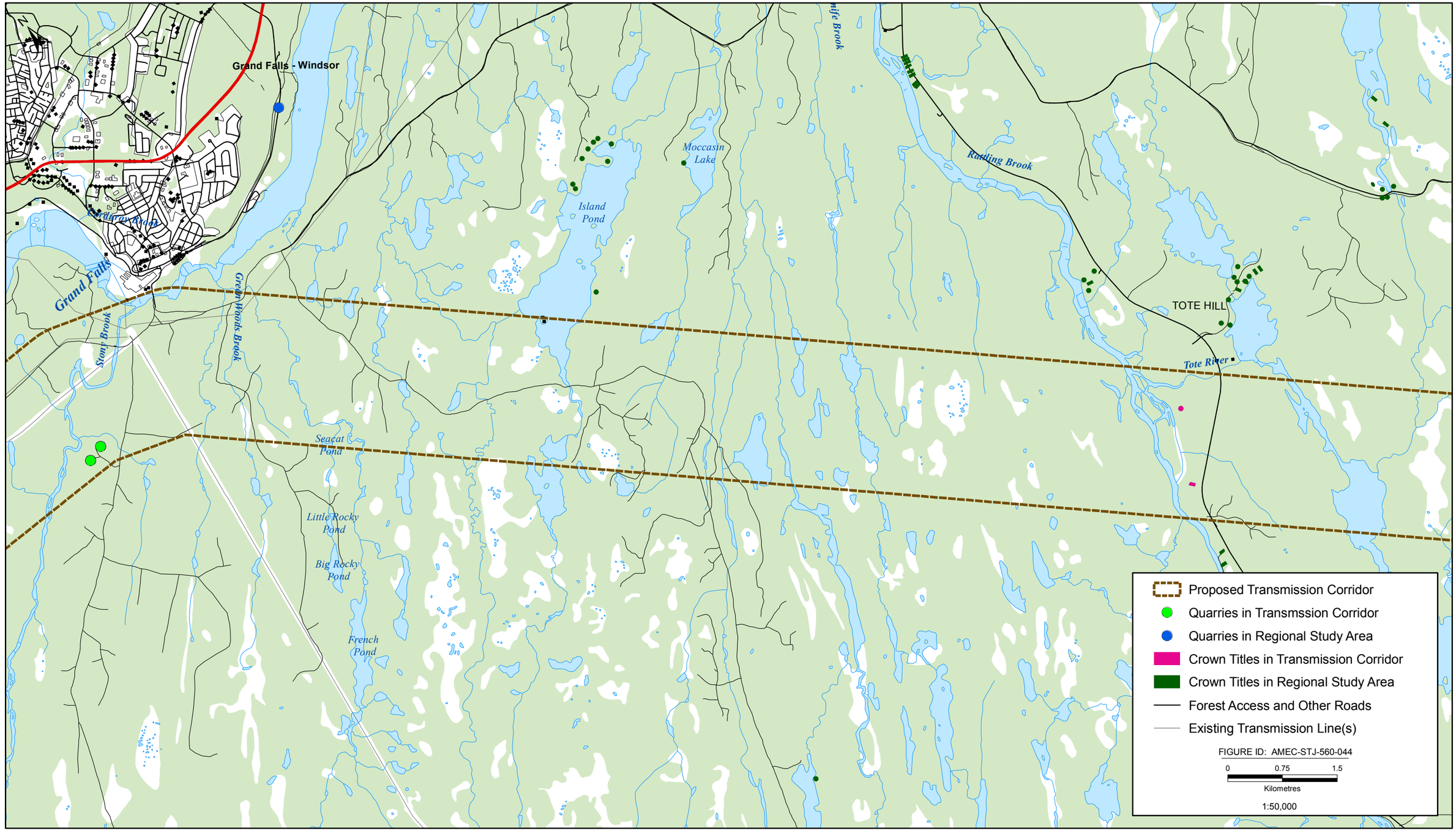

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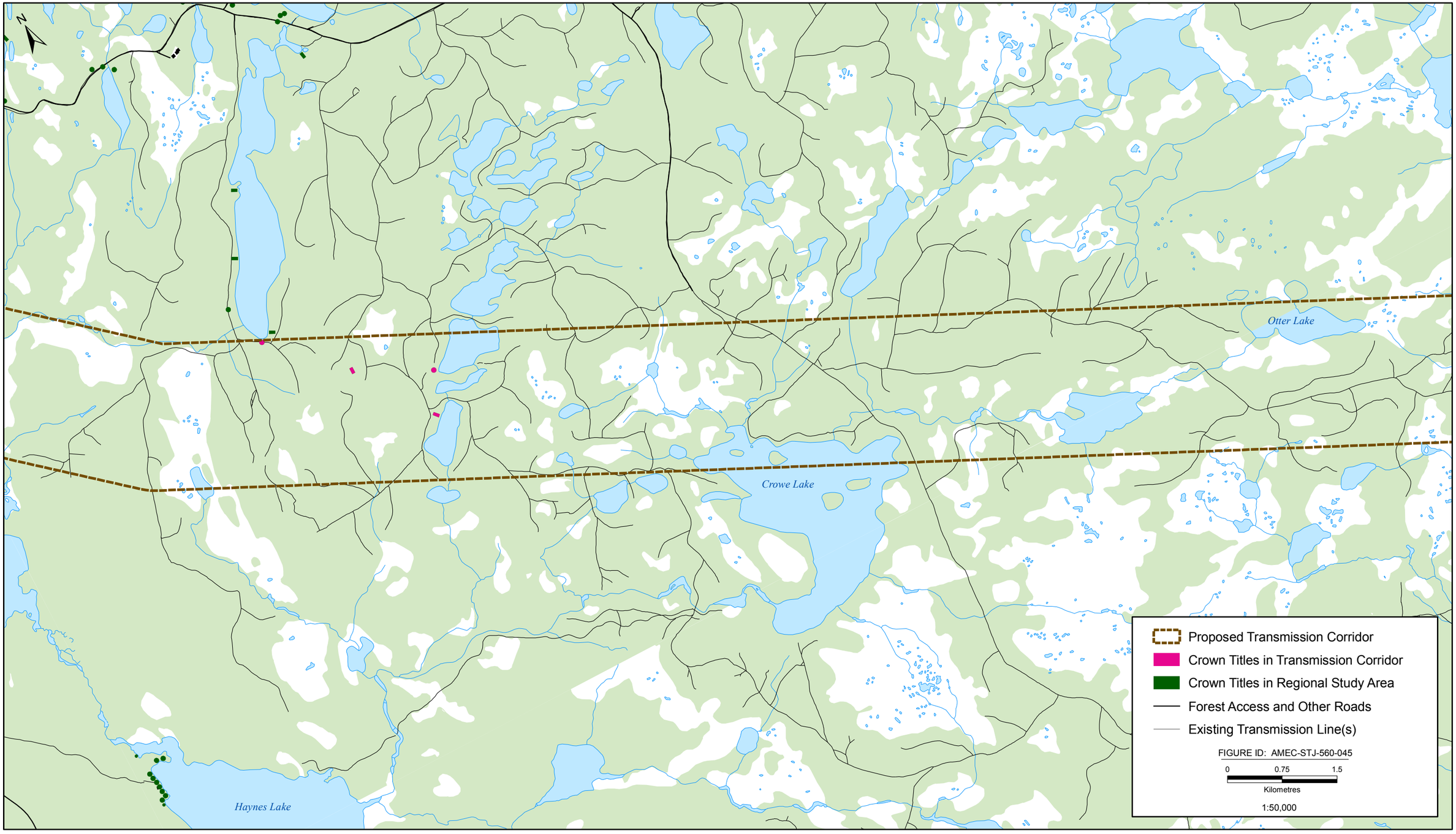

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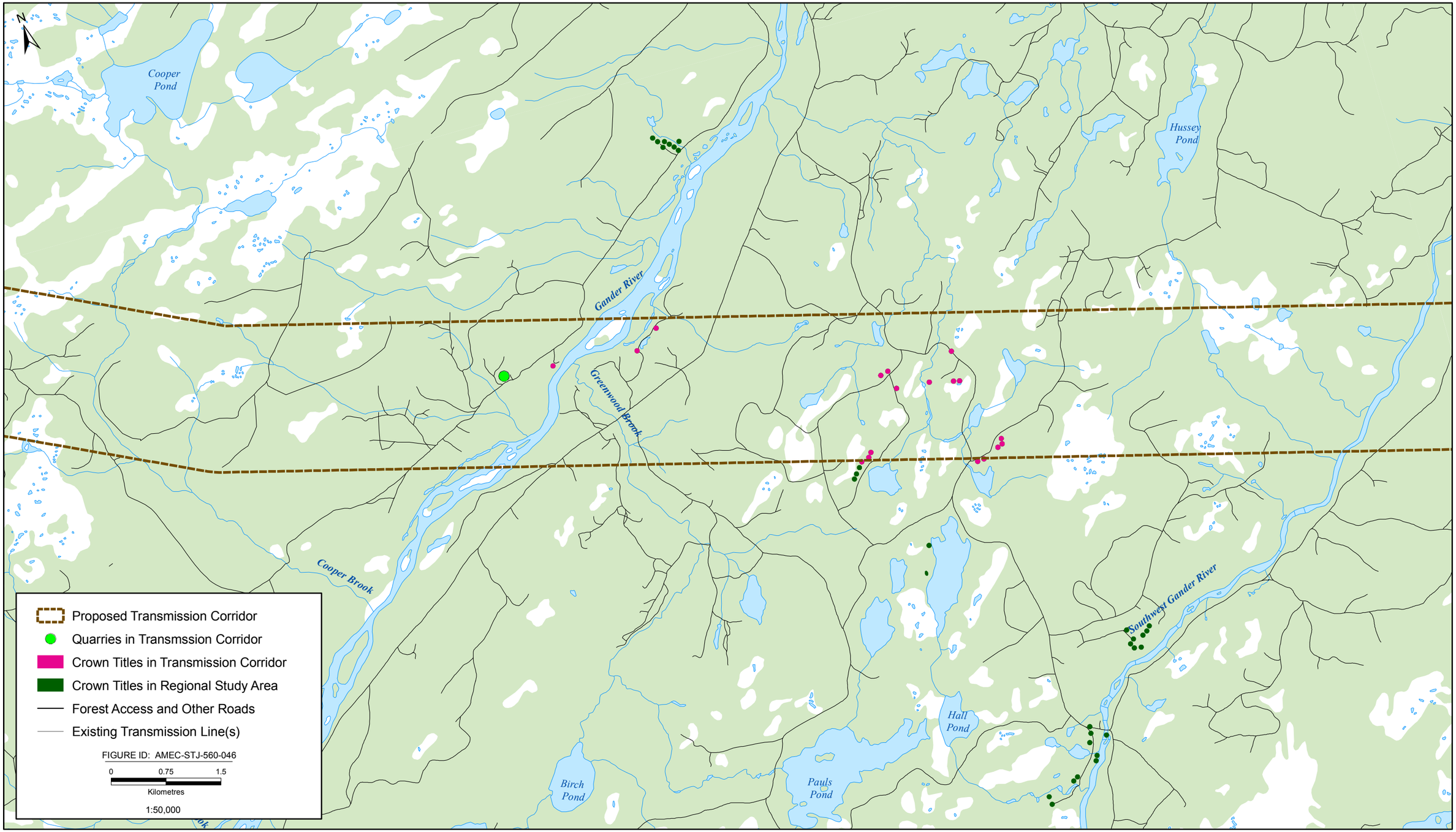

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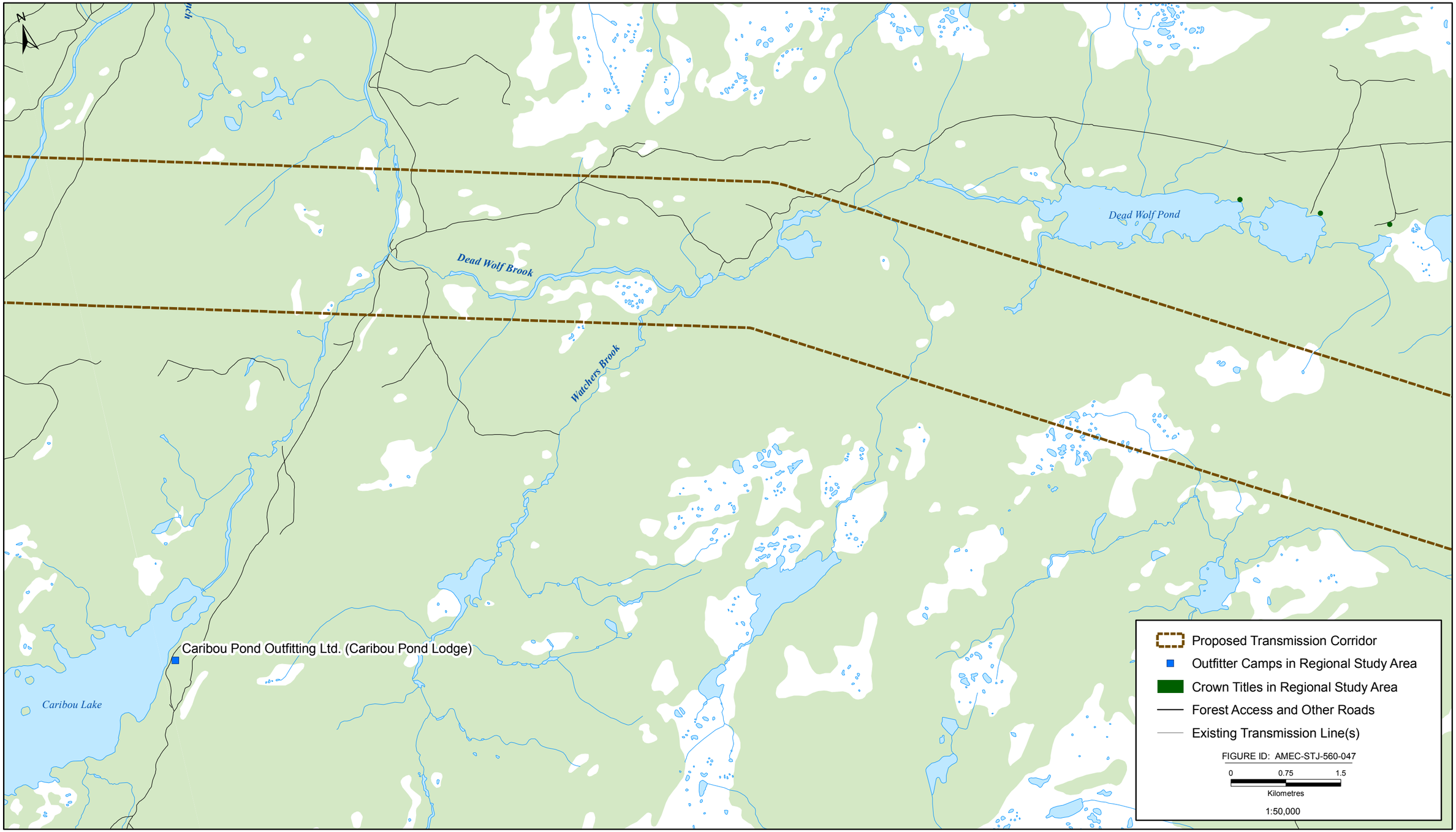

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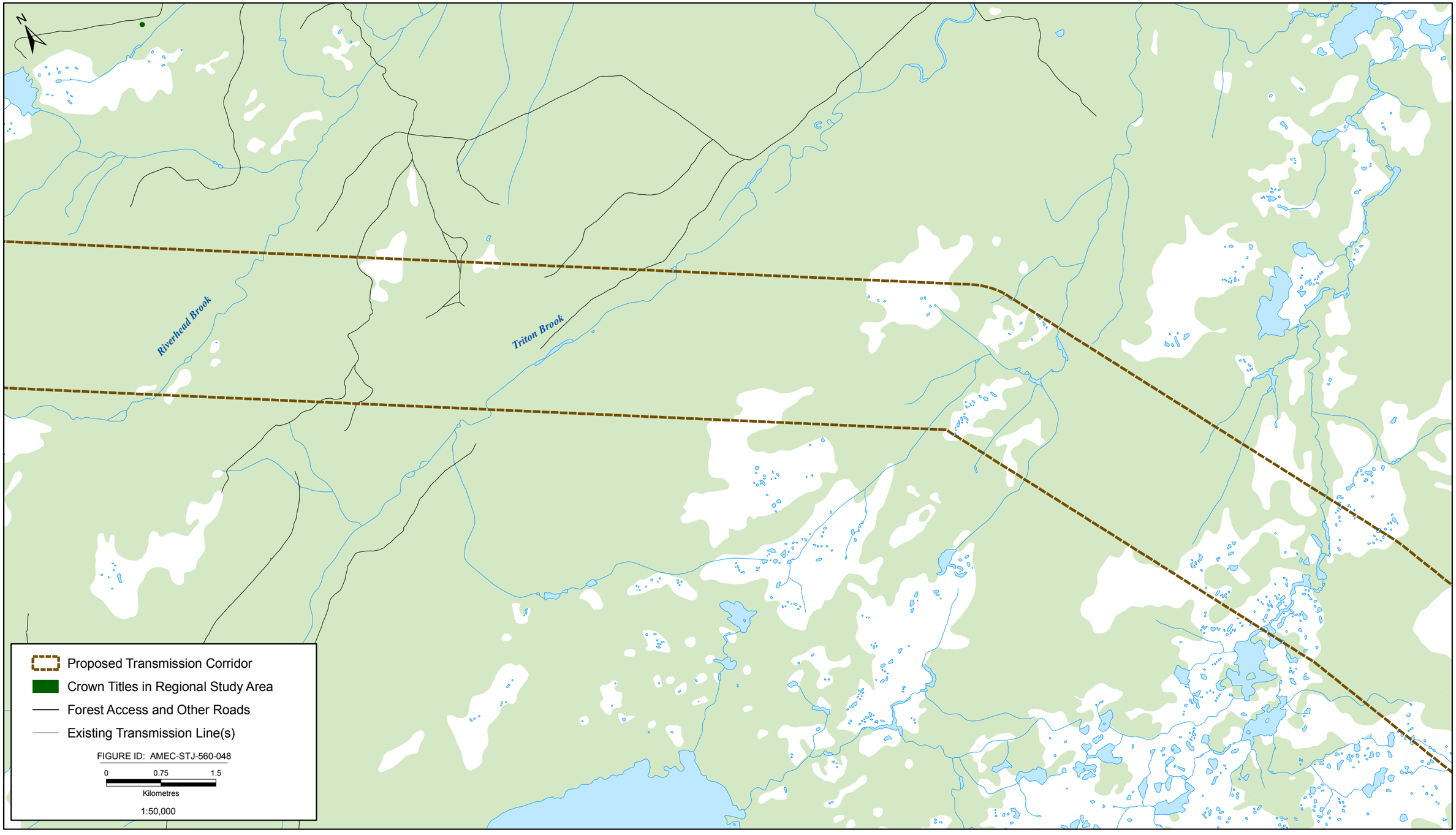

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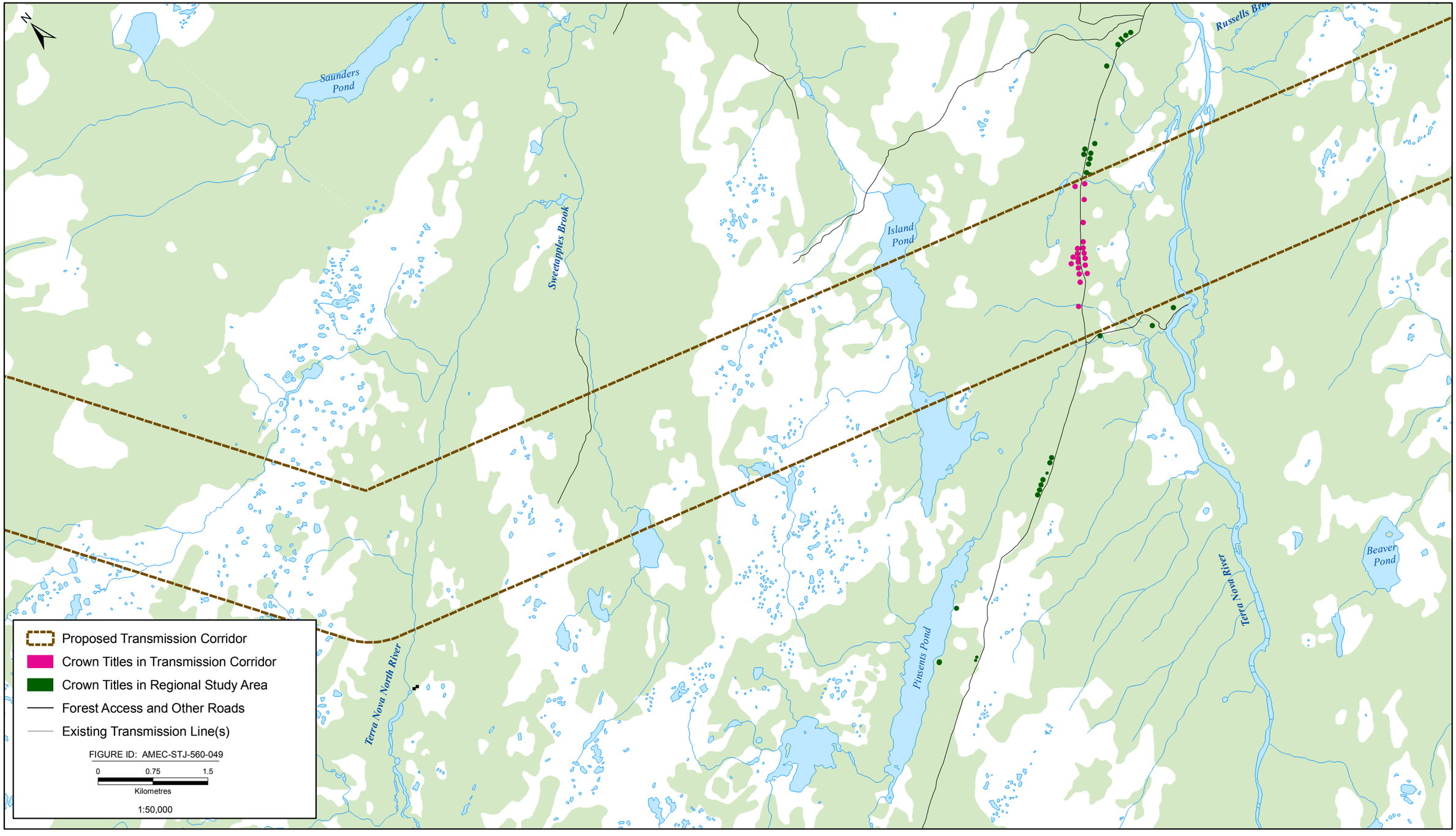

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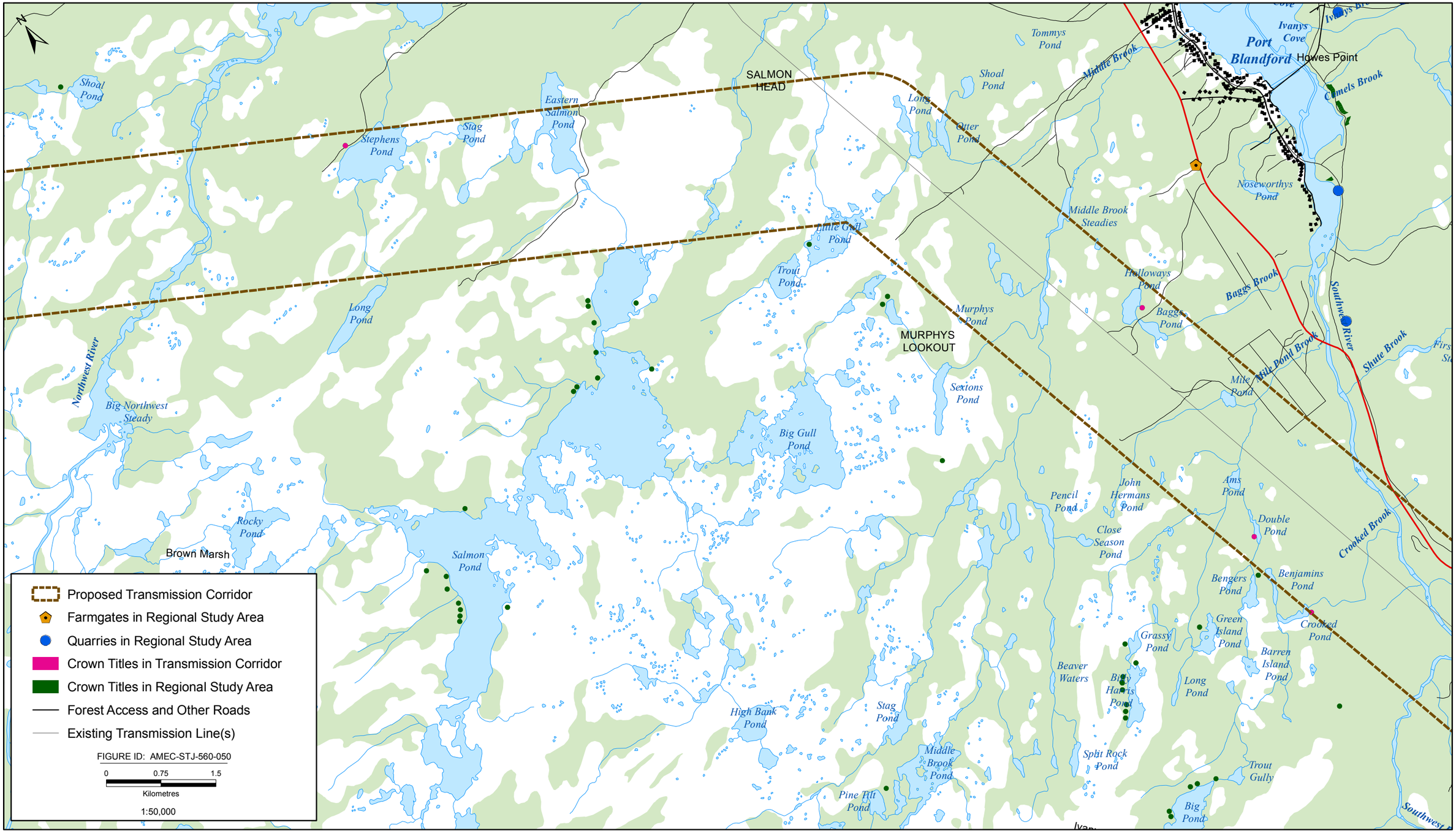

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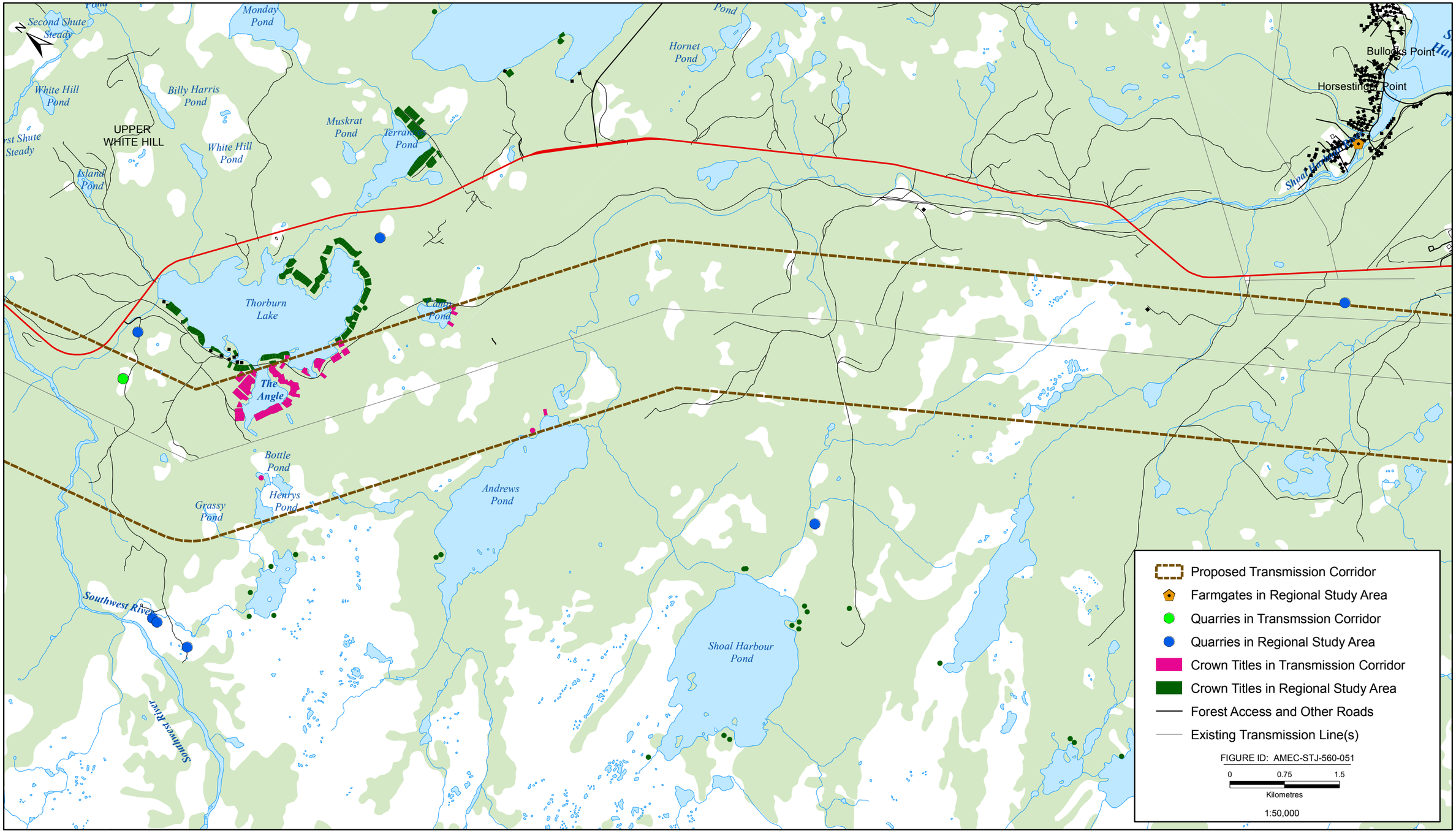

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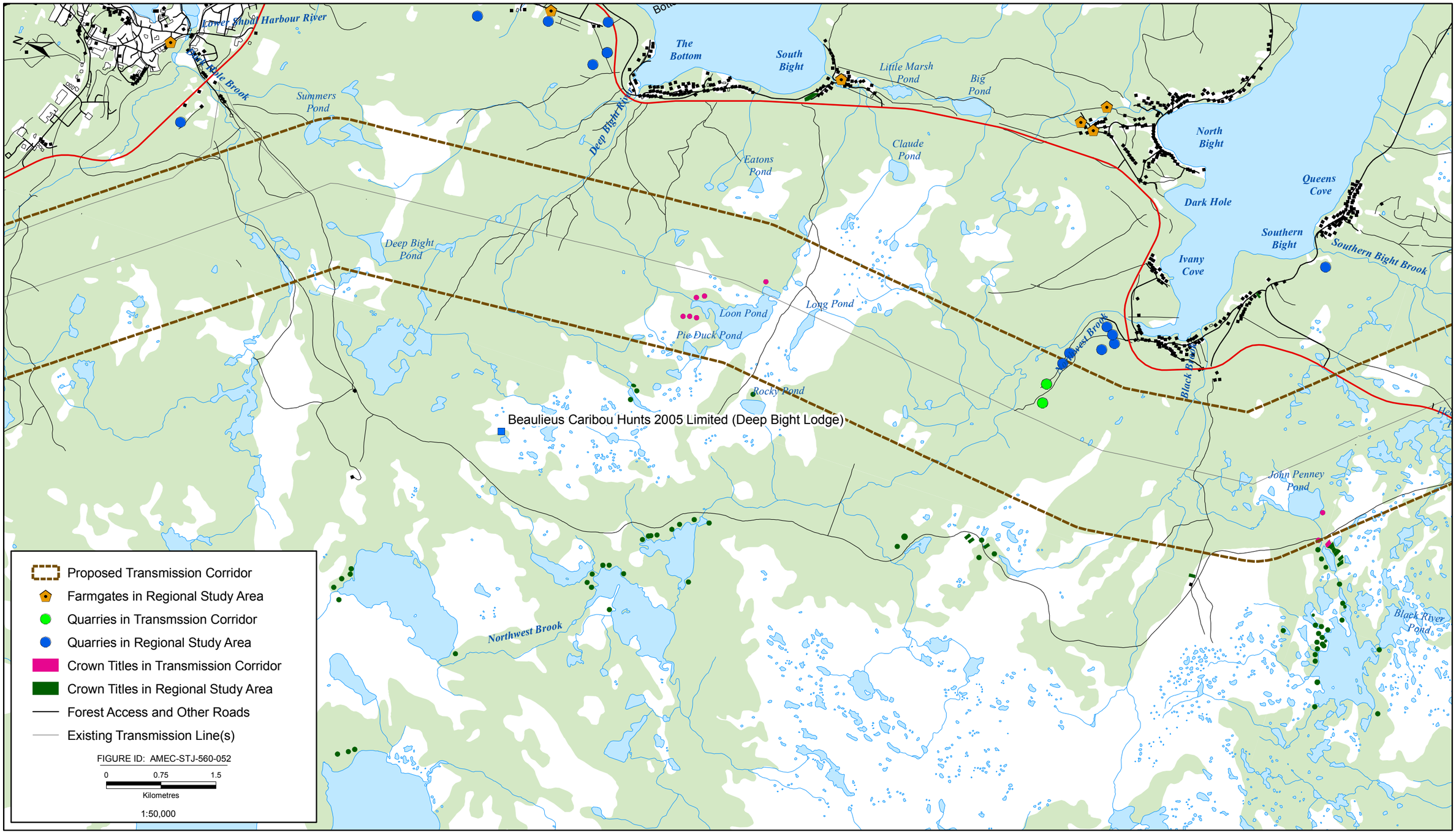

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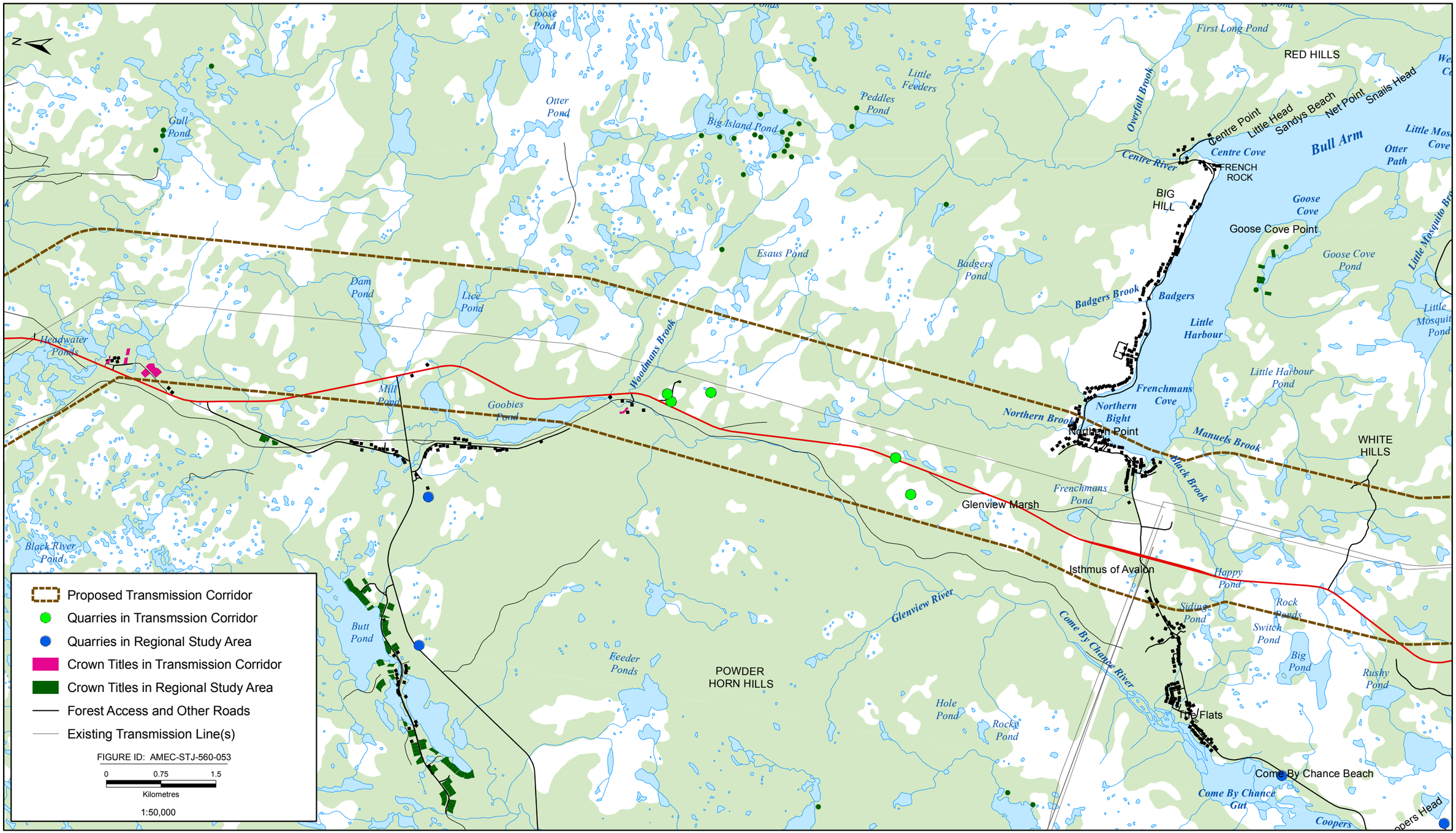

FIGURE 53

Labrador - Island Transmission Link: Select Land Uses

FIGURE 54

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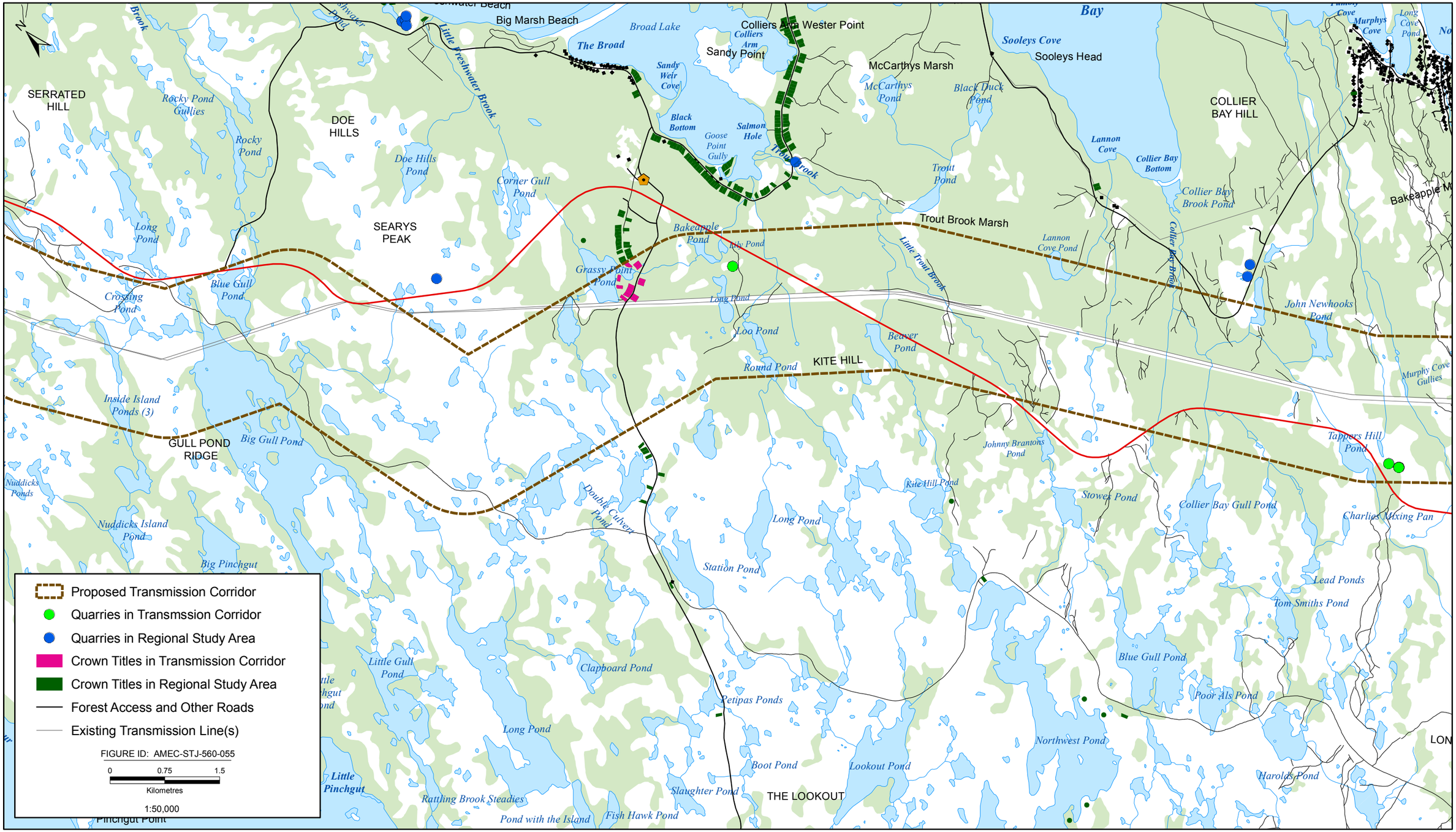

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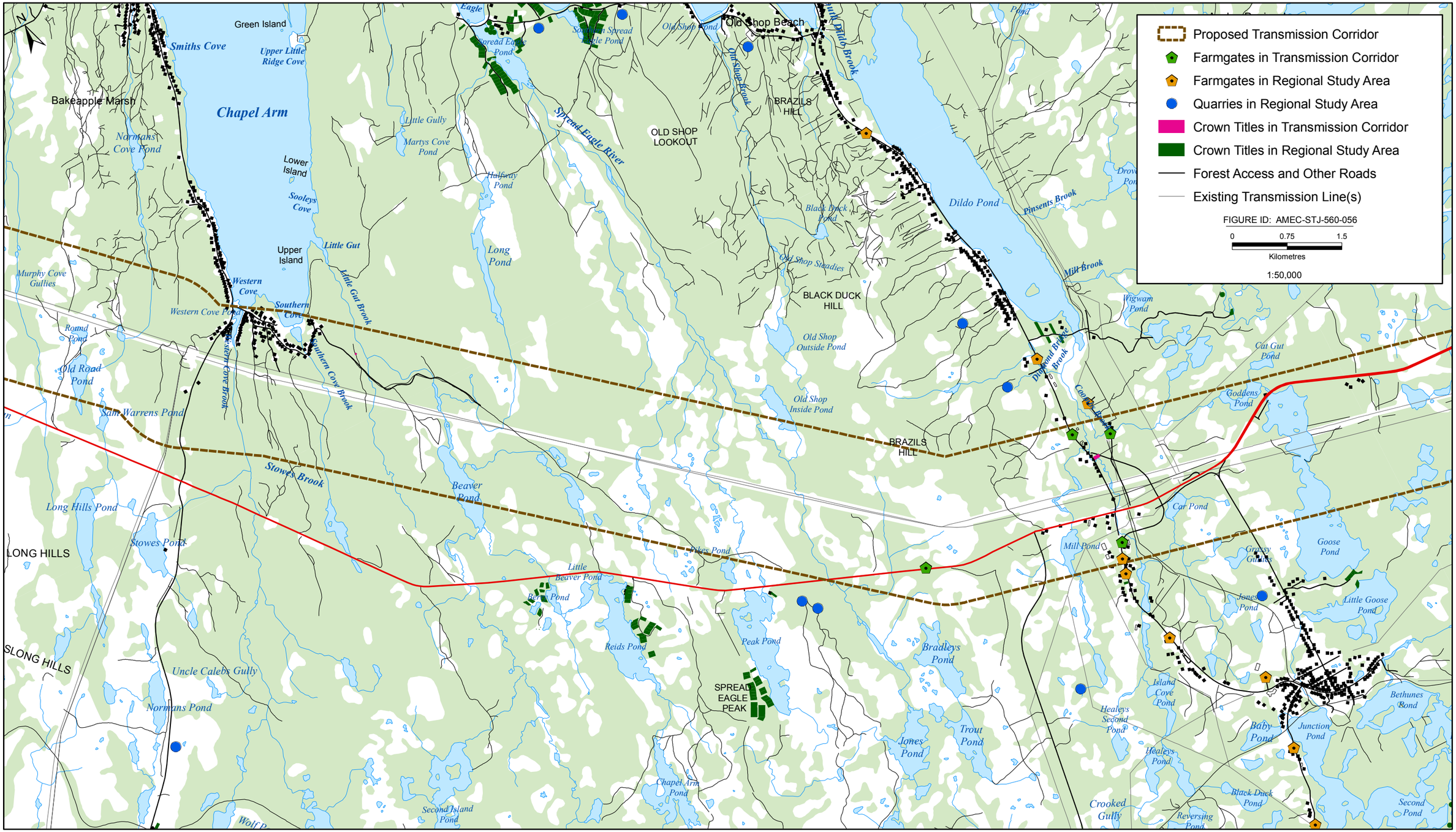

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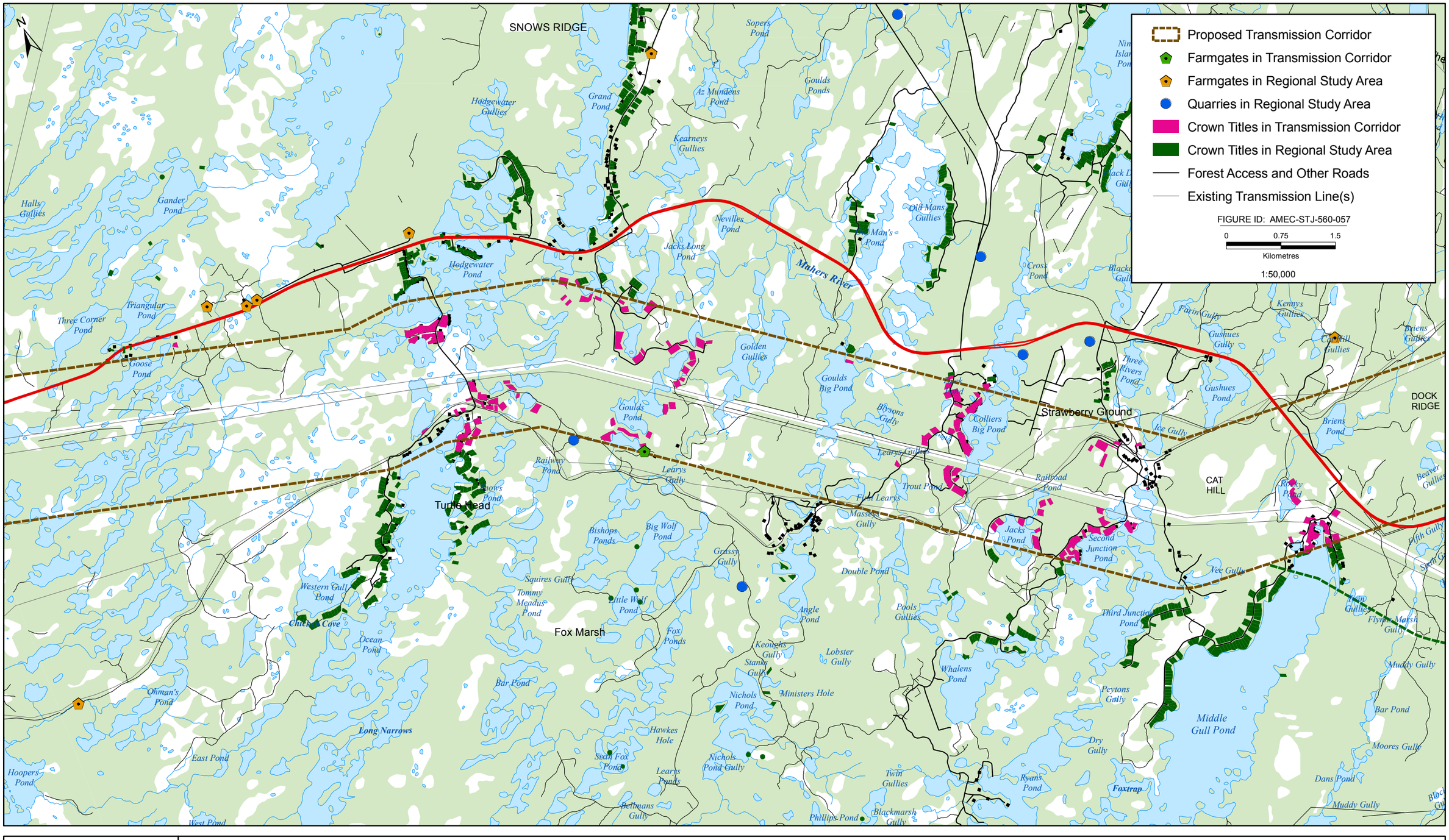


FIGURE 57

Labrador - Island Transmission Link: Select Land Uses

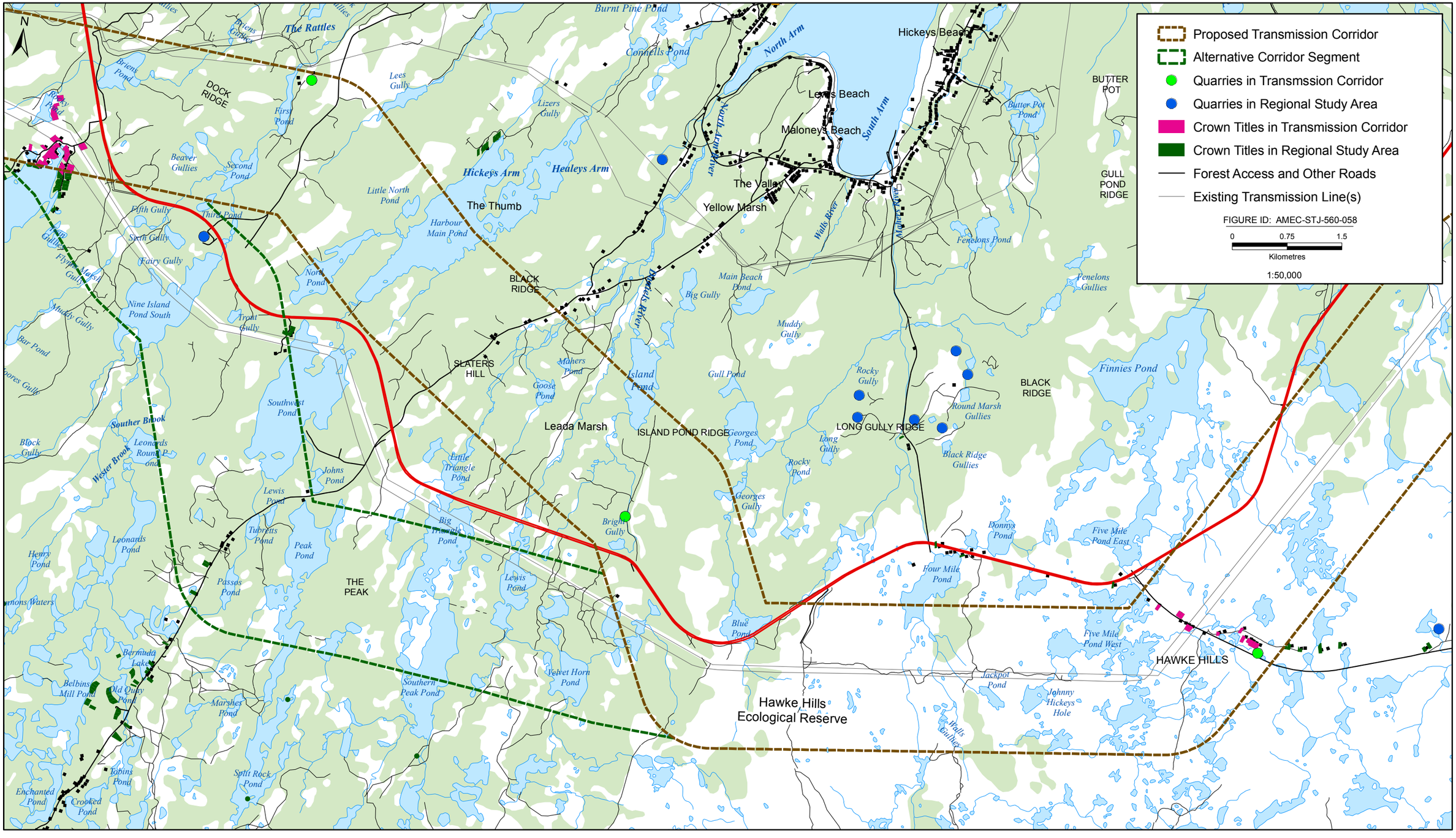


FIGURE 58

Labrador - Island Transmission Link: Select Land Uses

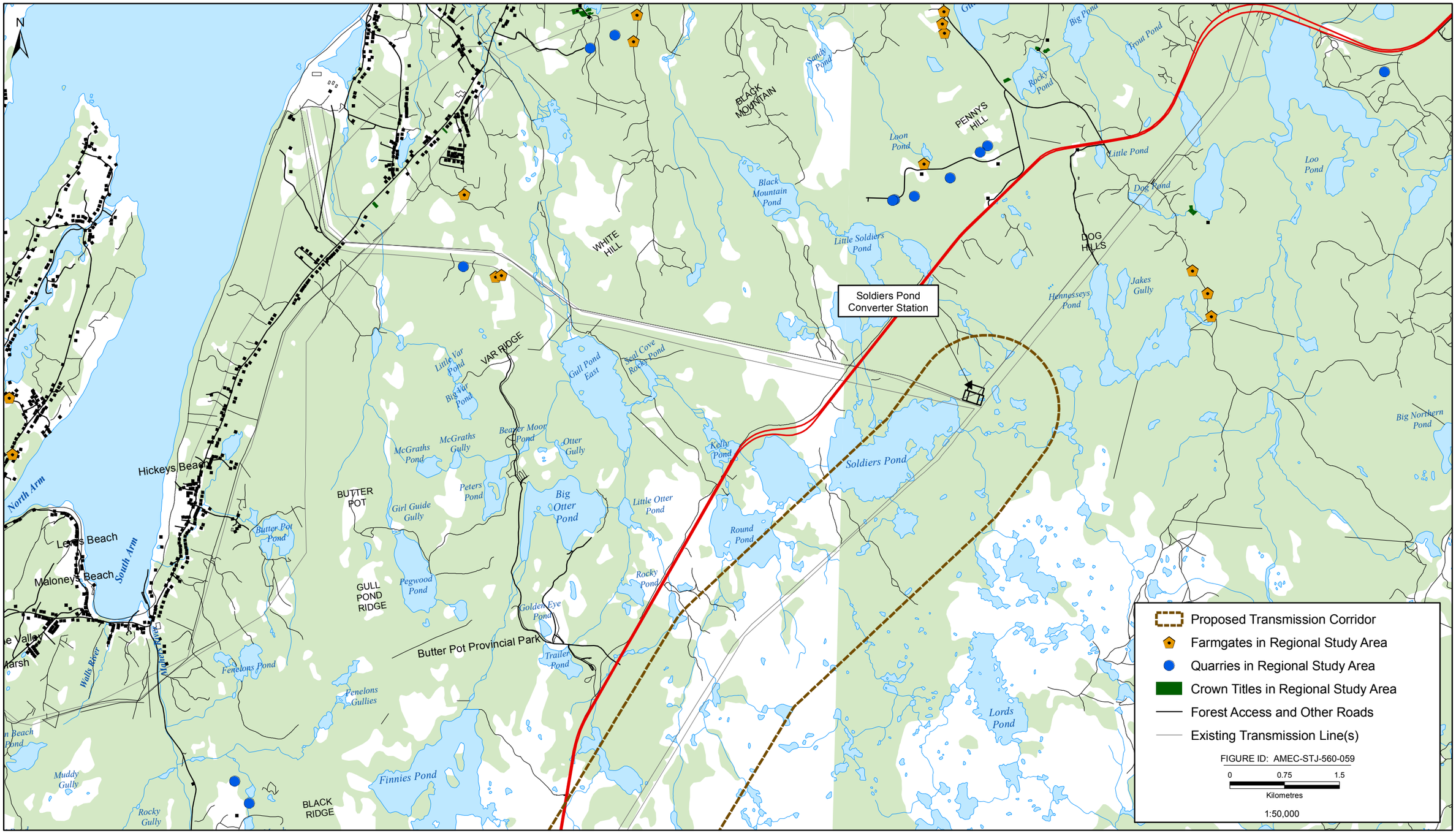


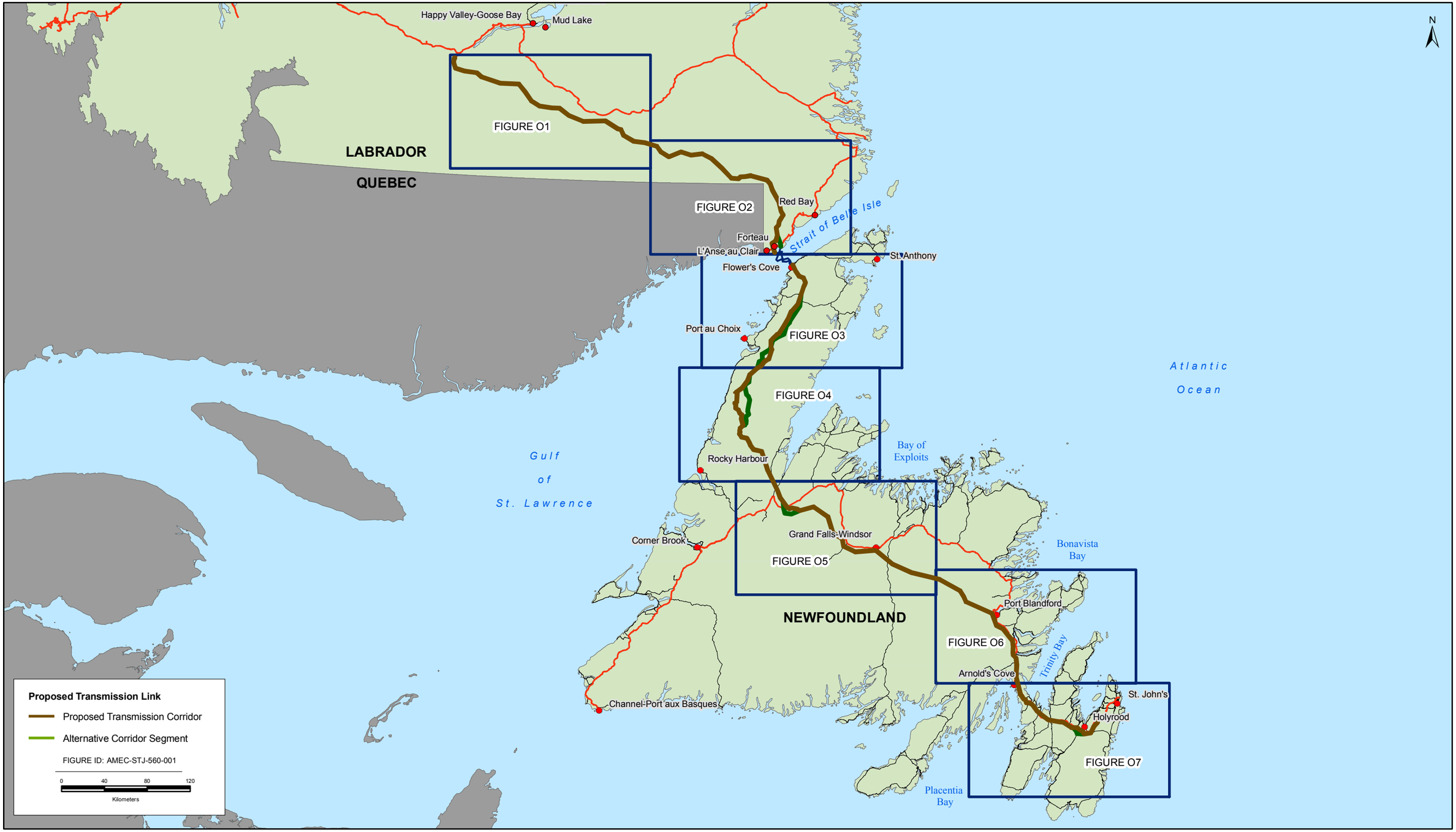
FIGURE 59

Labrador - Island Transmission Link: Select Land Uses

APPENDIX C

Map Atlas: Forestry Access Roads

The following provides a map set illustrating the Labrador-Island Transmission Link corridor in relation to the existing network of forest access roads in Newfoundland and Labrador. Information on the current forest access road network in the province was obtained from Department of Natural Resources, Forest Services Division. The Index Map provides a guide to the various map sheets which together extend across the area of the proposed and alternative transmission corridors.



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Index A

Index Map - Forest Access Roads

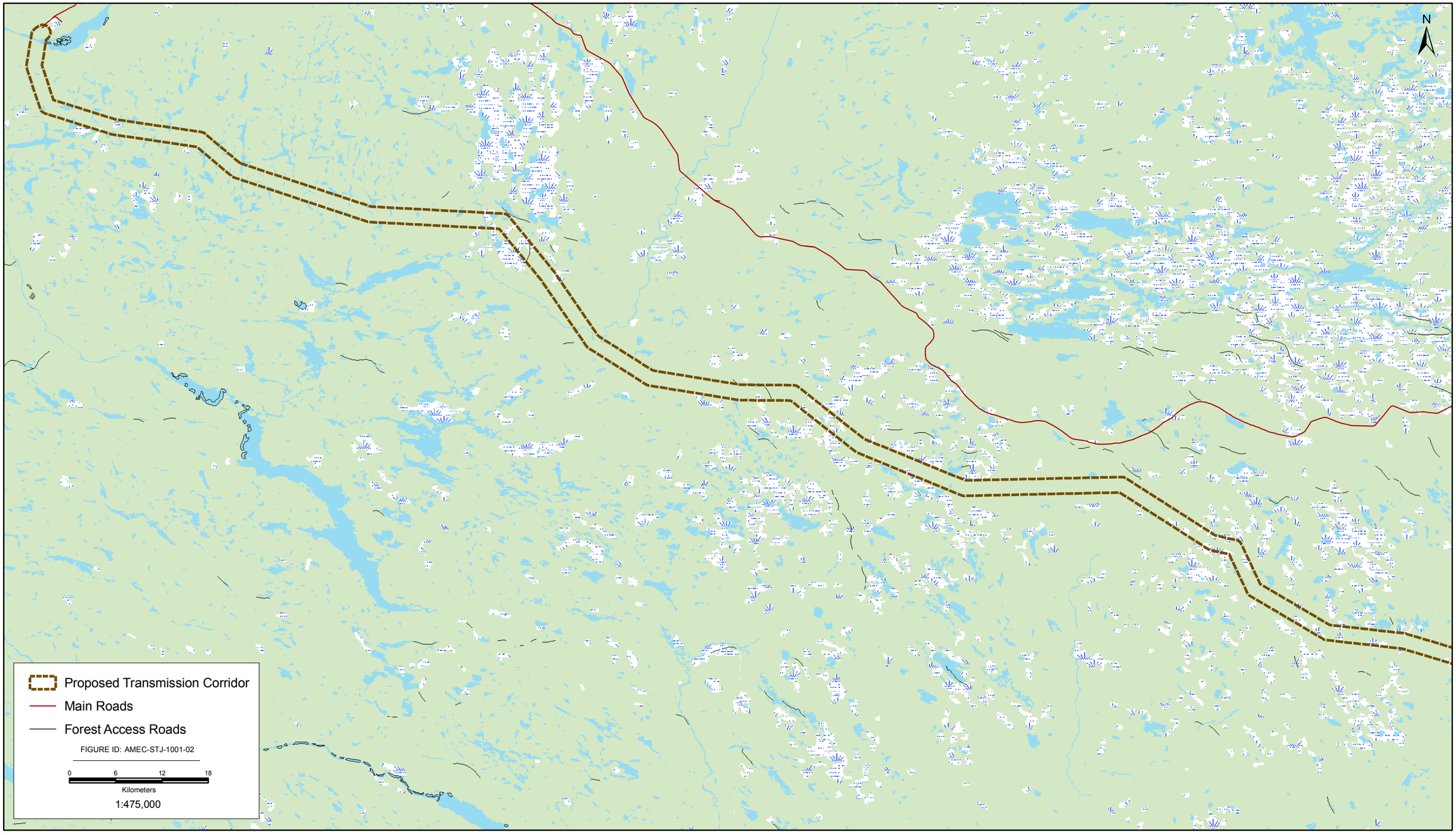

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Figure 01

Labrador - Island Transmission Link: Forest Access Roads

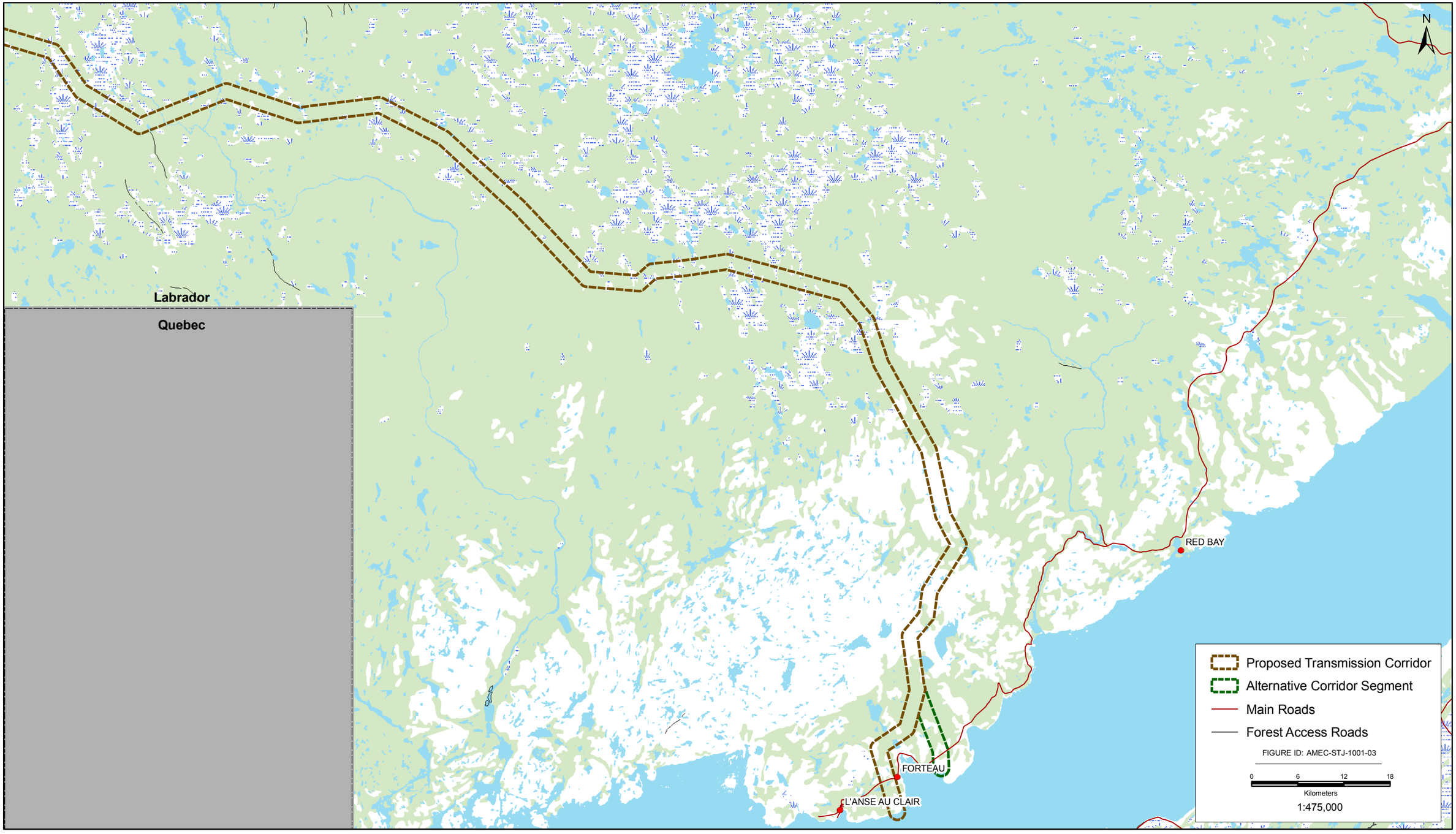

Figure 02

Labrador - Island Transmission Link: Forest Access Roads

Figure 03

Labrador - Island Transmission Link: Forest Access Roads

Figure 04

Labrador - Island Transmission Link: Forest Access Roads

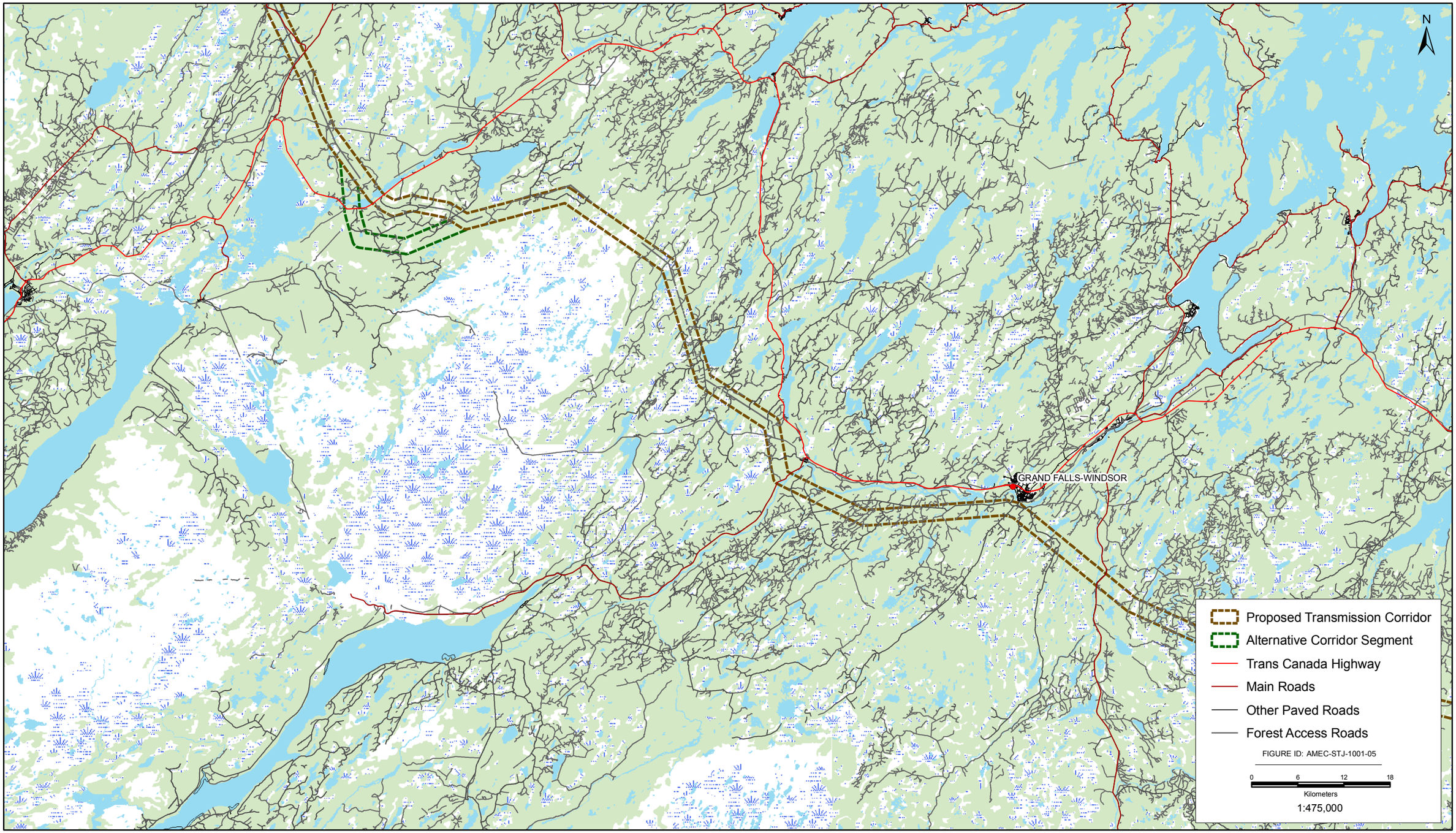

Figure 05

Labrador - Island Transmission Link: Forest Access Roads

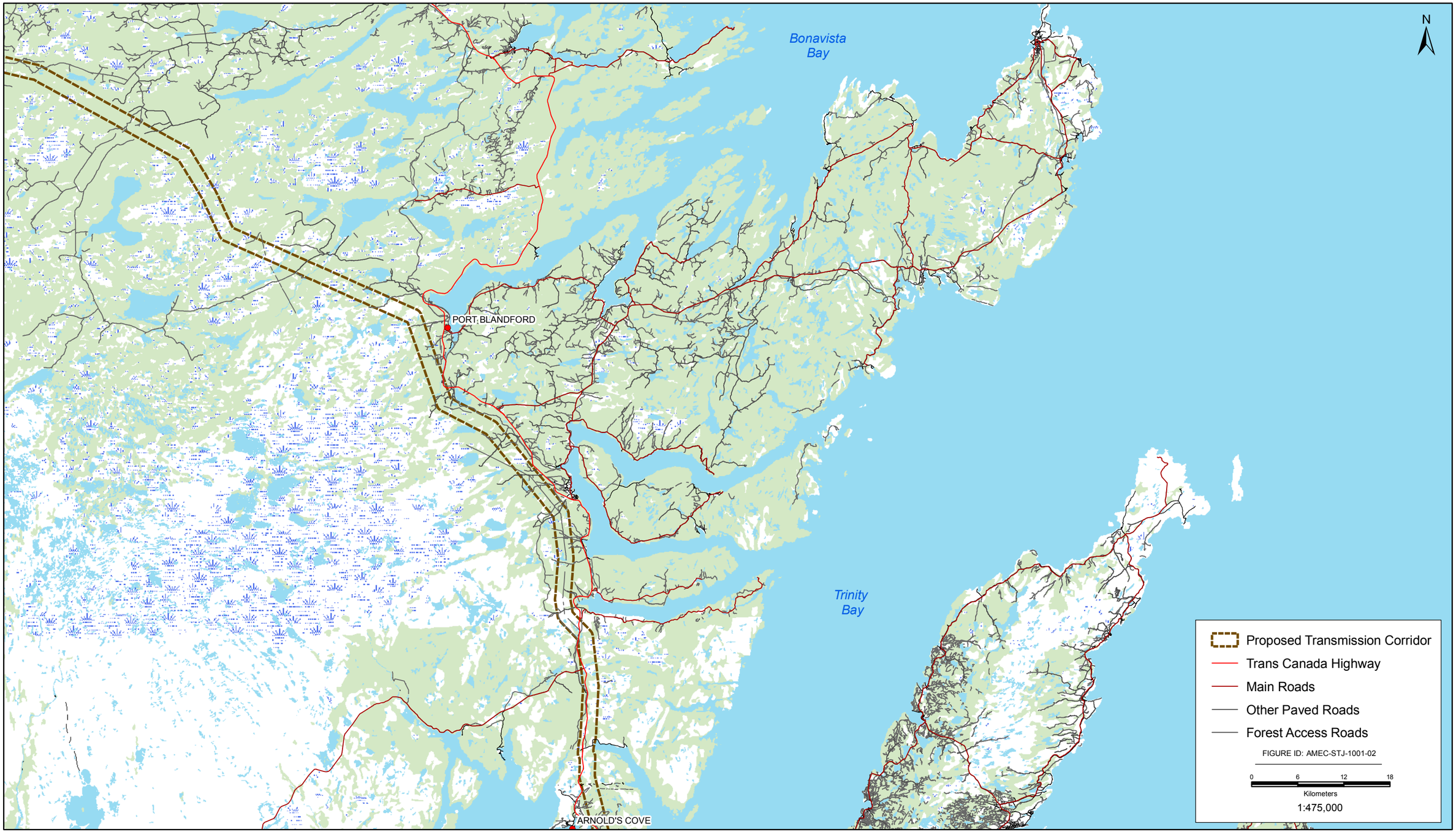

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Figure 06

Labrador - Island Transmission Link: Forest Access Roads

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Figure 07

Labrador - Island Transmission Link: Forest Access Roads

Labrador – Island Transmission Link

Socioeconomic Environment:
Communities, Land and Resource Use, Tourism and Recreation
Revised Component Study: Supplementary Report

Labrador Transmission Corridor Option: Muskrat Falls to the Strait of Belle Isle

Prepared for:

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Project #: TF11104103

February 23, 2012

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1.0 INTRODUCTION

Nalcor Energy is proposing to develop the *Labrador – Island Transmission Link* (the Project), a High Voltage Direct Current (HVdc) transmission system extending from Central Labrador to the Island of Newfoundland's Avalon Peninsula.

The environmental assessment (EA) process for the Project was initiated in January 2009 and is in progress. An Environmental Impact Statement (EIS) is being prepared by Nalcor Energy, which will be submitted for review by governments, Aboriginal and stakeholder groups and the public. In preparation for and in support of the Project's EA, a series of environmental studies have been completed to provide information on the existing biophysical and socioeconomic environments in and near the Project area.

At the time of the commencement of the EA and these associated environmental studies, the Labrador component of the Project included a proposed Converter Station facility at Gull Island on the lower Churchill River, as well as a proposed transmission corridor extending from Gull Island to the Strait of Belle Isle. In mid-November 2010, Nalcor Energy advised the provincial and federal governments that it would also be assessing the potential option of locating the Project's Labrador converter station at or near the Muskrat Falls site on the lower Churchill River. If that were to be the case, the Labrador transmission corridor would potentially extend from Muskrat Falls to the Trans Labrador Highway (Phase 3), and then follow generally along the south side of the highway to approximately its southernmost point before meeting and continuing along the previously identified corridor from that location to the Strait of Belle Isle. Figure 1.1 shows this Labrador Transmission Corridor Option.

The purpose of this Supplementary Report is to expand and update the scope of the *Socioeconomic Environment: Communities, Land and Resource Use, Tourism and Recreation Component Study* completed for the EA in November 2010 (AMEC, 2010), to provide similar environmental information for this additional transmission corridor option, for eventual use in Project planning and in the EIS.

Figure 1.1

Labrador - Island Transmission Link: Labrador Transmission Corridor Option (Muskrat Falls to Strait of Belle Isle)

2.0 APPROACH AND METHODS

The *Socioeconomic Environment: Communities, Land and Resource Use, Tourism and Recreation Component Study* (AMEC, 2010) and this Supplementary Report identify and describe key aspects of the socioeconomic environment that are relevant to the nature of the Project and its potential environmental interactions, as defined by the results of the EA process and associated consultations to date. These include communities, land and resource use and other tourism and recreational activities that are crossed by or adjacent to the transmission corridor.

The November 2010 Component Study Report described the existing socioeconomic environment in the Central and Southeastern Labrador Region (AMEC, 2010). This Supplementary Report focuses on the existing socioeconomic environment for the Labrador Transmission Corridor Option only – from Muskrat Falls to and along the Trans Labrador Highway (TLH) to the point where it re-joins the original transmission corridor to the Strait of Belle Isle (Figure 1.1) - and the associated Regional Study Area as described below. In doing so, it does not reproduce the information and analysis provided in the November 2010 Component Study Report (AMEC, 2010). The socioeconomic environment within or immediately adjacent to the identified transmission corridor (2 km wide) is the key focus. However, the study has also sought to provide an appropriate larger "regional context" by generally describing components and activities within a larger geographic area surrounding this immediate corridor.

The following terms are used throughout this report for clarity and consistency:

Labrador Transmission Corridor Option (2 km wide): The currently identified 135 km long transmission corridor option from Muskrat Falls, to and along a portion of the TLH and connecting to the previously identified transmission corridor to the Strait of Belle Isle;

Regional Study Area (15 km wide): An approximately 15 km wide regional area extending about 7.5 km on either side of the centre of the above noted transmission corridor option. This regional area is used primarily for socioeconomic components that are somewhat "stationary" and "footprint" based, such as those that involve land uses or infrastructure with specific locations; and

Regional Study Area (30 km wide): An approximately 30 km wide regional area extending about 15 km on either side of the centre of the above noted transmission corridor option. This regional area is used primarily for socioeconomic components such as resource harvesting activities that are wide-ranging and / or less geographically defined.

An overview of the Study Areas applied to each of the various socioeconomic components and the underlying rationale for each is presented in Table 2.1.

Table 2.1: Study Area Overview

Components or Activities	Primary Study Area: Labrador Transmission Corridor Option	Regional Study Area	
		Delineation	Nature and Rationale
Communities	Transmission Corridor (2 km)	Regional Study Area (15 km)	Stationary features within the landscape
Transportation	Transmission Corridor (2 km)	Regional Study Area (15 km)	Stationary infrastructure within the landscape
Hunting and Trapping	Transmission Corridor (2 km)	Regional Study Area (30 km)	General and wide ranging activities
Angling and Other Fishing	Transmission Corridor (2 km)	Regional Study Area (30 km)	General and wide ranging activities
Hunting and Fishing Outfitters	Transmission Corridor (2 km)	Regional Study Area (30 km)	General and wide ranging activities
Motorized Recreational Vehicles	Transmission Corridor (2 km)	Regional Study Area (30 km)	General and wide ranging activities
Cabins and Cottage Development Areas	Transmission Corridor (2 km)	Regional Study Area (15 km)	Stationary features within the landscape
Other Outdoor Recreational Activities	Transmission Corridor (2 km)	Regional Study Area (30 km)	General and wide ranging activities
Parks, Reserves and Other Protected and Special Areas	Transmission Corridor (2 km)	Regional Study Area (30 km)	Sensitive and protected areas often associated with wide ranging (recreational) activities
Forestry	Transmission Corridor (2 km)	Regional Study Area (15 km)	Defined activities within the landscape
Mining and Energy	Transmission Corridor (2 km)	Regional Study Area (15 km)	Defined activities within the landscape
Agriculture	Transmission Corridor (2 km)	Regional Study Area (15 km)	Defined activities within the landscape
Other Harvesting Activities	Transmission Corridor (2 km)	Regional Study Area (30 km)	General and wide ranging activities

This study has identified and made use of a range of information sources to describe the existing socioeconomic environment in and adjacent to the Project area. This has included general literature (published and unpublished sources), government reports and datasets and other existing available sources. A comprehensive discussion of these sources is provided in the November 2010 report, and those used specifically for this report are listed as references in Chapter 4.

3.0 RESULTS AND DISCUSSION

This section describes communities, land and resource use, and tourism and recreation activities within the Labrador Transmission Corridor Option and in the associated Regional Study Areas in Central and Southeastern Labrador.

Again, this report and associated mapping focus exclusively upon the new transmission corridor segment from Muskrat Falls, to and along a portion of the TLH, to the point where that corridor option joins the previously identified corridor to the Strait of Belle Isle (See Figure 1.1).

This 135 km long transmission corridor segment is generally referred to as the "*Labrador Transmission Corridor Option*" in the text that follows. In Figures 3.1 to 3.19, this corridor option, in combination with the segment of the original corridor that extends on to the Strait of Belle Isle, are collectively referred to as the "*Proposed Transmission Corridor*" - in order to maintain the terminology used in the November 2010 Component Study report (AMEC, 2010), and to distinguish it from other alternative corridor segments that have been identified in certain areas.

3.1 Communities

In the Central and Southeastern Labrador Region, communities exist in the Upper Lake Melville Area, along the Southeastern coast and in the Labrador Straits area (Figure 3.1). No communities or drinking water supplies are crossed by the Labrador Transmission Corridor Option (DF-ES, 2010; DMA, 2009; DEC-WR, 2009). The Labrador Transmission Corridor Option is closer (than the previously proposed corridor) to Happy Valley-Goose Bay but does not cross any municipal boundaries in the area. Likewise, no communities or drinking water supplies are within the larger associated Regional Study Area.

A number of Aboriginal groups in Labrador and Quebec claim Aboriginal rights and / or title to portions of Labrador, including areas within or near the identified transmission corridors. The relationship of the Labrador Transmission Corridor Option to these Aboriginal communities and their land claim areas and traditional land use activities is described in other Socioeconomic Studies prepared and submitted for the Project's EA.

3.2 Transportation

The Central and Southeastern Labrador Region has existing transportation infrastructure and activities (e.g. roads, air facilities, a military flight training area and marine infrastructure and traffic).

Route 510 (or the TLH), the major road route in Central and Southeastern Labrador, begins in the Labrador Straits and connects to Happy Valley-Goose Bay (Figure 3.2). Route 510 is designated as a "protected road" under the *Protected Road Zoning Regulations* of the *Urban and Rural Planning Act, 2000*. This means that any development within the designated planning area must be approved by the Department of Government Services in consultation with other relevant government departments and agencies (DMA, 1999).

The Muskrat Falls area is currently accessible through a gravel road that extends to that site from the TLH (Phase 1) near Happy Valley - Goose Bay, as well as a number of existing trails on both the north and south sides of the Churchill River (see Appendix A). From Muskrat Falls, the Labrador Transmission Corridor Option extends to and

generally along the western half of the TLH (Phase 3), and crosses it a number of times (Figure 3.2 and Appendix A).

Registered air facilities in Central and Southeastern Labrador are also shown in Figure 3.2. None are located within the Labrador Transmission Corridor Option (DTW, 2010; DTW, 2009), and no such air facilities are located within the Regional Study Area. An airstrip at Crow Head is located within the alternative transmission corridor at Point Amour. Long Pond, which overlaps the proposed transmission corridor near Forteau Point is used as a float plane base by several local operators (Belbin, 2011).

Figure 3.3 shows the designated flight training area in Central and Southeastern Labrador. The Labrador Transmission Corridor Option crosses through a small portion of the east-central part of the training area, where minimum flying altitudes are 100' and 250' (DND, 2010).

3.3 Hunting and Trapping

The following sections generally describe hunting and trapping management areas in the Labrador Transmission Corridor Option. In all cases, this corridor segment crosses through the same hunting and trapping areas as those that overlapped the original (Gull Island) transmission corridor. Detailed information on harvesting activities and their management within these areas is provided in the February 2012 Revised Component Study Report (AMEC, 2012).

Big game management areas are shown in Figures 3.4 and 3.5. The Labrador Transmission Corridor Option crosses portions of Moose Management Areas 53, 58, 59, 84, 86 and 87 and the "Labrador South" Black Bear Management Area. Southern Labrador is closed to caribou hunting (DEC-W, 2011).

Small game hunting is divided into several management areas and zones which are presented in Figures 3.6 and 3.7. The Labrador Transmission Corridor Option crosses the "All of Labrador" Small Game Management Area for Ptarmigan, Arctic Hare, Snowshoe Hare and Porcupine hunting and the "Southern Zone" Small Game Management Areas for Spruce and Ruffled Grouse (DEC-W, 2011).

The Labrador Transmission Corridor Option crosses the "Central Labrador" and "Southern Labrador" Migratory Game Bird Hunting Zone (DEC-W, 2011) (Figure 3.8). Figure 3.9 shows murre hunting zones in Newfoundland and Labrador. The Labrador Transmission Corridor Option crosses Murre Hunting Zone 2 (DEC-W, 2011).

As shown in Figure 3.10, the Labrador Transmission Corridor Option crosses portions of the "Labrador South" Fur Zone (DEC-W, 2011).

3.4 Angling and Other Fishing

Figure 3.11 shows scheduled salmon rivers in Central and Southeastern Labrador. The Labrador Transmission Corridor Option does not cross any scheduled salmon rivers (DFO, 2009). Similarly, no scheduled salmon rivers are within the larger Regional Study Area (30 km).

In Central and Southeastern Labrador, the Labrador Transmission Corridor Option crosses the Eagle Plateau Management Zone (Figure 3.11), a large recently established conservation area for trout angling (DFO, 2009).

As both this and the original (Gull Island) transmission corridor cross through the same areas with regard to angling, detailed information on these activities and their management in this region is provided in the February 2012 Revised Component Study Report (AMEC, 2012).

3.5 Hunting and Fishing Outfitters

In late 2009, the Department of Tourism, Culture and Recreation (DTCR) provided information (from its database) on the locations, names and owners / operators of hunting and fishing outfitting camps throughout Newfoundland and Labrador. This information was used and presented in the initial Component Study report (AMEC, 2010). While useful overall, there are some known issues and apparent discrepancies in the database with regard to the locations of some individual camps, and the Study Team understands that this government dataset is the subject of on-going revision and updating.

Through its EA-related information gathering and consultation activities with outfitters and others, Nalcor Energy has received additional information and clarification on outfitter locations, particularly in the Central and Southeastern Labrador region. This has included discussions with the Labrador Outfitters Association (Emmens, 2011) who provided information and clarification, and confirmed that the outfitter information presented in the recent EIS and associated studies for the Trans Labrador Highway Phase 3 (Happy Valley - Goose Bay to Cartwright Junction) (DTW, 2004) is a generally accurate representation of outfitter locations in this area.

This updated outfitter information has therefore been incorporated into this Supplementary Report, and will be utilized in the EIS. The information presented in Figure 3.12 is therefore an amalgamation of the updated and verified location information for outfitters in and near the general study area, and from the original DTCR dataset for outfitters elsewhere in Labrador.

Figure 3.12 shows outfitting camps Central and Southeastern Labrador (DCTR, 2009). No outfitting camps are located within the Labrador Transmission Corridor Option but one is located within the Regional Study Area. As described in the Component Study (AMEC, 2010), several camps are located within the Regional Study Area near the Labrador Straits. Even when camps are not located within the corridor itself, guides and / or their clients may sometimes travel through or use the corridor area.

3.6 Motorized Recreational Vehicles

Figure 3.13 shows Central and Southeastern Labrador snowmobile and ATV trails. None of these snowmobile trails are crossed by the Labrador Transmission Corridor Option (DEC-L, 2010). The Grand River Snowmobile Trail, approximately 150 km of groomed routes on the north side of the Churchill River, is within the Regional Study Area (Grand River Snowmobile Club, 2009).

ATVs are used extensively throughout Central and Southeastern Labrador, particularly on back woods trails, forestry access roads, snowmobile trails and within communities. No known trails are located within the Labrador Transmission Corridor Option (DEC-L, 2010) or within the Regional Study Area.

Motorized boats may be used at some of the outfitting camps within the Central and Southeastern Study Region (Section 3.5 and Figure 3.12).

3.7 Cabins and Cottage Development Areas

Figure 3.14 shows the locations of permitted cottage development areas and crown titles for cottages in Central and Southeastern Labrador. Cottages are accessible by road and remote cottages are not accessible by conventional motor vehicle. A cottage development area on the north side of the Churchill River is outside the transmission corridor but within the Regional Study Area (DEC-L, 2009). No known cottages or remote cottages are located within the Labrador Transmission Corridor Option or within the larger Regional Study Area. Further information is also provided in Appendix A.

3.8 Other Outdoor Recreational Activities

Residents of the province participate in a variety of other outdoor recreational activities including bicycling, camping, canoeing, kayaking, white-water rafting, golfing, hiking and skiing.

Bicyclists may use the TLH - which is crossed by the Labrador Transmission Corridor Option - but the unpaved nature of this road may make it too rough for extensive bicycling.

Four campgrounds are located in Central and Southeastern Labrador (Figure 3.15). However, no campgrounds are located within the Labrador Transmission Corridor Option or within the Regional Study Area (DTCR, 2010).

Canoeing occurs on the Churchill River and possibly elsewhere, including in proximity to some of the outfitting lodges (Figure 3.12). Lack of road access to suitable areas has limited kayaking, but the TLH has improved access to waterbodies in Central and Southeastern Labrador.

Two golf courses are located in Labrador: one in Labrador West and the other in Happy Valley-Goose Bay. No golf courses are located within in the Labrador Transmission Corridor Option or Regional Study Area (Golf Newfoundland and Labrador, 2010).

More than 300 hiking trails are found in Newfoundland and Labrador. No known hiking trails are located in the Labrador Transmission Corridor Option or Regional Study Area (DTCR, 2010).

No known cross country ski areas or downhill skiing / snowboarding slopes are located in the Labrador Transmission Corridor Option or Regional Study Area (DTCR, 2010).

3.9 Parks, Reserves and Other Protected and Special Areas

No parks or other protected areas are crossed by the Labrador Transmission Corridor Option (Figure 3.16). The proposed Eagle River Waterway Provincial Park is not within the corridor, but is within the larger Regional Study Area (DEC, 2010). The current proposed boundary for the Mealy Mountains National Park Reserve is not within the Labrador Transmission Corridor Option or the Regional Study Area (Parks Canada, 2009; Taylor, S., 2010).

3.10 Forestry

The Labrador Transmission Corridor Option crosses through Forest Management Districts 19A and 19C (Figure 3.17). Currently, forestry activity is planned for Districts 19A but not for 19C (DNR-FS, 2009). Forestry activities and their management are discussed in detail in the November 2010 Component Study Report (AMEC, 2010).

3.11 Mines and Energy

There are no developing or producing mines or oil and gas exploration activities in the Central and Southeastern Labrador Region (Figure 3.18). Fifteen quarries and four staked claims are located in the Labrador Transmission Corridor Option (DNR-ME, 2009). The quarries were established during the construction of the TLH. Appendix A illustrates quarries and staked claims in greater detail. Twenty-two other quarries and five staked claims are within the larger Regional Study Area.

3.12 Agriculture

Farming activity is limited in Central and Southeastern Labrador, but is expanding and evolving in recent years. An agricultural development area surrounds Upper Lake Melville (Figure 3.19). No commercial farmgates are located in the Labrador Transmission Corridor Option or the Regional Study Area (DNR-A, 2010).

3.13 Other Harvesting Activities

Residents of Newfoundland and Labrador participate in a variety of other harvesting activities including wood cutting, roadside gardening and gathering wild berries, fruits, flowers, plants, lichens and mushrooms. These activities are an integral part of traditional subsistence and recreational lifestyles throughout the province.

Because of the nature of these pursuits, it is not possible to define precisely when and where they occur. However activities typically occur in season where the resource in question is found and near access routes.

Figure 3.1

Communities - Central and Southeastern Labrador

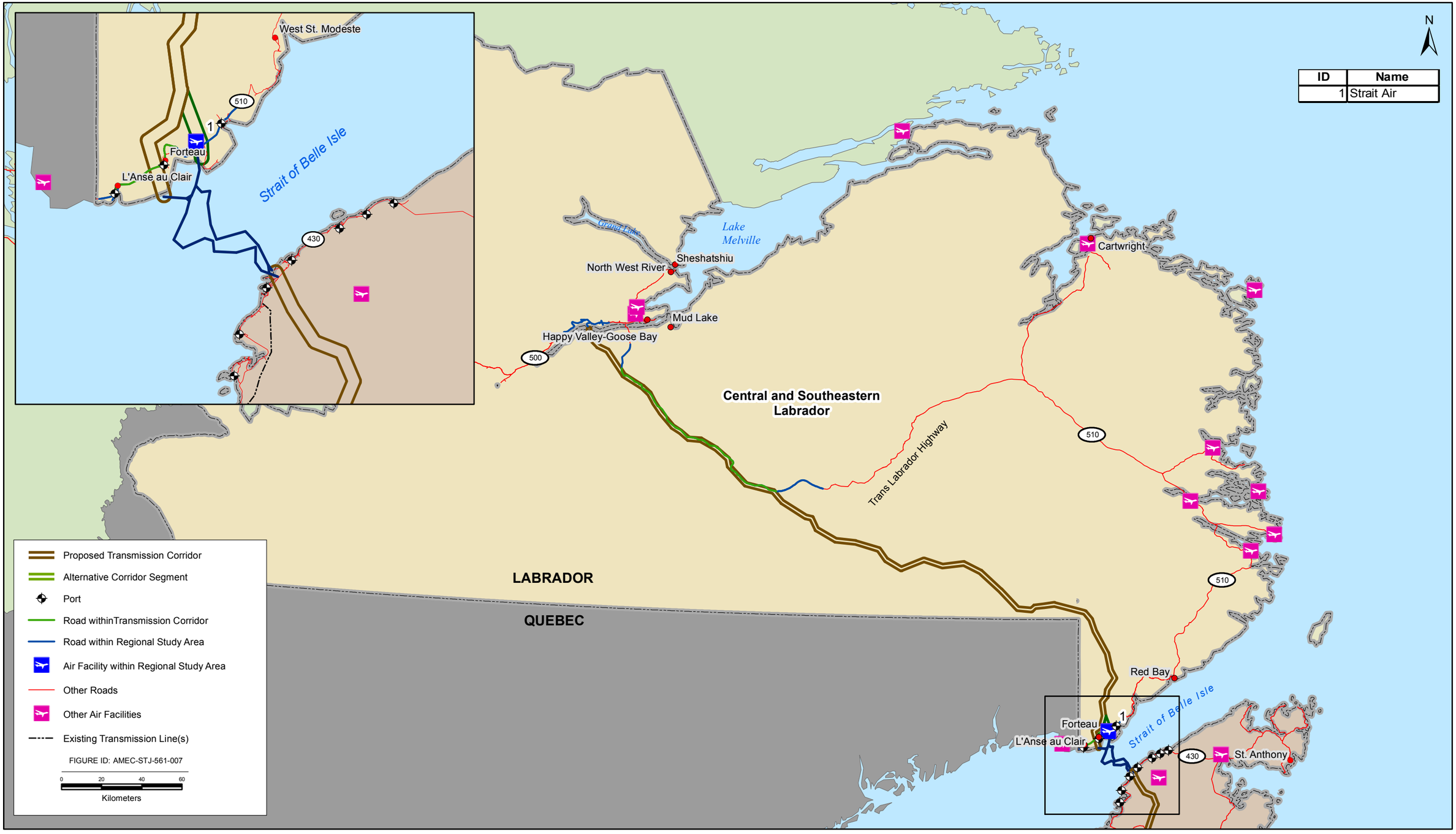

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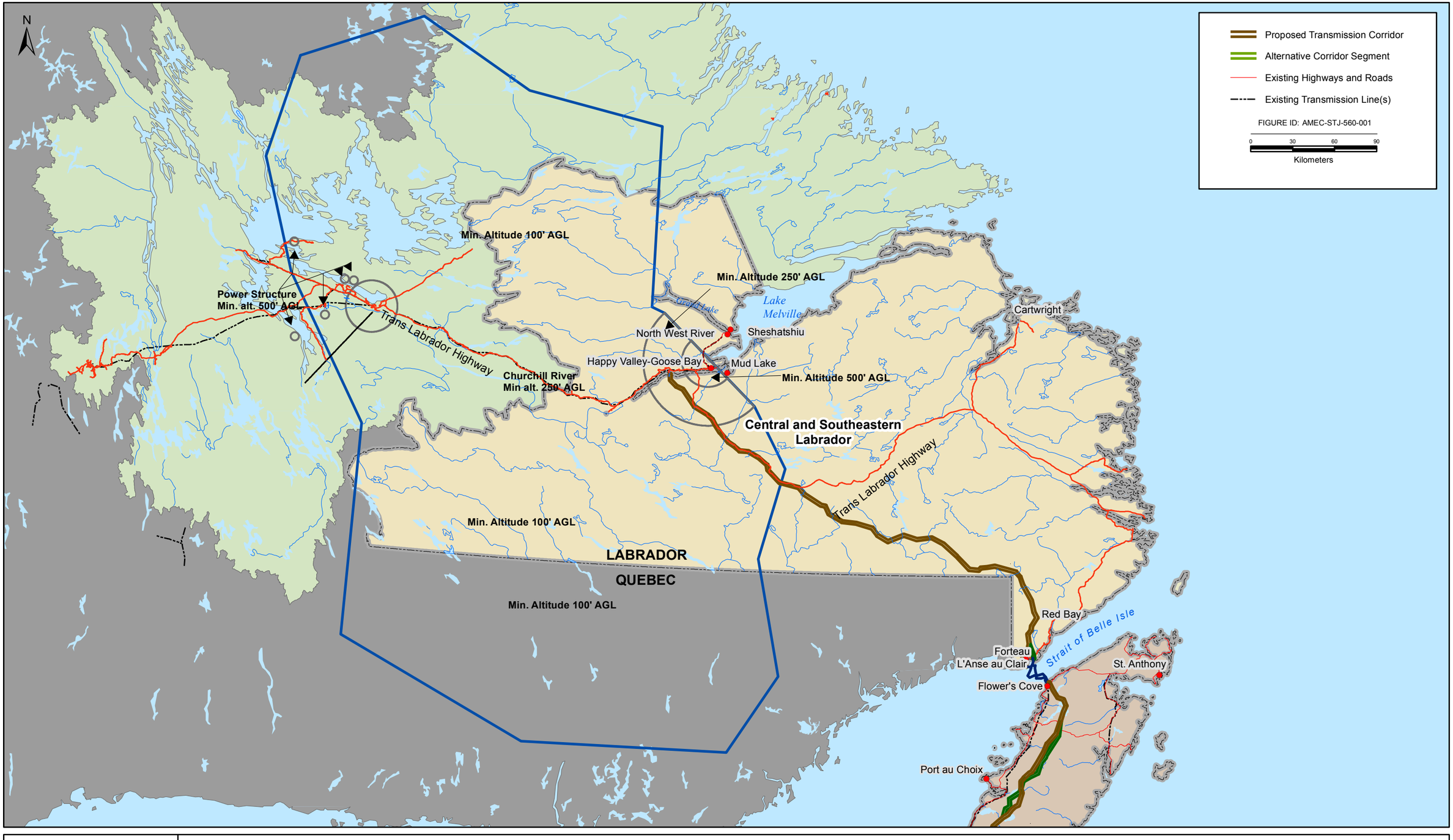
Figure 3.2

Transportation - Central and Southeastern Labrador



nalcor energy

Figure 3.3

Designated Flight Training Area

Moose Management Areas		
ID	Name	Total Quota 2011-2012
58	Alexis River	5
86	St. Augustin	5
87	Eagle Plateau	5
59	Upper Kenamu	15
84	Traverspine	5
53	Muskrat Falls	25

N

Trans Labrador Highway

Grand Lake

Lake Melville

Sheshatshiu

North West River

Happy Valley-Goose Bay

Mud Lake

Cartwright

53

87

84

59

Central and Southeastern Labrador

Trans Labrador Highway

86

58

LABRADOR

QUEBEC

Red Bay

Strait of Belle Isle

Forteau

L'Anse au Clair

St. Anthony

Proposed Transmission Corridor

Alternative Corridor Segment

Moose Management Area

Existing Highways and Roads

Existing Transmission Line(s)

FIGURE ID: AMEC-STJ-561-011

0 20 40 60

Kilometers

nalcor energy

Figure 3.4

Moose Hunting - Central and Southeastern Labrador

Figure 3.5

Black Bear Hunting - Central and Southeastern Labrador

Small Game Management Area	Species	Bag Limit: Daily/Possession
All Labrador	Ptarmigan	25/50
	Arctic Hare	No Limit
	Snowshoe Hare	No Limit
	Porcupine	1 (possession)

N

Lake Melville

Grand Lake

Sheshatshiu

North West River

Happy Valley-Goose Bay

Mud Lake

Cartwright

Trans Labrador Highway

Central and Southeastern Labrador

Trans Labrador Highway

LABRADOR

QUEBEC

Red Bay

Strait of Belle Isle

Forteau

L'Anse au Clair

Proposed Transmission Corridor

Alternative Corridor Segment

Small Game Management Area

Existing Highways and Roads

Existing Transmission Line(s)

FIGURE ID: AMEC-STJ-561-022

0 20 40 60

Kilometers

nalcor energy

Figure 3.6

Small Game Hunting (Ptarmigan, Arctic Hare, Snowshoe Hare and Porcupine) - Central and Southeastern Labrador

Small Game Management Area	Species	Bag Limit: Daily/Possesion
Southern Zone	Grouse	20/40

N

Grand Lake
Lake Melville
Sheshatshiu
North West River
Cartwright
Happy Valley-Goose Bay
Mud Lake
Trans Labrador Highway
Central and Southeastern Labrador
Trans Labrador Highway
LABRADOR
QUEBEC
Red Bay
Strait of Belle Isle
Forteau
L'Anse au Clair

Proposed Transmission Corridor
Alternative Corridor Segment
Grouse Management Area
Existing Highways and Roads
Existing Transmission Line(s)

FIGURE ID: AMEC-STJ-561-022

0 20 40 60
Kilometers

nalcor energy

Figure 3.7

Small Game Hunting (Grouse) - Central and Southeastern Labrador

Migratory Game Bird Hunting Zones	Species	Bag Limit (Daily/Possession)
Central Labrador Zone	Ducks, Geese and Snipe	6/12 (Ducks) 5/10 (Geese) 10/20 (Snipe)
	Eiders	6/12 Eider
Southern Labrador (Straits)	Ducks, Geese and Snipe	6/12 (Ducks) 5/10 (Geese) 10/20 (Snipe)
	Eiders	6/12 Eider

N

Smallwood Reservoir
Grand Lake
Lake Melville
North West River
Sheshatshiu
Happy Valley-Goose Bay
Mud Lake
Trans Labrador Highway
Central and Southeastern Labrador
CENTRAL LABRADOR
SOUTHERN LABRADOR
LABRADOR
QUEBEC
Atlantic Ocean
Red Bay
Strait of Belle Isle
Forteau
L'Anse au Clair
St. Anthony
Flower's Cove

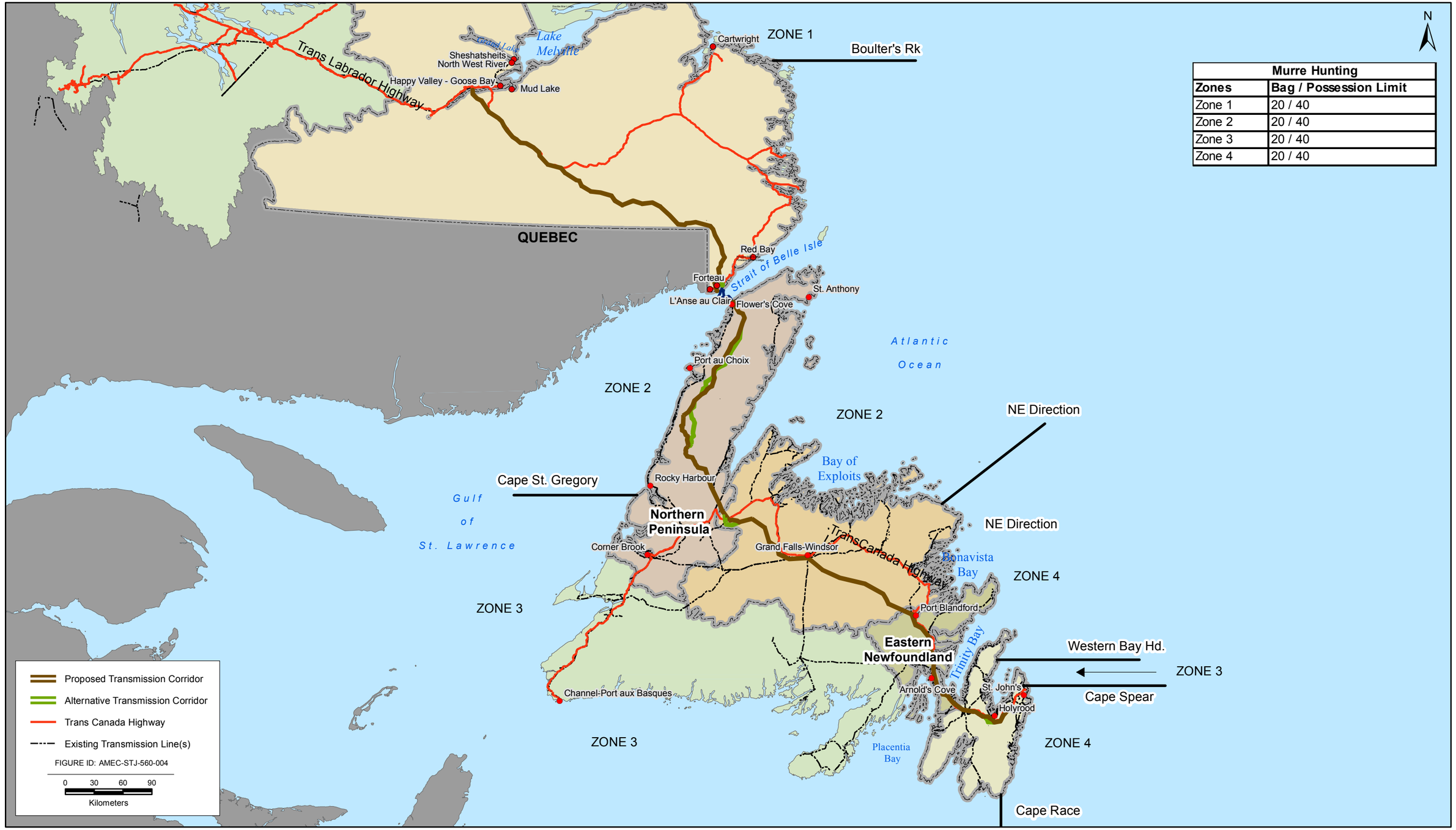
Proposed Transmission Corridor
Alternative Transmission Corridor
Migratory Game Bird Hunting Zone
Existing Highway
Existing Transmission Line(s)

AMEC-STJ-561-002
0 30 60 90
Kilometers

nalcor energy

Figure 3.8

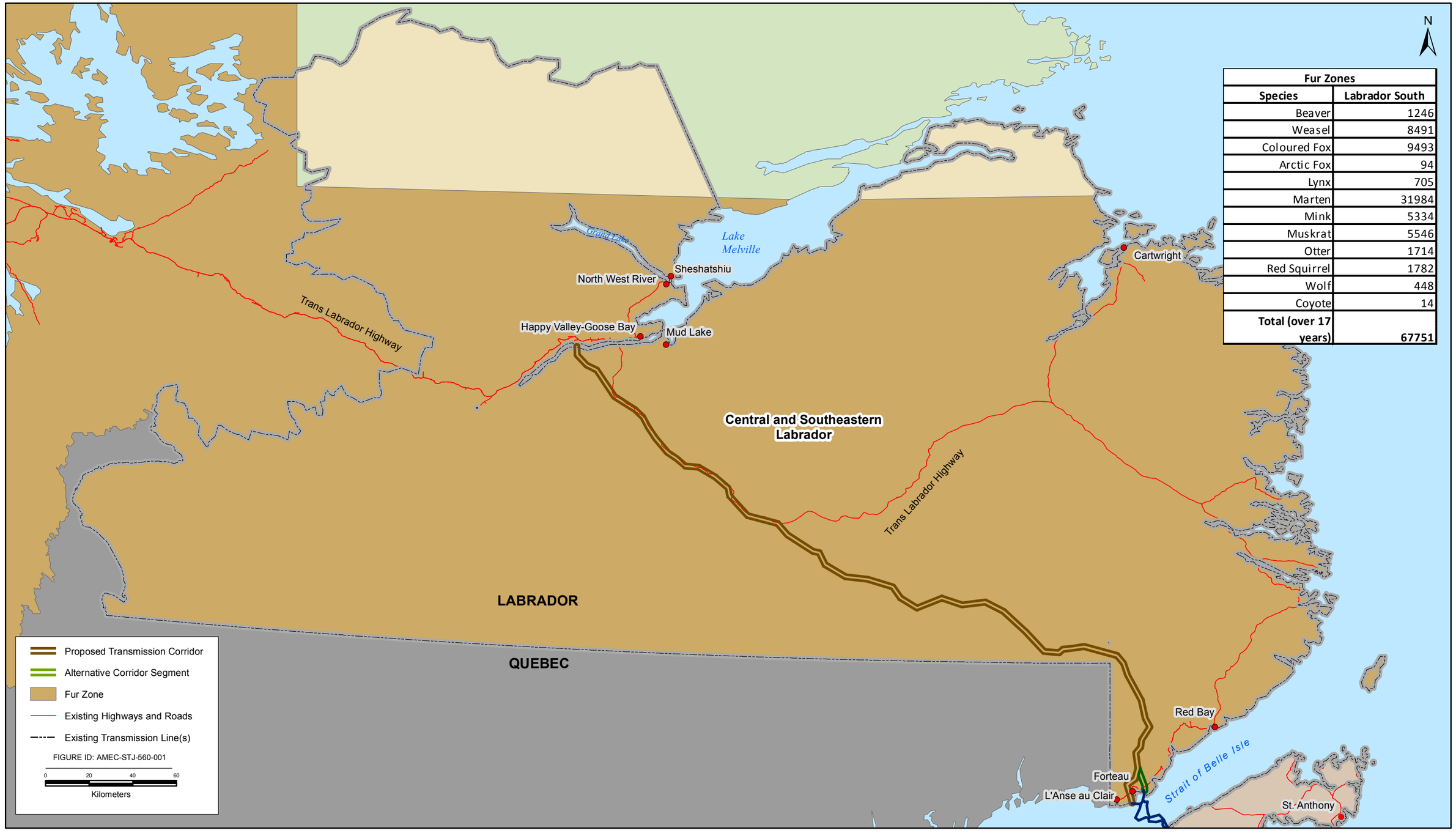
Migratory Game Bird Hunting - Central and Southeastern Labrador



nalcor energy

Figure 3.9

Murre Hunting - Newfoundland and Labrador



nalcor energy

Figure 3.10

Fur Trapping - Central and Southeastern Labrador

Scheduled Salmon Rivers	
ID	Name
175	Forteau River
176	L'anse au Loup Brook
177	Pinware River

N

Strait of Belle Isle
Forteau
L'Anse au Clair
176
175
Grand Lake
Lake Melville
Sheshatshiu
North West River
Happy Valley-Goose Bay
Mud Lake
Cartwright
Trans Labrador Highway
Central and Southeastern Labrador
LABRADOR
QUEBEC
177
Red Bay
St. Anthony

Proposed Transmission Corridor
Alternative Corridor Segment
Eagle Plateau Management Area
Rivers and Streams
Scheduled Salmon River Intersecting Transmission Corridor
Scheduled Salmon River within Regional Study Area
Existing Highways and Roads
Existing Transmission Line(s)

FIGURE ID: AMEC-STJ-562-001

0 20 40 60
Kilometers

nalcor energy

Figure 3.11

Angling - Central and Southeastern Labrador

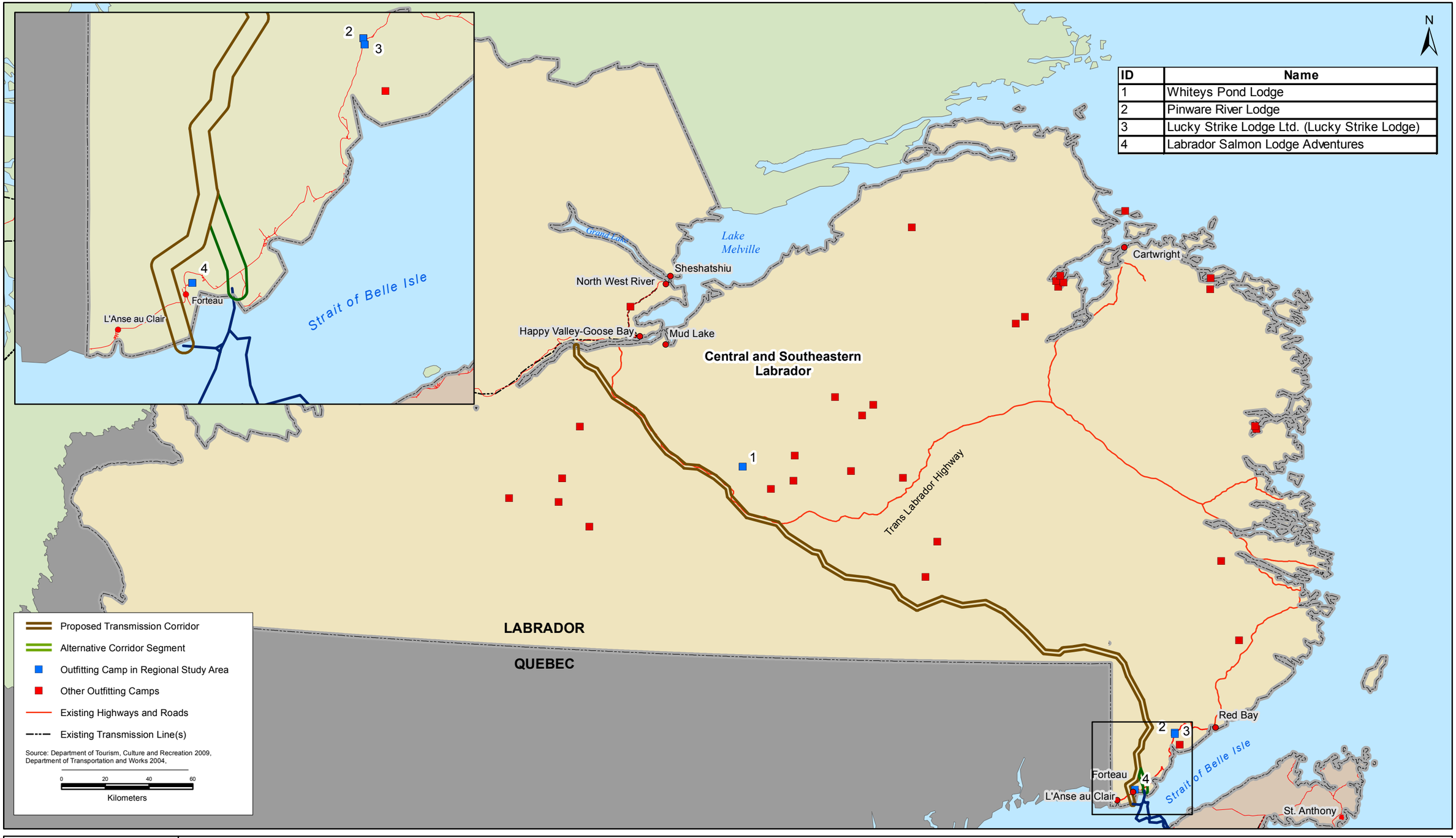


Figure 3.12

Hunting and Fishing Outfitters - Central and Southeastern Labrador

Figure 3.13

Motorized Recreational Vehicles - Central and Southeastern Labrador

Figure 3.14

Cabins and Cottage Development Areas - Central and Southeastern Labrador

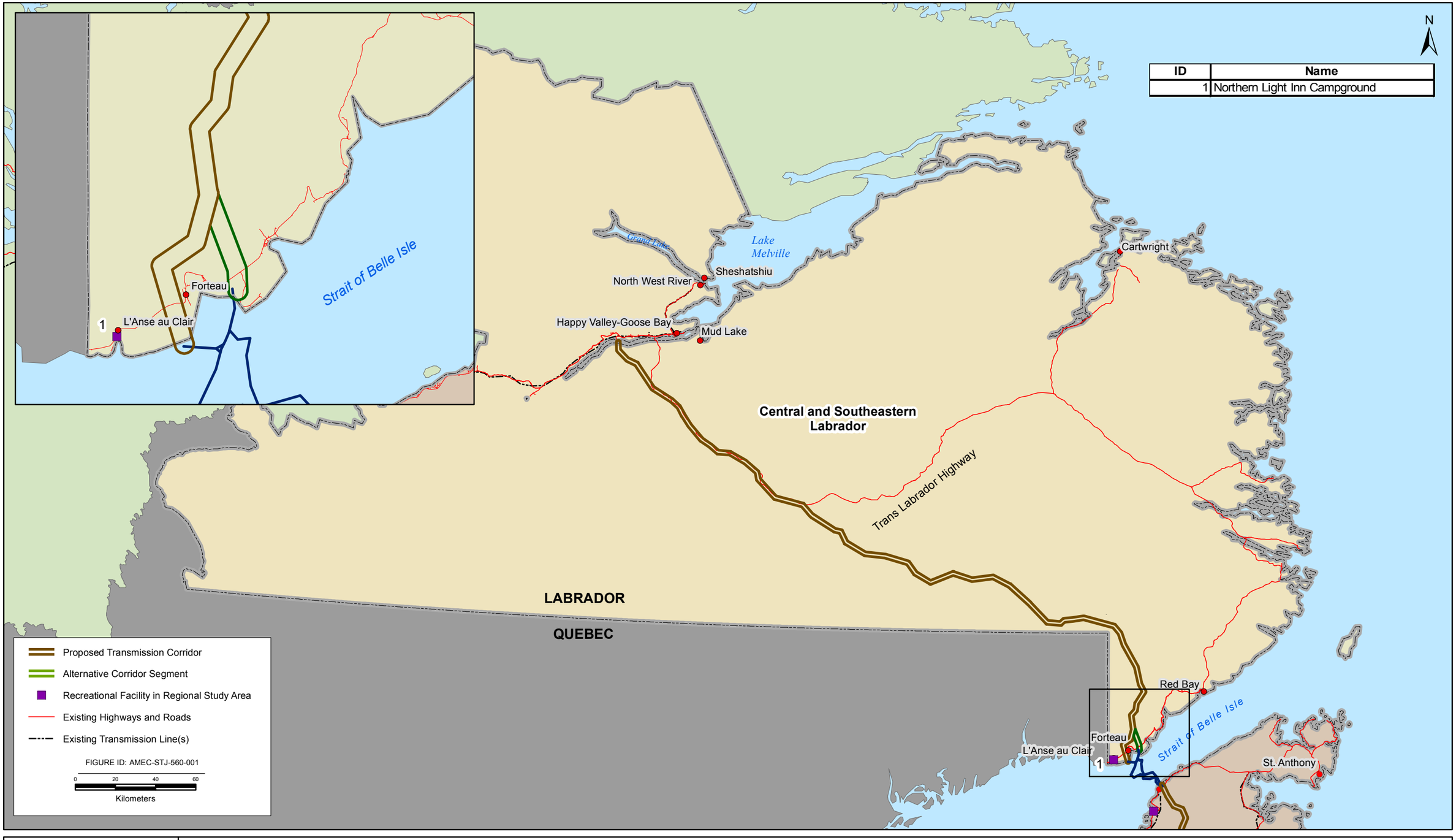


Figure 3.15

Tourism and Recreational Areas - Central and Southeastern Labrador

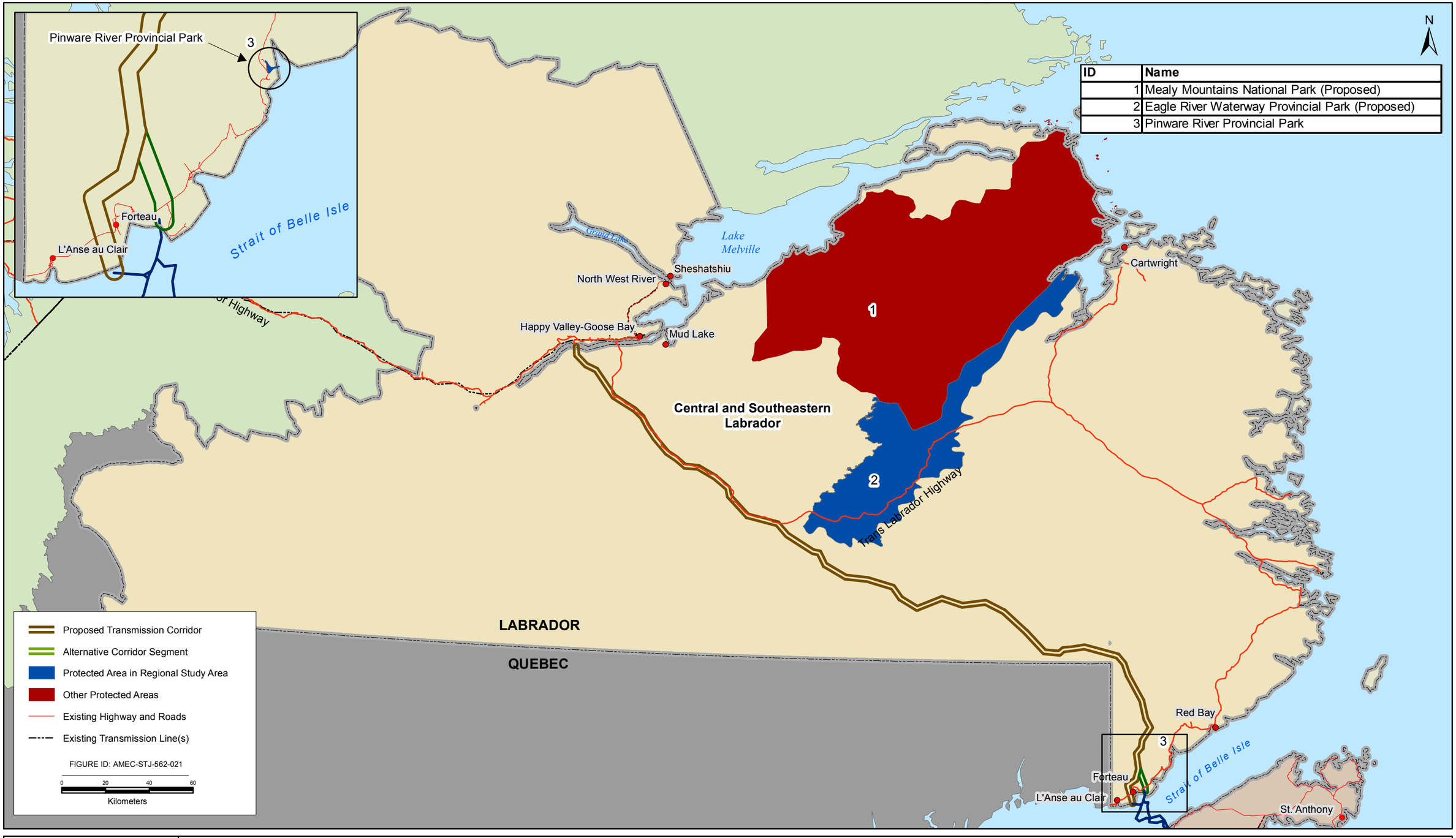


Figure 3.16

Parks, Reserves and Protected and Special Areas - Central and Southeastern Labrador

Figure 3.17

Forestry - Central and Southeastern Labrador

Figure 3.18

Mining Activities and Energy Exploration - Central and Southeastern Labrador

nalcor energy

Figure 3.19

Agriculture - Central and Southeastern Labrador

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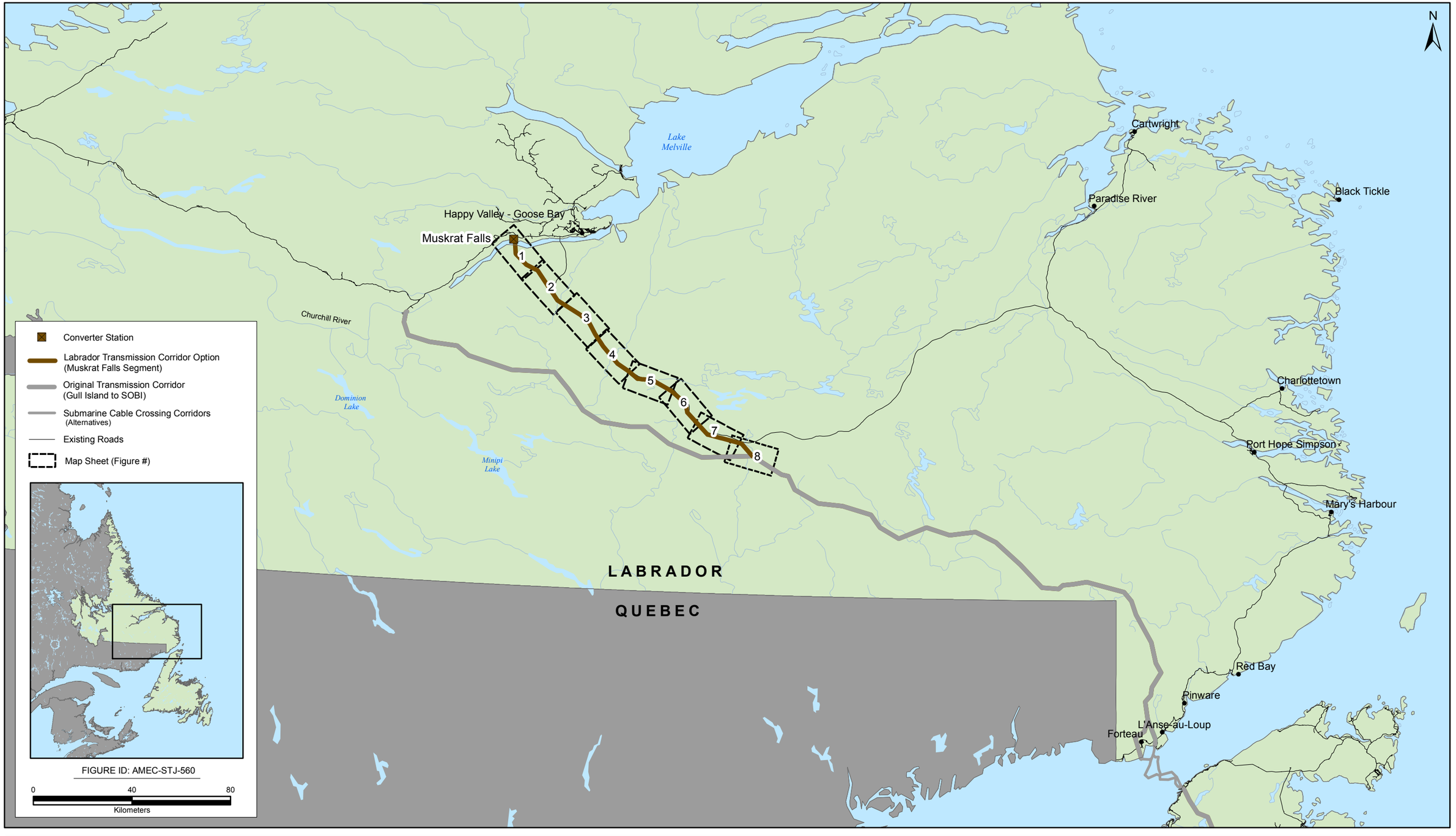
APPENDIX A

Map Atlas: Selected Land Uses



INDEX A

Labrador - Island Transmission Link: Labrador Transmission Corridor Option (Muskrat Falls to Strait of Belle Isle)
Select Land Uses

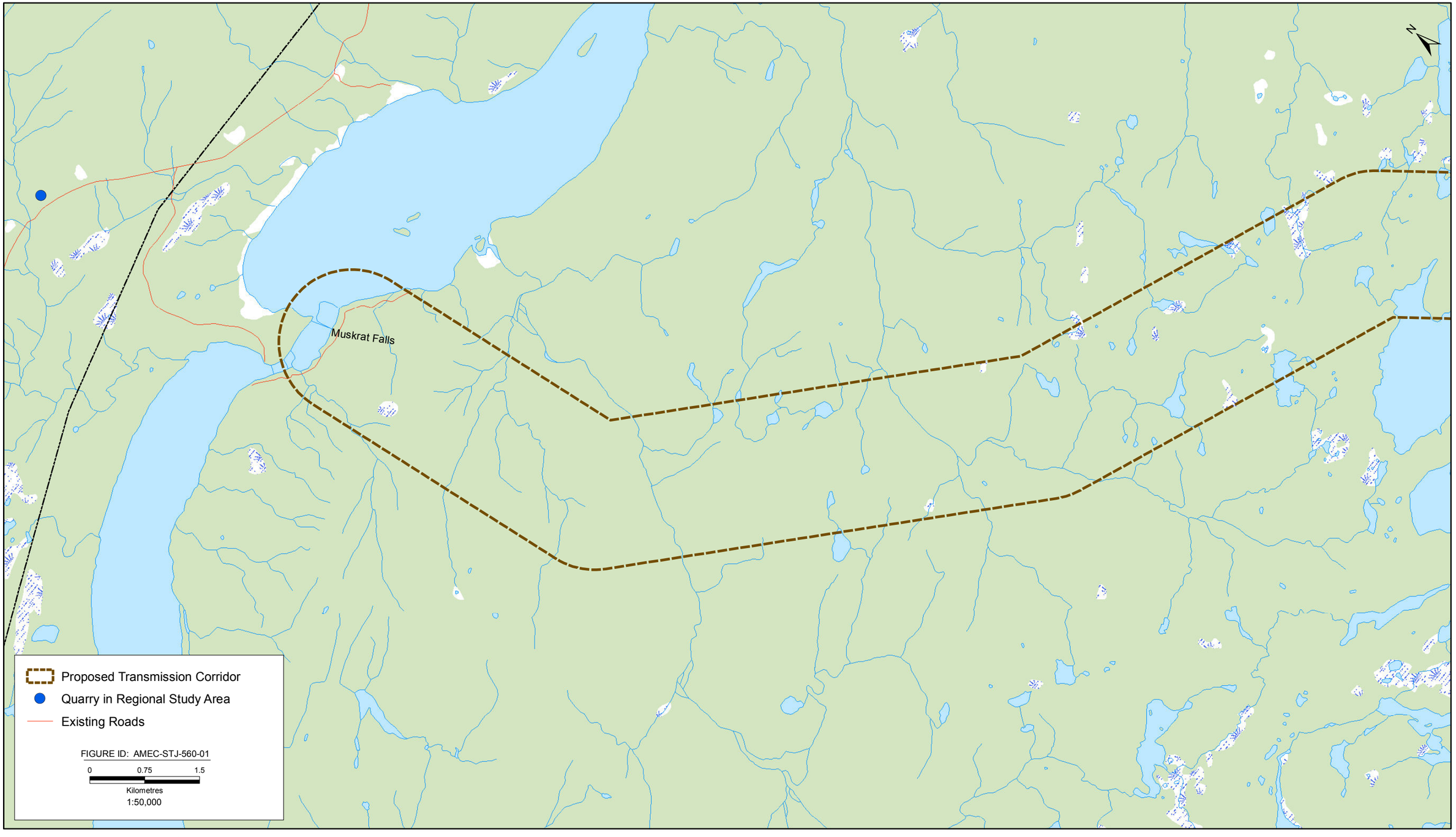


FIGURE 1

Labrador - Island Transmission Link: Select Land Uses

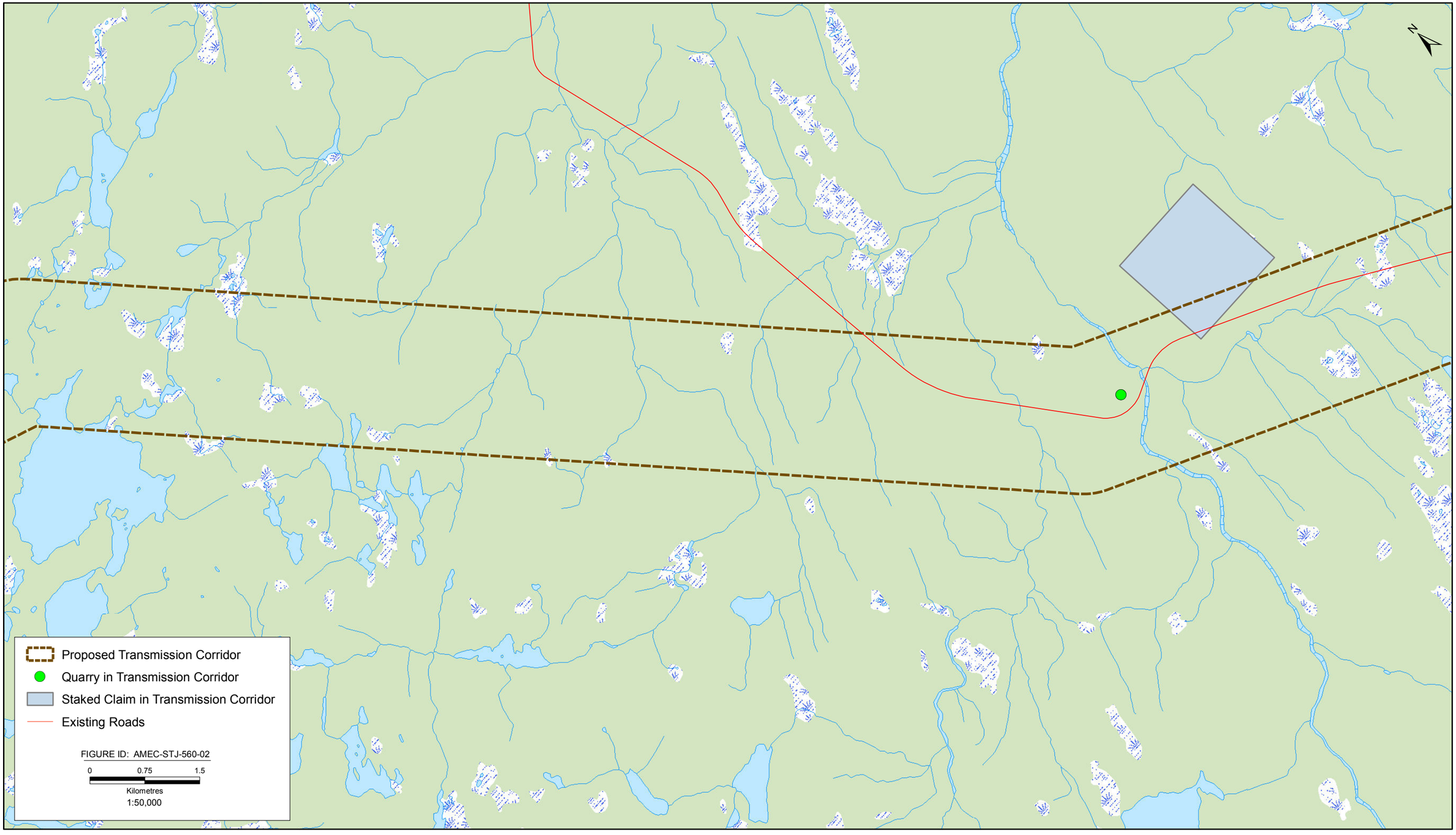


FIGURE 2

Labrador - Island Transmission Link: Select Land Uses

N

Proposed Transmission Corridor

Existing Roads

FIGURE ID: AMEC-STJ-560-03

0 0.75 1.5

Kilometres

1:50,000

FIGURE 3

Labrador - Island Transmission Link: Select Land Uses

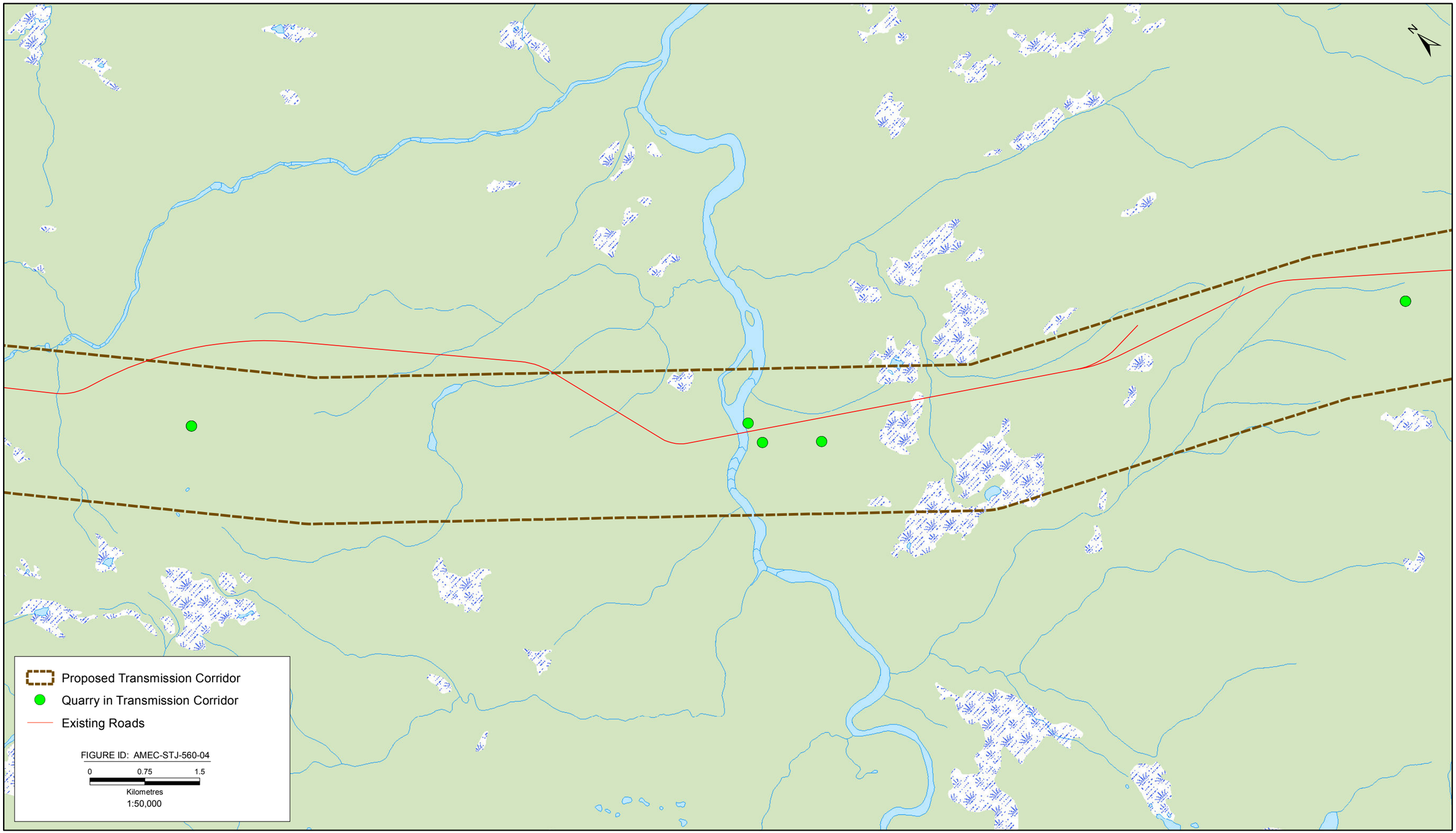


FIGURE 4

Labrador - Island Transmission Link: Select Land Uses

N

Proposed Transmission Corridor

Quarry in Transmission Corridor

Existing Roads

FIGURE ID: AMEC-STJ-560-05

0 0.75 1.5

Kilometres

1:50,000

nalcor energy

FIGURE 5

Labrador - Island Transmission Link: Select Land Uses

N

Proposed Transmission Corridor
Quarry in Regional Study Area
Existing Roads

FIGURE ID: AMEC-STJ-560-06

0 0.75 1.5

Kilometres

1:50,000

FIGURE 6

Labrador - Island Transmission Link: Select Land Uses

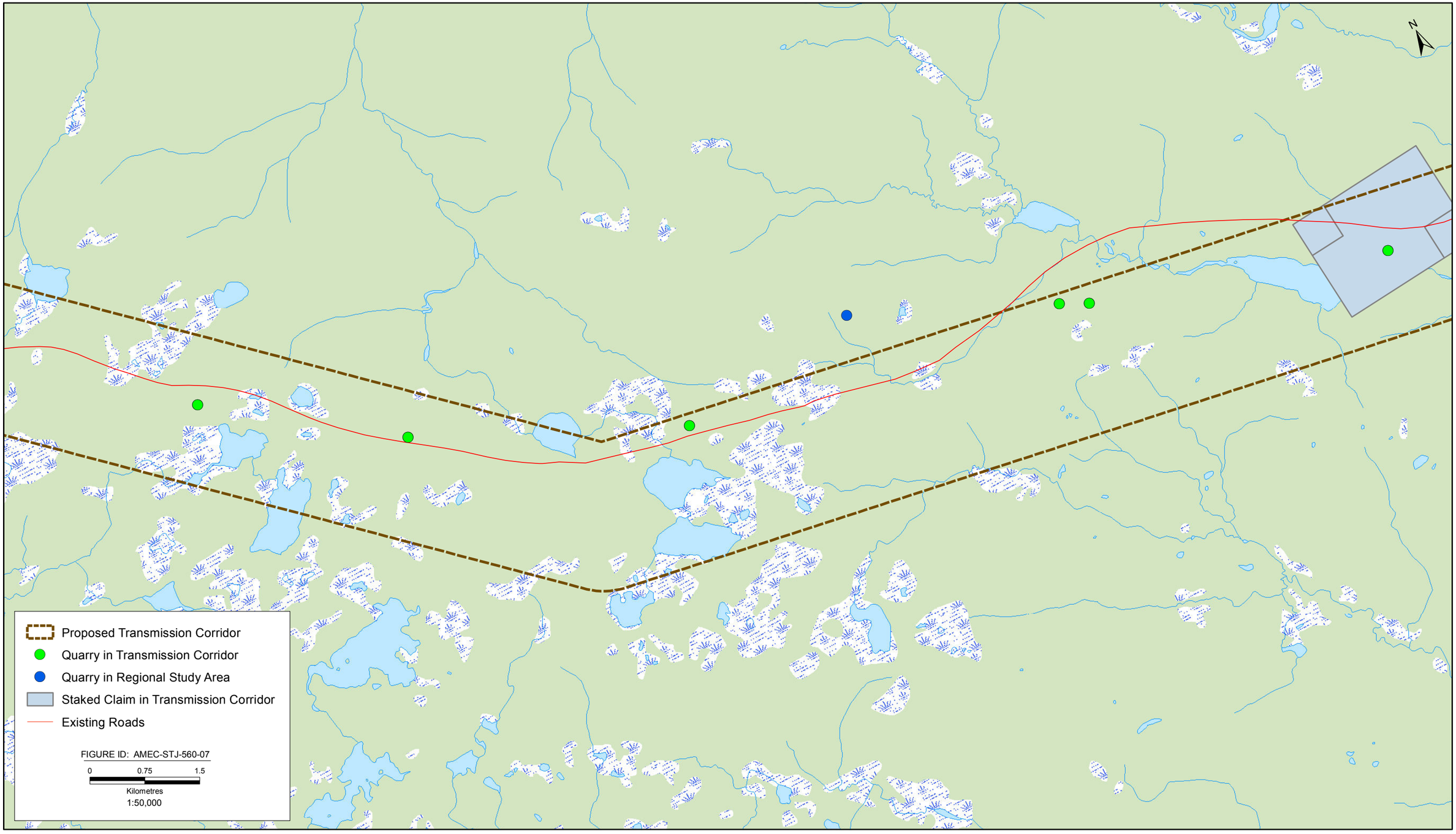


FIGURE 7

Labrador - Island Transmission Link: Select Land Uses

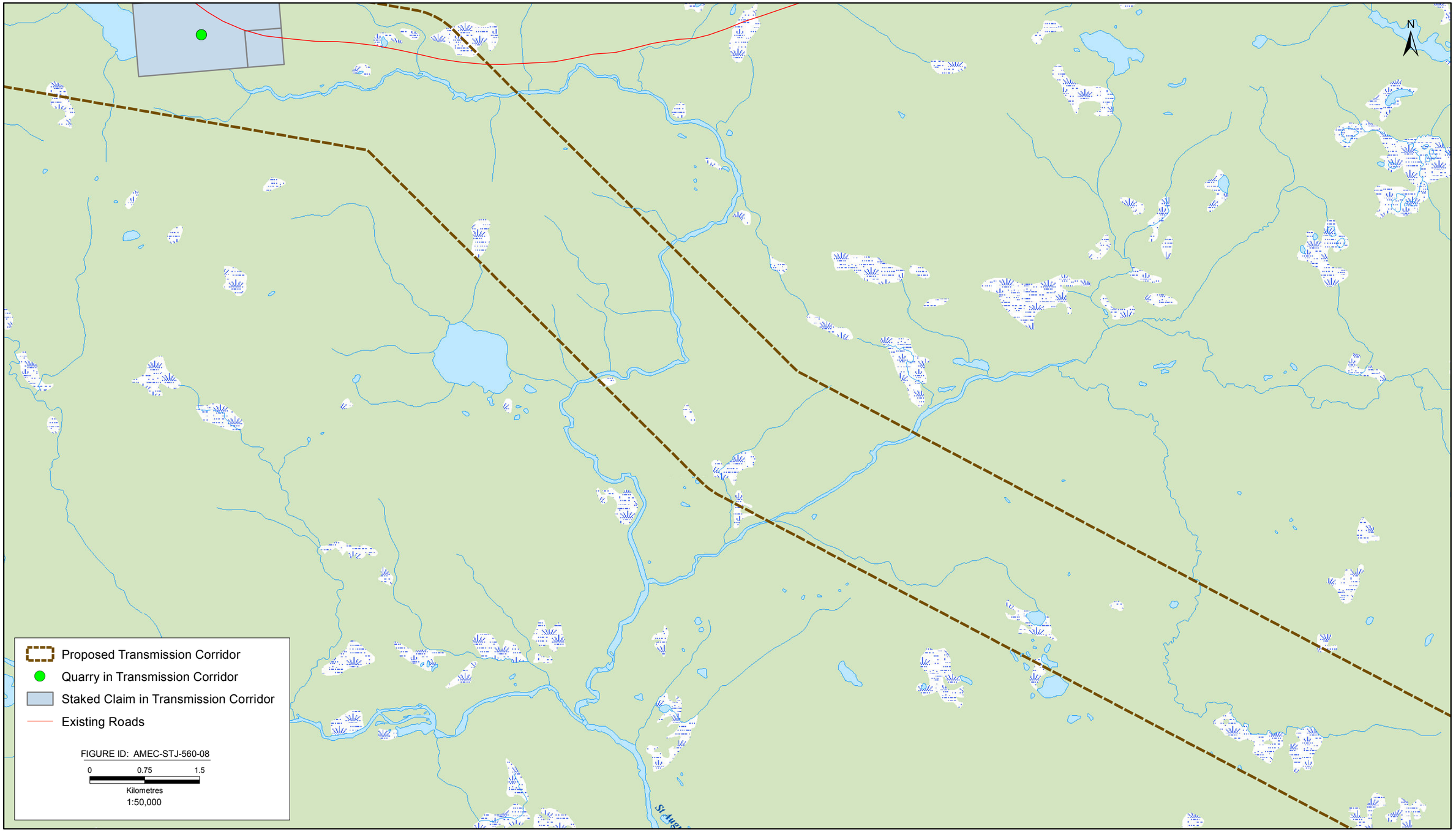


FIGURE 8

Labrador - Island Transmission Link: Select Land Uses

Labrador – Island Transmission Link

Analysis of Current Levels of Accessibility Along the Transmission Corridor

Prepared for:

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St. John's, Newfoundland and Labrador
Canada A1B 0C9

***Contract #*LC-EV-063**

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March 29, 2011

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Appendix A Map Atlas: Labrador-Island Transmission Link Existing Access

1.0 INTRODUCTION

Nalcor Energy is proposing to develop the *Labrador – Island Transmission Link* a High Voltage Direct Current (HVdc) transmission system extending from Central Labrador to the Island of Newfoundland's Avalon Peninsula.

The environmental assessment (EA) process for the Project was initiated in January 2009 and is in progress. An Environmental Impact Statement (EIS) is being prepared by Nalcor Energy, which will be submitted for review by governments, Aboriginal and stakeholder groups and the public.

In preparation for and support of the EA of the Project, this study was completed into order to assess and describe existing levels of human access to and within the transmission corridor, for use in on-going Project planning and design, as well as in the environmental effects analyses being conducted as part of the EA.

1.1 Project Overview

The proposed Labrador – Island Transmission Link (the Project) involves the construction and operation of transmission infrastructure within and between Labrador and the Island of Newfoundland. Nalcor Energy is proposing to establish a High Voltage Direct Current (HVdc) transmission system extending from the lower Churchill River in Central Labrador to Soldiers Pond on the Island's Avalon Peninsula (Figure 1.1).

The proposed transmission system, as currently planned, will include the following key components:

- an ac-dc converter station at Gull Island (or potentially, Muskrat Falls) in Central Labrador, on the lower Churchill River adjacent to the switchyard for the Lower Churchill Hydroelectric Generation Project;
- an HVdc transmission line extending from that site and across Southeastern Labrador to the Strait of Belle Isle. This overhead transmission line will be approximately 400 km in length with a cleared right-of-way averaging approximately 60 m wide, and consist of single galvanized steel lattice towers;
- cable crossings of the Strait of Belle Isle with associated infrastructure, including cables placed across the Strait through various means to provide the required cable protection;
- an HVdc transmission line (similar to that described above) extending from the Strait of Belle Isle across the Island of Newfoundland to the Avalon Peninsula, for a distance of approximately 700 km;
- a dc-ac converter station at Soldiers Pond on the Island of Newfoundland's Avalon Peninsula; and
- electrodes at each end of the HVdc transmission line in Labrador and on the Island, with overhead lines connecting them to their respective converter stations.

Project planning and design are currently at a stage of having identified a 2 km wide corridor the on-land portions of the proposed HVdc transmission line and 500 m wide corridors for the proposed Strait of Belle Isle cable crossings, as well as various alternative corridor segments in particular areas (Figure 1.1). Potential (alternative) on-land corridors and study areas have also been identified for the proposed electrodes, although the nature, type and location of these electrodes are the subject of ongoing analysis and engineering.

It is these proposed transmission corridors and components that were the subject of Nalcor Energy's environmental study program. Project planning is in progress, and it is anticipated that the Project description will continue to evolve as engineering and design work continue. The EA of the Project will also identify and evaluate alternative means of carrying out the Project that are technically and economically feasible.

In conjunction and concurrent with the EA process, Nalcor Energy will be continuing with its technical and environmental analyses of the corridors, in order to identify and select a specific routing for the Project. The eventual transmission routes and locations will be selected with consideration of technical, environmental and socioeconomic factors.

Again, this study focuses on the HVdc transmission corridor as defined at the time that the Project's EA was initiated, and as described in the EA Registration / Project Description (September 2009). At the time of the commencement of the EA and its associated environmental studies, the Labrador component of the Project included a converter station facility at Gull Island on the lower Churchill River, as well as a proposed transmission corridor extending from Gull Island to the Strait of Belle Isle. In mid-November 2010, Nalcor Energy advised the provincial and federal governments that it would also be assessing the potential option of locating the Project's Labrador converter station at or near the Muskrat Falls site on the lower Churchill River. If that were to be the case, the Labrador transmission corridor would potentially extend from Muskrat Falls to the Trans Labrador Highway (Phase 3, TLH3), and then follow generally along the south side of the highway to approximately its southernmost point before meeting and continuing along the previously identified corridor from that location to the Strait of Belle Isle (Figure 1.2).

That additional Labrador transmission corridor option is being fully considered in the EA of the Project. As that option follows generally along the south side of the TLH3, it will utilize existing transportation infrastructure in that portion of Southeastern Labrador rather than requiring or creating new access in that part of the Project area. Given that the "existing access" characteristics of this Muskrat Falls corridor segment are relatively clear, and given the timing of the initiation of this study, it has not been included for detailed analyses in this report.

The access characteristics of both the Gull Island and Muskrat Falls corridor options, including any key differences and similarities between them and the implications for environmental effects, will however be fully considered in the EIS.

Figure 1.1 Labrador-Island Transmission Link: Project Overview

Figure 1.2 Labrador-Island Transmission Link: Muskrat Falls Corridor Option

1.2 Study Purpose and Objectives

The purpose of the study is to provide an understanding of the current degree of accessibility to and within the transmission corridor, as information for use in on-going Project planning and design and in the EA.

Using a combination of automated processes and manual interpretation with both satellite and ortho-imagery and existing road and trail network data, the Study Team has mapped and classified existing access roads and trails and used these data to perform spatial analysis and conducted a quantitative assessment of the current degree of access for the defined regions from Central Labrador through to the Avalon Peninsula. The overall study area (2 km wide transmission corridors and larger 15 km wide regional study area) and the various study sub-regions (Southeastern Labrador, Northern Peninsula, Central and Eastern Newfoundland and the Avalon Peninsula) are illustrated in Figure 1.3. The results and discussion presented in this report are generally structured according to these regional areas.

Figure 1.3 Study Area and Associated Regions

2.0 APPROACH AND METHODS

The following sections provide an overview of the information sources and methods used in this study, including the access data and spatial imagery obtained and utilized, as well as the manner in which it was processed and analysed to describe and quantify existing access levels along and adjacent to the transmission corridor.

2.1 Data Compilation and Review (Access Data and Spatial Imagery)

The access data used for this study were acquired from a variety of sources, as documented in Table 2.1. Upon receipt of the GIS files from the various sources the Study Team verified the spatial reference systems and coverage for each of the layers. Preliminary review of the datasets confirmed that although there were many common features amongst the data sets, no one dataset that contained all access. Also, when compared with the imagery, it was immediately evident that that not all access was captured in these data sets.

Table 2.1 Data Sources Acquired and Used in the Analysis

Data	Source
Newfoundland and Labrador Road Network Data – Edition 6.0	GeoBase - National Road Network Data
Various Data layers including Provincial Road Network data, Forestry Access Roads and Trails	Forestry Branch NL Department of Natural Resources
Existing Transmission Lines and access data	Nalcor Energy
Existing access data prepared by other consultants as part of the Labrador - Island Transmission Link environmental studies	Nalcor Energy (see Amec 2010 – *Labrador-Island Transmission Link: Socioeconomic Component Study, Communities, Land and Resource Use, Tourism and Recreation*)
Snowmobile Trails – Island of Newfoundland	Newfoundland and Labrador Snowmobile Federation

The spatial imagery used for this study was acquired by Nalcor Energy and included imagery previously compiled and used for other environmental studies. The data are comprised of SPOT-5 2.5 m panchromatic and colour imagery as well as 1:30,000 black and white ortho-imagery.

Table 2.2 describes the imagery data sets and their origin. A combination of these imagery products covered the entirety of the approximately 1,100 km long and 15 km wide study area.

Table 2.2 Imagery Acquired and Used in the Study

Data	Date Range	Source
SPOT-5 2.5m and 5m spatial resolution imagery provided in panchromatic and colour	2004-2008	Iunctus Geomatics Corp., National SPOT-5 Distributors
1:30,000 Black and White Ortho-imagery	2005-2007	Surveys and Mapping Division, Lands Branch Department of Environment and Conservation

2.2 Identification and "Extraction" of Access from the Spatial Imagery

The Study Team initially proposed to capture any 'new' access (ie., that not included in the access datasets outlined in Table 2.1) through image classification of the satellite and ortho-imagery. The SPOT-5 satellite imagery would allow for automated classification of access through a combined unsupervised and supervised image classification approach. The majority of the access could be extracted from the imagery based on this method for the areas covered by SPOT-5. For areas where SPOT- 5 imagery was not available, the provincial ortho-imagery was used. Some automated extraction could be performed on the panchromatic (black and white) ortho-imagery as the spectral properties (class) for roads are very distinct from other land classes.

Upon review of the existing access data and a thorough testing of this proposed approach it was determined that an automated extraction process would be successful in extracting new access, but also that it would require significant effort to filter this data from the existing access information without increasing the comprehensiveness and quality of the final product. In addition, classification (assigning access class) of the 'new' access would be a manual process regardless of the chosen method as the access class could not be determined through the image classification process. For these reasons the approach to the extraction of access data from image classification was revisited and revised somewhat, as described below.

Cut lines, trails, roads and other access routes distinguishable from the available imagery for the defined Study Area were collected using a "heads-up" digitizing method. Using ArcGIS software, the GIS operator panned along the study corridor from east to west identifying and manually digitizing polylines representing access routes. A consistent scale (1:15,000) was chosen to digitize the data to maintain a standard collection process for all areas regardless of the underlying imagery. The classified imagery referenced above was used to assist in identifying access that had not been previously captured within the existing data collected, but the access was digitized directly from the satellite and ortho-imagery. Over 1,100 km of new access from 1700 additional line segments was collected as part of the manual extraction exercise.

2.3 Merging and Filtering Access Data

The latest Provincial road network, forest access roads and trail data were acquired from the appropriate sources (Table 2.1 above), and these data served as the framework and baseline for incorporating the access data acquired through manual extraction from the imagery.

The initial filtering step was to "clip" the provided access data using the 15 km study area. The next stage involved addressing the common features between the input datasets. This involved overlaying all of the acquired access from the various sources and the process utilized a combination of automated overlay and manual intervention techniques. Each of the input layers were directly compared to each of the others, and features that shared the same spatial geometry were automatically removed using the proximity overlays within ArcGIS. A number of GIS filters were run to achieve the desired results including testing for exact occurrences of access features between layers.

For features that did not share the same geometry but clearly represented the same feature, a manual process was implemented to eliminate the redundant feature(s). As the GIS operator moved visually along the corridor and Study Area in the digitizing process, all directly overlapping access was compared and redundant features were removed. This decision process was governed by several key guidelines to ensure consistency, including that the access that remained was taken from the most recently acquired dataset and/or the feature that best matched the imagery. For example, if the redundant feature was classed as a resource road from an earlier data set but has since been classed as an abandoned resource road in a more recent data set, the most recent classification was considered more valid.

Attributes derived for the final merged data are defined in Table 2.3. These field definitions and valid entries are a product of refining the provincial forestry roads and trails data provided by the NL Department of Natural Resources (Forestry Branch).

Table 2.3 Merged Features Attribute Table

Field	Description	Valid Entries
ROADSOURCE	Describes how the access data was captured	CP – Colour Photography; BP – Black and White Photography; SI – Satellite Imagery; GP – Global Positioning System; CT – Canadian Topographic Data; UK - Unknown
SOURCE	Describes the original source of the information	Text field documenting the original source of the data
ROADCL	Describes the numeric road class according to the Provincial Forestry classification scheme	30 - Trans-Canada Highway 31 - Paved Public Road 32 - Unpaved Public Road 33, 34, 39 - Resource Roads 27 - Abandoned – Not Passable 28 - Abandoned Resource Roads 29 - Winter Roads 35, 36 - Trails, Extraction Roads 92 - Abandoned Railways 98 - Snowmobile Trails 99 -Existing Transmission Lines
LCP_CLASS	A grouping of the original access classes for the purpose of this study. The grouping of classes is further explained in Section 2.4	Trans-Canada Highway Other Paved Public Roads Resource Roads (existing) Resource Roads (abandoned) Railbed Existing Transmission Lines Snowmobile Trails Other Trails and Other Access
WEIGHT	The weight assigned to each of the 'LCP Classes'. Further information on how these weights were derived is included in Section 2.4	Values from 1 to 10 representing the perceived amount of access use and how that relates to accessing the proposed transmission corridor
LENGTH	Numeric field that is assigned a length (in metres) for each line segment in the database	Numeric field

2.4 Classification of Access Data and Assignment of Attributes and Weightings

The classification scheme inherent in the input access datasets was the basis for the newly acquired access and the resultant merged data. The data acquired from the NL Forestry Branch had the most detailed classification system and thus it was adopted for this study and all other input layers were assigned a related feature type. The NL Forestry Branch classification scheme is presented in Table 2.4.

Table 2.4 Access Classes (NL Forestry Branch)

Original Access Class	Numeric ID
Trans-Canada Highway	30
Paved Public Road	31
Unpaved Public Road	32
Resource Roads	33, 34, 39
Abandoned – Not Passable	27
Abandoned Resource Roads	28
Winter Roads	29
Trails / Extraction Roads	35, 36
Abandoned Railways	92
Snowmobile Trails*	98
Existing Transmission Lines*	99

**Classes created by Study Team as part of this study*

If the class of access was not apparent from the imagery or from the interpretation of surrounding access data, then the lowest level of access class was assigned to avoid over estimation of access class and subsequent weighting in the spatial analysis process. For the purpose of this study, trails were deemed to be the lowest level of access with the highest level being the Trans-Canada Highway.

Similar access types were grouped according to the overall level of accessibility that they likely provide, and a new set of classes were created for the purposes of this study (Table 2.5). Many of the classes remained generally the same, but some grouping was required for 'winter roads' and 'abandoned – not passable' access was very limited amount within the study area and therefore its significance in the spatial modeling was relatively low. Both of these classes were therefore merged into a new 'Other Trails and Other Access' category.

In some cases, the class names were altered slightly to better suit the nature and purpose of this analysis and study.

Table 2.5 Access Classes used for the Study

Access Class	Original Numeric ID
Trans-Canada Highway	30
Other Paved Public Roads	31
Unpaved Public Roads	32
Resource Roads (existing)	33, 34, 39
Resource Roads (abandoned)	28
Railbed	92
Snowmobile Trails	98
Existing Transmission Lines	99
Other Trails and Other Access	27, 29, 35, 36

Accessibility "weightings" were derived by assigning a score from 1 to 10 to the access classes based on the likely degree of accessibility that they provide. This can perhaps best be explained by way of an example - a paved public road offers a far easier access to a site than an ATV trail due to the condition, width, and maintenance of the route. A variety of larger vehicles can travel along a paved and maintained road (ploughed, repaired and serviced) but smaller numbers and fewer types of motor vehicles can travel along a narrow, unmaintained and rough dirt trail. The assignment of weights also considered the potential volume of traffic for the each of the access types.

The weightings provide a range of classes which were then used in the spatial analysis as part of the weighted line density modeling. The assigned weightings for each access class are listed in Table 2.6.

Table 2.6 Weightings Assigned by Access Class

Access Class	Weight
Trans-Canada Highway	10
Other Paved Public Roads	8
Unpaved Public Roads	6
Resource Roads (existing)	4
Resource Roads (abandoned)	3
Railbed	3
Existing Transmission Lines	2
Snowmobile Trails	2
Other Trails and Other Access	1

2.5 Preparation of Data for Spatial Analysis

The dataset was subsequently subdivided into each of the sub-regions that comprise the Study Area: Southeastern Labrador, Northern Peninsula, Central and Eastern Newfoundland, and the Avalon Peninsula, which allow for regional breakdowns of the data for analysis and presentation purposes.

The length of each access "line" segment in the merged access data was calculated within ArcGIS. The length of each line segment within the database was calculated in metres and stored within the 'Length' field. After the data was clipped for each region the 'Length' field was updated to ensure that any clipped line segments were tagged with the appropriate values.

2.6 Spatial Analysis

The length of access for each class was calculated using the 'Summarize' function within the attribute table toolset of ArcGIS. Results were output to Microsoft Excel for summary of data and creation of tables. The summaries were prepared for the 15 km study area and the 2 km proposed transmission line corridor.

Line density analysis was completed across the 15 km wide study area, for each of the associated study regions. Line density modelling basically calculates the length of line segments per unit area. The density results for this study were then output to an ArcGIS raster grid, and the values written to each 250 m grid cell represent the density of access calculated in units of length per square kilometer. Therefore, the density measure used for this study is the number of kilometres of access per square kilometer of area. Based on the study area extent(s) and

an understanding of the input access layers scales the parameters presented in Figure 2.1 were chosen for the analysis.

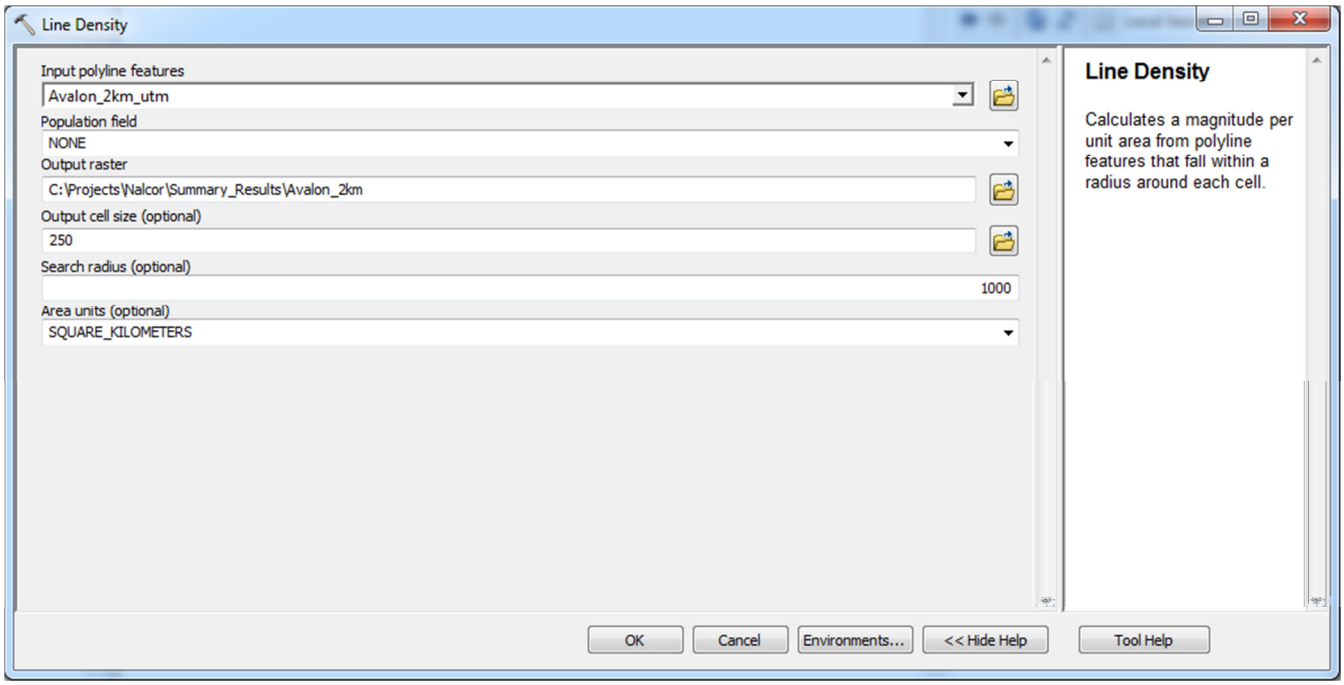
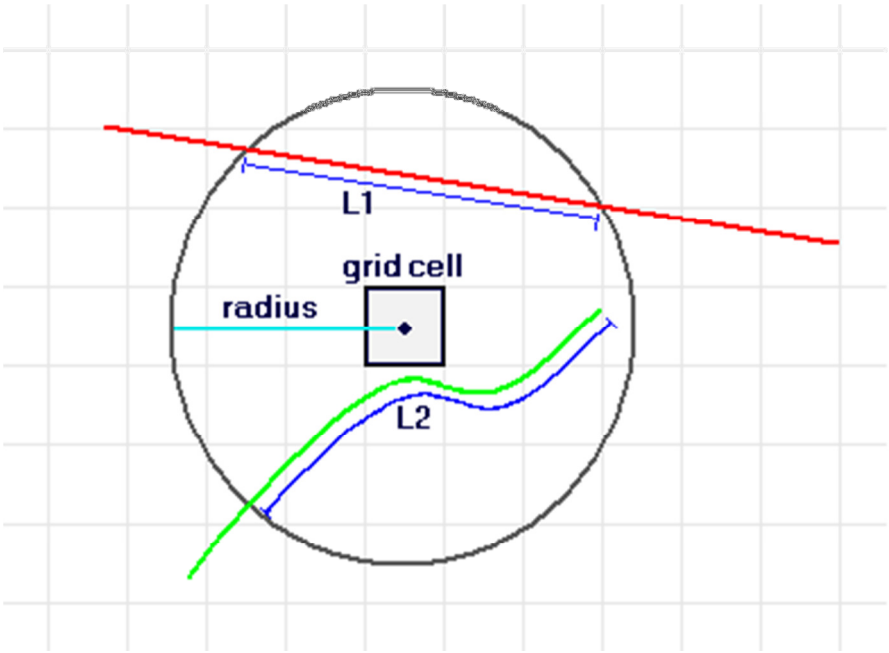


Figure 2.1 Input Parameters for Line Density Analysis

Figure 2.2 illustrates how the line density analysis was calculated, with each raster cell assigned a density value. The formula used to calculate the density analysis is as follows:

$$\boldsymbol{density} = \frac{\boldsymbol{L1 + L2}}{\boldsymbol{area\ of\ circle}}$$

, where L1 and L2 represent the length of the line segments per unit area.



Source (ESRI ArcGIS 10 Help File, 2010)

Figure 2.2 How Line Density Calculation Assigns Values to Raster Cells

Simple line density analysis does not take into account the type of access and therefore, the type and level of access it provides.

Weighted line density analyses were therefore completed for the 15 km study area, for each of the regions. Weighted density modeling uses the same approach for calculating the length of line segments per unit area (kilometres per square kilometre) but this analysis also incorporates the type of access (weighting) into the equation. With reference to Figure 2.2, the following formula was used to calculate the density for each cell for the weighted line density analysis:

$$\boldsymbol{density} = \frac{\boldsymbol{L1} \times \boldsymbol{W1} + \boldsymbol{L2} \times \boldsymbol{W2}}{\boldsymbol{area\ of\ circle}}$$

, where W1 and W2 represent the weights assigned to a particular access class. For the purpose of this study the weightings used were those presented in Table 2.6.

Based on the study area extent(s) and an understanding of the input access layers scale the parameters presented in Figure 2.3 were chosen for the analysis. The parameters chosen are suitable for a regional assessment of this nature and were defined to produce meaningful units of measure (ie., kilometres of access per square kilometre).

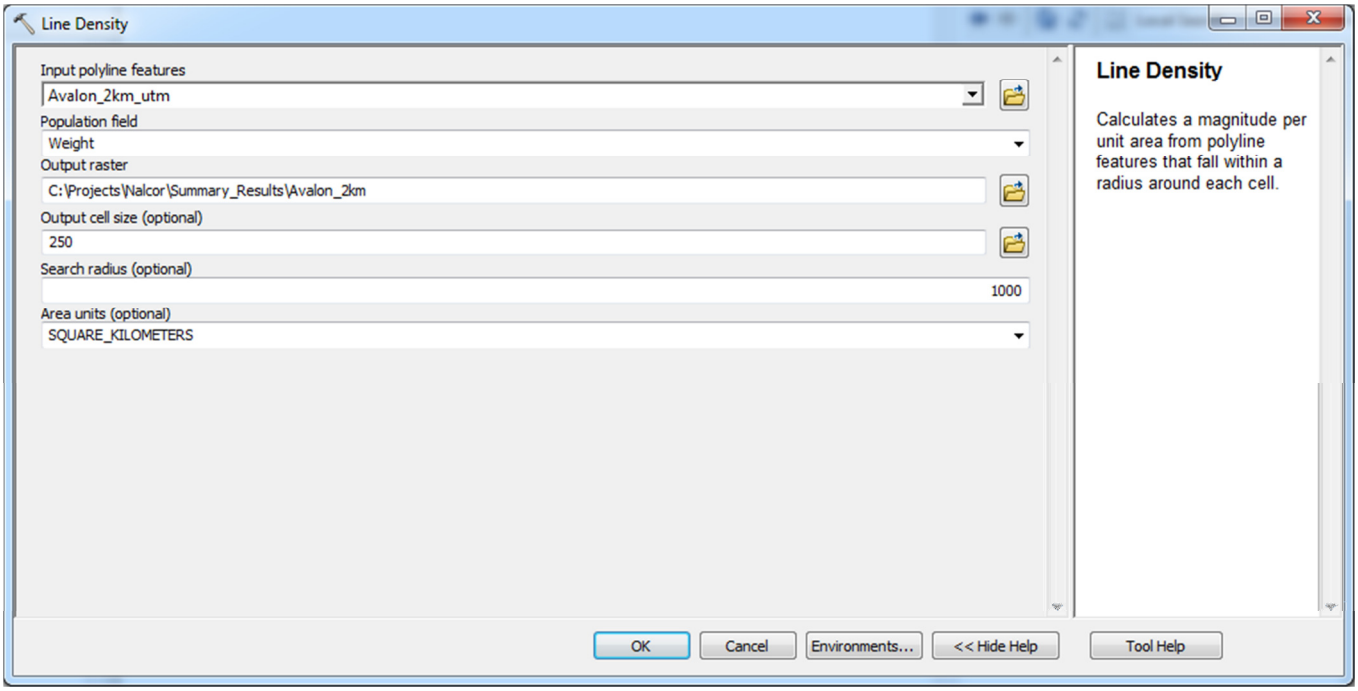


Figure 2.3 Input Parameters for the Weighted Line Density Analysis

2.7 Assumptions and Considerations

It should be noted that the datasets and analysis provided in this study are focussed on existing ground access "infrastructure" only, and specifically, that which involves some visible footprint (eg, cleared area) upon the landscape, and which is available for (and potentially subject to) year-round use. It therefore does not explicitly consider and address more "seasonal" access routes and activities, such as general snowmobile use, which certainly occurs throughout the Study Area but which often does not require such established access routes.

The access data was collected from a variety of sources, and much of the data inputs were lacking detailed metadata and details regarding the use limitations, capture date, spatial accuracy etc. Any information that was present in the original data that documented how the access was derived has been included in the final merged database. Data should not be used for navigation purposes.

The data compiled is a product of multiple scales and resolutions as it was gathered using differing technology such as digitizing and GPS. Because of the variety of data collection techniques and the range of scales some input data sets aligned more closely to the imagery than others. The spatial analysis for this study was performed at a regional level (ie. much smaller scale than input data) and therefore this limitation is minimized.

Some light use trails or other narrow or poorly defined access may not have been visible using the imagery for digitizing and were likely not captured as part of this study. Only access clearly visible and distinguishable from the imagery was captured during the digitizing process. This study is thus inherently conservative in its approach and subsequent results in that there is likely more access within the study area than presented in this study.

There is some level of subjectivity inherent in the process for the assignment of weights for this study. Best efforts were taken to assign weights that were meaningful for each access class. As previously discussed, for

access where the GIS operator was uncertain of the class based on the imagery interpretation the lowest level of access class and related weight (trail) was assigned. In doing so, any potential overestimation of the access class was avoided during the modeling and summary of results.

2.8 Study Team

Stephen Rowe is a senior GIS consultant with Integrated Informatics Inc. in St. John's, NL. Mr. Rowe was responsible for all aspects of the GIS data gathering, access digitizing, spatial analysis and report writing. Jason Humber is a Principal Consultant with Integrated and was responsible for senior review of the spatial data, analysis and the report.

3.0 RESULTS AND DISCUSSION

3.1 Access Class and Length by Region

An overview and breakdown of the total and by category lengths of access (in kilometres) within the Study Area and transmission corridor for each study region is provided in Tables 3.1 and 3.2. These numbers can assist the reader in understanding the type and level of ground access that is currently available within each region. Regional maps showing existing access by class are presented in Figures 3.1 to 3.4. The map atlas presented in Appendix A shows this information at a larger scale.

Table 3.1 Access Class and Length within the 15 km Wide Study Area by Region

Access Class	Southeastern Labrador (km)	Northern Peninsula (km)	Central and Eastern Newfoundland (km)	Avalon Peninsula (km)
Trans-Canada Highway	0	0	164	188
Other Paved Public Roads	33	64	282	301
Unpaved Public Roads	59	36	111	318
Resource Roads (existing)	11	667	823	210
Resource Roads (abandoned)	0	7	1,095	0
Railbed	0	0	144	129
Existing Transmission Lines	15	86	319	307
Snowmobile Trails	0	212	298	133
Other Trails and Other Access	47	1609	1,977	1,435
Total (km)	**165**	**2,681**	**5,213**	**3,021**

Table 3.2 Access Class and Length within the 2 km Wide Proposed Transmission Corridor by Region

Access Class	Southeastern Labrador (km)	Northern Peninsula (km)	Central and Eastern Newfoundland (km)	Avalon Peninsula (km)
Trans-Canada Highway	0	0	8	61
Other Paved Public Roads	2	6	19	34
Unpaved Public Roads	4	5	3	52
Resource Roads (existing)	1	153	168	36
Resource Roads (abandoned)	0	0	171	0
Railbed	0	0	12	30
Existing Transmission Lines	0	10	136	143
Snowmobile Trails	0	39	61	22
Other Trails and Other Access	6	385	463	229
Total (km)	**13**	**598**	**1,041**	**607**

Figure 3.1 Existing Access – Southeastern Labrador

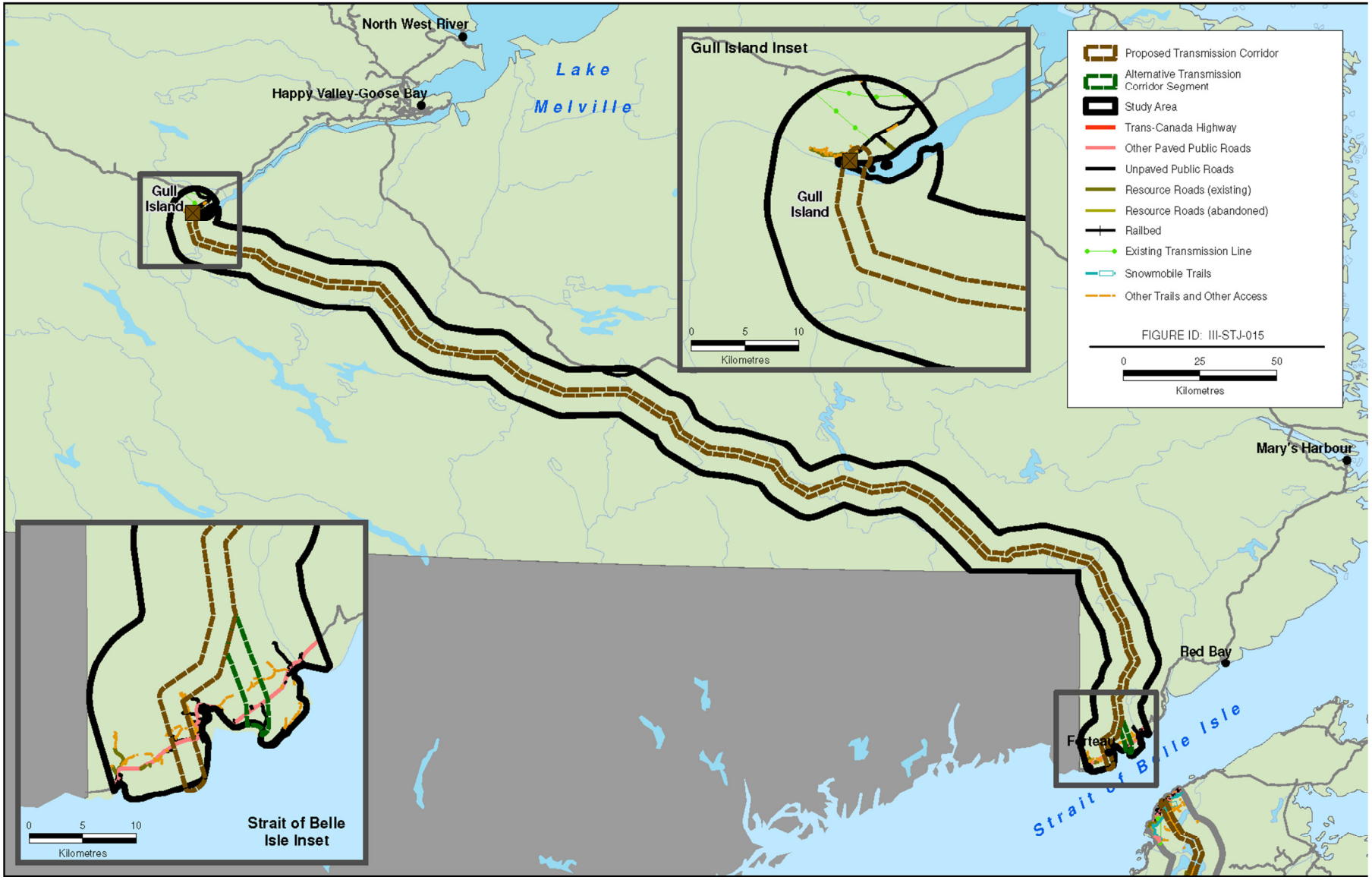


Figure 3.2 Existing Access – Northern Peninsula

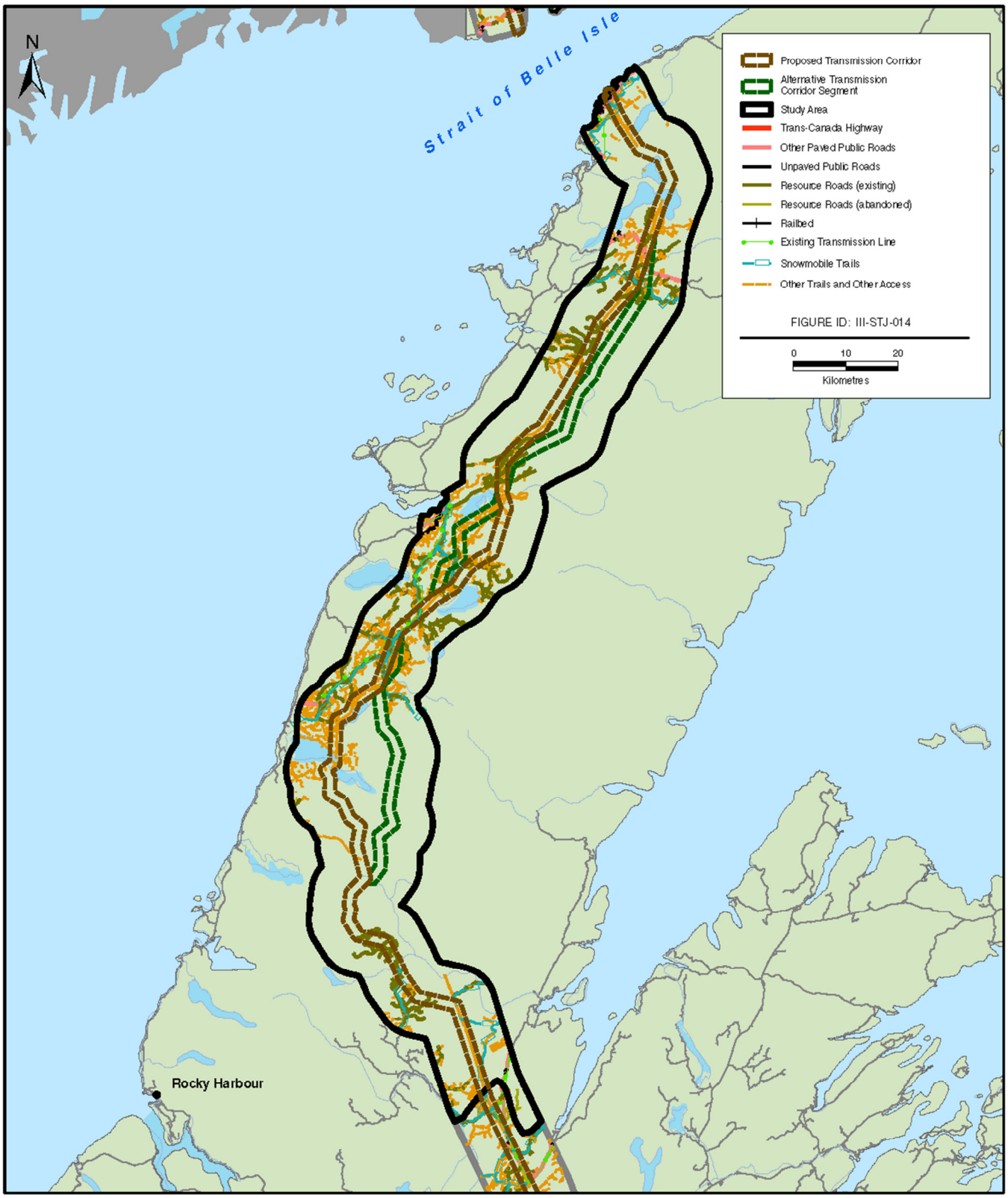


Figure 3.3 Existing Access – Central and Eastern Newfoundland

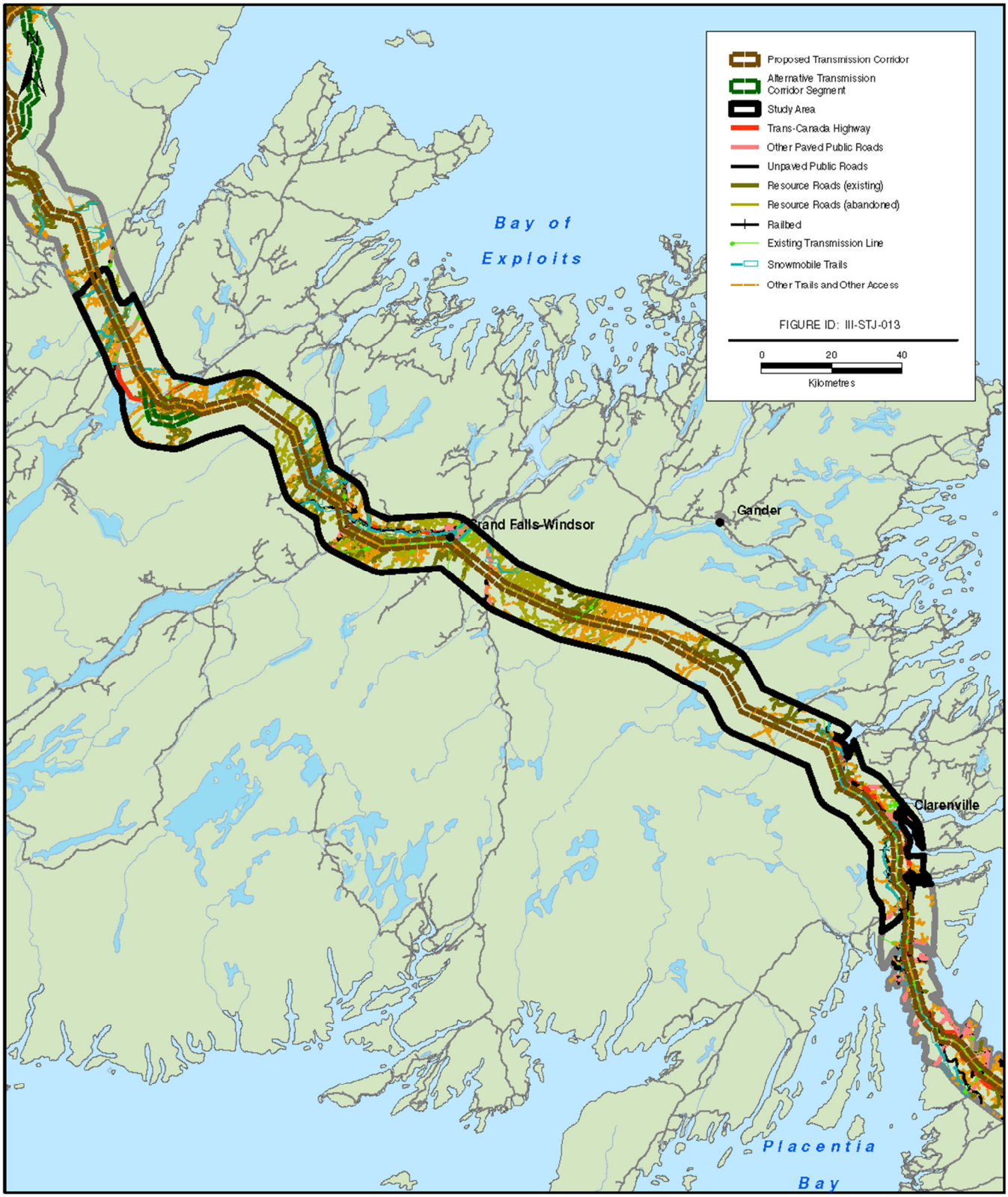
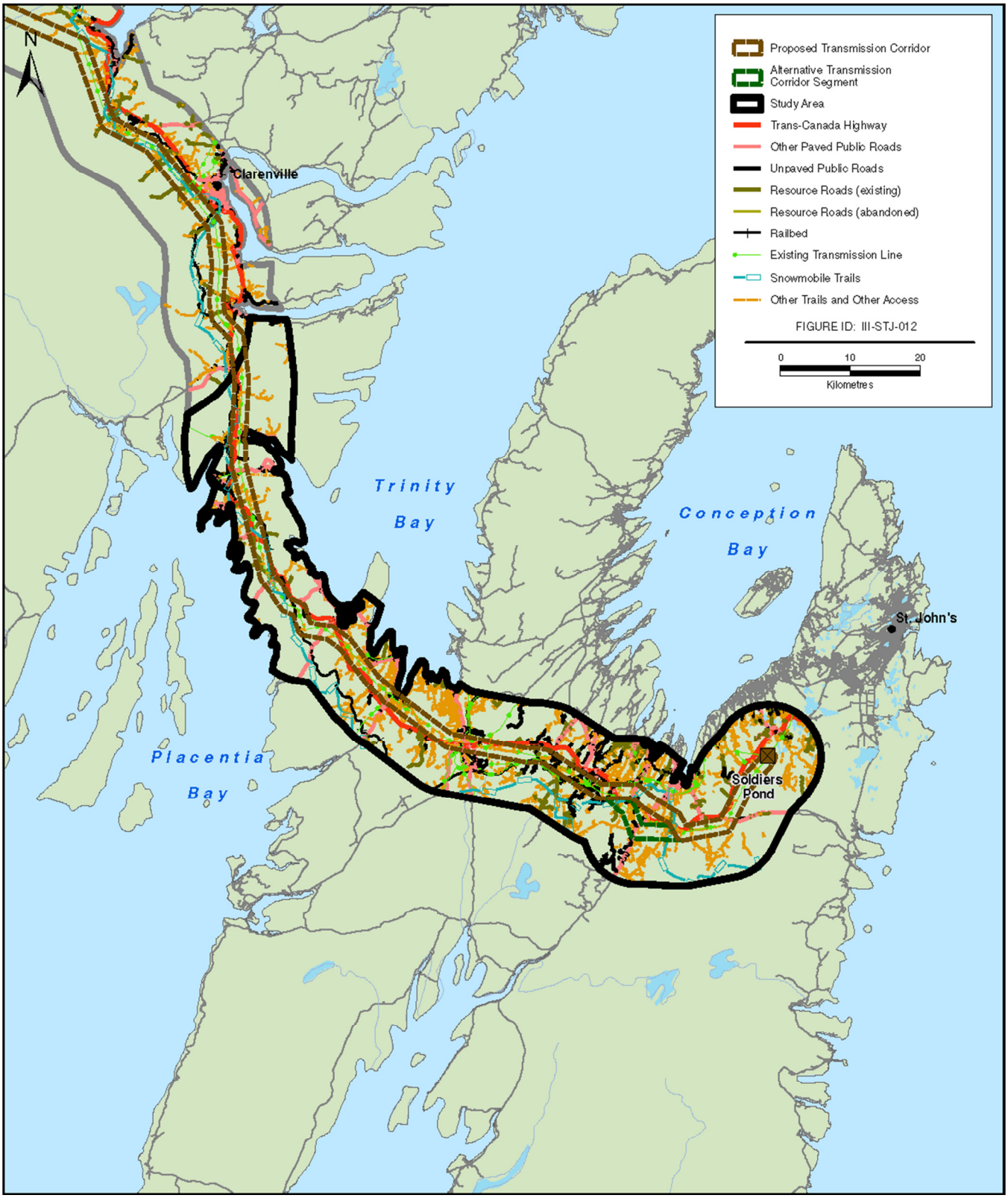


Figure 3.4 Existing Access – Avalon Peninsula



3.2 Line Density Modeling

The line density modeling results are presented in Figures 3.5 to 3.8 for the 15 km study area by study sub-region. The colours for access density range from light yellow to dark brown. As an example, values greater than zero but less than or equal to one fall within the first class (>0 – 1). A value of zero in the modeling results in no shading and therefore is represented by the light green shading depicting land; these areas contain no existing access according to the data used for analysis. The same classes are applied to each of the four regions to ensure standardization and comparability between the Figures.

For clarity, the values presented for each pixel in the model result are derived by calculating the number of kilometres of existing access infrastructure per square kilometre area.

Figure 3.5 Line Density Modeling – Southeastern Labrador

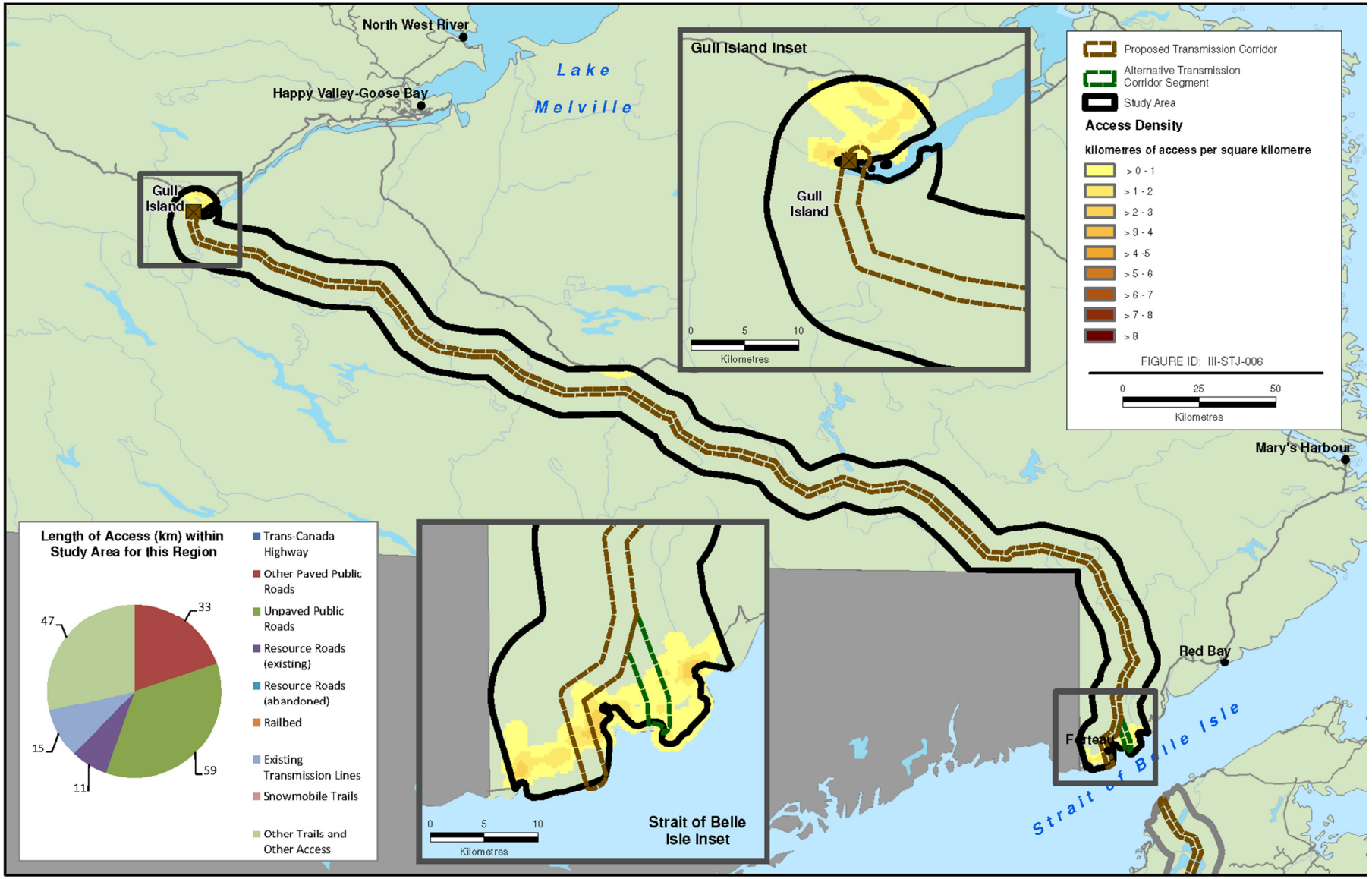


Figure 3.6 Line Density Modeling – Northern Peninsula

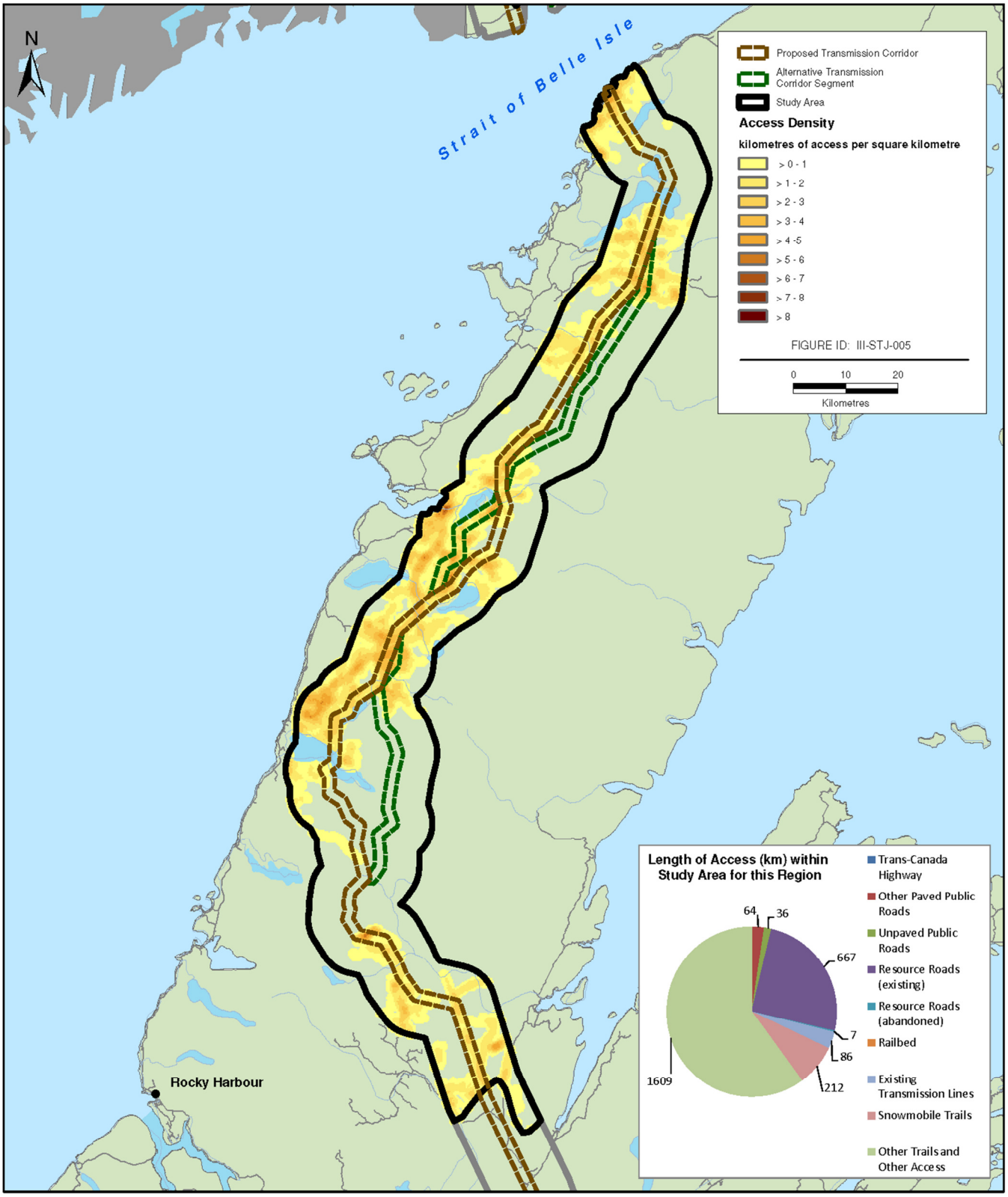


Figure 3.7 Line Density Modeling – Central and Eastern Newfoundland

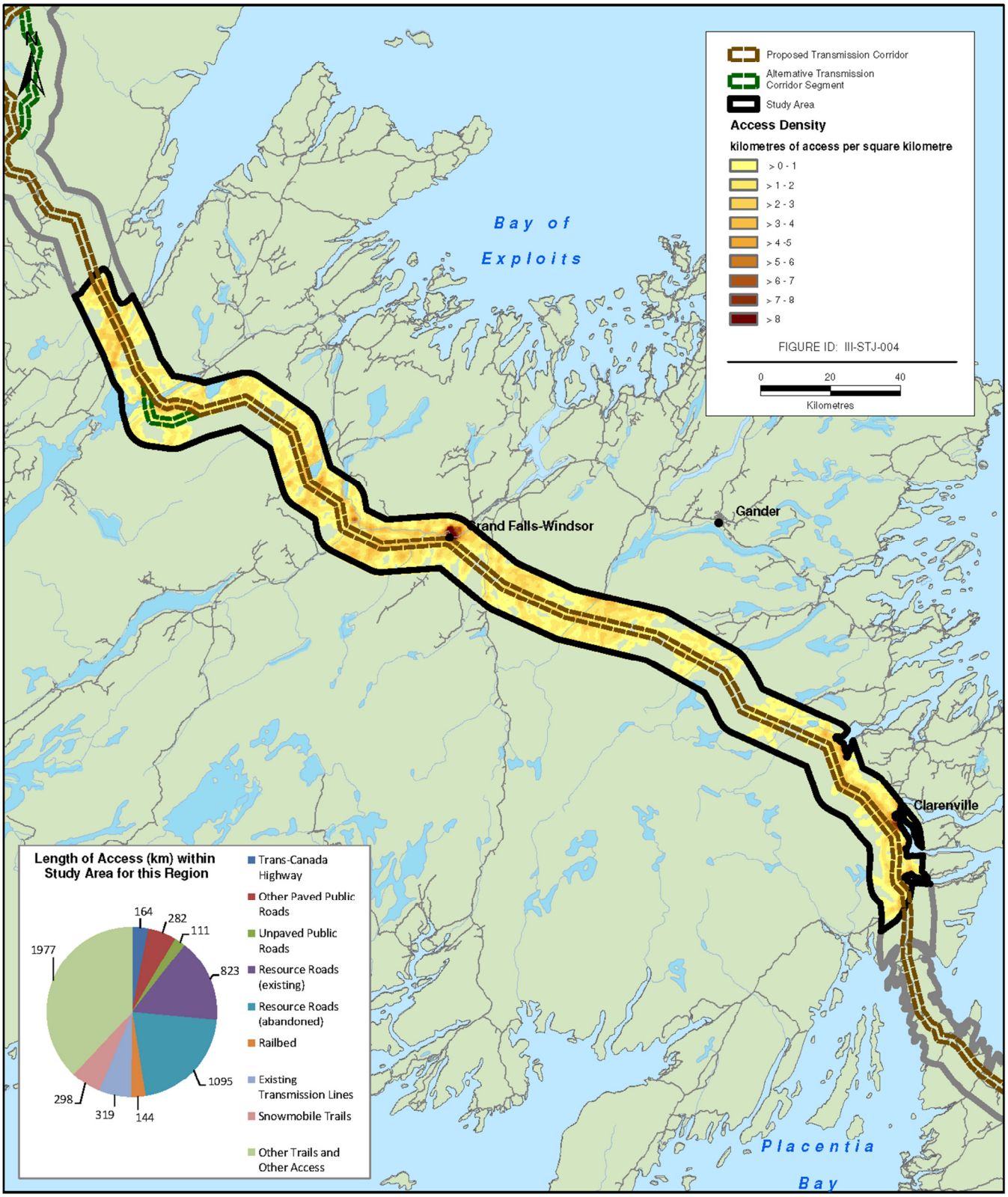
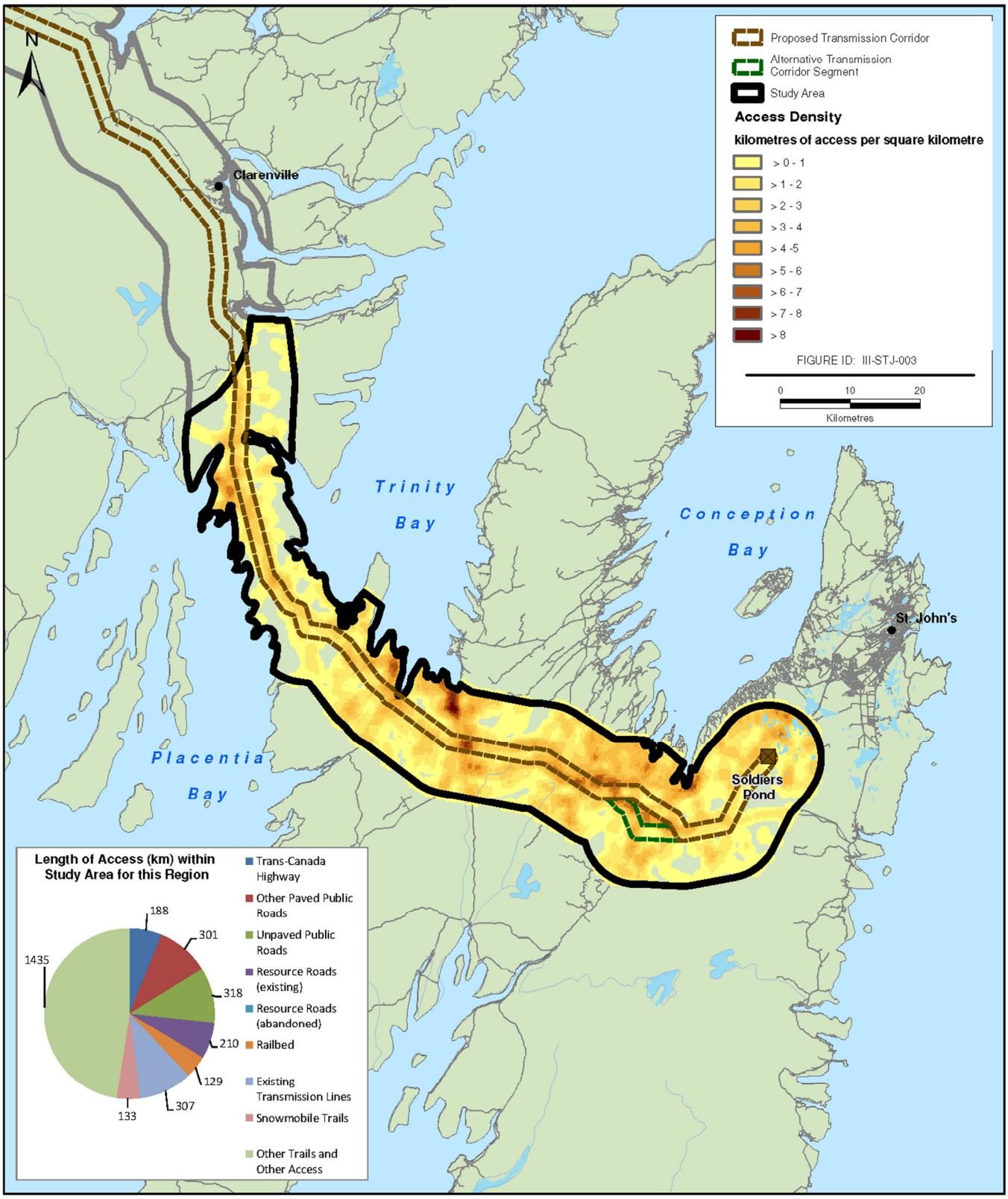


Figure 3.8 Line Density Modeling – Avalon Peninsula



3.3 Results of Weighted Line Density Modeling

The weighted line density modeling results are presented in Figures 3.9 to 3.12. The legend included in each of the figures shows a stretched classification where light yellows represent areas of low density and brown representing areas of relatively high density within the 15 km study area. A value of zero in the modeling results in no shading; these areas are representative of no existing access according to the data used for analysis. The minimum and maximum values are applied to each of the four regions to ensure standardization and comparability between the Figures. These modeling results illustrate the current level of accessibility within the study area with the addition of weighting for the various access classes.

For clarity, the values between one and forty are the calculated access values (weighted) for each pixel in the model result. The calculated access values are derived by multiplying the number of kilometres of access per square kilometer area by the assigned weight for the particular access class.

Figure 3.9 Weighted Line Density Modeling – Southeastern Labrador

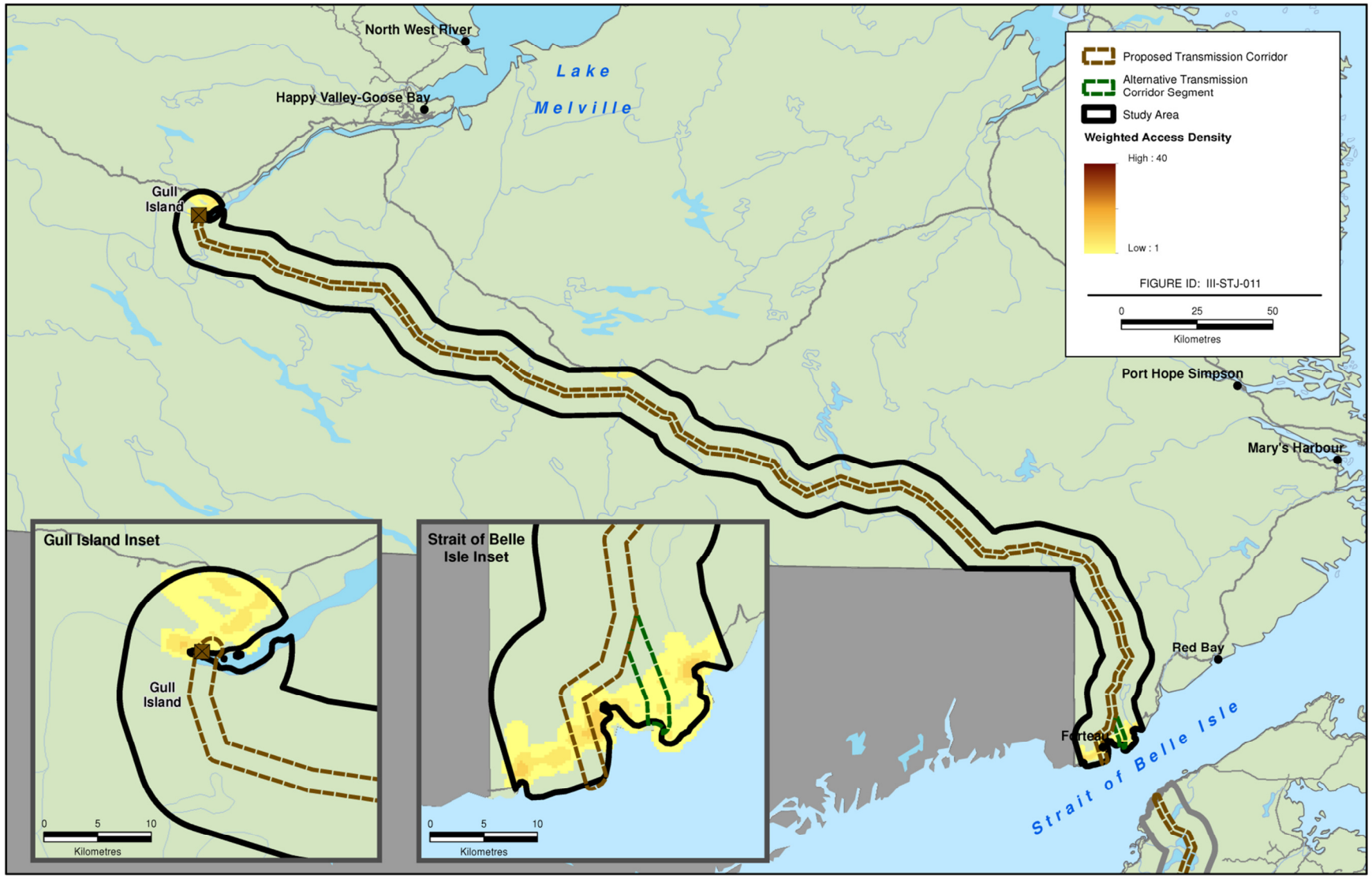


Figure 3.10 Weighted Line Density Modeling – Northern Peninsula

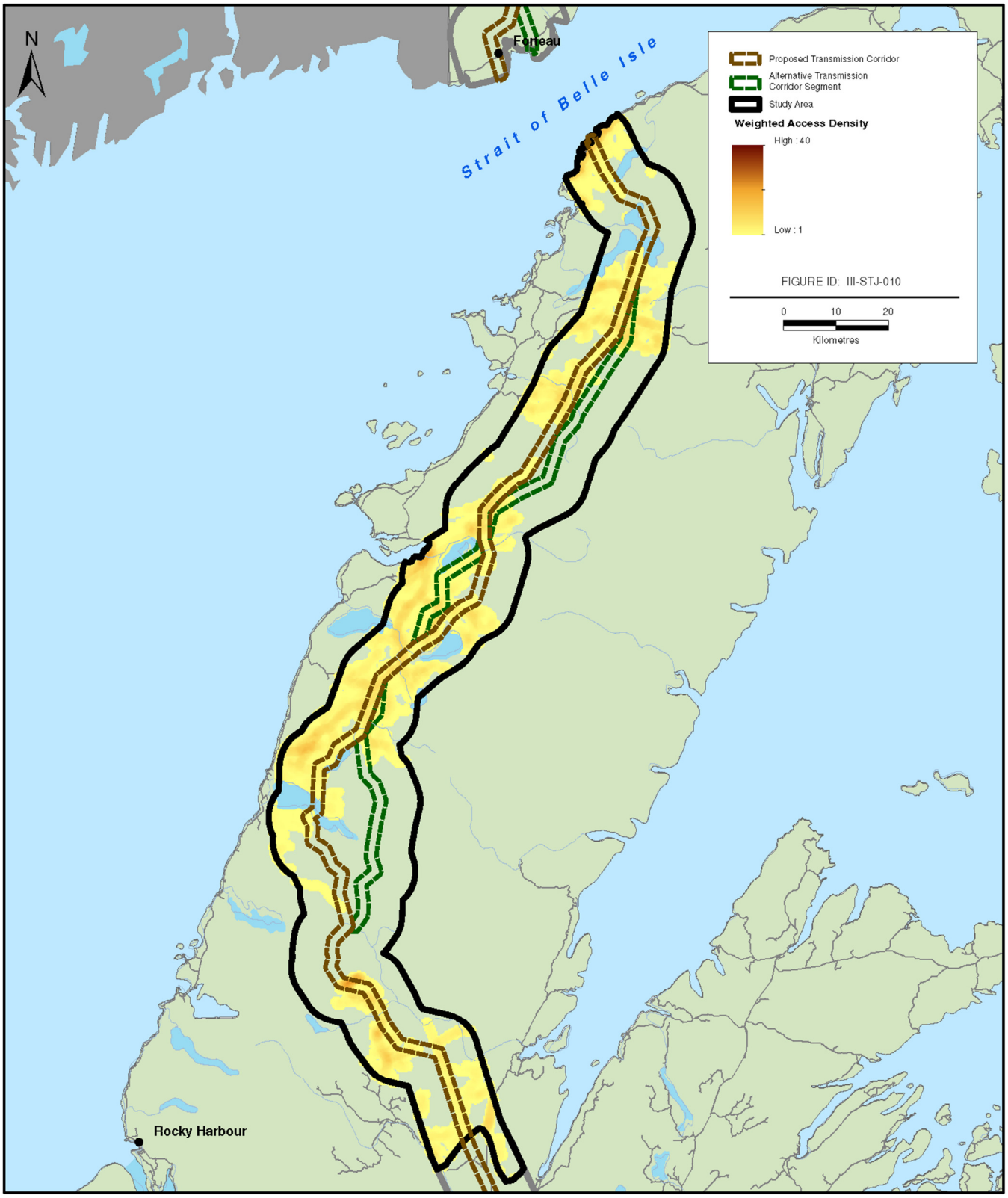


Figure 3.11 Weighted Line Density Modeling – Central and Eastern Newfoundland

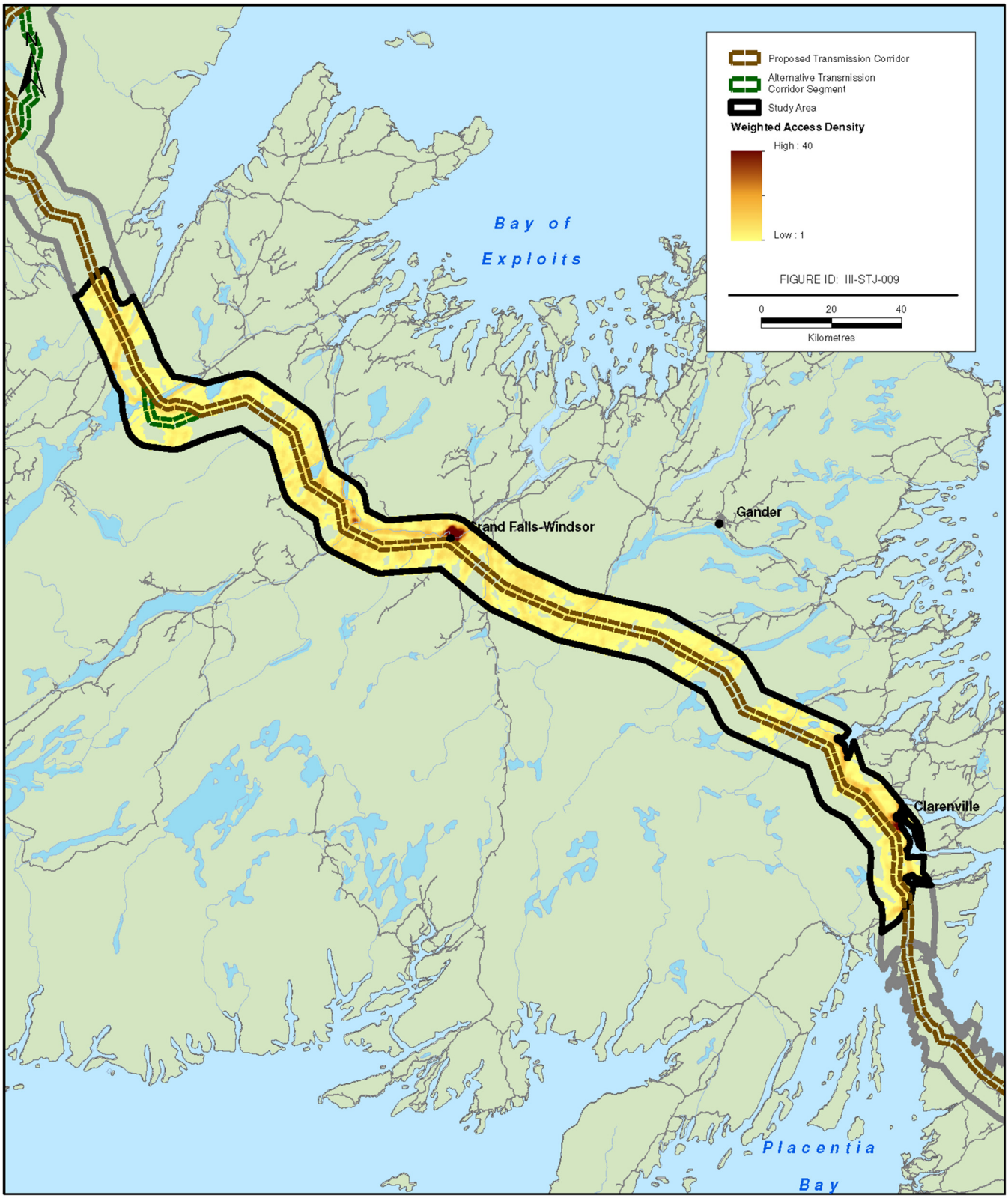
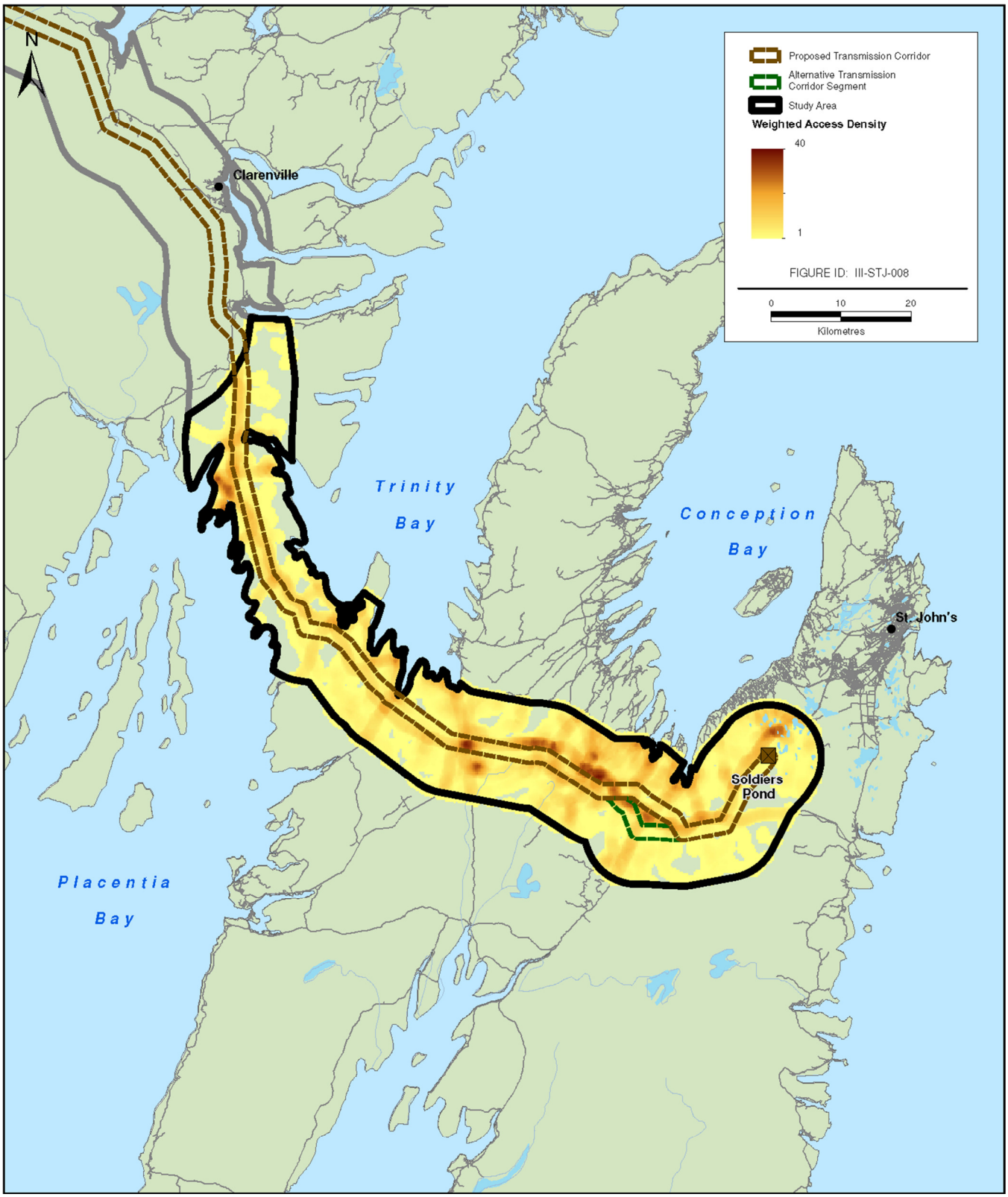
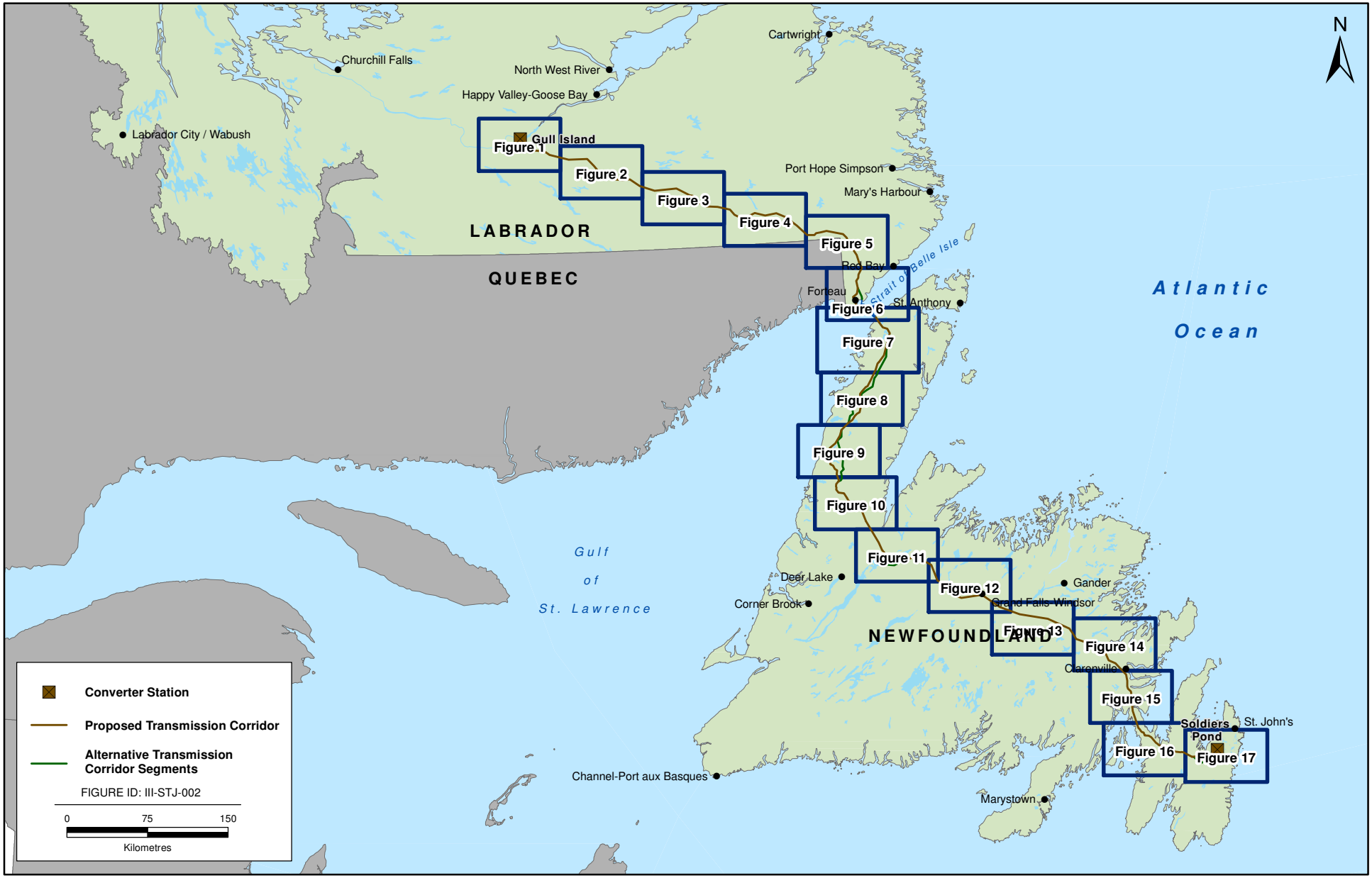


Figure 3.12 Weighted Line Density Modeling – Avalon Peninsula



APPENDIX A

Map Atlas: Labrador-Island Transmission Link Existing Access



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APPENDIX A - INDEX MAP

Labrador - Island Transmission Link: Existing Access

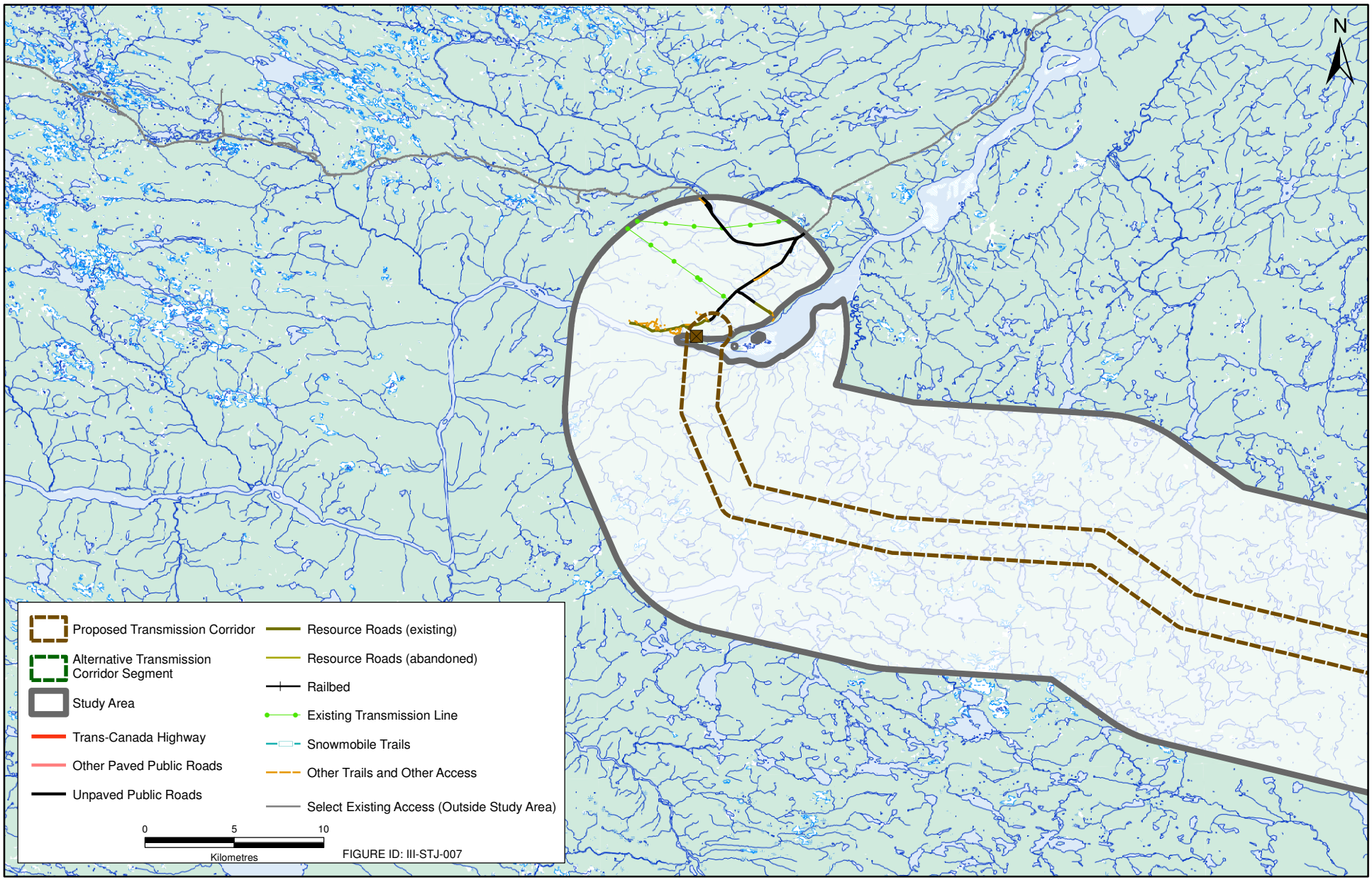

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FIGURE 1 of 17

Labrador - Island Transmission Link: Existing Access

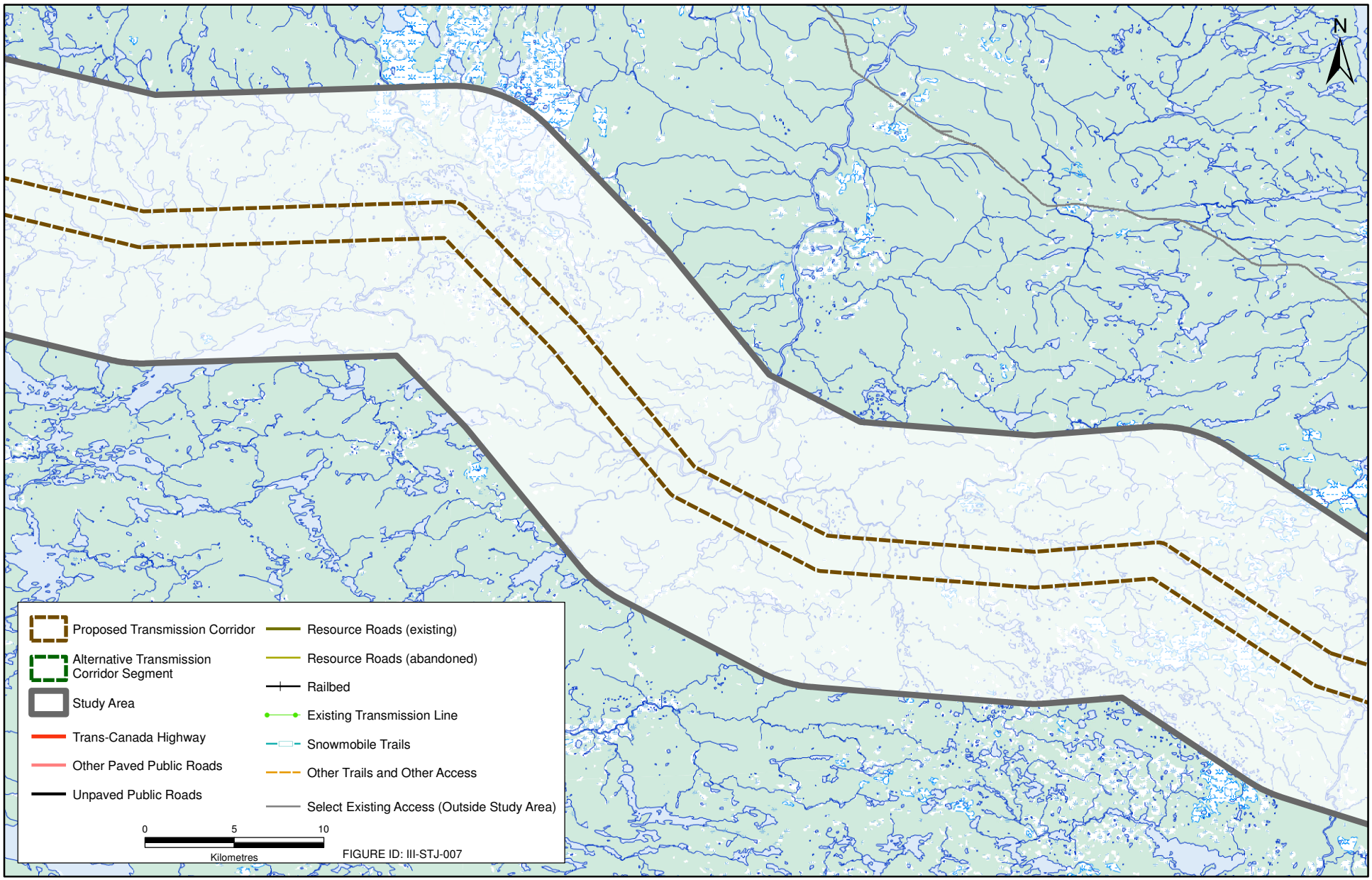

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FIGURE 2 of 17

Labrador - Island Transmission Link: Existing Access

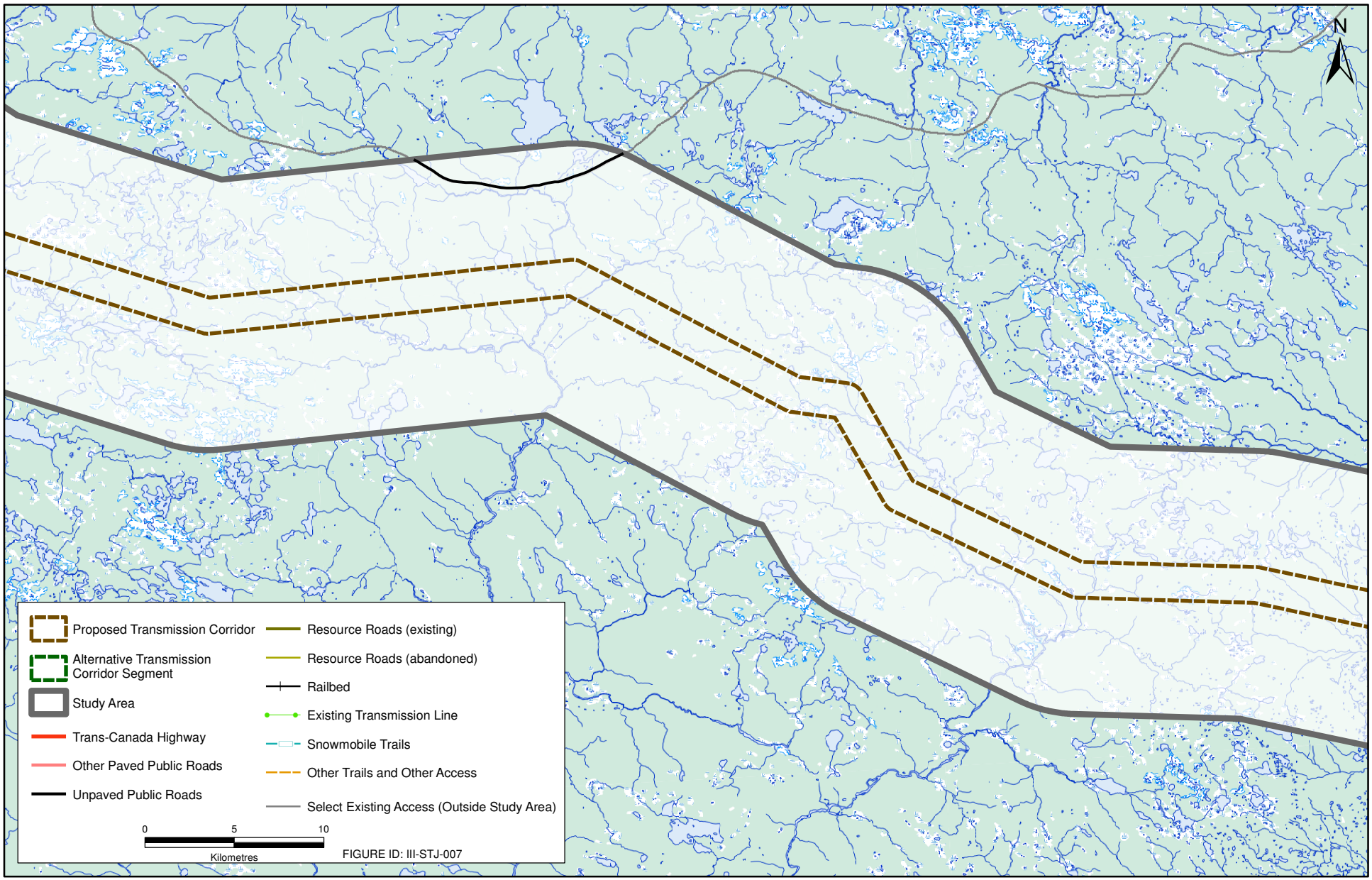

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FIGURE 3 of 17

Labrador - Island Transmission Link: Existing Access

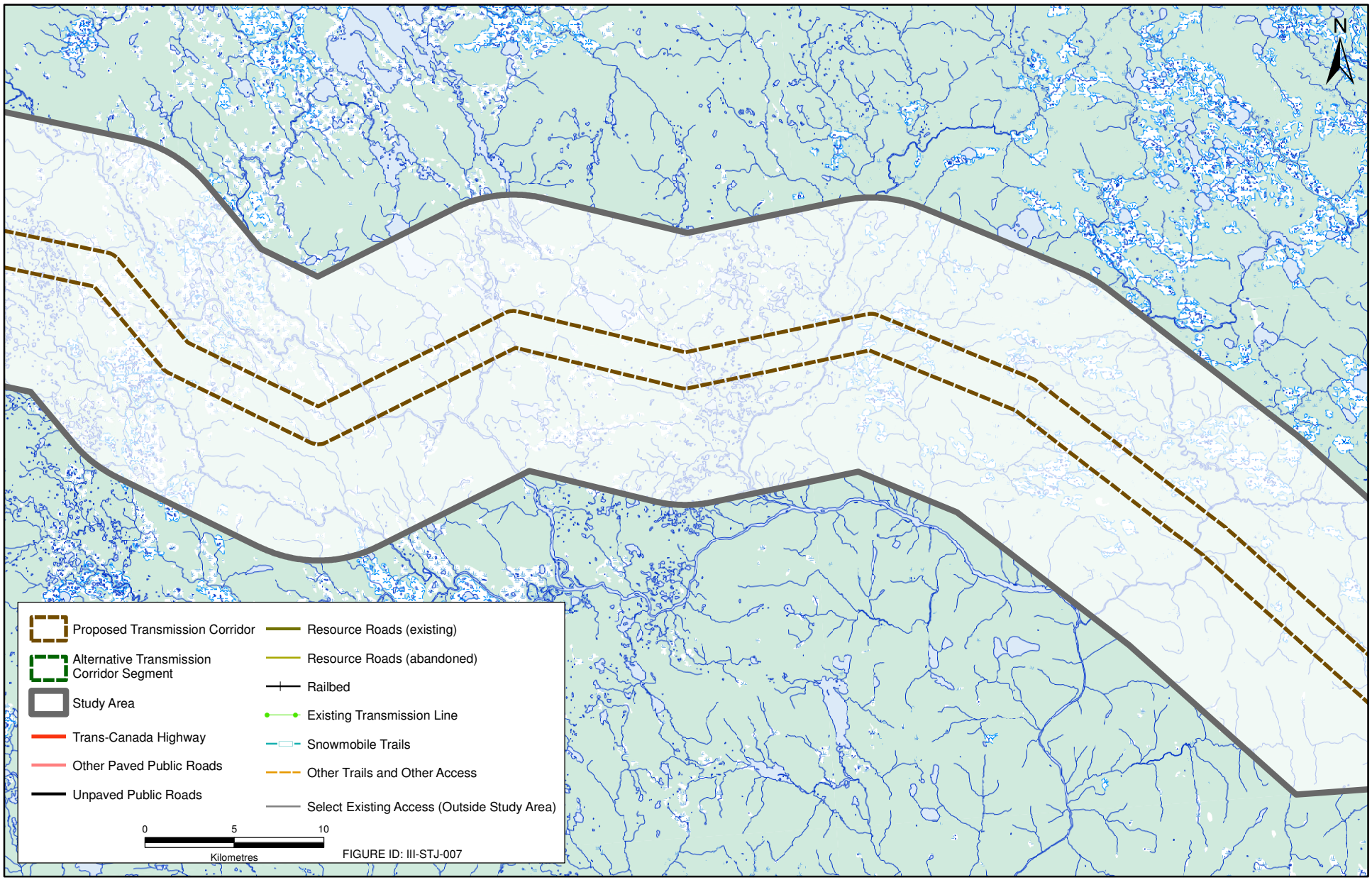

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FIGURE 4 of 17

Labrador - Island Transmission Link: Existing Access

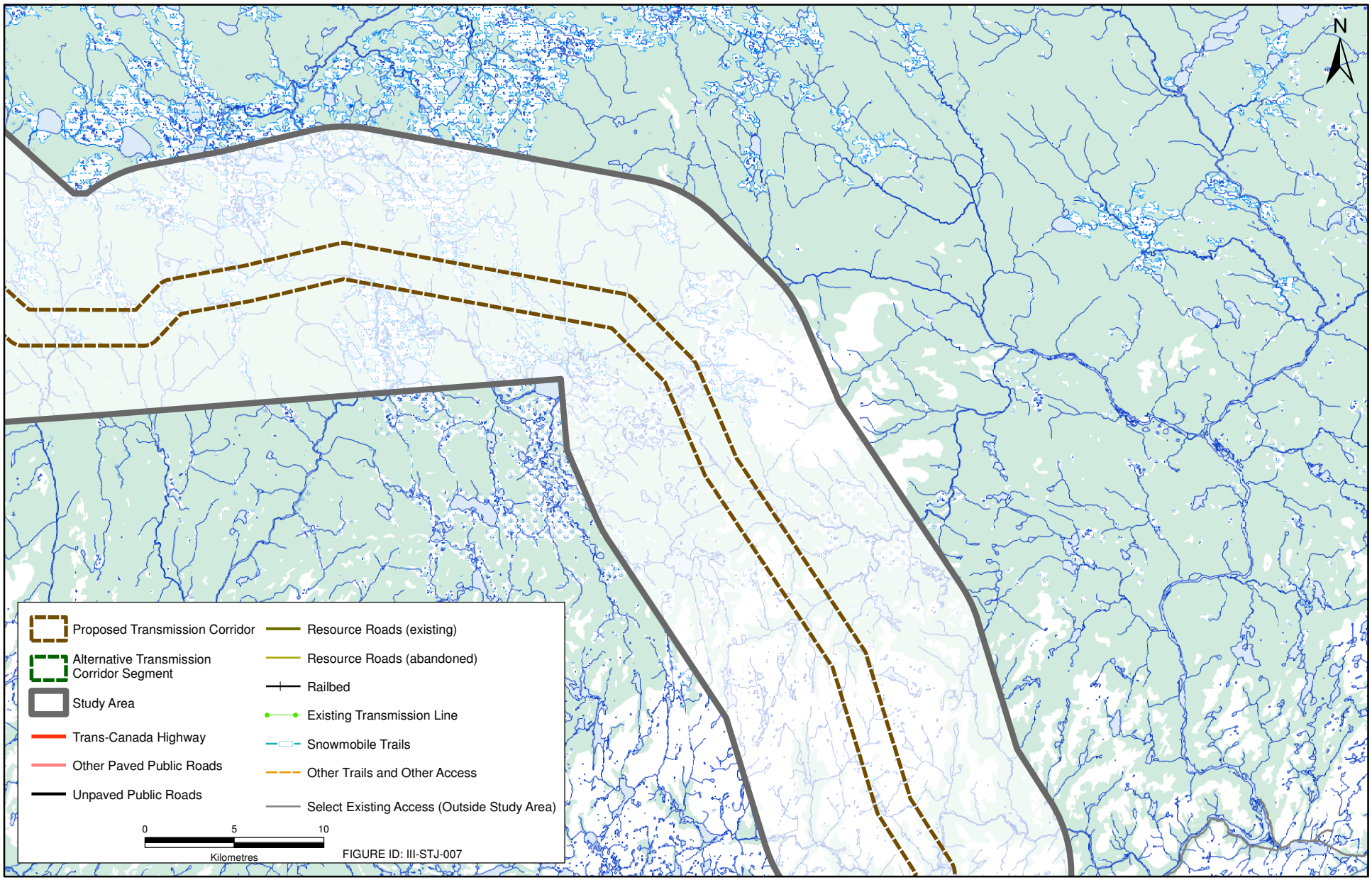

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FIGURE 5 of 17

Labrador - Island Transmission Link: Existing Access

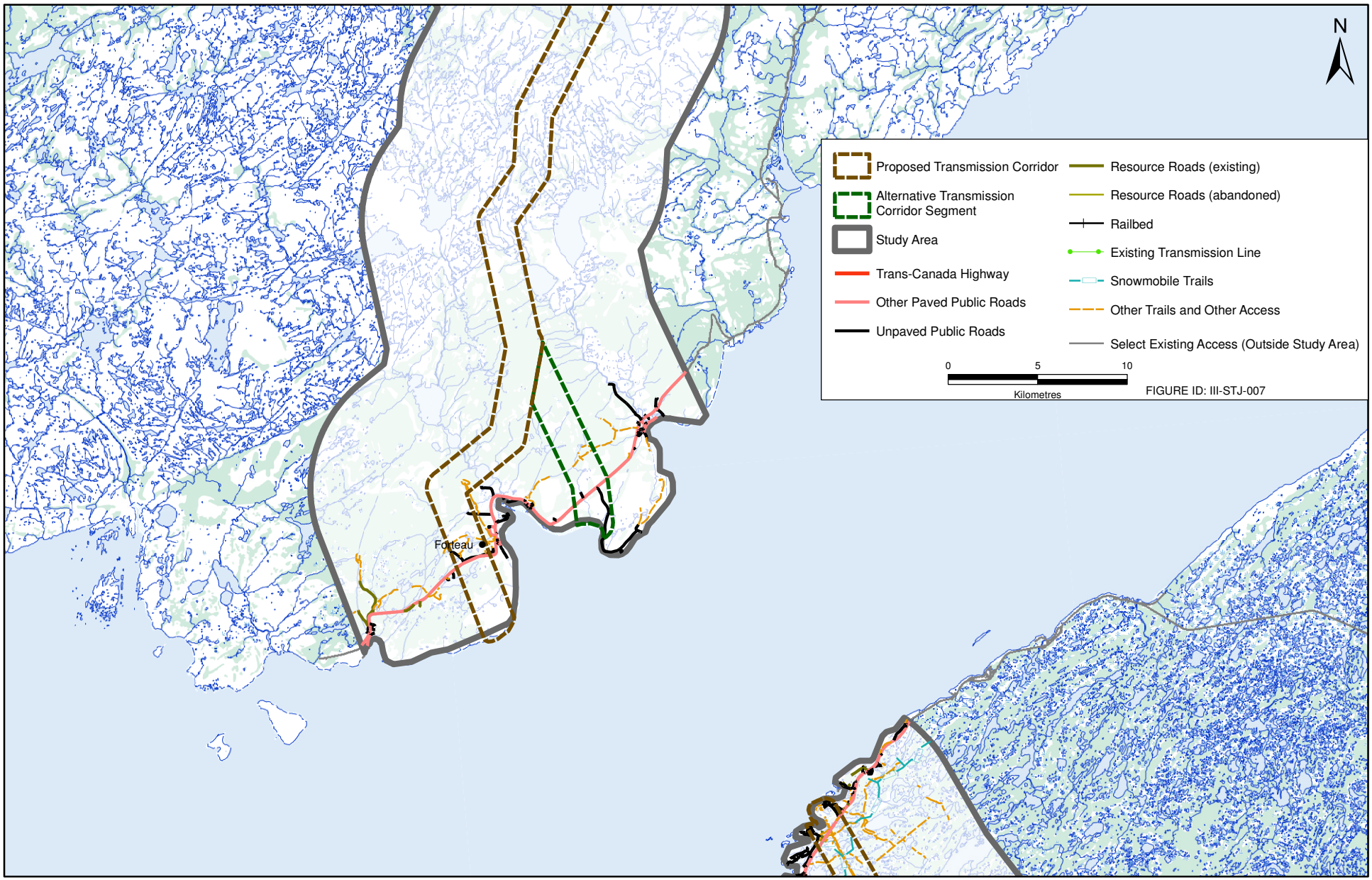

FIGURE 6 of 17

Labrador - Island Transmission Link: Existing Access

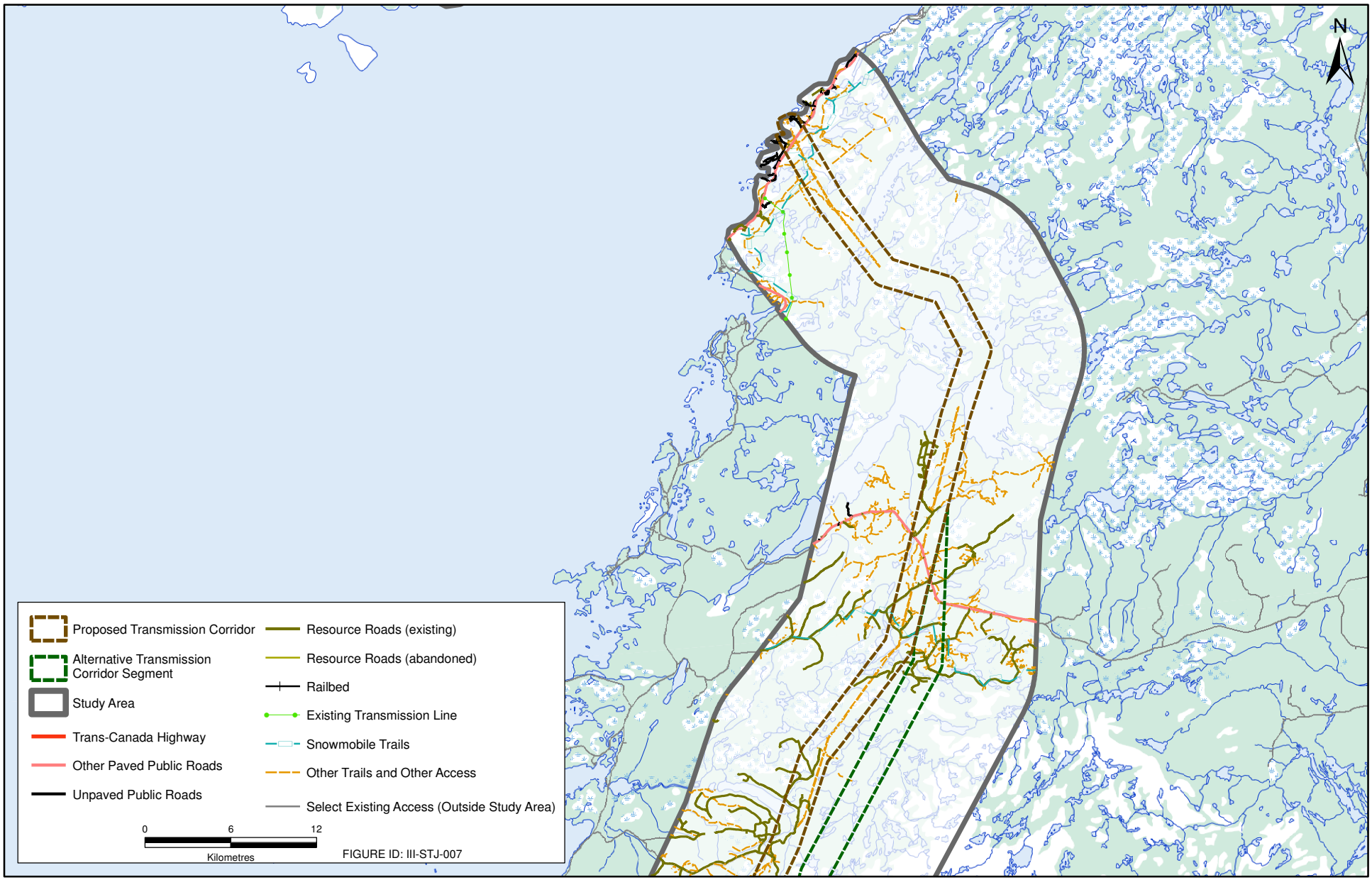

FIGURE 7 of 17

Labrador - Island Transmission Link: Existing Access

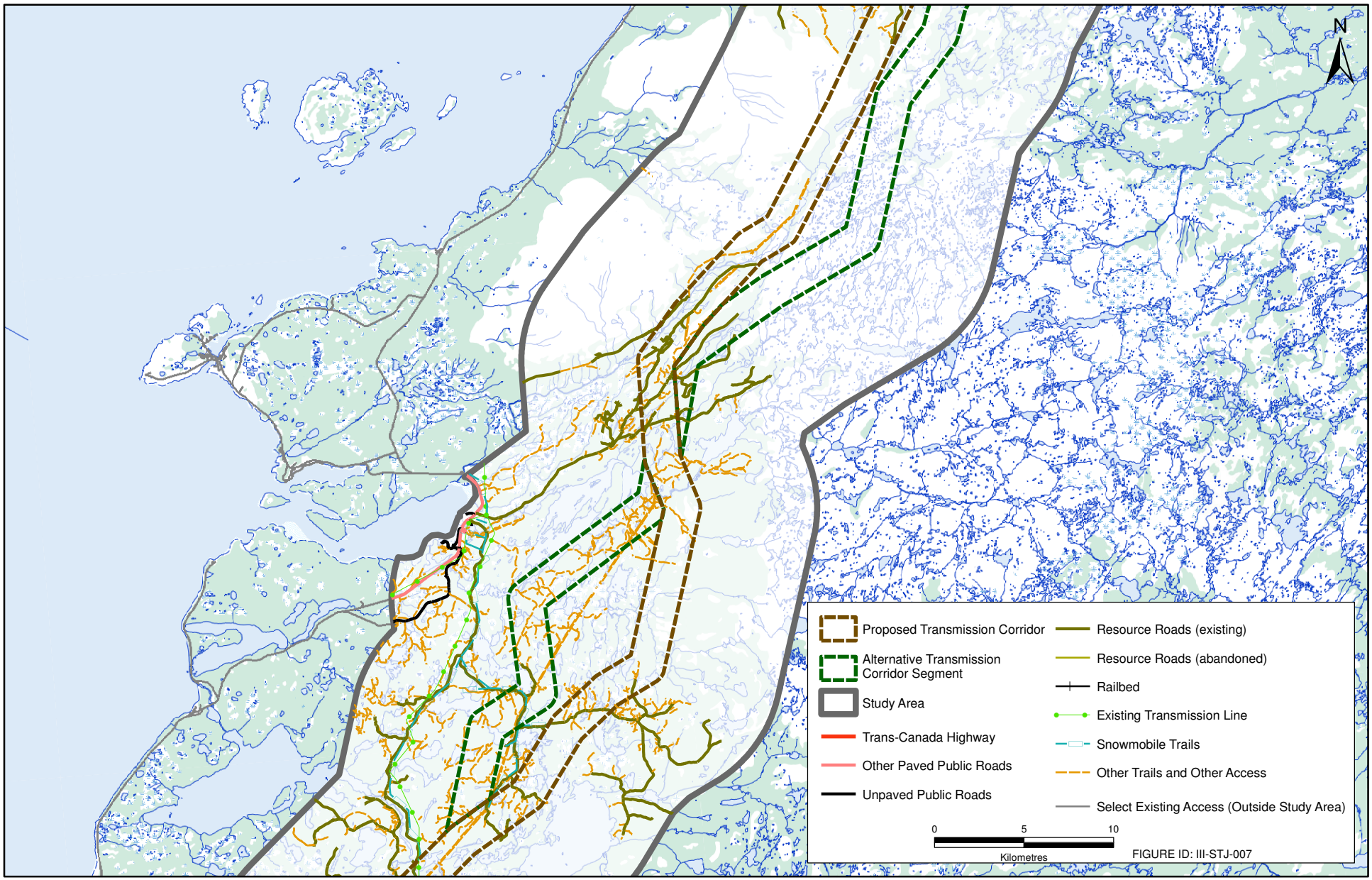

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FIGURE 8 of 17

Labrador - Island Transmission Link: Existing Access

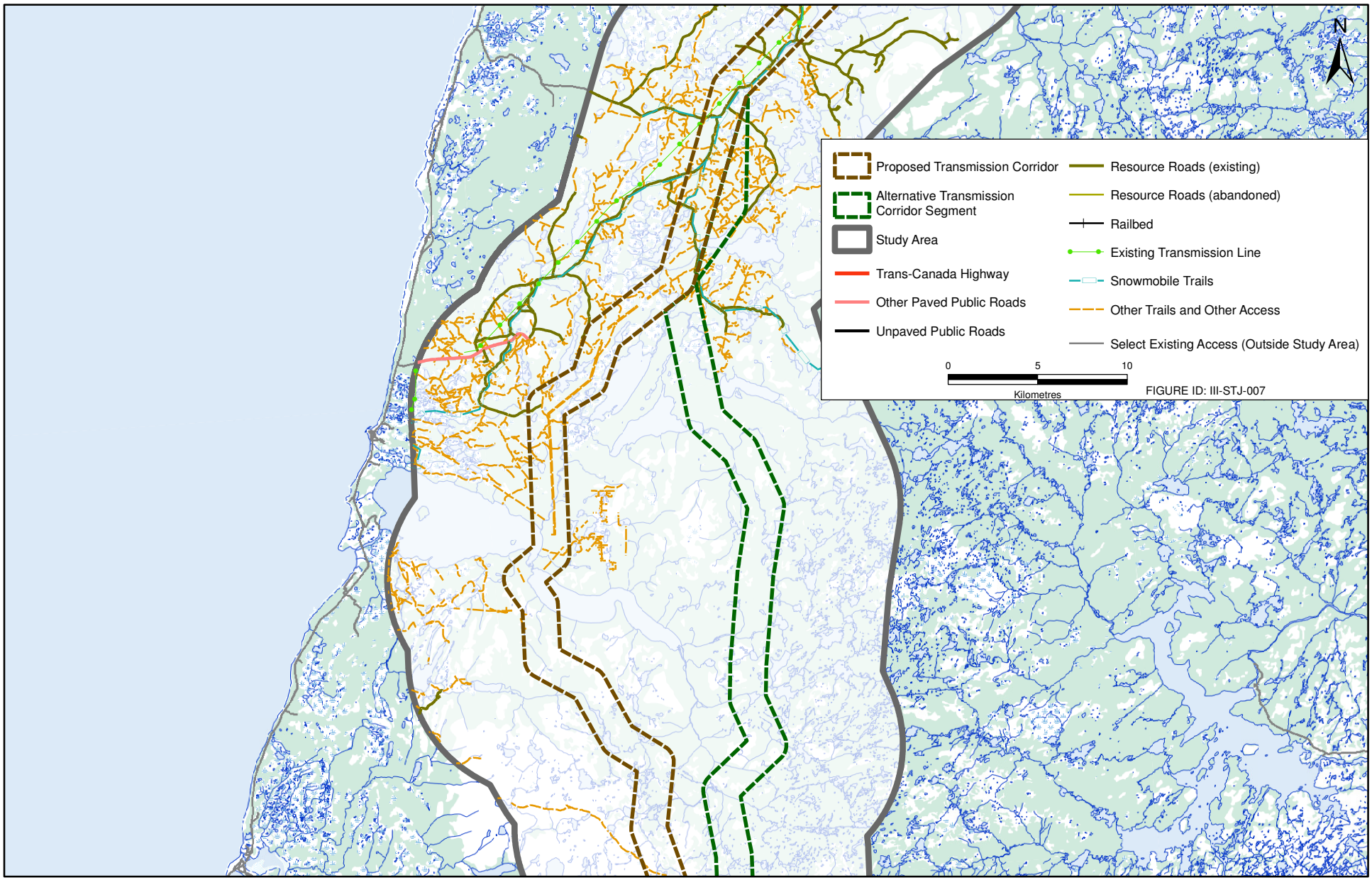

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FIGURE 9 of 17

Labrador - Island Transmission Link: Existing Access

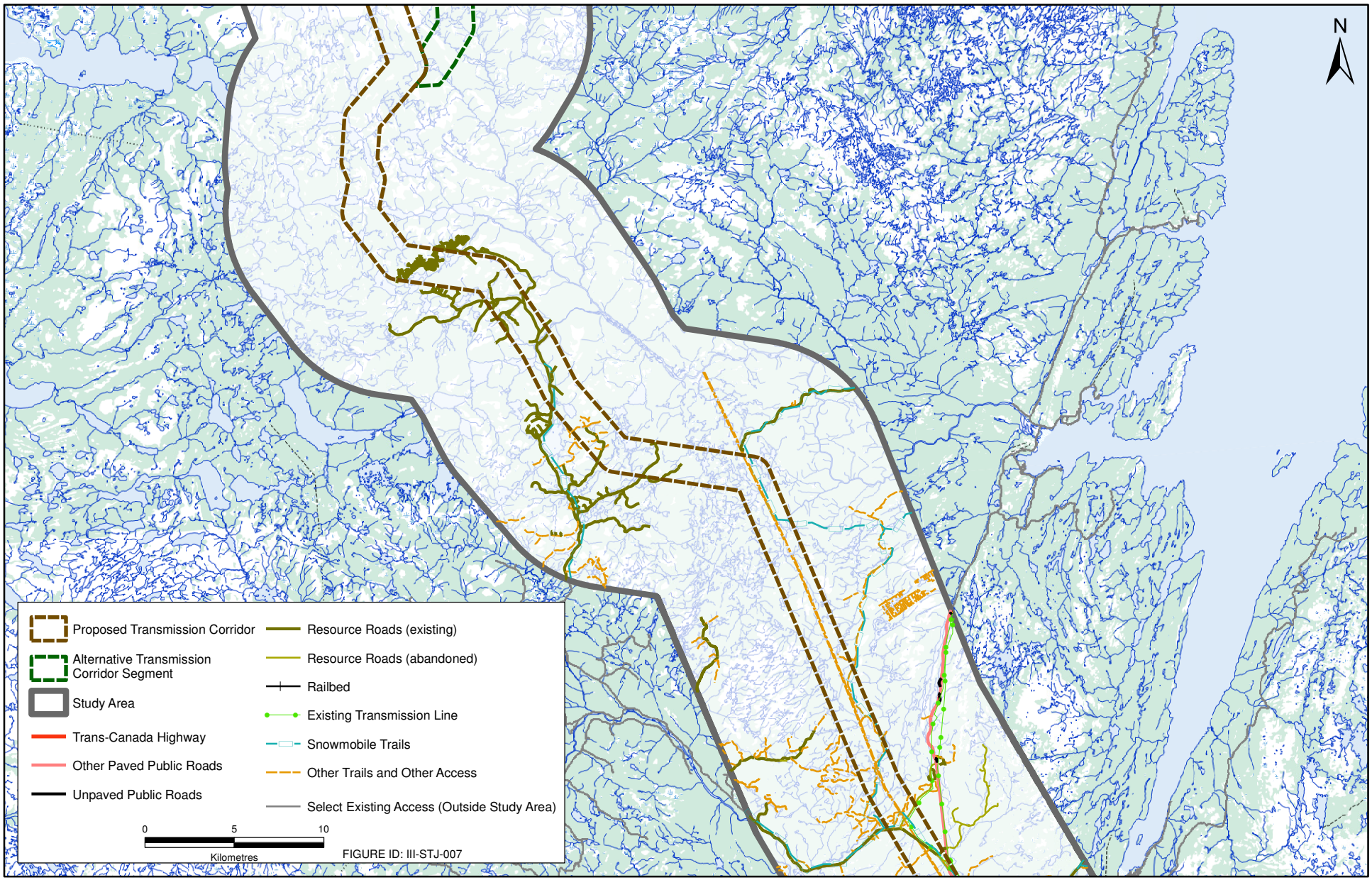

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FIGURE 10 of 17

Labrador - Island Transmission Link: Existing Access

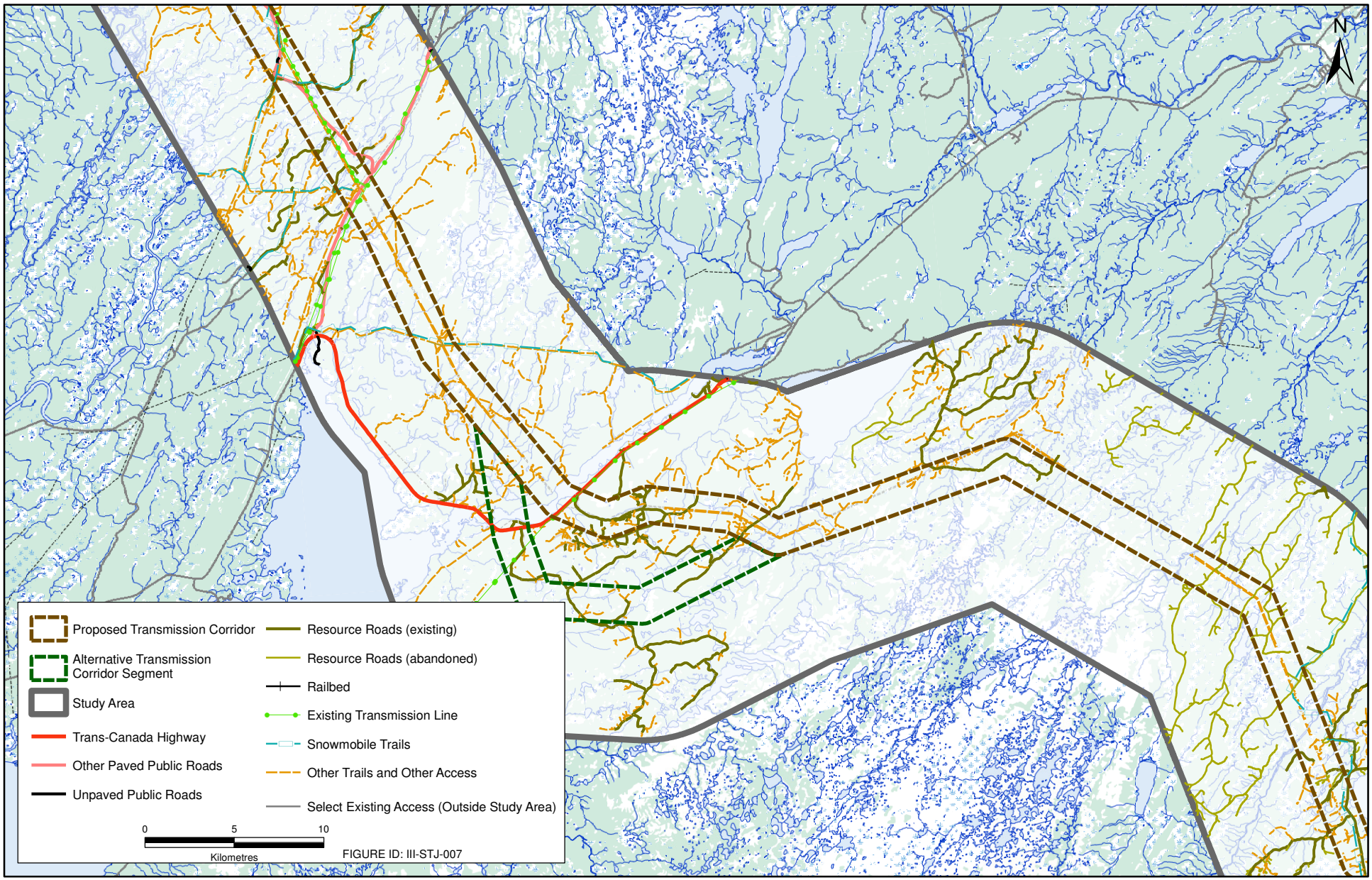

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FIGURE 11 of 17

Labrador - Island Transmission Link: Existing Access

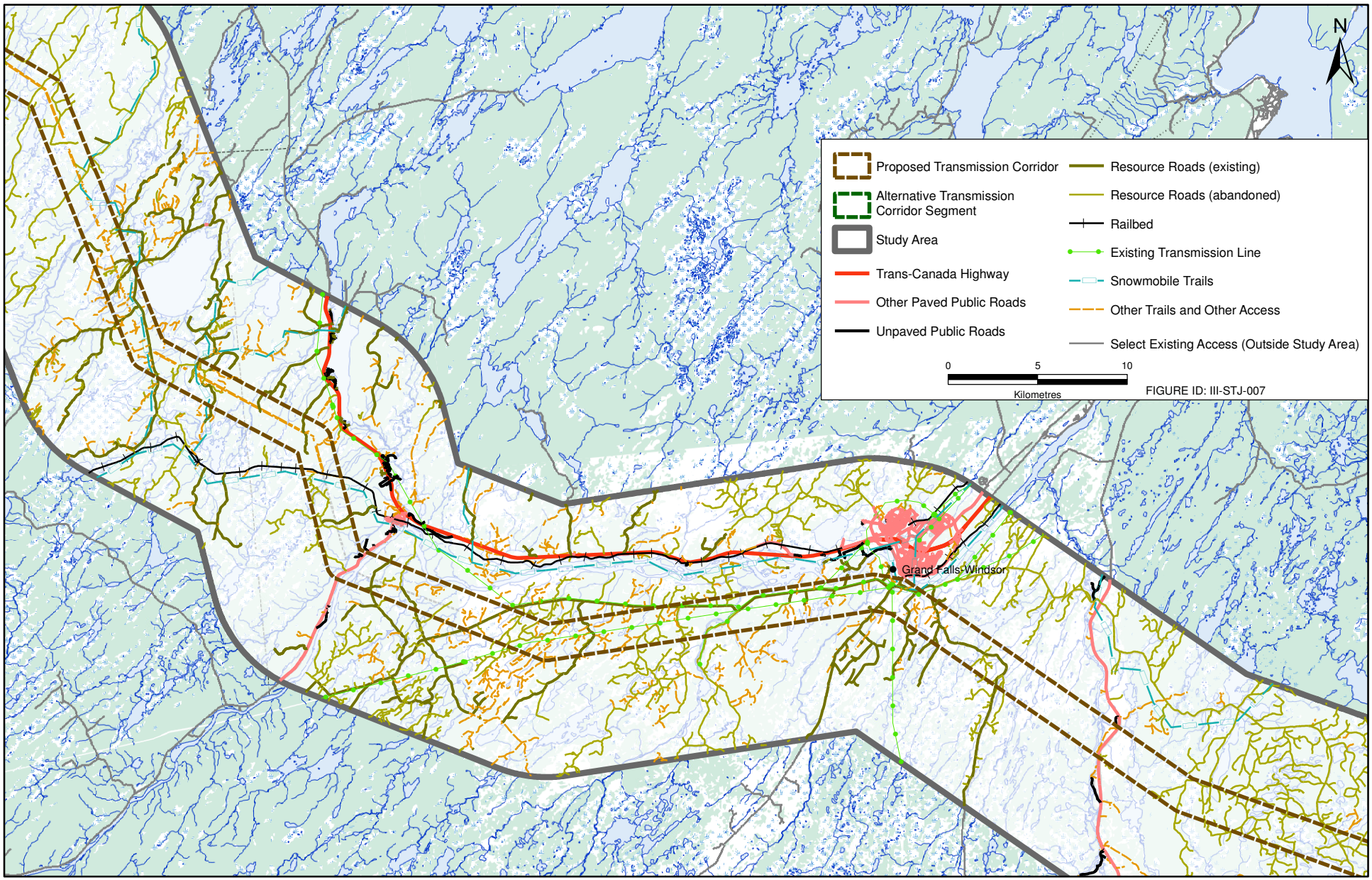

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FIGURE 12 of 17

Labrador - Island Transmission Link: Existing Access

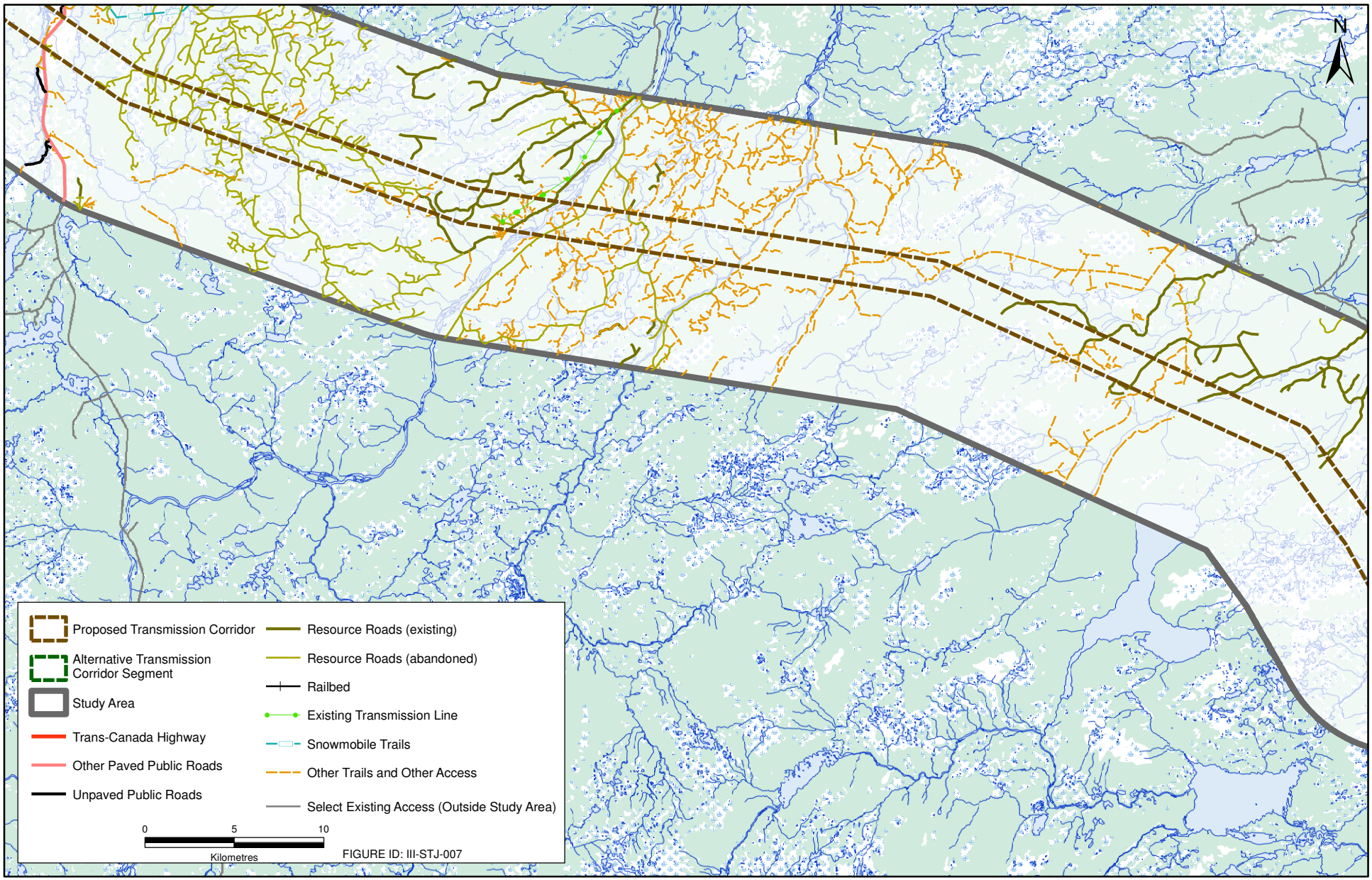

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FIGURE 13 of 17

Labrador - Island Transmission Link: Existing Access

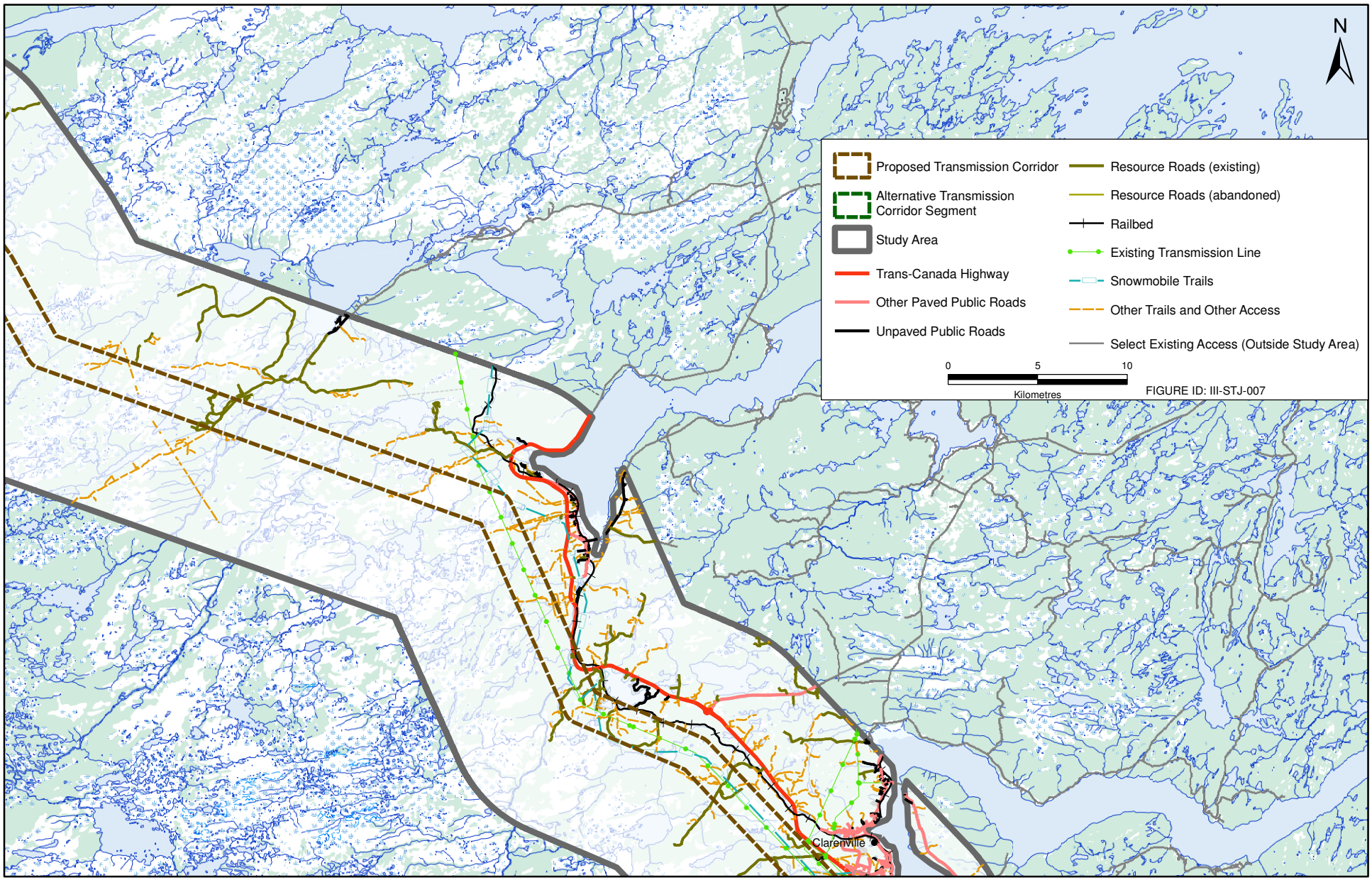

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FIGURE 14 of 17

Labrador - Island Transmission Link: Existing Access

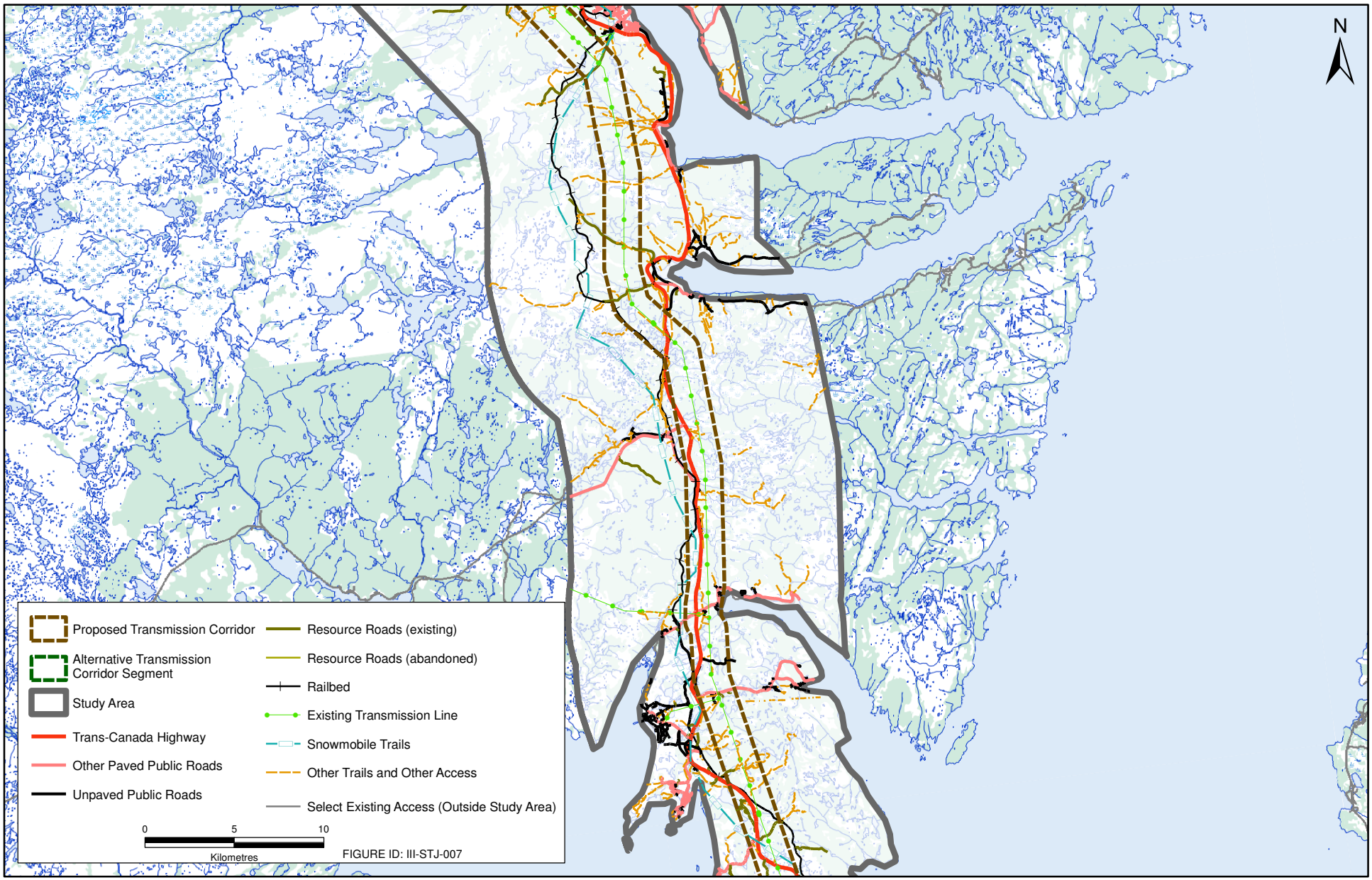

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FIGURE 15 of 17

Labrador - Island Transmission Link: Existing Access

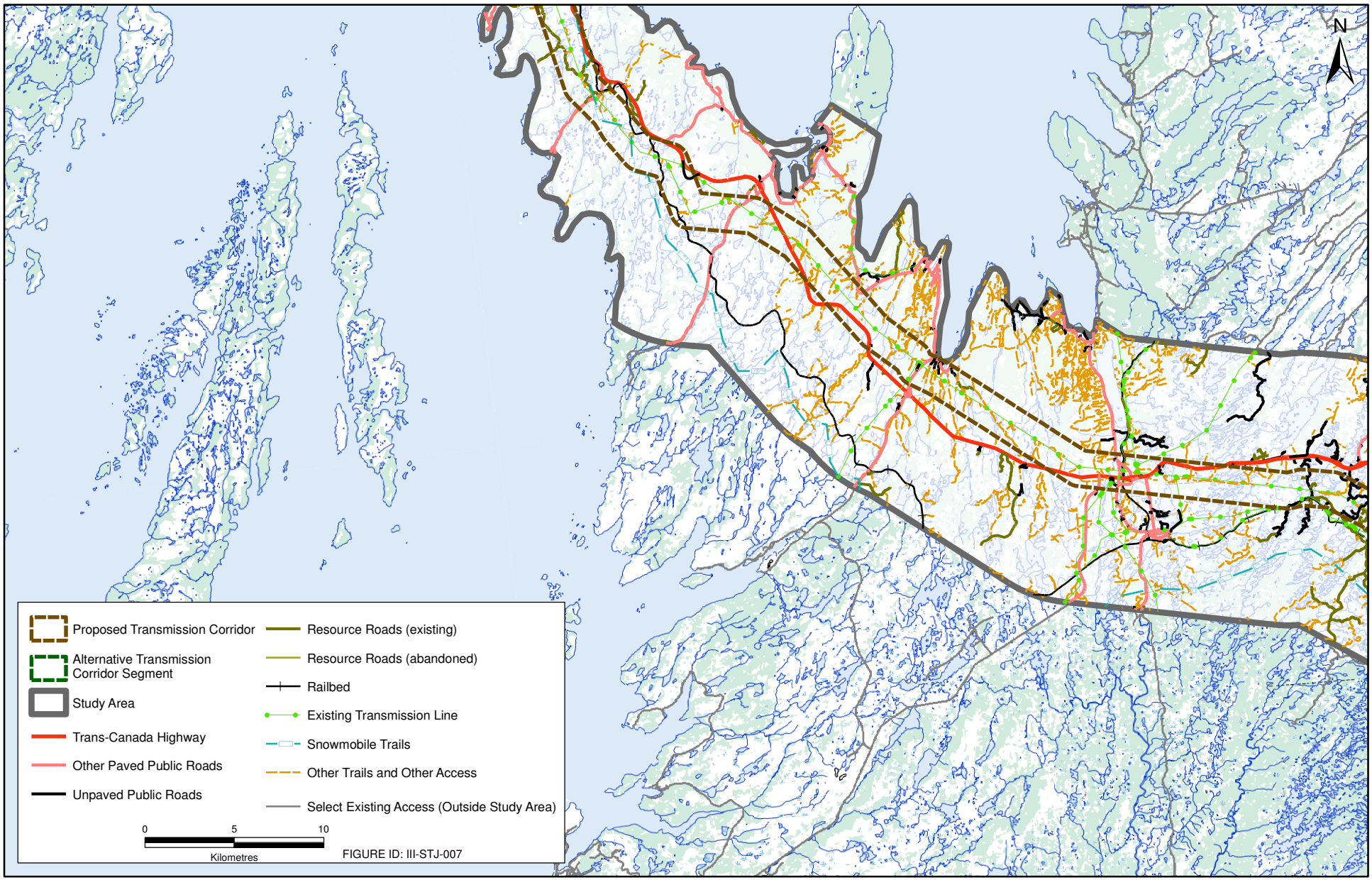

FIGURE 16 of 17

Labrador - Island Transmission Link: Existing Access

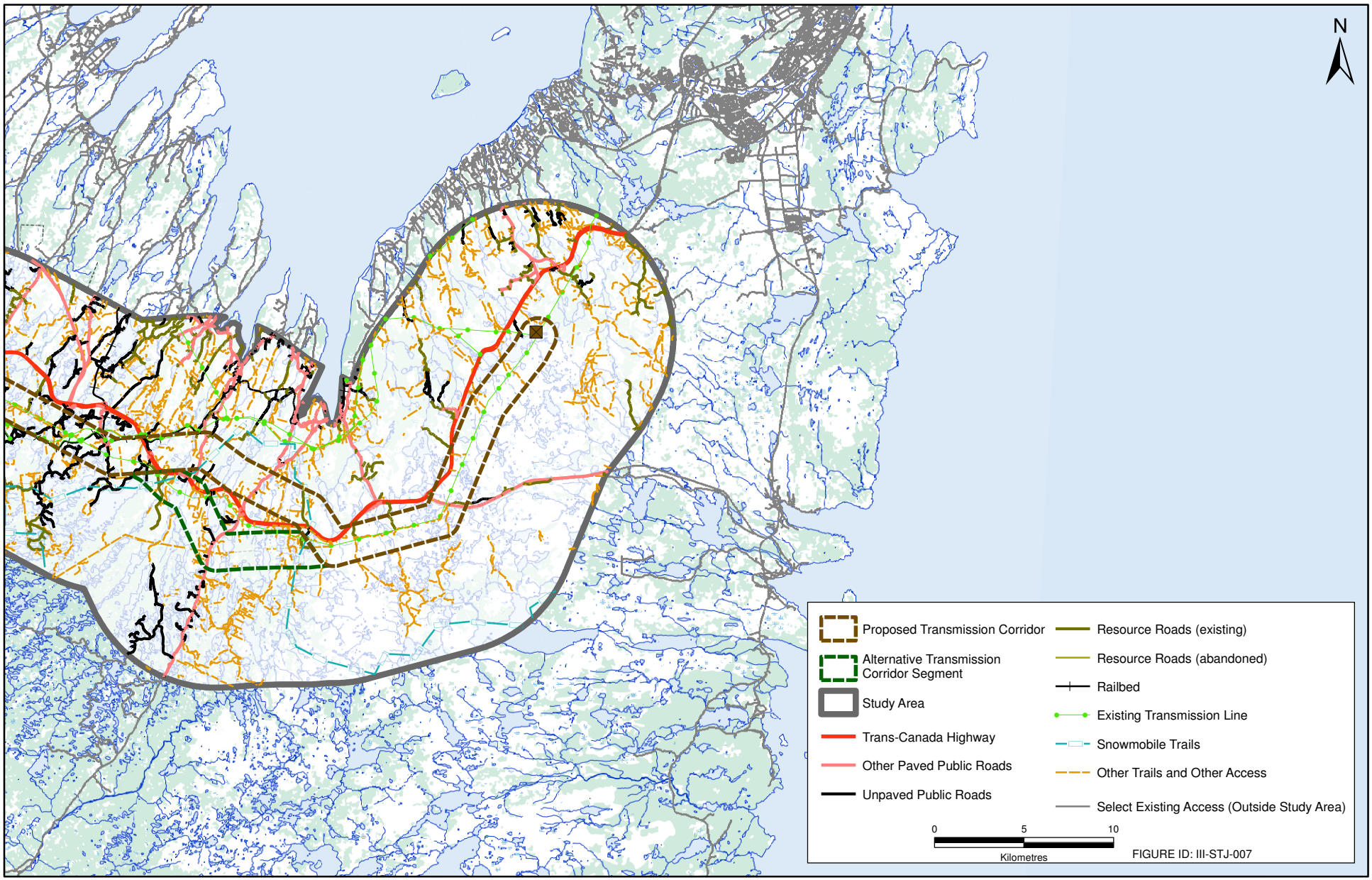

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FIGURE 17 of 17

Labrador - Island Transmission Link: Existing Access

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