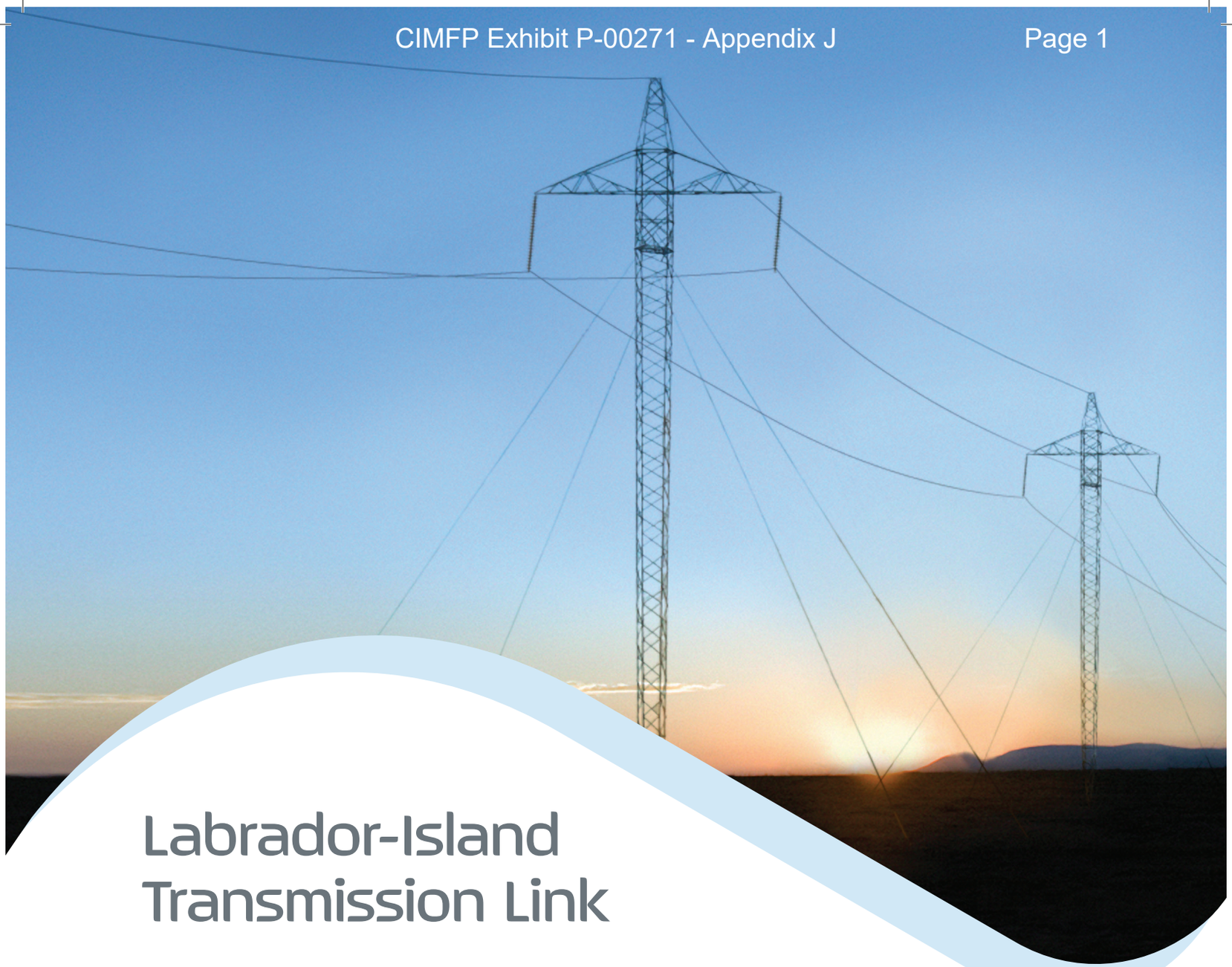


Labrador-Island Transmission Link

Environmental Impact Statement

Volume 3
Existing Socioeconomic Environment
Socioeconomic Effects Assessment
Commitments, Sustainability and Conclusions

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LABRADOR-ISLAND TRANSMISSION LINK

ENVIRONMENTAL IMPACT STATEMENT

Chapter 15

Existing Socioeconomic Environment

April 2012

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LIST OF ACRONYMS

Acronym	Description
%	percent
<	less than
>	greater than
A.D.	Anno Domini
ACOA	Atlantic Canada Opportunities Agency
ADA	Agricultural Development Areas
AHTF	Aboriginal Health Transition Fund
AMEC	AMEC Earth & Environmental
APEC	Atlantic Provinces Economic Council
ATK	Aboriginal Traditional Knowledge
ATVs	all-terrain vehicles
BBMT	Bay Bulls Marine Terminal
BCMF	British Columbia Ministry of Forestry
BLM	Bureau of Land Management
BMI	body mass index
BP	before present
BWA	Boil Water Advisory
ca.	circa
CAAs	Canadian Airport Authorities
CAM	Conseil Attikamek-Montagnais
CBC	Canadian Broadcasting Corporation
CBPPL	Corner Brook Pulp and Paper Limited
CCG	Canadian Coast Guard
CDLI	Centre for Distance Learning and Innovation
CEAR	Canadian Environmental Assessment Registry
CFB	Canadian Forces Base
CFS	Canadian Forestry Service
CHS	Canadian Hydrographic Service
CLEDB	Central Labrador Economic Development Board
CMA	Caribou Management Area
CMHC	Canadian Mortgage and Housing Corporation
CNA	College of the North Atlantic
C-NLOPB	Canada-Newfoundland and Labrador Offshore Petroleum Board
CPU	catch per unit effort
CRTC	Canadian Radio-television and Telecommunications Commission
CTSA	Canadian Tourism Satellite Account

Acronym	Description
DARE	Drug Abuse Resistance Education
DCC	Defence Construction Canada
DFA	Department of Fisheries and Aquaculture, Newfoundland and Labrador
DFO	Fisheries and Oceans Canada
DFTA	Designated Flight Training Area
DLRAAI	Deer Lake Regional Airport Authority Inc.
DND	Department of National Defence
e.g.,	for example
EA	Environmental Assessment
EI	Employment Insurance
EIS	Environmental Impact Assessment
FASD	Fetal Alcohol Spectrum Disorder
FPA	Forest Process Agreement
FPSO	Floating Production, Storage and Offloading
GDP	Gross Domestic Product
GIAAI	Gander International Airport Authority Inc.
GNL	Government of Newfoundland and Labrador
ha	hectare
HNL	Hospitality Newfoundland and Labrador
HROA	Historic Resources Overview Assessment
HRSDC	Human Resources and Skills Development Canada
i.e.,	that is
IAT	International Appalachian Trail
IATNL	International Appalachian Trail Newfoundland and Labrador
IEDE / Jacques Whitford	IED Enterprises in partnership with Jacques Whitford Environment Limited
INAC	Indian and Northern Affairs Canada.
INSIFN	Innu Nation and Sheshatshiu Innu First Nation
KKSN	Katherine Kemp and Shaila Nijhowne Consultants
km	kilometre
km^2	square kilometres
LFA	Lobster Fishing Area
LILCA	Labrador Inuit Lands Claim Agreement
LISA	Labrador Inuit Settlement Area
LMN	Labrador Métis Nation
LOA	length overall
LSA	Local Study Area
LSHDC	Labrador Straits Historical Development Corporation

Acronym	Description
m	metres
m^3	cubic metres
MAINC	Ministère des Affaires Indiennes et du Nord Canada
MBC	Marilyn Butland Communications
MCTS	Marine Communications and Traffic Services
mm	millimetre
MMA	Moose Management Areas
MW	megawatt
NAFO	North Atlantic Fisheries Organization
NAP	National Airports Policy
NAS	National Airports System
NATO	North Atlantic Treaty Organization
NCC	NunatuKavut Community Council
NEDC	Nordic Economic Development Corporation
NEQA	Northeaster Québec Agreement
NEWDOCK	St. John's Dockyard
NFD	National Forestry Database
NLCDLI	Newfoundland and Labrador Centre for Distance Learning and Innovation
NLCHI	Newfoundland and Labrador Centre for Health Information
NLDB	Newfoundland and Labrador Department of Business
NLDE	Newfoundland and Labrador, Department of Education
NLDEC	Newfoundland and Labrador Department of Environment and Conservation
NLDEC and NLDNR	Newfoundland and Labrador Department of Environment and Conservation and Department of Natural Resources
NLDEC-L	Newfoundland and Labrador Department of Environment and Conservation, Lands Division
NLDEC-P	Newfoundland and Labrador Department of Environment and Conservation, Parks Division
NLDEC-W	Newfoundland and Labrador Department of Environment and Conservation, Wildlife Division
NLDF	Newfoundland and Labrador Department of Finance
NLDFA	Newfoundland and Labrador Department of Fisheries and Aquaculture
NLDF-ES	Newfoundland and Labrador Department of Finance, Economics and Statistics Branch
NLDHCS	Newfoundland and Labrador Department of Health and Community Services
NLDHRLE	Newfoundland and Labrador Department of Human Resources, Labour and Employment
NLDMA	Newfoundland and Labrador Department of Municipal Affairs
NLDNR	Newfoundland and Labrador Department of Natural Resources

Acronym	Description
NLDNR and NLDEC	Newfoundland and Labrador Department of Natural Resource and Newfoundland and Labrador Department of Environment and Conservation
NLDNR-A	Newfoundland and Labrador Department of Natural Resources, Agrifoods Division
NLDNR-FS	Newfoundland and Labrador Department of Natural Resources, Forestry Services Branch
NLDNR-ME	Newfoundland and Labrador Department of Natural Resources, Mines and Energy
NLDNR-ML	Newfoundland and Labrador Department of Natural Resources, Mineral Lands Division
NLDTCR	Newfoundland and Labrador Department of Tourism, Culture and Recreation
NLDTCR-S	Newfoundland and Labrador Department of Tourism Culture and Recreation, Tourism Statistics
NLDTW	Newfoundland and Labrador, the Department of Transportation and Works
NLDTW and NLDLAA	Newfoundland and Labrador Department of Transportation and Works and Department of Labrador and Aboriginal Affairs
NLEC	Newfoundland and Labrador Executive Council
NLFES	Newfoundland and Labrador, Fire and Emergency Services
NLH	Newfoundland and Labrador Hydro
NLHC	Newfoundland and Labrador Housing Corporation
NLSA	Newfoundland and Labrador Statistics Agency
NNK	Naskapi Nation of Kawawachikamach
NorPen	Northern Peninsula Regional Service Board
NRCan	Natural Resources Canada
NSF	Newfoundland Snowmobile Federation
NSR	Non-scheduled Rivers
PAL	Provincial Airlines.
PAO	Provincial Archaeology Office
PC	Parks Canada
PRAC	Petroleum Research Atlantic Canada
PROS	Police Reporting and Occurrence System
RCMP	Royal Canadian Mounted Police
RED	Regional Economic Development
RNC	Royal Newfoundland Constabulary
ROW	right-of-way
SARA	*Species at Risk Act*
SCH	Small Craft Harbours
SGMA	Small Game Management Areas
SIFN	Sheshatshiu Innu First Nation
SJIA	St. John’s International Airport
SJIAA	St. John’s International Airport Authority

Acronym	Description
SJPA	St. John's Port Authority
Ski NL	Ski Newfoundland and Labrador.
STRIVE	Students Taking Responsibility in Violence Education
t	tonnes
TAC	Total Allowable Catch
TC	Transport Canada
TCH	Trans-Canada Highway
TLH#	Trans-Labrador Highway (where # represents the Phase when present)
UA	Unit Area
UNESCO	United Nations Educational, Scientific and Cultural Organization
USDI	United States Department of the Interior
VBNC	Voisey's Bay Nickel Company Limited
VECs	Valued Environmental Components
VTS	Vessel Traffic Service
WHO	World Health Organization

15 EXISTING SOCIOECONOMIC ENVIRONMENT

15.1 Introduction

This chapter describes the existing human environment, including each of its associated and relevant components. In doing so, it establishes the current, baseline environmental conditions from which likely Labrador-Island Transmission Link (Project)-related effects will be assessed and evaluated later in the Environmental Impact Statement (EIS).

The chapter focuses on describing the existing environment that overlaps and may interact with the proposed Project, while also recognizing the larger spatial and temporal dimensions and distributions of these socioeconomic components and systems, as well as ensuring appropriate regional context.

Given the nature and extent of the Project, study areas vary by component and are identified in each relevant subsection. For those aspects of the socioeconomic environment that are identified as Valued Environmental Components (VECs), specific Environmental Assessment (EA) study areas are defined later to focus and frame the environmental effects assessment (Chapter 16).

15.2 Historic and Heritage Resources

The human occupation of Newfoundland and Labrador is long and complex, dating back at least 8,000 years. The sequence begins in Labrador with an initial late Palaeo-Indian / early Maritime Archaic Amerindian occupation in the Strait of Belle Isle (McGhee and Tuck 1975). The early Maritime Archaic people gradually spread north along the coast to reach northern Labrador by 7,500 years before present (BP) (Fitzhugh 1978a, 1972).

After 4,000 BP, coastal Labrador was also populated by Arctic-adapted peoples from the north (Cox 1978), and thereafter, the pre-contact period in Labrador (i.e., the period before the arrival of Europeans in North America and “contact” with Aboriginal people) is characterized by Intermediate Amerindian (Nagle 1978) and Late Pre-contact Amerindian occupations - a people demonstrably ancestral to the modern-day Innu (Fitzhugh 1978b), along with Palaeo-Eskimo peoples (Pre-Dorset, Groswater, Dorset), culminating with the arrival of the Thule, ancestors of the modern Labrador Inuit, approximately 700 BP (Fitzhugh 1994; Kaplan 1983).

After approximately 500 BP, Labrador and the Lower North Shore of Québec also became the focus for European activities, initially whaling by Basques in the 16th century (Tuck and Grenier 1989), and fishing, sealing and fur-trading by people from other European countries (Kennedy 1995; McAleese 1991). Trading contact between Europeans on the one hand, and Innu and Inuit on the other, began in earnest with the establishment of the Postes du Roy and the Seigneurie de Mingan on the Québec Lower North Shore in the 17th century, and Fornel's post at Kissessakiou (Hamilton Inlet) in the 18th century (Mailhot 1997; Trudel 1978; Zimmerly 1975).

Through most of the fur trade period, the Innu spent most of each year moving through central and southern Labrador interior hunting and trapping grounds. Throughout this period, the interior remained remote and relatively unknown to Europeans. In Hamilton Inlet in the 18th century, and continuing through most of the 19th century, the parties involved in the fur trade consisted primarily of European traders on the one hand and Innu hunters and trappers on the other. However, by the closing years of the 19th century, the Settler population (the term used until recently to describe people of mixed Aboriginal (usually Inuit but sometimes Innu) and European ancestry) became increasingly involved in fur trapping for trade, and by the early 20th century had largely usurped Innu trapping grounds along the Churchill, Kenamu, Naskaupi rivers and elsewhere (Kennedy 1995; Goudie 1991; Davis 1987; Burt 1980; Rich and Palliser 1980; Ames 1977; Tanner 1977, 1947; McGee 1961).

Archaeological investigations on the Island of Newfoundland, particularly over the last 25 years, have provided a clear, if not yet entirely complete, understanding of the Island's long-term culture history. The initial occupation appears to have occurred late in the Maritime Archaic period, ca. 5,000 BP. The Maritime Archaic

Amerindian occupation followed, after a hiatus of several centuries, by an Early Palaeo-Eskimo (Groswater) occupation, dating to ca. 3,000 to 2,200 BP. This in turn is followed by a distinct Late Palaeo-Eskimo (Middle Dorset) occupation dating to ca. 2,000 to 1,200 BP. Dorset sites in Newfoundland are both larger and more numerous than those of any other period, and although absolute population estimates are impossible to gauge based on current data, the Dorset occupation appears to have been the most extensive and its population levels were probably the highest in the Island's prehistory. It was also the briefest, apparently ending by ca. 1,000 BP.

The final Recent Amerindian occupation (sometimes referred to as the "Recent Indian", or Late Pre-contact Period) began by at least 1,200 BP (or potentially as early as 2,000 BP; see Hartery 2007), and ended with the historically-documented extinction of the Beothuk early in the 19th century. Beothuk sites of the Early Contact Period (A.D. 1,500 to 1,700) have been identified on the Avalon Peninsula (Gaulton 2001; Gilbert and Reynolds 1989), Bonavista Bay (McLean 1994) and in Notre Dame Bay (Pastore 1992). Later historic Beothuk sites (A.D. 1,700 to 1,829) are limited to the Exploits Valley; the final refuge of the Beothuk prior to their extinction in 1829 (LeBlanc 1973; Devereux 1970, 1965).

Newfoundland has had a long history of European settlement, with the earliest being the Norse site at L'Anse aux Meadows, dated ca. 1,000 BP (Ingstad 1970, 1969), a period that archaeologists still generally regard as "pre-historic" in Newfoundland. The intensive European migratory fishery that developed and expanded through the 16th century is well documented by the Basque remains at Red Bay (Tuck and Grenier 1989). The 17th century has recently become a focus of investigation (Gilbert 2000; Tuck 1996). Outside of the Avalon Peninsula, this century is still sparsely documented archaeologically, though there are likely many sites of this period along the coast, pertaining to the English, French and Basque migratory fisheries. Possible 17th century Basque material has been recovered in surveys on the west coast (Schwarz 1994). The 18th century, a period which saw considerable growth in the resident population of Newfoundland, is well-represented at archaeological sites across the Island (Skanes 2004a, 2004b, 1997; Skanes and Reynolds 1996), including Lower Sandy Point, a frontier salmon fishing and trapping station in the Bay of Exploits (Schwarz 1995). The 19th century is similarly well represented but this period, like the 20th century, has yet to attract detailed archaeological investigation. As with archaeology of the Pre-contact Period, and for many of the same reasons, research in historic archaeology has been strongly focused on the coast. Historic European activities in the interior, such as trapping (Schwarz 1995; Pastore 1987) and "winterhousing" (Smith 1987), have not been investigated archaeologically.

For the purposes of this EIS, Historic and Heritage Resources include pre-contact and historic archaeological sites, structural remains and objects, palaeontological materials (i.e., fossils), architectural sites and buildings, and historic and natural sites, as well as burial, cultural, spiritual and other heritage sites and resources.

15.2.1 Study Area

The Study Area for Historic and Heritage Resources focuses on the 2 km wide proposed transmission corridor extending from Muskrat Falls on the Churchill River to the Strait of Belle Isle in southern Labrador, the proposed 500 m wide submarine cable corridor across the Strait of Belle Isle, and the 2 km wide transmission corridor from the landing point on the Northern Peninsula of Newfoundland to Soldiers Pond on the Avalon Peninsula, as well as considering the location of other Project-related components and activities (e.g., access, camps, electrode sites, converter stations). Also included in the Study Area are expanded areas on either side of the Strait of Belle Isle in recognition of their Historic and Heritage Resources potential (Stantec 2010a) (Figure 15.2.1-1). In addition, the larger regional context of the Historic and Heritage Resources, as defined in the previous section, of the province was generally and integrally considered in describing the existing environment for Historic and Heritage Resources, particularly in the vicinity of the Project components.

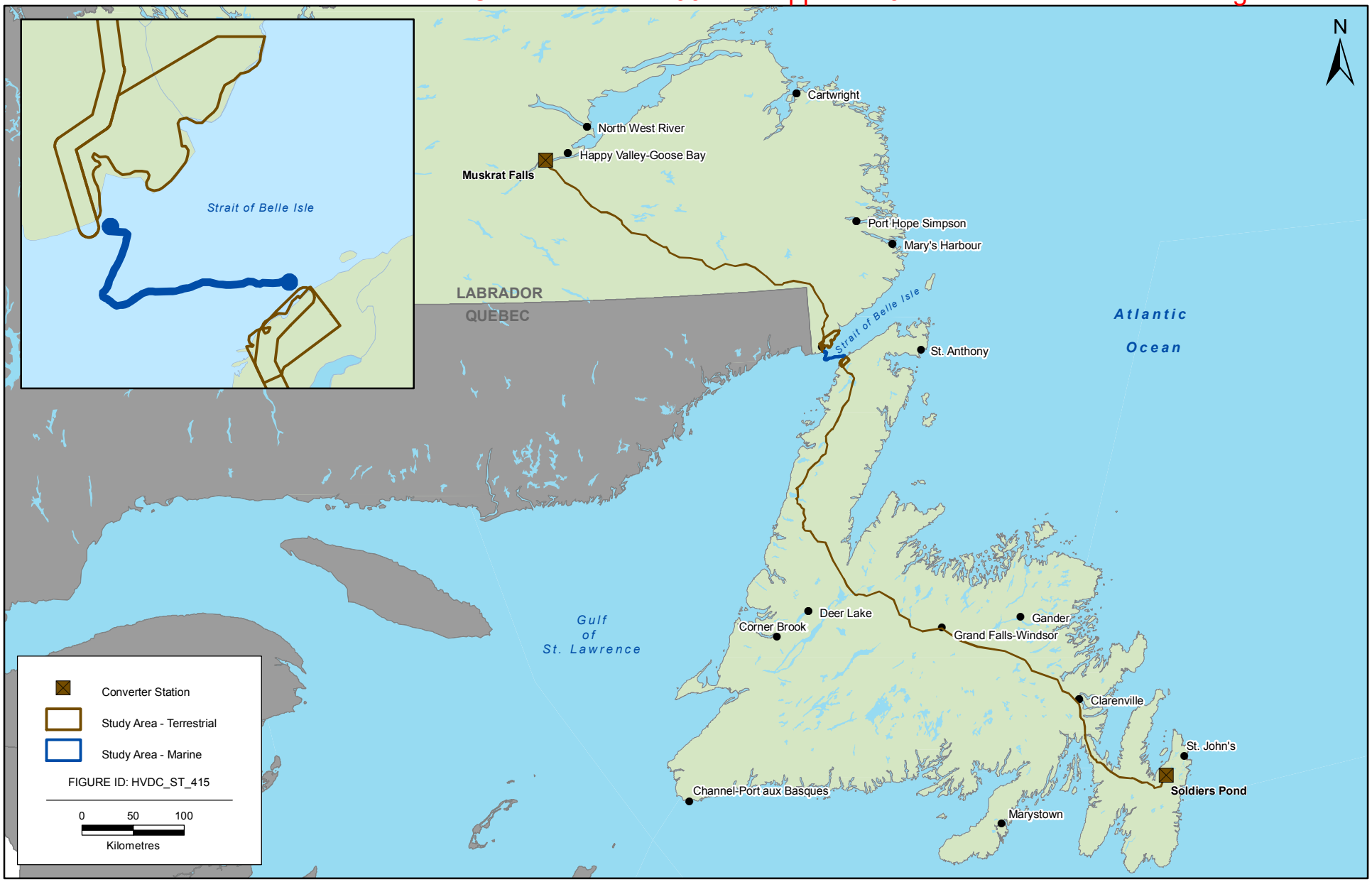


FIGURE 15.2.1-1

Historic and Heritage Resources Study Areas

15.2.2 Information Sources and Data Collection

15.2.2.1 Archaeological Resources

The following sources were used to compile information related to Archaeological Resources within the Study Area:

- the *Historic and Heritage Resources Component Study* (Stantec 2010a), which includes archaeological potential mapping of the Study Area as well as references for all sources consulted;
- the *Historic and Heritage Resources Component Study Supplementary Report* (Stantec 2011a), which updates the information contained in the above noted Component Study to accommodate changes in the corridor within the Labrador portion of the Study Area, beginning at Muskrat Falls;
- the *2011 Historic and Heritage Resources Assessment and Potential Mapping: Strait of Belle Isle Cable Landing Sites and Shore Electrode Locations* (Stantec 2011b);
- published and unpublished archaeological reports and historical sources, including Stopp (2000), Auger and Stopp (1989), Renouf (1977, 1976), Madden (1976), McGhee and Tuck (1975), and Harp (1963);
- the Archaeological Site Record Inventory and Site Record Forms at the Provincial Archaeology Office (PAO) used to gather data regarding any sites registered for (or adjacent to) the Study Area;
- Project mapping and aerial photography used to identify areas of Historic and Heritage Resources potential for subsequent ground testing; and
- field surveys of the Study Area, undertaken by Nalcor Energy (Nalcor) in relation to the Project, as well as in relation to the proposed Lower Churchill Hydroelectric Generation Project, specifically:
  - *Historic and Heritage Study Pre-Fieldwork Overview Assessment.* (Jacques Whitford 2008): this study outlines research results of a Pre-Fieldwork Overview Assessment undertaken to identify and assess the Historic and Heritage Resources potential of the Study Area (as defined at that time), and to help plan fieldwork activities scheduled for that year. Preparation of the overview assessment report involved a review of archaeological, ethnographic, ethnohistoric, historic, theoretical literature and topographic mapping. Based on the results of the research, which included a review of relevant data gathered as part of the Lower Churchill Hydroelectric Generation Project, it was determined that little new fieldwork would be required for the current Project in Labrador. The 2008 field study therefore focused on the portions of the transmission corridor in Newfoundland. In addition, a study of the palaeontological potential of the Study Area in Labrador and Newfoundland was completed.
  - *Background Information Related to Proposed Geotechnical Drilling Program, Strait of Belle Isle, Newfoundland and Labrador* (Stantec 2009): this study involved a review of background information related to locations where geo-technical drilling was proposed to occur along the Strait of Belle Isle in southern Labrador and on the Northern Peninsula of Newfoundland.
  - *Final Report, Stage 1 Historic and Archaeological Resources Assessment, Strait of Belle Isle Area* (Stantec 2010b): this report discussed the archaeological findings of a Stage 1 Assessment completed at six locations in the Strait of Belle Isle for proposed drilling activities, including Point Amour and Fox Cove in southern Labrador; and Green Island Cove, Shoal Cove, Savage Cove and Yankee Point on the Northern Peninsula of Newfoundland. At Fox Cove, archaeological remains dating to the Pre-contact Period were identified. Findings included chipping debris from stone tool manufacture and what appeared to be the working end of a ground stone tool. Also identified at Fox Cove were remains of a stone quarry possibly associated with construction of the Pointe Amour lighthouse in the 1850s. On the Northern Peninsula, one historic site of possible 19th century origin was identified at Green Island Cove.
  - *Churchill River Power Project 1998 Environmental Studies-Historic Resources Overview Assessment, Labrador Component (LHP 98-17)* (IEDE / Jacques Whitford 2000): this effort had a widely-defined

study region that encompassed all of southern and central Labrador and portions of adjacent Québec. Research included reviews of archaeological, historic, ethnographic and ethnohistoric literature and data, as well as data on Labrador Innu land-use and geomorphology. Site inventory analysis was undertaken in 1998 in order to identify strategic, high-potential locations. Field surveys were also completed.

- *2006 Historic Resources Overview and Impact Assessment of Muskrat Falls Generating Facility and Reservoir and Muskrat Falls to Gull Island Transmission Line Corridor* (LCP 535865 / 866) (Minaskuat Inc. 2008): this study presents information collected as part of the Lower Churchill Hydroelectric Generation Project, but is directly applicable to the current Project in that it includes discussion of testing locations lying within or in close proximity to the proposed transmission corridor.

Data collection methods used in relation to Archaeological Resources extends over a 13-year period (1998 to 2011) and includes:

- a literature review of published and unpublished sources, including archaeological reports and ethnographic, ethnohistoric, historic and theoretical literature;
- a review of contemporary and historic land-use data;
- a review of the Archaeological Site Record Inventory on file with the Provincial Archaeology Office (PAO);
- land-form analysis, including aerial photograph and topographic map analyses;
- geomorphologic research;
- archaeological potential mapping;
- archaeological field surveys and assessments within the Study Area in Labrador and Newfoundland (as referenced in the previous section); and
- surveys of the seabed corridor and electrode sites in the Strait of Belle Isle in 2007, 2008, 2009 and 2011 for the purpose of assessing and quantifying marine fauna, flora and fish habitat characteristics as well as to identify any materials of anthropogenic origin and / or significance.

A Stage 1 Historic Resources Overview Assessment (Stage 1 HROA) was completed for the Project (Jacques Whitford 2008). The primary objectives of the Stage 1 HROA were to undertake background research, field surveys and archaeological potential mapping to build on existing data (Penney 2002; Tuck 1979) and augment the information for the Study Area to meet all requirements for the EA of the Project. The Stage 1 HROA was carried out under permit from the PAO and in accordance with provincial guidelines (Government of Newfoundland and Labrador (GNL) 1992), and focused on identifying and assessing the Historic and Heritage Resources potential or sensitivity in the Study Area (Stantec 2011b, 2010a) (see Section 16.2 for maps). For the archaeological potential mapping, empirical data on archaeological testing effort and site frequency were employed to map defined zones of High, Medium and Low potential within the Study Area. The results of the field surveys and archaeological potential mapping of the Study Area are used in the EA and will be used in planning the final routing and placement of Project components, including the eventual selection of a specific route for the proposed transmission and electrode lines.

Field surveys completed between 1998 and 2009 on behalf of Nalcor and as referenced above, investigated 457 testing locations, of which 436 with archaeological potential were assessed on the ground. Twenty-one areas originally selected for ground survey were assessed by aerial inspection only, as topographic conditions (i.e., sloped, boggy) downgraded the archaeological potential to Low and no testpitting was warranted. Of those assessed on the ground, 119 were investigated by visual inspection only, and 15,095 test pits were excavated at the remaining 317 testing locations, for an average of 48 test pits per sub-surface testing location. Of this total, 3,695 testpits and 199 ground testing locations were within the current Study Area (Stantec 2010a).

All field surveys undertaken for the Project were completed with the necessary permitting in place from the PAO. In accordance with PAO guidelines, Site Record Forms were filed for all archaeological and ethnographic sites identified, and reports on the research were completed and submitted to the PAO as required under conditions of the Archaeological Investigation Permit.

In addition to the above, in 2007, Fugro Jacques Geosurveys Inc. conducted a detailed bathymetric survey of the Strait of Belle Isle on behalf of Nalcor to verify the seabed conditions and aid in the eventual planning and design of the submarine cable corridors. Prior to survey operations, information on the natural and human environments in and around the Strait of Belle Isle was identified and compiled. The objective was to bring together all known existing information concerning the geology, bathymetry, oceanography, ecology, fisheries, archaeology and other aspects of the Strait of Belle Isle. This study also involved mapping these and other environmental phenomena and constraints, including known and suspected historic resources and shipwrecks in the Strait of Belle Isle. Following completion of the desktop analyses, detailed sub-sea sonar surveys of the general crossing area and identified corridors were undertaken in the fall of 2007, including side-scan sonar, multi-beam and sub-bottom profile surveys. The 2007 sonar surveys provided detailed information on two proposed 500 m-wide sub-sea High Volume direct current (HVdc) cable corridors. The survey operation was carried out by an offshore vessel travelling over a pre-selected survey grid with appropriate line spacing. A total of 840 km of geophysical survey lines were surveyed.

Side-scan mosaics were generated at 1 m (nearshore) and 2 m (offshore) spatial resolutions for interpretation and corridor analysis. Interpretations were validated against original side scan data at full resolution using Caris SIPS software so that, on average, objects of approximately 0.5 m in size could be identified. All survey results were analyzed and processed, and geologists formulated a description of the sub-sea corridor conditions by interpreting the findings of all three different survey results. In addition, registered archaeological remains situated along the shoreline within the Study Area were plotted on Project constraints mapping, as were the general locations of a number of shipwrecks reported for the Strait of Belle Isle.

In 2008, AMEC Earth & Environmental (AMEC) conducted a marine field study to collect information on the seafloor characteristics along two proposed Strait of Belle Isle submarine cable crossing corridors. The 2008 marine survey was completed using a 55' longliner vessel from which a drop video system was deployed. The drop video was used to collect video footage of the seafloor along pre-determined transects within each of the two submarine cable corridors. Due to the shallow depths of the nearshore area on the Newfoundland side, the drop video system was not able to be used. For this shallow (<30 m depth) nearshore area, a 2009 underwater video survey was performed with a smaller vessel and a team of surface-supply divers covering an additional 2.8 km within the two corridors on the Newfoundland side of the Strait. The underwater video resulting from the 2008 and 2009 marine surveys was subsequently reviewed and analyzed in detail for the purpose of assessing and quantifying marine fauna, flora and fish habitat characteristics along the proposed submarine cable corridors, as well as to determine if any objects of anthropogenic origin and significance were detectable within the corridors.

Underwater surveys were conducted by Sikumiut Environmental Management Ltd. at two proposed shore electrode sites at L'Anse au Diable and Dowden's Point, and the corridor segment to Shoal Cove (Sikumiut 2011a and 2011b). Both of these surveys were completed using a drop video system. The video was reviewed and analyzed in detail for marine flora and fauna, and fish habitat characteristics. It was also reviewed to determine if any objects of anthropogenic origin and importance were present.

In 2011, Stantec Consulting Ltd. conducted a detailed historic and heritage resource assessment at the proposed Strait of Belle Isle cable landing sites at Forteau Point (Labrador) and Shoal Cove (Newfoundland), and at the identified shore electrode locations at L'Anse au Diable (Labrador) and Dowden's Point (Newfoundland). Field assessment involved compiling data on previously recorded archaeological and contemporary sites, as well as visual reconnaissance and sub-surface testing and concluded with archaeological potential mapping. The results of the surveys and archaeological potential mapping are used in the EA and will be used in planning the final routing and placement of Project components.

15.2.2.2 Palaeontological Resources

The following sources were used to compile information related to Palaeontological Resources within the Study Area:

- *Historic and Heritage Resources Component Study* (Stantec 2010a);
- *Historic and Heritage Resources Component Study Supplementary Report* (Stantec 2011a);
- literature and resources, including Handcock and Skinner (2000), Bergstrom et al. (1997), Landing and Benus (1994) and Barnes (1988); and
- digital geological mapping of the Study Area obtained from Newfoundland and Labrador Geoscience Atlas (Newfoundland and Labrador Department of Natural Resources (NLDNR) 2010a, internet site).

Under the current regulatory framework, no fieldwork was required or completed for the Palaeontological Resources component of the *Historic and Heritage Resources Component Study* (Stantec 2010a). Therefore, to assess the likelihood of Project interactions with any resources that might be present within the Study Area, a review of published and unpublished sources and the relevant geological mapping (superimposed over 1:50,000-scale Project mapping) was completed to help establish the palaeontological (i.e., fossils) potential of the transmission and potential electrode line corridors, and the regional areas on either side of the Strait of Belle Isle.

To predict areas of potential for Palaeontological Resources within the Study Area, data from detailed studies of known geological outcrops, which have laid the foundation for knowledge of the age and structure of the geology in Newfoundland and Labrador, were examined. In particular, this included:

- the study of the structure of Newfoundland in the development of the Theory of Plate Tectonics where fossils determined which fault system was the suture in the Iapetus Ocean (Handcock and Skinner 2000); and
- the identification of the position of the World-wide Gold Spike at the systemic boundary between the PreCambrian and Cambrian systems (Landing and Benus 1994) and the Gold Spike at the boundary between the Cambrian and the Ordovician systems (Bergstrom et al. 1997; Barnes 1988).

These studies were used to demonstrate how and where major fossils have been found and the potential for them to occur within the Study Area. The Study Area traverses inland portions of the province for major sections of the corridor. Inland portions of the province are not as well mapped or studied for Palaeontological Resources unless they are adjacent to areas of natural outcrops such as riverbeds, outcrops exposed as a result of human activity (i.e., road construction and other excavations), or have been the object of geological mapping. Therefore, targeting locations within the Study Area that hold particular potential for Palaeontological Resources was based on knowledge of similar geological formations in other areas of the province that are known to support fossils.

The results of the Palaeontological Resources research are presented in Section 3.4 of the *Historic and Heritage Resources Component Study* (Stantec 2010a).

15.2.2.3 Architectural Resources

The Newfoundland and Labrador's Registered Heritage Structures digital information collection maintained by the Heritage Foundation of Newfoundland and Labrador was searched for registered sites (Newfoundland and Labrador's Registered Heritage Structures 2010, internet site).

15.2.3 Archaeological Resources

Archaeological Resources are those of historic, cultural, spiritual, natural, scientific and aesthetic importance. This includes, for example, campsites, stone tool workshops and burial sites dating to the Pre-contact Period, as well

as sites from the Historic Period associated with the fishery, fortifications or trading. Archaeological Resources are non-renewable and, in many cases, the resources themselves and the information and cultural importance they contain cannot be replaced if damaged or destroyed. Archaeological Resources are valued intrinsically and for the information they can provide on Pre-contact and historic human activities in the province.

The protection and management of Archaeological Resources in Newfoundland and Labrador is the responsibility of the PAO of the Newfoundland and Labrador Department of Tourism, Culture and Recreation (NLDTCR). The PAO administers its mandate through the Newfoundland and Labrador *Historic Resources Act* (1985), which has its own distinct regulatory requirements.

On-land Archaeological Sites – Labrador

The 115 archaeological sites that are registered with the PAO within the Study Area in Central and Southeastern Labrador are presented in Figure 15.2.3-1. Twelve of these sites were identified during field surveys conducted by Nalcor between 1998 and 2011: four are likely campsites and seven sites of unconfirmed function (but appear to be locations where stone tools were manufactured) dating to the Pre-contact Period. Evidence indicates that the twelfth site dates to the Historic Period (i.e., the 19th century) and results from rock quarrying required for construction of the Pointe Amour Lighthouse (see Figure 15.2.3-1). Ten of the twelve sites identified by Nalcor are situated along the coast of the Strait of Belle Isle in a region long known for its high archaeological potential (McGhee and Tuck 1975). The remaining 92 sites in the Study Area at the Strait of Belle Isle (the majority of which contain Pre-contact Period Aboriginal artifacts) were registered by other researchers not connected with the Project. Details regarding all the archaeological sites identified by Nalcor's study team are provided in the *Historic and Heritage Resources Component Study* (Stantec 2010a) and the *Historic and Heritage Resources Component Study Supplementary Report* (Stantec 2011a). There is no background information or archaeological evidence of cultural or spiritual sites for the Study Area in Labrador (Armitage 2010), although one Maritime Archaic Amerindian burial dating to ca. 7,500 BP is known for the Study Area at Pointe Amour (McGhee and Tuck 1975).

Marine Archaeological Sites

Within the Strait of Belle Isle, only one marine archaeological site – the remains of the HMS Raleigh – had been registered with the PAO. This site (EiBf-30) is scattered along at least 1 km of shoreline and large segments of the wreckage are situated within the Study Area (Figure 15.2.3-2). Other shipwrecks in the Strait have not been registered by the PAO as archaeological sites (PAO Site Record Inventory).

On-land Archaeological Sites – Newfoundland

In Newfoundland, there are eleven archaeological sites registered with the PAO within the Study Area (Figure 15.2.3-3). Seven of these were identified during field surveys commissioned by Nalcor between 1998 and 2011: two sites date to the Historic Period, four are Pre-contact Period Aboriginal sites, and one is of an undetermined period and cultural affiliation (Stantec 2010a). The remaining four sites situated within the Newfoundland Study Area were discovered by other researchers (e.g., Ingstad 1970) and include two Pre-contact Period sites and two sites dating to the Historic Period (for a description of these sites see Stantec 2011b, 2010a).

Archaeological potential was mapped and presented in Stantec (2011a, 2010a) for the transmission corridor. Additional archaeological potential mapping is presented in Stantec (2011b) for the proposed cable landing sites and the shore electrode sites. The potential mapping will be used in planning the final routing and placement of Project components.

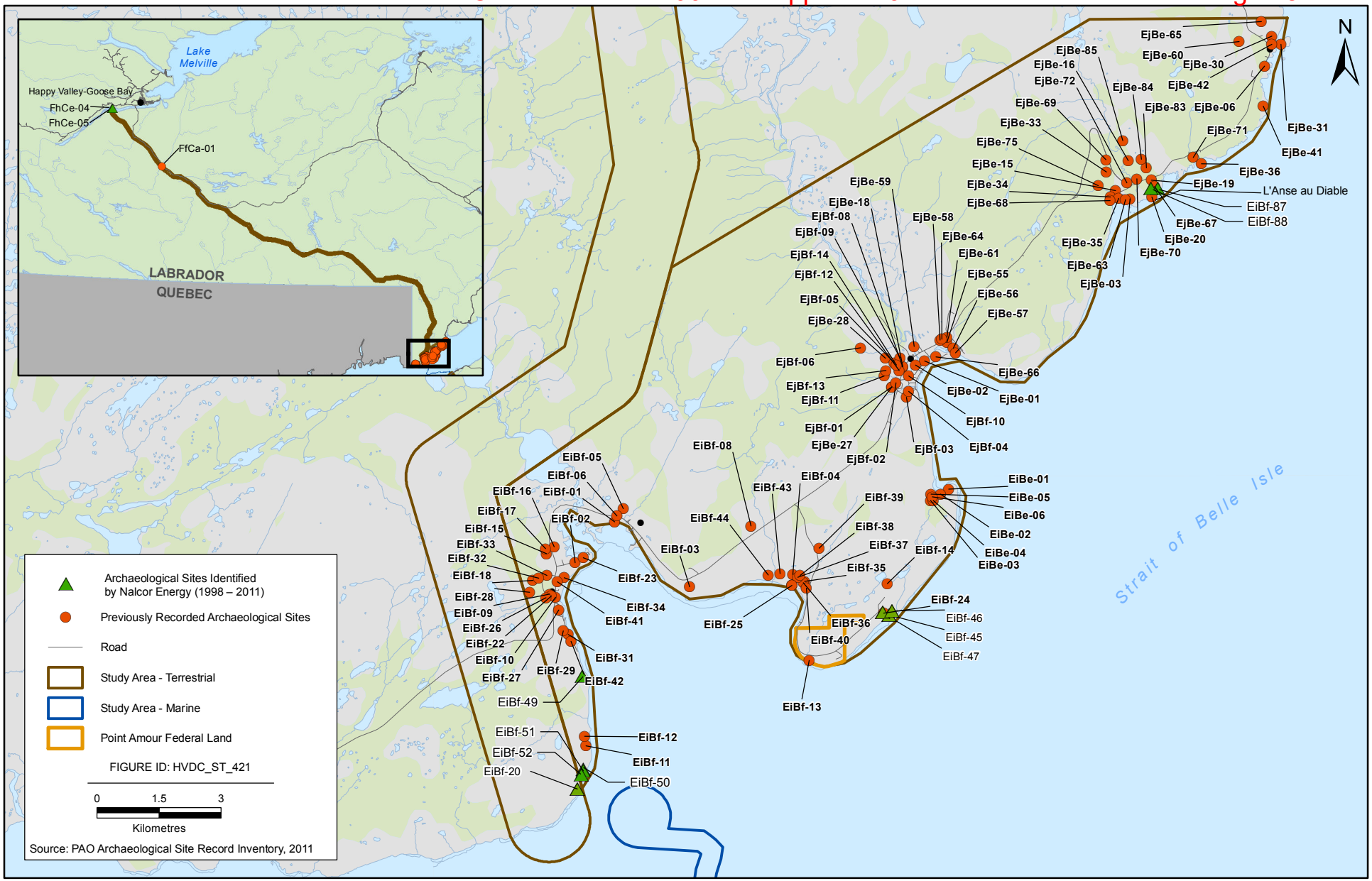


FIGURE 15.2.3-1

Archaeological Resources: Study Area, Labrador

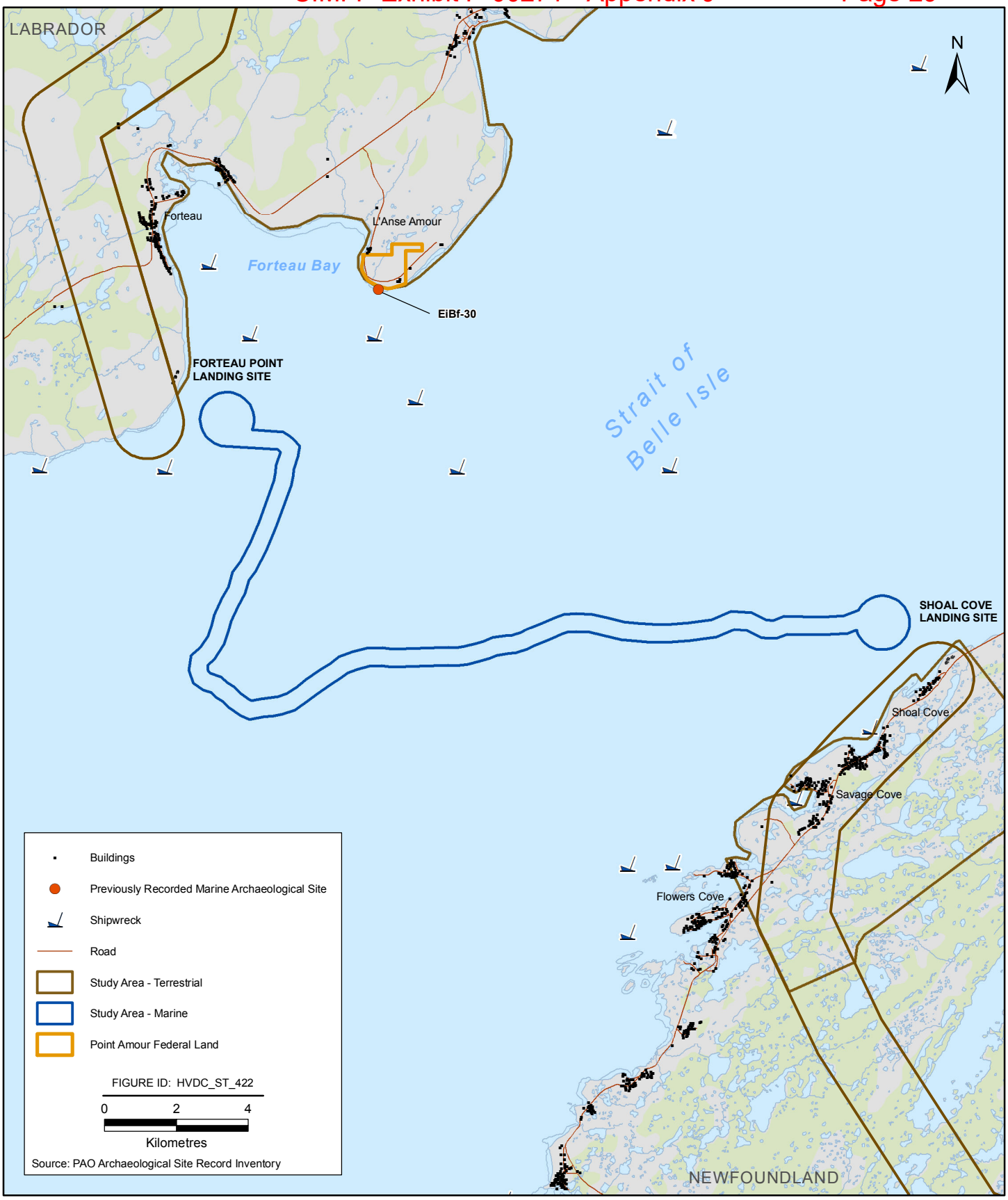


FIGURE 15.2.3-2

Marine Archaeological Resources: Strait of Belle Isle Study Area

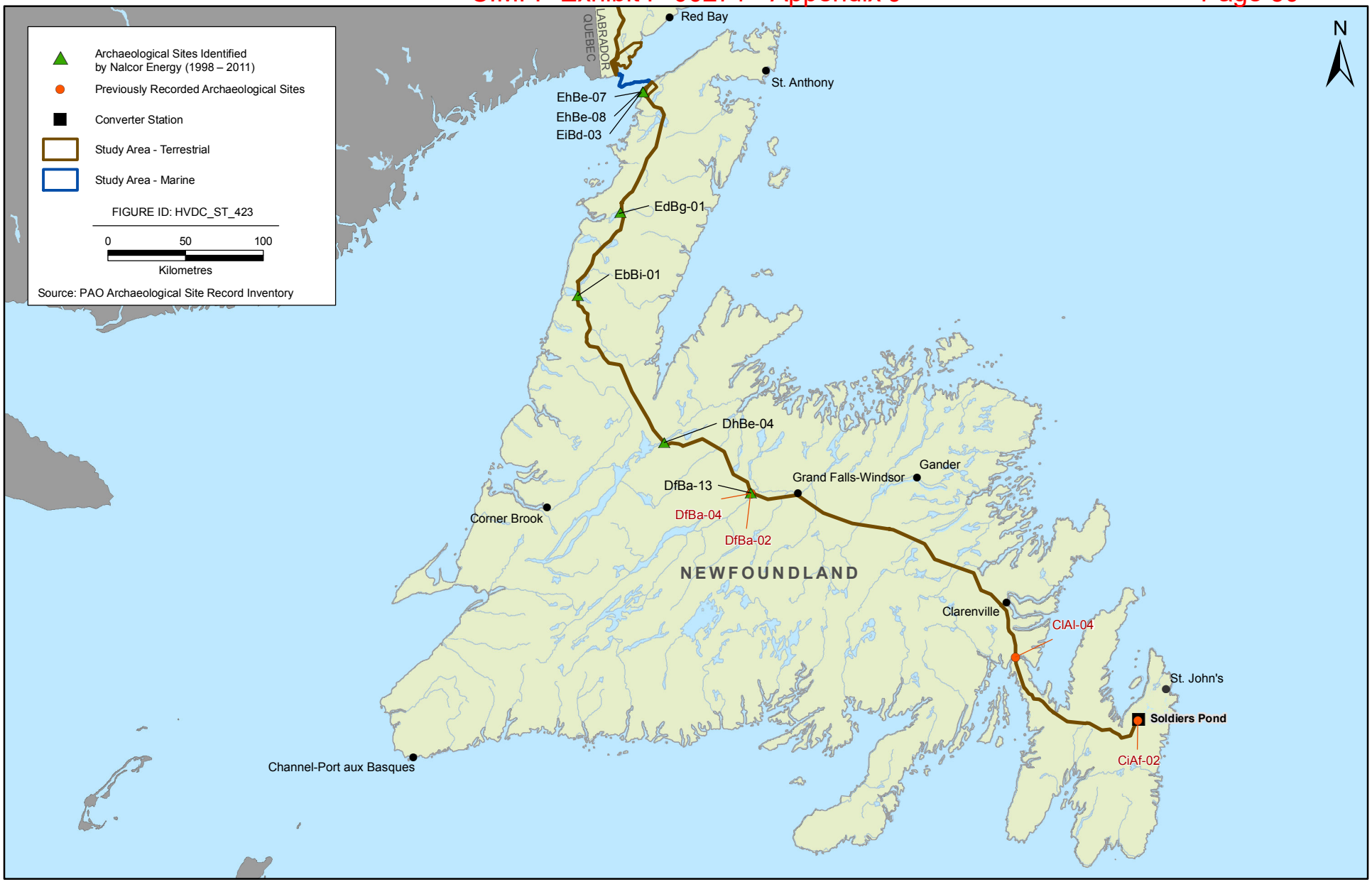


FIGURE 15.2.3-3

Archaeological Resources: Study Area, Island of Newfoundland

Archaeological potential for the transmission corridor was mapped and is presented in the environmental assessment reports (Stantec 2011a, 2010a). In Labrador, areas with High archaeological potential along the corridor were identified and included the crossings of several streams, including the Traverspine, Kenamu and St. Augustine rivers, as well as several large ponds. Two of these ponds have known Innu toponyms: *Mush-nipi* and *Tshiashku-nipi. Mush-nipi* has served as an Innu Outpost Program camp location. Areas of High archaeological potential were also identified in the Muskrat Falls area and the Strait of Belle Isle area.

In Newfoundland, several areas of High archaeological potential were identified along the transmission corridor. Areas of High archaeological potential were highest in strategic locations on the banks of major rivers, preserved marine or riverine terraces in strategic locations and along coastal plains, including on the Northern Peninsula, in the Strait of Belle Isle area. Detailed mapping of archaeological potential is provided in the component studies (Stantec 2011a, 2010a).

Archaeological potential was mapped for the Study Area at the two proposed cable landing sites and the shore electrode locations. Forteau Point and L'Anse au Diable study areas both contain areas of High and Moderate archaeological potential. The Shoal Cove study area contains small areas of High and Moderate Potential and the study area at Dowden's Point was rated as Low potential (Stantec 2011b).

Sites of Cultural and Spiritual Importance

As part of the *Historic and Heritage Resources Component Studies* (Stantec 2010a, b), no background information or archaeological evidence of burial, cultural or spiritual sites for the Study Area in Newfoundland were identified. However, areas of special significance have been identified in Labrador based on ongoing consultation activities with Aboriginal groups. Information on areas of Cultural Significance in either the transmission corridor or in the Study Area, have been identified for Innu Nation and Pakua Shipi. Any information and data obtained from ongoing mapping and the finalization of reports from NunatuKavut Community Council (NCC) and Unamen Shipu will be considered and incorporated, where relevant, including the potential for mitigation and adaptive management during detailed design and routing.

Armitage (2010) described places of Cultural Significance to Innu Nation, including birth, burial, death and gathering places, places of religious significance, one place of historical significance, shaking tent ceremony locations and the location of the Land-based Family Treatment Programme camp.

Three features fall within the Study Area, and potentially within the proposed transmission corridor. *Manitu-utshu*, or the rock knoll, located on the north side of Muskrat Falls and within the proposed transmission corridor, is considered by Innu Elders to be the home of giant otter-like beings known as *Uenitshikumishiteu*. One birth place was recorded within about 10 km of Muskrat Falls. The location of a former shaking tent ceremony was at Muskrat Falls. The last shaking tent ceremony took place in 1969.

Birth and gathering places, shaking tent locations and one place of religious significance were recorded along the Churchill River between Gull Island and Muskrat Falls. In the Happy Valley-Goose Bay and Mud Lake areas, death and gathering places, burial grounds as well as one place of religious significance and one shaking tent location were noted. Approximately 65 km east the transmission corridor, near Carter Basin and Gibeon Point in Happy Valley-Goose Bay, Armitage (2010) recorded birth and death places, burial grounds, places of religious significance and a shaking tent location. East and south of this area many birth places and burial grounds were recorded, as well as one location marking a death, one shaking tent location and three places of religious significance. Another place of religious significance was situated further south and east, approximately 30 km the transmission corridor (Armitage 2010).

Other places of religious importance, gathering places, birth places and shaking tent locations were recorded between Sheshatshiu and Happy Valley-Goose Bay, along the Trans-Labrador Highway Phase 1 (TLH1) toward Churchill Falls, and near Muskrat Falls (Armitage 2010; Armitage 2008).

Place names are an important part of the use, occupation, history and meaning of a landscape, as they act as links between physical landforms and cultural events passed down in oral traditions including myths, cultural

histories and personal biographies (Armitage 2010). In addition to the ponds noted above, the Labrador Innu have many place names for topographic features situated throughout their traditional territory (Armitage 2010, Innu Nation and Sheshatshiu Innu First Nation (INSIFN) 2008) which have been noted on Map 15 of the Armitage (2010) Report.

During the interviews conducted with Pakua Shipi community members in 2010, four birth places and five burial grounds were identified. One of the burial grounds identified is located near the area where the St. Paul River overlaps with the transmission corridor in the Study Area. This polygon is identified as a cultural site on the map of Current Land and Resource Use in the Aboriginal Communities and Land Use Component Study. Two other places of Cultural Significance which fall within the Study Area are northeast of the St. Augustin River, just east of the transmission corridor in the Study Area. Additional data on places of cultural significance are being collected as part of the Phase II Agreement and will be considered, as relevant, once available.

Places of cultural significance identified during interviews with members of NCC during 2011 as a part of the Phase II Community Engagement Agreement were not near the transmission corridor or other Project-related components (see Section 15.5.7, Figure 15.5.7-3a).

15.2.4 Palaeontological Resources

Palaeontological Resources refer to any fossilized traces or imprints of organisms preserved in or on the Earth's crust that provide information about early life on Earth. They are non-renewable and are of both scientific and educational value. The ability to assess and seek to avoid negative interactions with Palaeontological Resources is contingent upon the understanding of their occurrences and distribution, both geologically and geographically. Palaeontology enhances the knowledge and understanding of the history of the environment by interpretation of the evolutionary relationships of organisms and ultimately a deeper understanding of biodiversity. The study compliments the understanding of Historic and Heritage Resources by providing information and data to place fossilized remains in a biological and geological context (Stantec 2010a). Similar to Archaeological Resources, the protection and management of Palaeontological Resources in Newfoundland and Labrador is the responsibility of the PAO of the NLDTCR. The PAO administers its mandate through the Newfoundland and Labrador *Historic Resources Act* (1985).

Fossils are normally found in sedimentary rocks (Blatt and Tracy 1994) because, unlike most igneous and metamorphic rocks, they form at temperatures and pressures that do not destroy the original organic material. The sedimentary rocks of Newfoundland and Labrador, often fossiliferous, were deposited during the late Precambrian and Paleozoic eras, between approximately 585 and 280 million years ago (Blatt and Tracy 1994).

Unlike archaeological materials that are typically localized and exist at or near the surface, fossils are distributed throughout geological formations that frequently cover vast areas. As there may be vast fossil-free areas within a given fossil-bearing deposit, and since fossiliferous materials may be buried beneath metres of glacial overburden and vegetation (and sometimes other rock), surface disturbance in an area of high potential may not encounter fossil remains.

As a result of these factors, it is difficult to determine if a rock type within the Study Area has the potential to contain fossils. For example, even though segments of the Study Area on the Northern Peninsula cross fossil-bearing sedimentary rock types, without previous palaeontological field studies or incidental disturbance in the area occasioned by road construction for example, it is not possible to state that specific locations contain fossils. However, details provided above and in the *Historic and Heritage Resources Component Study* (Stantec 2010a) on the geological parameters that are conducive to the formation of fossils were used to indicate where within the Study Area there is "potential" for their occurrence.

15.2.4.1 Labrador

Consideration of the potential for Palaeontological Resources to occur in the Study Area in Central and Southeastern Labrador is based largely on Wardle et al. (1997). The Study Area includes lands underlain by igneous rocks that make up the core of the North American continent. The only sedimentary rocks (i.e., those

with some potential for Palaeontological Resources) within the portion of the Study Area near the Churchill River are sandstone and conglomerate strata of the Neoproterozoic Double Mer Formation. The Double Mer Formation is a continental deposit in which a massive amount of material accumulated quickly in a rift valley. As all evidence of early life is restricted to ocean contexts, the palaeontological potential of this continental deposit is negligible and fossils have not been recorded here (Gower 1986; Williams et al. 1985, internet site) and the likelihood that such resources are present is low. Other than stromatolites that are formed by cyanobacteria and are found through most of the PreCambrian deposits, the only fossils reported from this area of Labrador are those of Cretaceous cover rocks found in the Labrador Trough, well to the north of the Study Area (Wardle et al. 1997).

With the exception of the sedimentary rocks near the Churchill River, the portion of the Study Area from Muskrat Falls to the south Labrador coast passes over Precambrian or very early Cambrian rocks. Bedrock along the transmission corridor is comprised mainly of coarse-grained intrusive igneous and high-grade metamorphic rocks, generally described as granites and gneisses, respectively (Gower 1986). These rocks are not considered to be a fossil host.

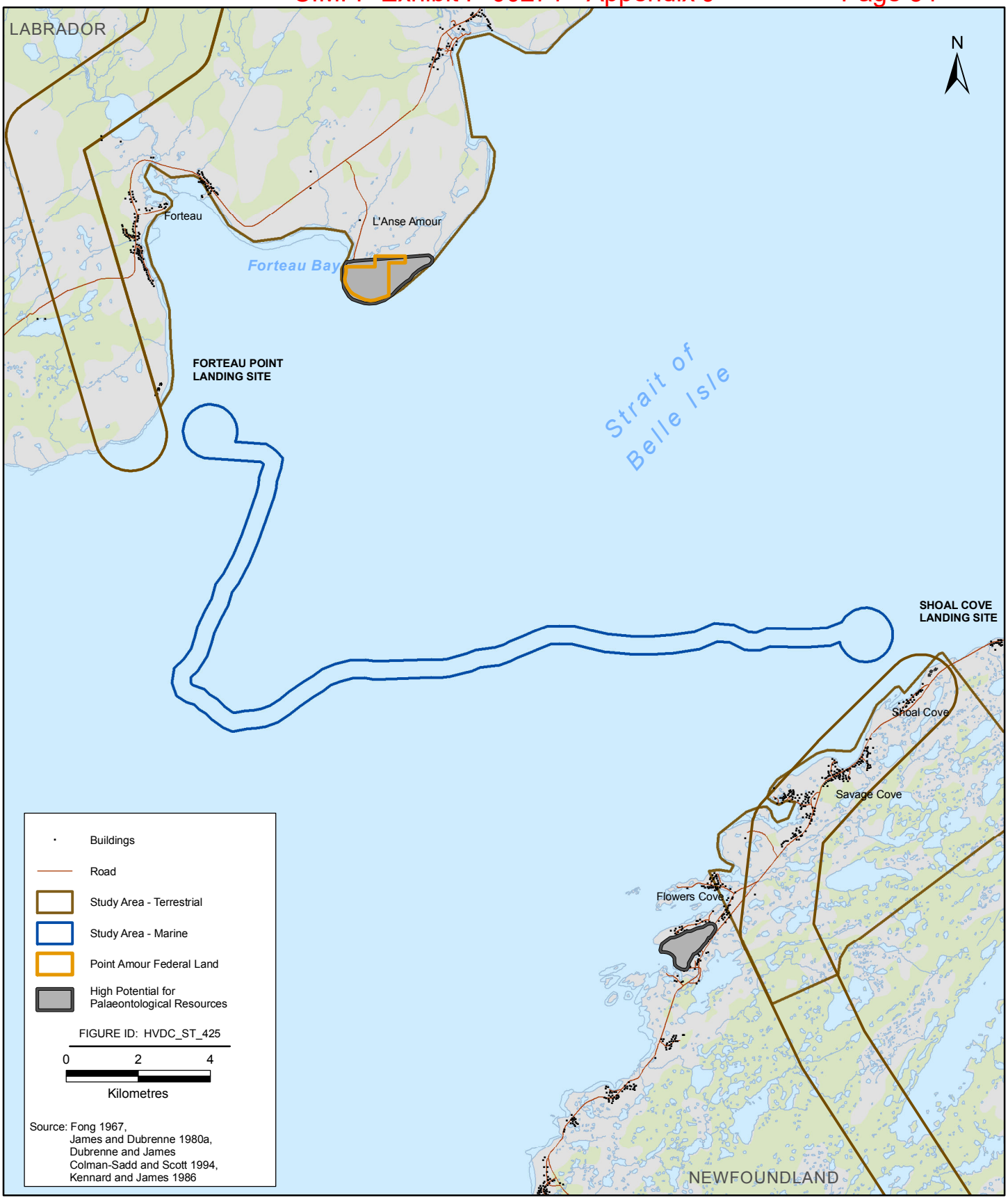
Where the Study Area crosses the south Labrador coast, it passes through the Forteau Formation near L'Anse Amour. Outcrops of red limestone situated along the cliffs at the upper end of the beach and just offshore at L'Anse Amour are the site of rare reef-building fossils referred to as Archeocyathids (Dubrenne and James 1981; James and Dubrenne 1980a; Fong 1967) (Figure 15.2.4-1). Archaeocyaths are an extinct group of sponges that diversified into hundreds of species during the Lower Cambrian period, with some of these species contributing greatly to the creation of the first reefs. They are the first reef-building fossils to appear in geological time other than cyanobacteria (James and Dubrenne 1980b; James and Kobluk 1978). The Archeocyathids at L'Anse Amour are of additional importance because, as opposed to other locations in the world where these fossils have been found, they occur in southern Labrador in the same position in shallow water just offshore in which they would have originally grown (Dubrenne and James 1981; James and Dubrenne 1980a; Fong 1967). Note that for the most part, these fossils occur on federal land, and there is overlap with the Study Area past the eastern boundary of federal government property (Figure 15.2.4-1).

15.2.4.2 Newfoundland

On the Northern Peninsula of Newfoundland, approximately 5 km south of the Study Area at Flower's Cove, there are outcrops of thrombolites (large algal mounds) that can be seen on both sides of this bay (Colman-Sadd and Scott 1994; Kennard and James 1986). The Study Area inland of the Strait of Belle Isle crosses many areas covered by bog, where no fossils have been reported (Stantec 2010a).

In Central and Eastern Newfoundland, the Study Area crosses mostly metamorphosed quartz-rich siliciclastic and intrusive igneous rock formations. These formations rarely contain fossils and a search of the literature produced no evidence of fossils near the Study Area (Stantec 2010a).

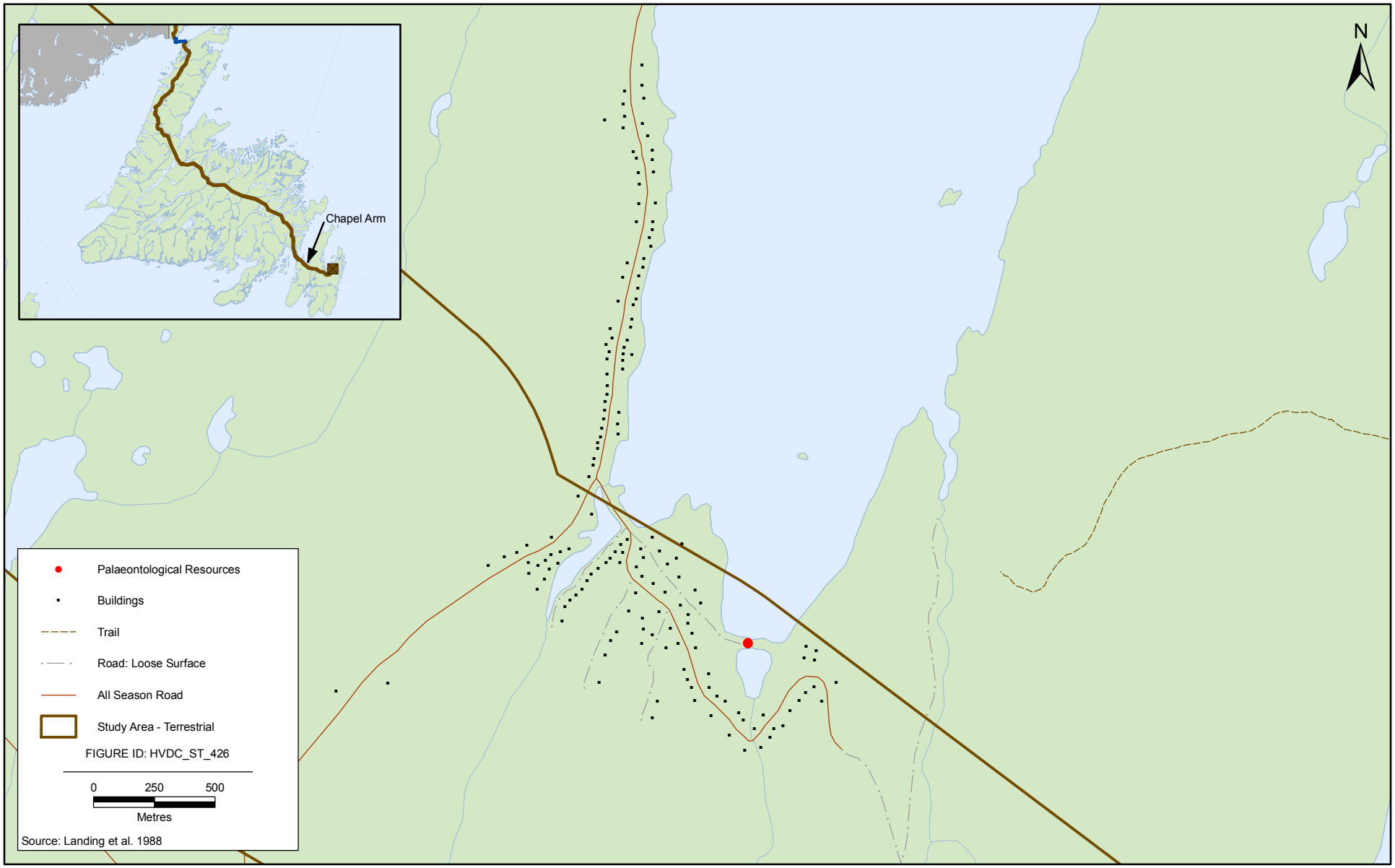
Near the community of Chapel Arm on the Avalon Peninsula and within the Study Area (Figure 15.2.4-2), there is an outcrop containing "small shelly fossils" of unknown affinity (Landing et al. 1988). Although other outcrops of fossils occur on the Avalon Peninsula, including the well-known Precambrian fossils of Mistaken Point, they are far outside the Study Area (Misra 1969).



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FIGURE 15.2.4-1

Palaeontological Resources Study Areas and Site Potential Rating: Strait of Belle Isle



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FIGURE 15.2.4-2

Palaeontological Resources Study Area and Recorded Resources: Island of Newfoundland

15.2.5 Architectural Resources

Architectural Resources include buildings, monuments or other structures, and parcels of land or landscapes considered to be of historical or architectural significance (*Historic Resources Act* (1985). Architectural Resources are valued by the public at large for their unique architectural characteristics and evidence they provide on the use of local building materials and local expertise. They are also valued for the contribution they make to architectural studies and tourism based on built heritage.

Architectural Resources are not protected under provincial legislation, although there are provisions in the *Historic Resources Act* (1985) to protect buildings and / or landscapes designated as Provincial Historic Sites (*Historic Resources Act* (1985): available on PAO internet site). Even though buildings, structure or sites can be commemorated and registered with the Heritage Foundation of Newfoundland and Labrador, there is still no protection under provincial legislation. However, under certain circumstances, the Lieutenant-Governor in Council may, on the recommendation of the Minister of the Department of Tourism, Culture and Recreation, designate a site, after which it is accorded all appropriate protection through government. To be considered a Heritage Structure, an application listing all the various historic assets and characteristics of the building as well as its age factors considered to be unique must be drafted and submitted to the Heritage Foundation of Newfoundland and Labrador for review.

A review of the assembled data for the Study Area (Stantec 2010a) indicates that there is one building, structures or sites meeting the criteria for protection on provincial lands within the Study Area. The registered historic structure is the 19th century Point Amour Lighthouse within the Study Area in southern Labrador (Figure 15.2.5-1).

15.3 Communities

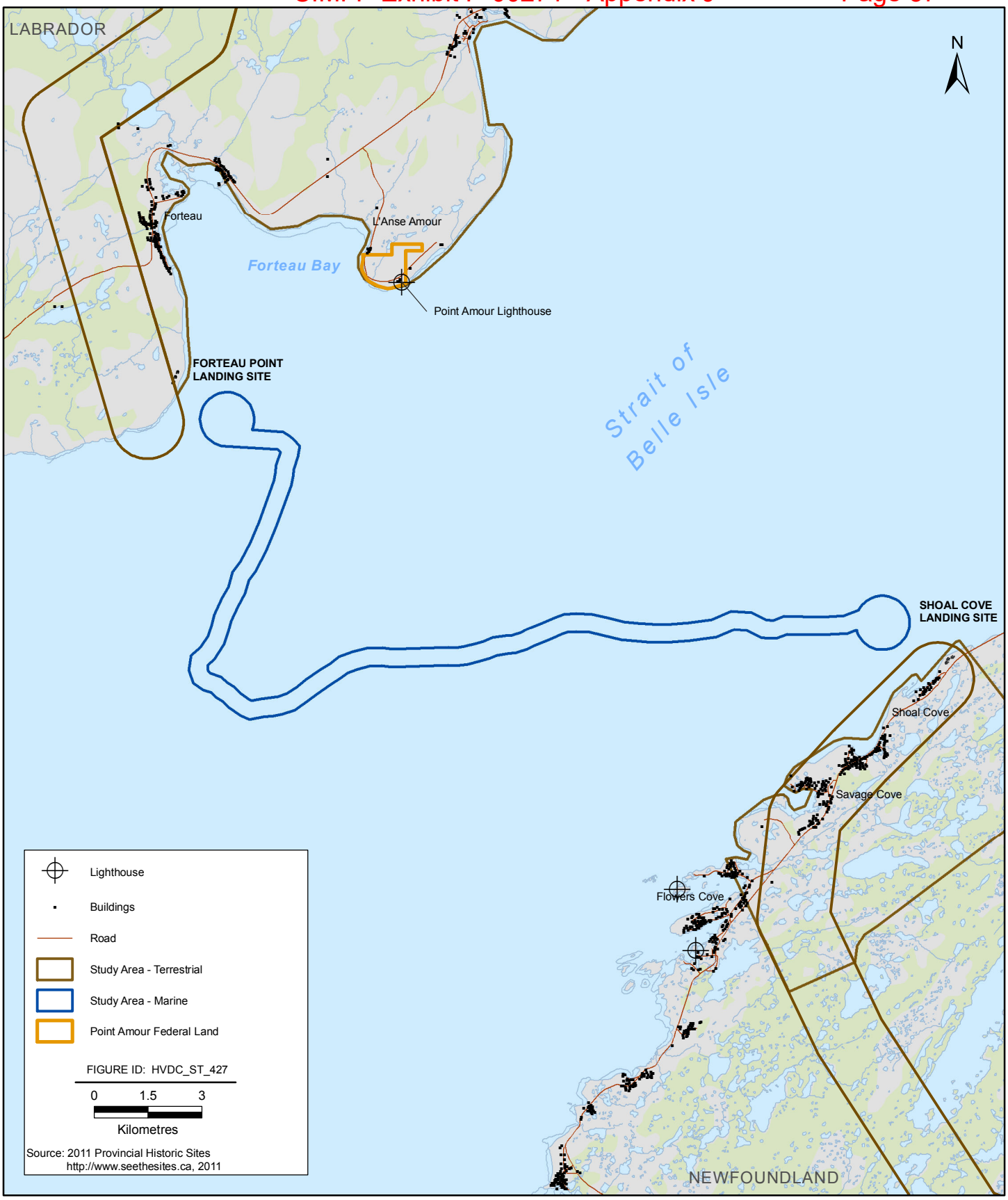
This section provides a description of the existing socioeconomic environment including demographic characteristics, physical and social infrastructure and services, and health and well-being of people in the communities that comprise the Study Area Regions. The following subsections discuss community elements that include consideration of demographics, community services and infrastructure (e.g., health services and social programs), human health, community health, family life, safety, culture, education and training, housing and accommodation, and property value (e.g., housing prices) and land use. In addition, the reader is referred to other sections of this chapter (e.g., Section 15.4 Economy, Employment and Business; Section 15.5 Land and Resource Use (Subsection 15.5.7 Aboriginal Contempory Traditional Land Use) for additional information that relates to to the community elements.

15.3.1 Study Area

The discussion of existing baseline conditions for Communities includes consideration of those regions that contain, are crossed by, or lie in close proximity to Project components, as well as the province as a whole. The regional discussions consider the Regional Economic Zones (see Figure 15.3.1-1), as outlined below:

- Central and Southeastern Labrador (Economic Zones 3, 4 and 5);
- Northern Peninsula (Economic Zones 6, 7 and 8);
- Central and Eastern Newfoundland (Economic Zones 11, 12, 14 and 15); and
- Avalon Peninsula (Economic Zones 17, 18, 19 and 20).

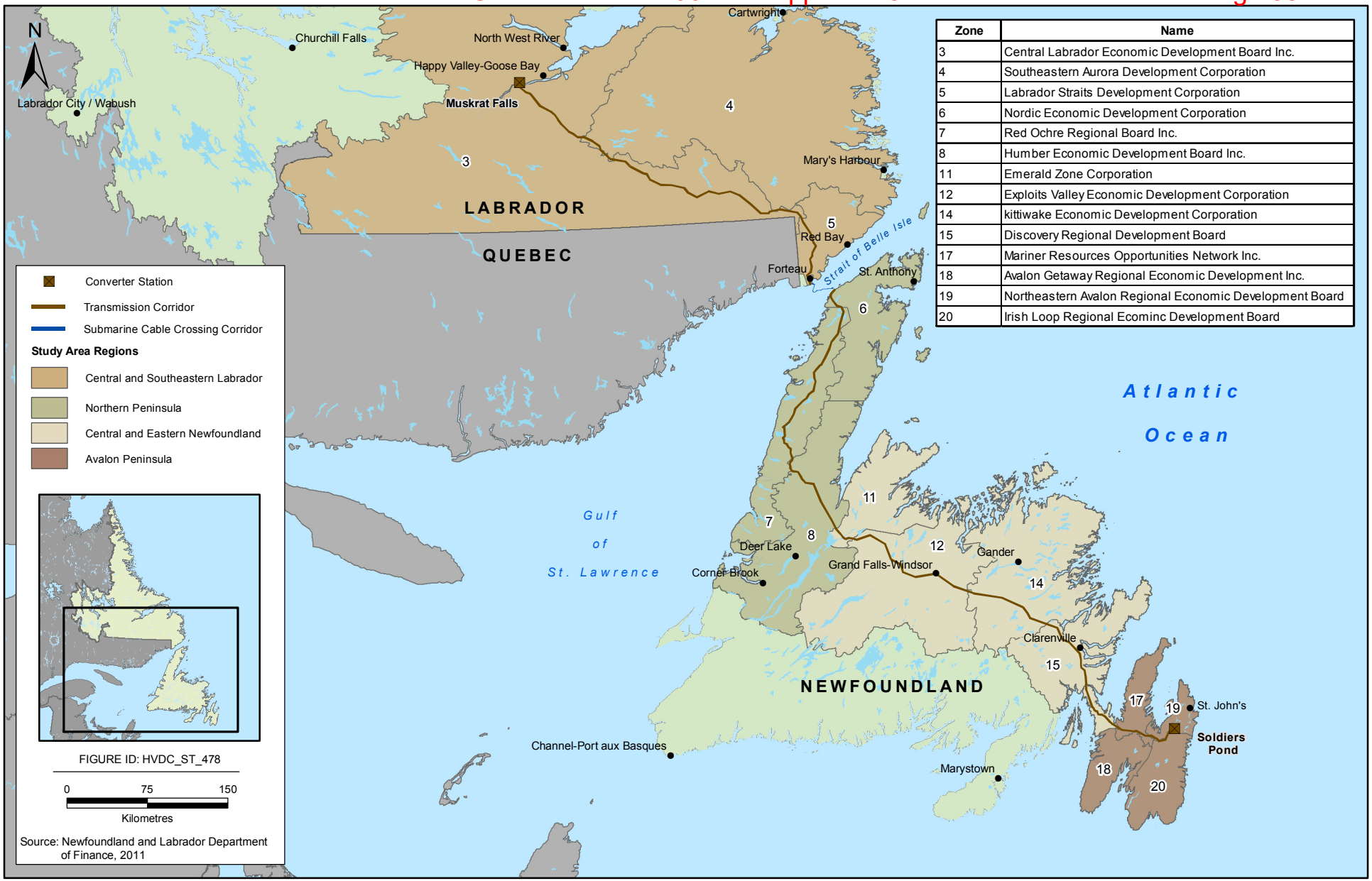
Where the Economic Zones do not match the Project regions, data from regions that are as comparable as possible are used. In cases where data are not available for each region, these data are consolidated and discussed for the regions as a whole. In addition, the Study Area includes relevant Aboriginal communities in Québec.



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FIGURE 15.2.5-1

Architectural Resources: Strait of Belle Isle Study Area



Zone	Name
3	Central Labrador Economic Development Board Inc.
4	Southeastern Aurora Development Corporation
5	Labrador Straits Development Corporation
6	Nordic Economic Development Corporation
7	Red Ochre Regional Board Inc.
8	Humber Economic Development Board Inc.
11	Emerald Zone Corporation
12	Exploits Valley Economic Development Corporation
14	kittiwake Economic Development Corporation
15	Discovery Regional Development Board
17	Mariner Resources Opportunities Network Inc.
18	Avalon Getaway Regional Economic Development Inc.
19	Northeastern Avalon Regional Economic Development Board
20	Irish Loop Regional Ecominc Development Board

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FIGURE 15.3.1-1

Study Area Regions and Regional Economic Development Zones of Newfoundland and Labrador

15.3.2 Information Sources and Data Collection

Existing and available secondary source data form the basis for the description of the existing environment, supplemented by primary data and information collected from agencies and organizations within the province with responsibility for the infrastructure, service or community characteristics discussed.

The current or the most recent available data are provided and, where appropriate and available, trends with respect to the nature, capacity and use of these components are presented. Sources from which the baseline data are drawn include:

- Statistics Canada and other departments and agencies of the Government of Canada;
- Newfoundland and Labrador Statistics Agency (Community Accounts) and other departments and agencies of the GNL;
- Economic Development Boards; and
- Municipal governments and local and regional authorities (Health Boards, Education Boards, etc.).

Additional information was collected through interviews with a range of organizations and agencies at the community, regional and provincial levels. A full list of references and sources is provided.

The information available through these sources provides a description of the existing socioeconomic environment for the purpose of the environmental assessment.

15.3.3 Regions and Communities

Table 15.3.3-1 summarizes the regional and community characteristics for each of the Study Area Regions, which are then discussed individually. As indicated, most of the population is concentrated in the Avalon Peninsula region and it is here that most of the larger cities and towns in the province are found. It is also the only region to show a growth in population in the 2001 to 2006 period.

Table 15.3.3-1 Region and Community Characteristics (2001 and 2006)

Study Region	Total Population (2006)	Total Population (2001)	Population Change (%)	Number of Communities	Community Population Range
Central and Southeastern Labrador	13,615	14,360	-5.2	18	<100-8,000
Northern Peninsula	58,875	60,550	-2.8	78	<100-20,000
Central and Eastern Newfoundland	115,905	121,245	-4.4	191	<100-14,000
Avalon Peninsula	243,835	238,020	+2.4	134	<100-100,000

Source: Statistics Canada 2006a.

15.3.3.1 Central and Southeastern Labrador

The Central and Southeastern Labrador Study Region encompasses communities in the Upper Lake Melville area of Labrador - Happy Valley-Goose Bay, North West River, Mud Lake and Sheshatshiu (Economic Zone 3, the Central Labrador Economic Development Board Inc. (CLEDB 2009, internet site)), together with the communities along the Labrador South Coast (Zone 4, the Southeastern Aurora Development Corporation (Southeastern Aurora Development Corporation 2008)) and in the Labrador Straits area (Zone 5, the Labrador Straits Development Corporation (Labrador Straits Development Corporation 2008, internet site)) (Figure 15.3.1-1). The total population of the Region in 2006 was 13,615, a decline of 5.2 percent (%) since

2001 (Table 15.3.3-1). Most of the communities in the region have populations of less than 500, with the main concentration of population in the Upper Lake Melville area and specifically in Happy Valley-Goose Bay.

15.3.3.2 Northern Peninsula

There are approximately 80 communities in the Northern Peninsula Study Region (Figure 15.3.1-1), from St. Anthony at the northern tip, south to Corner Brook on the west coast. This Region is made up of three Regional Economic Development (RED) boards: the Nordic Economic Development Corporation (Zone 6) (NEDC 2009, internet site), the Red Ochre Regional Board Inc. (Zone 7) (Red Ochre Regional Board Inc. 2009, internet site), and the Humber Economic Development Board Inc. (Zone 8) (Humber Economic Development Board 2009, internet site). The total population of the Region in 2006 was 58,875, a decline of 2.8% since 2001 (Table 15.3.3-1), with the City of Corner Brook the largest community in the region.

15.3.3.3 Central and Eastern Newfoundland

The Central and Eastern Newfoundland Study Area Region is located to the southeast of the Northern Peninsula, through the north-central portion of the Island, and southeast as far as the Isthmus of Avalon. It is made up of the Emerald Zone Corporation (Zone 11) (Emerald Zone Corporation 2009, internet site), the Exploits Valley Economic Development Corporation (Zone 12) (Exploits Valley Economic Development Corporation 2009, internet site), the Kittiwake Economic Development Corporation (Zone 14) (Kittiwake Economic Development Corporation 2009, internet site), and the Discovery Regional Development Board (Zone 15) (Discovery Regional Development Board 2009, internet site) (Figure 15.3.1-1). In 2006 the population of the Region was 115,905, a decline of 4.4% since 2001 (Table 14.5-1). There are approximately 200 communities in the Region, of which Grand Falls-Windsor, Gander and Clarenville are among the largest.

15.3.3.4 Avalon Peninsula

The Avalon Study Area Region (Figure. 15.3-1) includes approximately 140 communities ranging from the larger cities of St. John's and Mount Pearl and towns such as Conception Bay South, Paradise and Bay Roberts, to small rural communities in the south, southwestern and northwestern parts of the region. The Region is comprised of four RED Boards: the Mariner Resource Opportunities Network Inc. (Zone 17) (Mariner Resource Opportunities Network Inc. 2009, internet site), Avalon Gateway RED Inc. (Zone 18), the Northeast Avalon RED Board (Zone 19) (Northeast Avalon RED Board 2009, internet site), and the Irish loop RED Board (Zone 20). The population increased by 2.4% over the 2001 to 2006 period to 243,835 (Table 15.3.3-1), which represents approximately 48% of the total provincial population.

15.3.4 Population and Demographics

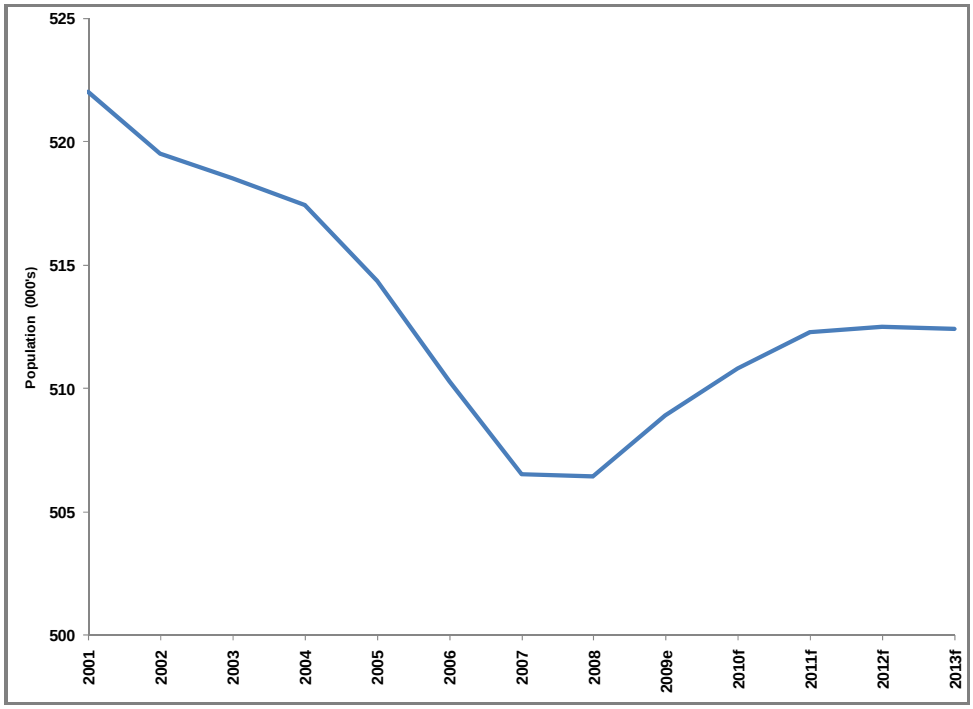
15.3.4.1 The Province of Newfoundland and Labrador

The population of Newfoundland and Labrador in January 2010 was estimated at 510,805 persons, an increase of 2,510 (0.5%) since July 2009 (NLDF 2010a, internet site). The 2006 census reported a total population of 505,469, although the provincial government currently uses a figure of 510,313 (Figure 15.3.4-1). This represents the first year-over-year population increase since 1992 (NLDF 2009a, internet site).

Net migration to the province in 2008-2009 was positive (Figure 15.3.4-2). This was the first time that this has been the case since 1982-1983 and it helped offset natural losses and was sufficient to generate a small overall increase. In 2010, population growth was the result of positive net-migration of almost 2,000, which offset a natural population decline (NLDF 2010a, internet site). Deaths now exceed births in the province and the natural increase component of population has had a negative value since 2006-2007 (Figure 15.3.4-3).

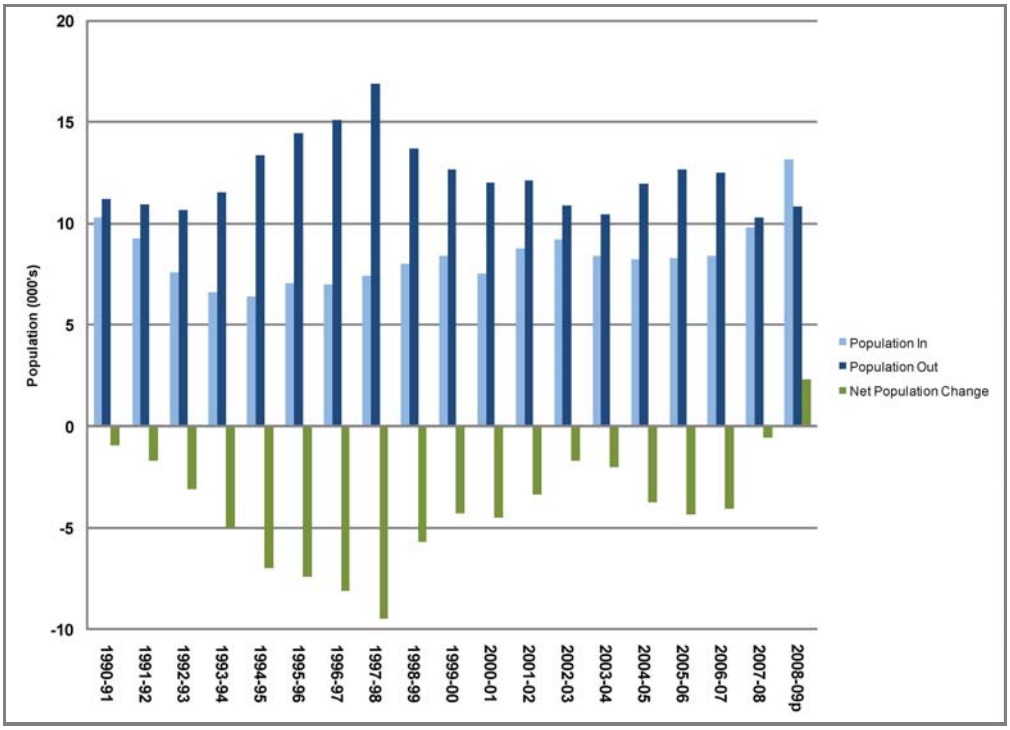
Positive net migration can be attributed in part to the strong performance of the provincial economy, but also to the fact that there were fewer jobs elsewhere in Canada, the global recession in 2008-2009 reducing the number of jobs in Alberta and Ontario in particular (NLDF 2010b, internet site).

Figure 15.3.4-1 Provincial Population as of July 1 (000s)



Source: NLDF 2009a, internet site.

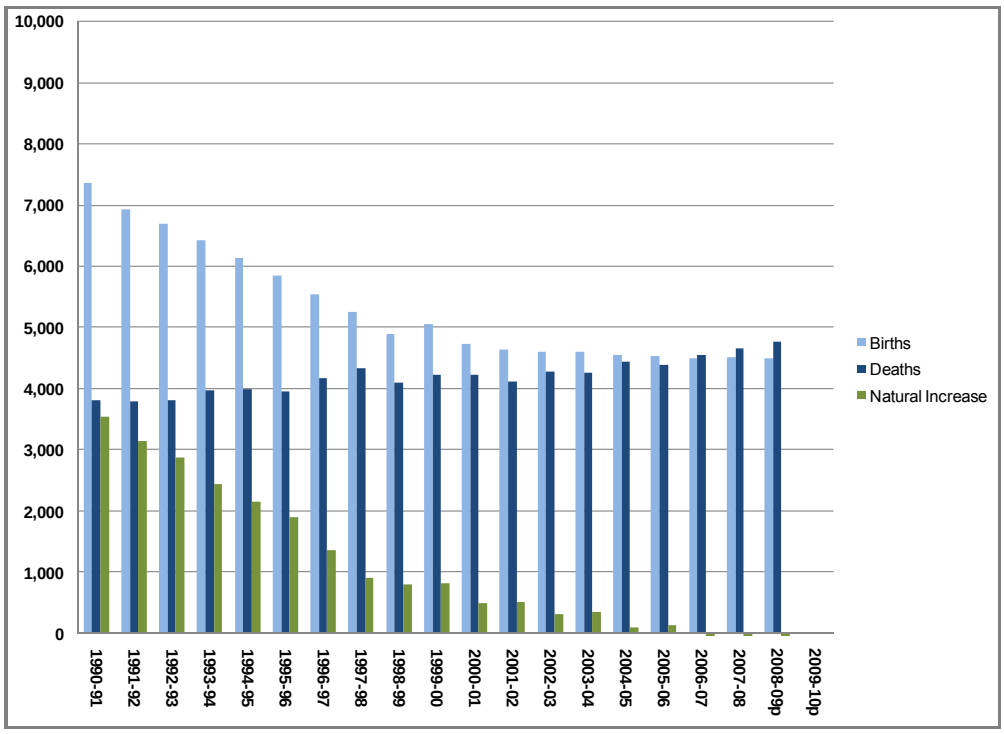
Figure 15.3.4-2 Inter-provincial Migration, Newfoundland and Labrador, 1991 to 2008



Source: NLDF 2009a, internet site

Note: "P" following year = preliminary

Figure 15.3.4-3 Natural Increase Components of Growth Newfoundland and Labrador, 1991 to 2010

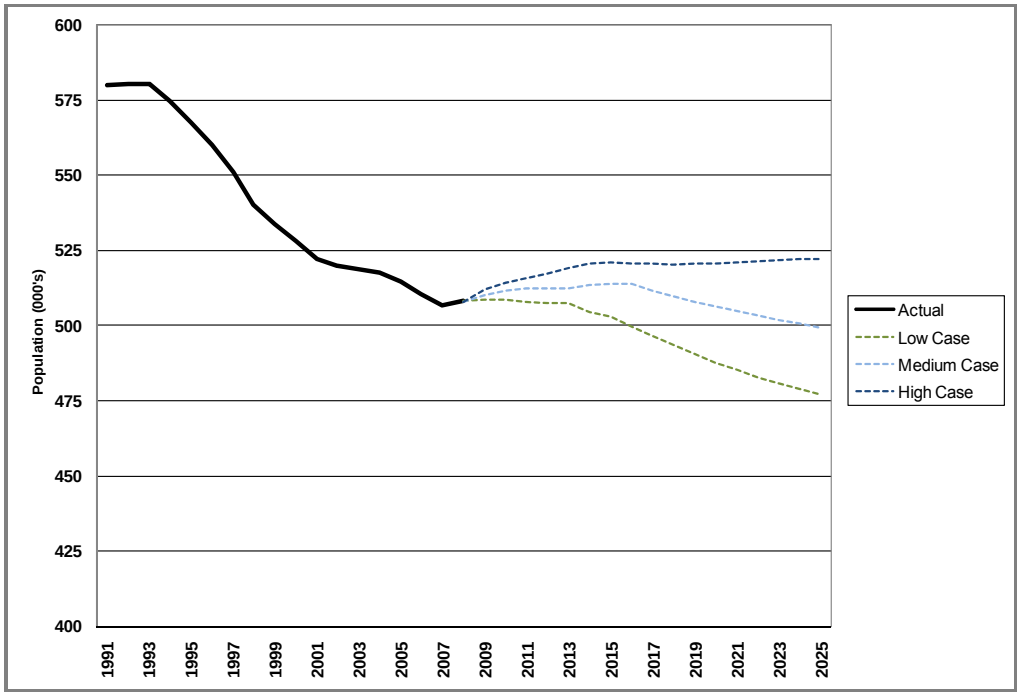


Source: NLDF 2009a, internet site.

The most recent population projections, to 2025, indicate that the total Newfoundland and Labrador population could reach 521,750 under a 'High Scenario' set of assumptions, 499,200 under a 'Medium Scenario' and 476,800 under a 'Low Scenario' (NLDF 2009b, internet site) (Figure 15.3.4-4). The Low and Medium scenarios would see an overall decline in total population between 2006 and 2025 of 6.6% and 2.2%, respectively. The High Scenario would see the population increase by 2.2% to return to approximately the 2001 level by 2025 (NLDF 2009b, internet site).

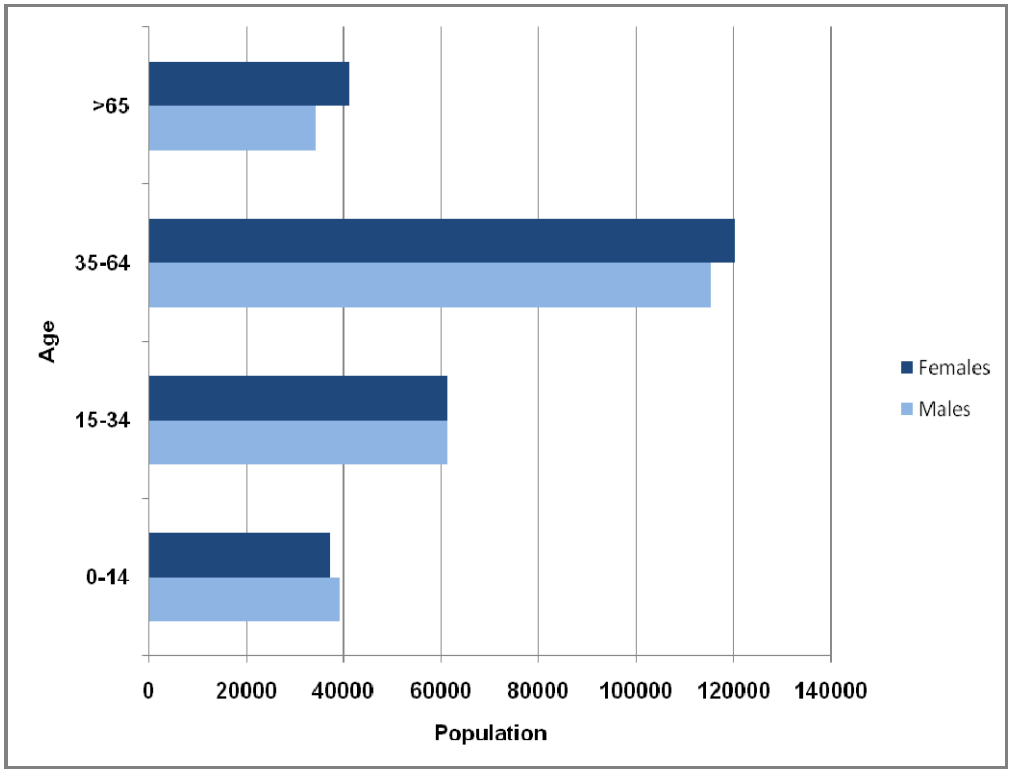
In 2006, the provincial population was comprised of 49% males and 51% females, with more females in the 35 years and over categories (Figure 15.3.4-5) (NLSA / Community Accounts 2011, internet site). The population is aging and the median age is expected to increase from 41.3 years in 2006 to approximately 49 years by 2021 (NLDF 2006, internet site).

Figure 15.3.4-4 Population Projections (000s) Newfoundland and Labrador, 1992 to 2025



Source: NLDF 2009b, internet site.

Figure 15.3.4-5 Population by Gender and Age Group, Newfoundland and Labrador, 2009

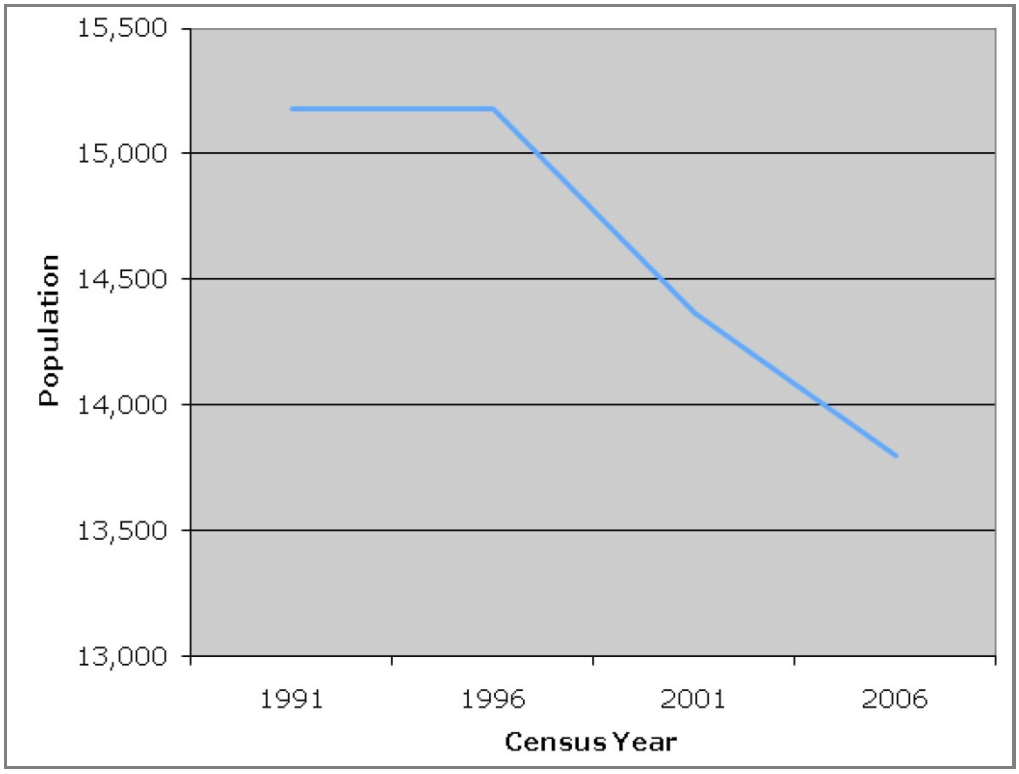


Source: NLSA / Community Accounts 2011, internet site.

15.3.4.2 Central and Southeastern Labrador

Central and Southeastern Labrador is the smallest of the four Study Area Regions in terms of total population. The population of this Region was 13,797 in 2006, down 9.1% from 15,182 in 2001 (NLSA / Community Accounts 2011, internet site) (Figure 15.3.4-6). Most communities in this Region have fewer than 500 people, although Happy Valley-Goose Bay, the largest town in the Region, had close to 8,000 residents in 2006. In 2006, men and women each represented approximately half of the Region's population (50.2% and 49.8%, respectively) (NLSA / Community Accounts 2011, internet site).

Figure 15.3.4-6 Population, Central and Southeastern Labrador Region, 1991 to 2006



There are number of Aboriginal communities and organizations in Labrador and Québec several of which are located within, and / or which claim Aboriginal right to, portions of the Central and Southeastern Labrador Study Region. The demographic characteristics of these communities and organizations are summarized below.

Approximately one third of people living in Labrador are of Aboriginal descent, self-identifying as Innu, Inuit or NunatuKavut Community Council (formerly the Labrador Métis Nation). In Census Division 10 (all of Labrador excluding Nunatsiavut), there were 7,760 Aboriginal persons in 2006, of whom 51% self-identified as Métis, 24% as Innu and 23% as Inuit (Statistics Canada 2006b, internet site).

Within the Study Area Region the Aboriginal population varies. In Economic Zone 3 Aboriginal people represented some 43% of the population in this Zone in 2001, of whom approximately 39% were Métis, 32% Inuit and 25% Innu (NLSA / Community Accounts 2011, internet site). In the Upper Lake Melville area (Happy Valley-Goose Bay, Sheshatshiu, Northwest River and Mud Lake) the total Aboriginal population increased from 2,035 to 4,130 between 1991 and 2001 before declining to 4,095 in (Statistics Canada 2006b, internet site; Statistics Canada 2001, 1991).

In Economic Zone 4 the Aboriginal population (510) represented 67% of the total population in 2001 with most (92%) self-identifying at the time as Métis. The Aboriginal component of the population of Zone 5 was much smaller at just over 7%; of these, the majority (86%) self-identified as Métis (NLSA / Community Accounts 2011, internet site).

Labrador Innu

Most Labrador Innu live in the communities of Sheshatshiu (Sheshatshiu Innu First Nation) and Natuashish (Mushuau Innu First Nation). Sheshatshiu, which is approximately 40 km northeast of Happy Valley-Goose Bay, is the largest Innu community in Labrador. Natuashish is a smaller community on the northern coast of Labrador. As of July 2010, there were approximately 1,325 Innu living in Sheshatshiu and 750 Innu living in Natuashish (Indian and Northern Affairs Canada (INAC) 2010, internet site).

The Innu population is relatively young. Census data for 2006 for Sheshatshiu and North West River indicate that 49% of the population was under 24 years of age, while only 5% were 65 and older (NLSA / Community Accounts 2011, internet site).

Labrador Inuit

There are five communities within the Labrador Inuit Settlement Area (LISA) on the Labrador North Coast; Nain, Hopedale, Makkovik, Postville and Rigolet. Some Inuit are resident in other communities in Labrador, including Happy Valley-Goose Bay, North West River and Mud Lake. In September 2009, there were 4,932 Labrador Inuit beneficiaries living in the eight communities listed above, 53% of whom lived in the five Inuit Communities (LISA Regional Planning Authority 2010). Between 1996 and 2006, the population of the Inuit Communities grew by approximately 3% (Statistics Canada 2006b, internet site).

The Labrador Inuit population is also relatively young and the age distribution is very similar to that of the Innu. Of the total Labrador Inuit population, 49% were under 24 years of age in 2006 while 46% were aged 25 to 64 years and only 5% were over the age of 65 (Statistics Canada 2006b, internet site).

NunatuKavut Community Council

The NunatuKavut Community Council (NCC) states that its 6,000 members live in 23 Labrador communities, seventeen of which are on the southeast coast from Paradise River to L'Anse au Clair. It also indicates that members reside in six other communities in central and western Labrador, including Happy Valley-Goose Bay and Labrador City (NunatuKavut 2011, internet site). Census data are not available specifically for NCC members.

Québec Innu

In eastern Québec there are a number of various First Nations that claim Aboriginal rights and / or title to portions of the Central and Southeastern Labrador Region (see Figure 3.1-1). Table 15.3.4-1 provides demographic data for these Québec Innu communities.

The total population of the six communities is approximately 7,600. The largest of these is Uashat mak Mani-Utenam and the smallest is Pakua Shipi. Most Québec Innu live on the reserve and the population is young, with people under the age of 25 years comprising almost half of the population in most of these communities (MAINC 2009; Hydro-Québec 2007).

Table 15.3.4-1 Demographics of Québec Innu Communities

Demographic Characteristics	Pakua Shipi	Unamen Shipu	Nutashkuan	Ekuanitshit	Uashat mak Mani-Utenam	Matimekush-Lac John
Total population	322	1,088	984	556	3,805	845
On Reserve	n/a	1,038	923	532	3,114	760
Off Reserve	n/a	50	61	24	691	85
Men	164	541	510	257	1,883	430
Women	158	547	474	299	1,922	415
Youth (15-24 years)	79	213	227	114	745	156

Source: Hydro-Québec 2007; MAINC 2009.
n/a Not applicable.

Québec Naskapi

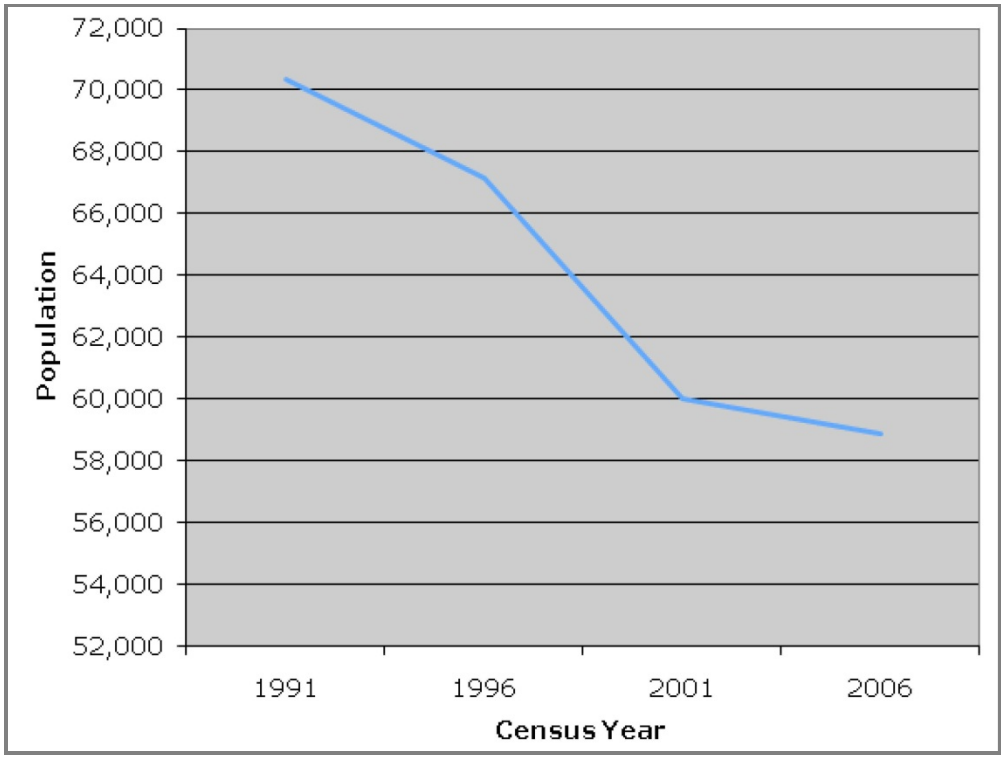
In March 31, 2007 there were 965 members of the Naskapi Nation of Kawawachikamach, a number that had increased to 1,024 by March 31, 2008. The average annual rate of increase of the population between 1986 and 2007 was 5.3%, such that during this period the population approximately doubled. In 2008, 59.6% of Naskapi members were under 30 years of age. The relative lack of Elders reflects the high mortality that occurred among Naskapi infants and children in the early 1950s (New Millennium Capital Corp. 2009, internet site).

15.3.4.3 Northern Peninsula

Many communities in the Northern Peninsula Study Region have fewer than 300 residents, but the largest urban centre, the City of Corner Brook, had a 2006 population of 20,083. As indicated in Figure 15.3.4-7, the population of the region declined from 70,336 to 58,889 between 1991 and 2006 (16.3%). In 2006, females comprised just over half (51.5%) of the Region's population (NLSA / Community Accounts 2011, internet site).

The populations of smaller communities are generally declining at a faster rate than those of the larger communities. In addition, the population of the region is aging, with the median age increasing from 29 years in the early 1990s to 49 in 2007 (NLDF 2007, internet site).

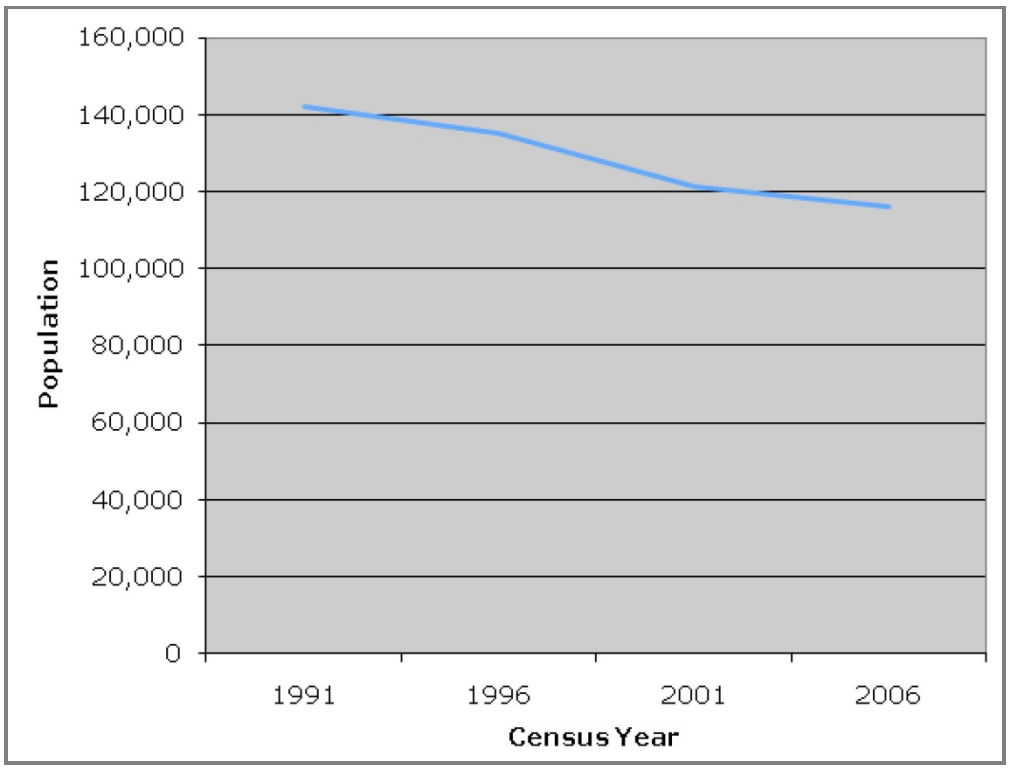
Figure 15.3.4-7 Population, Northern Peninsula Region, 1991 to 2006



15.3.4.4 Central and Eastern Newfoundland

The Central and Eastern Newfoundland Region has the greatest number of communities (200) of the four Study Area Regions. The smallest of these communities typically have fewer than 100 people and the largest, Grand Falls-Windsor, had 13,558 residents in 2006. The Region's total population fell from 142,111 to 115,918 between 1991 and 2006, a decrease of 18.4% (Figure 15.3.4-8). In 2006, almost half of the population of the Central and Eastern Newfoundland Study Region was male (49%) (NLSA / Community Accounts 2011, internet site).

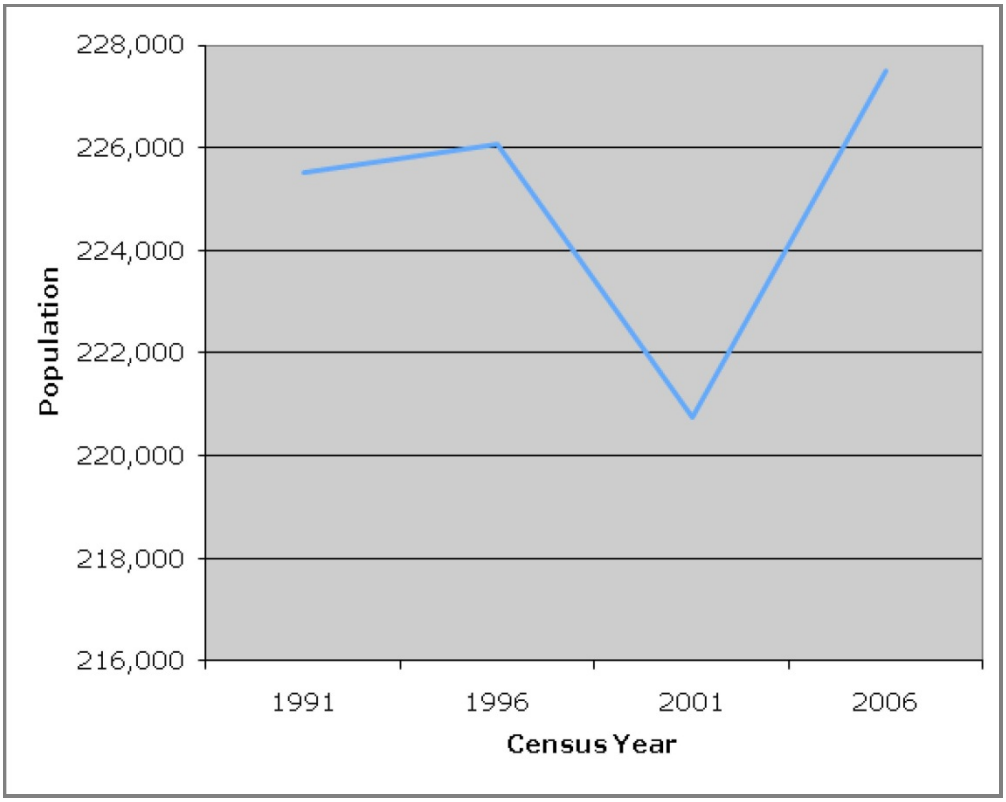
Figure 15.3.4-8 Population, Central and Eastern Newfoundland Region, 1991 to 2006



15.3.4.5 Avalon Peninsula

The Avalon Peninsula is home to almost half of the province's population, with the majority of people living in communities with populations over 5,000. The largest community is the City of St. John's, which had a 2006 population of 100,646. The Avalon Peninsula is the only one of the four Study Area Regions to have experienced a population increase between 1991 and 2006. In 2006, the total population of the Region was 227,490, up 2.4% from 225,517 in 1991 (Figure 15.3.4-9). However, as indicated in the figure, the population rebounded between 2001 and 2006 from the decline experienced in the 1996 to 2011 period. In 2006, there were slightly more females (52%) living in this Region than men (48%) (NLSA / Community Accounts 2011, internet site).

Figure 15.3.4-9 Population, Avalon Peninsula Region, 1991 to 2006



The region includes a variety of community types, ranging from the city entities of St. John's and Mount Pearl and larger towns such as Conception Bay South, Paradise and Bay Roberts, to small rural communities in the north and northwestern parts of the region. Unlike most of the other regions included within the Study Area, the majority of people in the region live in communities with populations over 5,000 (NLSA / Community Accounts n.d., internet site).

15.3.5 Community Infrastructure and Services

Community infrastructure and services refers to those physical elements (i.e., roads, ports, schools), and organizational systems (i.e., education, social assistance, security) that support the economy and the quality of life for people and communities. This section describes the existing conditions of select infrastructure and services.

15.3.5.1 Highways and Roads

In Newfoundland and Labrador, the Department of Transportation and Works (NLDTW) is responsible for the construction of public roads and the management of road improvement projects together with the year-round maintenance of over 9,000 km of primary and secondary highways and community access roads (NLDTW 2008, internet site). In general, municipal authorities are responsible for construction and maintenance of local streets within the municipality (Municipalities Newfoundland and Labrador n.d.a, internet site).

Central and Southeastern Labrador

The Trans-Labrador Highway (TLH) is the main highway serving the region. Route 500, the first section constructed, links the Labrador-Québec border with Happy Valley-Goose Bay. The Labrador Transportation

Initiative Fund, established in 1998, included upgrading of the TLH between Wabush and Happy Valley-Goose Bay (Phase 1) to a high-standard gravel surface highway. That project was completed between 1997 and 1999 at a cost of $60 million (Russo Garrido and Stanley 2002). A chip-seal surface has been applied at each end of the TLH1 and a permanent hard surface is planned for the entire length of Phase 1, a project that started in the spring of 2009. As of August 2010, more than 75% of Phase 1 had been widened and more than 180 km was hard-surfaced.

In February 2011, the GNL issued two tender calls for the paving of an additional 160 kilometres of Phase 1. The first of the two sections begins 92 km west of Happy Valley-Goose Bay and continues 80 km west toward Churchill Falls. The second section is an 80-km stretch of highway from near the Ranger Lake highway depot toward Churchill Falls. As of February 2011, the provincial government had invested more than $93 million in the widening and hard-surfacing of TLH1. Hard-surfacing is expected to be completed in 2014 (NLDTW and NLDLAA 2011, internet site).

The original Route 510 is an asphalt surface highway that links the communities along the Labrador Straits from Blanc Sablon to Red Bay (Figure 15.3.5-1). Phase 2 of the TLH (TLH2) is an extension of Route 510, and is a two-lane, all-season, 323 km mixed asphalt and gravel road that runs between Red Bay and Cartwright. There are also links to St. Lewis (Route 513) and Charlottetown and Pinsent's Arm (Route 514). That project was initiated in 1999 and completed in 2002 at a cost of $130 million (Russo Garrido and Stanley 2002).

Construction on Phase 3 of the TLH (TLH3), a 280 km section, connects Cartwright Junction and Happy Valley-Goose Bay. This phase of the highway was officially opened to the public in December 2009 and was completed in 2010 (Tee 2011, pers. comm.). The three phases of the TLH now form a continuous route of approximately 1,150 km linking Labrador West and Southern Labrador (NLDTW 2009a, internet site). As yet there is no indication when gravel sections of the highway might be paved (Dyson 2011, internet site).

Northern Peninsula

In this Study Area Region, the main highway is Route 430, linking St. Anthony in the north and Deer Lake in the south (Figure 15.3.5-1). Route 430 runs west of the proposed transmission line route along the west coast of the Northern Peninsula to Rocky Harbour, before turning southeast to Deer Lake where it joins Route 1, the Trans-Canada Highway (TCH).

Central and Eastern Newfoundland

The TCH is the main highway link across the province (Figure 15.3.5-1). In this Study Area region it links Deer Lake, Grand Falls-Windsor, Gander and Clarenville. Other major highways in the region providing branches from the TCH include Route 410 to Baie Verte, Route 360 to Harbour Breton and Route 230 to Bonavista.

Avalon Peninsula

The TCH is the main link between Clarenville and St. John’s (Figure 15.3.5-1). Branch highways south from the TCH link it to Placentia (Route 100), St. Mary’s (Route 90) and Trepassey (Route 10), while highways to the north link it to Baie de Verde (Route 80) and Harbour Grace (Route 71). Numerous other highways linking the communities of Conception Bay result in this area having the most dense highway network in the province.

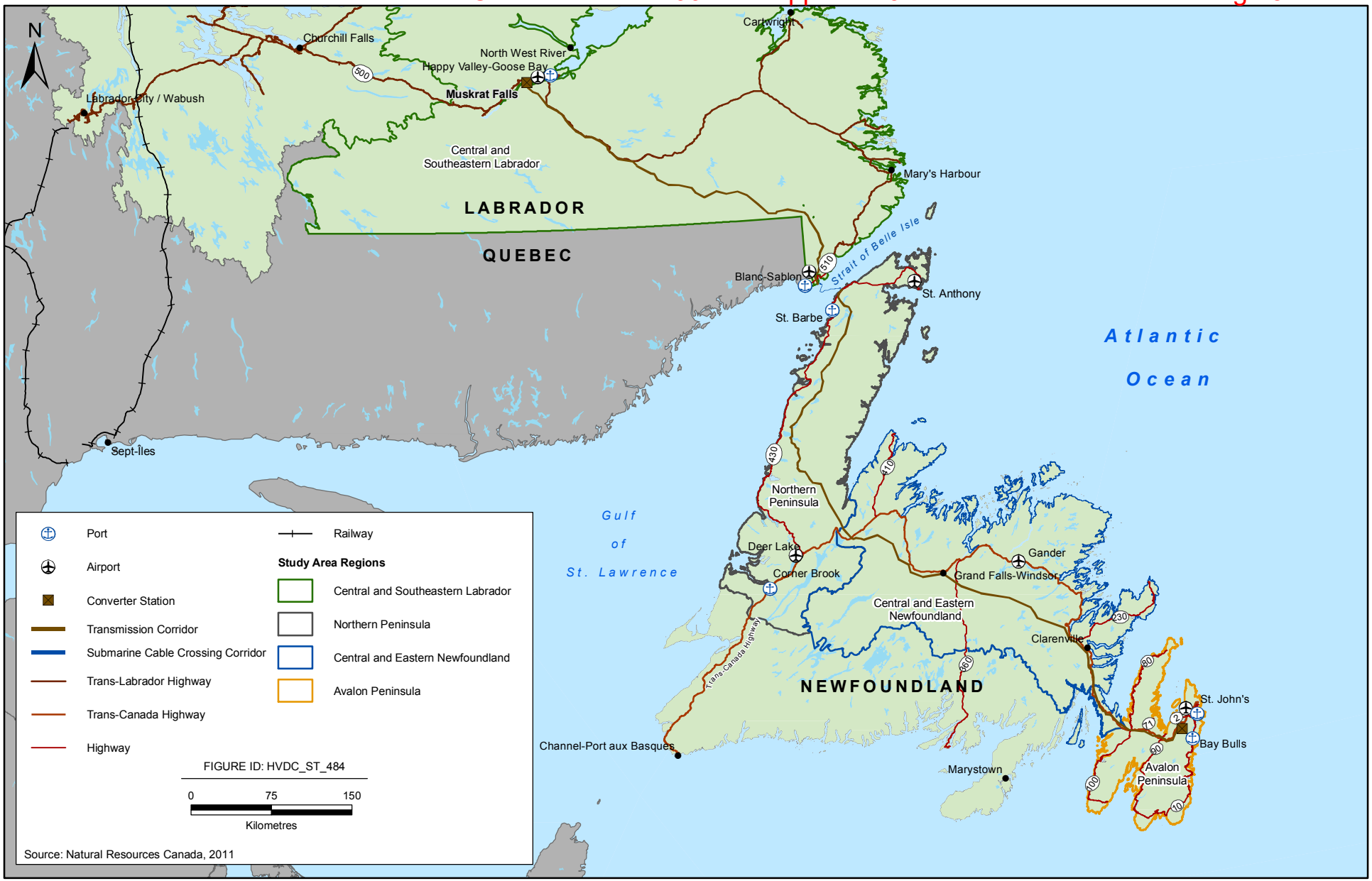


FIGURE 15.3.5-1

Study Area Regions Transportation Infrastructure

15.3.5.2 Ports, Airports and Rail

The island and coastal geography and settlement history of the province mean that ports in particular play an important role in many aspects of community life. By contrast there is only one railway in the province, in Labrador, and this has a highly specialized role associated with iron ore shipments. A summary of selected aspects of this transportation infrastructure follows, with emphasis on those elements of particular relevance to the Project.

Ports

The Canadian ports system is composed of several types of ports and harbour facilities, all with different administrative and jurisdictional structures. The 17 main ports in the country are operated by Canada Port Authorities, one of which is the Port Authority of St. John's, and which are overseen by Transport Canada (Transport Canada (TC) 2010a, internet site).

In December 1995, the federal government's National Marine Policy provided for the divesture of federal ports that did not meet the test of being ports of national significance to the country as a whole. Many of these ports were transferred to provincial governments or to municipal authorities, and others were divested to local communities or to private interests, and still other facilities were deproclaimed as port facilities and closed permanently. Independent local ports in Newfoundland and Labrador are the Corner Brook Port Corporation, the Port Harmon Authority Ltd. (Stephenville) and the Argentia Port Corporation (IMPACPorts.com 2011, internet site).

Transport Canada also owns and administers 14 smaller ports within the province including, for example, Goose Bay in Labrador (Central and Southeastern Labrador Study Area Region), Botwood (Central and Eastern Newfoundland) and Long Pond (Avalon Peninsula) on the Island (TC 2010b, internet site).

Small Craft Harbours (SCH) is a nationwide program of the Fisheries and Oceans Canada (DFO). SCH operates and maintains a national system of harbours to provide commercial fish harvesters and other harbour users with safe and accessible facilities. Part of the SCH mandate is to maintain a network of core harbours essential to the fishing industry, promote the formation of Harbour Authorities to ensure local control over commercial fishing harbours and to transfer ownership of non-essential harbours and recreational harbours to local communities. Arnold's Cove in the Avalon Study Area Region, for example, is managed by the Harbour Authority of Arnold's Cove, which is one of 208 Harbour Authorities in the province (DFO 2010a, internet site).

There are numerous ports and harbours in each of the Study Area Regions, some of which could play a role in the Project. No final decisions have been made on which ports or harbours might be used for particular purposes, hence the focus here is on the larger port facilities and those closest to known and particular Project activities.

Central and Southeastern Labrador

The Regional Port of Happy Valley-Goose Bay in Terrington Basin (Figure 15.3.5-1), operated by TC, provides transshipment services to coastal Labrador as well as handling bulk shipments into the Upper Lake Melville Region. The shipping season normally runs from June to September and access to the harbour outside the standard season is possible when not restricted by sea ice. Studies conducted for the Lower Churchill Hydroelectric Generation Project indicated that the port facilities would require upgrading to handle the heavy loads associated with that project (Nalcor Energy (Nalcor) 2009a).

The closest industrial port to the Labrador-Island Transmission Link crossing of the Strait of Belle Isle is at Blanc Sablon, Québec, a small port with two berths of 110 m and 65 m. The wharf is used primarily to supply the local population with goods on a weekly basis, to receive general goods and petroleum products, and to provide a daily ferry service between Blanc Sablon and St. Barbe on the Island of Newfoundland, and a weekly service to Rimouski, Québec. The ferry service normally runs from May to January (TC 2010c, internet site).

The ferry continues to provide service from Blanc Sablon to the island for the duration of the winter with two round-trips each week to Corner Brook (The Aurora 2010, internet site).

Local Harbour Authorities also exist in the Labrador Straits in Forteau, L'Anse au Clair and L'Anse au Loup, which manage these small ports originally established to support the fishery. The town of Red Bay also operates a Harbour Authority through the town of Forteau (Letto 2010, internet site).

Northern Peninsula

The Port of Corner Brook (Figure 15.3.5-1), managed by the Corner Brook Port Corporation, is a major commercial distribution centre for western Newfoundland. Ocean freight is handled either over private wharves (e.g., Corner Brook Pulp and Paper Limited, Barry's Seafood's Inc., Ultramar, Irving Oil and Imperial Oil) or via a public wharf, the TC facility at what is known locally as Seal Head.

There is 362 m of berthage, approximately 28,000 m^2 of space for container storage, and a high-capacity crane (53 tonnes (t)) to facilitate the loading and unloading of containers at dockside. In addition, two top lifts allow quick retrieval and storage of containers within the dock facilities. The Port is directly connected to the TCH via a four-lane arterial road, providing easy highway connections to two airports within an hour's drive.

The Port Authority plans to construct a new dock that would replace the Corner Brook Pulp and Paper Company dock and create additional multi-use berth space across the basin, allowing the Port to accommodate multiple vessels at the same time and to ship a broader range of commodities (Corner Brook Port Corporation 2010, internet site).

In recent years, there have been significant increases in freight traffic through Corner Brook, particularly from the Northern Peninsula and Southern Labrador. The export of fish products, for example, is moving more and more into refrigerated containers, which can be shipped out of Corner Brook to customers elsewhere in North America and overseas.

In addition to Corner Brook there are numerous smaller ports and harbours in the Study Area Region. Transport Canada owns and administers ports at Main Brook and Roddickton, while between St. Anthony and Corner Brook there are some 54 harbours of various sizes and types, of which 36 are designated as Core Fishing Harbours (DFO 2011a, internet site).

Central and Eastern Newfoundland

There are no large ports compared to Corner Brook and St. John's in the Central and Eastern Newfoundland Study Area Region. Transport Canada operates and administers ports at Botwood, Lewisporte and Charlottetown (TC 2010b, internet site), and there are numerous small-craft harbours along the north and northeast coasts (DFO 2011a, internet site).

Avalon Peninsula

The Port of St. John's (Figure 15.3.5-1) is a modern industrial port with state-of-the-art handling and storage facilities and the capability of handling any large volume commercial business. The port is administered by the St. John's Port Authority, a Crown agency, and since 1999 has undergone extensive modifications as the result of a multi-million dollar capital investment strategy. It is the primary offshore oil supply and service centre on Canada's east coast, the largest fish-handling port in Newfoundland and Labrador, a cruise ship destination and the province's primary container terminal (St. John's Port Authority (SJPA) n.d., internet site).

There is a total of approximately 5 km of dockface, 51% of which is owned by the Port Authority. This includes the container and roll-on / roll-off terminal, which handles approximately half of the cargo entering the province. Of the remaining dockage, 32% is privately owned and 17% directly or indirectly owned by government departments and agencies (SJPA 2010, internet site).

The St. John's Dockyard (NEWDOCK), at the western end of the Port of St. John's, includes a graving dock, a marine elevator, transfer and repair berths, mobile cranes, fabrication shops, warehousing and laydown areas. NEWDOCK's capabilities include provision of marine services and offshore services (NEWDOCK n.d., internet site). The dockyard changed ownership in 2010, but no changes in operational or capital expenditures were anticipated at that time (The Telegram 2010a).

Bay Bulls Marine Terminal (BBMT) is located approximately 32 km south of St. John's. Completed in 2005, it has 12.5 acres of waterfront space suitable for light and heavy marine industrial activity, for loading and discharging vessels, and for repairing and upgrading drill rigs. The BBMT has two wharves and over 14 acres of lay-down area without load restriction, and storage facilities adapted for bulk, pumping and tubular handling. Fabrication, office space as well as 8,500 square feet of warehouse space are also available on-site. The Terminal is close to highway linkages to St. John's and surrounding industrial parks (Bay Bulls Marine Terminal 2007, internet site).

Transport Canada operates and administers ports at Come by Chance, Holyrood and Long Pond (TC 2010b, internet site), and there are some 84 designated small-craft harbours in the region (DFO 2011a, internet site).

Airports

The federal government's National Airports Policy (NAP) defines the federal government's role with airports. That role is defined through two main levels of federal involvement in airports with scheduled passenger traffic: nationally significant airports that will form a National Airports System (NAS) and regional / local airports. The NAS includes airports in all national, provincial and territorial capitals, as well as airports with annual traffic of 200,000 passengers or more. Responsibility for the operation and management and development of NAS airports rests locally with approved Canadian Airport Authorities (CAAs), but the federal government retains ownership of these airports to guarantee the integrity and long-term viability of the NAS (TC 2010d, internet site).

Central and Southeastern Labrador

The Goose Bay Airport (Figure 15.3.5-1) was developed following the outbreak of World War II. It is a designated Regional Airport operated by the Goose Bay Airport Corporation. Goose Bay Airport is undergoing expansion to the Air Terminal Building. Air passenger traffic has increased significantly of late, from 64,278 in 1997 (Voisey's Bay Nickel Company Limited (VBNC) 1997, internet site) to 94,252 in 2007 (Statistics Canada 2007, internet site). The planned $14 million investment to more than double the terminal's capacity to service passengers is expected to be completed in December 2011 (Goose Bay Airport 2010, internet site).

The Lourdes-de-Blanc Sablon Airport on the north shore of the St. Lawrence in Québec is the closest airport to the proposed location of the Transmission Link crossing of the Strait of Belle Isle. The airport is designated as a Remote Airport under NAP and is owned and operated by TC. It supports scheduled flight services between the Island of Newfoundland, Labrador and Québec, air freight and charter operations (TC 2009a, internet site). There are also several smaller airstrips along the coast of the Region, including those at Cartwright, Black Tickle, Charlottetown, Port Hope Simpson, Williams Harbour, St. Lewis, Mary's Harbour, and L'Anse Amour (Crow Head). Long Pond, which overlaps the proposed transmission corridor near Forteau Point, is used as a float plane base by several operators (Belbin 2011).

Northern Peninsula

The Regional Airport at St. Anthony (Figure 15.3.5-1) is owned and operated by TC. It hosts two airlines that have regular flights in and out of St. Anthony (TC 2009b, internet site). Traffic has declined from 5,734 aircraft movements in 2004 to 4,242 in 2008 (Statistics Canada 2009a, internet site). Several small airstrips are present in the region, including a private airstrip in the Strait of Belle Isle area near Savage Cove, near the marine crossing cable landing site at Shoal Cove. Further south along the Peninsula there is an airstrip at Port au Choix.

The Deer Lake Regional Airport is operated by the Deer Lake Regional Airport Authority Inc. (DLRAAI), which was established in 1998. At that time its traffic volume was less than 200,000 passengers per annum, but since then the number of aircraft movements has increased from 18,896 in 2004 to 20,075 in 2008, for example (Statistics Canada 2009a, internet site), while passenger traffic increased to 293,847 in 2008 (DLRAAI 2009, internet site). The airport has undergone major expansion over the past two decades with a new $12 million terminal building, customs and immigration facilities opening in 2007 (DLRAAI 2009, internet site) and a runway extension was recently completed.

Central and Eastern Newfoundland

Gander International Airport (Figure 15.3.5-1) is designated as part of the NAS under the NAP and is operated by the Gander International Airport Authority Inc. (GIAAI). It has a major service role of providing technical stop services to commercial carriers and corporate aircraft for their transatlantic activities. As the main entry points into North American airspace, the airport and the town also provide essential medical and security services in the event of in-flight emergencies. Customs and immigration services are provided on-site in support of this role (GIAAI 2005, internet site).

The airport provides residents, and businesses in Central Newfoundland with scheduled and charter services for passengers and cargo to major airports, and connecting with transcontinental and international routes. It also provides regional and local charter services, other commercial operations, flying training, and a base for government civilian / military aircraft activities such as search and rescue and fire protection services. Five Fixed Base Operators serving corporate and private aircraft are located at the airport. Passenger movements have fluctuated annually (e.g., 70,563 in 2006 and 79,427 in 2007 (Statistics Canada 2007, internet site)), but were reported as being at a nine-year high in 2010 (GIAAI 2011a, internet site).

The Department of National Defence (DND) operates the Canadian Forces Base (CFB) 9 Wing Gander on the airport site. The base's primary operation is search and rescue.

Elsewhere in the region there are a number of airstrips including those at Buchans, Springdale and Bishop's Falls.

Avalon Peninsula

St. John's International Airport (Figure 15.3.5-1) is also part of the NAS and is the busiest commercial airport in the province. The St. John's International Airport Authority Inc. (SJIAA), a not-for-profit corporation, assumed control in December 1998. The main terminal serves scheduled national and international passenger aircraft, most charter flights and air cargo traffic (SJIAA 2011a, internet site). Between 2005 and 2007, over $22 million was spent in infrastructure upgrades and general capital improvements to the airport (Petroleum Research Atlantic Canada (PRAC) 2009). The SJIAA recently announced a $150 million expansion plan to accommodate growing passenger traffic (Canadian Broadcasting Corporation (CBC) 2011a, internet site).

General aviation activities take place on the east side of the airport in an area that supports corporate aviation, government and military operations, charter services, flight training, search and rescue, helicopter, cargo and courier services. The multi-purpose Cougar Helicopters Inc. facility, adjacent to the main terminal on the west side, is used for helicopters and some military and private aircraft use. Universal Helicopters Ltd. has a terminal building and landing area, under the control of the airport control tower but outside Airport property, on Major's Path.

Between 2002 and 2005, passenger volumes increased 35%. Since 2005 the SJIA has annually been used by approximately 1.2 million passengers (SJIAA 2011a, internet site). Air cargo has been increasing steadily in recent years. Current facilities can handle present volumes, but a site has been set aside to accommodate increased traffic when needed. There are plans for an extension of the cargo / baggage handling area.

There are also airstrips at Placentia and Harbour Grace.

Rail

The Québec North Shore and Labrador Railway (Figure 15.3.5-1), owned and operated by the Iron Ore Company of Canada, connects Labrador City and the Port of Sept-Îles, Québec. This rail link, together with the Tshiuetin Rail Transportation line, Arnaud Railway, Wabush Lake Railway, and Bloom Lake Railway, forms an isolated railroad network in western Labrador and Québec, as it does not interchange with any other rail lines on the North American network. The primary purpose of the network is transportation of iron ore from Québec and Labrador to the north shore of the St. Lawrence, but the railway is also used to transport passengers, materials and equipment (Chen 2006).

15.3.5.3 Waste Management

The handling of garbage – solid waste – has become an increasing concern in the province and represents a challenge for communities and government. In a 2002 report by the Newfoundland and Labrador, Department of Environment (NLDEC 2002, internet site), it was estimated that Newfoundlanders and Labradorians generated more than 400,000 t of waste materials a year at a rate of approximately two kilograms per person per day. At that time this waste was being sent to approximately 240 disposal sites that served an estimated 654 communities. Many of the sites were at the end of their useful life, and there were approximately 50 aging teepee incinerators in use throughout the province. Nuisance problems from poorly or improperly maintained landfill sites, inconsistency with the growth of the province's tourism industry, and a general recognition by the public and government that present ways of handling waste needed to change, prompted the development of a provincial waste management strategy.

The purpose of the Strategy was to provide a basis for the modernization of the province's waste management program and it called for the phasing out of 80% of the sites and implementation of a regional waste management system, with 15 regional management zones: 11 on the Island and four in Labrador. The Strategy also called for three full-service disposal facilities, one each in the Avalon, Central and Western zones of the Island. Once these are operational, the remaining Island zones would develop systems to transport waste to these facilities (NLDEC 2002, internet site). The regional waste management zones that approximate the Study Area Regions are shown in Figure 15.3.5-2.

Since the release of the strategy in 2002, there have been some changes regarding the waste management zones. Currently, eight Regional Waste Management Authorities operate on the Island (Burke 2011, pers. comm.; Field 2011, pers. comm.):

- Bonavista Peninsula Regional Waste Management Committee;
- Coast of Bays Waste Management Authority;
- Green Bay Waste Authority;
- Burin Peninsula Waste Management Corporation;
- Eastern Waste Management;
- Central Newfoundland Regional Service Board;
- Northern Peninsula Regional Service Board; and
- Western Regional Waste Management Committee;

There are four in Labrador (Burke 2011, pers. comm.; Field 2011, pers. comm.):

- Western Labrador;
- Central Labrador;
- North Coast Labrador; and
- Southern Labrador.

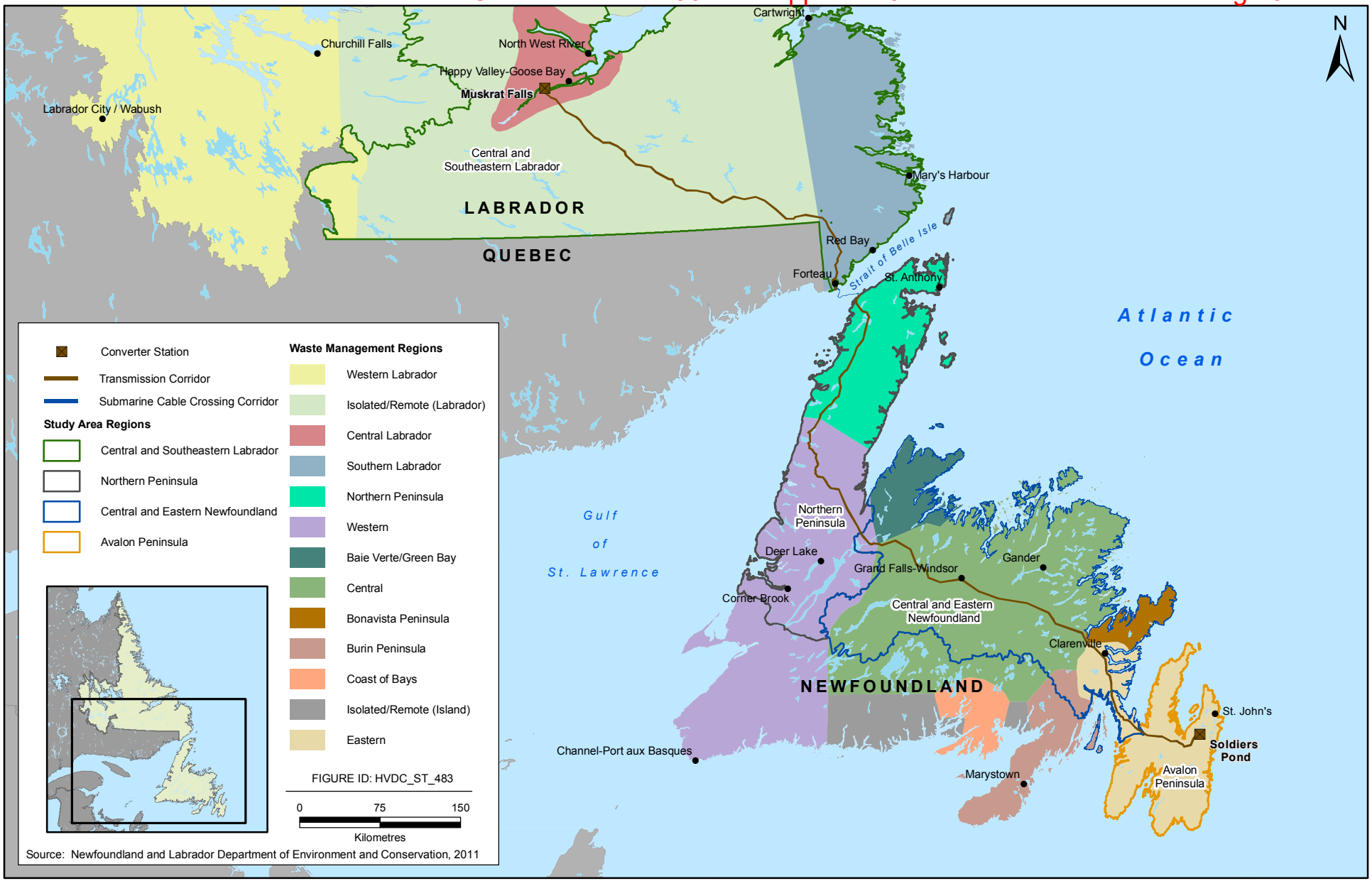


FIGURE 15.3.5-2

Waste Management Regions of Newfoundland and Labrador

Each authority is responsible for waste management activities within its respective region, such as recycling, waste diversion and composting, as well as management of waste that is harmless to the environment, and disposing of true waste materials at one of the regional sites. The Department of Municipal Affairs administers the strategy, while environment standards and regulations are the responsibility of the Department of Environment and Conservation (NLDMA and NLDEC 2007, internet site).

For isolated areas, community disposal sites will remain in operation. However, emphasis will be on improving these existing disposal sites and enhancing opportunities for diversion. Isolated communities will be expected to contribute to the goal of 50% reduction of waste sent to disposal.

Changes have also been made with respect to the number of central waste disposal facilities. Currently, Robin Hood Bay in St. John's has been identified to service Clarenville and the east, and a site in Norris Arm, which is still under construction, will service the rest of the island (Burke 2011, pers. comm.).

Central and Southeastern Labrador

The Central and Southern Labrador Waste Management Regions and part of Isolated / Remote Labrador fall within the Central and Southeastern Labrador Region (Figure 15.3.5-2). The provincial government has yet to finalize a waste management plan for Labrador. Happy Valley-Goose Bay is currently acting as an informal regional landfill site for the central part of the Region (Municipalities Newfoundland and Labrador n.d.b., internet site).

The Labrador Straits Waste Disposal Committee oversees waste management in the Straits area. A landfill serving the communities from L'Anse au Clair to Pinware is located at Crow Head, within the municipal boundaries of Forteau. Currently, the landfill is near capacity and Hatch Mott MacDonald has been hired to conduct a study examining alternatives to the current landfill (Flynn 2011, pers. comm.).

Northern Peninsula

Two Regional Waste Management Authorities oversee waste management in the Northern Peninsula Study Area Region: the Western Regional Waste Management Committee and the Northern Peninsula Regional Service Board (NorPen). The former manages the area on the province's west coast from Harbour La Cou on the southwest coast to Bellburns on the Northern Peninsula and east past Highway 420. The Northern Peninsula Regional Service Board includes all of the communities on the Northern Peninsula north of River of Ponds (NorPen 2010, internet site).

In 2008 the GNL provided funds to enable NorPen to decommission a landfill at Castors River, clean-up the St. Barbe and Straits landfill sites, and then re-develop the St. Barbe / Straits site into one consolidated landfill site. This work has been completed. NorPen is currently in the process of closing out dump sites at St. Lunaire-Griquet and Cook's Harbour (NorPen n.d., internet site).

Central and Eastern Newfoundland

The Study Area Region overlaps with five waste management regions. However, the Central Newfoundland Regional Service Board, which covers the area from Terra Nova Park (inclusive) in the east to Buchans in the west and Fogo Island / Twillingate in the north, is responsible for most of the Region (Figure 15.3.5-2). The Board is overseeing the construction of the waste disposal site at Norris Arm, as well as the operations of seven local waste management facilities or transfer stations. The Norris Arm site, which is approximately 30 km north of Grand Falls-Windsor, will be the main waste disposal site for all communities on the Island west of Clarenville. The Board will also work closely with communities in central Newfoundland in preparation for closing 42 landfill sites in the region (Central Regional Service Board 2010, internet site).

Avalon Peninsula

The Avalon Peninsula Study Area Region is covered by Eastern Waste Management, which includes the region from the Avalon Peninsula to Clarenville, including Random Island and communities to Burgoyne's Cove in the east and to Swift Current to the west. A total of 42 landfill sites are planned to be closed, with the Robin Hood Bay waste management site in St. John's used as the main waste disposal site for all communities east of Clarenville (Eastern Waste Management 2011, internet site).

15.3.5.4 Water Supply

Responsibility for the provision of water supply and sanitation services in Canada lies with municipalities. However, the provincial government and the federal government also have important responsibilities related to the setting of standards, research, economic regulation, and water resources management (NLDEC 2009, internet site).

Data by Study Area Regions for supply source, water quality and other descriptors are not available. However, approximately 83% of the province's population receives water from public sources and 17% from private sources. The majority of public water sources are surface water (88%) (i.e., lakes, ponds, reservoirs, rivers and streams), and the remaining are groundwater (12%) (i.e., dug and drilled wells). Approximately 75% of the public surface water supply sources and about 3% of the public groundwater supply sources are protected. Approximately 83% of the total population of the province has access to public water supplies while the remaining 17% use private supplies.

There are 794 water systems in the province, of which 607 are public systems and 187 are private systems, defined here as unserviced communities where each household has its own water source (Water.ca 2008, internet site). Water quality varies widely across the province. A Boil Water Advisory (BWA) is generally issued when there is reason to suspect possible pathogen contamination of a community's drinking water. The number of BWAs has declined from 322 in 2001 to 211 in 2009, and the number of communities affected from 223 in 2001 to 145 in 2009 (NLDEC 2009, internet site).

Additional information on water supplies in the Study Area Regions is presented in Section 10.4.4 from a water quality perspective and Section 15.5.3 from a land use perspective.

15.3.5.5 Electrical Power and Communications

In Newfoundland and Labrador, the generation and distribution of electricity is primarily the responsibility of two energy utilities. Newfoundland and Labrador Hydro (NLH), a crown corporation and subsidiary of Nalcor, is the main generator of electricity in the province. The utility has an installed generating capacity of approximately 1,635 MW that is comprised of a mix of hydroelectric, oil-fired thermal, gas turbine, and diesel plants as well as thousands of kilometres of associated transmission and distribution lines. Newfoundland Power, an investor-owned utility and subsidiary of Fortis Inc., is the main distributor of electricity in the province (Newfoundland Power 2011, internet site). The company distributes power to approximately 240,000 customers on the Island of Newfoundland, over 90% of which it purchases from NLH. In Labrador, customers on that interconnected system are served by NLH with power from the Churchill Falls Hydroelectric Generating Station in Labrador West. Customers on various isolated systems on the coasts of Newfoundland and Labrador receive their power from generators operated by NLH.

Telecommunications infrastructure and services in Newfoundland and Labrador are delivered by the private sector that, since 1989, has been regulated by the federal government through the Canadian Radio-television and Telecommunications Commission (CRTC). Landline services are available throughout the province. Cellular telephone service became available to the province in 1990 (Newfoundland and Labrador Heritage Website 2008, internet site), but cell phone coverage still varies geographically by availability, type and company. In a few areas there is no telephone service coverage at all. The last category includes sections of the TLH. However, in this case emergency telephone service is available through the provincial government's TLH satellite phone service, through which phones are available to travellers on the highway between Labrador

West and Happy Valley-Goose Bay and between Happy Valley-Goose Bay and the South Coast (NLDTW and NLDLAA 2011, internet site).

Access to the internet has increased steadily in the province in recent years. In 2005, 55% of the population had internet access from any location. By 2009 this had increased to 69%. Home, work and school Internet access by individuals have all increased substantially, with school access showing some of the largest gains. However, the percentage of individuals with access to the Internet is still well below that for Canada as a whole (80.3% of all individuals in 2009) and is the lowest among the provinces (Statistics Canada 2010a, internet site). Type of access also varies considerably, with many areas (approximately 20% of the province) still without access to broadband Internet (CBC 2011b, internet site). In 2011 the provincial government announced an $8 million program to further expand broadband services (GNL 2011, internet site).

Relative to Canada as a whole, Newfoundland and Labrador schools are now well connected to the internet. In 2003-2004, 99.5% of schools in the province were connected with 93.1% of computers in the schools connected to the Internet. Comparative figures for Canada as a whole were 97.7% and 92.7% respectively (Statistics Canada 2009b, internet site). However, 15.7% of schools at that time still relied on dial-up access compared to 8.6% for Canada as a whole. Use of dial-up access is typically associated with rural and small schools where the cost of providing broadband services. Wireless broadband delivered by satellite systems is an alternative in remote areas and in Newfoundland and Labrador 16% of schools used satellite connections in 2003 / 04 (Ertl and Plante 2004, internet site).

The GNL has collaborated with a variety of organizations to ensure that everyone has equal learning opportunities through the Centre for Distance Learning and Innovation (CDLI) regardless of where they live in the province. Established in 2000 by the provincial Department of Education, the CDLI mandate was to bring schools and communities access to a greater range of high quality educational programs and services by providing high-speed Internet access to schools located in rural areas. Since 2002 many schools have made e-courses available through the Centre. These courses use the same curriculum as classroom-based education but are available to students whose schools may not offer courses they wish to take or are required for certain professions (NLCDLI 2009, internet site).

15.3.5.6 Policing, Fire Protection and Emergency Response

Policing

The Royal Newfoundland Constabulary (RNC) and the Royal Canadian Mounted Police (RCMP) have responsibility for policing in Newfoundland and Labrador. The RNC currently polices the St. John's Metropolitan Area (St. John's, Mount Pearl and surrounding communities), Corner Brook and Labrador West (Labrador City, Wabush, Churchill Falls and surrounding area), of which the first two are within the Study Area Regions. There are 11 RCMP Police Districts, 44 detachments, and satellite offices and patrol cabins within Newfoundland and Labrador (Figure 15.3.5-3).

Newfoundland and Labrador has the lowest requirement level for policing in Canada, reflecting the province's relatively low crime rates. In 2009-2010, the RCMP had 671.5 established positions in "B" Division, comprising 524 regular members, 55 civilian members and 92.5 public service positions (RCMP 2011, internet site). Among the programs and services provided by the Newfoundland and Labrador RCMP are: the Atlantic Region Integrated Technological Crime Unit, Auxiliary Constables, Commercial Crime Section, Provincial Emergency Unit, Police Dog Services, Underwater Recovery Team, Violent Crime Linkage Analysis System and a Major Crime Unit (RCMP 2011, internet site).

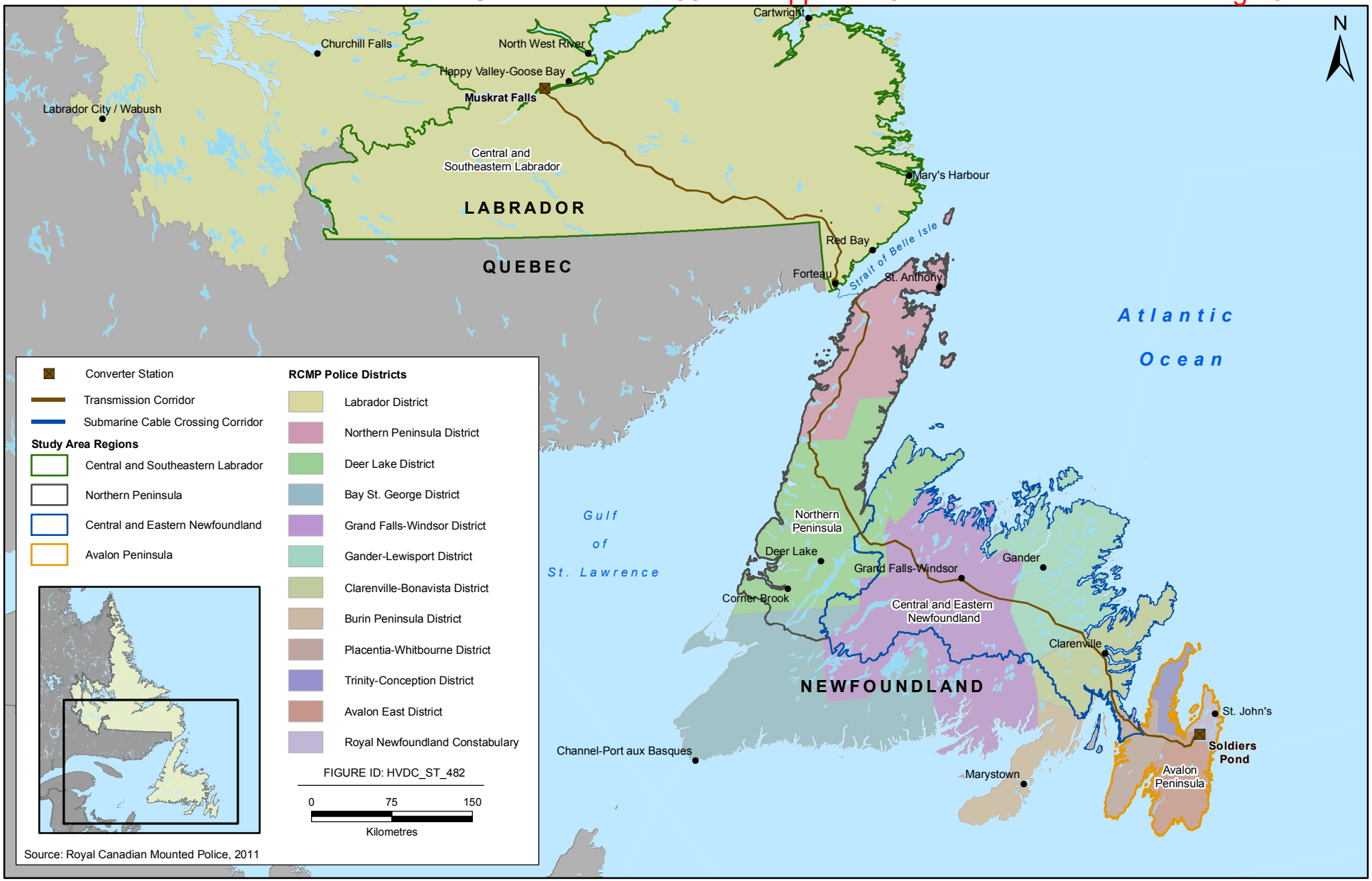


FIGURE 15.3.5-3

Royal Canadian Mounted Police Districts of Newfoundland and Labrador

The RNC Headquarters is located in St. John's at Fort Townshend. The RNC's regional operations are managed by a Superintendent with an Inspector in Corner Brook and an Inspector in Labrador City. The regional divisions are responsible for managing assigned budgets and participating in strategic and operational planning activities (RNC 2011, internet site).

In 2009-2010 there were 383 RNC officers (of whom 327 were in the North East Avalon and 41 in Corner Brook) and an additional 142 civilian staff (RNC 2010, internet site). The RNC is involved with a variety of community services including the Junior Police Academy, Students Taking Responsibility in Violence Education (STRIVE), Drug Abuse Resistance Education (DARE), Neighbourhood Watch, Drive Wise, Armed Robbery Prevention, Shoplifting Prevention, Crime Prevention for Business, Internet Safety, Identity Theft and Bicycle Safety (RNC 2011, internet site).

Crime statistics for selected offences for the period 2006 to 2009 recorded by the RCMP and the RNC for the province as a whole are given in Table 15.3.5-1. The greatest increase in the activity categories listed is in Drug Enforcement, which increased by 106% over the period.

Table 15.3.5-1 Selected Crime Statistics, RCMP and RNC Newfoundland and Labrador, 2006 to 2009

Criminal Activity	2006	2007	2008	2009
Total Crimes Against Persons				
RCMP	4,170	4,235	4,220	4,281
RNC	2,797	3,543	4,123	4,166
Total Crimes Against Property				
RCMP	11,300	11,210	11,065	11,001
RNC	11,373	12,150	11,232	11,782
Total Other Criminal Code				
RCMP	5,195	4,525	4,880	4,732
RNC	2,509	3,465	3,499	3,485
Federal				
Drug Enforcement				
RCMP	490	625	755	1,018
RNC	314	394	541	640

Source: RCMP Police Reporting and Occurrence System (PROS) cited in NLSA / Community Accounts 2011, internet site; RCMP 2010, internet site; RNC 2010, internet site.

Data for the number of offenders appearing in court by those policing Regions which best approximate the Study Area Regions are provided for the 2006 to 2009 period in Table 15.3.5-2. The number of offenders shows an increase of 15.2% over the period. For the province as a whole, most offenders over the age of 18 are in the 18 to 24 year age category. However, on a region-to-region basis the age category with most offenders varies considerably.

Table 15.3.5-2 Provincial Court Offenders, Study Area Region / Policing Region, 2006 to 2009

Study Area Region / Police Region	2006	2007	2008	2009
Newfoundland and Labrador	5,160	5,285	5,530	5,945
Labrador				
Labrador District, RCMP	535	580	665	695
Total	**535**	**580**	**665**	**695**
Northern Peninsula				
Northern Peninsula District, RCMP	125	150	135	130
Corner Brook, RNC	290	290	200	225
Deer Lake District, RCMP	250	240	270	285
Total	**665**	**680**	**605**	**640**
Central and Eastern Newfoundland				
Grand Falls-Windsor District, RCMP	280	360	320	315
Gander-Lewisporte District, RCMP	365	405	440	415
Clarenville-Bonavista District RCMP	230	210	215	235
Total	**875**	**975**	**975**	**965**
Avalon Peninsula				
Trinity-Conception District, RCMP	200	210	245	280
Placentia District, RCMP	90	95	100	120
Avalon East District RCMP	165	135	165	135
Avalon East, RNC	1,935	1,810	1,895	2,215
Total	**2,390**	**2,250**	**2,405**	**2,750**

Source: NLSA / Community Accounts 2011, internet site.

Note: Includes all of Labrador except Labrador West (Labrador City, Wabush, Churchill Falls).

Fire and Emergency Response

Fire and Emergency Services Newfoundland and Labrador is an agency that combines the roles of the Provincial Fire Commissioner with the Emergency Measures Organization. Its mandate is to maintain an emergency management system across the province, in collaboration with such partners as municipalities. It is the only agency that is authorized to coordinate the activities of all police, fire, health, social services, and other services in an area, either municipal or provincial, and to engage civilian personnel to assist in these services (NLFES 2011, internet site).

In respect to ambulance services, the Department of Health and Community Services is responsible for policies, procedures, standards and negotiations with private and community operators. The province's Regional Integrated Health Authorities are responsible for delivery of the provincial road and air ambulance programs. A road ambulance service is provided from 80 locations across the province (NLDHCS 2011a, internet site).

An emergency air ambulance program has been in place in this province since the early 1950s. Today, there are two King Air 350s, which provide dedicated service to the entire province and are located in St. John's and Happy Valley-Goose Bay. A Twin Otter also located in Happy Valley Goose-Bay mainly services the Labrador region. In addition to these fixed-wing aircraft, five helicopters on contract are used for special trips, including

Medevacs from remote areas, which cannot be reached with a fixed-wing aircraft. These helicopters are located in Gander, St. Alban's, St. John's, Pasadena and Happy Valley-Goose Bay. Private charter services are also used when provincial aircraft are not available (NLDHCS 2011a, internet site).

Community fire protection services are provided across the province by local or regional fire departments, the majority of which are staffed by either voluntary personnel or a composite of career and voluntary personnel. In 2009, 301 fire departments served the province (Porter 2010, pers. comm.), several of which serve regional functions, such as the Straits Volunteer Fire Department in Flower's Cove. All departments across the province participate in ongoing training, coordinated by Fire and Emergency Services Newfoundland and Labrador (Hollett 2010, pers. comm.).

The provincial government through the Forestry Services Branch, Department of Natural Resources, provides forest fire protection. Since 1975, the province has taken the lead role in forest fire management and suppression substantial purchases of new equipment, technology and aircraft have been made since then to help protect forest resources. The Forest Service operates six CL-215 Air Tankers along with a Cessna spotter. Four long-range helicopters are on full-time standby and others are hired as needed. This equipment is used for initial attack along with ground crews who are scattered throughout the Island and in Labrador in 27 depots. Fire co-ordination is handled by a Duty Officer for each region who oversees the initial attacks and deploys equipment as required. There are approximately 100 forest fire suppression field staff employed by the department throughout the various districts (NLDNR 2011, internet site).

The Forest Fire Protection Centre, located in Gander, opened in 1986. The Centre coordinates communications and assignment of resources between forest fires occurring in Eastern Region and serves as a base for a regional Helitack Crew. This two-person crew responds to forest fire reports in the central part of the Eastern Region generally within Forest Management Districts 4, 5, 6 and 8. The crew also has access to a fire truck to respond to fires in and around the Town of Gander and Gander International Airport. In 1996, a state-of-the art hose drying, testing and repair facility was opened adjacent to the Forest Protection Centre (NLDNR 2011, internet site).

The number of fires each year fluctuates largely in association with local weather conditions. For example, in 2009 there were 176 fires that burned 35,268 ha (National Forestry Database (NFD) 2011, internet site). The 2009 forest fire season in Newfoundland and Labrador was slightly above the ten-year average in fire starts and hectares (ha) burnt (NLDNR 2011, internet site). By contrast in 2010 there were only 61 fires and only 1,020.4 ha of forest were burned. Most of the area subject to forest fire in 2010 was in Labrador (981.7 ha) of which only 9.0 ha were considered productive forest (NLDNR 2011, internet site).

15.3.5.7 Housing

In 2006 there were 197,245 occupied private dwellings in Newfoundland and Labrador, an increase of 4.3% from 2001 (Statistics Canada 2006a, internet site; Statistics Canada 2001). Nalcor has addressed property values in the EIS through housing prices. Once the final right-of-way (ROW) has been determined, Nalcor property acquisition process discussed in Section 16.5.5.1 will be initiated and relevant property values will be determined at that time.

In 2009, housing starts in the province totalled 3,057 units. Although this was 6.3% fewer units than in 2008, this level was relatively high in a historical context and performance was much better than nationally, where housing starts decreased by 29.4% (NLDF 2010b, internet site). In 2010, the number of housing starts in Newfoundland and Labrador increased by 18% to 3,606 (Statistics Canada 2011, internet site).

The province has recently experienced a surge in house prices. This has been attributed to historically low interest rates, combined with overall economic strength, which has led to high overall market demand (Canadian Mortgage and Housing Corporation (CMHC) 2010a, internet site). Between 1997 and 2007 the New House Price Index for Newfoundland and Labrador increased 36.3%, an average of 3.6% per year. Since then new home prices in the province have increased significantly, for example, by 19.6% in 2008 and by 11.5% in 2009. The cumulative increase in house prices in the province in 2008-2009 was the greatest increase observed

in Canada (CMHC 2010a, internet site). In 2009 the residential MLS average price was $206,374 and was forecast to rise to $233,125 by the end of 2010 and to $241,500 in 2011 (CMHC 2010a, internet site).

More recent information from CMHC suggest that average prices in the province appear to have stabilized around the $235,000 level and while housing prices continue to be strong, continued weakness in sales combined with an increase in active listings may slow further upward price movement and create a more balanced market (NLDF 2011b, internet site).

In terms of rental costs, the average rent for a two-bedroom unit in spring 2011 was $683 across five urban centres surveyed. In April 2011 the St. John's Census Metropolitan Area (Avalon Study Area Region) had the highest rent costs at $744, Grand Falls-Windsor (Central and Eastern Newfoundland) was $632, Corner Brook $577 (Northern Peninsula) and Gander (Central and Eastern Newfoundland) $567. In April 2011 the overall provincial vacancy rate was 2.1%, up from 1.1% in April 2010. The strong economy helped keep vacancies at near historic lows in the St. John's Census Metropolitan Area, with a vacancy rate of 2.0% in spring 2011. Vacancy rates were highest in Grand Falls-Windsor while Corner Brook had the lowest vacancy rate at this time at 1.7% (CMHC 2011, internet site).

Newfoundland and Labrador has some of the oldest public housing in Canada. Construction began in 1949 and at that time homes were built to house larger families. Almost 80% of units have three or more bedrooms. The province's population characteristics have since changed and now the majority of the housed tenants and applicants are smaller families, which require only one or two bedroom homes. 70% of public housing tenants are either single occupants or are single parent families. Almost 85% of applicants for social housing are single parents, single individuals and seniors (NLHC 2009, internet site).

Census data for 2006 give the number of dwellings in each Study Area Region and for the province as a whole (Table 15.3.5-3).

Table 15.3.5-3 Total Number of Dwellings by Study Area Region, 2006

Region	Total Dwellings
Newfoundland and Labrador	197,245
Central and Southeastern Labrador	4,675
Northern Peninsula	22,910
Central and Eastern Newfoundland	45,745
Avalon Peninsula	95,225

Source: NLSA / Community Accounts 2011, internet site.

Most dwellings in the Study Area Regions are detached homes, ranging from 97% of the total dwellings in Zone 20 on the Avalon Peninsula, to 82% in Zone 14 in Central and Eastern Newfoundland. Other types of dwellings (e.g., semi-detached units and apartments) are more common in the larger urban areas and here the proportion of detached homes is smaller. In Zone 19, in northeast Avalon, for example, the proportion of detached homes is only 56%. In all Study Area Regions the percentage of one-family households occupying the homes is more than 70%.

Much of the recent economic growth in the province has occurred in the St. John's Census Metropolitan Area and it is here that price increases have been greatest. However, large increases have also been experienced in Central and Western Newfoundland. For example, in 2009 prices in the Gander and Grand Falls-Windsor areas in the Central and Eastern Newfoundland Study Area Region increased by 7% to 8% over the previous year (notwithstanding the economic distress associated with the closure of the paper mill in Grand Falls), and in the same period Corner Brook in the Northern Peninsula Study Area Region experienced an 18% increase (CBC 2010, internet site).

15.3.5.8 Education

Public school boards in Newfoundland and Labrador administer the daily operations of Kindergarten to Grade 12 schools within their district. The boards are funded by the Department of Education, are guided by trustees, and serve the Labrador, Western, Central, Eastern areas of the province, and in the case of the Francophone school board, the province as a whole.

In recent years, Newfoundland and Labrador has seen a decline in the number of schools, students and full-time teachers, and in the student-teacher ratio. In the 2010-2011 school year there were 272 public schools in the province and the number of full-time students in grades kindergarten to 12 was 68,716. This represents a decline of 1.4% from 2009-2010. Student enrolment is expected to continue to decline at a rate of 1.0% to 1.7% for the next four years to 2014. In 2010-2011 there were 5,631 full-time equivalent educators allocated, 34 fewer than the previous year. In addition to the public schools there are five private schools and three First Nations schools in the province (NLDE 2011a, internet site).

Post-secondary education and training in the province is provided primarily through Memorial University, which has its main campus and a Fisheries and Marine Institute (Marine Institute) in St. John's, and the Grenfell Campus in Corner Brook. In addition, there is the College of the North Atlantic (CNA), which has 17 campuses throughout the province. There are also 27 registered private training institutions, some of which are trade union sponsored, the majority of which are in the St John's area. The private colleges primarily offer vocational training (NLDE 2011b, internet site).

Table 15.3.5-4 summarizes recent school data for the Study Area Regions. These and other education-related data for each of the Study Area regions are discussed below.

Table 15.3.5-4 Education Indicators, Study Area Regions, 2009-2010 and 2010-2011

	Number of Schools (2009-2010)	Enrolment (2010-2011)	Number of Teachers (2009-2010)
Central and Southeastern Labrador	18	1,975	191
Northern Peninsula	38	7,728	640
Central and Eastern Newfoundland	75	14,872	1,239
Avalon Peninsula	93	34,403	2,560

Source: NLSA / Community Accounts 2011, internet site.

Central and Southeastern Labrador

The Central and Southeastern Labrador Study Area Region overlaps with two school districts: the Labrador School District and the Western School District. In 2010-2011, the Labrador District School Board provided educational services to 3,413 students in 15 schools, which are located in three distinct regions: Coastal Labrador, Western Labrador and Central Labrador (NLDE 2011c, internet site). Of the 14 communities under the Board's jurisdiction, seven have a native / Aboriginal designation and three others have a significant population of native people as well. As such, the Labrador School Board provides educational services for the vast majority of the province's Inuit and First Nations children. In fact, nearly 40% of the District's students are of Aboriginal ancestry. The Board delivers instruction in four languages, French, English, Innu-aimun, and Inuktitut (Labrador School Board 2008, internet site).

In 2008, the Board had 638 full- and part-time employees, of which 257 are full-time equivalent teachers and another 60 are substitute teachers to varying degrees on an annual basis (Labrador School Board 2008). In 2010-2011, the Labrador School Board had six urban schools and nine rural schools. There were 2,673 students enrolled in urban schools (78.3%) and 740 enrolled in rural schools (21.7%) (NLDE 2011c, internet site).

The Western School District includes the western portion of Newfoundland and the southeastern portion of Labrador. The district includes southeastern Labrador, all of the Northern Peninsula, Deer Lake, Corner Brook, and Stephenville, south to Port aux Basques, and Francois on the south coast. As of July 1, 2008, there are 72 schools in the Western School District, ranging in enrolment from six students (William's Harbour School) to 989 students (Corner Brook Regional High). The average school size is 185 students. As of July 1, 2008, the Western School District has 2,174 employees. Of these, approximately 1,625 are permanent employees, and the remaining work in a substitute or call-in capacity (Western School District 2011, internet site).

As indicated in Table 15.3.5-4, the Central and Southeastern Labrador Study Area Region had 18 schools in the 2009-10 school year employing 191 teachers. During the 2010-11 school year, 1,975 students were enrolled in these schools. There is a CNA campus in Happy Valley-Goose Bay, which admits approximately 300 full-time students annually in a variety of programs. More than 1,200 part-time students participate in contract training, *ad hoc* programs and continuing education courses. In addition to the main campus, CNA manages Coastal Learning Centres in North West River and Port Hope Simpson, which teach Adult Basic Education to local residents.

Northern Peninsula

Education in the Northern Peninsula Study Area Region is mainly the responsibility of the Western School district, the area of which was described in the previous section. There is also some overlap with the Nova Central School District in the Central and Eastern Study Area Region. As indicated in Table 15.3.5-4 there were 38 schools in the Northern Peninsula Study Area Region, employing 640 teachers in the 2009-2010 school year. During 2010-2011, these schools enrolled 7,728 students.

The CNA has two campuses in this Region: St. Anthony and Corner Brook. Full-time credit course registration at the Corner Brook campus is approximately 700 students per semester, with another 100 registered part-time. Upwards of 1,200 students participate in Continuing Education evening courses (CNA n.d., internet site). The Grenfell Campus of Memorial University in Corner Brook is a liberal arts and science institution of 1,350 students (Memorial University 2011, internet site).

Central and Eastern Newfoundland

The Central and Eastern Newfoundland Study Area Region falls within the Nova Central and Eastern School Districts. The Nova Central School District is responsible for Central Newfoundland, ranging from just east of Terra Nova Park to the Baie Verte Junction. It includes schools in Gander and east to Charlottetown; in the Lewisporte-Twillingate area; Grand Falls-Windsor west, including Buchans and Green Bay area; the Baie Verte Peninsula; and the Connaigre Peninsula.

During the 2007-2008 school year, the Nova Central School District had 12 urban schools with a total enrolment of 4,585 students (35.3%), and 55 rural schools with a total enrolment of 8,413 (64.7%). Many rural schools are centralized and serve several communities. There are 16 schools with populations of 50 or fewer students. Eight schools are located on islands accessible only by ferries. There are 26 schools with grades Kindergarten to 12 in Nova Central School District (Nova Central School District 2011, internet site).

The Eastern School District includes communities in the region east of Clarenville, including those on the Burin, Bonavista and Avalon peninsulas.

During the 2009-2010 school year, this Region had 1,239 teachers working in 75 schools. During the 2010-2011 school year and it had an enrolment of 14,872 students (Table 15.3.5-4). The CNA operates four campuses in the Region, in Baie Verte, Grand Falls-Windsor, Gander and Clarenville (CNA n.d., internet site).

Avalon Peninsula

As noted in the previous section, education in the Avalon Peninsula Study Area Region is administered by the Eastern School District, which includes 122 schools and has an enrolment of approximately 41,000 students.

The District employs approximately 4,100 teaching and support staff (Eastern School District 2010, internet site).

In the St. John's area the *Conseil scolaire francophone provincial de Terre-Neuve et du Labrador* operates one school and there are also three private schools: Lakecrest Independent School, First Baptist Academy and St. Bonaventure Academy.

There were 93 schools in the Avalon Peninsula Study Area Region during the 2009-2010 school year and 2,560 teachers. The 2010-11 school year saw an enrolment at these schools of 34,403 students.

Post-secondary education and training in this Region is provided through Memorial University's St. John's campus and the Marine Institute, which had a total of 18,746 students in 2010 (Memorial University 2010, internet site), five campuses of the CNA, and a number of private training institutions.

15.3.5.9 Income Support and Employment Services

In Newfoundland and Labrador, the provincial social assistance program is known as Income Support. The *Income and Employment Support Act* and the Income and Employment Support Regulations govern Newfoundland and Labrador's social assistance program. Income Support provides basic benefits to adults only. Children's basic benefits are provided through the Newfoundland and Labrador Child Benefit (Human Resources and Skills Development Canada (HRSDC) 2011, internet site).

In 2008 / 2009, Newfoundland and Labrador had the second lowest increase in social assistance cases in the country, likely because of the high Employment Insurance (EI) coverage. The Income Support caseload increased 2.4% between October 2008 and December 2009, rising to 24,781 cases in December 2009. In January 2010, the caseload increased even further to 24,984. By contrast, Newfoundland and Labrador was the only province to have EI coverage decline during the recent recession, although it still has the second highest coverage in the country (Citizens for Public Justice 2011, internet site).

The Department of Human Resources, Labour and Employment provides financial benefits and other services to eligible low-income individuals and families to assist in meeting daily living expenses (Newfoundland and Labrador Department of Human Resources, Labour and Employment (NLDHRLE) 2011, internet site).

Data for the incidence of Income Support are reported here by their constituent economic zones, as aggregating to the Study Area Region level risks distorting the data.

In 2008, the incidence of Income Support varied from a low of 3.3% in Economic Zone 5 of the Central and Southeastern Labrador Study Area Region to 11.8% in Economic Zone 12 in the Central and Eastern Newfoundland Study Area Region (Table 15.3.5-5).

Table 15.3.5-5 Incidence of Income Support, Economic Zones, 2008

Region	Income Support Assistance Incidence (%)[(a)]
Central and Southeastern Labrador	
Zone 3	8.1
Zone 4	8.0
Zone 5	3.3
Northern Peninsula	
Zone 6	6.2
Zone 7	7.1
Zone 8	9.2
Central and Eastern Newfoundland	
Zone 11	8.2
Zone 12	11.8
Zone 14	8.6
Zone 15	8.6
Avalon Peninsula	
Zone 17	10.8
Zone 18	9.2
Zone 19	10.4
Zone 20	6.9

Source: NLSA / Community Accounts 2011, internet site.

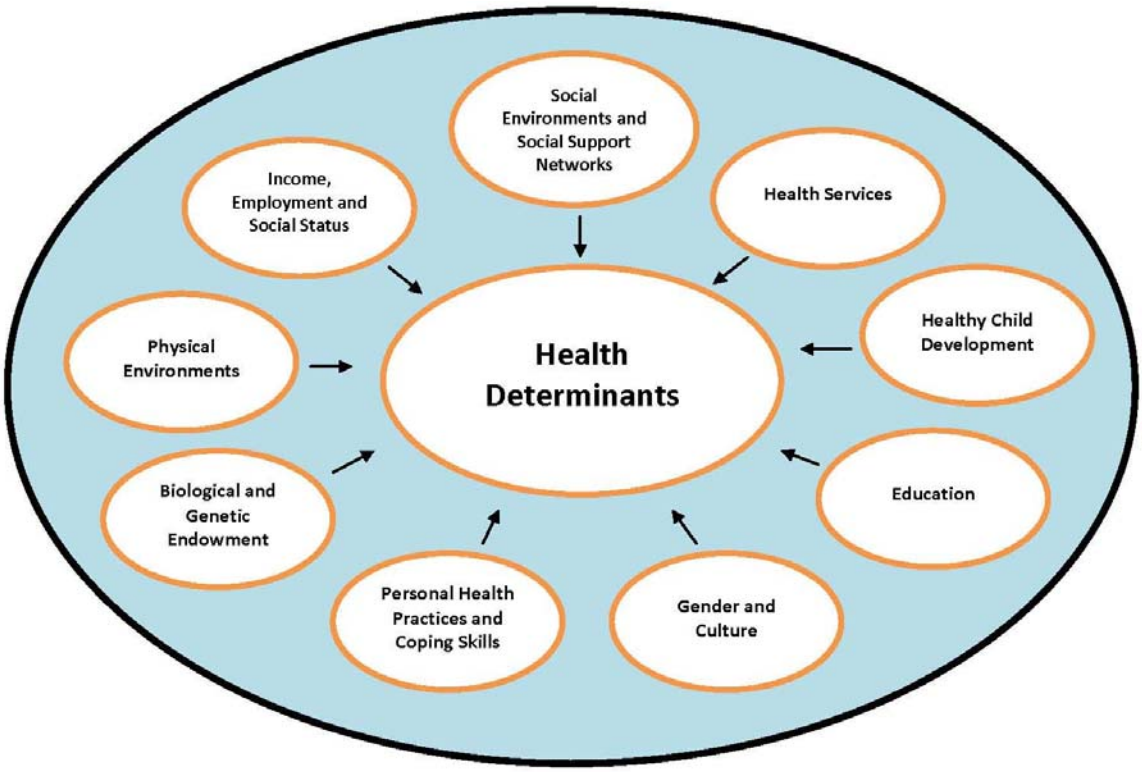
(a) The 2007 and 2008 Income Support Assistance incidence has been approximated using the 2006 Taxfilers and Dependents figures.

15.3.6 Community Health

Human health is defined as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (World Health Organization (WHO) 1947). Recognizing this, Health Canada (1999) has adopted a health determinant approach (Figure 15.3.6-1), which now often forms the basis for environmental assessments.

As indicated there is a complex relationship between human health and well-being and environmental, economic, social and community characteristics.

Figure 15.3.6-1 Health Determinants



Source: Health Canada 1999.

In this section the focus is on community and individual health and well-being, and describes existing conditions with respect to health services and facilities and aspects of health and well-being, including health status, emotional status, health practices, preventative behaviours and health issues. Readers are also encouraged to review chapters that describe physical environmental, economic and other human environmental aspects that also contribute to the overall health of members of the communities in the Study Area Regions.

Community and individual health are commonly mediated by aspects of family life and culture. In Newfoundland and Labrador these are valued and often viewed as being powerful, although demographic and economic change has to a degree undermined the importance of both.

In 2006, 89.7% of the Newfoundland and Labrador population lived in family households, compared to only 86.0% in Canada as a whole. However, the structure of families in Newfoundland and Labrador in 2006 was very similar to that for Canada; for example, lone-parent families comprised 15.5% of Newfoundland and Labrador families and 15.9% of Canadian families. Reflecting the province's low birth rates in recent decades, the average number of children at home in couple families (but not lone-parent families) was lower than is the case nationally: 0.9 versus 1.0 children per family.

The historical importance of extended families and family support in caring for both children and the elderly has also been undermined by high rates of out-migration, both from rural communities to urban centres (and especially the St. John's metropolitan area), and from the province to other parts of Canada (especially Northern Alberta). These demographic changes, allied to recent rapid economic growth, have also undermined family- and rural-based aspects of Newfoundland and Labrador culture. At the same time, some of the increased personal affluence has been directed at supporting the more commercial forms of cultural production, and there has been an increasing recognition of the economic value of local culture in attracting tourists, leading to its increased commoditization.

15.3.6.1 Health Services and Facilities

The Department of Health and Community Services administers health and community services in Newfoundland and Labrador. In 2004, the provincial government announced the transition of 14 health boards into four Regional Integrated Health Authorities (Eastern, Central, Western and Labrador-Grenfell, see Figure 15.3.6-2) to provide better coordination of health needs within the province (NLDHCS 2005). In addition, there is a regional Nursing Home Board in St. John's. Approximately 20,000 health care providers and administrators provide services to approximately 520,000 residents throughout the province (NLDHCS 2011a, internet site).

In 2002, there were 35 hospitals and health care centres, 21 nursing homes, three community clinics and 13 nursing stations in the province, which provided a total of 1,681 acute care beds and 2,839 long-term care beds (Table 15.3.6-1) (NLDHCS 2002). The number of health care facilities fluctuates from year to year, but the general trend for the 2002 to 2008 period saw a reduction in the number of acute and long-term care beds, from 1,681 to 1,594 and from 2,839 to 2,779, respectively (NLDHCS 2009, 2002). The level of service, as defined by the number of nurses and doctors per capita, is comparable to other provinces in Canada.

Table 15.3.6-1 Health Services and Facilities, Newfoundland and Labrador, 2002, 2007 and 2008

Health Services and Facilities	2002	2007	2008
Hospitals and health care centres	35	34	37
Nursing homes	21	22	19
Community clinics	3	14	14
Nursing stations	13	n.d.	n.d.
Acute care beds	1,681	1,626	1,594
Long-term care beds	2,839	2,747	2,779

Source: NLDHCS 2009, 2002; NLDHCS 2008, internet site.

n.d. No data.

Acute care services are provided in hospitals and health centres across Newfoundland and Labrador. All facilities provide 24-hour emergency services, outpatient clinics, and laboratory and x-ray services. The other services provided by a facility vary by location, but range from general surgery, internal medicine and obstetrics to specialized services such as cardiology and neurology (NLDHCS 2011a, internet site).

Long-term care services are delivered in both long-term care homes (nursing homes) and in some hospital / health centres with combined long-term and acute care services. All facilities provide 24 hour nursing care plus varying degrees of medical, rehabilitative, social work, pastoral care, dietetic, pharmaceutical, palliative care, respite and recreation programs. Some facilities maintain specialized programs and units for groups with special needs (e.g., Alzheimer's disease) (NLDHCS 2011a, internet site).

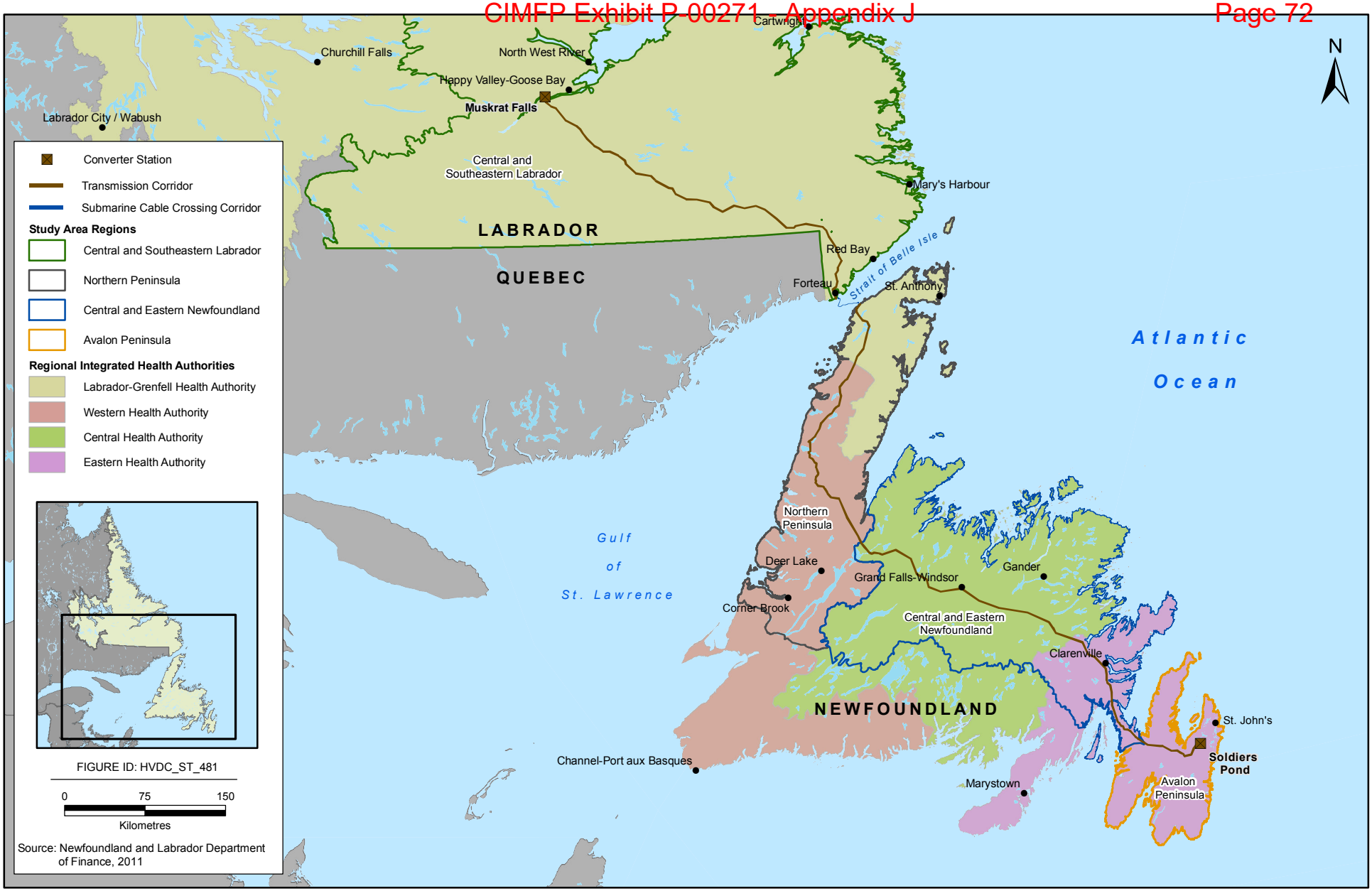


FIGURE 15.3.6-2

Regional Integrated Health Authorities of Newfoundland and Labrador

Central and Southeastern Labrador

Health services in the Central and Southeastern Labrador Study Area Region are provided by the Labrador-Grenfell Regional Health Authority (Labrador-Grenfell Health). It is an integrated health and community services board that delivers primary and secondary health services to the residents of the region, including: acute care, diagnostic and clinical support services; community health and wellness; dental services; health protection services; long term care; mental health and addictions services; residential services; and therapeutic intervention, rehabilitation and other rehabilitation services (Labrador-Grenfell Health 2011, internet site).

Labrador-Grenfell Health provides health and community services to approximately 40,000 people in Labrador and on the Northern Peninsula of Newfoundland (Figure 15.3.6-2). It employs more than 1,500 staff and operates three hospitals, three community health centres, 14 community clinics and two long-term care homes. Among these facilities are:

- the Labrador Health Centre, in Happy Valley-Goose Bay, which is equipped with 25 beds and has a 24-hour emergency department, as well as outpatient clinics;
- the Happy Valley-Goose Bay Long Term Care Home, which has 50 beds for those requiring level 3 and 4 care (Labrador-Grenfell Health 2011, internet site);
- the Labrador South Health Centre in Forteau, which has five in-patient beds a crib and an attached long-term care facility with 14 beds for those needing level 2,3, and 4 care; and
- community clinics in Black Tickle, Cartwright, Charlottetown, Mary's Harbour, Port Hope Simpson, St. Lewis and North West River / Sheshatshiu.

Northern Peninsula

Health care in the Northern Peninsula Study Area Region is the responsibility of both the Labrador-Grenfell Regional and Western Regional Health Authorities. Labrador-Grenfell Health manages health care for communities north of Bartlett's Harbour on the Northern Peninsula. Within this part of the Study Area Region, Labrador-Grenfell Health operates three health care facilities: Curtis Memorial in St. Anthony, the White Bay Central Health Centre in Roddickton and the Strait of Belle Isle Health Centre in Flower's Cove (Labrador-Grenfell Health 2011, internet site).

The Western Regional Health Authority (Western Health) services a population of 79,460 residents with 49% of the total population residing within the Corner Brook - Humber Valley area. Western Health's responsibilities extend from Port aux Basques southeast to Francois, northwest to Bartlett's Harbour, and on the eastern boundary north to Jackson's Arm (Figure 15.3.6-2).

Western Health operates 226 acute care beds, and 434 long-term care beds as well as 40 enhanced assisted living beds for individuals with mild to moderate dementia. The organization employs over 3,000 staff that work in 51 sites throughout the region. The Authority operates 20 community-based offices, 24 medical clinics, four health centres, and two long-term care centres and offers community-based programs, including health promotion, health protection, mental health and addictions, intervention services, and community health nursing. Facilities in the Study Area Region include:

- Western Memorial Regional Hospital in Corner Brook, which has 192 beds;
- the Bonne Bay (Norris Point, 22 beds), and Rufus Guinchard (Port Saunders, 29 beds) Health Centres; and
- the Corner Brook Long Term Care Home (236 beds) (Western Health 2011, internet site).

Central and Eastern Newfoundland

The Central Regional Health Authority (Central Health) is the second largest health region in the province, serving a population of approximately 94,000 and offering them a full range of health care services. It is responsible for health care in most communities in the Central and Eastern Newfoundland Study Area Region. The boundaries of Central Health extend from Charlottetown in the east, from Fogo Island in the northeast, and from Harbour Breton in the south to Baie Verte in the west (Figure 15.3.6-2) (Central Health 2010, internet site).

Central Health provides primary, secondary, long-term care, community health and some enhanced secondary services. These are provided through two regional health centres, 31 community health centres, and five long-term care facilities. Central Health's responsibilities include promoting health and well-being, preventing illness and injury, providing supportive care, treating illness and injury, and providing rehabilitation services. There are 842 beds throughout the Central Health region: 264 acute care, 518 long-term care, 32 residential units and 28 bassinets. Central Health is responsible for the licensing and monitoring of personal care homes and child care centres within the region and partners with the Miawpukek First Nation to support health services delivery in Conne River. The total workforce for Central Health is approximately 3,200 (Central Health 2010, internet site).

The Eastern Regional Health Authority (Eastern Health) also provides health services within this Study Area Region. Eastern Health's jurisdiction extends from St. John's West to Port Blandford, and includes all communities on the Avalon, Burin and Bonavista Peninsulas (Figure 15.3.6-2). Its region includes 111 incorporated municipalities, 69 local service districts and 66 unincorporated municipal units. In 2009-10, Eastern Health operated seven acute care facilities (hospitals), 6 community health centres, and 13 long-term care facilities. Of these facilities, seven are in the Central and Eastern Newfoundland Study Area Region (Eastern Health 2010a, internet site; Eastern Health 2010b).

Avalon Peninsula

Eastern Health operates all health care facilities on the Avalon, Burin and Bonavista Peninsulas and is responsible for health care in the Avalon Peninsula Study Area Region. It is the largest integrated health organization in Newfoundland and Labrador and it provides the full continuum of health services to a regional population of almost 294,000. In addition it has provincial responsibilities for a range of services including cancer care, child rehabilitative clinics and genetics. Health and community services are offered through community-based offices, medical clinics, nursing homes and clinics.

Eastern Health employs 13,000 health care and support services professionals and operates 28 health care facilities, of which seven are acute care facilities, six community health centres, 13 long-term care facilities, a provincial cancer care and a provincial rehabilitation centre. In addition there are community-based offices in 30 communities. In 2009-2010, there were a total of 2,671 beds: 1,619 long-term care, 1,039 acute care and 13 observation / holding beds. The largest facilities are in the St. John's area, and include six long-term care facilities, four hospitals and a hostel. In 2009, the long-term care facilities in the St. John's area provided 1,056 beds, 44 in a hospital and 1,012 in six nursing homes (Eastern Health 2010a, internet site).

15.3.6.2 Health and Well-Being

Well-being, as discussed here, includes the health status, emotional status, health practices, preventative behaviours and health issues of the population in each of the Study Area Regions. Data for each of these components by Region are summarized in Table 15.3.6-2. As data availability varies by year, data years are indicated in parentheses in the discussion that follows.

For comparative purposes maximum and minimum beneficial and adverse well-being indicator values are highlighted. In the case of self-assessed health status, high reporting scores are considered as beneficial. On the other hand high reporting for smoking or alcohol consumption are considered as adverse indicators.

Table 15.3.6-2 Health and Well-Being Indicators, Study Regions and Comprising Economic Zones

Indicator	Central and Southeastern Labrador			Northern Peninsula			Central and Eastern Newfoundland				Avalon Peninsula			
	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 11	Zone 12	Zone 14	Zone 15	Zone 17	Zone 18	Zone 19	Zone 20
Health Status														
Excellent or very good self-assessed health status, age 12+ (2007-08)	57.6%	83.3%	41.5%	65.3%	67.8%	63.2%	67.7%	61.2%	58.1%	52.0%	61.6%	43.2%	65.3%	80.8%
Life expectancy at birth (years) (2005 / 2007)	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3
Median Age of Death (Total) (2004-2009)	71	74	80	79	75	77	78	78	80	79	78	79	78	77
Emotional Status (2007-08)														
Self-Assessed Mental Health as Excellent	44.7%	65.0%[(a)]	No Data	33.4%	50.7%	49.0%	32.8%	36.6%	35.2%	36.1%	42.2%	63.9%[(a)]	43.8%	31.1%[(a)]
Suicide, mortality rate per 100,000 (2007)	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3
Very Strong Sense of Belonging to a Community	21.8%	50.1%[(a)]	No Data	34.1%	46.2%	40.7%	30.6%	31.6%	35.2%	35.0%	29.0%	No Data	24.8%	No Data
Rated life stress as 'quite a bit', age 18+	10.5%	10.5%	10.5%	10.1%	10.1%	10.1%	10.1%	10.4%	9.0%	10.1%	10.1%	10.1%	10.0%	9.9%
Health Practices (2007-08)														
Smoke daily, age 12+	24.7%	25.4%	25.4%	19.9%	15.6%	18.4%	19.9%	19.9%	19.3%	19.9%	19.9%	19.9%	18.0%	18.1%
Heavy drinkers (5 or more drinks on one occasion, 12 or more times a year), age 12+	35.4%	40.0%	40.0%	22.3%	34.2%	27.8%	31.2%	29.0%	27.4%	27.1%	24.3%	31.2%	32.3%	46.6%

Table 15.3.6-2 Health and Well-Being Indicators, Study Regions and Comprising Economic Zones (continued)

Indicator	Central and Southeastern Labrador			Northern Peninsula			Central and Eastern Newfoundland				Avalon Peninsula			
	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 11	Zone 12	Zone 14	Zone 15	Zone 17	Zone 18	Zone 19	Zone 20
BMI 25 or greater, age 18+ (excluding pregnant women)	65.5%	46.6%	64.7%	77.9%	55.8%	62.1%	61.0%	68.0%	72.9%	62.7%	68.6%	76.4%	57.6%	55.0%
Physically inactive, age 12+ (2007)	51.2%	51.2%	51.2%	51.2%	51.2%	51.2%	51.2%	51.2%	51.2%	51.2%	51.2%	51.2%	51.2%	51.2%
Preventative Behaviours (2007-08)														
Have a regular Medical Doctor	57.7%	36.1%[(a)]	52.1%[(a)]	58.8%	68.8%	93.3%	72.9%	80.2%	19.3%	87.1%	92.4%	No Data	96.2%	No Data
Health Issues (Chronic Conditions 2008-09)														
Heart disease	48.8%[(a)]	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	24.6%	37.4%[(a)]	n.d.	n.d.
Diabetes	n.d.	n.d.	72.2%[(a)]	n.d.	32.3%	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
High blood pressure	n.d.	n.d.	n.d.	43.3%[(a)]	48.5%[(a)]	48.2%	61.7%	35.8%	50.3%	38.7%	n.d.	n.d.	37.7%	45.3%[(a)]

Source: NLSA / Community Accounts 2011, internet site.

Note: Indicates the most beneficial level of the indicator among the Economic Zones / Study Area Regions.

Indicates the most adverse level of the indicator among the Economic Zones / Study Area Regions.

(a) A high sampling variability associated with the estimate. The coefficient of variation for these estimates is equal to or falls between 16.6% and 33.3%. Please use with caution.

5

These data should be viewed and interpreted with caution. Aggregate data for each Study Area Region are not given as the component data for each of the Economic Zones (see Figure 15.3.1-1) that make up the Regions are available only as percentage values and, given the high sampling variability for some component estimates, aggregating information to the Study Area Region level risks additional distortion of the data. In addition, some reported results appear contradictory and need more in-depth analysis to explain them fully. For example, data for Economic Zone 20 (Avalon Peninsula Study Area Region) indicate that 80.8% of respondents consider their health to be 'excellent' or 'very good', but, at the same time, 46.6% report that they are heavy drinkers (as defined by the survey), and 55% indicate that they have a Body Mass Index (BMI) greater than 25, an indicator of obesity (Table 15.3.6-2).

The health status and overall well-being of members of Aboriginal groups is generally quite different from that of others, and warrant specific attention. Data for Aboriginal groups in Labrador and Québec are not always directly comparable to that for the Economic Zones and Study Area Regions, but are included in the following health and well-being themes.

15.3.6.3 Health Status

Self-assessed health status is accepted as a reliable and valid measure for assessing the subjective and objective health of individuals and complements other health status indicators (HRSDC 2011, internet site). In 2007-2008, 61.8% of people living in Newfoundland and Labrador self-assessed their health status as 'excellent' to 'very good'. Of those, 73.0% believed their health status was 'about the same' as compared to the previous year. The life expectancy at birth was 78.3 years for the entire province (2005 to 2007) and the median age of death between 2004 and 2009 ranged from 71 years in Zone 3 (Central and Southeastern Labrador) to 80 years in Zones 5 (Central and Southeastern Labrador) and 14 (Central and Eastern Newfoundland) (Table 15.3.6-2) (NLSA / Community Accounts 2011, internet site).

Within the Central and Southeastern Labrador Study Area region there was both the highest percentage of people over the age of 12 years who self-assessed their health status to be 'excellent' or 'very good' (Economic Zone 4 at 83.3%), and the lowest (Economic Zone 5 at 41.5%). The Avalon Peninsula Study Area Region shows similar internal variation, with a high of 80.8% in Economic Zone 20 and a low of 43.2% in Economic Zone 18 (NLSA / Community Accounts 2011, internet site). While a number of studies have explored the reasons for such regional variations, for example the relationship between self-assessed health status and income differentials (e.g., van Doorslaer and Koolman 2004; Hildebrand and Van Kerm 2005), such explanations are complex and beyond the scope and requirement of this assessment.

15.3.6.4 Emotional Status

A good indicator of emotional well-being is how a person perceives his or her mental health. In Newfoundland and Labrador 43.0% of people in 2007-2008 had some self-perceived life stress (Table 15.3.6-2). In addition, feeling a sense of community is likely to contribute to a person's emotional well-being, especially when it contributes to an individual's overall general health. In 2007-08, 30.5% of Newfoundland and Labrador residents felt a very strong sense of belonging to community (NLSA / Community Accounts 2011, internet site). The overall suicide mortality rate in 2007 was 10.3 per 100,000 people for Newfoundland and Labrador and for each of the Study Area Regions (NLSA / Community Accounts 2011, internet site).

The data on emotional well-being by economic zone suggests that there is a reasonably strong positive relationship between self-reported emotional status and sense of belonging to a community. At the same time, and as with self-reported health status, there is considerable variation between Economic Zones in the same Study Area Region with respect to these measures. In Central and Southeastern Labrador, for example, 65.5% respondents in Economic Zone 4 self-assessed their mental health as 'excellent' and 50.1% indicated a 'very strong sense of community'. By contrast, the responses in Economic Zone 3 for the same variables were only 50.1% and 21.8%. Data for the Avalon Peninsula Study Area Region are less complete, but in Economic Zone 18 63.8% indicated that their mental health was 'excellent', while only 31.1% of those in Economic Zone 20 reported the same (Table 15.3.6-2) (NLSA / Community Accounts 2011, internet site).

Suicide and attempted suicide is a particularly important issue among some Aboriginal populations. The age-adjusted suicide rate (the standardized rate based on the age distribution of the population as a whole) for Labrador in 2001 was estimated at 27 per 100,000, compared with 6.7 per 100,000 for the province as a whole (Statistics Canada 2001). Risk factors for suicide include mental health issues, alcohol-related factors and feelings of isolation. Although education is not a predictor of suicide, it does play an important role in understanding and preventing suicide attempts. Between 1998 and 2000 the rate of attempted suicide among Labrador Innu youth was 17 times the provincial rate (NLCHI 2004, internet site). In 2001, 42% of people in Sheshatshiu reported having actively thought about suicide and 28% had attempted suicide (Rogan 2001).

The suicide rate among Labrador Inuit is even higher at 239 per 100,000 for the 1999 to 2003 period. 22% of respondents to a 1997 Regional Health Survey had seriously thought of suicide, and 15% had made at least one attempt (National Aboriginal Health Organization 2006, internet site).

Personal and social well-being data regarding the mental health of Aboriginal populations in Québec are not as readily available, but in Unamen Shipu, for instance, suicide and suicide attempt rates are also reported as high. In 2006-2007, approximately 50 people tried to take their lives, and several succeeded (Hydro-Québec 2007).

15.3.6.5 Health Practices

The way individuals take care of themselves, as well as their daily lifestyle practices, including exercise and nutrition, is a large part of their well-being. According to the 2008-09 Canadian Community Health Survey (those sampled were 45 years and older), 79.4% of people in Newfoundland and Labrador did not smoke. This compared to 17.6% of people who were daily smokers (Table 15.3.6-2) (NLSA / Community Accounts 2011, internet site).

From the same survey, 53.6% considered themselves to be overweight and 43.9% thought they were the appropriate weight. Furthermore, 73.7% of survey participants said they had consumed alcohol in the past 12 months, while 56.4% admitted they never had five or more drinks on one occasion in that same time frame. Just over half (51.2%) of the entire population (over the age of 12 years) of Newfoundland and Labrador claimed they were physically inactive (NLSA / Community Accounts 2011, internet site).

Of all the Study Area Regions, Central and Southeastern Labrador (all Economic Zones) had the highest percentage (approximately 25%) of daily smokers over the age of 12 years (2007-08) (NLSA / Community Accounts 2011, internet site). This Region also had the highest number of heavy drinkers (defined as five or more drinks on one occasion, 12 or more times a year), with a range from 35.4% to 40.0%. The percentages of those with a BMI of 25 or greater ranged from the lowest in the province at 46.6% in Economic Zone 4 to 65.5% in Economic Zone 3 (NLSA / Community Accounts 2011, internet site).

Elsewhere, Economic Zone 20 in the Avalon Peninsula Study Area Region has the highest percentage of heavy drinkers in the province, 46.6%, while Economic Zone 18 in the same Region has among the highest percentage of those with BMI levels above 25.

Alcohol and solvent abuse is one of the most pressing health issues among Aboriginals in Labrador and is believed to be at the root of many other social ailments such as homicide, child abuse and neglect, family dysfunction and suicide. In addition, dietary practices are often poor with typical diets high in fat and deficient in fruits, vegetables and dairy products, as well as calcium and other important minerals. Among Innu, for example, increased reliance on store-bought foods as a result of a reduction in hunting compared to past generations, and a consequent decreased proportion of country food in the typical Innu diet increases health problem risks stemming from poor nutrition, increased obesity and Type II diabetes (Samson and Pretty 2006).

15.3.6.6 Preventative Behaviours

Preventative health behaviour generally stems from a belief that such actions will benefit health, for example quitting smoking can reduce the chances of early morbidity and mortality. Preventive actions can reduce, but

not eliminate, the chances of acquiring a disease or illness. The strength of the cause and effect relationship between certain behaviours and the health problem one is trying to prevent will determine the impact that performing the behaviour will have on reducing the risk (ENotes 2011, internet site).

Having a regular medical doctor is considered likely to be important in encouraging and facilitating preventative behaviours such as having flu shots and breast and prostate examinations. For the province as a whole, 87.8% of people in had access to regular medical doctor in 2007-08 (Table 15.3.6-2) (NLSA / Community Accounts 2011, internet site).

There is a very wide variation by Study Area Region and Economic Zone in the percentage of respondents having a regular medical doctor. For example, In Economic Zone 14 in Central and Eastern Newfoundland only 19.3% reported that they had a regular doctor, compared to 93.3% in Economic Zone 8 in the Northern Peninsula Study Area Region. In a regional sense, Central and Southeastern Labrador residents had the lowest level of regular access to a doctor with responses ranging from 36.1% in Economic Zone 4 to 57.7% in Economic Zone 3.

15.3.6.7 Health Issues

Provincial departments are working with regional health authorities, Aboriginal and community groups, businesses and organizations across the province to support programs that promote healthy living and provide opportunities to make healthy choices in this province. Diabetes and heart disease are two of the most common diseases in Canada and they are more common in Newfoundland and Labrador than in Canada as a whole (NLDHCS 2008, internet site).

In 2008-2009, for the healthy aging category (those 45 years plus), other chronic conditions affecting the people of Newfoundland and Labrador included arthritis (39.4%), high blood pressure (40.5%), back problems (26.3%) and thyroid condition (10.1%). In addition, 15.8% of Newfoundland and Labradorians suffered from diabetes and 40.5% reported having high blood pressure (NLSA / Community Accounts 2011, internet site).

Data for some of the most important health issues by Economic Zone and Study Area region are presented in Table 15.3.6-2. Data are limited for some Regions. For example, while heart disease is an important issue, data are not available for most regions and there is a high sampling variability for most Regions for which there are some data. While high blood pressure issues are fairly uniform across the Study Area regions, Zone 11 in the Central and Eastern Newfoundland Study Area Region stands out as higher than others.

Labrador Innu have higher than average rates of diabetes, mortality of people aged 65 or younger, youth mortality, teenage pregnancy and learning difficulties consistent with Fetal Alcohol Spectrum Disorder (FASD) (Philpott et al. 2004), compared to the Labrador-Grenfell Health Region as a whole.

The percentage of adult Labrador Inuit reporting excellent or very good health (58%) is similar to that for the general Canadian population (60%). The most commonly reported chronic conditions for Labrador Inuit adults are high blood pressure (19%) and arthritis / rheumatism (12%); in Canada, 12% of the population reported high blood pressure and 13% reported arthritis / rheumatism. About 30% of Labrador Inuit children have been hungry because the family had run out of food or money to buy food. This figure is the same as for Inuit children elsewhere in Canada (Statistics Canada 2006c, internet site).

Among Québec Innu, alcohol and drug abuse is prevalent, fostering violence and creating safety issues. In many cases, the traditional Québec Innu diet has been replaced with bad nutrition, which, combined with the lack of physical activity, lead to obesity. Diabetes is also more widespread among the Innu than the general population of Québec (Hydro-Québec 2007).

In an effort to address the unique health challenges and needs of the Aboriginal people of Newfoundland and Labrador, the GNL, in budget 2010, provided funding to hire a dedicated Aboriginal Health Liaison. This Liaison will work with Aboriginal governments and organizations in the province to facilitate the development of a holistic and collaborative Provincial Aboriginal Health Policy Framework (NLDHCS 2011b, internet site).

Similarly, in an effort to improve the health status of Canada's Aboriginal peoples, the federal government has partnered with the provinces and territories to deliver the Aboriginal Health Transition Fund (AHTF). The AHTF provides funding for Aboriginal initiatives that:

- improve accessibility of health programs and services for Aboriginal peoples;
- adapt existing health programs and services to better meet the needs of Aboriginal peoples; and
- increase the participation of Aboriginal peoples in the design, development, implementation and evaluation of programs and services that serve Aboriginal populations.

In Newfoundland and Labrador there are now some ten AHTF projects underway of which Aboriginal groups are the lead organizations in seven (NLDHCS 2011b, internet site).

15.4 Economy, Employment and Business

An appropriate description of the socioeconomic environment is required to define the context in which the Project will be constructed and provide a baseline that includes and evaluates Project related activities and likely effects. This includes the definition and discussion of the economy employment, and business environment. 'Economy' here refers to the set of activities relating to material production, distribution and consumption of goods and services, while 'Employment' relates to those persons in the labour force engaged in the production, distribution and servicing of those goods and services. 'Business' refers to the firms and other entities involved in organizing those production, distribution and service activities.

For this assessment and where data are available, employment, economy and business is considered at two geographic scales. First, and primarily, it is considered at a provincial level for all of Newfoundland and Labrador. In addition, the Study Area has been subdivided into four different on-land regions. Economic data for these four Study Area regions are based on data from those provincial Economic Development Zones through which the transmission corridor passes. The Study Area regions discussed are Central and Southeastern Labrador (Economic Zones 3, 4 and 5), the Northern Peninsula (Economic Zones 6, 7 and 8), Central and Eastern Newfoundland (Economic Zones 11, 12, 14 and 15), and the Avalon Peninsula (Economic Zones 17 and 19). Figure 15.3.1-1 illustrates the province's Economic Development Zones in relation to the Study Area regions.

Included within this section is a discussion of the following:

- Nature of the economic environment, including factors influencing economic growth, the contribution of key industries. This includes the economy of the province as a whole, as well as key elements of the economy in the Study Area regions.
- Definition of the provincial labour force, including age, education and skill levels, the availability of labour based on anticipated Project needs, and the relationship between labour and industry.
- A description of the business environment in the both the province and the Study Area regions.

Establishing the current and forecasted economic context for both the province and the regions is important in understanding how economic benefits of the Project can best be optimized and local opportunities for business and employment maximized.

15.4.1 Study Area

The discussion of existing baseline conditions for Economy, Employment and Business is focused primarily on the province as a whole as well as considering the various regions from Central and Southeastern Labrador to the Island of Newfoundland's Avalon Peninsula within which Project activities will occur. The Project regions are discussed, as feasible, using economic data for these regions from those provincial Economic Development Zones crossed. The regions discussed are Central and Southeastern Labrador (Economic Zones 3, 4 and 5), the

Northern Peninsula (Economic Zones 6, 7 and 8), Central and Eastern Newfoundland (Economic Zones 11, 12, 14 and 15), and the Avalon Peninsula (Economic Zones 17 and 19). Figure 15.3.1-1 illustrates the province's Economic Development Zones in relation to the regions.

15.4.2 Information Sources and Data Collection

Baseline data relating to Economy, Employment and Business were obtained from secondary sources, including:

- Statistics Canada and other agencies and departments of the Government of Canada;
- the Newfoundland and Labrador Statistics Agency (NLSA) / Community Accounts, and other agencies and departments of the GNL; and
- municipal governments, local and regional authorities, and RED boards.

Information available through these sources was used to provide a description of the existing environment for the purposes of the environmental assessment.

15.4.3 Demographics

Changes in the province's economic health are reflected in a number of ways in the province's demography, while in turn, its demographic characteristics are in part reflected in economic conditions in the province. To set the context for these potential interactions, the current demographic structure and trends are summarized below. Additional information on population characteristics is provided in the Communities section (Section 15.3.4).

15.4.3.1 Newfoundland and Labrador

The January 2010 population for the province was estimated at 510,805, an increase of 2,510 since July 2009 (NLDF 2010a, internet site). The last census in 2006 reported a total population of 505,469, although the provincial government uses an estimate of 510,313 (Figure 15.3.4-1). There have been year-over-year population increases since 2008, the first time this has occurred since 1992 (NLDF 2009a, internet site).

A major consequence of the closure of the fishery in the early 1990s was the decline of the population. Between 1991 and 1996, there was a net loss of approximately 20,000 people and a further loss of almost 50,000 people between 1996 and 2002 (NLDF 2009a, internet site). These losses were concentrated in rural Newfoundland and Labrador, but were reflected in an overall decline in provincial economic health. This included higher unemployment rates (20.4% in 1994), a decline in the labour force, decreases in retail trade and declining housing starts.

Net migration to the province in 2008-2009 was positive, the first time this has occurred since 1982-1983 (see Figure 15.3.4-3). Positive net migration can be attributed in part to the strong performance of the provincial economy, but also to the fact that there were fewer jobs elsewhere in Canada, the global recession in 2008-2009 reducing the number of jobs in Alberta and Ontario in particular (NLDF 2010b, internet site).

Rapid aging of the population is one of the most important demographic challenges confronting the province because of its implications for both government and business (Figure 15.3.4-5). These include implications for government in terms of revenue generation capabilities, including federal transfers, local sales taxes and excise revenues. At the same time, public sector service needs, demands and expectations will change, with an increasing share of expenditures likely having to be allocated to health care in particular.

Low reproductive rates and an aging population have implications for labour supply. With fewer young people entering the labour force and with older workers retiring, the reduced labour supply could result in competition for labour, thereby driving up wage rates. Together with the pull of opportunities elsewhere in Canada, this could negatively affect private and public sector hiring in the province. However, a shrinking

labour force could have positive effects on the current high levels of youth unemployment and encourage investments to increase productivity.

For the business sector, an aging and potentially declining population has implications for consumer demand and shifting spending patterns by the sector. For both the business and government sectors, these demographic changes mean that provision of some services, for example, banking and education, may no longer be viable in some communities (particularly rural ones), with implications for the longer-term viability of those places affected (NLDF 2002, internet site).

Additional information on population characteristics is provided in the Communities section (Section 15.3.4).

15.4.3.2 Central and Southeastern Labrador

Demographic data for the Central and Southeastern Labrador region are based on information for Economic Zones 3, 4 and 5 (Figure 15.3.1-1). Demographic change in this region of the Study Area generally reflects that of Labrador as a whole, with a decline in the number of total births and negative net migration in recent years. As indicated in Figure 15.3.4-6, the total population of the area has declined 9.1% from 15,182 in 1991 to 13,797 in 2006 (NLSA 2007, internet site). Happy Valley-Goose Bay, located within Economic Zone 3, is the largest community in the region, with a population of 7,572 in 2006 (NLSA / Community Accounts n.d., internet site).

15.4.3.3 Northern Peninsula

Demographic data for the Northern Peninsula region of the Study Area is based on information from Economic Zones 6, 7 and 8 (see Figure 15.4.1-1). As indicated in Figure 15.3.4-7, the population of this region declined from 70,336 to 58,889 between 1991 and 2006 (16.3%). As in other Study Area regions, this has been primarily a result of declining reproduction rates and high levels of net out-migration, particularly amongst youth.

15.4.3.4 Central and Eastern Newfoundland

Demographic data for the Central and Eastern Newfoundland region of the Study Area is based in data from Economic Zones 11, 12, 14 and 15 (see Figure 15.4.1-1). This region too has seen a decline in population since 1991, from 142,111 to 115,918 in 2006, a decrease of 18.4% (Figure 15.3.4-8). While fewer births and out-migration account for the decline, geographically most of the population loss has occurred in the smaller communities. This has been partially offset by growth in a few of the larger regional centres along the TCH, such as Grand Falls-Windsor (1.6%), Gander (3.1%) and Clarenville (3.3%) (NLSA / Community Accounts n.d., internet site), to which many from smaller places in the region and elsewhere have moved.

15.4.3.5 Avalon Peninsula

The Avalon Peninsula Study Area region comprises Economic Zones 17 and 19 (Figure 15.4.1-1). The Isthmus of Avalon is not included in the region as it is part of Economic Zone 15. The region includes a variety of community types, ranging from the city entities of St. John's and Mount Pearl and larger towns such as Conception Bay South, Paradise and Bay Roberts, to small rural communities in the north and northwestern parts of the region. Unlike most of the other regions included within the Study Area, the majority of people in the region live in communities with populations over 5,000 (NLSA / Community Accounts n.d., internet site).

The total population of the region increased by 0.9% between 1991 and 2006, from 225,517 to 227,490 (Figure 15.3.4-9) and rebounded between 2001 and 2006 from the decline experienced in the 1996-2001 period. Most of the losses have been in the rural, smaller and more isolated communities in the region. For the 2001-2006 period, the population grew by 4.3% (NLSA / Community Accounts n.d., internet site). While the strength of the economy of the Census Metropolitan Area is closely associated with growth in the offshore oil sector, discussed below in Section 15.8.3, much of the population increase is associated with in-migration from elsewhere in the region and the province (NLDF 2008, internet site).

15.4.4 Economy

For many years since Confederation, Newfoundland and Labrador had the slowest growing economy in Canada. This situation was aggravated in the late 1980s and early 1990s with closures in the groundfish industry. The performance of the Newfoundland and Labrador economy today has improved dramatically, largely a result of the growth of the offshore oil sector, mineral production in northern Labrador and iron ore production in western Labrador. The Hibernia, Terra Nova and White Rose offshore petroleum projects (Shrimpton 2004, internet site); iron ore expansion in Labrador West (NLDNR 2010b, internet site); the Voisey's Bay mine / mill development in Labrador (Vale 2010, internet site) and most recently the Vale nickel processing facility at Long Harbour (Newfoundland and Labrador Executive Council (NLEC) 2009, internet site), are among the larger capital projects that have been or are presently sources of considerable employment. These projects are the reason why the economy of the province, as reflected in Gross Domestic Product (GDP) growth, has been one of the fastest growing in Canada in recent years (NLDF 2010b, internet site).

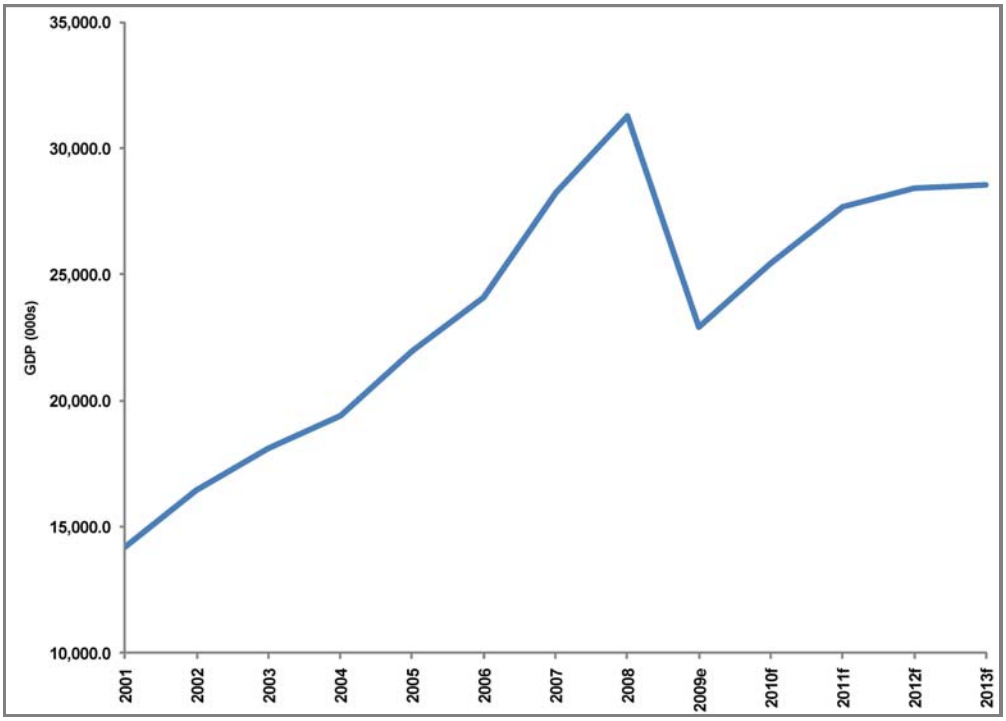
The provincial GDP, which represents the annual total value of all goods and services, petroleum and minerals extracted, etc., declined in 2009 by 8.9% as a result of the recession, which began in the third quarter of 2008. A decrease in oil exports combined with a substantial decrease in the price of oil, as well as in the value of minerals produced and recession-related output cuts were the main factors associated with this decline. Provincial GDP has and is anticipated to continue to rebound in 2010 and 2011, with forecast growth rates of 4.0% and 3.1%, respectively. This growth will likely be driven by rebounding commodity prices and increased construction activity. Future provincial GDP growth is largely dependent on the timing of other major capital projects such as the Hebron offshore oil project and the Lower Churchill Hydroelectric Generation Project (NLDF 2010b, internet site).

Despite the progressive weakening in Newfoundland's employment growth in 2009, housing demand has remained robust. This has been due in part to a reversal, since the first-quarter of 2008, of the province's chronic pattern of out-migration, low interest rates and consumer confidence in the economy. Between 1997 and 2007, the New House Price Index for Newfoundland and Labrador increased 36.3% or an average of 3.6% per year. However, since 2007, new home prices in Newfoundland and Labrador have increased by 33.3%, with a 19.6% increase in 2008 followed by an 11.5% increase in 2009. The increase in housing prices in the province over the last two years was the largest cumulative increase observed in Canada (CMHC 2010a, internet site).

Selected indicators of the overall performance of the provincial economy are illustrated in Figure 15.4.4-1 and Figure 15.4.4-2 for 2001 to 2013 (forecast).

As illustrated by Figure 15.4.4-2, the goods-producing sector contributed 61.4% to the provincial GDP in 2008. Oil extraction and support activities dominated, contributing almost 40% to total provincial GDP. Mining contributed a further 11.5%, and manufacturing, which includes fish products and forestry products such as newsprint, an additional 3.7%. Travel and tourism, included as part of the services-producing sector, contributed 2.4% to the total provincial GDP in 2008 (NLDF 2010c, internet site).

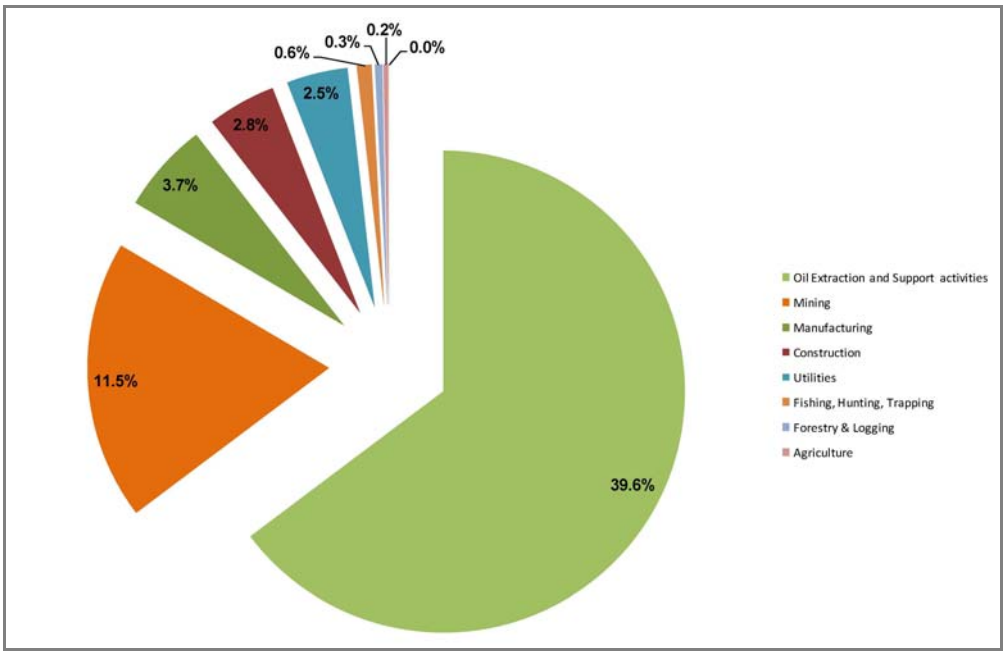
Figure 15.4.4-1 Gross Domestic Product at Market Prices ($ Millions), Newfoundland and Labrador, 2001 to 2013



Source: NLDF 2010c, internet site.

Note: "e" following year = estimated.
"f" following year = forecast.

Figure 15.4.4-2 Contributions to Provincial Gross Domestic Product by Goods-Producing Sector, Newfoundland and Labrador 2008



Source: NLDF 2010d, internet site.

15.4.4.1 Economic Sectors

The following is a brief description of activity in some of the province's major industries. In addition, the reader is referred to Section 15.5 Land and Resource Use, as various specific commercial activities are discussed further in that section.

Petroleum Sector

The petroleum industry has become the dominant sector of the Newfoundland and Labrador economy. The start of the 1990s saw the beginning of a new phase in the province's offshore petroleum industry with the construction of the Hibernia platform at Bull Arm. This $5.9 billion project, the largest construction project in North America at the time, created, at peak (in September 1995), approximately 6,100 jobs in Newfoundland and Labrador (Community Resource Services Ltd. 2003), and is reflected in the substantial increase in capital investment in the 1993 to 1996 period.

Other projects completed during this time included the construction of the Newfoundland Transshipment Terminal and the initial phase of development for the Terra Nova oil field. Work on the latter, a $2.8 billion project, started in 1998 and the completed Terra Nova Floating Production, Storage and Offloading (FPSO) vessel arrived at the Grand Banks in August 2001, with oil production starting in January 2002 (Community Resource Services Ltd. 2003). Subsequently, work on the $2.35 billion White Rose Project began in 2002 and the first oil from that field was delivered in 2005.

Production from offshore petroleum projects was 97.7 million barrels of oil in 2009, a 22% decrease from the previous year. In addition, the value of production decreased by 48% in 2009 to $6.6 billion. This was a result of both reduced production and a sharp decline in crude oil prices, which declined from an average of US$96.94 in 2008 to US$61.74 in 2009. With rebounding prices, offshore oil production continues to increase in importance as the dominant contributor to the provincial economy. By the end of 2009, cumulative production from the provincial offshore oil industry was 1.09 billion barrels, with an estimated value of $65.6 billion (NLDF 2010c, internet site).

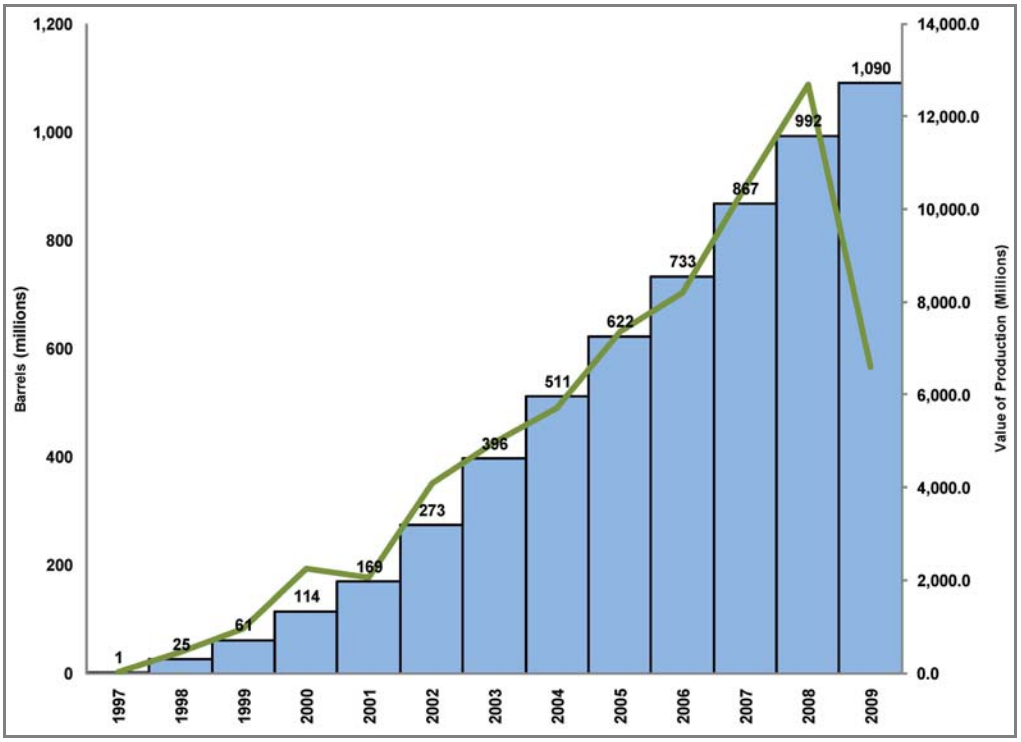
Total oil production in the province is shown in Figure 15.4.4-3, with peak production to date occurring in 2007. Oil-related expenditures from 1992 to 2008 are illustrated in Figure 15.4.4-4. Overall, expenditures for offshore exploration, pre-development, development and offshore oil production have increased during this period, reaching a peak of $1.6 billion in 2008 (Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) 2010a, b, internet sites).

In August 2008, the province announced that it had reached a Memorandum of Understanding with the Hebron offshore project proponents (Exxon-Mobil, Chevron, Suncor, Statoil-Hydro and Nalcor) to develop that oil field, which is estimated to contain approximately 700 million barrels of oil. In February 2010, the GNL ratified the Memorandum of Understanding reached in 2009 and signed a formal agreement with its industry partners to develop the Hibernia South Extension (NLDF 2010c, internet site), a project which is expected to add an estimated $10 billion to provincial revenues (NLEC 2009, internet site).

Mining

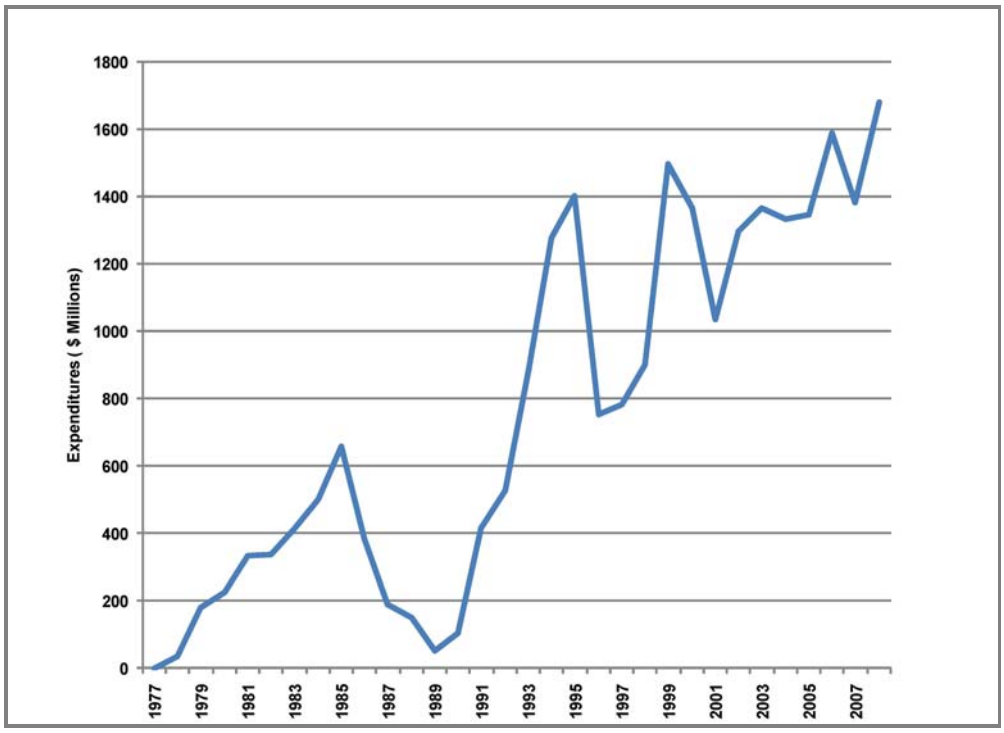
Largely as a result of the global recession, the value of mineral production from the provincial mining industry declined in 2009. The value of shipments declined by approximately 50% to $1.9 billion (Figure 15.4.4-5), largely due to the influence of lower prices and production of nickel and iron ore. Additionally, lower demand resulting from the recession led to a 60% decline in exploration expenditures. Finally, direct employment resulting from mining decreased by 11% to approximately 3,500 person-years. However, prices for nickel and copper rose steadily throughout 2009, while increases were also seen in spot prices for iron ore, all of which will benefit the province in 2010 and beyond (NLDF 2010c, internet site).

Figure 15.4.4-3 Cumulative Offshore Oil Production / Annual Value of Production in Newfoundland and Labrador, 1997 to 2009 (million barrels and millions $)



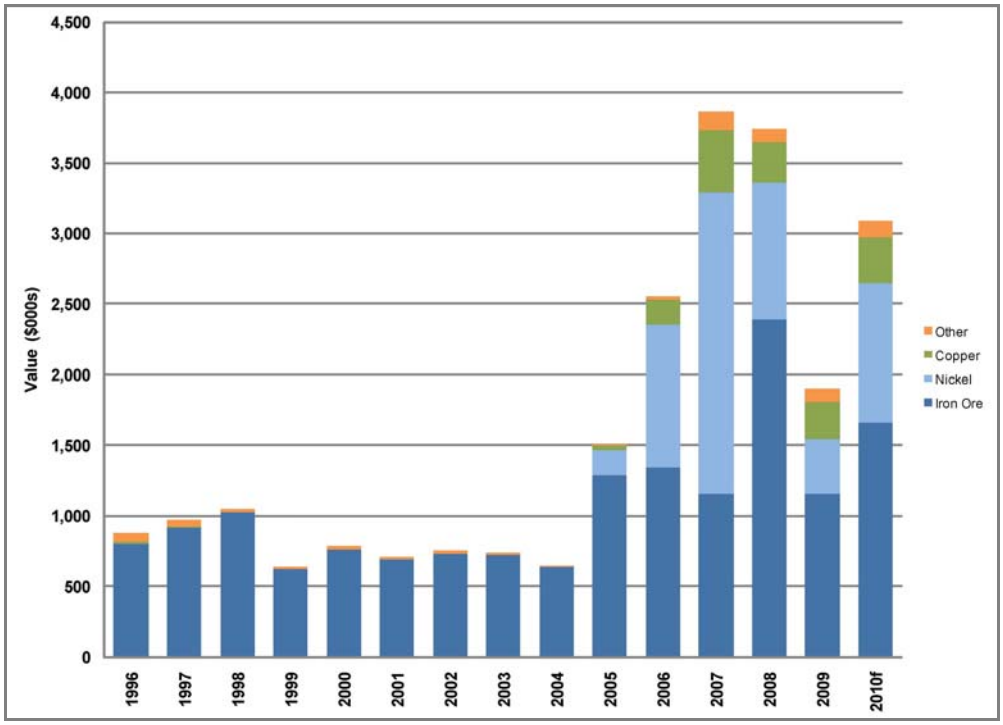
Source: C-NLOPB 2010a, internet site.

5 **Figure 15.4.4-4 Offshore Area Expenditures: 1977 to2008**



Source: C-NLOPB 2010b, internet site.

Figure 15.4.4-5 Value of Mineral Shipments ($000s), Newfoundland and Labrador; 1996 to 2010



Source: NLDF 2010c, internet site.

Note: "f" following year = forecast.

Manufacturing

Fish production is an important, but recently declining component of the provincial manufacturing sector. Primary production of shellfish (e.g., shrimp and crab), groundfish (e.g., cod and flounder). pelagics (e.g., mackerel and capelin) and aquaculture products (e.g., Atlantic salmon and blue mussels) form the basis of the industry. In 2009, fish landings dropped 8.5% to 300,700 t. However, the value of landings declined by 19.2% to approximately $420 million, largely due to lower prices for key species as a result of the global recession. Export values also declined in 2009, decreasing by 11.2% to $721 million. Employment in both harvesting and processing declined in 2009, with total industry employment averaging 10,300 people, down from 12,000 in 2008. Production from the processing industry was 176,377 t in 2009, a 4.3% decrease from the previous year. Additionally, the value of shipments declined 19.3% compared to the previous year, a reflection of the lower prices that affected the harvesting industry (NLDF 2010c, internet site).

In recent years, provincial manufacturers of both newsprint and lumber have been facing challenges that threaten the viability of large and small firms in the industry. Changing currency values, increased demands on fibre supply, declining or at best flat demand for key products, and rising input costs have combined to create a difficult operating environment for the province's forest products producers (Milley 2006, internet site).

With respect to newsprint, demand continues to decline. Between 2000 and 2009, North American newsprint production declined by 53%; in 2009 alone, production fell by 28%. This downturn has negatively affected the provincial newsprint industry, which has seen a series of mill closures since 2005. Abitibi Bowater closed its Stephenville mill in 2005 and its Grand Falls mill in March 2009, leaving Corner Brook Pulp and Paper Limited (CBPPL) the only newsprint facility in operation in the province. The volume of provincial newsprint shipments was 264,500 t in 2009, a 49% decrease from the previous year. Low prices resulted in a substantial decrease in value, with average prices down 19. 4%, to US$565 per tonne (NLDF 2010c, internet site).

In its 2010 Budget, the GNL announced that it would provide $15.4 million in assistance to Kruger Inc., the owner of CBPPL. This assistance is in the form of provincial participation in the annual silviculture program, as well as foregoing the company's annual financial contribution to the Forest Inventory, Forest Insect Control and Managed Land Tax programs (NLDF 2010c, internet site).

The lumber sector has also experienced difficult conditions in recent years. Prices have declined 50% since 2004, largely associated with downturns in the Canadian and US housing markets. Producers have found lumber production increasingly unprofitable given low prices and, as a consequence, the volume of production declined 14% in 2009 to 60 million board feet, which is low by historical standards. The decline in newsprint production has also had an adverse effect on the production of pulp chips, an important by-product of the lumber industry. Some relief for the lumber sector was evident in late 2009 and early 2010 as prices showed an increase to US$300 from US$198 per 1,000 board-feet in the first quarter of 2009 (NDLF 2010c, internet site).

In 2008, the provincial government announced a $14 million Forest Industry Diversification Fund to assist the forest sector (NLDNR 2008, internet site). This fund is designed to help the provincial sawmill sector modernize and diversify, and to provide sawmill operators with capital to acquire new infrastructure, technology and equipment to support innovation and modernization of the industry (see Section 15.8.4 Northern Peninsula, below).

Tourism

Although the Canadian tourism industry experienced a sharp decline in 2009 due to the recession and the strong Canadian dollar, the provincial tourism industry performed positively, with a 0.8% increase in non-resident visitors. Estimated spending also increased by 1.4%, to $375 million. Air travel accounted for 72% of visitors and 80% of spending in 2009, with non-resident air travel increasing by 0.6% to 348,300 passengers (NLDF 2010c, internet site). This is discussed in detail in the Tourism Section 15.7.

15.4.4.2 Regional Economies in the Study Area

Central and Southeastern Labrador

The economy of Central and Southeastern Labrador is based primarily on the service industry and raw material extraction. Major industries include hydro, aerospace, services to the mining industry, fish harvesting and processing, forest resources and tourism (NLDTW 2006, internet site).

The economy of this region, and particularly the Upper Lake Melville area of Economic Zone 3, has improved with the ongoing development of the TLH, which has resulted in new commercial trading patterns, business expansions and tourism opportunities (AMEC 2010a, internet site). The Voisey's Bay project, ongoing mineral development and exploration in Labrador West, and the proposed Lower Churchill Hydroelectric Generation Project, have been cited as the drivers behind a positive economic mood in the region (Central Labrador Economic Development Board (CLEDB) 2008, internet site), though labour disruption at Voisey's Bay negatively affected personal income levels and spending in this and other regions of Labrador in 2009 and 2010.

Happy Valley-Goose Bay is the largest community in Labrador and is the administrative hub for the delivery of government services to central and coastal Labrador. The offices of many provincial and federal government departments are located here and these departments and agencies are large employers of professionals and trades people (CLEDB 2008, internet site). Happy Valley-Goose Bay is a transportation hub and administrative centre for the delivery of services to central and coastal areas, and it is expected to be an important staging area for the Labrador portion of the Project.

The military base in Happy Valley-Goose Bay (5 Wing Goose Bay), established in 1941, has historically been the largest employer in the Upper Lake Melville region. In the 1950s, it became a support base for the Strategic Air Command, and by the 1960s, the Happy Valley-Goose Bay population included more than 12,000 military personnel and their dependants. Subsequent reorganization, deactivation and relocation of military units

resulted in a decline in the number of personnel at 5 Wing Goose Bay. Marketing and other efforts to attract allied training are ongoing. The Department of National Defence does operate a Search and Rescue helicopter unit (444 Squadron) at 5 Wing Goose Bay and preparations for a five-year (2011 to 2016) North Atlantic Treaty Organization (NATO) exercise within the 130,000 km^2 air range are ongoing (CLEDB 2008, internet site).

Reduced activity at 5 Wing Goose Bay is a concern with respect to the economy of Happy Valley-Goose Bay. Nevertheless, base expenditures still contribute considerably to the local economy. In 2006-2007, direct expenditures at 5 Wing Goose Bay in Labrador were $56.4 million. Capital works expenditures in 2006-2007 (e.g., hangars, buildings, taxiways, parkways, runways and construction projects) totalled $3.6 million; further, 5 Wing Goose Bay has engaged contractors for a multi-year environmental clean-up program. In 2006 and 2007, the total direct expenditure associated with environmental remediation was $5.6 million (AMEC and Gardner Pinfold 2008). In 2009, the federal government committed $300 million for cleanup efforts at 5 Wing Goose Bay. The 10 year program is expected to substantially clean up waste caused by the past storage of contaminants (Defence Construction Canada (DCC) 2011, internet site).

Fisheries continue to be the largest employer for people living in coastal communities in Economic Zones 4 and 5, despite the shortage of some species such as snow crab and turbot. This shortage, combined with an aging labour force and the challenge of labour recruitment, are major issues for the fishing industry. Increased fuel prices and the high cost of transporting materials and products also add to the uncertainty of the industry (Newfoundland and Labrador Department of Fisheries and Aquaculture (NLDFA) 2010, internet site). Tourism, agriculture (wild berries) and fur farming are other important sectors within Economic Zone 5.

Major gas reserves identified off the North Coast of Labrador in the 1970s have recently gained renewed interest. A call for bids by the C-NLOPB produced $186 million in expenditure commitments in return for exploration rights in four parcels in offshore Labrador (C-NLOPB 2008, internet site), which might have long-term implications for coastal communities in Economic Zone 5.

Labrador has 18 million hectares (ha) of forested land. With 5.5 million ha of productive forest, the gross volume of merchantable timber is estimated at 180,000,000 m^3 (NLDNR 2009, internet site). A provincial government Labrador Value Added Forestry Study, completed in 2006 (Milley 2006, internet site), evaluated the potential of developing sawmills and value-added wood products. It identified potential business plans for secondary processing of wood products with the objective of increasing economic development in the area. Forestry Management District 19A in central Labrador currently has 11 commercially licensed sawmills, with annual outputs ranging from a few thousand board feet to over 1.0 million board feet. Average production since 1990 is approximately 1.4 million foot-board-measures (3,304 m^3) (NLDNR 2009, internet site).

In 2009, tourism in Labrador experienced a decline relative to the previous year, with a 6.5% decrease in passenger movements through the Goose Bay airport and a 2.7% decline in hotel occupancy from 2008 to 2009. However, registered campsites in Pinware River Provincial Park (Economic Zone 5) by 21.5% over the same period (Newfoundland and Labrador Department of Tourism, Culture and Recreation (NLDTCR) 2010a, internet site).

Northern Peninsula

The fishery has historically been the main economic activity on the Northern Peninsula, and the collapse of the groundfish sector and subsequent closure of many of the fish processing plants had a substantial social and economic effect. Recently, the area has experienced some economic diversification through harvesting and processing of alternative species such as shellfish, and an increase in tourism. Tourism and the forestry sector are the other principal economic drivers within this region's economy (NEDC 2008, internet site).

While the Northern Peninsula region's economy has traditionally been based on natural resource industries, sites such as Gros Morne National Park have become major tourism industry generators. In 2009, the Park attracted 174,000 visitors, 72% of which came from outside of the province. Tourists to the area spent $38 million in 2009 which generated employment in the area.

The influence of CBPPL is felt both on the Northern Peninsula and in Central and Eastern Newfoundland. The company manages over 2 million ha of forest land in Newfoundland and the CBPPL licence area extends from Plum Point on the Northern Peninsula east to Gander in the Central and Eastern Newfoundland Study Area region. The woodlands division of CBPPL employs 600 employees in harvesting and silviculture operations in almost 50 Newfoundland communities, with another 700 people at the mill in Corner Brook and at the Deer Lake Power Company (Corner Brook Pulp and Paper Limited (CBPPL) 2010, internet site).

In 2009, the provincial government announced that it would modernize a sawmill and establish a wood inventory yard and pelletizing facility on the Northern Peninsula. Funded through the Forest Industry Diversification program announced in 2008 (NLDNR 2008, internet site), the $10 million investment in Holson Forest Products of Roddickton, once in operation, is forecast to sustain approximately 300 direct and indirect jobs in the region and create a new industry in manufacturing wood pellets (NLDNR and NLDEC 2009, internet site). In January 2010, the Atlantic Canada Opportunities Agency (ACOA) announced that it would contribute more than $1 million towards development of the wood lot associated with the pellet plant (Western Star 2010, internet site).

Central and Eastern Newfoundland

The economy of Central and Eastern Newfoundland has long been based on resource extraction and related industrial activities, including fishing, mining, pulp and paper. The Grand Falls-Windsor and Bishop's Falls areas are major industrial, service and government centres in Central and Eastern Newfoundland, with the forestry and pulp and paper industries serving historically as major employers. Since the closure of the Grand Falls-Windsor pulp and paper mill in the first quarter of 2009, there have been ongoing efforts to increase the economic diversification in the region, including consideration of a wood pellet plant for the area (Farm Focus 2010, internet site).

The Town of Gander also serves as a public and private sector service centre and transportation hub for the region. In the eastern portion of the region, Clarenville is the commercial and government service centre for the surrounding area, including the Bonavista and Trinity Bay areas. In the coastal areas of the Central and Eastern Newfoundland region, the fishery remains an important element of the economy.

As noted earlier, there has been a surge in house prices in the province, particularly since 2007. While increases in Central and Eastern Newfoundland have not been as great as in the St. John's Census Metropolitan Area, they have nonetheless been considerable; home prices in the Gander area, for example, increased by approximately 7% between 2009 and 2010. Prices also increased by a similar amount in Grand Falls-Windsor, notwithstanding the economic distress associated with the closing of the paper mill in Grand Falls (CBC 2010, internet site).

Avalon Peninsula

The economy of the Avalon Peninsula region is dominated by activity in the St. John's Census Metropolitan Area. As the main centre of government and the location for many of the province's major industries, the Census Metropolitan Area has a more diverse and well-developed economic base compared to other parts of the province. Despite a 7.3% drop in GDP for the Census Metropolitan Area in 2009, St. John's out-performed most other Canadian Census Metropolitan Areas in 2009 and ranked fifth in employment growth and sixth in housing starts. This strong performance is expected to continue as within the Census Metropolitan Area a variety of industries, including professional, scientific, construction and retail trade, are forecast to experience strong growth in 2010 and beyond (City of St. John's 2010, internet site).

The current strength of the economy in the Census Metropolitan Area is reflected in house prices. In 2008 the average house price was $187,571 increasing to $218,862 in 2009 (NLDF 2010c, internet site) and to $251,485 by March 2010 (CMHC 2010b, internet site). The Canada Mortgage and Housing Corporation project prices to continue to rise to $255,000 in 2011 (CMHC 2010b, internet site).

The St. John's International Airport and the Port of St. John's represent the main transportation hubs in the province, serving as gateways to the rest of Canada, the United States, and the rest of the world. A 2007 study into the economic impact of the St. John's International Airport estimated that the airport contributed $250 million to the provincial economy and $18 million in tax revenue to the GNL. Additionally, an estimated 80% of non-resident visitors to the province enter through the airport (Strategic Concepts Inc. 2008, internet site).

A 2010 economic study estimates that the annual contribution of the Port of St. John's to the provincial GDP has climbed to almost $255 million. The Port, in addition to serving as the primary offshore energy supply and service centre, also serves as a fish-handling centre, a container handling terminal and a base for the Canadian military and Coast Guard (SJPA 2010, internet site).

15.4.5 Employment

This section describes the characteristics of the labour force for the province of Newfoundland and Labrador and for the four regions considered within the Study Area.

15.4.5.1 Newfoundland and Labrador

In March 2010, the provincial labour force was estimated at 258,700, up from 254,200 in 2009, 253,100 in 2006 and 242,700 in 2001 (Figure 15.4.5-1). Despite some measurable fluctuations, the participation rate in the province (i.e., the percentage of the work-age population working or actively looking for employment) increased from 58.7% in 2001 to 59.3% in 2009 (Figure 15.4.5-2) (NLDF 2010e, internet site).

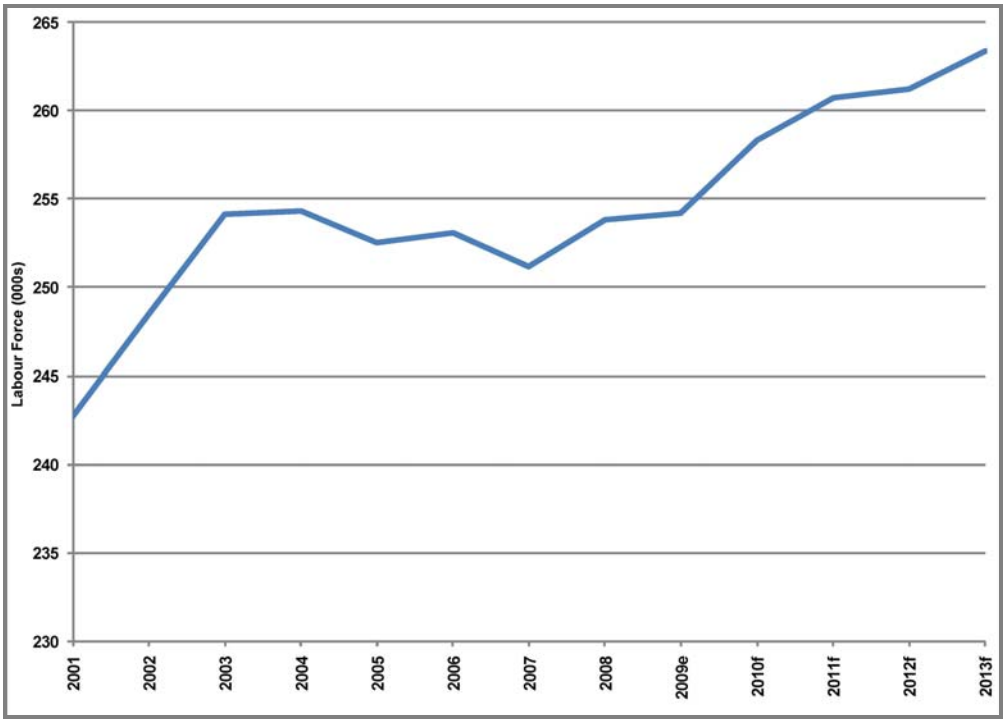
The overall unemployment rate in the province fell from approximately 16.2% in 2001 to 13.2% in 2008 (Figure 15.4.5-3). Unemployment rose to 15.5% in 2009 during the recession. Employment losses and growth in the labour force have contributed to the recent increases in the unemployment rate. Assuming the continued recovery of the economy, annual average employment is projected to grow over the next four to five years (Figure 15.4.5-4) (NLDF 2010e, internet site).

Data from the 2006 Census indicate there were 248,685 people aged 15 and over in the provincial labour force. The main sources of employment by industry were Business Services, which employed 35,390 people (14.2%), Retail Trade (30,580, 12.3%), Health Care and Social Assistance (30,360, 12.2%) and Other Services (50,040, 20.1%) (Figure 15.4.5-5). The industries that employed the fewest people were Finance and Real Estate (7,895, 3.2%) and Wholesale Trade (6,630, 2.7%) (Statistics Canada 2006d, internet site).

There has been an overall improvement in provincial employment indicators, but these have not kept pace with GDP growth. This is primarily due to the capital-intensive nature of offshore oil developments and mining projects. The unemployment rate in the province remains the highest in Canada, although it varies substantially from region to region. For example, in the St. John's Census Metropolitan Area, the 2009 unemployment rate (9.0%) was comparable to the rest of Canada (8.4%), whereas it was much higher in rural Newfoundland and Labrador, and as high as 21.9% in Economic Zones 2 and 4 (Burin Peninsula and South Coast, and Notre Dame-Central-Bonavista Bay) (NLDF 2010f, internet site). This reflects the continued shift in the provincial economy from rural, labour-intensive, resource-based activities to highly capital-intensive, concentrated resource-based activities.

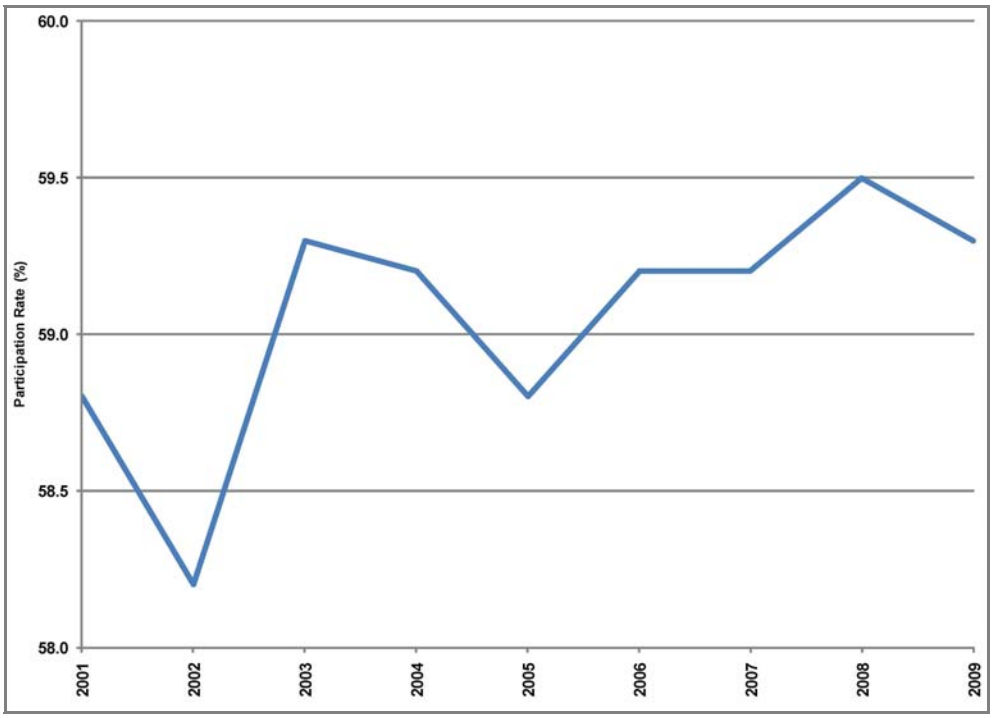
Education and skills requirements have and will continue to play an important role in this shift in industry focus. Entry-level employment into most sectors requires increasingly higher formal education levels. As illustrated in Figure 15.4.5-6, one-third of the current labour force does not have a high school certificate or other certificate or diploma. This compares to 23.8% for Canada as a whole (Statistics Canada 2006d, internet site).

Figure 15.4.5-1 Provincial Labour Force, Annual Average (000s)



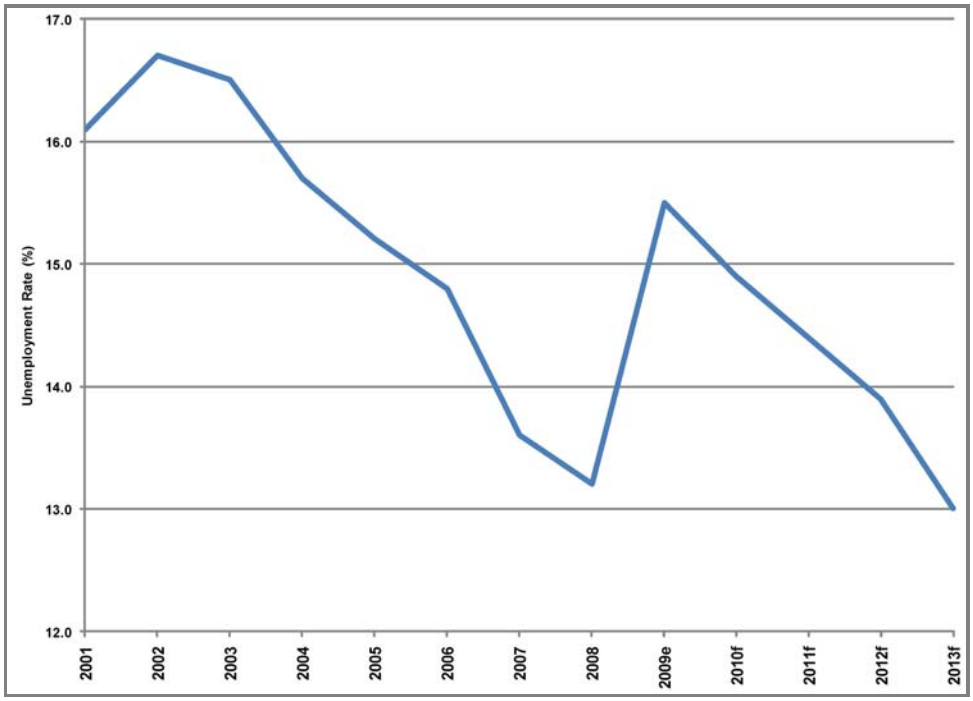
Source: NLDF 2010c, internet site.
Note: "e" following years = estimated.
"f" following years = forecast.

Figure 15.4.5-2 Provincial Participation Rates, 2001 to 2009



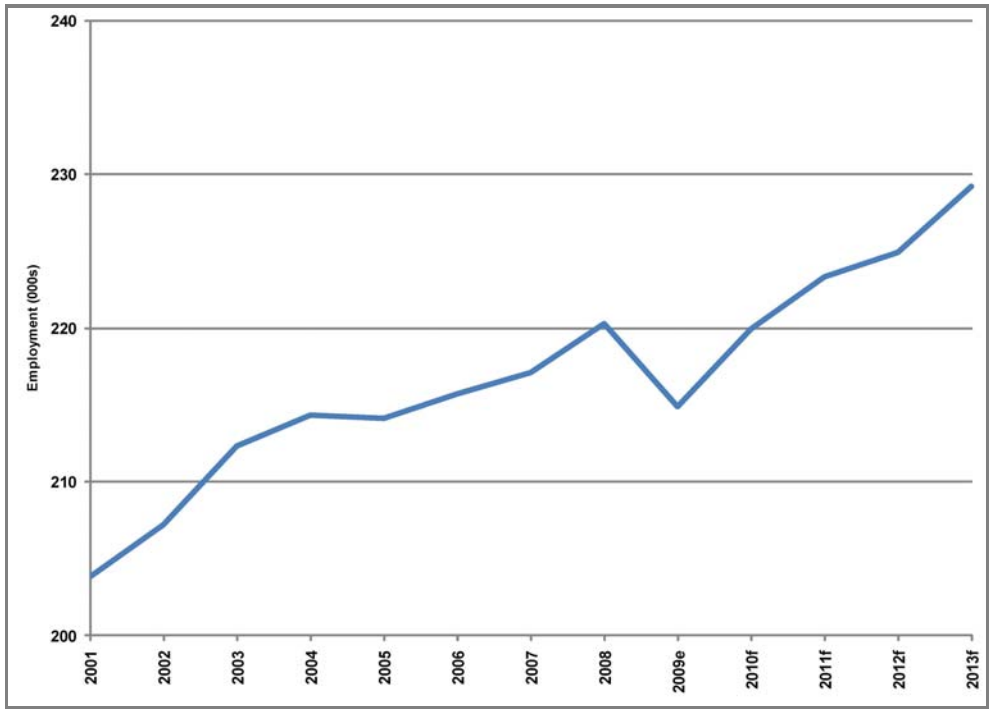
Source: NLDF 2010c, internet site.

Figure 15.4.5-3 Provincial Unemployment Rates, Annual Average (%)



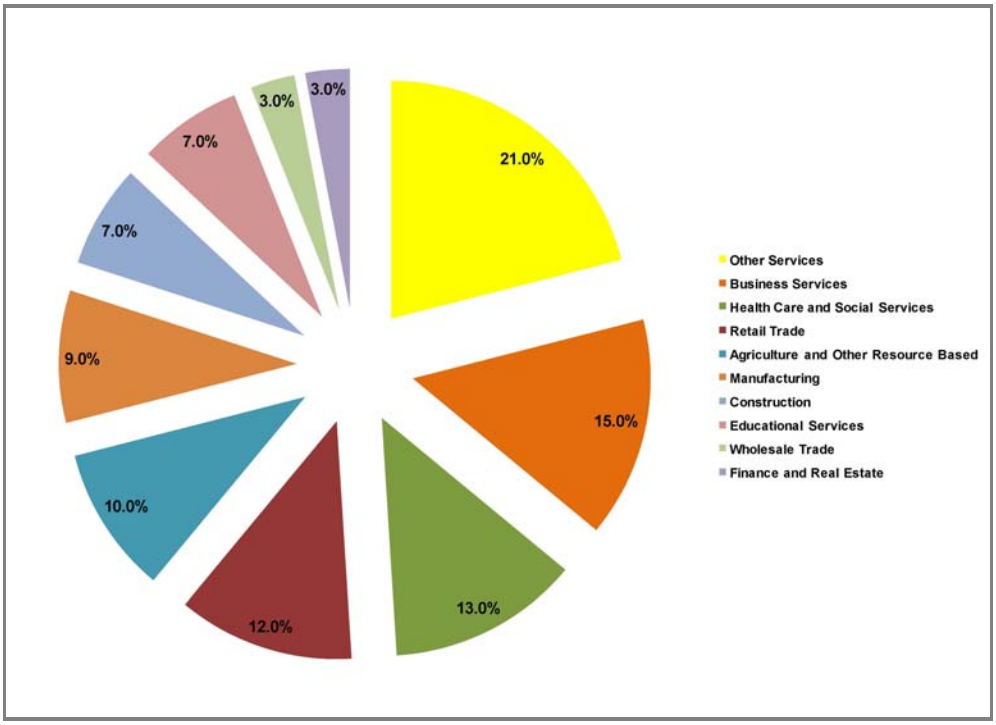
Source: NLDF 2010c, internet site.
Note: "e" following year = estimated.
"f" following year = forecast.

Figure 15.4.5-4 Provincial Employment, Annual Average (000s)



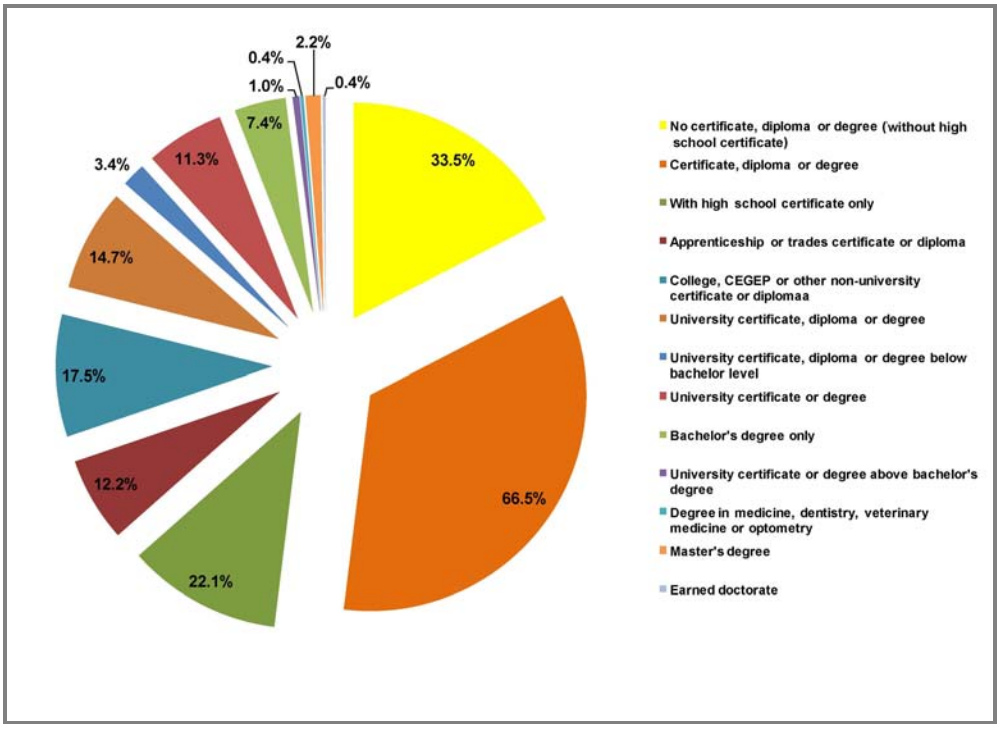
Source: NLDF 2010c, internet site.
Note: "e" following year = estimated.
"f" following year = forecast.

Figure 15.4.5-5 Labour Force (%) by Industry, Newfoundland and Labrador



Source: Statistics Canada 2006d, internet site.

Figure 15.4.5-6 Education Levels in Newfoundland and Labrador



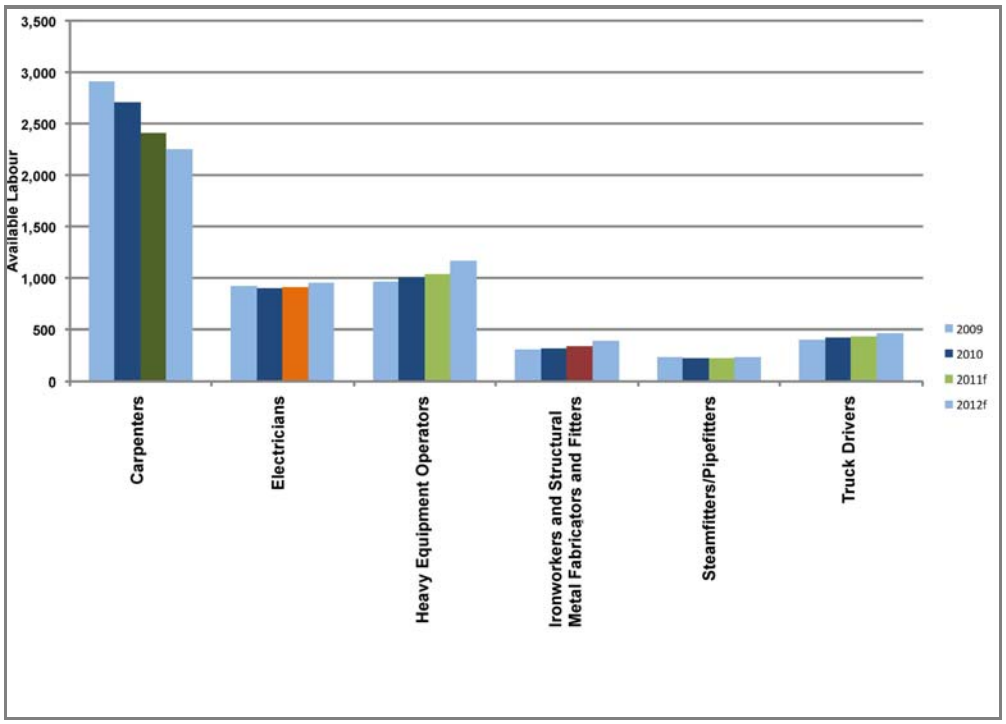
Source: Statistics Canada 2006d, internet site.

The availability of skilled labour is becoming an increasingly important issue, both in Canada and in Newfoundland and Labrador. An analysis by the Newfoundland and Labrador Department of Finance for the Skills Task Force indicates that the recession that persisted through 2009 provided temporary relief from some of the anticipated labour pressures, but suggests that labour force requirements for the current major project inventory in Newfoundland and Labrador will peak in 2014-2015 (NLDF 2010d, internet site). Possible shortages exist for civil engineers, industrial electricians, ironworkers, concrete finishers, industrial painters, drillers / blasters, truck drivers and stationary engineers.

The Construction Sector Council (2010, internet site) has also completed an assessment of construction labour markets in Newfoundland and Labrador from 2010 to 2018. Over this period, the study estimates that retirements and mortality will total 3,780 and employment will drop by 470 jobs. While 2,230 new entrants are expected, there will still be a decrease of 1,360 workers. This assessment concludes that construction trades in the province will see an "ebb and flow" of demand for workers, with peak demand from 2012 to 2014, which corresponds to the current estimated construction dates for the Project. The period from 2012 to 2014 is the estimated peak for construction trades in the province, due to a series of major industrial projects (e.g., the Hebron offshore project, Vale nickel processing facility and continued expansion of the White Rose oil field). Low availability and shortages in several occupational categories (e.g., carpenters, electricians, heavy equipment operators, ironworkers and structural metal fabricators, pipefitters and truck drivers) are forecast to coincide with Project construction as currently scheduled.

As indicated in Figure 15.4.5-7, the projected supply of workers in these trades, at best, shows small increases in the immediate future, with the exception of carpenters, the supply of which is expected to continue to decline. Potential shortages in key occupations of particular relevance to the Project and other labour supply-related issues are discussed in Chapter 16, Section 16.4, which addresses the effects assessment of the Project on the Economy, Employment and Business of Newfoundland and Labrador.

Figure 15.4.5-7 Labour Supply, Selected Trades, Newfoundland and Labrador, 2009 to 2012



Source: Construction Sector Council 2010, internet site.
Note: "f" following year = forecast.

Employment Equity and Diversity

Working-age people who are not in the labour force today will play an increasingly important role in helping to meet future labour demands. There are also a number of groups already in the labour market that are underrepresented and continue to face employment challenges and barriers that limit their full participation, including women, persons with disabilities, Aboriginal groups, youth and mature workers. In the 2010 Work Activity Survey, the Department of Human Resources, Labour and Employment (HRLE) asked survey respondents (18 to 64 years old) who were not in the labour force about their main reasons for not working. This population represented about 84,000 people, or 25% of the 18 to 64 year-old age group. The largest share of those not in the labour force, about one-quarter (or 25.9%) were retirees, another 18.4% had a permanent disability that prohibited them from working, and 16.7% were in school (NLDHRLE 2011, internet site).

Women tend to have lower participation rates than men. However, unemployment rates among women are also lower than men which suggest women are more likely to find work when they enter the labour force. Relative to men, women are more likely to work in the health and social service occupations; sales and service occupations; and business and administration occupations. Women are significantly under-represented in the skilled trade occupations. The 2010 Work Activity Survey results indicate that conditions have been improving, with about 5% of women working in the skilled industrial trades (NLDHRLE 2011, internet site).

Aboriginal populations are more likely to participate in the workforce than other groups. However, a high unemployment and relatively lower employment rate indicates they face challenges to finding employment. Aboriginal workers tend to have lower levels of formal education. In 2006, 42% of the Aboriginal population in the province had less than high school education and 6.3% had a university degree (NLDHRLE 2011, internet site).

A much lower proportion of persons with disabilities participate in the labour market. Employment rates are significantly lower for this population and unemployment rates tend to be higher than the general population. These indicators point to significant employment barriers for persons with disabilities who enter the labour market (NLDHRLE 2011, internet site).

15.4.5.2 Central and Southeastern Labrador

The labour force in this region of the Study Area increased slightly (0.8%) between 2001 and 2006 from 7,240 to 7,295. Unemployment rates varied widely and showed differences in their directions of change in the 2001-2006 period. In Zone 3, for example, the unemployment rate was slightly lower than that for the province as a whole, but showed an increase from 13.9% to 14.4% between 2001 and 2006. By contrast, unemployment in Zone 4 increased from 54.9% to 57.5%, while in Zone 5 it decreased from 41.8% to 33.1% (NLSA / Community Accounts n.d., internet site).

These differences can be mainly attributed to the nature of the respective local economies. In Zone 4, for example, some 36% of the labour force had occupations in Fishing or Fish Processing in 2006. By comparison only 21% were similarly occupied in Zone 5. Occupations in Zone 3 indicate a more diversified economy, with a much smaller percentage occupied in primary activities or associated processing. Of potential relevance to the Project is that some 18% of the region's labour force had occupations in Construction and Related activities in 2006 (NLSA / Community Accounts n.d., internet site).

15.4.5.3 Northern Peninsula

The labour force in the Northern Peninsula region of the Study Area also showed a small increase (0.9%), from 28,130 to 28,395 in the 2001 to 2006 period. In Economic Zones 6 and 7, unemployment rates were significantly higher (35.7% and 35.6%) than that for Zone 8 (17.9%) in 2006, though all zones saw a decrease in unemployment rates between 2001 and 2006 (NLSA / Community Accounts n.d., internet site).

As in Central and Southeastern Labrador, higher zonal unemployment rates are associated with greater occupational dependence on primary activities and lower levels of economic diversity. In Zones 6 and 7, for

example, 28% and 25% of the labour force had occupations in Fishing and Fish Processing and 19% and 4% Logging and Other Processing in 2006. On the other hand, Zone 8, which includes Corner Brook and the CBPPL operations, had only 4% and 5% respectively, engaged in these occupations. Corner Brook's service role within the larger region offers a wider range of employment possibilities and greater employment stability. In this region also, some 17% of the labour force had occupations in Construction and related activities (NLSA / Community Accounts n.d., internet site).

15.4.5.4 Central and Eastern Newfoundland

The labour force in this region of the Study Area showed a small (0.5%) decrease in the 2001 to 2006 period, but as in the other regions, unemployment rates, while still well above the provincial average, decreased over the period. Zone 11 showed the greatest decrease from 39.2% to 28.3%, while the other zones decreased between 1% and 5%. By 2006, the unemployment rates in each of the other zones (12, 14 and 15) had decreased to approximately 24% (NLSA / Community Accounts n.d., internet site).

The importance of primary occupations, particularly fishing, varies across the region. In Zone 11, for example, 21% of the labour force had occupations in Fishing and Fish Processing, while in Zone 12 only 2% had occupations in these activities. As in the other study regions, a substantial proportion (20%) of the labour force report that they are in Construction and related occupations (NLSA / Community Accounts n.d., internet site).

15.4.5.5 Avalon Peninsula

The labour force of the Avalon Peninsula region of the Study Area grew by 7.4%, from 110,440 to 118,595 in the 2001-2006 period. This was the largest increase of all the Study Area regions and reflects the population growth in the area. Unemployment rates varied considerably across the region, from 20.4% in Economic Zone 17 in 2006 to 10.4% in Zone 19. As with most other economic zones in the other regions, unemployment rates had decreased over the 2001-2006 period. Decreases were almost 8% in Zone 17 and 1.4% in Zone 19 (NLSA / Community Accounts n.d., internet site).

The relative strength and diversity of the economy in Zone 19, in particular, has undoubtedly had an influence on population and labour force growth and decreasing unemployment rates. The occupational structure is also quite different from that of Zone 17 and of that of most other economic zones in the Study Area. In Zone 17, for example, Fishing and Fish Processing represents 17% of the occupations, while it represents less than 1% in Zone 19. Health, Education, Sales and Service, Management, and Office and Related occupations are absolutely and relatively more important in Zone 19 compared to other regions and zones. With respect to the labour force in Construction and related activities, Zone 17 shows a similar proportion (17%) to that for other the regions. In Zone 19, however, only 12% are in this occupation category, again reflecting the relative occupational and economic diversity of Zone 19 (NLSA / Community Accounts n.d., internet site).

15.4.6 Business

Businesses provide goods and services to others who want or need them. The overall structure of the business community in Newfoundland and Labrador (businesses by sector and number of firms) and changes over time is highlighted in Table 15.4.6-1, while Table 15.4.6-2 provides the most recent data for businesses by type and number in the Study Area regions.

Table 15.4.6-1 Number of Businesses by Type, Newfoundland and Labrador, 2001, 2005 and 2009

Industry	2001		2005		2009	
	Number of Businesses	Percent of Total (%)	Number of Businesses	Percent of Total (%)	Number of Businesses	Percent of Total (%)
Retail Trade	2,913	16.5	2,853	17.0	2,576	15.0
Health Care and Social Assistance	2,460	13.9	2,183	13.0	2,063	12.0
Construction	1,835	10.4	1,847	11.0	1,896	11.0
Other Services	1,870	10.6	1,718	10.2	3,130	18.2
Accommodation and Food Services	1,439	8.1	1,427	8.5	1,308	7.6
Professional, Scientific and Technical	932	5.3	895	5.3	1,025	5.9
Transportation and Warehousing	861	4.9	824	4.9	713	4.1
Wholesale Trade	880	5.0	773	4.6	703	4.1
Administrative and Support, Waste Management and Remediation	614	3.5	611	3.6	568	3.3
Agriculture, Forestry, Fishing and Hunting	697	3.9	631	3.8	568	3.3
Manufacturing	757	4.3	629	3.7	501	2.9
Real Estate, Rental and Leasing	524	3.0	521	3.1	509	3.0
Public Administration	463	2.6	468	2.8	408	2.4
Finance and Insurance	437	2.5	436	2.6	388	2.3
Arts, Entertainment and Recreation	408	2.3	444	2.6	329	1.9
Educational Services	213	1.2	179	1.1	147	0.9
Information and Cultural Industries	172	1.0	174	1.0	135	0.8
Management of Companies and Enterprises	143	0.8	108	0.6	142	0.8
Mining and Oil and Gas Extraction	71	0.4	72	0.4	87	0.5
Utilities	18	0.1	19	0.1	32	0.2
Total	**17,707**	**100**	**16,812**	**100**	**17,228**	**100**

Source: NLSA 2009, 2001, internet sites.

Table 15.4.6-2 Number of Businesses by Type, by Region, 2009

Industry	Central and Southeastern Labrador		Northern Peninsula		Central and Eastern Newfoundland		Avalon Peninsula	
	Number of Businesses	Percent of Total (%)	Number of Businesses	Percent of Total (%)	Number of Businesses	Percent of Total (%)	Number of Businesses	Percent of Total (%)
Retail Trade	93	19.6	222	13.3	580	16.4	975	12.3
Health Care and Social Assistance	68	14.3	174	10.5	476	13.5	880	11.1
Construction	36	7.6	192	11.5	378	10.7	1,032	13.0
Other Services	71	15.0	323	19.4	720	20.3	1,252	15.8
Accommodation and Food Services	37	7.8	136	8.2	283	8.0	557	7.0
Professional, Scientific and Technical	14	2.9	70	4.2	109	3.1	743	9.4
Transportation and Warehousing	18	3.8	94	5.6	178	5.0	271	3.4
Wholesale Trade	13	2.7	63	3.8	107	3.0	415	5.2
Administrative and Support, Waste Management and Remediation	12	4.8	51	3.1	80	2.3	322	4.1
Agriculture, Forestry, Fishing and Hunting	12	2.5	90	5.4	146	4.1	151	1.9
Manufacturing	17	3.6	38	2.3	118	3.3	245	3.1
Real Estate, Rental and Leasing	15	3.2	53	3.2	85	2.4	273	3.4
Public Administration	10	2.1	34	2.0	86	2.4	134	1.7
Finance and Insurance	—	—	49	2.9	68	1.9	209	2.5
Arts, Entertainment and Recreation	6	1.3	40	2.4	72	2.0	136	1.8
Educational Services	—	—	14	0.8	20	0.6	93	1.1
Information and Cultural Industries	—	—	7	0.4	10	0.3	81	1.0

Table 15.4.6-2 Number of Businesses by Type, by Region, 2009 (continued)

Industry	Central and Southeastern Labrador		Northern Peninsula		Central and Eastern Newfoundland		Avalon Peninsula	
	Number of Businesses	Percent of Total (%)	Number of Businesses	Percent of Total (%)	Number of Businesses	Percent of Total (%)	Number of Businesses	Percent of Total (%)
Management of Companies and Enterprises	7	1.5	14	0.8	5	0.1	91	1.1
Mining and Oil and Gas Extraction	—	—	—	—	12	0.3	48	0.6
Utilities	—	—	—	—	6	0.2	10	0.1
Total[(a)]	**474**	**100**	**1,664**	**100**	**3,539**	**100**	**7,923**	**100**

Source: NLSA 2009, internet site.

— Data not available.

(a) Total and percentages may not add up as in some cases the numbers of businesses were suppressed to meet confidentiality requirements.

As of December 2009, there were 17,228 businesses in Newfoundland and Labrador, most of which (56.2%) employed one to four people. There were 248 businesses (1.4%) with 100 to 499 employees and 48 businesses (0.3%) with over 500 employees. Between 2001 and 2005, the total number of businesses in the province declined from 17,707 to 16,812. Although the number of businesses has rebounded somewhat since 2005, it has not returned to 2001 levels. The decline in the number of businesses has been offset somewhat by an increase in the size of some operations. In the 2001 to 2009 period there was a decrease in the number of businesses in the 1-4 employee category from 62.8% to 56.2%, while businesses in the 5 to 19 employee group increased from 26.5% to 33.3% (NLSA 2009, 2001, internet sites).

Retail Trade (15%), Health Care and Social Assistance (12%), and Construction (11%) represented the largest specific businesses categories in 2009. The general category of Other Services (18.2%) was in fact the largest and, in recent years, the fastest growing category (NLSA 2009, internet site). Growth in this unspecified services category perhaps reflects an increasing diversification of business activity in the province.

The number of construction businesses in the province decreased by 3.3% over the 2001-2009 period, but within the Study Area regions, discussed in greater detail below, the overall decrease was less at 0.9%, with the Central and Southeastern Labrador region accounting for most of the decline within the group (NLSA 2009, 2001, internet sites).

15.4.6.1 Central and Southeastern Labrador

Retail Trade (19.6%), Other Services (15%), Health Care and Social Assistance (14.3%) and Accommodation and Food Services (7.8%) were the major categories of businesses in Central and Southeastern Labrador in 2009 (NLSA 2009, internet site). In the region, there was a 19.5% decline in the number of businesses between 2001 and 2009. Although this decline affected most sectors, manufacturing was the hardest hit, suffering a 39% decline. This is primarily associated with the decline in fish processing over that time (NLSA 2009, 2001, internet sites).

15.4.6.2 Northern Peninsula

Of the 1,664 businesses in the Northern Peninsula region, Other Services (19.4%) was again the single largest category, with Retail Trade (13.3%), Construction (11.5%), and Health Care and Social Assistance (10.5%) the major specific business categories. As in Central and Southeastern Labrador, the overall number of businesses declined between 2001 (2,409) and 2009 (2,198) by 8.8%, with manufacturing establishments declining by 42% over this time period (NLSA 2009, 2001, internet sites).

15.4.6.3 Central and Eastern Newfoundland

The pattern of overall decline in the number of businesses in the study region between 2001 and 2009 is repeated in Central and Eastern Newfoundland. In this period, the number of businesses decreased by 16.6%, with manufacturing businesses decreasing by 24.1%. As in the other regions, Other Services (20.3%) was the largest category, with Retail Trade (16.4%), Health Care and Social Assistance (13.5%), and Construction (10.7%) the other major categories (NLSA 2009, 2001, internet sites).

15.4.6.4 Avalon Peninsula

The Avalon Peninsula region showed an increase in the number of businesses between 2001 (7,585) and 2009 (7,923) of 4.5%. All the growth was in Economic Zone 19, which includes the St. John's Census Metropolitan Area. In Economic Zone 17, the number of businesses declined by 5% in this time period. In 2009, Other Services was the single largest category, but in this particular study area region Construction (13%) was larger than Retail Trade (12.3%) or Health Care and Social Assistance (11.1%), the other major business categories (NLSA 2009, 2001, internet sites).

15.4.7 Summary and Economic Prospects

Overall, the economy of the province has performed well since 1996, with substantial growth in GDP and employment, and an overall decline in unemployment. In 2006, for example, unemployment fell below 15% for the first time in 25 years and by 2008, it had declined further to 13.2%, the lowest rate experienced by the province since the mid-1970s. In April 2008, the province declared a budget surplus of $1.4 billion, the largest in its history, and Newfoundland and Labrador has now joined the ranks of Canadian "have" provinces, bringing an end to the federal equalization payments on which the province had depended since Confederation in 1949.

The recession of 2008 set back this growth path somewhat. Despite robust growth of capital spending in the first-quarter of 2009 (49.4% over the previous year), plunging energy prices, plus declining petroleum production, caused the value of the province's energy exports to drop by 36% from the previous year and total manufacturing exports to fall by 29%. This weakness in resource revenues had a negative effect on total employment. Compared to a 3% annual growth in total employment between May 2007 and 2008, by May of 2009, it had contracted by 5.3%, primarily due to substantial drops in employment in manufacturing, public administration, forestry and retail trade (Clinkard 2009, internet site).

Consumer confidence continues to be bolstered by the current strength of the economy and future prospects. This has been, and is projected to be reflected in increased residential house prices (CMHC 2010a, internet site). In addition the Major Project Inventory compiled by the Atlantic Provinces Economic Council (APEC) in 2010 suggests that much of the anticipated investment in major projects in Atlantic Canada in the near term is expected to occur in Newfoundland and Labrador. Higher spending as a result of the Vale nickel processing facility, the Hibernia Southern Extension and an increase in mining investment is expected to push annual major project investment to over $4 billion in 2011. Looking further ahead, spending associated with the development of the Hebron offshore oil field and the Lower Churchill Project will contribute to further economic growth (APEC 2010).

Regionally, the economic picture is varied. Much of the recent economic growth has been experienced on the Avalon Peninsula region and particularly in the St. John's Census Metropolitan Area in Economic Zone 19. In contrast, the closure of the paper mill in Grand Falls-Windsor represented a significant economic setback for the Central and Eastern Newfoundland region. Based on the GNL's Major Project Inventory (NLDF 2010g, internet site), economic prospects for the short- to medium-term suggest that many of the Study Area regions could see significant new economic activity, including for example, the Lower Churchill Project, mining activity in the Baie Verte area, and construction of mineral processing and offshore petroleum production facilities at Bull Arm.

15.5 Land and Resource Use

In this section, land and resource use refers to the use of land and resources by and for communities and transportation systems, natural resource-based industries (e.g., forestry, mining and agriculture), commercial activities (e.g., hunting, trapping and outfitting), recreational activities (e.g., boating, snowmobiling, cross-country and downhill skiing, kayaking, canoeing, hiking, bicycling, bird watching and riding motorized recreational vehicles) and subsistence activities (e.g., fishing, hunting and other harvesting). Recreation areas such as cottage developments, campgrounds, ski areas, trails, lakes, and golf courses are also discussed as are parks and protected areas.

Given the number and diversity of land and resource uses and the rather extensive geographic scale of the Project, it was not practical to map all of these in any detail in the EIS. Regional maps are included for general illustration, but the reader is referred to the socioeconomic component studies (AMEC 2011; Nalcor et al. 2011; AMEC 2010b) for further information and detailed mapping.

Several land and resource use related aspects are addressed in other sections of this EIS. Vehicular traffic is discussed in Sections 15.4 and 16.4; communities are discussed in 15.3 and 16.3; tourism in 15.7 and 16.7; economy, in 15.4 and 16.4; and visual aesthetics is addressed in Sections 15.8 and 16.8. Resource use related to the marine environment is also discussed in Section 15.6 and assessed in 16.6.

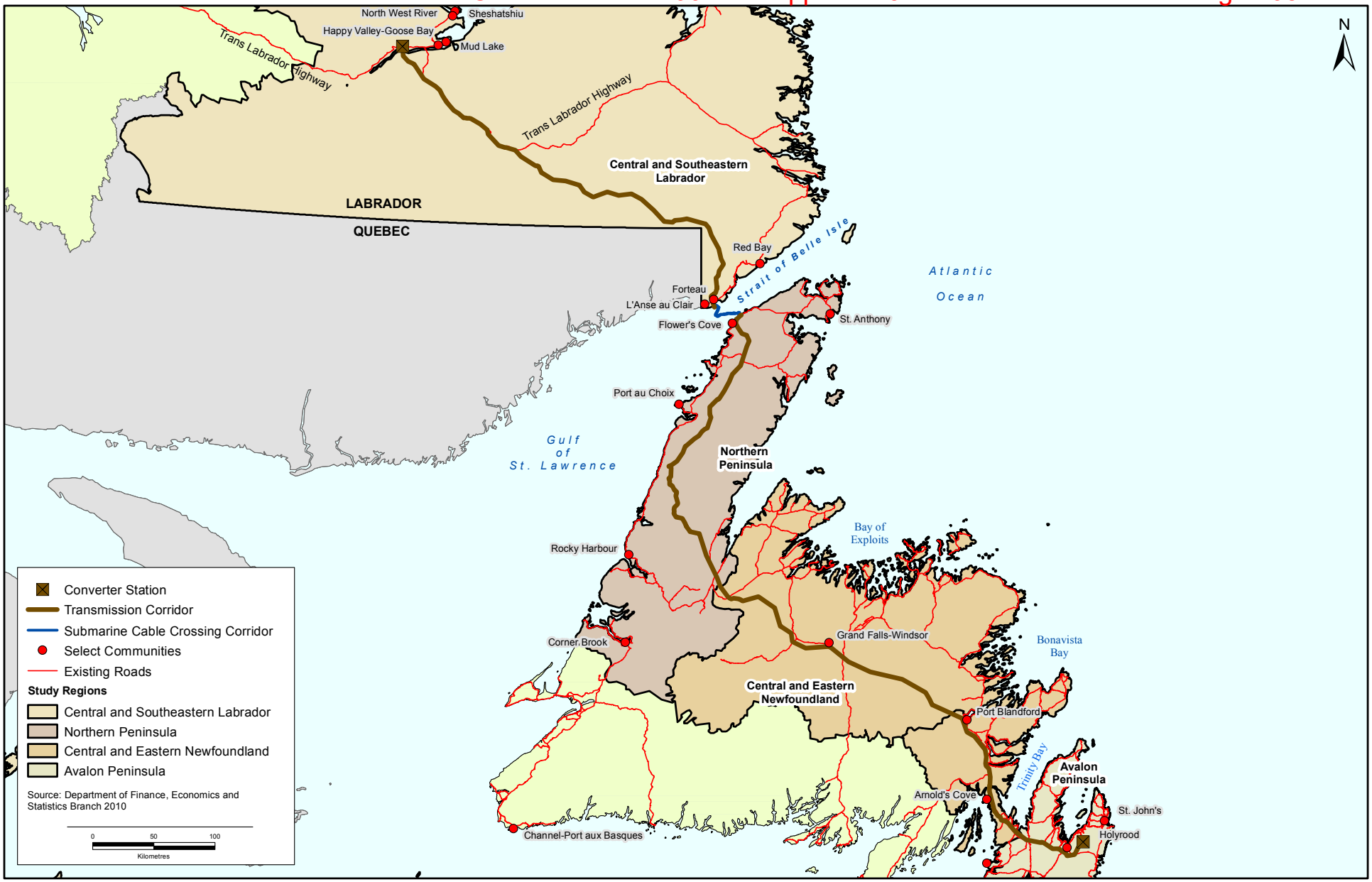
15.5.1 Study Areas

The land and resource uses within or adjacent to the transmission corridor (2 km wide) as well as considering the location of other Project-related components and activities (e.g., access, electrode sites, electrode line, temporary camps) are the focus of this existing environment section. To provide an appropriate "regional context", a larger geographic area, such as a 15 km wide buffer on either side of the transmission corridor centreline was selected for resource harvesting activities that are more wide-ranging and less geographically defined. For other socioeconomic components that are "stationary" such as communities and transportation, a very broad and general description of the "Study Region" is provided. The larger study area for each land and resource use component or activity is described within each subsection.

Given the extensive geographic area involved, land and resource uses are also generally described by "Study Region". The "Study Region" description provides a regional context by generally describing land and resource use activities within the relevant regions of the province as shown in Figure 15.5.1-1.

15.5.2 Information Sources and Data Collection

Data and information for land and resource use components were gathered mainly from secondary sources as no field work was conducted. Sources include reports, documents, web sites and press releases from government departments. Relevant unpublished data and information were obtained from government departments through direct contact with agency representatives. Nalcor gathered information through communications with NL Department of Natural Resources' Conservation Officers whose extensive knowledge has been gained through personal and professional experience and observation. Information related to land and resource use was also gathered from media reports, private companies, user groups, not-for-profit organizations and consulting reports prepared for Nalcor. Additional information was collected from Nalcor and other authors contributing to this EIS, as appropriate. Sources are documented in the references section of this report.



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FIGURE 15.5.1-1

Land and Resource Use Study Regions in Newfoundland and Labrador

More detail is provided in the Component Study, "*Socioeconomic Environment: Communities, Land and Resource Use, Tourism and Recreation*" (AMEC 2010b), "*Socioeconomic Environment: Communities, Land and Resource Use, Tourism and Recreation, Supplementary Report*" (AMEC 2011), "*Socieoeconomic Environment: Communities, Land and Resource Use, Tourism and Recreation – Revised Component Study*" (AMEC 2012), as well as "*Socioeconomic Environment: Aboriginal Communities and Land Use Component Study"* (Nalcor et al. 2011). These documents identify and describe key aspects of the socioeconomic environment in regions crossed by or near the transmission corridor. The Component Studies provide details on land and resource use activities including communities, transportation, commercial activities, recreational pursuits and subsistence activities. The Component Studies were developed using data and information from numerous sources, all of which are listed in those reports.

For the Aboriginal contemporary traditional land use component of this section, several information sources were identified, compiled and reviewed. These include published and unpublished literature, information and data provided to Nalcor by Aboriginal groups and the results of recent consultation activities and socioeconomic data collection initiatives completed for the EA by Aboriginal groups in cooperation with, and through funding and resources provided by Nalcor. Chapter 7 of this EIS presents additional details on Nalcor`s Aboriginal consultation for the Project.

In certain cases, though substantive communication attempts and consultation offers were made by the Proponent to particular Aboriginal communities, some groups declined to participate or provide information. In those cases, the information provided in this EIS is based on existing and available secondary sources.

In some instances, Nalcor was successful in concluding community engagement agreements with Aboriginal communities. These agreements provided mechanisms for sharing information and resources. Where an agreement was reached between Nalcor and an Aboriginal group, primary information was collected and incorporated into this EIS as available. Since December 2009, four agreements have been signed between Nalcor and the following Aboriginal groups: Innu Nation, NCC, Conseil des Innus de Pakua Shipi and Conseil des Innus de Unamen Shipu. Subsequent to the initial agreements, additional Phase II agreements were signed with NCC and Conseil des Innus de Pakua Shipi. The objectives of the community engagement agreements were / are to:

- familiarize the group with the Project and its potential environmental effects;
- identify any issues of concern with respect to potential environmental effects of the Project on the interests of the group;
- collect and document Aboriginal Ecological Knowledge (AEK) and information respecting contemporary land use and harvesting activities; and
- identify potential ways to address the issues identified.

The specific workplan and data collection methodology for each of these agreements were developed collaboratively by Nalcor and a project coordinator or researcher, who was hired by the Band or its Executive Council. The workplan and research methodology were subsequently approved by the Band or Executive Council and implemented by the project coordinator or researcher, in cooperation with a Nalcor representative.

The agreement with Innu Nation was signed in July 2010 and completed in November 2010. The initial agreement with NCC, signed in December 2009, expired at the end of March 2011 and set the groundwork for data collection in the subsequent agreement. A Phase II agreement was signed with NCC in January 2011 and is still ongoing. A Phase I agreement was signed with the Conseil des Innus de Pakua Shipi in April 2010 and was scheduled to last four months. However, due to unforeseen circumstances, completion of the agreement was delayed to June 2011. A Phase II agreement was signed in February 2011 and is currently ongoing. The Conseil des Innus de Unamen Shipu and Nalcor entered into an agreement in July 2011. Data collected under the completed agreements have been incorporated into this EIS. The agreement with NCC has not been finalized, however data obtained by Nalcor as a result of land use interviews with members of NCC (an aspect of the community engagement agreement) has been incorporated into this EIS. Any information and data obtained by Nalcor will be considered and incorporated, where relevant, including the potential for mitigation and adaptive management during detailed design and routing. Additionally, mapping pertaining to data and community reports under the Phase II agreement with Pakua Shipu is ongoing and will be considered if and when the information becomes available.

15.5.3 Communities and Public Water Supply Areas

The following subsections discuss communities by region from Central and Southeastern Labrador to the Avalon Peninsula. Additional information is included in the Component Study (AMEC 2010b) and Supplementary Report (AMEC 2011). This section generally describes communities in the region, and then focuses on identifying communities (including unorganized communities) as well as municipal water supply areas through which the 2 km wide corridor may pass. Communities are discussed more broadly in Section 15.3.

15.5.3.1 Central and Southeastern Labrador

Central and Southeastern Labrador communities are located in the Upper Lake Melville area (Happy Valley-Goose Bay, Northwest River, Sheshatshiu and Mud Lake), along the south-eastern coast and along the Strait of Belle Isle. The south-eastern coast has 11 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 Straits area currently includes the eight communities of Red Bay, Pinware, West St. Modeste, Capstan Island, L'Anse au Loup, L'Anse Amour, Forteau and L'Anse au Clair (NLDMA 2009).

The transmission corridor does not interact directly with any Central Labrador communities. It crosses the community boundary (municipal boundary, municipal planning area, infilling limits or protected road boundary) of two communities in the Labrador Straits: Forteau L'Anse and au Loup (Figure 15.5.3-1). The transmission corridor passes through the following public water supply areas: L'Anse au Loup River Unprotected Water Supply Area (WS-S-0402) and the Trout Brook Protected Water Supply Area (WS-S-0252) which services the community of Forteau (Table 15.5.3-1).

Table 15.5.3-1 Communities and Water Supply Areas Overlapping the Transmission Corridor: Central and Southeastern Labrador

Community	Water Supplies
L'Anse au Loup	Yes
Forteau	Yes

The transmission corridor also crosses portions of L'Anse Amour's drinking water supply, but the community is not overlapped by the transmission corridor.

15.5.3.2 Northern Peninsula

The Northern Peninsula region includes nearly 100 small to medium sized communities from the northern points of Cook's Harbour and Straitsview to Corner Brook in the south-west and Hampden in the south-east (NLDMA 2009). Communities in the north focus on the fishery and forestry industries and to some extent on tourism (NEDC 2009, internet site). The northern and central areas of the Northern Peninsula have experienced population decline of 8 to 12% between 2000 and 2006 (NLDF-ES 2010, internet site).

The Strait of Belle Isle submarine cable crossing will make landfall at Shoal Cove on the Northern Peninsula. South of the landing location, the transmission corridor overlaps the boundaries of four communities (Table 15.5.3-2) (Figure 15.5.3-2).

Table 15.5.3-2 Communities and Water Supply Areas Overlapping the Transmission Corridor: Northern Peninsula Communities

Community	Water Supplies
Shoal Cove East	Yes
Savage Cove-Sandy Cove	Yes
Nameless Cove	Yes
Flower's Cove	Yes

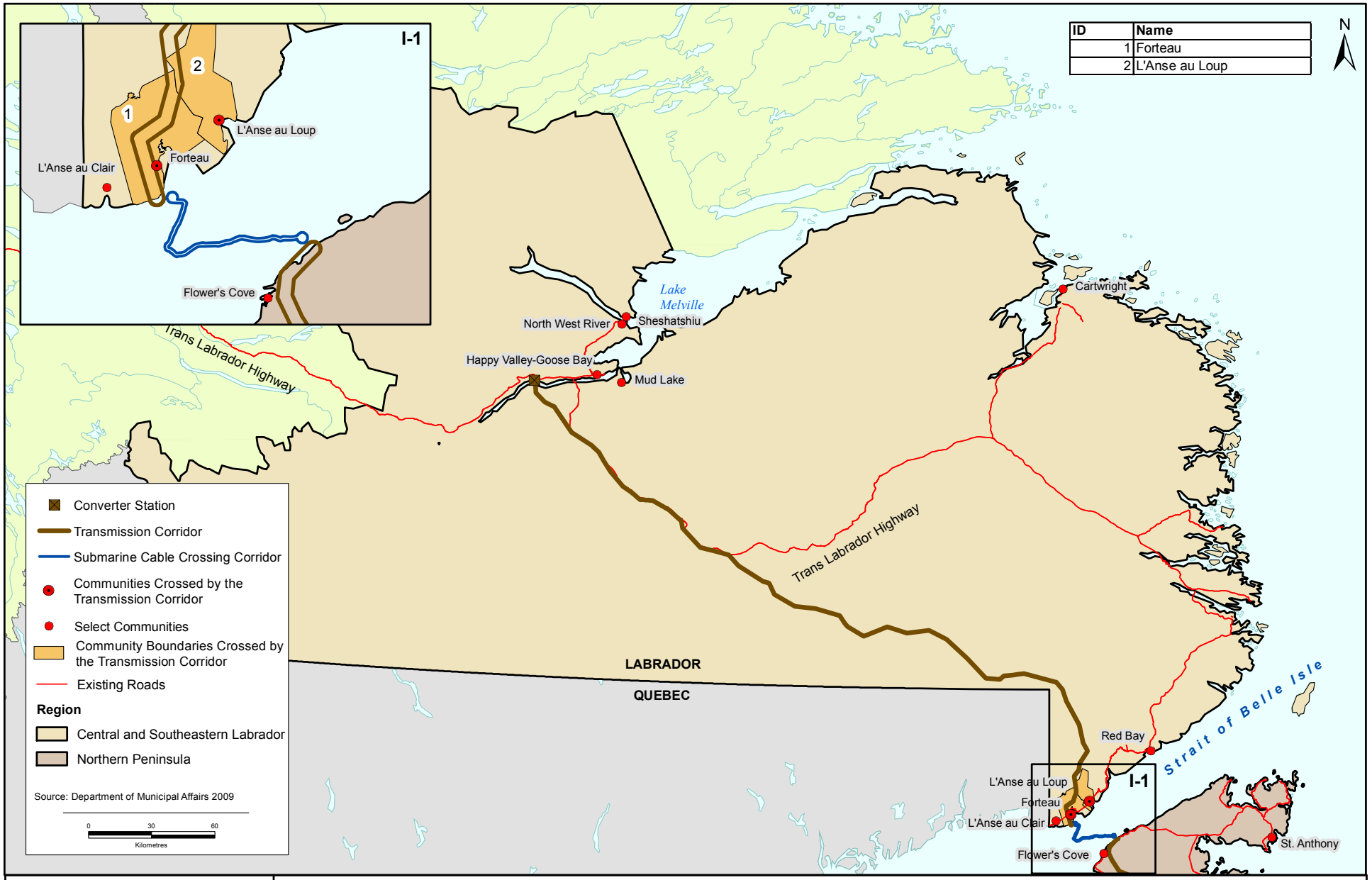
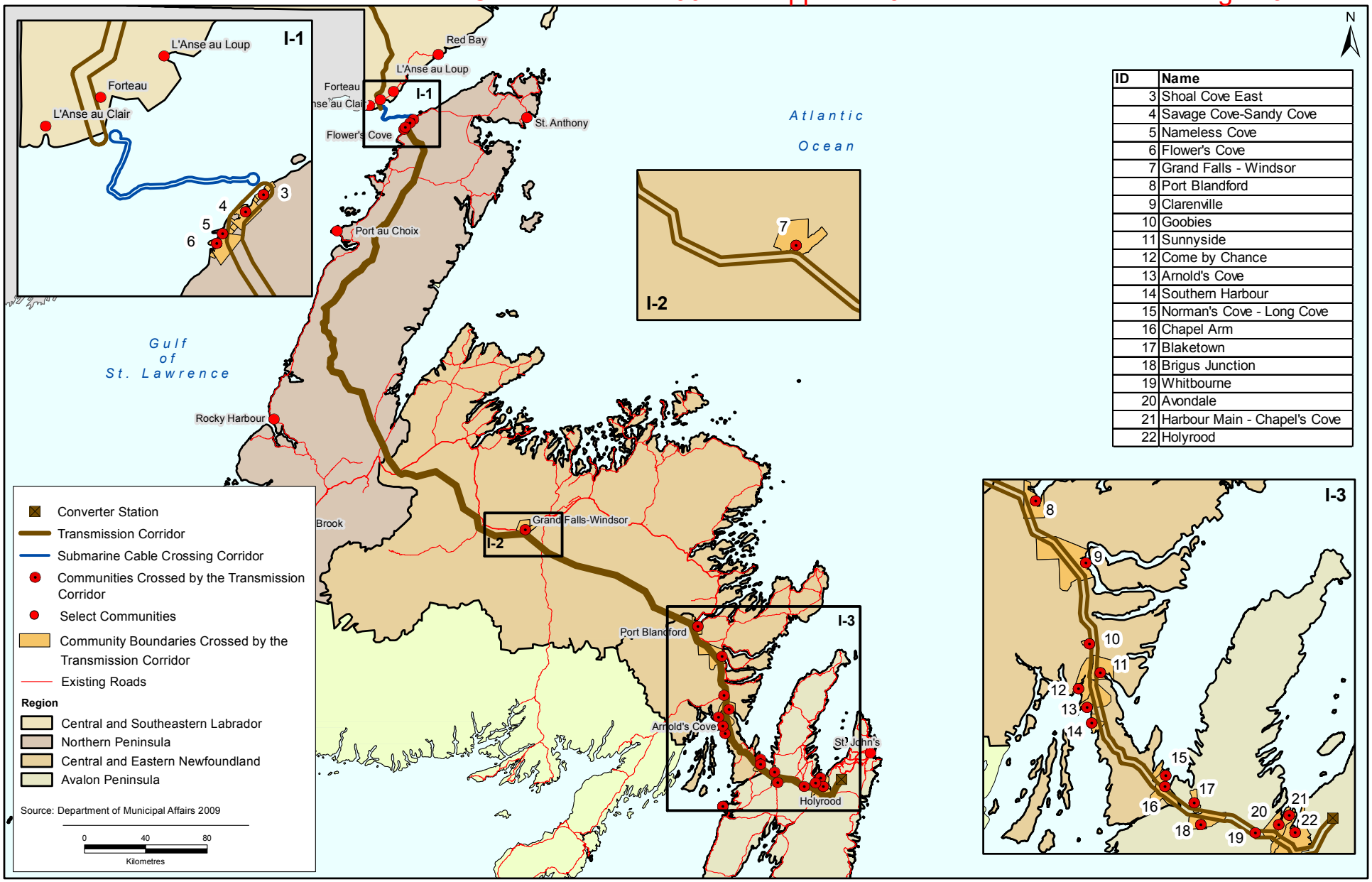


FIGURE 15.5.3-1

Land and Resource Use - Communities Along the Transmission Corridor in Labrador



ID	Name
3	Shoal Cove East
4	Savage Cove-Sandy Cove
5	Nameless Cove
6	Flower's Cove
7	Grand Falls - Windsor
8	Port Blandford
9	Clarenville
10	Goobies
11	Sunnyside
12	Come by Chance
13	Arnold's Cove
14	Southern Harbour
15	Norman's Cove - Long Cove
16	Chapel Arm
17	Blaketown
18	Brigus Junction
19	Whitbourne
20	Avondale
21	Harbour Main - Chapel's Cove
22	Holyrood

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FIGURE 15.5.3-2

Land and Resource Use - Communities Along the Transmission Corridor in Newfoundland

Portions of the drinking water supply of Hawke's Bay are also within the transmission corridor but the community is not within the transmission corridor.

15.5.3.3 Central and Eastern Newfoundland

The Central and Eastern Newfoundland region includes approximately 275 communities from the east side of White Bay to the west side of Trinity Bay encompassing the Baie Verte Peninsula, Notre Dame Bay, Bonavista Bay and the Bonavista Peninsula. Central and Eastern Newfoundland includes the larger towns of Grand Falls - Windsor, Gander and Clarenville which are located along the TCH.

The transmission corridor overlaps the boundaries of nine communities in Central and Eastern Newfoundland (Table 15.5.3-3) (Figure 15.5.3-2).

Table 15.5.3-3 Communities and Water Supply Areas Overlapping the Transmission Corridor: Central and Eastern Newfoundland

Community	Water Supplies
Grand Falls-Windsor	No
Port Blandford	Yes
Clarenville	Yes
Goobies	No
Sunnyside	No
Arnold's Cove	Yes
Southern Harbour	Yes
Norman's Cove-Long Cove	Yes
Chapel Arm	Yes
Come By Chance	No

Source: NLDMA 2009.

Portions of the drinking water supply of the communities of Gander, Glenwood and Appleton are also within the transmission corridor (Gander Lake Protected Water Supply (WS-S-0268)).

15.5.3.4 Avalon Peninsula

The Avalon Peninsula region includes nearly 90 communities on the north-west and north-east tips of the Avalon Peninsula, and includes the provincial capital of St. John's. The Avalon is the most populated area of the province and has many communities varying in size from St. John's at over 100,000 people to small unincorporated communities. The transmission corridor overlaps the boundaries of five communities (Table 15.5.3-4) (Figure 15.5.3-2). Also, the shoreline electrode for the Project is located within the town of Conception Bay South.

Table 15.5.3-4 Communities and Water Supply Areas Overlapping the Transmission Corridor: Avalon Peninsula

Community Name	Water Supplies
Whitbourne	Yes
Blaketown	No
Avondale	Yes
Harbour Main-Chapel's Cove-Lakeview	Yes
Holyrood	No
Brigus Junction	No
Conception Bay South	No

Source: NLDMA 2009.

15.5.4 Transportation

This discussion of land use, as it relates to transportation, includes roads, air facilities, a military flight training area and marine traffic in the Strait of Belle Isle between southern Labrador and northern Newfoundland. These are discussed in detail and illustrated in the component study (AMEC 2010b, 2011) which also includes a map atlas of forestry access roads in the province. Transportation is discussed primarily from a land use perspective below; a community infrastructure perspective is provided in Section 15.3.5.

15.5.4.1 Road System

The province of Newfoundland and Labrador has an extensive highway and road network. In Labrador, Route 500 (the TLH) from Labrador West to Happy Valley-Goose Bay is currently being paved with an estimated completion date of 2014 (NLDTW 2011a). The final section of the TLH is designated as Route 510 (Happy Valley-Goose Bay to Cartwright) which connects central and southern Labrador and was completed in December 2009. This road is paved from L'Anse au Clair to Red Bay and maintenance grade gravel surfaced from Red Bay to Happy Valley-Goose Bay.

In Newfoundland, Route 1 (TCH) runs approximately 900 km from Port aux Basques to St. John's. The TCH has two lanes except for the following sections where it has four: through Corner Brook, Grand Falls-Windsor and Glovertown and for approximately 100 km from Whitbourne to St. John's. Route 1 and all other highways in Newfoundland are paved. Local roads are mostly paved but some short gravel roads exist in rural communities.

Forestry access roads, which are made of sub-base material grade, are generally 4 to 9 m wide and typically have a grade of between 10% and 6% (DFO and CFS 1985). These exist throughout the province but are most extensive on the Northern Peninsula and in Central Newfoundland where the economies have been based on forestry, lumber and paper industries. Forest access roads are also used for mineral exploration and other non-industrial activities such as hunting, fishing, domestic woodcutting, berry picking, other harvesting and operating motorized recreational vehicles such as all-terrain vehicles (ATVs) and snowmobiles. Forestry access roads are shown in Appendix C of the Component Study (AMEC 2010b).

15.5.4.2 Airport System

The province has eight airports. Gander and St. John's are included in TC's NAS meaning that they are nationally significant. Churchill Falls, Deer Lake, Goose Bay, Stephenville, St. Anthony and Wabush are classified as Regional / Local airports meaning that they serve local areas and provide connections to larger airports and systems. Residents of the Labrador Straits are also served by an airport in Blanc-Sablon, Québec (Wikipedia 2011, internet site; NLDTW 2009b; TC 1994, internet site).

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 in Newfoundland. In addition, the province has five heliports and seven aerodromes (NLDTW 2009b). Several private operators also own landing strips, heliports and float plane bases in the province (Belbin 2011, pers. comm.; Wikipedia 2011, internet site; Letto 2009, pers. comm.).

15.5.4.3 Ferry System

Coastal communities and islands off the Newfoundland and Labrador coast are served by a provincial ferry system. The NLDTW provides ferry services between Labrador and Newfoundland through a private operator. As a result of the new highway connection in Labrador, government is proposing to discontinue a seasonal vehicle and freight ferry, which currently runs between Happy Valley-Goose Bay and Lewisporte from spring to fall (NLDTW 2010a). The Strait of Belle Isle ferry operates between from Blanc-Sablon, Québec and St. Barbe on the Northern Peninsula in summer and from Blanc-Sablon to Corner Brook in winter (NLDTW 2010a).

15.5.4.4 Regional Transportation in the Study Area

Central and Southeastern Labrador

Route 510 (TLH) begins at Happy Valley-Goose Bay and ends at the Québec border in the Labrador Straits. The Cartwright to Happy Valley-Goose Bay portion was completed in December 2009 and most communities in the region are now connected by road (Natural Resources Canada (NRCan) 2005) (Figure 15.5.4-1).

A regional airport and a water aerodrome are located in Happy Valley-Goose Bay. Landing strips are also located in the coastal communities of Cartwright, Black Tickle, Charlottetown, Port Hope Simpson, William's Harbour, St. Lewis and Mary's Harbour (NLDTW 2009b). Scheduled commercial flights currently offer passenger service to these communities (Air Labrador 2010, internet site; Provincial Airlines (PAL) 2010, internet site). However, with the connection of Route 510, services may be reduced in the region (NLDTW 2010a). Strait Air, owned by a private operator, has an air strip at Crow Head near L'Anse Amour. A float plane base is also operated on Long Pond near Forteau Point (Belbin 2011, pers. comm.; Letto 2009, pers. comm.).

A Designated Flight Training Area (DFTA) begins at 5-Wing Goose Bay and covers an area extending south, west and north and into the province of Québec. DND Flying Orders include minimum altitudes of between 100 feet, 250 feet and 500 feet for this area (DND 2010). A map is provided in the Component Study (AMEC 2010b).

The transmission corridor parallels and crosses Route 510 a number of times along the recently completed section (TLH3) and near Forteau (Figure 15.5.4-1) and the DFTA (Table 15.5.4-1).

Table 15.5.4-1 Central and Southeastern Labrador Transportation Infrastructure Crossed by the Transmission Corridor

Infrastructure	Name	Location
Road	Route 510	TLH3 and Forteau
Designated Flight Training Area	DFTA 5-Wing Goose Bay	Central Labrador

Source: DND 2010; NRCan 2005.

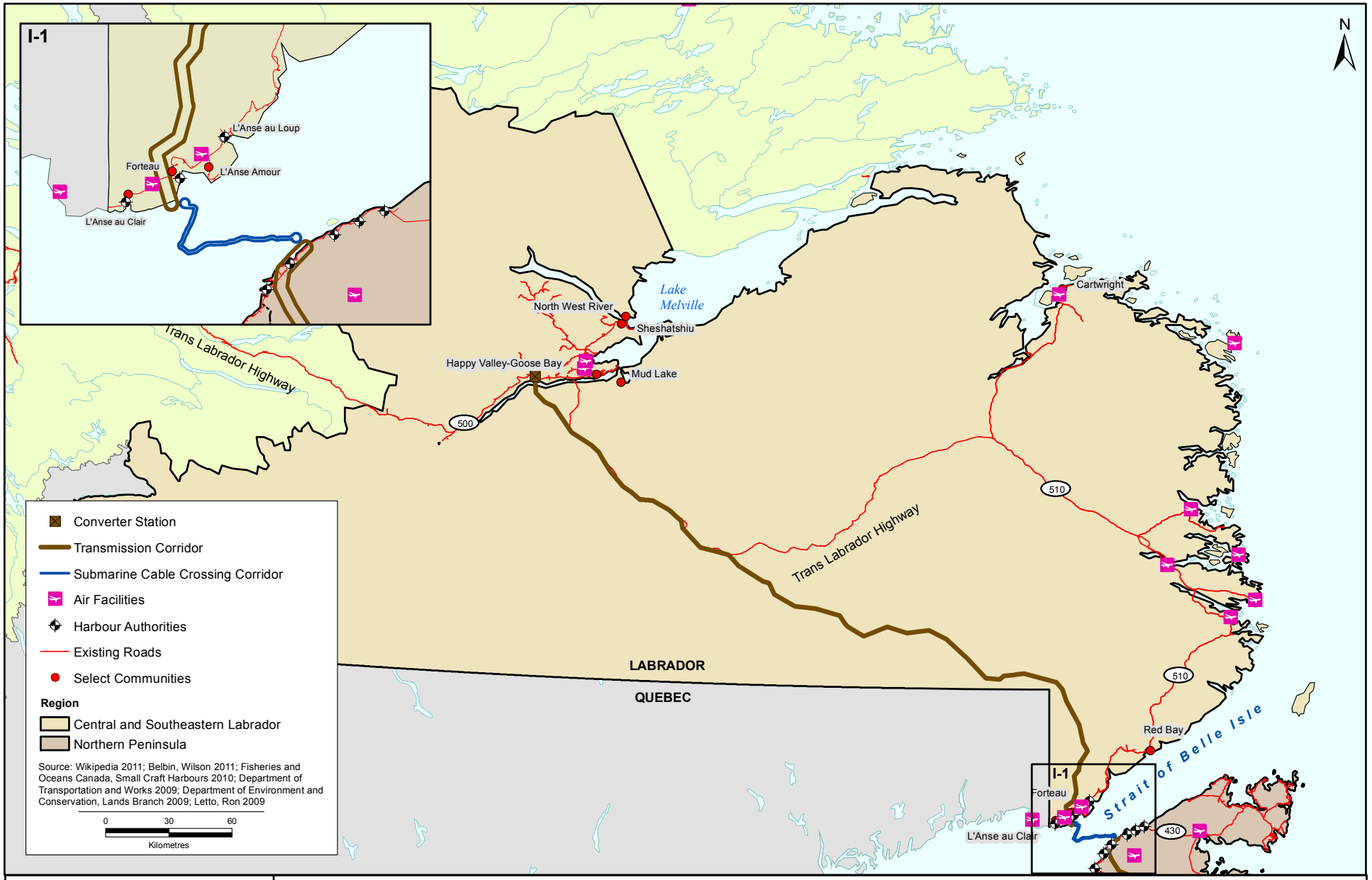
Strait of Belle Isle

Marine traffic through the Strait of Belle Isle is limited to ice free periods – usually between April and January. Several types of vessels travel across and through the Strait when the channel is open. The Labrador Straits ferry crosses between Blanc-Sablon and St. Barbe two to three times daily in each direction during ice free periods (Figure 15.5.4-2). During winter 2010 and 2011 the ferry service was maintained year-round by operating between Blanc-Sablon and Corner Brook (NLDTW 2010a).

Demand on the Labrador Straits Ferry has increased since the TLH opened in December 2009 and since the ferry service to Corner Brook became available in the winter of 2009-10. A significant increase in vehicles using the ferry in the summer of 2010 (between 24% and 175% per month between April and July) resulted in an additional ferry run (in each direction) on Fridays and Mondays in August and September (NLDTW 2010b).

Through its Small Craft Harbours program, Fisheries and Oceans Canada (DFO) and 208 volunteer harbour authorities operate approximately 227 harbours in Newfoundland and Labrador. Ten are located on either side of the Strait of Belle Isle (Figure 15.5.4-2). Fishing vessels from both sides and recreational craft (motor and sail) from within and outside of the province also use the Strait (DFO 2010a, internet site).

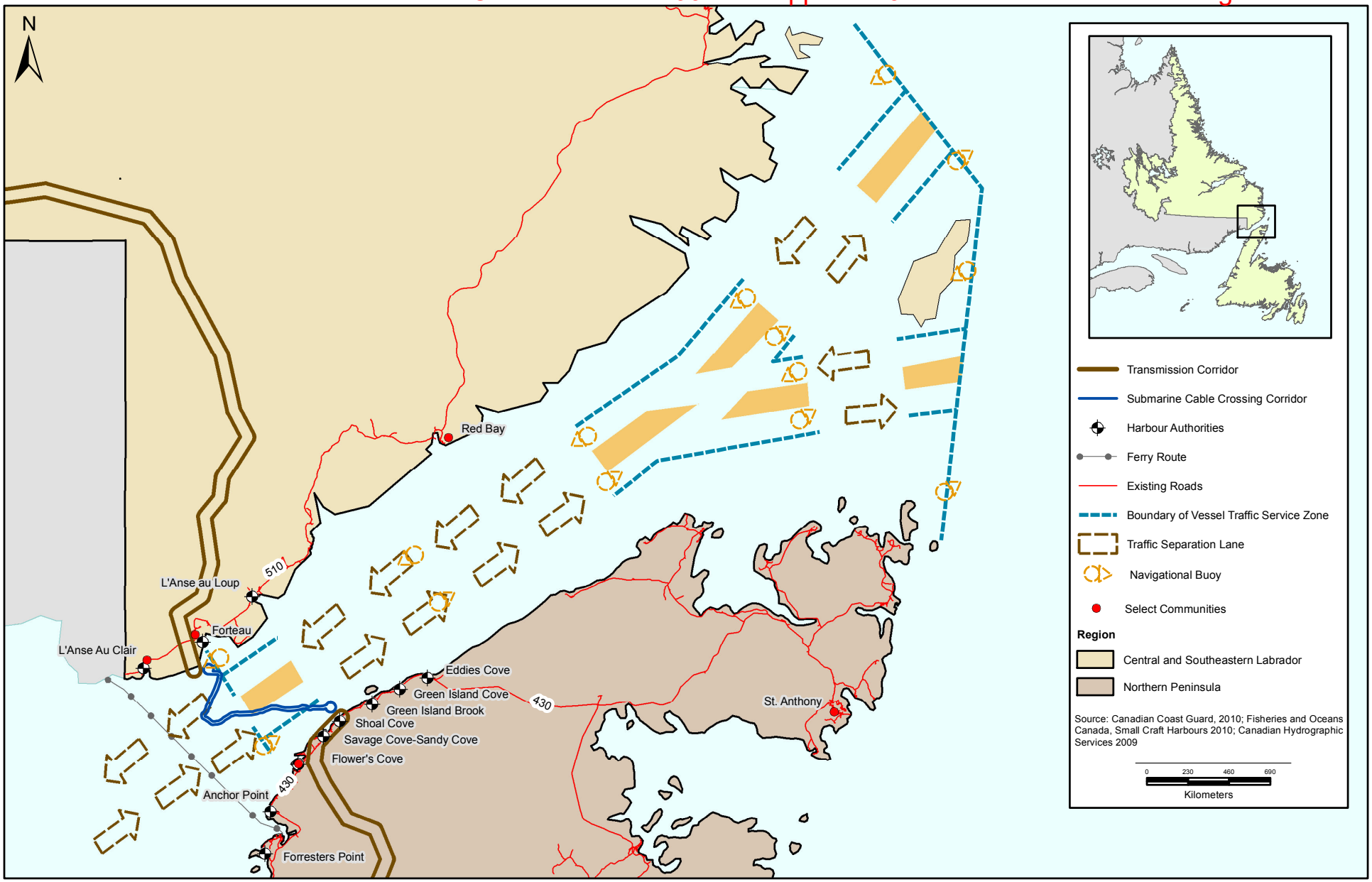
Shipping vessels (i.e., bulk carriers, container ships and tankers) travel through the Strait of Belle Isle to and from the Atlantic Ocean and the St. Lawrence River and Seaway. The Canadian Coast Guard (CCG) has established a regulated Vessel Traffic Service (VTS) zone (Figure 15.5.4-2). Marine traffic in the Controlled Vessel Traffic Lanes is monitored by CCG's St. Anthony Marine Communications and Traffic Services (MCTS). Vessel operators in the Strait of Belle Isle are not required to report to St. Anthony MCTS but may do so voluntarily. Therefore, existing MCTS data are incomplete and only partially represent the activity. Most activity is from June to December (CCG 2010a, internet site; CCG 2010b; Warren 2010, pers. comm.; CHS 2009).



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FIGURE 15.5.4-1

Land and Resource Use - Labrador Transportation Infrastructure



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FIGURE 15.5.4-2

Land and Resource Use - Strait of Belle Isle Transportation Infrastructure

The location of the submarine cable crossing corridor in the Strait of Belle Isle, between Forteau Point and Shoal Cove, is shown in Figure 15.5.4-2.

Northern Peninsula

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. On the eastern side and base of the Northern Peninsula, Routes 420 and 421 connect White Bay communities to the TCH (NRCan 2005).

Regional airports are located at St. Anthony and Deer Lake. A private landing strip, owned by Strait Air, is located near the community of Sandy Cove. Government landing strips are located at Port au Choix and St. Andrew's (Codroy Valley) (NLDTW 2009b; Letto 2009, pers. comm.).

The transmission corridor crosses four highways on the Northern Peninsula (Figure 15.5.4-3). These roads are shown in Table 15.5.4-2.

Table 15-5.4-2 Northern Peninsula Transportation Infrastructure Crossed by the Transmission Corridor

Infrastructure Type	Name	Location Crossed
Roads	Route 430	Shoal Cove to Savage Cove-Sandy Cove
	Route 432	Inland
	Route 420	White Bay South
	Route 421	Hampden

Source: NRCan 2005.

Central and Eastern Newfoundland

The TCH is the main highway through Central and Eastern Newfoundland. From the TCH other highways branch off to the Baie Verte Peninsula, Notre Dame Bay, the Connaigre Peninsula, Bay of Exploits, Twillingate Islands, Bonavista Bay, Eastport Peninsula, Bonavista Peninsula, Burin Peninsula, Trinity Bay and Placentia Bay (NRCan 2005). The proposed transmission corridor crosses five highways in Central and Eastern Newfoundland including the TCH (Table 15.5.4-3; Figure 15.5.4-3).

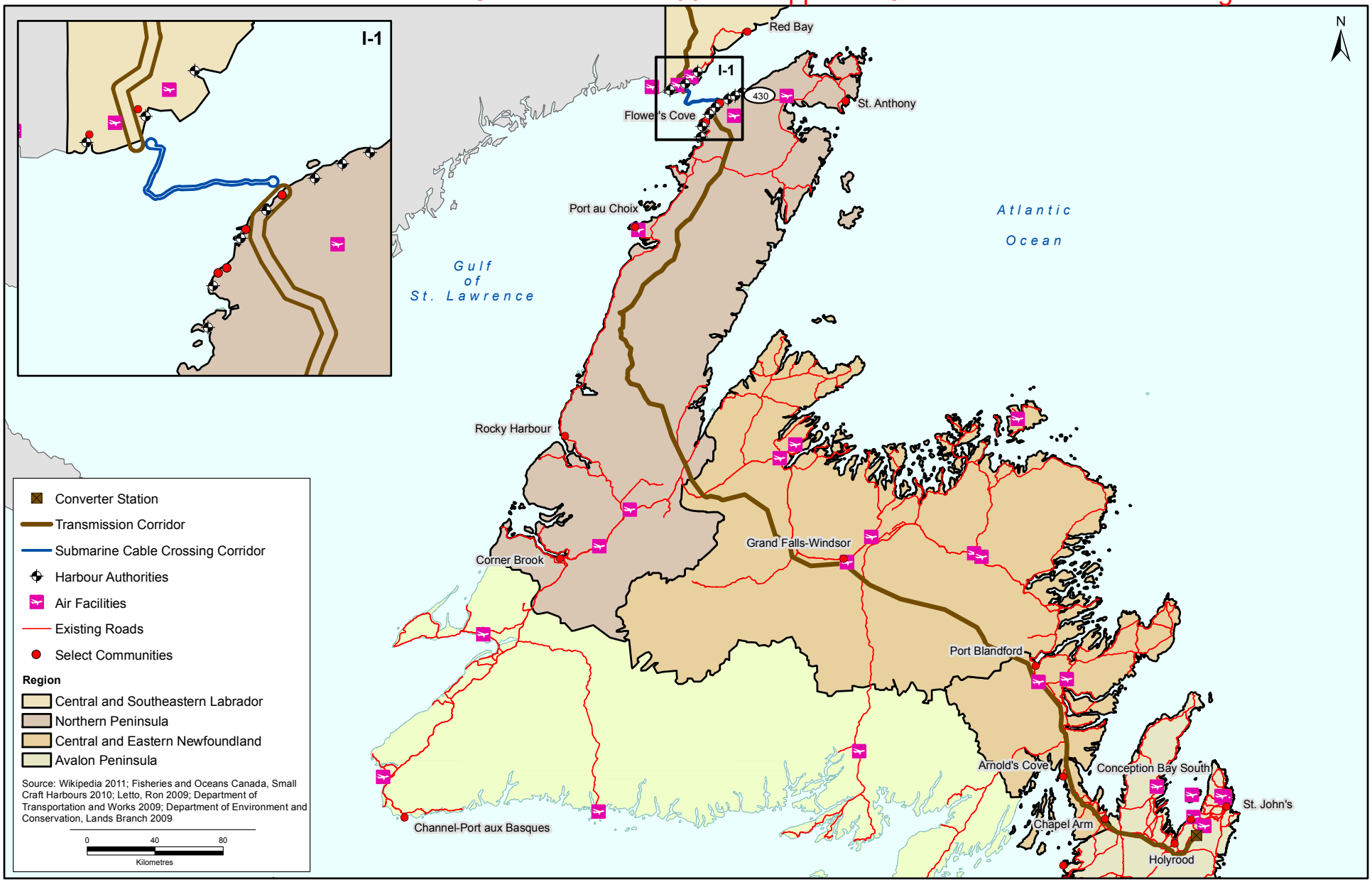
Landing strips are located in Exploits Valley, Springdale, Bishop's Falls and Clarenville. The Grand Falls-Windsor Heliport is located in that town. Gander International Airport and a hospital heliport are located in Gander (NLDTW 2009b). A private aerodrome, owned by Clarenville Aviation Limited, is located on Thorburn Lake (Wikipedia 2011, internet site).

The transmission corridor crosses five highways in Central and Eastern Newfoundland and slightly overlaps the edge of Thorburn Lake, the location of an aerodrome.

Table 15.5.4-3 Central and Eastern Newfoundland Transportation Infrastructure Crossed by the Transmission Corridor

Infrastructure Type	Name	Location Crossed
Roads	Route 1-TCH	Various locations
	Route 370	Buchans
	Route 360	Bay d'Espoir
	Route 201	Chapel Arm-Bellevue
	Route 203	Fair Haven
Aerodrome	Clarenville Aviation Limited	Thornburn Lake (near Clarenville)

Source: Wikipedia 2011, internet site; NLDTW 2009b; NRCan 2005.



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FIGURE 15.5.4-3

Land and Resource Use - Newfoundland Transportation Infrastructure

Avalon Peninsula

The main highway on the Avalon Peninsula is the TCH. A number of other highways branch off to communities in Trinity Bay, Placentia Bay, St. Mary's Bay, Conception Bay and the greater St. John's area (NRCan 2005).

Air facilities on the Avalon Peninsula are located in Conception Bay and Northeast Avalon areas (Figure 15.5.4-3). St. John's International Airport is located on the north side of the city. Landing strips are located at Harbour Grace and on Bell Island. Private heliports are located in Foxtrap and at the St. John's airport (NLDTW 2009a, internet site). A water aerodrome is located on Paddy's Pond (Wikipedia 2011, internet site).

No air facilities on the Avalon Peninsula are located within the transmission corridor.

The transmission corridor crosses and / or parallels the TCH and a number of paved two-lane highways that connect to communities from Chapel Arm to Conception Bay South (Figure 15.5.4-3). Table 15.5.4-4 shows these Avalon Peninsula roads.

Table 15.5.4-4 Avalon Peninsula Transportation Infrastructure Crossed by the Transmission Corridor

Infrastructure Type	Name	Location Crossed
Roads	Route 1-TCH	Various locations
	Route 13	Witless Bay Line
	Route 63	Avondale
	Route 80	Trinity Bay South
	Route 81	Markland
	Route 90	Salmonier Line
	Route 100	Argentia Access Road

Source: NRCan 2005.

15.5.5 Hunting and Trapping

Current Newfoundland and Labrador lifestyles are influenced by a history of commercial, recreational and subsistence hunting, trapping and fishing. Trapping is primarily a commercial activity and hunting is mainly a recreational and subsistence pursuit. However, restaurants and food producers may obtain commercial licences to purchase wild game (Dicks 2010, pers. comm.). Greater detail of the information summaries provided below are available in AMEC (2010b).

The Department of Environment and Conservation, 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 (NLDEC-W 2010a).

Black bear hunting licences are available to all residents of Newfoundland and Labrador and each licence holder may harvest two bears annually in open hunting areas. All black bear management areas (BBMA) on the Avalon Peninsula, and one Eastern Newfoundland management area, are closed to hunting (NLDEC-W 2010a). However, the availability of black bear licenses province-wide exceeds demand.

Moose and caribou licence demand exceeds quotas. 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. Approximately 40% of applicants received licences (The Telegram 2010b, internet site).

In the 2011-2012 hunting season, moose quotas were increased on the island in 41 moose management areas (MMA) including parts of the Northern Peninsula, Central and Eastern Newfoundland and the Avalon Peninsula. Labrador quotas increased in six MMAs (NLDEC-W 2011, internet site). Moose populations are generally abundant.

The province of Newfoundland and Labrador has prepared a recovery strategy for three Labrador woodland caribou herds, and Southern Labrador is closed to caribou hunting. Conservation measures are in effect in Labrador which has 18 caribou management areas (CMA). Upon confirmation of the presence of the protected woodland caribou – boreal population, the Department of Environment and Conservation may immediately close areas that have fixed season dates (NLDEC-W 2010b, internet site).

During the 2009-2010 hunting season, the Department of Environment and Conservation reduced the number of woodland caribou licences in Newfoundland by 355, or 40% (NLDEC-W 2009a). Quotas were also reduced by 85 animals in the 2010-2011 season (NLDEC-W 2010b, internet site). Quotas remained the same in the 2011-2012 season (NLDEC-W 2011, internet site). Caribou Management Areas that are closed or had quota reductions are located in Central and Southeastern Labrador, on the Northern Peninsula, in Central and Eastern Newfoundland and on the Avalon Peninsula (NLDEC-W 2010b, internet site). There were no closed zones in Labrador for the 2011-2012 season. However, the hunting season for 15 CMAs are to be determined (NLDEC-W 2011, internet site).

There is no quota cap on barren-ground caribou for Labrador residents. Several areas with undetermined dates are opened once NLDEC confirms the presence of sufficient numbers of the migrating George River Caribou herd. This herd was estimated to have a population of 785,000 in 1993 and 385,000 in 2001. A population and health census, conducted in 2010, confirmed population declines and has resulted in further conservation measures (NLDEC-W2011; NLDEC and NLDNR 2010, internet site).

The Island of Newfoundland has four main small game management areas (SGMAs) (Remainder of Island, The Topsails, Burin and Avalon / Swift Current). Seasons and bag limits are area and / or species specific. Grouse may be hunted anywhere in season. Ptarmigan may be hunted in all areas except Bell Island. Snowshoe hare may be hunted anywhere except Bell Island, with special conditions at Great Island - Ramea and Little Bay Islands. Arctic hare hunting is closed for all of Newfoundland (NLDEC-W 2011, internet site).

There are two trapping fur zones in Labrador and 13 in Newfoundland that apply to most species. However, there are special cases. Lynx trapping is managed in two zones in Newfoundland.

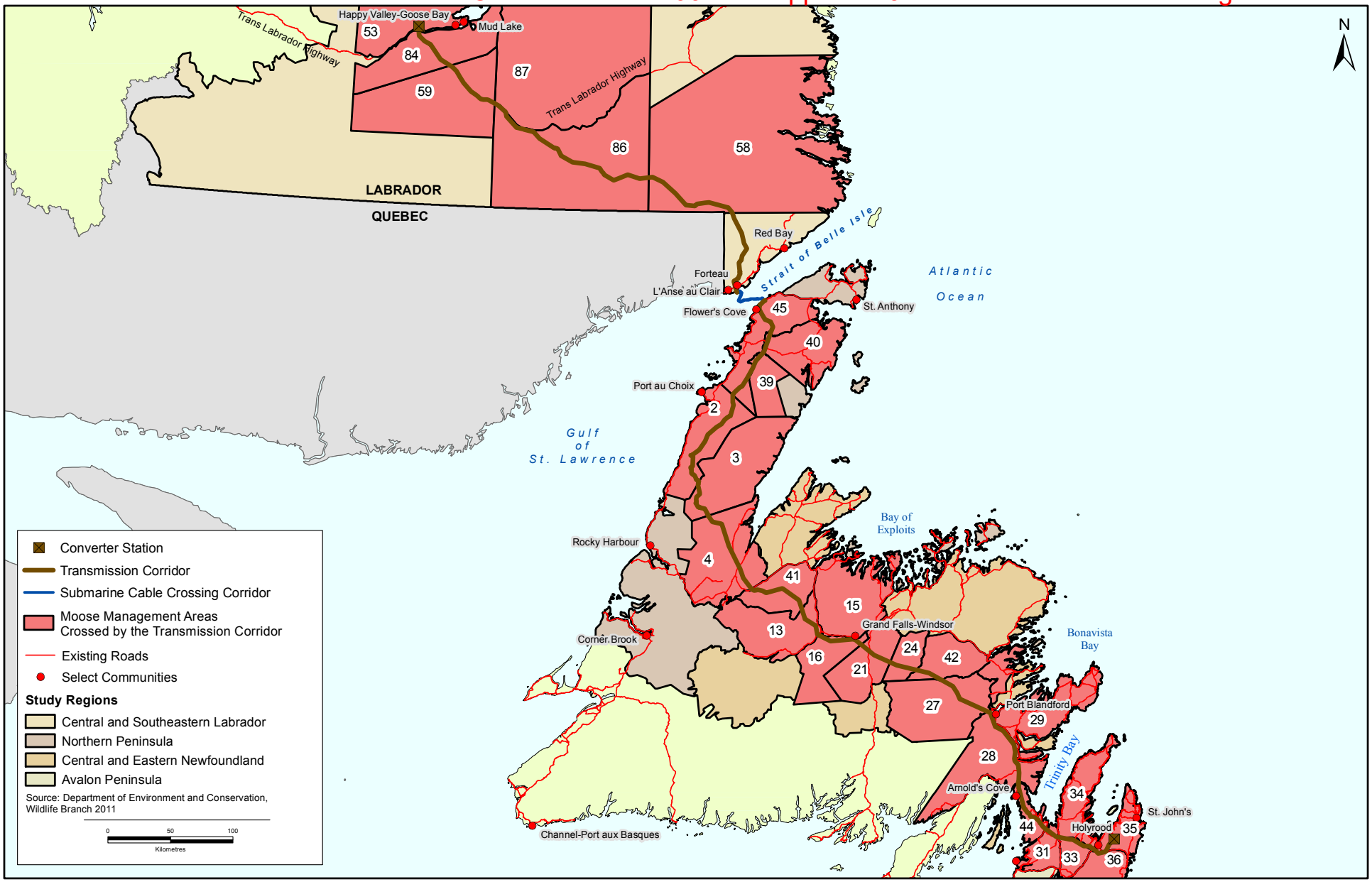
The following sections discuss hunting (including big game, small game and migratory game birds) and trapping on a regional basis from west to east.

15.5.5.1 Central and Southeastern Labrador

Big Game Hunting

This region includes portions of 12 MMAs: 49, 50, 52, 53, 54, 57, 58, 59, 60, 84, 86 and 87. In the 2010-2011 season, moose hunting was not permitted in an area of Central and Southeastern Labrador that extends from Lake Melville south to the Québec border, but limited hunting was allowed for the 2011-2012 season (NLDEC-W 2011, internet site). The entire region is covered by “Labrador South” black bear management area (BBMA). While caribou hunting is permitted in some areas of Labrador, no caribou hunting is currently permitted south of Lake Melville and the Churchill River (NLDEC-W 2011, internet site).

The transmission corridor crosses several big game management areas as shown in Figure 15.5.5-1, Figure 15.5.5-2 and Figure 15.5.5-3. These management areas and their seasons and quotas are presented in Table 15.5.5-1.



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FIGURE 15.5.5-1

Land and Resource Use - Moose Management Areas

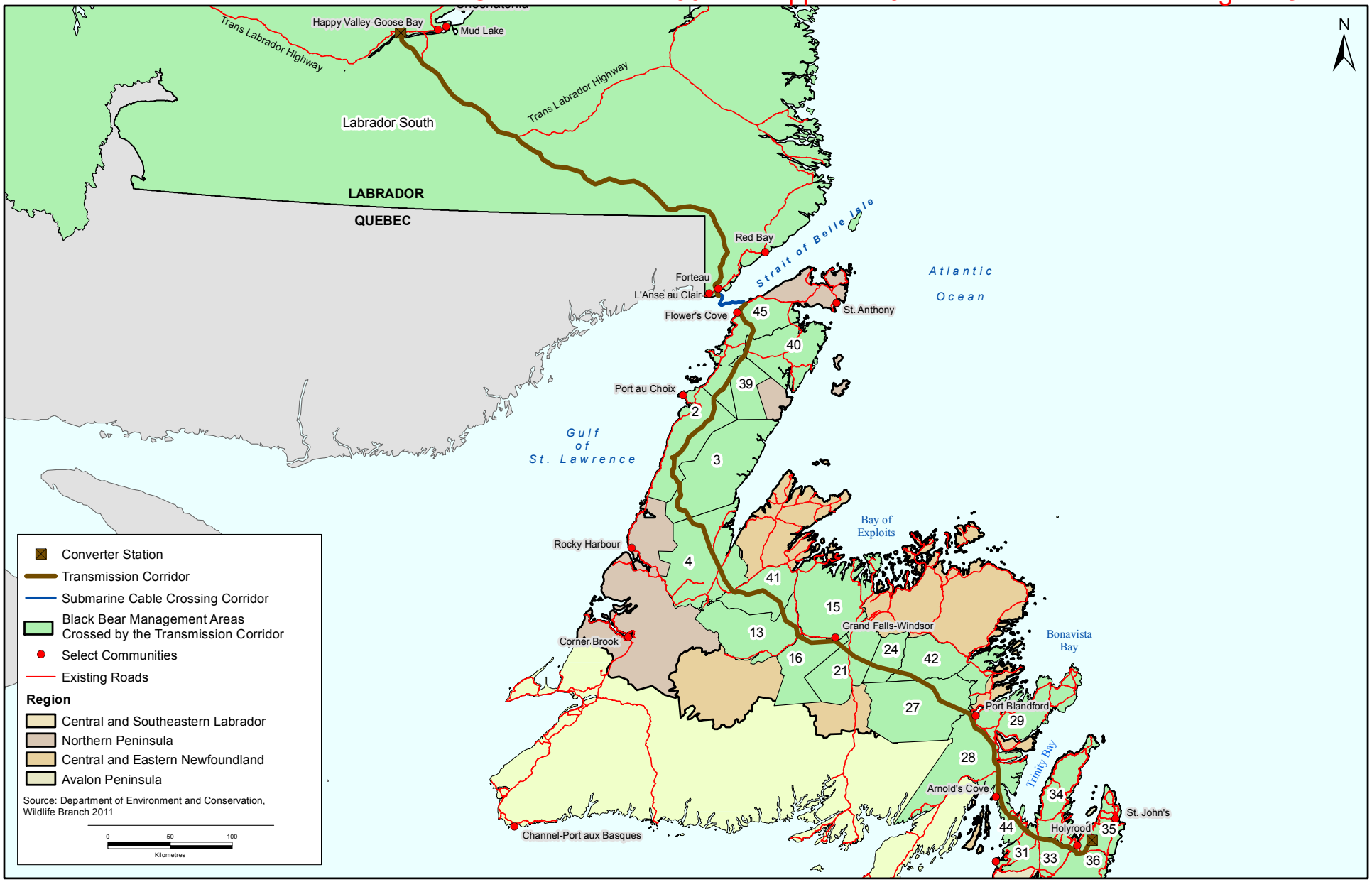
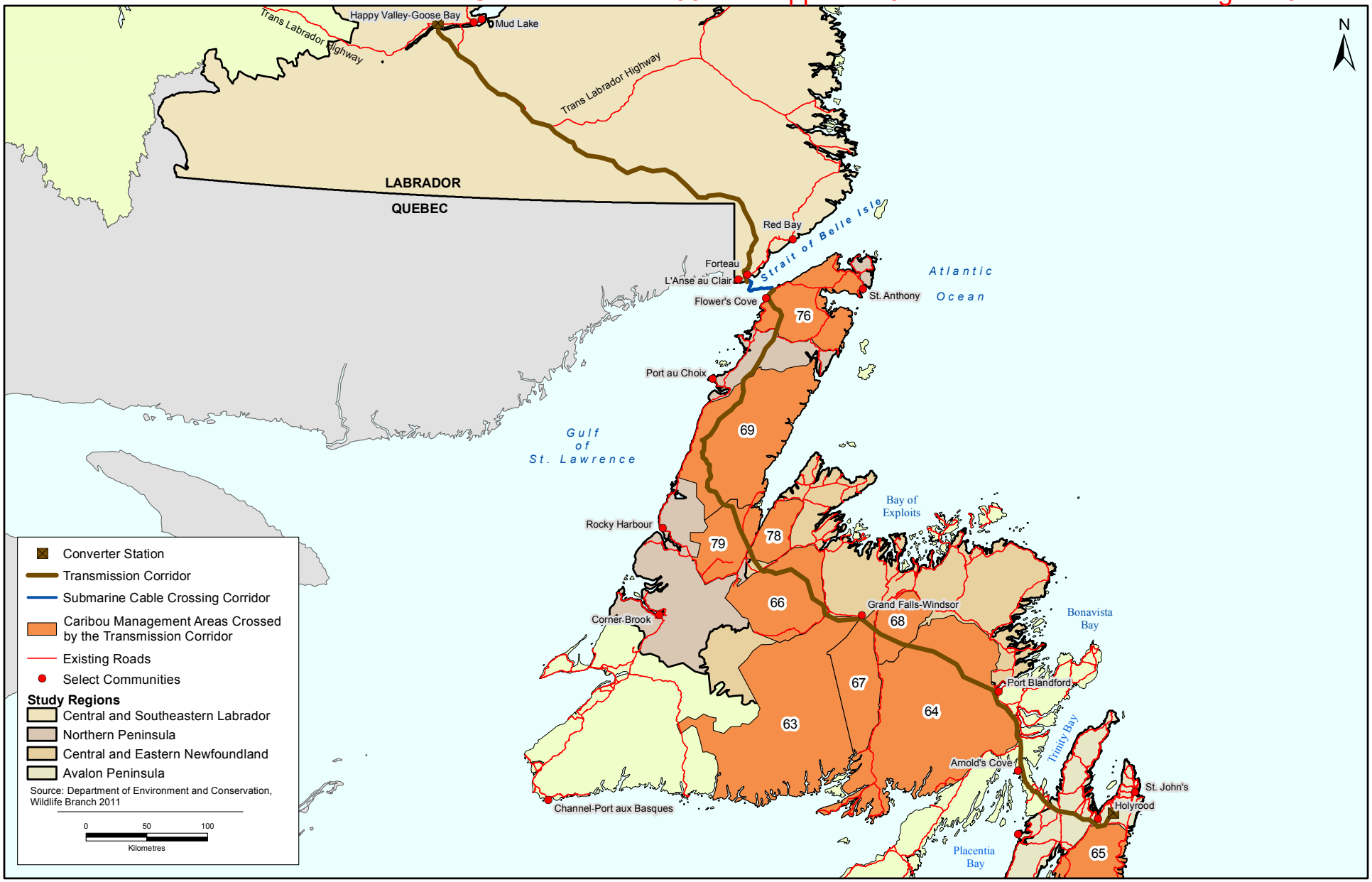


FIGURE 15.5.5-2

Land and Resource Use - Black Bear Management Areas



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FIGURE 15.5.5-3

Land and Resource Use - Caribou Management Areas

Table 15.5.5-1 Moose and Black Bear Management Areas Crossed by the Transmission Corridor in Central and Southeastern Labrador

Species	Management Area	Spring / Summer Season	Fall / Winter Season	Quota
Moose	Area 53-Muskrat Falls	No season	September 10, 2011 – March 11, 2012	25
	Area 58-Alexis River	No season	September 10, 2011 – March 11, 2012	5
	Area 59-Upper Kenamu	No season	September 10, 2010 – March 11, 2012	15
	Area 86-St. Augustin	No season	September 10, 2011 – March 11, 2012	5
	Area 87-Eagle Plateau	No season	September 10, 2011 – March 11, 2012	5
	Area 84 – Traverspine	No season	September 10, 2011 – March 11, 2012	5
Black bear	Labrador South	April 1 – July 13, 2011 and April 1 – July 13, 2012	September 1 – November 30, 2011	2 (either sex) per year per resident / non-resident

Source: NLDEC-W 2011, internet site.

Small Game Hunting

The Southern Zone SGMA covers the entire Central and Southeastern Labrador region. Hunting in this area is regulated for ptarmigan, snowshoe hare, Arctic hare, porcupine, spruce grouse and ruffed grouse (NLDEC-W 2010a).

The transmission corridor crosses portions of the Southern Zone. SGMAs for particular species along with their hunting seasons and bag / possession limits are shown in Table 15.5.5-2.

Table 15.5.5-2 Small Game Management Areas Crossed by the Transmission Corridor in Central and Southeastern Labrador

Management Area	Species	Shooting Season	Snaring Season	Bag Limit (Daily / Possession)
All of Labrador (Northern and Southern Zones)	Ptarmigan	October 1, 2011 – April 20, 2012	October 1, 2011 – March 31, 2012	25 / 50
	Snowshoe hare	October 1, 2011 – April 20, 2012	October 1, 2011 – March 31, 2012	No limit
	Arctic hare	October 1, 2011 – April 20, 2012	October 1, 2011 – March 31, 2012	No limit
	Porcupine	October 1, 2011 – March 31, 2012	No Season	1 / 1
Southern Zone	Grouse (Spruce and Ruffed)	October 1, 2011 – April 20, 2012	October 1, 2011 – March 31, 2012	25 / 50 (combined)

Source: NLDEC-W 2011, internet site.

Migratory Game Bird and Murre Hunting

Central and Southeastern Labrador has two migratory game bird (e.g., ducks, geese, snipe, eiders, Long-tailed Ducks, mergansers and scoters) hunting zones. The province does not have an open season for Harlequin Ducks in Labrador or Newfoundland. The Central Labrador Zone covers most of the region and Southern Labrador Zone includes the south-eastern coastal area from Batteau (north of Norman Bay) to L'Anse au Clair. The Labrador Straits is covered by murre (Turr) Hunting Zone 1.

The transmission corridor crosses portions of both migratory game bird hunting zones and the murre hunting zone in the Strait of Belle Isle. Table 15.5.5-3 provides details on the hunting seasons and bag limits of these zones.

Table 15.5.5-3 Bird Hunting Zones Crossed by the Transmission Corridor in Central and Southeastern Labrador

Hunting Zone	Species	Hunting Season	Bag Limit (Daily / Possession)
Central Labrador	Ducks, geese and snipe	First Saturday in September to second Saturday in December 2011	6[(a)] / 12[(b)] (ducks except mergansers, Harlequin Ducks, eiders and scoters) 6 / 12 (mergansers, scoters and eiders) 5 / 10 (geese) 10 / 20 (snipe)
	Eiders	Last Saturday in October to last Saturday in November 2011 and first Saturday in January to last day of February 2012	6 / 12
Southern Labrador (Straits)	Ducks, geese and snipe	Second Saturday in September to third Saturday in December 2011	6[(a)] / 12[(b)] (ducks) 5 / 10 (geese) 10 / 20 (snipe)
	Eiders	Fourth Saturday in November 2011 to last day of February 2012	6 / 12
Murre Hunting Zone 1	Murre (turr)	September 1 to December 16, 2011	20 / 40

Source: NLDEC-W 2011, internet site.
(a) Not more than one Barrow's Goldeneye.
(b) Not more than two Barrow's Goldeneye.

Trapping

The Labrador South fur zone includes most of the Central and Southeastern Labrador region (Figure 15.5.5-4). Trapping is available for a number of species including beaver, muskrat, otter, mink, coyote, coloured fox, white fox, lynx, wolf, ermine (weasel), squirrel and marten. Currently, Labrador does not have an open season for fisher and wolverine (NLDEC-W 2010a).

The transmission corridor crosses portions of the fur zone (Figure 15.5.5-4). Seasons, species and average annual harvest for trapping seasons from 1990-01 to 2007-08 are provided in Table 15.5.5-4.

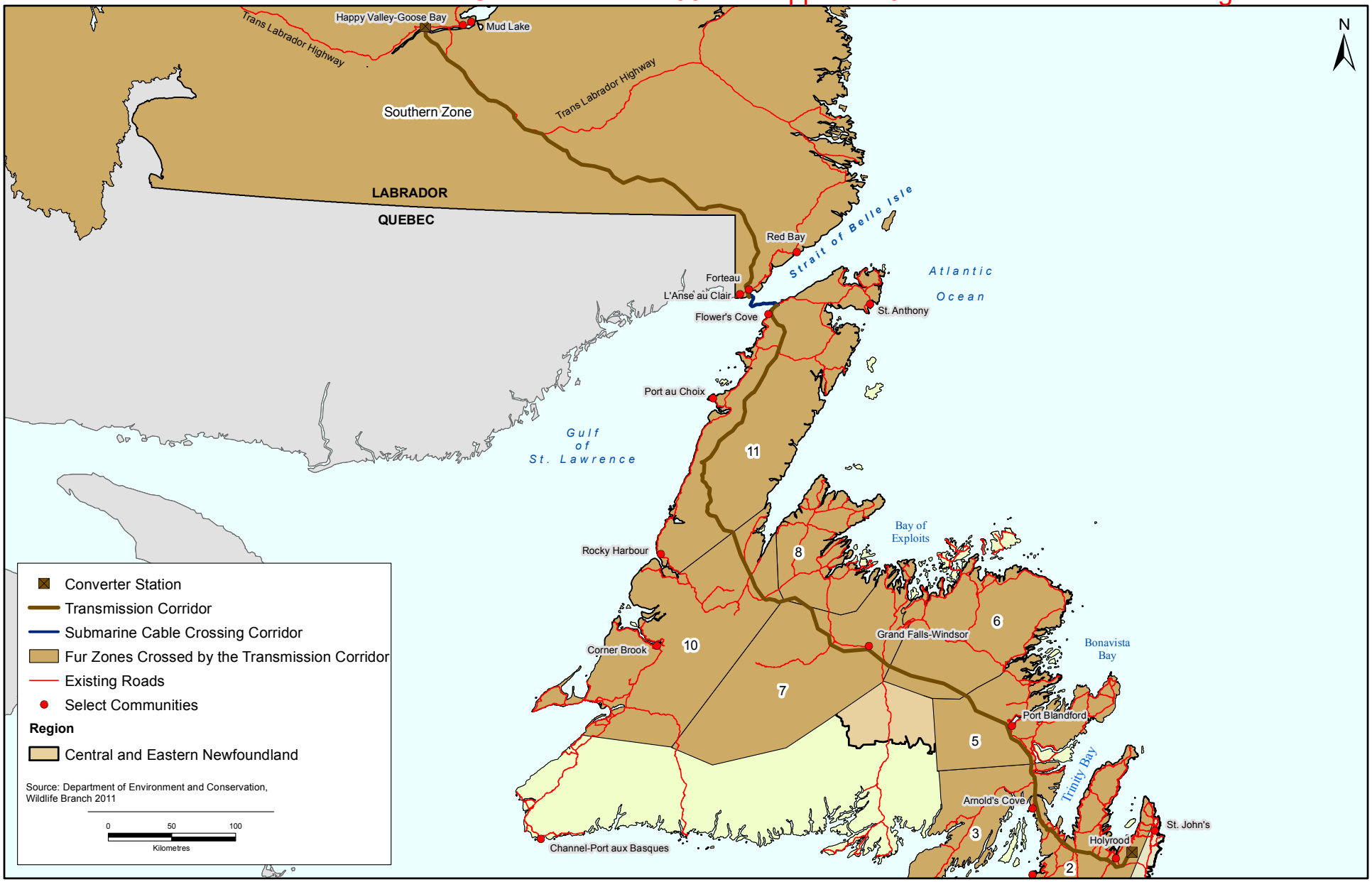


FIGURE 15.5.5-4

Land and Resource Use - Fur Zones

Table 15.5.5-4 Fur Trapping Zones Crossed by the Transmission Corridor in Central and Southeastern Labrador

Fur Trapping Zone	Season	Species	Average Annual Harvest for All of Labrador (1990 – 2008)
Labrador South	October 15, 2011 – May 31, 2012	Beaver	73
		Muskrat	326
	October 15, 2011 – March 31, 2012	Otter	101
	November 1, 2011 – March 1, 2012	Mink	314
	October 15, 2011 – March 31, 2012	Coyote	1
		Coloured Fox	558
		White Fox	6
		Lynx	41
		Ermine (Weasel)	499
		Marten	1,881
	October 15, 2011 – March 1, 2012	Squirrel	105
	October 15, 2011 to April 30, 2012	Wolf	26
		All Species	3,932

Source: NLDEC-W 2011, internet site; NLDEC-W 2009a.

15.5.5.2 Northern Peninsula

Big Game Hunting

The Northern Peninsula region as previously defined in this section includes portions of 13 MMAs (1, 2, 3, 4, 5, 6, 7, 12, 13, 39, 39A, 40 and 45). Three small moose hunting enclaves (2A, 2B and 5A) are located in Gros Morne National Park. BBMAs are the same as the MMAs in Newfoundland. The Northern Peninsula has three open CMAs (69, 76 and 79) (NLDEC-W 2011, internet site).

The transmission corridor crosses portions of six MMAs and BBMAs (2, 3, 4, 39, 40 and 45) (Figure 15.5.5-1, Figure 15.5.5-2) and CMAs 69, 76 and 79 (Figure 15.5.5-3). These management areas and their seasons and quotas are outlined in Table 15.5.5-5.

Table 15.5.5-5 Big Game Management Areas Crossed by the Transmission Corridor on the Northern Peninsula

Species	Management Area	Season	Quota
Moose	2-Portland Creek	September 10, 2011 – January 8, 2012	1,450
	3-Harbour Deep		1,250
	4-Taylor's Brook		1000
	39-Cloud River		500
	40-Conche		1,350
	45-Ten Mile Brook		1,300
Black bear	2-Portland Creek	September 10 – November 6, 2011	2 (either sex) per licence
	3-Harbour Deep		
	4-Taylor's Brook		
	39-Cloud River		
	40-Conche		
	45-Ten Mile Brook		
Woodland caribou	69-Northern Peninsula	September 10 – December 11, 2011	140
	76-St. Anthony		60
	79-Adies Lake		10

Source: NLDEC-W 2011, internet site.

Small Game Hunting

The Northern Peninsula region is included in the Remainder of Island SGMA. Hunting is available for ptarmigan, spruce and ruffed grouse and snowshoe hare. Gros Morne National Park and the Main River Study Area are closed to snaring to prevent accidental mortality of pine marten (NLDEC-W 2010a).

The proposed transmission corridor crosses portions of Remainder of Island SGMA. Table 15.5.5-6 outlines the shooting and snaring seasons and bag limits for the Remainder of Island SGMA.

Table 15.5.5-6 Small Game Management Areas Crossed by the Transmission Corridor on the Northern Peninsula

Management Area	Species	Shooting Season	Snaring Season	Bag Limit (Daily / Possession)
Remainder of Island	Ptarmigan (Willow and Rock)	September 17 – December 11, 2011	October 8, 2011 – February 26, 2012	12 / 24 (combined)
	Snowshoe hare	October 8, 2011 – February 26, 2012		40 (possession)
	Grouse (Spruce and Ruffed)	September 17 – December 25, 2011		20 / 40 (combined)

Source: NLDEC-W 2011, internet site.

Migratory Game Bird and Murre Hunting

Migratory game bird hunting zones include Northern Inland, Western Coastal and Northern Coastal. Hunting is not permitted (no open season) for Long-tailed Ducks, eiders or scoters in Newfoundland inland zones. The Murre Hunting Zone 2 incorporates the coastal areas around the Northern Peninsula (NLDEC-W 2010a).

The transmission corridor crosses a portion of the Northern Coastal, Northern Inland and Murre Hunting Zone 2. Table 15.5.5-7 outlines the hunting zones, species, seasons and bag limits.

Table 15.5.5-7 Bird Hunting Areas Crossed by the Transmission Corridor on the Northern Peninsula

Hunting Area	Species	Season	Bag Limit (Daily / Possession)
Northern Coastal	Ducks (except Long-tailed Duck, Harlequin Ducks, eiders and scoters), geese and snipe	Third Saturday in September to last Sat. in December 2011	6[(a)] / 12[(b)] (ducks) 6 / 12 (mergansers) 5 / 10 (geese) 10 / 20 (snipe)
	Long-tailed Ducks, eiders, and scoters	Fourth Saturday in November, 2011 to last day in February 2012	6 / 12
Northern Inland	Ducks (except Long-tailed Duck, Harlequin Ducks, eiders and scoters), geese and snipe	Third Saturday in September to last Saturday in December 2011	6[(a)] / 12[(b)] (ducks) 6 / 12 (mergansers) 5 / 10 (geese) 10 / 20 (snipe)
Murre Hunting Zone 2	Murre (turr)	October 6, 2011 to January 20, 2012	20 / 40

Source: NLDEC-W 2011, internet site.
(a) Not more than one may be Barrow's Goldeneye.
(b) Not more than two may be Barrow's Goldeneye.

Trapping

The Northern Peninsula has two Fur Zones (Figure 15.5.5-4). Zone 11 is on the northern part of the Peninsula from the Straits area to Rocky Harbour. Zone 10 is located from White Bay to the Port au Port Peninsula (NLDEC-W 2010a). The Northern Peninsula falls within Zone A of the Lynx Management Zone (NLDEC-W 2011, internet site).

The transmission corridor crosses portions of both Fur Zones 10 and 11 (Figure 15.5.5-4) as well as Lynx Management Zone A. Table 15.5.5-8 provides information on the fur zones, seasons and harvest data by species for the period between 1990-91 and 2007-08. Only those species for which trapping is currently permitted are included.

Table 15.5.5-8 Fur Trapping Zones Crossed by the Transmission Corridor on the Northern Peninsula

Fur Trapping Zone	Season	Species	Average Annual Harvest (1990 – 2008)
10, 11	October 20, 2011 – March 15, 2012	Beaver (traplines)	431
		Muskrat	269
		Otter	132
	November 1, 2011 – February 28, 2012	Mink	496
	October 20, 2011 – February 1, 2012	Coyote	14
		Coloured Fox	693
		White Fox	1
	October 20, 2011 – February 28, 2012	Ermine (Weasel)	532
		Squirrel	372
Zone A (Lynx)	November 5, 2011 – December 4, 2011	All Species	2,940
		Lynx	No data

Source: NLDEC-W 2011, internet site; NLDEC-W 2009a.

15.5.5.3 Central and Eastern Newfoundland

Big Game Hunting

Central and Eastern Newfoundland region includes parts of 12 MMAs (Figure 15.5.5-1) and BBMAs (Figure 15.5.5-2) and six CMAs (Figure 15.5.5-3). All of these areas are open to hunting except BBMA 44 and CMA 63. Table 15.5.5-9 shows the open big game areas and their relative seasons and quotas.

Small Game Hunting

In Central and Eastern Newfoundland (as on the Northern Peninsula), small game hunting is allowed for grouse, ptarmigan and snowshoe hare. Management areas include Remainder of Island, The Topsails, Burin and Avalon / Swift Current. A portion of the latter is closed to ptarmigan hunting (NLDEC-W 2010a).

The proposed transmission corridor crosses Remainder of Island, The Topsails and Avalon / Swift Current SGMAs. Table 15.5.5-10 outlines the relevant small game hunting areas, the seasons and the bag limits.

Migratory Game Bird and Murre Hunting

Migratory game bird hunting zones include Southern Inland, Northeastern Coastal and Avalon-Burin Inland and Avalon-Burin Coastal. Murre Hunting Zone 2 is located on the north coast of Central Newfoundland and Zone 4 surrounds the Bonavista Peninsula (NLDEC-W 2010a).

The proposed transmission corridor crosses the Southern Inland zone through Central and Eastern Newfoundland. Table 15.5.5-11 outlines the hunting zones, species, seasons and bag limits.

Table 15.5.5-9 Big Game Management Areas Crossed by the Transmission Corridor in Central and Eastern Newfoundland

Species	Management Area	Fall / Winter Season	Quota
Moose	4-Taylor's Brook	September 10, 2011 – January 8, 2012	1,000
	13-Gaff Topsails		550
	15-Twin Lakes		1,100
	16-Sandy Badger		350
	21-Rattling Brook		500
	24-North West Gander		250
	27-Terra Nova		300
	41-Sheffield Lake		400
	42-Gambo		200
	28-Black River	October 1, 2011 – January 29, 2012	550
	29-Bonavista Peninsula		1,200
	44-Bellevue		450
Black bear	4, 13, 15, 16, 21, 24, 27, 28, 29, 41, 42, 44	September 10 – November 6, 2011	2 (either sex) per licence
Woodland caribou	64-Middle Ridge	September 10 – December 11, 2011	140
	66-Gaff Topsails		40
	67-Pot Hill		50
	68-Mount Peyton		15
	78-Hampden Downs		5

Source: NLDEC-W 2011, internet site.

Table 15.5.5-10 Small Game Management Areas Crossed by the Transmission Corridor in Central and Eastern Newfoundland

Management Area	Species	Shooting Season	Snaring Season	Bag Limit (Daily / Possession)
Remainder of Island	Ptarmigan (Willow and Rock)	September 17 – December 11, 2011	October 8, 2011 – February 26, 2012	12 / 24 (combined)
	Snowshoe hare	October 8, 2011 – February 26, 2012		40 (possession)
	Grouse (Spruce and Ruffed)	September 17 – December 25, 2011		20 / 40 (combined)
The Topsails	Ptarmigan (Willow and Rock)	September 17 – November 27, 2011		6 / 12 (combined)
	Grouse (Spruce and Ruffed)	September 17 – December 25, 2011		20 / 40 (combined)
Avalon / Swift Current (except for Fairhaven)	Ptarmigan (Willow and Rock)	September 17 – November 13, 2011		6 / 12 (combined)
	Grouse (Spruce and Ruffed)	September 17 – December 25, 2011		20 / 40 (combined)

Source: NLDEC-W 2011, internet site.

Table 15.5.5-11 Bird Hunting Areas Crossed by the Transmission Corridor in Central and Eastern Newfoundland

Hunting Area	Species	Season	Bag Limit (Daily / Possession)
Southern Inland	Ducks (except Long-tailed Ducks, eiders and scoters), geese and snipe	Third Saturday in September to last Sat. in December 2011	6[(a)] / 12[(b)] (Ducks) 5 / 10 (geese) 10 / 20 (snipe)

Source: NLDEC-W 2011, internet site.

[(a)] Not more than four may be American Black Ducks; not more than one may be Barrow's Goldeneye.

[(b)] Not more than 8 may be American Black Ducks; not more than two may be Barrow's Goldeneye.

Trapping

The Central and Eastern Newfoundland region includes portions of Fur Zones 3, 4, 5, 6, 7 and 8, and a small portion of Zone 2 which is discussed in the next section, as well as Lynx Zone A. Trapping is available for a number of species (NLDEC-W 2010a). The transmission corridor crosses portions of all of these zones except for Zone 4 (Figure 15.5.5-4). Table 15.5.5-12 outlines the fur zones, the seasons and average annual harvests by species (for those that are currently permitted for trapping).

Table 15.5.5-12 Fur Trapping Zones Crossed by the Transmission Corridor in Central and Eastern Newfoundland

Fur Trapping Zone	Season	Species	Average Annual Harvest (1990 – 2008)
3, 5, 6, 7, 8	October 20, 2011 – March 15, 2012	Beaver	993
		Muskrat	379
		Otter	384
	November 1, 2011– February 28, 2012	Mink	1,289
	October 20, 2011 – February 1, 2012	Coyote	47
		Coloured Fox	1,290
		White Fox	4
	October 20, 2011 – February 28, 2012	Ermine (Weasel)	466
		Squirrel	674
		All Species	5,527
Lynx Zone A	November 5, 2011 – December 4, 2011	Lynx	No data

Source: NLDEC-W 2011, internet site; NLDEC-W 2009a.

15.5.5.4 Avalon Peninsula

Big Game Hunting

The Avalon Peninsula region includes MMAs and BBMAs 31, 32, 33, 34, 35 and 36. However, all BBMAs on the Avalon are closed to hunting. The Avalon includes CMA 65 (closed to hunting) and 77 (NLDEC-W 2011, internet site).

The transmission corridor crosses portions of MMAs 31, 33, 34, 35 and 36 (Figures 15.5.5-1) and CMA 65 (Figure 15.5.5-3). Table 15.5.5-13 presents these MMAs and the seasons and quotas.

Table 15.5.5-13 Big Game Management Areas Crossed by the Proposed Transmission Corridor on the Avalon Peninsula

Species	Management Area	Season	Quota
Moose	31-Placentia	October 1, 2011 – January 29, 2012	700
	33-Salmonier		550
	34-Bay de Verde		650
	35-St. John's		575
	36-Southern Shore		1,400

Source: NLDEC-W 2011, internet site.

Small Game Hunting

The Avalon / Swift Current SGMA covers the Avalon Peninsula. Hunting is available for ptarmigan and grouse (NLDEC-W 2010a). The transmission corridor crosses this SGMA. Seasons and bag limits are shown in Table 15.5.5-14.

Table 15.5.5-14 Small Game Management Areas Crossed by the Transmission Corridor on the Avalon Peninsula

Management Area	Species	Shooting Season	Snaring Season	Bag Limit (Daily / Possession)
Avalon / Swift Current	Ptarmigan (Willow and Rock)	September 17 – November 13, 2011	October 8, 2011 – February 26, 2012	6 / 12 (combined)
	Grouse (Spruce and Ruffed)	September 17 – December 25, 2011	October 8, 2011 – February 26, 2012	20 / 40 (combined)

Source: NLDEC-W 2011, internet site.

Migratory Game Bird and Murre Hunting

The Avalon Peninsula has two migratory game bird hunting zones: Avalon-Burin Coastal and Avalon-Burin Inland. Murre Hunting Zones 3 and 4 are also located on the Avalon (NLDEC-W 2010a).

The transmission corridor crosses the Avalon-Burin Inland migratory game bird hunting zone. Table 15.5.5-15 provides details on the hunting season and bag limits by species of this zone.

Table 15.5.5-15 Bird Hunting Areas Crossed by the Transmission Corridor on the Avalon Peninsula

Hunting Area	Species	Season	Bag Limit (Daily / Possession)
Avalon-Burin Inland	Ducks (except Long-tailed Ducks, eiders and scoters), geese and snipe	Third Sat. in Sept. to last Sat. in Dec. 2011	$6^{(a)}$ / $12^{(b)}$ (ducks) 5 / 10 (geese) 10 / 20 (snipe)

Source: NLDEC-W 2011, internet site.

(a) Not more than four may be American Black Ducks; not more than one may be Barrow's Goldeneye.

(b) Not more than 8 may be American Black Ducks; not more than two may be Barrow's Goldeneye.

Trapping

The Avalon Peninsula has two fur zones: Zone 1 and Zone 2 (NLDEC-W 2010a). The transmission corridor crosses Fur Zone 2 (Figure 15.5.5-3). Table 15.5.5-16 provides details on the seasons for species harvested in Zone 2 and the average annual harvest from 1990-91 to 2007-08.

Table 15.5.5-16 Fur Trapping Zones Crossed by the Transmission Corridor on the Avalon Peninsula

Fur Trapping Zone	Season	Species	Average Annual Harvest (1990 to 2008)
2	October 20, 2011 – March 15, 2012	Beaver	207
		Muskrat	135
		Otter	82
	November 1, 2011 – February 28, 2012	Mink	348
	October 20, 2011 – February 1, 2012	Coyote	6
		Coloured Fox	267
		White Fox	1
	October 20, 2011 – February 28, 2012	Ermine (Weasel)	87
		Squirrel	48
		All Species	1,180

Source: NLDEC-W 2011, internet site; NLDEC-W 2009a.

15.5.6 Recreational Fishing

Recreational sport and subsistence fishing includes both freshwater and marine species. Atlantic salmon are fished in 186 scheduled salmon rivers in Labrador and Newfoundland. Ouananiche (land locked Atlantic salmon), brook trout, rainbow trout, brown trout, sea-run trout and smelt are fished for throughout the province. Arctic char are fished primarily in Labrador and in a limited number of locations in Newfoundland (e.g., Northern Peninsula). Northern pike and lake trout are fished in Labrador but not in Newfoundland. Whitefish (both lake and round) are primarily fished for in Labrador. With the exception of northern pike, the species discussed above can occupy both freshwater and marine waters and all are fished in both. Although Atlantic salmon can be fished for in marine waters, retention is not permitted. In marine environments, Atlantic cod, squid, halibut, mackerel, and capelin, are fished recreationally. Details of the information summaries provided are available in AMEC 2010b. Marine fisheries are further discussed in Section 15.6.

Ice fishing occurs mostly on stream fed ponds and lakes throughout the province and brook trout is the most sought after species. Due to additional access resulting from the 2009 extension of Route 510 in south-eastern Labrador, ice fishing increased on ponds and lakes in the winter of 2009-10. Avalon Peninsula ponds and lakes experience a high level of use due to a higher population concentration and convenient access (Conservation Officers 2010, pers. comm.).

DFO's current Multi-Year Salmon Management Plan (2007-2012) (DFO 2011b) sets annual season dates and retention limits for salmon angling. Seasons are shown in Table 15.5.6-1.

Table 15.5.6-1 Salmon Angling Seasons in Newfoundland and Labrador, 2011-2012

Zones	Area	Open	Close
1 and 2	Labrador North and East	June 15	September 15
14B	L'Anse au Clair to Cape Charles		
3-8	Cape Bauld to Cape Race	June 1	September 7
9-12	Cape Race to Cape Ray		
13	Cape Ray to Cape St. Gregory		
14A	Cape St. Gregory to Cape Bauld		
Fall Angling[(a)]	Gander River, Exploits River, Humber River	September 8	October 7

Source: DFO 2011b.
[(a)] Some individual rivers have different opening and closing dates depending on individual watershed management plans.

Salmon stream classifications and daily bag limits are described in Table 15.5.6-2.

Table 15.5.6-2 Salmon Retention Limits in Newfoundland and Labrador, 2011-2012

River Class	Seasonal Limit	Daily Retention	Possession Limit	Catch-and-Release
Class I Rivers	6 fish	2 fish	4 fish	4 per day
Class II Rivers	4 fish	2 fish	4 fish	4 per day
Class III Rivers	2 fish	2 fish	2 fish	4 per day
Class IV Rivers	Catch-and-Release	n/a	n/a	2 per day
Unclassified Rivers (Zones 1 and 2)	4 fish	2 fish	4 fish	4 per day
Non-Scheduled Rivers (Class III)	2 fish	2 fish	2 fish	4 per day

Source: DFO 2011b.
n/a Not applicable.

The DFO collects data from salmon anglers and uses it to describe fishing activity and catch rate. 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 (DFO 2010b). A CPUE of over 1.0 is rare and anglers consider streams with a CPUE of 0.25 (one fish per four days of angling) to be desirable fishing areas (McCarthy 2010, pers. com.).

The DFO prepares an annual trout management plan to maintain sustainable fishing. Season dates may be adjusted for any species in any geographic area (DFO 2010b). Trout angling zones and seasons are provided in Table 15.5.6-3.

Table 15.5.6-3 Trout Angling Zones and Seasons in Newfoundland and Labrador, 2011-2012

Zone	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 (Québec-Labrador border to Cape Charles)	March 1	n/a	n/a	
3 – Southeastern Labrador, north of latitude to 52° to Groswater Bay and bounded inland by west longitude 58°				
5 – Central Labrador	February 1			September 15
6 – Northern Labrador				

Source: DFO 2011b.
n/a Not applicable.

Trout angling is permitted generally from winter 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 15.5.6-4.

Table 15.5.6-4 Trout Retention Limits in Newfoundland and Labrador, 2011-2012

Area	Species	Daily Bag Limit	Possession Limit
Labrador	Trout (speckled trout and ouananiche)	12 fish or 5 lbs round weight (2.25 kg) + 1 fish, whichever is reached first of the two species combined. No rainbow or ouananiche less than 20 cm (8 inches) can be retained.	Twice daily bag limit
	Lake trout (Zone 2)	2 fish	4 fish
	Lake trout (Zones 3-6)	3 fish	3 fish
	Brook trout in Eagle Plateau Management Zone, Chateau Pond and Gilbert's Lake	6 fish or 2.5 lbs (1.14 kg) + 1 fish whichever limit 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 5 lbs (2.25 kg) round weight + 1 fish, whichever is reached first of all species combined	Twice daily bag limit
	Arctic char	12 fish or 5 lbs (2.25 kg) round weight + 1 fish whichever is reached first	Twice daily bag limit
	Smelt	No limit	No limit

Source: DFO 2011b.

Labrador bag and possession limits are lower than those in Newfoundland for lake trout, northern pike and Arctic char. Lower limits are also set for brook trout in several areas of Labrador. As data are not collected from resident anglers, success rates are not reported for trout angling.

The following sections provide an overview of salmon and trout fishing by region.

15.5.6.1 Central and Southeastern Labrador

Central and Southeastern Labrador has a number of scheduled salmon rivers including Eagle River, Paradise River, St. Lewis River, Pinware River and Forteau River (DFO 2010b).

Labrador has five trout angling zones. Zones 2, 3, and 5 are in Central and Southeastern Labrador. DFO has set conservation measures for lake trout, northern pike and Arctic char in Labrador. Zone 5 includes the Eagle Plateau Management Zone, a conservation area for trout angling (DFO 2010b).

The transmission corridor crosses the Forteau River (Figure 15.5.6-1). Angling zone, class, total catch and CPUE are shown in Table 15.5.6-5.

Table 15.5.6-5 Scheduled Salmon Rivers Crossed by the Transmission Corridor in Central and Southeastern Labrador 2011-2012

Scheduled Salmon River	Angling Zone	Class	2010 Catch Data		
			Rods	Catch	CPUE
175 - Forteau River including First, Second and Third Lakes	14B	III	610	249	0.41

Source: DFO 2011b.

Salmon anglers enjoy high success rates in south-eastern Labrador scheduled salmon rivers. This is possibly related to a fairly low population density and limited road access.

The transmission corridor crosses the Eagle Plateau Management Zone, a special trout management area (Figure 15.5.6-1). Season and daily bag limit are shown in Table 15.5.6-6.

Table 15.5.6-6 Trout Retention Limits in the Eagle Plateau Management Zone, 2011-2012

Summer Season	Bag Limit
February 1 to September 15, 2011	Bag limit for brook trout is 6 fish or 2.5 lbs (1.14 kg) + 1 fish, whichever is reached first. Possession limit is equal to bag limit.

Source: DFO 2011b.

15.5.6.2 Northern Peninsula

Of the 186 scheduled salmon rivers in Newfoundland and Labrador, approximately half are located on the Northern Peninsula. These include rivers around St. Anthony, Hare Bay, Main Brook, St. Barbe, Canada Bay, St. John Bay, Hawke's Bay, River of Ponds, Portland Creek, Harbour Deep, Main River and Humber River (Figure 15.5.6-1) (DFO 2010b).

Three scheduled salmon rivers are crossed by the transmission corridor on the Northern Peninsula (Figure 15.5.6-1). Portions of the East River are currently closed to salmon fishing (DFO 2010b). Angling zone, river class, total catch and CPUE for Northern Peninsula scheduled salmon rivers crossed by the transmission corridor are shown in Table 15.5.6-7.

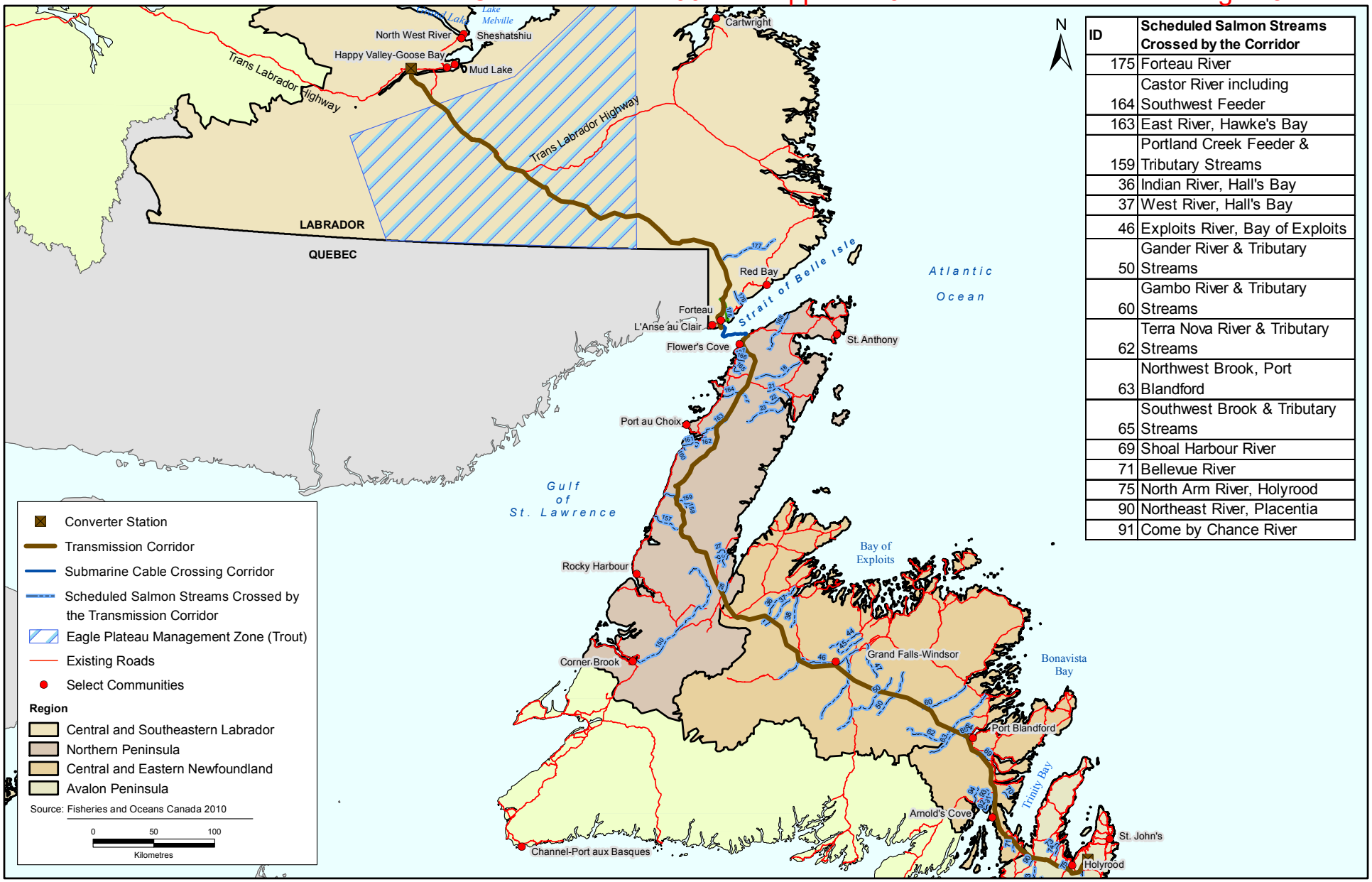
Table 15.5.6-7 Scheduled Salmon Rivers Crossed by the Transmission Corridor in the Northern Peninsula, 2011-2012

Scheduled Salmon River	Angling Zone	Class	2010 Catch Data		
			Rods	Catch	CPUE
159 - Portland Creek feeder and tributary streams	14A	II	n/a	n/a	n/a
163 - East River[(a)], Hawke's Bay	14A	III	1,276	909	0.71
164 - Castor River including south-west feeder	14A	II	1,912	1,604	0.84

Source: DFO 2011b.

n/a Not applicable.

[(a)] All or portions of closed to salmon angling.



ID	Scheduled Salmon Streams Crossed by the Corridor
175	Forteau River
164	Castor River including Southwest Feeder
163	East River, Hawke's Bay
159	Portland Creek Feeder & Tributary Streams
36	Indian River, Hall's Bay
37	West River, Hall's Bay
46	Exploits River, Bay of Exploits
50	Gander River & Tributary Streams
60	Gambo River & Tributary Streams
62	Terra Nova River & Tributary Streams
63	Northwest Brook, Port Blandford
65	Southwest Brook & Tributary Streams
69	Shoal Harbour River
71	Bellevue River
75	North Arm River, Holyrood
90	Northeast River, Placentia
91	Come by Chance River

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FIGURE 15.5.6-1

Land and Resource Use: Scheduled Salmon Streams and Special Management Areas

Success rates for salmon are high in most scheduled salmon streams in this region but not in all. Some streams are wholly or partially closed to salmon angling for conservation reasons.

A special trout management area includes Ten Mile Lake, Round Lake and all waters running in and out of both of these lakes and the St. Genevieve River System. No winter angling is permitted. Season and daily bag limits for trout in these lakes are shown in Table 15.5.6-8.

Table 15.5.6-8 Trout Retention Limits in Ten Mile Lake and Round Lake, 2011-2012

Summer Season	Daily Bag Limit
July 1 to July 15, 2011	2 trout or 5 lbs (2.27 kg) whichever is reached first. Trout greater than 58 cm must be released.

Source: DFO 2011b.

15.5.6.3 Central and Eastern Newfoundland

Central and Eastern Newfoundland has a number of scheduled salmon rivers including those flowing into White Bay, Hall's Bay, Notre Dame Bay, Bay of Exploits, Gander Bay, Bonavista Bay, Trinity Bay and Placentia Bay. Important salmon fishing rivers in this area include the Exploits River and the Gander River (DFO 2010b).

Ten scheduled salmon rivers are crossed by the proposed transmission corridor in this region (Figure 15.5.6-1). Five of these are partially closed to salmon angling (DFO 2010b). Table 15.5.6-9 shows angling zone, class, catch and CPUE for scheduled salmon rivers crossed by the proposed transmission corridor. Non-scheduled rivers in insular Newfoundland and Labrador are Class III, with a retention limit of two fish (DFO 2010b).

Table 15.5.6-9 Scheduled Salmon Rivers Crossed by the Transmission Corridor in Central and Eastern Newfoundland, 2011-2012

Scheduled Salmon Rivers	Angling Zone	Class	2010 Catch Data		
			Rods	Catch	CPUE
36 - Indian River, Hall's Bay including Burnt Berry Brook below falls	4	II	2,385	869	0.36
37 - West River, Hall's Bay including Rowsell's Brook and Barney's Brook	4	III	604	192	0.32
46 - Exploits River and tributary streams[(a)]	4	I, II, III, or IV depending on area	17,061	7,657	0.45
60 - Gambo Brook and tributary streams including Mint Brook, Narrows, Triton Brook, Riverhead Brook and Parsons Brook	5	II	3,269	914	0.28
62 - Terra Nova River and tributaries including Maccles Brook, Georges Brook and Butts Brook[(a)]	5	III	2,017	779	0.39
63 - Northwest Brook, Port Blandford and tributary streams[(a)]	5	NSR-III	193	82	0.42
65 - Southwest Brook, Port Blandford and tributary streams	5	III	218	105	0.48
69 - Shoal Harbour River, Trinity Bay and tributaries[(a)]	6	III	249	37	0.15
71 - Bellevue River, Trinity Bay[(a)]	6	III	81	9	0.11
91 - Come By Chance River	10	III	280	55	0.20

Source: DFO 2011b.

[(a)] All or portions of closed to salmon angling.

Anglers enjoy successful fishing in several Central and Eastern Newfoundland rivers but some areas are closed to fishing.

15.5.6.4 Avalon Peninsula

On the Avalon Peninsula, scheduled salmon rivers empty into Placentia Bay, St. Mary's Bay, Conception Bay, Trepassey Bay and the Atlantic Ocean (DFO 2010b).

The transmission corridor crosses two scheduled salmon rivers: North Arm River and Northeast River (Figure 15.5.6-1) (DFO 2010b). Table 15.5.6-10 shows the angling zone, river class, catch and CPUE for the North Arm River and the Northeast River.

Table 15.5.6-10 Scheduled Salmon Rivers Crossed by the Transmission Corridor in the Avalon Peninsula, 2011-2012

Scheduled Salmon Rivers	Angling Zone	Class	2010 Preliminary Catch Data		
			Rods	Catch	CPUE
75 - North Arm River, Holyrood	7	IV	68	10	0.15
90 - Northeast River, Placentia[(a)]	10	III	1,457	428	0.29

Source: DFO 2011b .
[(a)] All or portions of closed to salmon angling.

The CPUE for the rivers in the Northern Peninsula region is lower than rivers in Central and Southeastern Labrador and the Northern Peninsula and similar to those found Central and Eastern Newfoundland.

15.5.7 Aboriginal Contemporary Traditional Land Use

Nalcor conducted an assessment of contemporary traditional land use for a number of Aboriginal groups who reside in, and/or claim Aboriginal rights and/or title to the area within or near the Project (e.g., the transmission corridor). The following subsections provide baseline information on contemporary traditional land use activities of the following Aboriginal groups and organizations:

- Labrador Innu (Sheshatshiu and Natuashish, as represented by Innu Nation);
- Labrador Inuit (Nunatsiavut Government);
- NunatuKavut Community Council (formerly Labrador Metis Nation);
- Innu and Naskapi of Québec:
  - Pakua Shipi;
  - Unamen Shipu;
  - Nutashkuan;
  - Ekuanitshit;
  - Uashat mak Mani-Utenam, Matimekush-Lac John; and
  - Naskapi Nation of Kawawachikamach.

More detailed information on contemporary traditional land use by these groups and organizations is available in the Socioeconomic Environment: Aboriginal Communities and Land Use Component Study (Nalcor et al. 2011).

15.5.7.1 Labrador Innu

The Innu residing in Labrador, first organized under the Naskapi-Montagnais Indian Association, are indigenous inhabitants of an area they refer to as Nitassinan, which comprises the eastern portion of the Québec-Labrador peninsula. They were traditionally a nomadic people, whose movements responded to the seasons and the migration of the animals they relied upon. The Labrador Innu continue to attach great importance to time spent in Nutshimit (the country), which for many is seen as an opportunity for cultural and physical renewal.

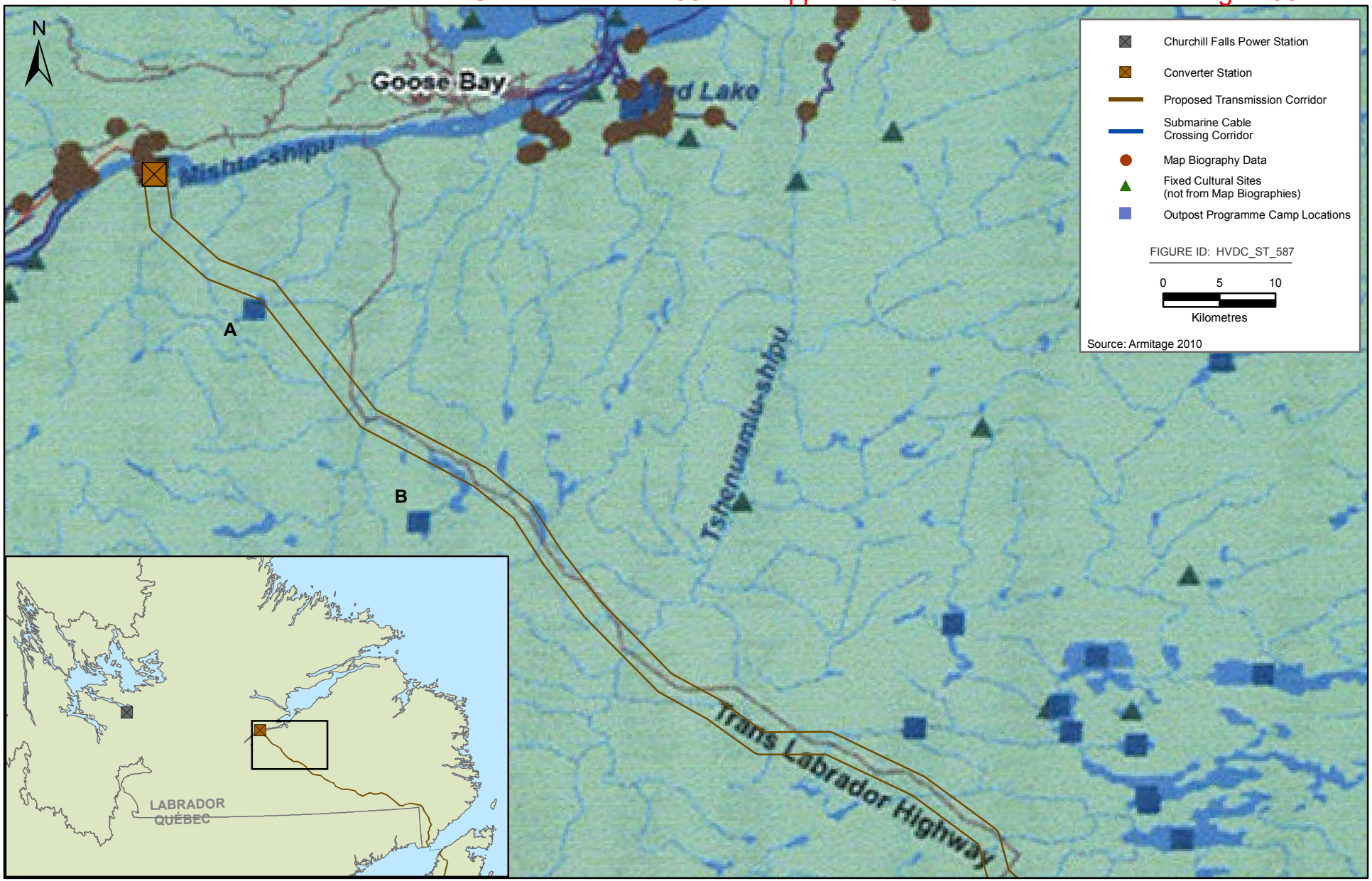
Today, most Labrador Innu reside in the communities of Sheshatshiu and Natuashish, although some reside in Happy Valley-Goose Bay (Happy Valley-Goose Bay) and elsewhere. Sheshatshiu, which is approximately 40 km north-east of Happy Valley-Goose Bay, is the largest Innu community in Labrador. Natuashish is a smaller community on the north-eastern coast of Labrador, 300 km north of Happy Valley-Goose Bay and 80 km south-east of Nain. Labrador Innu living in Davis Inlet resettled to Natuashish in 2002 and 2003. The Labrador Innu continue to practice traditional land use and harvesting activities within their traditional territory, where they have camps and cabins, travel, hunt, fish and gather.

Based on available information, there is little contemporary traditional land use within the transmission corridor or within the Study Area (Figure 15.5.7-1). Figure 15.5.7-1 presents a portion of the original "Map 16 – Hodgepodge – All categories" from Armitage (2010). The land use data associated with Map 16 have not been altered in the reproduction of this figure. The figure does include the currently proposed transmission corridor superimposed on the original figure. Rather, contemporary traditional land use activities are practiced mainly along the Churchill River, near Happy Valley-Goose Bay, in the Mealy Mountains area and in parts of south-west Labrador. In the last 20 years, there has been a trend toward a community based harvest which relies on expanded use of the Labrador road network for land use and harvesting by Sheshatshiu Innu, and this trend is likely to continue (Armitage 2010). Since the 1960s, activities have become more and more focused on road corridors such as the TLH1, between Happy Valley-Goose Bay and Churchill Falls, and Esker Road. Families who have a long-time association with the Mealy Mountains and the Eagle River plateau will likely spend more time there now that the TLH3 is complete. It is unlikely that there will be increased land use and harvesting by Labrador Innu in the areas south and west of the plateau toward the Strait of Belle Isle due to the current scarcity of caribou and other resources. However, use of the Salmon River / Little Drunken River for caribou hunting and use of the area at the south end of Minipi Lake for the harvesting of small game have also been documented (Armitage 2010; Armitage and Stopp 2003).

Travel Routes and Camp Sites

Community living and access to funding for cultural activities have had notable effects on traditional activities, including how people travel to and from seasonal hunting, trapping and fishing areas. Whereas in the past, hunters and their families would have walked and travelled by canoe, preferred modes of contemporary transportation have become vehicles, snowmobiles and motorized boats. Funding for cultural activities has enabled the chartering of aircraft to transport people from their communities to interior harvesting areas (Stopp 2002).

The Sheshatshiu Innu First Nation (SIFN) began facilitating an Outpost Programme in the 1970s. This program still finances, although since the early 2000s to a lesser degree, a country-based harvest, referred to as Kakushpinanut, whereby Innu families travel to and from camps in the interior of Labrador to spend time hunting caribou and engaging in other traditional activities (Armitage and Stopp 2003).



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FIGURE 15.5.7-1

Innu of Labrador Contemporary Land Use
(From Map 16 - Hodgepodge - All Categories (Armitage 2010))

While the data provided are approximate and the location would need to be confirmed, Armitage (2010) reports that the Innu Nation cabin database identifies camp locations within the Study Area, and some which are potentially within the transmission corridor. Outpost Programme data indicate a camp is located 25 km south of Muskrat Falls, which is within or near the transmission corridor (see "A" on Figure 15.5.7-1) (Armitage 2010). Armitage (2010) also indicates this camp has not been occupied since 1993. Another camp, identified as "B" on Figure 15.5.7-1, is located close to the TLH, and also within or near the transmission corridor, and was last occupied in 1984 (Armitage 2010). A third camp which was last occupied in 1985, is located approximately 25 km from the transmission corridor (Armitage 2010). According to Outpost Programme data, there are seven other camps located within the larger Study Area, and these are in an area around Crooks Lake where the transmission corridor follows the TLH south. One of the cabins located in this area is approximately 5 km east of the transmission corridor and TLH, while the remaining six are more than 10 km east of the transmission corridor and TLH. Outpost Programme data indicates these camps were established post-1990; however, data on further land use in this area has not been recorded (Armitage 2010).

Other Labrador Innu camp locations have been recorded at and around Parke Lake, to the south of Lake Melville and east of the proposed transmission corridor (Armitage 2010). Armitage (2010) found that in comparison to data collected earlier (Armitage and Stopp 2003), which looked at land use from the mid-1990s, many Sheshatshiu Innu no longer depend on the Outpost Programme for access to their cabins and harvesting activities. Rather, Armitage (2010) indicated that road accessible harvesting, camping and cabin occupancy are now the most important components of contemporary traditional Sheshatshiu Innu land use. Consequently, traditional Innu travel corridors and temporary camp locations are used less frequently (Armitage 2010; Armitage and Stopp 2003; Stopp 2002).

Armitage (2010) recorded travel routes, which included road, snowmobile, walking, canoe and motorboat. Labrador Innu use the Churchill River and TLH as travel routes. At Muskrat Falls, a portion of the Churchill River overlaps with the transmission corridor. Where the transmission corridor follows the TLH, this travel route overlaps with the transmission corridor. Other routes documented in Armitage (2010) include those in the Happy Valley-Goose Bay area, as well as in an area approximately 100 km north of where the TLH branches away from Gull Island and heads towards Churchill Falls. Canoe, snowmobile and walking routes were recorded near Gull Island, Dominion Lake and Minipi Lake. Canoe and walking routes, lying between Dominion Lake and the transmission corridor, were also identified. Other canoe, motorboat, walking and snowmobile routes were recorded in an area approximately 65 km east of the transmission corridor, extending south from Happy Valley-Goose Bay (Armitage 2010).

Hunting, Trapping and Gathering

Land use and harvesting by Sheshatshiu Innu are still centred on a series of lakes situated at the headwaters of the Eagle River to the east of the transmission corridor. Up until the early 2000s, roughly half of the male population of the community who participated in the country-based harvest in that area practiced harvesting activities on the Eagle River plateau (Degnen 2001). Several sources have identified harvesting locations distributed across Central and Southeastern Labrador, with notable concentrations north and west of the Churchill River, in the Mealy Mountains where caribou are hunted, and on the Eagle River plateau where waterfowl and other species are harvested (Armitage and Stopp 2003; Armitage 1990). Armitage and Stopp (2003) indicated that due to reductions in caribou populations and other resources found in this area, it was unlikely that land use and harvesting activities in the area south and west of the Eagle River plateau toward the Strait of Belle Isle, where the transmission corridor crosses, would increase.

Land use also occurs near Dominion Lake and Minipi Lake (Armitage 2010), around an area bounded by Winokapau Lake in the south, Smallwood Reservoir in the west, Seal Lake in the north and Nipishish Lake in the east, and in an area centred on Shipiskan Lake (Ashuapamatikuan), Snegamook Lake and Shapio Lake (Armitage and Stopp 2003).

Armitage (2010) indicated that large mammals hunted by the Labrador Innu include caribou, moose and black bear, although harvesting of moose and black bear is uncommon and has not occurred in proximity of the

transmission corridor. Between 1979 and 1987, caribou and black bear were harvested in areas along the south shore of Lake Melville and in the Mealy Mountains, at Disappointment Lake and Hope Lake, and in the Metchin River system (MacLaren Plansearch 1994). Armitage (2010) identified a caribou hunting area between Gull Lake and Churchill Falls and another one in the Salmon River / Little Drunken River area. However, this caribou hunting area does not overlap with the Project.

Hunting of small game was reported in the area around Grand Lake and the Red Wine River as well as at a number of locations along and north of the TLH 1 between Happy Valley-Goose Bay and Churchill Falls. Partridge and porcupine kill sites were reported within the transmission corridor near Muskrat Falls (Armitage 2010). Approximately 10 km north-west of Muskrat Falls, beaver, duck and geese kill sites were reported, along with one boil-up and one drinking water location (Armitage 2010). Other hunting areas included a large tract of land south of Lake Melville on the Eagle River plateau, in the Mealy Mountains at Disappointment and Hope lakes, in the Metchin River system, and in an area to the south of Muskrat Falls along the Churchill River.

Furbearer trapping areas roughly correspond to those described above for small game, with concentrations in the area along the TLH 1 and north to just above the Red Wine River (MacLaren Plansearch 1994). Armitage (2010) also recorded harvesting near Dominion Lake and at Minipi Lake. Small game harvesting areas were all located outside the Study Area.

Migratory waterfowl were hunted around Crooks Lake and Parke Lake east of the transmission corridor along the TLH 1, at various locations along the shoreline of Lake Melville, along several roads between Happy Valley-Goose Bay and Sheshatshiu and on the south side of the Churchill River at Gull Island (MacLaren Plansearch 1994). Two key hunting areas were recorded on the Eagle River plateau. Waterfowl were also harvested in the Mud Lake / Upper Lake Melville area, and near Sheshatshiu and North West River (Armitage 2010; Armitage and Stopp 2003).

Berry picking is widespread throughout Labrador along access routes and in river valleys. Berries commonly gathered by Labrador Innu include blueberries, partridgeberries and bakeapples (Armitage 1989). The harvesting of blueberries occurs in dry open areas and burnovers, with other berries harvested in marshy areas (Goudie 1991; Tanner 1978). Wild fruits were gathered at a number of locations east and north of the transmission corridor, including the area around Sheshatshiu, at the north end of Grand Lake and near the Red Wine River (MacLaren Plansearch 1994). Medicinal plants are also harvested by the Labrador Innu (Armitage 2010). Based on available information there is no record of berry picking or medicinal plant harvesting in the transmission corridor or within the Study Area.

Fishing

Between 1979 and 1987, fish were harvested from areas along the south shore of Lake Melville, in the Mealy Mountains, at Disappointment Lake and Hope Lake, in the Metchin River system, and at the Naskaupi River including, the watersheds of Wachusk Lake, Seal Lake, Pocket Knife Lake, Salmon Lake, Portage Lake, Namaycush Lake and North Pole Lake (MacLaren Plansearch 1994). Fishing was also recorded to occur in the area around Grand Lake and Red Wine River, as well as at a number of locations along and north of the TLH1 between Happy Valley-Goose Bay and Churchill Falls. Other fishing areas were identified south of Lake Melville on the Eagle River plateau, south of Muskrat Falls along the Churchill River, on the south side of the Churchill River at Gull Island, and on the north side of the Churchill River between Gull Island and Happy Valley-Goose Bay. Between 1979 and 1987, it was reported that the Labrador Innu harvested trout and smelt from North West Point, on Rabbit Island, near the mouth of Kenamu River, on Carter Basin, in Mulligan Bay and at the west end of Double Mer (MacLaren Plansearch 1994).

More recently, Armitage (2010) identified the location of fishing sites utilized by the Labrador Innu. Fishing locations include sections of the Churchill River, the Mud Lake area, approximately 15 km from Sheshatshiu along the TLH towards Churchill Falls, and in and around the Dominion Lake area. Fish harvesting was also reported within the Study Area, less than 10 km north-west of Muskrat Falls (Armitage 2010).

Places of Cultural Significance

Armitage (2010) described places of cultural significance, including birth, burial, death and gathering places, places of religious significance, one place of historical significance, shaking tent ceremony locations and the location of the Land-based Family Treatment Programme camp.

Three features fall within the Study Area. *Manitu-utshu*, or the rock knoll, located on the north side of Muskrat Falls is considered by Innu Elders to be the home of giant otter-like beings known as Uenitshikumishiteu. One birth place was recorded within approximately 10 km of Muskrat Falls. The location of a former shaking tent ceremony was at Muskrat Falls. The last shaking tent ceremony took place in 1969. Each of these features is discussed in detail in Armitage (2010).

Birth and gathering places, shaking tent locations and one place of religious significance were recorded along the Churchill River between Gull Island and Muskrat Falls. In the Happy Valley-Goose Bay and Mud Lake areas, death and gathering places, burial grounds as well as one place of religious significance and one shaking tent location were noted. Approximately 65 km east of the transmission corridor, near Carter Basin and Gibeon Point in Happy Valley-Goose Bay, Armitage (2010) recorded birth and death places, burial grounds, places of religious significance and a shaking tent location. East and south of this area many birth places and burial grounds were recorded, as well as one death location, one shaking tent location and three places of religious significance. Another place of religious significance was noted further south and east (Armitage 2010), approximately 30 km from the transmission corridor.

Other places of religious significance, gathering places, birth places and shaking tent locations were recorded between Sheshatshiu and Happy Valley-Goose Bay, along the TLH1 toward Churchill Falls, and near Muskrat Falls (Armitage 2010; Armitage 2008).

Place names are an important part of the use, occupation, history and meaning of a landscape, as they act as links between physical landforms and cultural events passed down in oral traditions including myths, cultural histories and personal biographies (Armitage 2010). The Labrador Innu have many place names for topographic features located throughout their traditional territory (Armitage 2010; INSIFN 2008). As observed on Map 15 of Armitage (2010), the following place names, and their associated English translation, are located within, or overlap with the Study Area:

- Mush-nipi (Moose lake);
- Tshiashku-nipi (Gull Lake);
- Tshiashku-shipiss (Gull River);
- Utshashukemu-shipiss (Salmon River);
- Tshishkuepeu-shipiss (Crazy Drunken River);
- Kakussanut (Where People Fish With a Hook and Line);
- Uapanatsheu-shipiss (Sneaking Creature River);
- Shinipesht-paushtiku (Sylvester Rapids);
- Pishiu-nipi (Lynx Lake); and
- Aissimeu-nipi (Inuit Lake).

Summary: Innu Nation

The Labrador Innu continue to practice traditional land use and harvesting activities within their traditional territory, where they have camps and cabins, travel, hunt, fish and gather. Based on available information, contemporary traditional land use activities are mainly practiced along the Churchill River, Goose Bay, the

Mealy Mountains and in some locations in south-western Labrador. The trend toward expanded use of the existing Labrador road network for land use and harvesting by Sheshatshiu Innu is likely to continue. Since the 1960s, activities have become more and more focused on road corridors such as the TLH1 and Esker Road, and as Armitage and Stopp (2003) point out, families who have a long-time association with the Mealy Mountains and the Eagle River plateau, will likely spend more time there (possibly as part of the community-based harvest) now that the TLH3 has been connected. Moreover, it seems unlikely, due to the current lack of caribou and other resources, that the area to the south and west of the plateau toward the Strait of Belle Isle where the transmission corridor crosses, will see any increased land use and harvesting by Sheshatshiu Innu. However, Armitage (2010) indicated that the Salmon River / Little Drunken River area has been used for caribou hunting, and the area at the south end of Minipi Lake was also used for the harvest of beaver, otter and muskrat.

15.5.7.2 Labrador Inuit

Labrador Inuit are now primarily resident in the north Labrador Inuit communities of Nain, Hopedale, Makkovik, Postville and Rigolet, and in the Central Labrador communities of North West River and Hope Valley-Goose Bay. The Labrador Inuits Land Claim Agreement (LILCA), signed by the Labrador Inuit, the Government of Canada and the province of Newfoundland and Labrador in January 2005, came into effect on December 1, 2001. The LILCA is a modern comprehensive treaty, and sets out the details of land ownership, resource sharing and self-government in the area covered by the LILCA in Northern Labrador. It also resulted in the establishment of the Nunatsiavut Government, which represents the over 6,000 beneficiaries of the LILCA.

Based on available information, there is no evidence of Labrador Inuit contemporary traditional land use activities in the Study Area. Rather, Labrador Inuit contemporary traditional land use activities are focused on lands within the LISA. These activities include hunting for seals, birds, rabbits, caribou and moose, as well as fishing and trapping. Outside the LISA, the general Lake Melville area has been used and continues to be used extensively by Labrador Inuit for a broad range of traditional activities, including hunting, fishing, trapping, wood cutting and snowmobile travel. The Project does not overlap with lands covered by the LILCA (Figure 15.5.7-2).

Travel Routes and Camp Sites

To access land use areas, Labrador Inuit use vehicles, boats, snowmobiles, snowshoes, planes and helicopters, or go by foot (Sikumiut 2009). The main modes of travel used by Labrador Inuit to and from Mud Lake and Happy Valley-Goose Bay are boats in the summer and snowmobiles in the winter.

Within many cultures, the naming of places is a link to understanding the use, occupation, history and meaning of a landscape (Armitage 2010; Collignon 1996). A Land Use and Occupancy Study completed in the 1970s (Brice-Bennett 1977) identifies Inuit place names recorded for Central and Southeastern Labrador for specific landforms on Lake Melville, including points, hills, ridges, lakes and rivers. The record of place names created at that time does not extend into the transmission corridor. Documented habitation sites in Central and Southeastern Labrador are located on the shoreline of Lake Melville (Brice-Bennett 1977).

Information from available sources, consultation efforts and materials submitted by the Nunatsiavut Government to the Lower Churchill Hydroelectric Generation Project as part of the EA process does not identify any trails, travelways or current habitation sites within or near the transmission corridor or Study Area.

Hunting, Trapping and Gathering

Labrador Inuit primarily hunt caribou, black bear, moose, and occasionally small game (Brice-Bennett 1977). Brice-Bennett (1977) also indicated that Labrador Inuit harvested birds, including geese and freshwater ducks, as well as seals within Hamilton Inlet and Lake Melville. Information available to date has not identified any Labrador Inuit marine mammal harvesting areas within transmission corridor or within the Study Area.

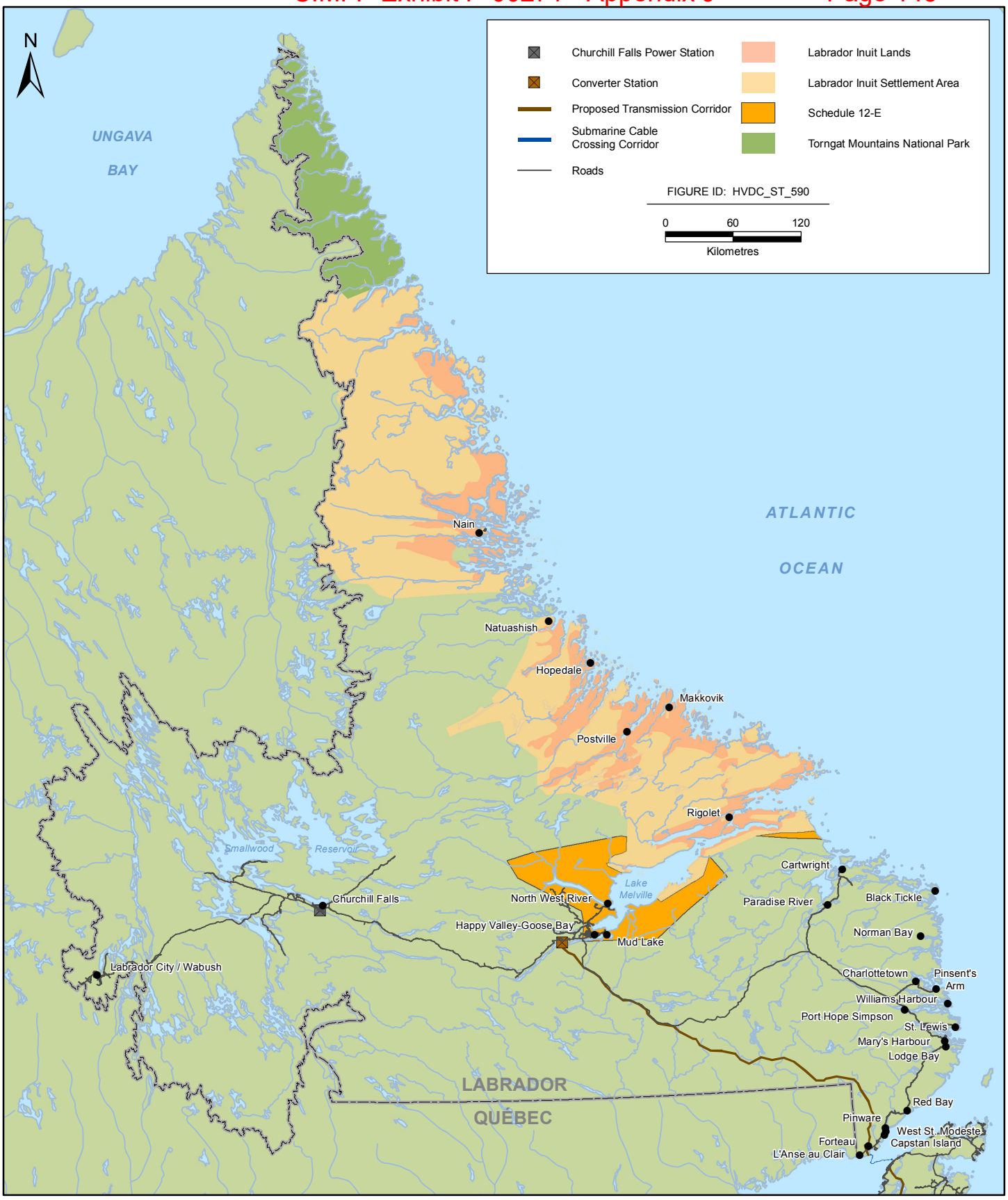


FIGURE 15.5.7-2

Labrador Inuit Land Claims Agreement

Currently, Inuit harvesting interests extend beyond the LISA. An Overlap Agreement was concluded with Nunavik Inuit to allow harvesting by Labrador Inuit for food, social or ceremonial purposes beyond the borders of the LISA. In addition, LILCA allows Inuit who ordinarily reside outside the LISA to harvest wildlife and migratory birds in the area described as Schedule 12-E of the Overlap Agreement. Contemporary traditional land use and harvesting by Beneficiaries in Schedule 12-E lands include the hunting of black bear, small game, migratory birds, moose and caribou. However, lands within Schedule 12-E are not designated for exclusive use by Beneficiaries. None of the lands described in Schedule 12-E are within the transmission corridor or the Study Area. The portion of Schedule 12-E lands which has the closest proximity to the Study Area is located around the mouth of Lake Melville, approximately 30 km east of Muskrat Falls (Figure 15.5.7-2).

Fishing

Information from the 2009 Nunatsiavut Government survey of Inuit Traditioanl Ecological Knowledge revealed that activities carried out by survey participants included fishing for Atlantic salmon and ice fishing (Sikumiut 2009). Labrador Inuit harvest of fish and seal within Hamilton Inlet and Lake Melville has been documented (Brice-Bennett 1977). Section 13.13.1 of the LILCA provides for the issuance of communal fishing licenses in Lake Melville to Inuit residing outside the LISA pursuant to an agreement between Canada and the Nunatsiavut Government. Contemporary traditional land use and harvesting by Beneficiaries in Schedule 12-E lands includes a communal fish harvest. Available information does not show any fishing activities by the Labrador Inuit in or near the transmission corridor or within the Study Area. Communal fish harvest that would occur in Schedule 12-E lands would not extend beyond the mouth of Lake Melville, which is located approximately 30 km from the Project at Muskrat Falls and therefore does not overlap with the Project (Figure 15.5.7-2).

Summary: Labrador Inuit

Contemporary traditional land use by the Labrador Inuit is focused on Inuit traditional lands both inside and in proximity to the LISA. Contemporary traditional land use activities include hunting for seals, birds, rabbits, caribou and moose, as well as fishing and trapping. The general Lake Melville area has been used, and continues to be used, extensively by Labrador Inuit for a broad range of traditional activities, including hunting, fishing, trapping, wood cutting and snowmobile travel. The transmission corridor does not overlap with land covered by the LILCA.

15.5.7.3 NunatuKavut Community Council

The more than 6,000 persons who form the membership of the NCC live throughout Labrador and elsewhere. Many live in the Upper Lake Melville area, Western Labrador, and along the south coast from Cartwright to L'Anse au Clair. Happy Valley-Goose Bay supports a large NCC population, as do the smaller communities of Mud Lake, North West River, Cartwright, Paradise River, Black Tickle, Norman Bay, Charlottetown, Pinsent's Arm, Williams Harbour, Port Hope Simpson, St. Lewis, Mary's Harbour and Lodge Bay.

Nalcor has been engaged with NCC in gathering additional regional contemporary traditional land and resource use information. The information collected as a result of a Phase II Community Engagement Agreement which includes data on contemporary traditional land and sea uses by member of NCC have been incorporated into this EIS. As previously stated, contemporary traditional sea uses are also discussed in Section 15.6 and assessed in Section 16.6.

The majority of NCC member land use occurs along the coast of south-east and southern Labrador, in the Lake Melville area and along the TLH (NCC 2010a, b, internet sites). The TLH is currently the main mode of travel for land use, however, NCC members use many routes, in particular snowmobile and boat routes along the south-eastern and southern coasts of Labrador, and Lake Melville. Members of the NCC fish, trap, hunt birds, and hunt both big and small game in central, south-eastern and southern Labrador. As shown in Figure 15.5.7-3a, b, c, members of NCC practice contemporary traditional land use within the transmission corridor and in the Study Area. Specifically, resource harvesting (e.g., hunting, fishing, wood harvesting) are known to occur in the transmission corridor and the Study Area.

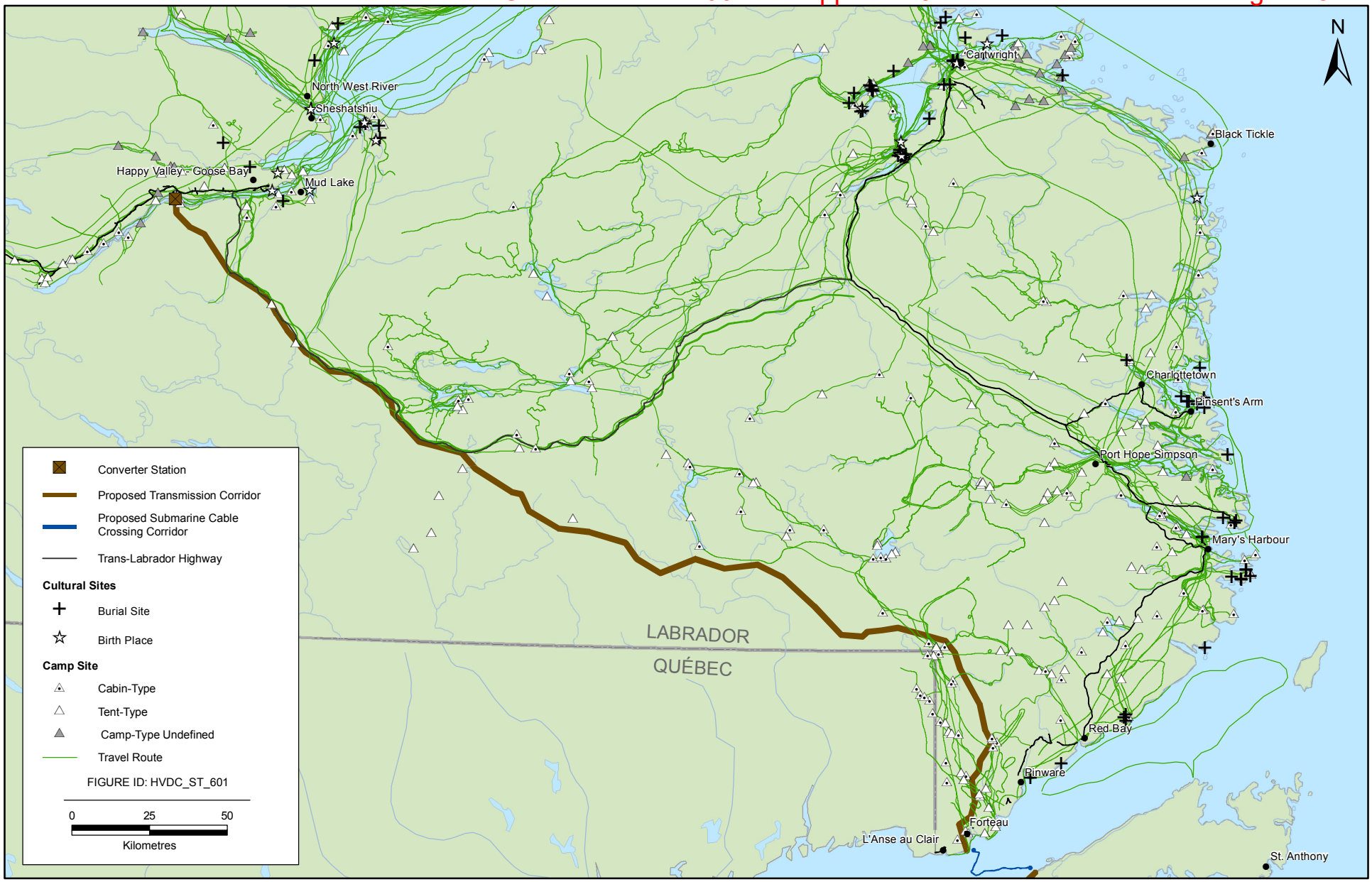


FIGURE 15.5.7-3a

Members of NunatuKavut Community Council Contemporary Land Use (Based on 2011 Interviews)
Travel Routes, Camp Sites and Cultural Sites

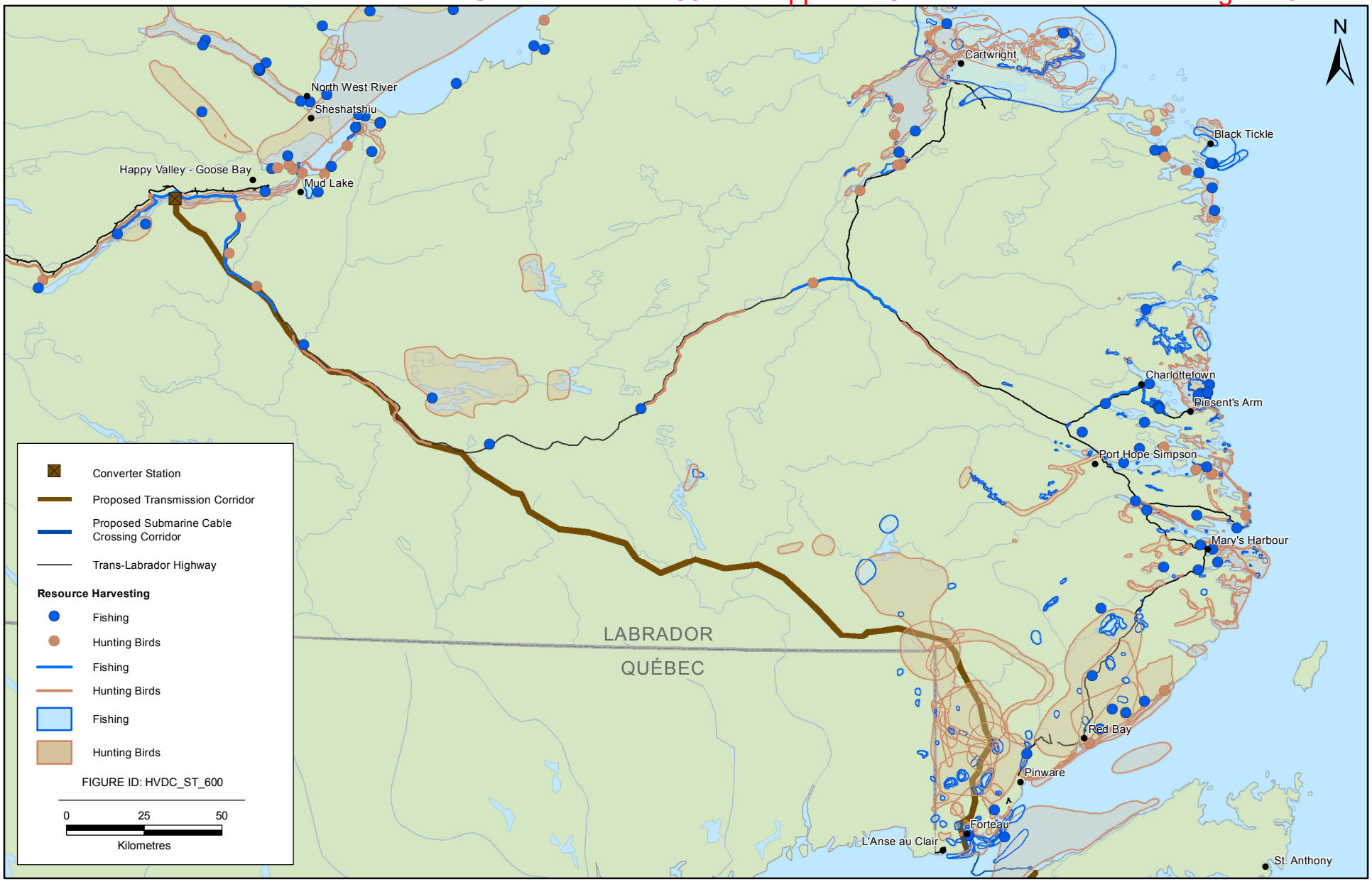
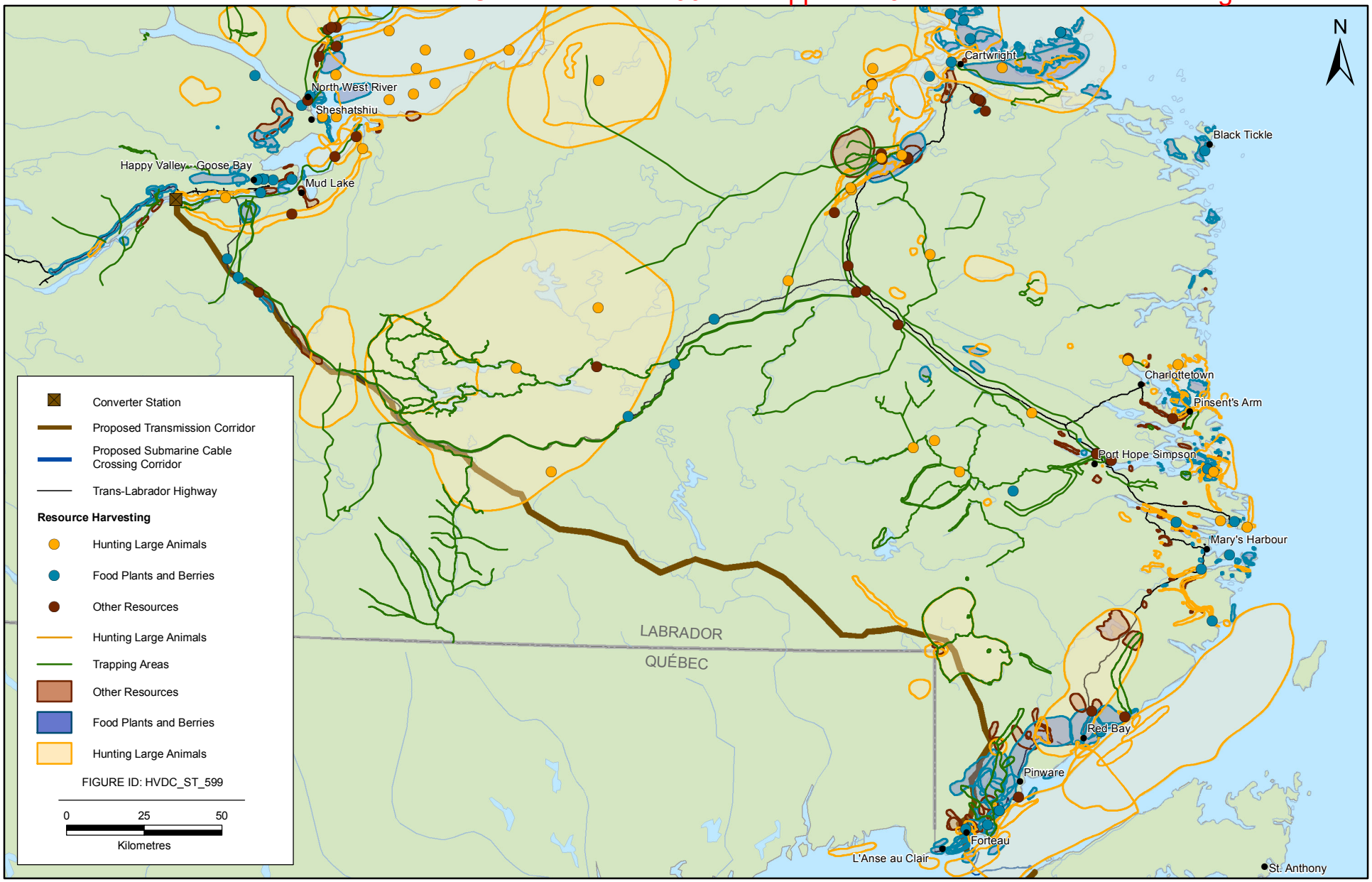


FIGURE 15.5.7-3b

Members of NunatuKavut Community Council Contemporary Land Use (Based on 2011 Interviews)
Resource Harvesting: Fishing and Bird Hunting



nalcor energy

FIGURE 15.5.7-3c

Members of NunatuKavut Community Council Contemporary Land Use (Based on 2011 Interviews) Resource Harvesting: Hunting, Trapping and Gathering

Travel Routes and Camp Sites

Members of NCC travel over land and water by vehicle, snowmobile, boat, foot, dog-team and snowshoe. Travel along the TLH via automobile is the main mode of contemporary travel. In addition, there is a network of snowmobile trails connecting North West River, Happy Valley-Goose Bay, Mud Lake and Churchill Falls with other communities in Labrador, including Labrador City and Cartwright that is used. There is another network of trails connecting communities along the Strait of Belle Isle with those in south-eastern Labrador such as Lodge Bay, Mary's Harbour, Port Hope Simpson, Charlottetown and Cartwright. The above-mentioned trails or travel arteries are not used exclusively by NCC members, but rather, are corridors of travel used by many other groups in the region. Contemporary traditional land use data from interviews conducted in 2011 indicate that travel routes occur throughout the Central and Southeastern Labrador region (Figure 15.5.7-3a). Travel routes overlap the transmission corridor in the section where the corridor generally follows the TLH3. In addition, travel routes in the vicinity of the southern portion of the corridor in Labrador (i.e., near the Strait of Belle Isle) were also identified during interviews conducted in 2011 with NCC.

Cabins and tent-type dwellings were identified by members of NCC during interviews conducted in 2011 throughout the Central and Southeastern Labrador Region, with concentrations along the coast near the communities of Charlottetown, Cartwright, Mary's Harbour, and in the Lake Melville area (Figure 15.5.7-3a).

Based on the 2011 interviews with members of NCC, cabins and sites where they have stayed in tents were identified in the Study Area. Near Muskrat Falls, only tent-type dwellings were identified. Two additional locations where tent-type dwellings have been used were identified in the transmission corridor where it follows the TLH3. In the southern portion of the transmission corridor, cabins were identified in the Study Area, and one cabin and one location of a tent-type dwelling were identified as being within the transmission corridor (Figure 15.5.7-3a).

Hunting, Trapping and Gathering

NCC describes its members' traditional trapping territory as having included the Churchill River Valley from the Kenamu River to Churchill Falls (LMN 2009, internet site). NCC member harvesting activities have also been identified as extending from the Sandwich Bay region south to Port Hope Simpson and Williams Harbour and west to the area of Paradise River and Eagle River (Jackson 1983).

Members of the NCC continue to hunt both big (e.g., caribou, moose and bear) and small (e.g., hare and porcupine) game in central and south-eastern Labrador (NCC 2010a, internet site). NCC members also hunt a variety of birds including grouse, ptarmigan, geese and black ducks, in addition to trapping marten. Members of the NCC harvest marine mammals (NCC 2010b, internet site), such as seals, which provide income and meat (Martin 2009).

Information obtained under the Phase II Community Engagement Agreement involving interviews with members of NCC in 2011 identified areas throughout the Central and Southeastern Labrador Region that are used for hunting, and trapping / snaring of game (Figure 15.5.7-3b,c).

Within the Study Area, areas for hunting, trapping, and snaring animals were identified along the TLH3 where the transmission corridor follows the TLH3, and in the southern section of the corridor near the Labrador Straits (Figure 15.5.7-3b,c).

A large area was identified that is used for hunting large animals near the headwaters of the Eagle River, that extends to, and overlaps with a section of the transmission corridor (Figure 15.5.7-3c). In the area where the transmission corridor follows the TLH3, locations were identified by NCC members where they have hunted birds, and trapped for furbearers (e.g., marten, fox, beaver). Several linear areas were identified for trapping that intersect the transmission corridor in the area near the TLH3 (Figure 15.5.7-3c). A small portion of the areas identified for harvesting large animals, overlap with the transmission corridor (Figure 15.5.7-3c).

NCC members identified areas in the southern section of the corridor, near the Labrador Straits including in the Strait of Belle Isle that have been used for hunting birds. Members of NCC also identified locations in this area where they have trapped furbearers (e.g., foxes, beaver, marten) (Figure 15.5.7-3c), and two areas were identified as areas used for hunting large animals, which partially overlap with the transmission corridor.

Marine areas such as the Strait of Belle Isle, coastal waters near the communities of Cartwright, Port Hope Simpson, and Lake Melville were also identified for harvesting large animals such as seals (Figure 15.5.7-3c).

According to Martin (2009), NCC members harvest plants for traditional medicines, food, firewood and other purposes. The NCC identified the Canada yew as an important source of traditional medicine (LMN 2009, internet site) but to date, has not identified the specific location where this plant is harvested. Based on interviews conducted with members of NCC in 2011, plant harvesting for medicinal purposes was identified in one area overlapping with the transmission corridor, near Forteau Point and the Labrador Straits Highway. The interviewee indicated that juniper was harvested in this area for medicinal purposes.

Berry harvesting areas were identified in three locations along the transmission corridor where the corridor follows the TLH3 (Figure 15.5.7-3c). Two locations in the same area were identified as areas used for wood harvesting identified under the category 'Other Resources' on Figure 15.5.7-3c.

Berry harvesting areas were also identified that overlap with the transmission corridor in the Forteau Point area, including the general area near the Strait of Belle Isle extending north for approximately 25 km (Figure 15.5.7-3c).

In the southern section of the corridor, near the Strait of Belle Isle, five areas were identified as wood harvesting areas near the transmission corridor, with two of these overlapping with the transmission corridor (Figure 15.5.7-3c).These areas are identified under the category 'Other Resources' on Figure 15.5.7-3c.

Fishing

Atlantic salmon fisheries are an integral part of the NCC member way of life. The modern Atlantic salmon fishery has changed from the past, as the netting of salmon has become regulated (Martin 2009). The federal government has established a Communal Fishing License for NCC members under the *Fisheries Act,* with a limit of six Atlantic salmon per net (Martin 2009).

Based on information obtained from interviews with members of NCC during 2011, the majority of the fishing activity occurs near the coast, near the communities of Black Tickle, Charlottetown, Mary's Harbour, and the Labrador Straits (Figure 15.5.7-3b). Fishing activity has also been identified in streams, rivers and ponds in the southern portion of the region, near the Labrador Straits. Three other areas were identified that overlap with the transmission corridor, including the Churchill River, and several locations along a 20 km section where the transmission corridor follows the TLH3. Areas were also identified near these coastal communities for harvesting marine fish such as cod. Within the Strait of Belle Isle, near Forteau, areas were identified that have been used for marine fishing activity.

Places of Cultural Significance

Places of cultural significance that were identified during interviews with members of NCC during 2011 were not near the transmission corridor or other Project-related components (Figure 15.5.7-3a).

Summary: NunatuKavut Community Council

The members of NCC, who reside in the communities throughout Central and Southeastern Labrador, traditionally lived a subsistence lifestyle and utilized the land primarily for this purpose. Currently, members of NCC travel along many routes, in particular from the coast; however, travel along the TLH is the main mode of contemporary travel for land use. There appears to be some potential overlap of land use by members of NCC in the Study Area where the transmission corridor follows the TLH3 and in the southern section of the corridor

near the Labrador Straits. Members of the NCC fish, trap, hunt birds, and hunt both big and small game in Central and Southeastern Labrador.

15.5.7.4 Pakua Shipi

The Québec Lower North Shore's easternmost community, Pakua Shipi, is located on the western shore of the Saint-Augustin River, 550 km north-east of Sept-Îles. The community covers 0.03 km^2 of land. Based on available data, the contemporary traditional land use of the Innu of Pakua Shipi is practiced mainly near the community. However, during the fall and winter, some community members spend longer periods of time on the territory. Some travel routes, camp sites, hunting and trapping areas, as well as one burial ground were identified along the transmission corridor. Information obtained as part of the Phase II Community Engagement Agreement to obtain additional information on land use near the transmission corridor and throughout the Study Area will be considered and incorporated, including the potential for mitigation and adaptive management during detailed design and routing.

Travel Routes and Camp Sites

Contemporary travel routes and camp sites are closer to the community than was the case historically (CAM 1983a). This pattern of land use was confirmed during the interviews conducted with community members in 2010, where land use activities were identified as being more prevalent along the coast of the Gulf of St. Lawrence in the summer (Figure 15.5.7-4). In the winter, land use activities are concentrated inland, mostly along the St. Augustin River, the Little Mecatina River and in some areas of Labrador. Based on the data collected during the Phase I Community Engagement Agreement, 17 travel routes were identified. According to the interview participants, three of these travel routes are near the St. Paul River, the St. Lewis River and the TLH.

In the contemporary period, some camp sites have been occupied within the Study Area, mainly near the St. Paul and Joir rivers. However, the polygons outlined on Figure 15.5.7-4 of current land and resource use do not differentiate between camp sites and trails. As the specific locations of neither were clearly identified, additional information regarding both travel routes and camp sites in the transmission corridor and in the Study Area is being collected and will be considered and incorporated where relevant.

Hunting and Trapping

The location of travel routes and camp sites are indicative that other land use activities, such as hunting and trapping, may be taking place in the surrounding areas. The information collected during the 2010 interviews with community members identified some travel routes and camp sites within the transmission corridor and within the Study Area, which in some instances may overlap with the occurrence of hunting and trapping activities.

For the last several decades, stays of more than one month on the land for hunting and trapping have occurred in the fall. To ensure that a high number of animals are trapped, a large territory is typically covered whereby hunters move between several secondary camps along the trap lines that they tend. When there is an opportunity during these excursions, the Innu will also kill large animals such as caribou, moose or bear (CAM 1983a). An interview participant identified such an area to the east of the St. Augustin River, which falls within the transmission corridor, where more than 1,000 caribou had been observed. According to this interview participant, the group hunted caribou and trapped beaver for two to three months in this area during the fall. Given that the specific year in which the event occurred was not given and that the participant mentioned that it happened a long time ago, further details on this area will have to be extracted from ongoing data collection with the community to ascertain whether this is a current area for resource harvesting.

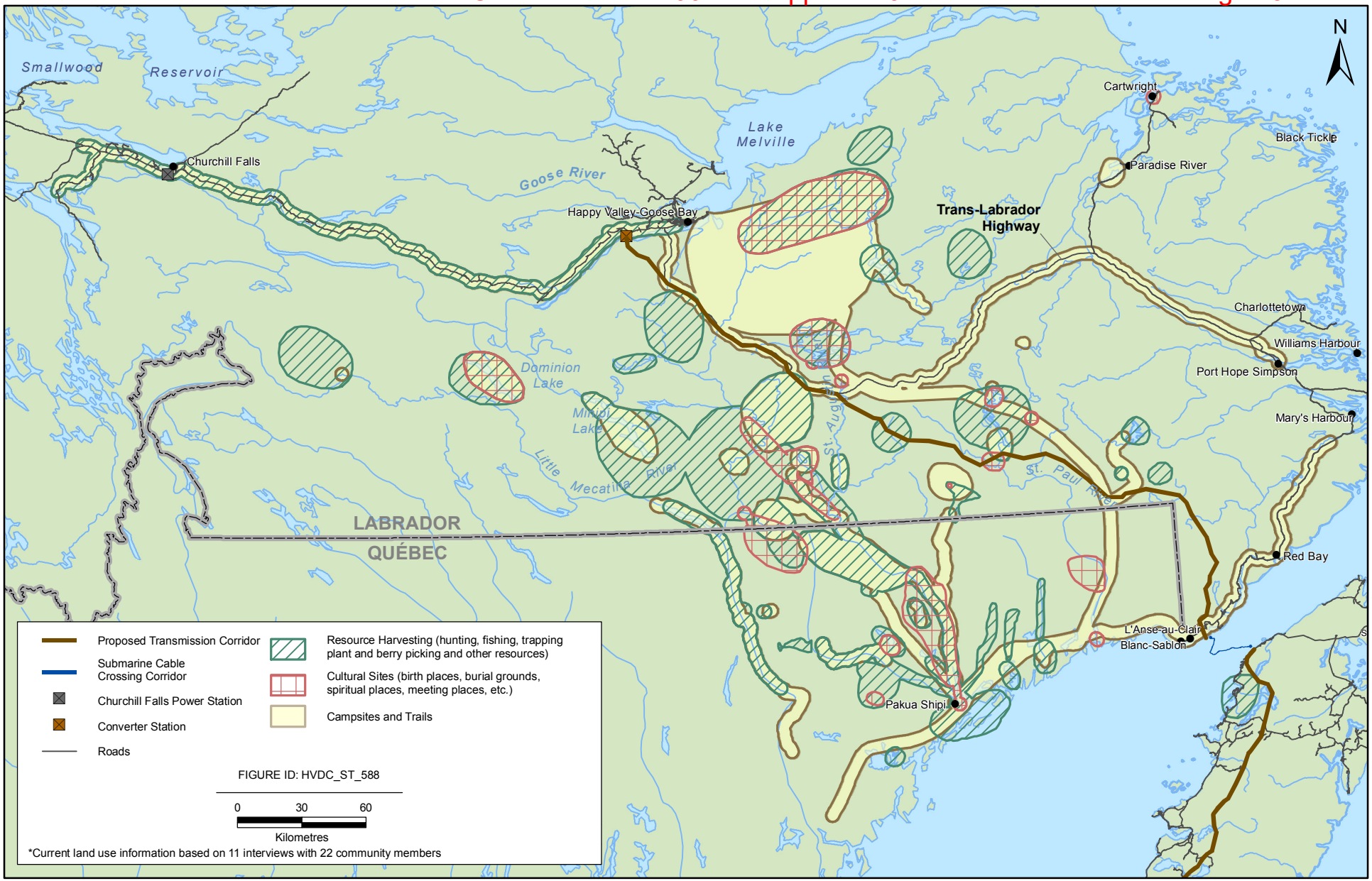


FIGURE 15.5.7-4

Current Land and Resource Use - Pakua Shipi (2010 Interviews)

Other hunting and trapping activities have been identified near the Traverspine River and Kenamu River. According to Figure 15.5.7-4, current land and resource harvesting in the area of the Traverspine River falls within the transmission corridor and within the broader Study Area. Other resource use activities are noted to the west of Gull Island and in the area south of Lake Melville, both of which are outside of the Study Area.

Since the introduction of snowmobiles, travel on the land during winter has facilitated short trips of two days to one week from Pakua Shipi. During the winter, caribou, moose, hare and partridge are the main species harvested for food. Lynx, beaver, marten, mink and otter are trapped for their fur (CAM 1983a). One interview participant identified caribou hunting activities within the Study Area, in the region where the St. Paul River is crossed by the transmission corridor. According to Figure 15.5.7-4, current land and resource use occurs just east of and partially overlaps the transmission corridor. According to this individual, a group of five to ten people have been going to that location at various times over the past couple of years to hunt caribou during the winter.

Spring is mainly spent along the coast, near the community, where species such as muskrat, beaver, porcupine, hare, partridge and migratory birds are harvested. In the summer, traditional activities include hunting birds, harvesting eggs, trapping muskrat, porcupine and hare, and hunting partridge (CAM 1983a). There have been no spring or summer land use activities identified in the transmission corridor or near the Study Area.

Fishing

The Innu of Pakua Shipi tend to remain mainly along the coast in the spring and summer (CAM 1983a). Data collected during the 2010 interviews confirm that land use activities are concentrated along the coast and near the community in spring and summer. According to CAM (1983a), the Innu of Pakua Shipi begin trout fishing in the spring. Fishing for salmon and trout is an important activity during the summer and continues during the journey north in the fall (CAM 1983a). Species harvested by the Innu of Pakua Shipi in contemporary times from 1958 to 1982 include salmon, lobster and trout. To date, there have not been any fishing activities by the Innu of Pakua Shipi identified in the Study Area.

Places of Cultural Significance

Four birth places and five burial grounds were identified during the interviews conducted with Pakua Shipi community members in 2010. One of the burial grounds identified is located in the area where the St. Paul River overlaps with the transmission corridor. This polygon is identified as a cultural site on Figure 15.5.7-4. Two other places of cultural significance which fall within the Study Area are north-east of the St. Augustin River, just east of the transmission corridor in the Study Area (Figure 15.5.7-4). Additional details on places of cultural significance, collected by Nalcor as part of the Phase II Community Engagement Agreement, will be considered and incorporated where relevant.

Summary: Pakua Shipi

Based on available data, some contemporary traditional land use of the Innu of Pakua Shipi overlaps with the Study Area While current land use activities are practiced mainly near the community, during the fall and winter some community members go on the land for longer periods of time and have identified some travel routes, camp sites, hunting and trapping areas as well one cultural site along the transmission corridor. Nalcor is collecting additional land and resource use information with the Innu of Pakua Shipi as part of the Phase II Community Engagement Agreement. Data collected as a part of this agreement will be considered and incorporated where relevant, including the potential for mitigation and adaptive management during detailed design and routing.

15.5.7.5 Unamen Shipu

The Innu community of Unamen Shipu is located in Québec at the mouth of the Olomane River, approximately 400 km east of Sept-Îles and 250 km from Havre-Saint-Pierre, on the north shore of the St. Lawrence River. The

community covers an area of 0.7 km^2. The contemporary traditional land use activities of the Innu of Unamen Shipu are based on a long history and tradition of hunting, fishing, travel, gathering and establishing encampments. Based on the information available to date, the activities of the Innu of Unamen Shipu appear to be concentrated south of the Labrador-Québec border with few reaching Labrador and with none overlapping with the transmission corridor or the Study Area (Figure 15.5.7-5). While it is suggested that Innu from Unamen Shipu, along with other groups from Quebec's Lower North Shore, use the TLH to harvest animals, no details as to specific locations used along the TLH have been specified (Armitage and Stopp 2003). As part of the recent community engagement agreement with the community of Unamen Shipu, Nalcor will continue the collection of land and resource will be considered and incorporated where relevant, including the potential for mitigation and adaptive management during detailed design and routing.

Travel Routes and Camp Sites

The Innu of Unamen Shipu were traditionally highly mobile and travelled over a large territory. Travel in contemporary times has been restricted due to economic changes in the community, schooling of children and the introduction of an economy based on trap lines. Although the areas travelled often changed annually, depending on the presence of game, many families continued to frequent hunting grounds occupied by generations of their family (CAM 1983b).

Hunting, Trapping and Gathering

Contemporary hunting and trapping practices of the Innu of Unamen Shipu were found to be rich and complex in that they included many species of wildlife, were seasonally influenced and, where possible, included the family unit (CAM 1983b). From a base camp, established in the fall, trap lines were tended over three- to ten-day cycles. Some hunters indicated that while they were on the land, in addition to tending traps, they hunted small game and fished when hunting was not possible. In its submission to the Joint Review Panel as part of the EA for the Lower Churchill Hydroelectric Generation Project, Unamen Shipu (2011) described that many hunters travel north of the TLH, in the fall and sometimes in the spring, between the Metchin River and Happy Valley-Goose Bay to hunt caribou.

The CAM study (1983b) describes the caribou hunt which occurred in the winter over a period of two to three weeks. Upon returning to Unamen Shipu following a successful caribou hunt, the rest of the winter was spent hunting small game. In the spring, traditional practices mainly included hunting birds, trapping muskrat, otter and beaver, and collecting eggs. Winter and spring hunting and trapping activities were further facilitated with access to snowmobiles. Finally in the summer, boats were usually used to pursue hunting, fishing and berry picking activities. Summer was a time of gathering with Innu from other communities. Species harvested in the contemporary period, from 1950 to 1982, include caribou, porcupine, beaver, hare, marten, mink, otter, weasel, lynx, muskrat, partridge, seagull, duck, goose and moyak (CAM 1983b).

Travel routes and camp sites are indicators of other land use activities such as hunting, trapping and gathering. As indicated in the previous subsection, travel routes and camp sites, used for hunting, trapping and gathering activities, are located outside the Study Area. Armitage and Stopp (2003) found that Innu from Unamen Shipu use the TLH to harvest animals encountered near the road, such as caribou, porcupine, beaver, ptarmigan and other species. However, the study does not specify which sections of the TLH are used by the Innu of Unamen Shipu.

Fishing

The CAM study (1983b) describes the fishing activities of the Innu of Unamen Shipu up to 1982. Contemporary fishing activities occurred over much of the territory used by the Innu of Unamen Shipu from 1950 to 1982, including along the coast of the Gulf of St. Lawrence. Species of fish harvested during that period include pike, salmon, trout, softshell clam, lobster, carp, whitefish and walleye (CAM 1983b). Travel routes and camp sites are indicators of traditional activities such as fishing. As described in the previous subsection, travel routes and camp sites, almost certainly used for fishing activities, are largely outside the Study Area.

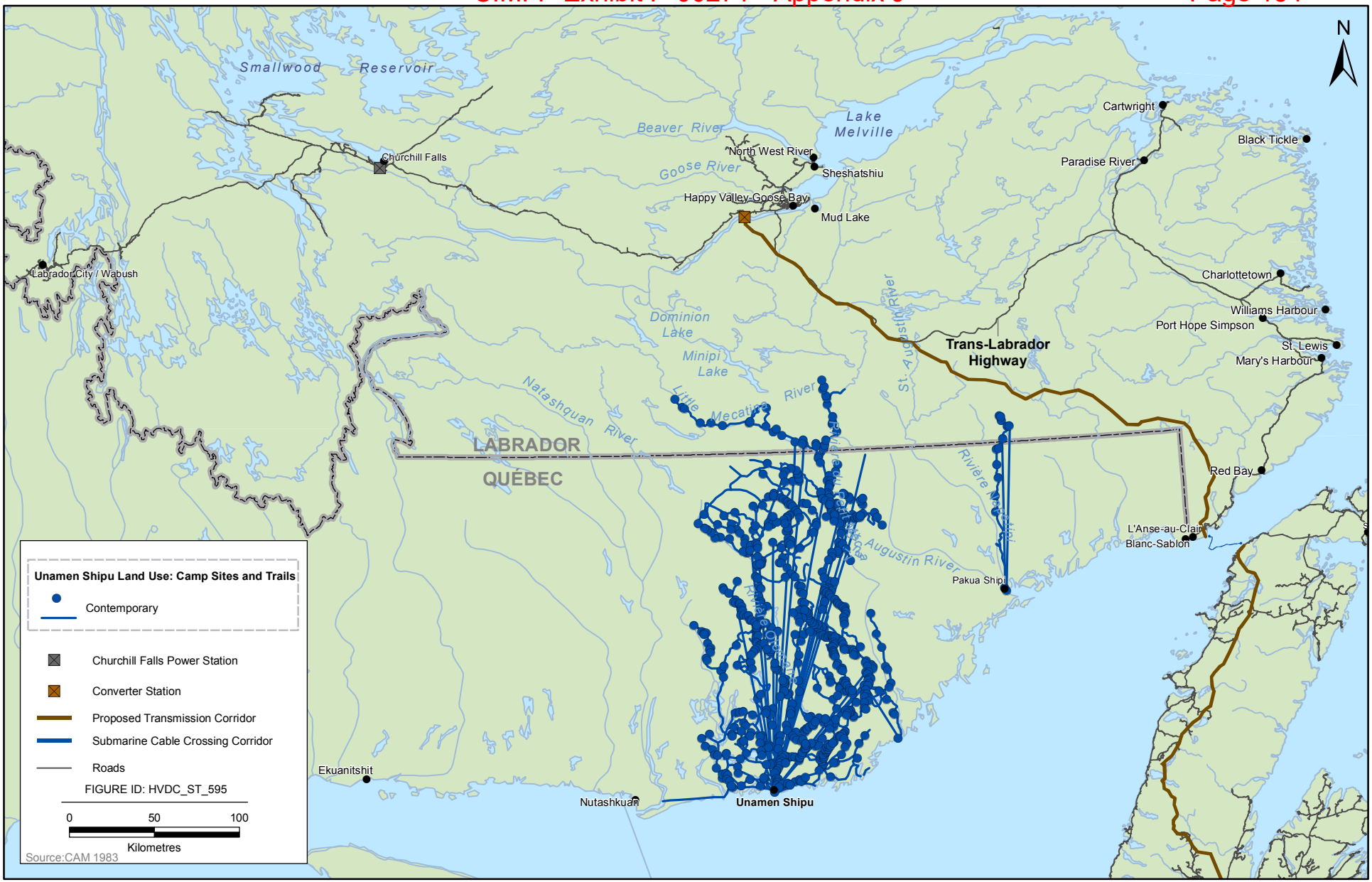


Figure: 15.5.7-5

Unamen Shipu: Contemporary Land Use

Summary: Unamen Shipu

The contemporary traditional land use activities of the Innu of Unamen Shipu are based on a long history and tradition of hunting, fishing, travelling, gathering, and establishing encampments. As confirmed in interviews conducted for the CAM study (1983b) the Innu of Unamen Shipu traditionally were highly mobile and travelled over a large territory (Figure 15.5.7-5), with none overlapping the Study Area. Nalcor will collect additional primary land and resource use information as part of the recent community engagement agreement with the community of Unamen Shipu. Detailed maps will be derived from the data collected under the community engagement agreement and will form part of the additional information that will be considered and incorporated where relevant, including the potential for mitigation and adaptive management during detailed design and routing.

15.5.7.6 Nutashkuan

The Innu community of Nutashkuan is located in Québec at the mouth of the Nutashkuan River in the Gulf of St. Lawrence, 336 km east of Sept-Îles. The community covers an area of 0.2 km^2 within the municipality of Nutashkuan. Travelling along traditional routes to set up encampments to practice hunting, trapping and fishing activities remains an important part of the traditional activities of the Innu of Nutashkuan. The contemporary traditional land use activities of the Innu of Nutashkuan are mainly practiced south-west of the proposed transmission corridor, along the coast of the St. Lawrence River and at the mouth of rivers. Available data do not indicate contemporary traditional land use by the Innu of Nutashkuan in or near the Study Area (Figure 15.5.7-6).

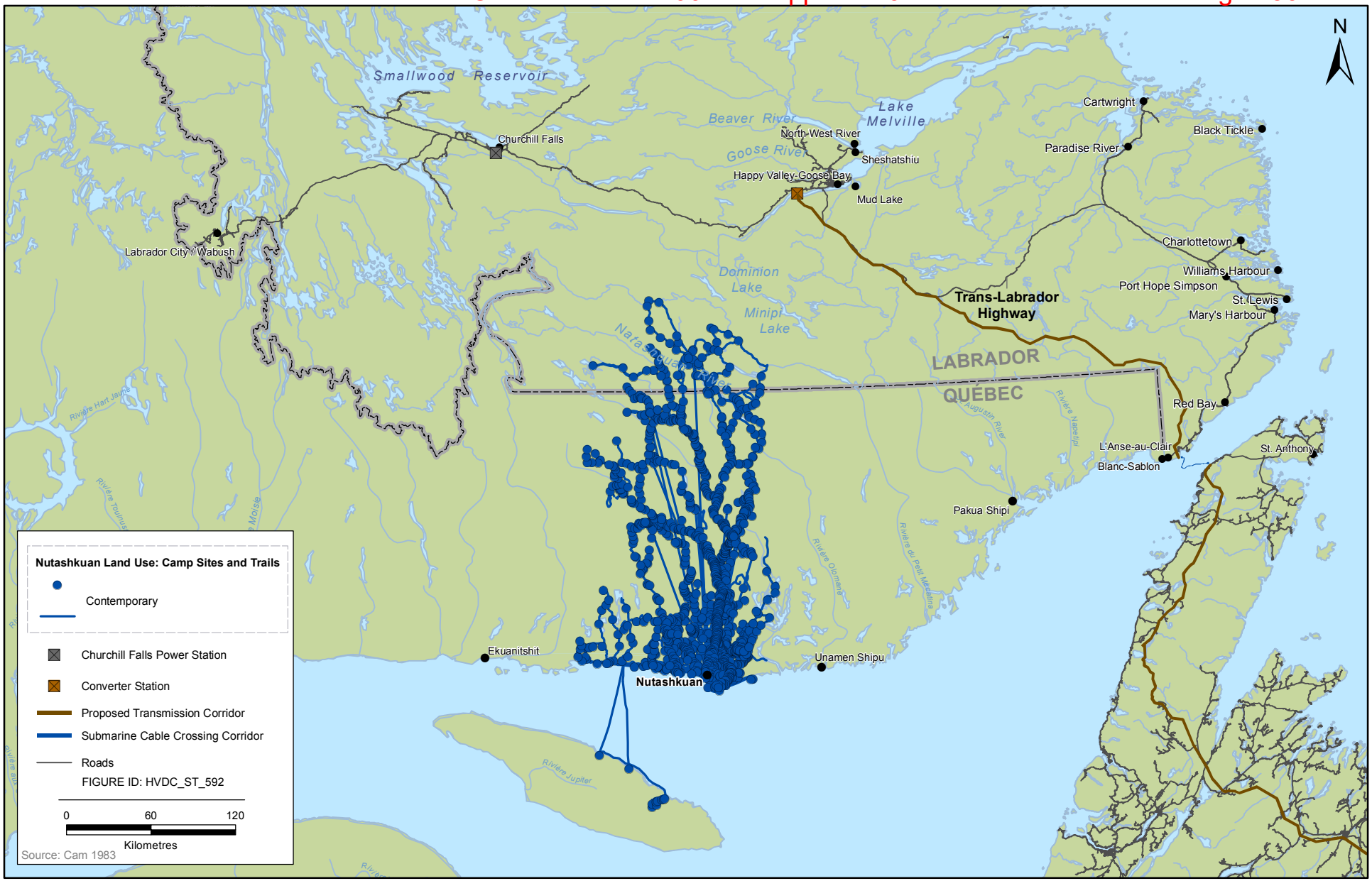
Travel Routes and Camp Sites

The CAM study (1983c) indicates locations of travel routes and camp sites used by the Innu of Nutashkuan in the contemporary period (1951-1982). Travel routes and camp sites are located near the community and along the coast of the Gulf of St. Lawrence, up to an area around the Québec-Labrador border to the north. The Innu of Nutashkuan were traditionally mobile, travelling over a large territory. However, travel in contemporary times has been less wide-ranging (CAM 1983c). In their submission to the Joint Review Panel for the Lower Churchill Hydroelectric Generation Project EA, representatives from Nutashkuan indicated that the cultural and traditional practices of the Innu of Nutashkuan extended into the transmission corridor (Nutashkuan 2011, internet site). However, the activities in and near the transmission corridor are identified as being historical and there is no evidence of contemporary traditional land use in that area. The contemporary traditional land use territory identified in Nutashkuan (2011) is located south of the Québec-Labrador border and this information supports data presented in the CAM study (CAM 1983c) (Figure 15.5.7-6).

Hunting, Trapping and Gathering

Hunting and trapping activities by the Innu of Nutashkuan have been, and remain, seasonal. These activities can cover a large area up to hundreds of kilometres from their community. In the fall, hunters travelled by boat along the rivers or by plane to establish main camp sites. When travelling over land, hunters relied mainly on small game and fish for food along the way. They also set up caches of food for their return trip. The main camps were established throughout their traditional territory including the most northern reaches in Labrador, near the Labrador-Québec border. Hunting during this period targeted all available wildlife, including caribou (CAM 1983c).

In the winter, hunting activities focused on caribou, hare and moose. Winter camps were usually set up within approximately 65 km of the coast, although the hunt occurred further away if airplanes were used. In late winter and early spring, the hunt was focused in areas near the community and snowmobiles were typically used to tend trap lines (CAM 1983c).



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FIGURE 15.5.7-6

Nutashkuan: Contemporary Land Use

After the ice was off the Nutashkuan River in the spring, encampments were usually set up near the community so that families could join the hunt and tend trap lines on weekends. The hunt shifted to ducks and the collection of eggs during the spring bird migration. The CAM study (1983c) found that hunting and trapping activities during the summer, were mainly near the community of Nutashkuan and focused on waterfowl. This was also an important time for picking berries and collecting edible plants.

The CAM study (1983c) provides information on the species hunted and trapped during each season from 1950 to 1982 on the territory used by the Innu of Nutashkuan. Species of mammals harvested included caribou, moose, beaver, porcupine, bear, hare, mink, otter, bobcat, muskrat, fox, wolf, ermine, squirrel, marten, deer, marmot, lynx and weasel. Birds hunted included partridge, willow ptarmigan, merganser, duck, goose, loon and owl (CAM 1983c).

Travel routes and camp sites are often indicators of other land use activities such as hunting, trapping and gathering. As indicated in the previous subsection, contemporary travel routes and camp sites, used for hunting, trapping and gathering activities, are outside the Study Area.

Fishing

The CAM study (1983c) describes the fishing activities of the Innu of Nutashkuan up to 1982. Fishing activities were found to be most common during spring and summer. In the spring, trout fishing was more commonly a family-based activity that occurred within a day's travel by snowmobile of the community. In late spring, once the rivers were ice-free, fishing for salmon and sea trout predominated. Other species of fish harvested by the Innu of Nutashkuan between 1950 and 1982 include sucker, pike, whitefish, burbot and ouananiche (CAM 1983c).

Travel routes and camp sites are indicators of other traditional activities such as fishing. As described in the previous subsection, travel routes and camp sites, almost certainly used for fishing activities, are located south of the Study Area.

Summary: Nutashkuan

Travelling along traditional routes to set up encampments to practice hunting, trapping, and fishing activities remains an important part of the traditional activities of the Innu of Nutashkuan. Interviews conducted during the CAM study (1983c) describe the importance and details of contemporary seasonal hunting, trapping and fishing patterns, which involved many species of fish and wildlife. The contemporary traditional land use activities of the Innu of Nutashkuan occur mainly south-west of the proposed transmission corridor, along the coast of the St. Lawrence River, at the mouth of rivers (Figure 15.5.7-6). In conclusion, data do not indicate contemporary traditional land use by the Innu of Nutashkuan in or near the transmission corridor.

15.5.7.7 Ekuanitshit

The Innu community of Ekuanitshit is located in Québec at the confluence of the Mingan River and the St. Lawrence River, 28 km west of Havre-Saint-Pierre on Route 138, on the north shore of the St. Lawrence River. The community covers an area of 19.2 km^2. The contemporary traditional land use activities of the Innu of Ekuanitshit are mainly practiced south-west of the transmission corridor, along the coast of the St. Lawrence River and at the mouth of rivers (Figure 15.5.7-7). In their submission to the Joint Review Panel for the Lower Churchill Hydroelectric Generation Project, representatives from Ekuanitshit indicated that there had been historical travel as far as North West River in Labrador (Ekuanitshit 2011, internet site). However, available data do not indicate contemporary traditional land use by the Innu of Ekuanitshit in or near the Study Area (Figure 15.5.7-7). A summary of contemporary traditional land use activities is provided below.

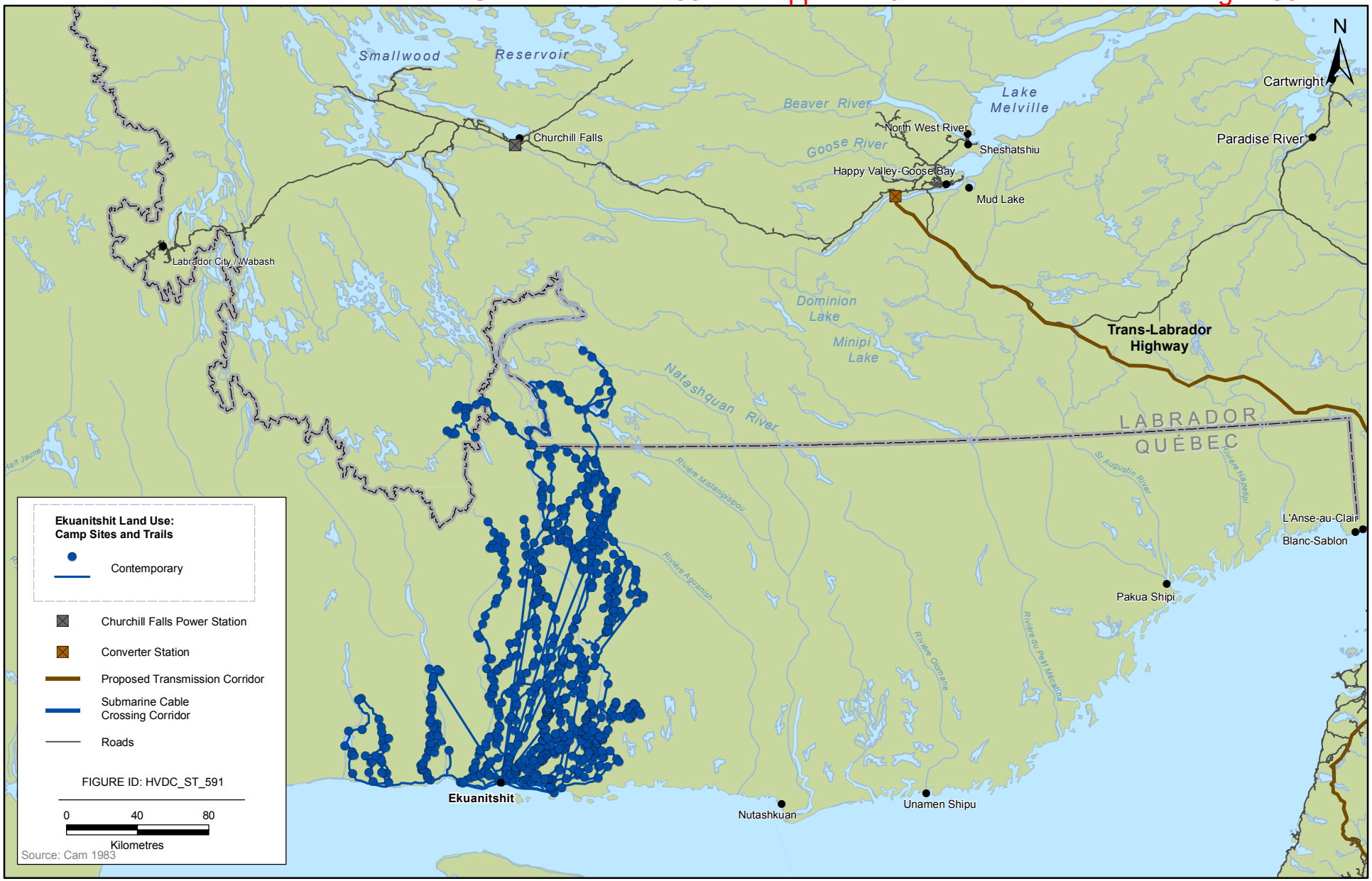


FIGURE 15.5.7-7

Ekuanitshit: Contemporary Land Use

Travel Routes and Camp Sites

The CAM study (1983d) includes a map of the camp sites and routes used by the Innu of Ekuanitshit in the contemporary period (1951 to 1982). Both the historic and contemporary routes and camp sites from the CAM study (1983d) are south-west of the Study Area. Although some of the routes were found to extend more than 100 km into Labrador, they are more than 100 km west of the transmission corridor (Figure 15.5.7-7). The distribution of camp sites up to 1983, was concentrated south of the Labrador-Québec border and were located near the community itself.

In their submission to the Joint Review Panel for the Lower Churchill Hydroelectric Generation Project, representatives from Ekuanitshit referred to the autobiography of Mathieu Mestokosho, an Innu from Ekuanitshit, who was born around 1885 and died in 1980 (Ekuanitshit 2011, internet site). Mestokosho recounted that for most of his life, he and many others in the community would leave in August and travel towards the interior of Labrador as far as North West River, returning again in the spring. A study conducted in 2000 supports the strong ties between Ekuanitshit and North West River in historic times (IEDE / Jacques Whitford 2000). However, available information does not indicate that they still travel there in contemporary times.

Hunting and Trapping

Travel routes and camp sites are often indicators of other land use activities such as hunting and trapping. As indicated in the previous subsection, known travel routes and camp sites, used for hunting and trapping activities, are outside the Study Area (Figure 15.5.7-7). Based on this information, the hunting territory of the Innu of Ekuanitshit appears to be located mainly near the community and south of the Labrador-Québec border.

CAM (1983d) provides information on the species hunted by the Innu of Ekuanitshit from 1950 to 1982 on the territory they used. Species of mammals harvested included caribou, beaver, porcupine, hare, fox, marmot, marten, mink, moose, otter, bear, weasel, lynx, muskrat, squirrel, seal and wolf. Species of birds harvested included partridge, willow ptarmigan, merganser, duck, loon, goose and black guillemot.

Fishing

As described in the CAM study (1983d), up to 1982, salmon fishing began towards the end of May and continued to be a common activity throughout the summer. Other species fished by the Innu of Ekuanitshit include pike, trout, lake trout, carp, whitefish, burbot and ouananiche (CAM 1983d). As for hunting and trapping, fishing is usually practiced in areas near travel routes and camp sites. As no travel routes or camp sites have been identified in or near the Study Area, it is not expected that fishing occurs in that area.

Summary: Ekuanitshit

Historic land use practices have shaped the contemporary practices of the Innu of Ekuanitshit. Hunting, trapping and fishing are practiced near their community and as far north as Labrador. Based on the CAM study (1983d), it is apparent that land use activities occur more than 100 km west of the transmission corridor (Figure 15.5.7-7). The contemporary traditional land use activities of the Innu of Ekuanitshit occur within the territory shown on Figure 15.5.7-7, and are mainly practiced south-west of the transmission corridor, along the coast of the St. Lawrence River, at the mouth of rivers. In their submission to the Joint Review Panel for the Lower Churchill Hydroelectric Generation Project, representatives from Ekuanitshit indicated that there had been historic travel as far as North West River in Labrador (Ekuanitshit 2011, internet site). To date, the available data do not indicate contemporary traditional land use by the Innu of Ekuanitshit in or near the transmission corridor or Study Area.

15.5.7.8 Uashat mak Mani-Utenam

The Uashat mak Mani-Utenam First Nation is located in two communities, Uashat and Mani-Utenam. Located in the province of Québec, on the western outskirts of Sept-Îles, Uashat covers 1.2 km^2 of land. Mani-Utenam is 16 km east of Sept-Îles near the mouth of the Moisie River and covers an area of 5.3 km^2. The Innu of Uashat mak Mani-Utenam continue to practice traditional activities within their traditional territory, where they travel, hunt, fish, gather and establish encampments. Based on available information, the contemporary traditional land use activities of the Innu of Uashat mak Mani-Utenam are mainly practiced west of the transmission corridor, along the coast of the St. Lawrence River, at the mouth of rivers and along Route 138. Available data do not indicate contemporary traditional land use by the Innu of Uashat mak Mani-Utenam in or near the Study Area.

Travel Routes and Camp Sites

The Innu of Uashat mak Mani-Utenam state that they have traditionally used the land comprised within the boundaries of a territory extending from an area south of Sept-Îles to north of Schefferville, with an eastern limit adjacent to Churchill Falls. They claim that this territory is still being used today and that many community members still travel in this area (Uashaunnuat et al. 2010, internet site). Beaver Reserves 227 and 228, near Churchill Falls, are attributed to families from Uashat (Ashini and Ashini 2011, internet site; Laurent 2011, internet site; Uashaunnuat et al. 2010, internet site). These beaver reserves are adjacent to Churchill Falls, and do not overlap with the Study Area (Figure 15.5.7-8).

The Innu of Uashat mak Mani-Utenam have identified that the areas along the coast are currently used more frequently (Uashaunnuat et al. 2010, internet site). Armitage and Stopp (2003) revealed that Innu from Uashat mak Mani-Utenam and other groups on Québec's Lower North Shore use the TLH for hunting, but specific sections of the TLH used by the group are not identified in the study. Part of the area used by the group is in Labrador, but current data do not indicate any overlap with the Study Area.

Hunting and Trapping

The Innu of Uashat mak Mani-Utenam identified that the regions where contemporary hunting and trapping occur include areas along the coast, at the mouth of rivers and along Route 138 (Uashaunnuat et al. 2010, internet site). The Innu hunt small game and caribou for subsistence and also take part in recreational activities. Trapping is also practiced, though to a lesser degree (Castonguay et al. 2006). Armitage and Stopp (2003) found that Innu from Uashat mak Mani-Utenam use the TLH to hunt animals such as caribou, porcupine, beaver and ptarmigan. Other species of mammals and birds harvested by the Innu of Uashat mak Mani-Utenam include moose, bear, otter, lynx, marten, fox, hare, duck and goose (Castonguay et al. 2006). Based on available information, none of the contemporary hunting and trapping activities practiced by the Innu of Uashat mak Mani-Utenam occur in the Study Area.

Fishing

The Innu of Uashat mak Mani-Utenam continue to fish regularly along the coast and in the rivers located within the boundaries of their traditional territory. The Moisie River is a prime fishing location for salmon and brook trout (Uashaunnuat et al. 2010, internet site). Between 2000 and 2005, the Innu of Uashat mak Mani-Utenam were known to harvest pike, burbot, brook trout, sea-run brook trout, Atlantic salmon and lake trout (Castonguay et al. 2006). Based on the information provided by the Innu of Uashat mak Mani-Utenam (Uashaunnuat et al. 2010, internet site), there is no evidence of fishing activities occuring in or near the Study Area.

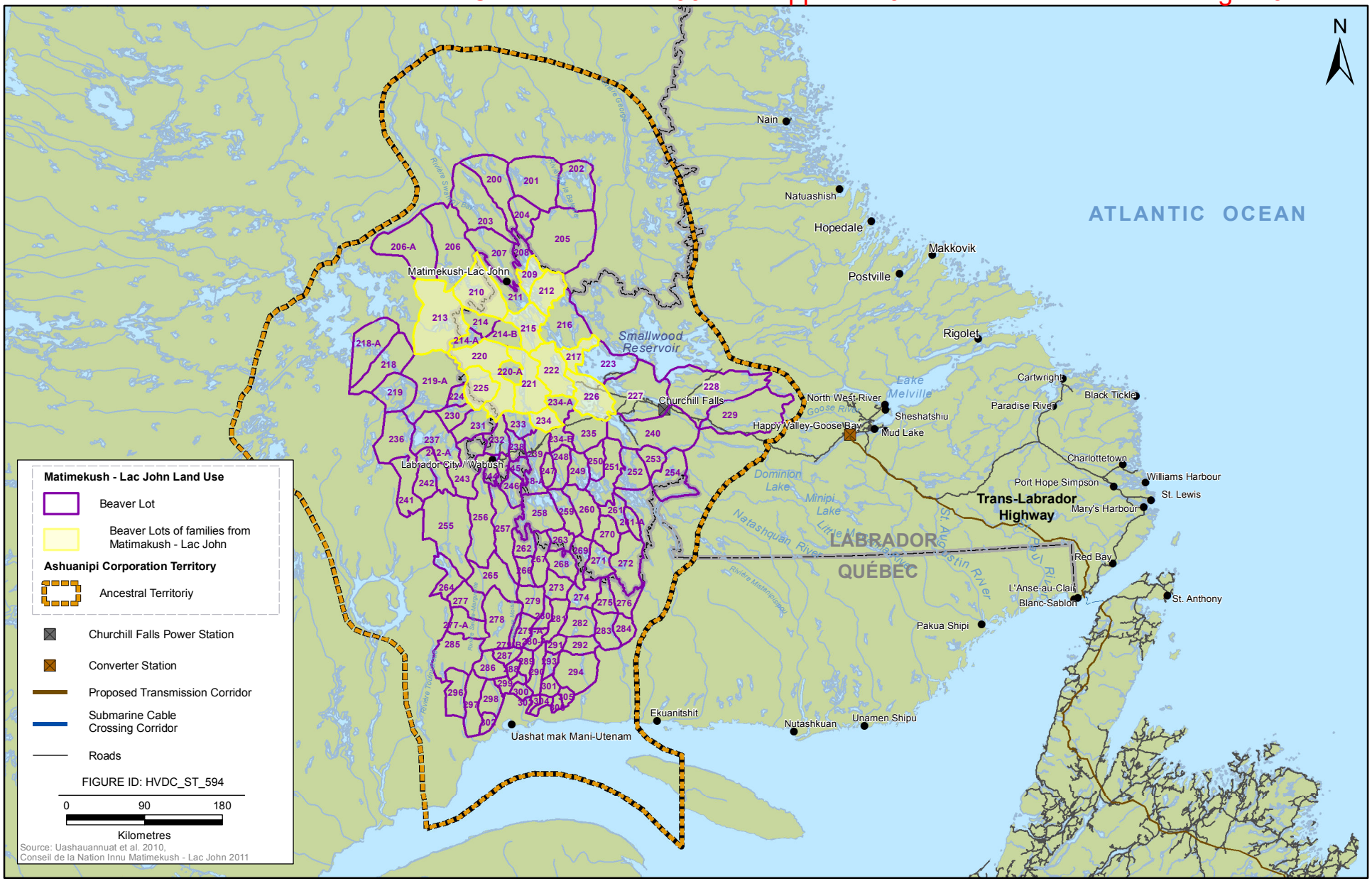


FIGURE 15.5.7-8

Saguenay Beaver Reserve and Ancestral Territory of the Ashuanipi Corporation (Matimekush - Lac John and Uashat mak Mani-Utenam)

Places of Cultural Significance

Cultural and spiritual activities are integral to the culture and they occur across the territory as they are based on the traditions of hunting, fishing, trapping and gathering (Uashaunnuat et al. 2010, internet site). Cultural visits and stays to teach traditional knowledge to troubled young people are sometimes organized. There are also community camps on the territory. The band has implemented several projects to consolidate these locations and foster land use (Castonguay et al. 2006). However, based on available information, places of cultural significance have not been identified in or near the Study Area.

Summary: Uashat mak Mani-Utenam

The Innu of Uashat mak Mani-Utenam continue to practice traditional activities within their traditional territory, where they travel, hunt, fish, gather and establish encampments (Uashaunnuat et al. 2010, internet site). Based on available information, the contemporary traditional land use activities of the Innu of Uashat mak Mani-Utenam occur within the territory as shown in Figure 15.5.7-8, and are mainly practiced west of the transmission corridor, along the coast of the St. Lawrence River, at the mouth of rivers and along Route 138. Available data do not indicate contemporary traditional land use by the Innu of Uashat mak Mani-Utenam in or near the transmission corridor or Study Area.

15.5.7.9 Matimekush-Lac John

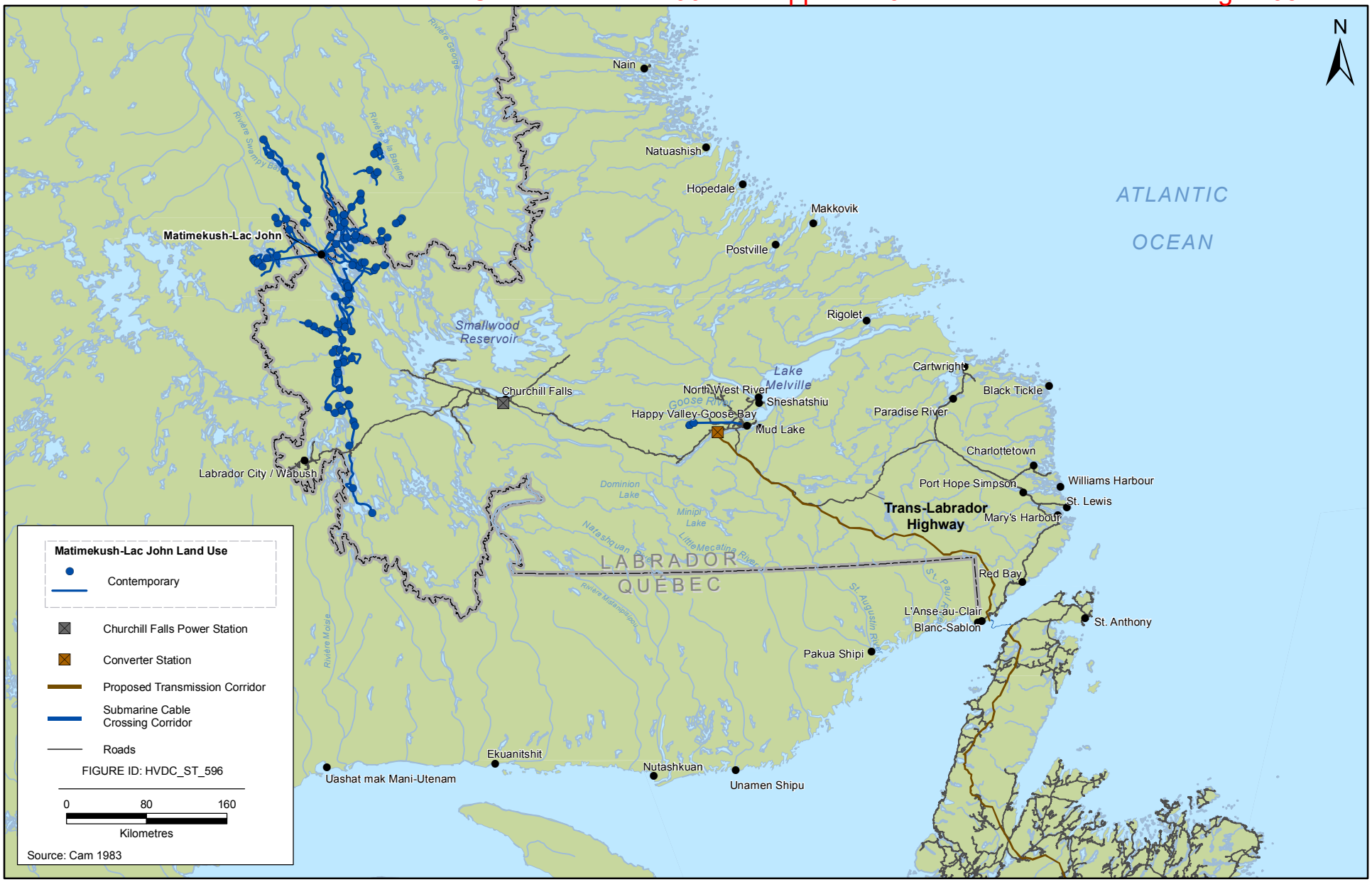
The Matimekush-Lac John First Nation is comprised of two communities, Matimekush and Lac John. Located in the province of Québec, approximately 510 km north of Sept-Îles, Matimekush is on the shore of Lac Pearce and covers an area of 0.68 km^2. The Lac John community covers an area of 0.23 km^2 and is located 3.5 km from Matimekush and from the centre of Schefferville. The contemporary activities of the Innu of Matimekush-Lac John take place in all areas surrounding both communities, but are excluded from the Saguenay Beaver Reserve, which assigned specific territories to trappers. The Innu of Matimekush-Lac John land use activities are mainly practiced west of the transmission corridor. Available data do not indicate contemporary traditional land use by the Innu of Matimekush-Lac John in or near the Study Area (Figure 15.5.7-9). Contemporary traditional land use activities practiced by the Innu of Matimekush-Lac John are described below.

Travel Routes and Camp Sites

Railway and roads were found to be the most popular departure points, with the remainder of the journeys being made by canoe, snowmobile, on foot, or by snowshoe. As most contemporary travel routes and camp sites were found to be located in regions that are near the communities (CAM 1983e), available information does not demonstrate use of travel routes and camp sites near the Study Area (Figure 15.5.7-9).

Hunting and Trapping

CAM (1983e) identifies hunting and trapping as important activities for sustaining the economy of the Innu of Matimekush-Lac John. The following species were identified as the species harvested by the Innu of Matimekush-Lac John between 1956 and 1982: porcupine, caribou, beaver, hare, marten, mink, otter, fox, weasel, muskrat, lynx, waterfowl, partridge and Canada goose. The contemporary hunting and trapping activities of the Innu of Matimekush-Lac John up to 1982 were mainly located near the reserves, and in areas north and south of Schefferville (CAM 1983e). This information was confirmed by the leadership of Matimekush-Lac John, who indicated that more than 12 families have a trapping lot extending into Labrador (Conseil de la Nation Innu Matimekush-Lac John 2011, internet site). These trapping lots are located around and to the south of the Reserve, as well as west of Churchill Falls. Based on available information, the hunting and trapping areas used by the Innu of Matimekush-Lac John are located outside the Study Area.



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FIGURE 15.5.7-9

Matimekush-Lac John Contemporary Land Use

Fishing

Fishing was found to occur mainly near the communities throughout summer, when many seasonal employees returned to work (CAM 1983e). Net fishing was found to be practiced by the Innu of Matimekush-Lac John during the fall, continuing throughout the winter and peaking in the spring. Contemporary fishing locations are not detailed in the CAM study as fishing was not found to be a dominant activity for the group. One study participant mentioned that fish were plentiful, but fishing only took place when there was no other food available (CAM 1983e). Since no travel routes or camp sites were identified near the transmission corridor, it is understood that fishing activities are outside the Study Area.

Summary: Matimekush-Lac John

Based on the available information, the contemporary traditional land use activities of the Innu of Matimekush-Lac John take place in all areas surrounding both communities but are limited by territory restrictions such as the Saguenay Beaver Reserve, which assigned specific territories to trappers. The Innu of Matimekush-Lac John contemporary traditional land use activities occur within the territory indicated in Figure 15.5.7-10, and are mainly practiced west of the transmission corridor. Available data do not indicate contemporary traditional land use by the Innu of Matimekush-Lac John in or near the transmission corridor or Study Area.

15.5.7.10 Kawawachikamach

Kawawachikamach is a community located 15 km north-east of Schefferville, Québec. The community is situated on lands of category 1A-N, which were created through the Northeastern Québec Agreement (NEQA) and fall under federal jurisdiction. The community covers an area of 41.9 km^2 and the land is for the exclusive use and benefit of Naskapi Nation of Kawawachikamach (NNK). Based on available information, there is no evidence of NNK member contemporary traditional land use activities within the transmission corridor or in or near the Study Area. Rather, NNK member contemporary traditional land use activities mainly occur near Schefferville and on the land set aside under the NEQA. A summary of the NNK contemporary traditional land use activities is provided below.

Travel Routes and Camp Sites

NNK members have travel routes throughout central Labrador and north-eastern Québec. Based on available information, the contemporary travel routes and camp sites are located near Schefferville, along the Québec North Shore, along the Labrador Railway, and along the TLH 1 (Weiler 1992; CAM 1982). Available information does not indicate that there are any travel routes or camp sites within or near the Study Area (Figure 15.5.7-11).

Hunting and Trapping

Caribou is the primary resource harvested by NNK members (NNK 2011a, internet site; Harper 1964). Caribou are harvested in the barren lands mainly from the George River Caribou Herd (NNK 2011b, internet site; Weiler 1992). Some of the contemporary caribou harvesting areas documented were located between Border Beacon and Lake Mistastin, east and north-east of Indian House Lake and north of Churchill Falls (Henriksen 1978). These areas are located approximately 300 km north-west of the Study Area.

The main animals harvested for fur by NNK members were marten, arctic fox, red fox, mink, lynx, otter, muskrat and weasel. Beaver are only present and harvested in the southern portion of NNK territory. Waterfowl, including Canada goose, black duck, oldsquaw and other ducks, were also harvested (Weiler 1992). A good porcupine harvesting area was indicated along the Notakwanon River (Henriksen 1978). This river is located more than 300 km north-west of the Study Area.

Based on available information, there is no evidence of hunting and trapping activities within or near the Study Area.

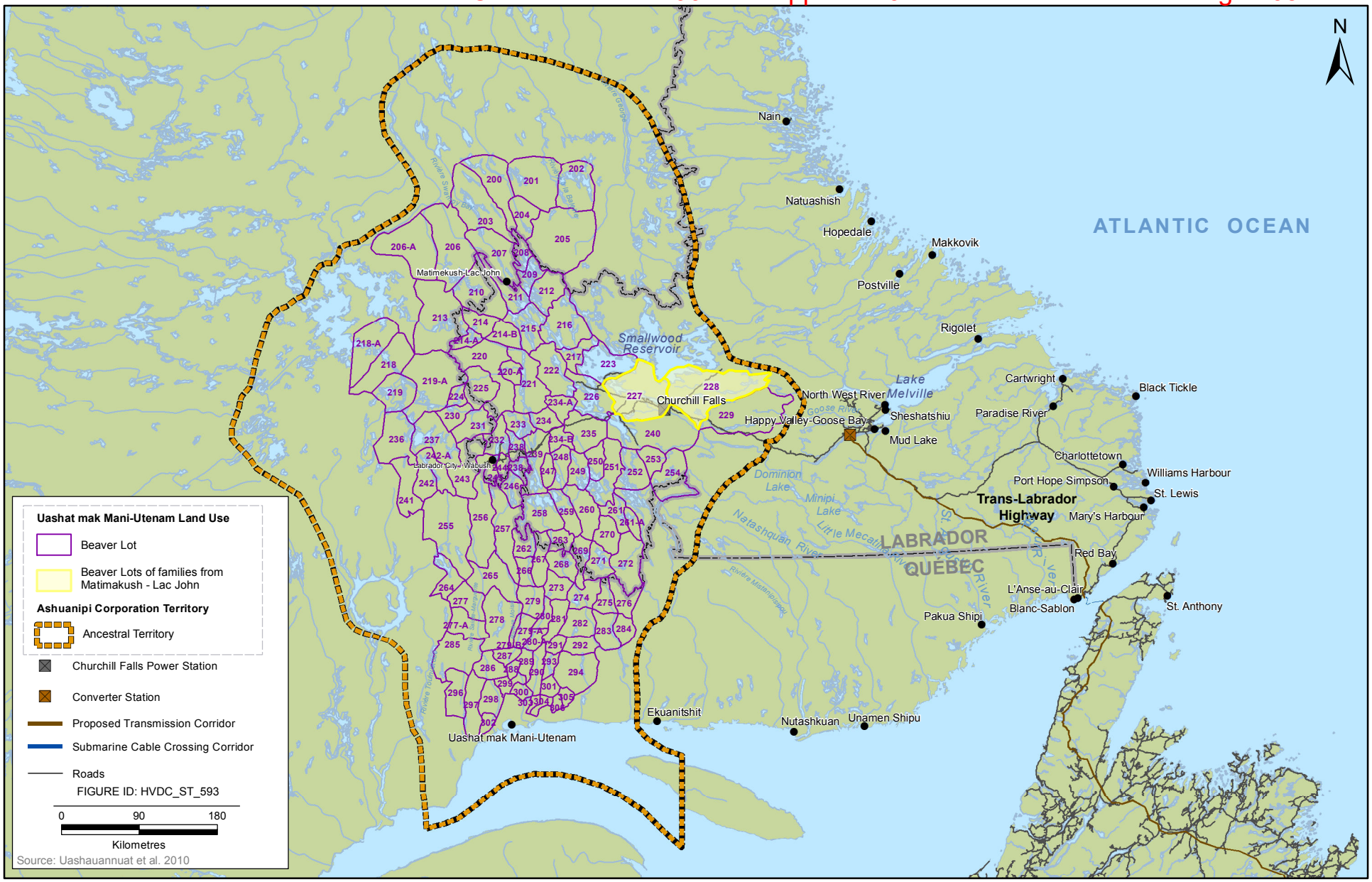


FIGURE 15.5.7-10

Saguenay Beaver Reserve and Ancestral Territory of the Ashuanipi Corporation (Matimekush - Lac John and Uashat mak Mani-Utenam)



FIGURE 15.5.7-11

Naskapi Nation of Kawawachikamach: Contemprary Land and Resource Use

Fishing

Fishing was reported as an important activity for NNK members (Weiler 1992; Henriksen 1978, 1973). According to Weiler (1992), the main species caught are lake trout, brook trout, speckled trout, whitefish, sucker, pike and ouananiche. Methods used for harvesting fish include nets, angling and ice-fishing (Weiler 1992; Speck 1977). There is limited information regarding the location of contemporary fishing sites; however, the known travel routes and camp sites suggest that any overlap between fishing and the Study Area is unlikely.

Places of Cultural Significance

The NNK maintain a number of culturally significant areas within their traditional territory. Available data suggest that some culturally significant sites are located in Québec, near Indian House Lake (Henriksen 1978; Harper 1964; Tanner 1947). NNK members have a deep connection to the land (Speck 1977) and places of cultural significance are often associated with travel routes and camp sites. As mentioned above, available data do not show any travel routes and camp sites in or near the Study Area.

Summary: Naskapi Nation of Kawawachikamach

Based on a review of the available literature and information provided by NNK, contemporary traditional land use activities by NNK members occur near Schefferville and on the land set aside under the NEQA. Henriksen (1978) and CAM (1982) have also identified travel routes and camp sites used by NNK members along the TLH in Labrador. Available data do not indicate that NNK members use areas in or near the transmission corridor or the Study Area.

15.5.7.11 Aboriginal Ecological Knowledge (Medicinal Plants)

Aboriginal Ecological Knowledge regarding medicinal plants and their use was obtained through land and resource use interviews with Innu Nation and members of the NunatuKavut Community Council (Table 15.5.7-1), and includes information on the types of plants used and where they were collected, and their medicinal use.

Table 15.5.7-1 Aboriginal Ecological Knowledge (Medicinal Plants)

Group or Individual	Source	Quote (Direct and / or Indirect)
Labrador Innu	Labrador Innu Traditional Knowledge Committee Member, November 29, 2006 (p. 67)[(a)]	"My mother found a medicine that looks like balsam fir boughs. They grow along the ground near the river and are called assiuashiku. We crushed the needles, mixed with fat, warmed it up, put on a cloth, and placed on the forehead. My daughter, Enen, was seven-eight months old at the time and was sick, so I gave her this medicine. The next morning she was okay. There's a lot of this plant on an island just above Tshiashku-nipi [Gull Island]" (P2.29.11.06).
	Labrador Innu Traditional Knowledge Committee Member, January 24, 2007 (p. 68)[(a)]	There is a light layer, inside the bark of minaiku (white spruce) that is good cough medicine. Chew it, and swallow the saliva but not the bark (P1.24.1.07).
	Labrador Innu Traditional Knowledge Committee Member, December 7, 2006 (p. 67)[(a)]	Another good medicine is mashkuminakashi (Northern mountain ash) which is good for flu, coughs. It is found at Uhuniau (North West Point). You chew the berries. You can also boil the bark for a long time until it looks like molasses and apply on a cloth to the back. Used if you have a sore back (P2.7.12.06).
	Labrador Innu Traditional Knowledge Committee Member, November 29, 2006 (p. 67)[(a)]	"Once, at Uapush-shipiss, I cut my foot badly with an axe. The bleeding wouldn't stop, so my grandfather mixed ushkuai-pishim (mushrooms) with powder from a tanned caribou skin and tied this over the wound. The day after, they boiled pitshuatiku and placed this on the wound, changing it regularly" (P8.29.11.06).
	Labrador Innu Traditional Knowledge Committee Member (p. 68)[(a)]	The round thing that turns into powder, kapiputepanit (kâpîputest), is good for infections and nose bleeds.
	Labrador Innu Traditional Knowledge Committee Members, November 17 and December 5, 2006, and January 24, 2007 (p. 68)[(a)]	Birch, tamarack, spruce and fir cones can be used as medicine for stomach problems. You drink one cup of a broth made from the boiled cones and you vomit (P8.17.11.06; P1.5.12.06; 24.1.07).
	Labrador Innu Traditional Knowledge Committee Member, December 5, 2006 (p.68)[(a)]	"Red berries are good for teething. One of my daughters had teething problems so I found red berries under the snow. It took only a couple of days to heal up" (P1.5.12.06).
	Labrador Innu Traditional Knowledge Committee Member, February 8, 2007 (p.68)[(a)]	Kâuîshâkəpekəshâtshî (unidentified) is a plant that grows on the ground. It has thread-thin roots that come off the main root. It is a medicine found anywhere (P3.8.2.07).
	Labrador Innu Traditional Knowledge Committee Member, December 8, 2006 (p. 68)[(a)]	Ikuta (Labrador tea) is used as medicine (preparation and application not specified) (P9.8.12.06).

Table15.5.7-1 Aboriginal Ecological Knowledge (Medicinal Plants) (continued)

Group or Individual	Source	Quote (Direct and / or Indirect)
Pian Penashue	Pian Penashue, translated by Daniel Ashini, Institute for Environmental Monitoring and Research Workshop, Northwest River, September 10, 1997[(b)]	The medicine he makes out of the young juniper tree is this type of medication; it is boiled, and a fluid mixture is made out of it. This is used for coughs or it can be used for other purposes as well; the juniper he says also has other different uses. If you scrape the outside of the bark, the white stuff, that also has a purpose. It can be used for infections or cuts or an abrasion that happens in the country.
	Pian Penashue, translated by Daniel Ashini, Institute for Environmental Monitoring and Research Workshop, Northwest River, September 10, 1997[(b)]	The other medicine that Pien is talking about is this type of medicine, he said it looks like “Tang”, but it Is not “Tang”. It is made from the spruce boughs that are gathered from the land. The purpose of this medicine is to serve when it is sort of hot. People sip it, to get rid of colds or shivers that people have in the winter time.
Lizette Penashue	Lizette Penashue, translated by Daniel Ashini, Institute for Environmental Monitoring and Research Workshop, Northwest River, September 10, 1997[(b)]	The other medication that Lizette here is talking about is some kind of powder made out of dead trees, rotten trees. She says that it is scattered from the forest and it is used…she says that she has often seen babies and young children have rashes, diaper rashes or rashes on their bodies. Quite often mothers have used baby powder on them and she has found out that they actually quite often didn’t work on the babies. So Lizette prefers to use sort of powder on rashes for babies and young children.
		The other type of tree that is used for making Innu medicine is the fir tree. You can see here there is turpentine, there [are] bubbles on the fir tree. The Innu people have many different uses for that turpentine. Innu people use it for making fluids of medication for different sorts of illnesses. They use it for cuts, [and as] medication for expecting mothers after they have delivered the baby. Lizette tells me that they usually have some complications and have a hard time getting well again, as you normally would, but that is used for those types of situations as well.
		But in terms of the medication from the tree, the fir tree, you have to be careful about the size and the age of the tree for the patient. You have to use a younger and smaller tree, fir tree, for developing medicine for young babies, because the medicine from older and bigger trees is too strong for young babies.

Table15.5.7-1 Aboriginal Ecological Knowledge (Medicinal Plants) (continued)

Group or Individual	Source	Quote (Direct and / or Indirect)
Labrador Metis Association, Institute for Environmental Monitoring and Research Workshop, Northwest River	John Howell, Labrador Metis Association, Institute for Environmental Monitoring and Research Workshop, Northwest River, September 10, 1997[(c)]	"Many people found their appetites declined and their energy reserves were low at the end of a long winter. Obviously, it wouldn't be wise to let this condition go on too long. As always, the land provided the solution. In this case it was the bog bean. Our mothers would go into certain bogs and using a hook to retrieve this plant growing underwater. Then they steeped it and gave us the liquid to drink. It didn't taste good, but it was effective. Those who needed it and took it felt better before long.
		"In the case of broken bones, we used birch bark to fashion casts. These would be left on until the bone set."

(a) Source: Innu Environmental Knowledge of the Mishta-shipu (Churchill River) Area of Labrador in Relation to the Proposed Lower Churchill Project (Armitage 2007). Refer to Appendix 10-1.

(b) Source: Penashue and Penashue (1998).

(c) Source: Howell (1998).

Nalcor will continue to collect data from Aboriginal groups provided to them through the community engagement agreements. Any information provided on medicinal plants and / or their use by Aboriginal groups through this process will be considered and incorporated, where relevant, including the potential for mitigation and adaptive management during detailed design and routing.

15.5.8 Hunting and Fishing Outfitters

Newfoundland and Labrador is a popular destination for non-resident hunters and anglers. The province has high success rates (e.g., 85% for moose, 90% for woodland caribou, 90% for barren ground caribou) and record sizes (e.g., salmon as large as 13 kg, brook trout as large as 4.5 kg and black bears of nearly 300 kg) within a short travel distance of major North American centres.

A number of outfitting companies (154 operators) have established 278 camps throughout the province. These outfitting camps are mostly located on the Northern Peninsula and in Central and Eastern Newfoundland regions. Government and outfitters have been concerned about the sustainability of the industry. In 1998, the province placed a moratorium on new outfitting operations. Only the sale of existing outfitting licences is permitted. Increasing the number of operators at this time could dilute the customer base and therefore the viability of individual operators. Concerns also relate to the decline of the caribou population and the economic recession in the United States from where most of the clients originate (Deveraux 2010, pers. comm.; NLDTCR 2009a, internet site).

Outfitters usually offer both fishing and / or hunting (bow or shotgun hunting mainly for black bear and moose) but some may offer other experiences such as hiking or snowmobiling. They may guide clients in any management area where appropriate licences are held and these areas are not always based on designated wildlife management zones (Deveraux 2010, pers. comm.).

While outfitters' licences are attached to a specific management zone, these zones are large geographic areas which may not be indicative of the way in which outfitters use the resources around them. To better understand and assist 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 2010, pers. comm.).

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 15.5.8-1 shows relevant seasons serviced by the outfitters in Labrador and in Newfoundland.

Table 15.5.8-1 Salmon Fishing and Big Game Hunting Seasons in Labrador and Newfoundland

Species	Labrador 2011-2012	Newfoundland 2011-2012
Salmon	Set annually (June to September 2011)	Set annually (June to September / October 2012) Fall angling on Gander River, Exploits River and Humber River (September to October 2011)
Moose	September 2011 to March 2012	September / October 2011 to January 2012
Black bear	April to July 2011, September to November 2011 and April to July 2012	September to November 2011
Woodland caribou	No woodland caribou hunting allowed in south-eastern Labrador	September to October / November / December 2011

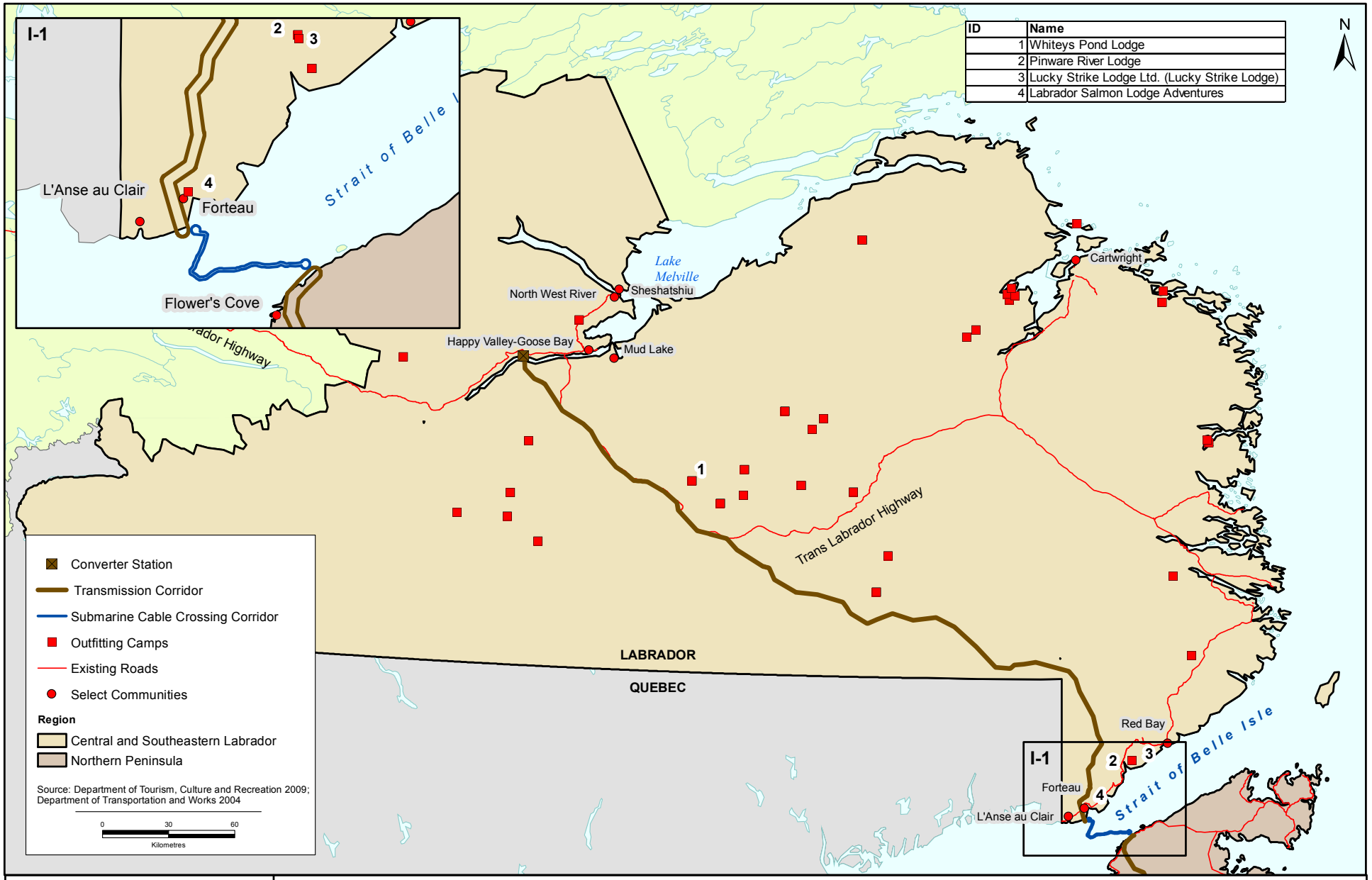
Source: DFO 2011b; NLDEC-W 2010a.

In Labrador, outfitting activities occur in spring, summer, fall and winter. In Newfoundland, outfitting opportunities are available in summer and fall to early winter.

The NLDTCR provided information (from its database) on the locations, names and owners / operators of hunting a fishing outfitting camps throughout Newfoundland and Labrador. This information was used and presented in the Component Study (AMEC 2011, 2010b).

15.5.8.1 Central and Southeastern Labrador

The Central and Southeastern Labrador region has 25 outfitting camps which are mainly located around the Minipi River, Eagle River, Paradise River, St. Lewis River, Pinware River and Forteau River systems (NLDTCR 2009b). No outfitting camps are located within the proposed transmission corridor. The locations of four nearby outfitter camps in the Study Area are identified in Figure 15.5.8-1. Outfitter information and locations for this region were based on information taken from the 2009 NLDTCR database and supplemented with information provided through consultation with the Labrador Outfitting Association, as documented in the Component Study Supplementary Report (AMEC 2011, 2010).



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FIGURE 15.5.8-1

Land and Resource Use - Outfitting Camp Locations in Labrador

15.5.8.2 Northern Peninsula

The 77 outfitting camps on the Northern Peninsula are located mainly in the Long Range Mountains with a concentration in the Main River area in the southern part of the peninsula, and several camps are located near Main Brook and Roddickton in the northern part (NLDTCR 2009b). Three outfitting camps are located within the transmission corridor (Figure 15.5.8-2). These outfitters, their locations, type of business, capacity and access are described in Table 15.5.8-2. Thirty-three additional outfitting camps are located within the 30 km wide Study Area based on information available from NLDTCR (NLDTCR 2010b; NLDTCR 2009b). Although outfitting camps may not be located within the proposed transmission corridor, guides and their clients may travel through or use an area crossed by the proposed transmission corridor. It should also be noted that the number of operating outfitters can vary from year to year. The information provided for Newfoundland outfitters is based on most current database available from NLDTCR.

Table 15.5.8-2 Outfitting Camps within the Transmission Corridor, Northern Peninsula 2009

Name	Location	Hunting / Fishing	Accommodations Capacity	Access
Hynes Hunting and Fishing Lodge	Portland Creek Pond	Moose, Black Bear, Woodland Caribou / Atlantic Salmon, Brook Trout	6	Forestry Access Roads
Four Ponds Outfitting Limited	Main River Watershed	Moose, Black Bear, Woodland Caribou / Atlantic Salmon, Brook Trout, Sea-Run Brook Trout	8	Fly-in
Parsons Pond Outfitters (Snowy Lake Lodge)	Main River Watershed	Moose, Black Bear, Woodland Caribou, Small Game	2-6	Fly-in

Source Tamalik Resorts Inc. 2011, internet site; NLDTCR 2010b; NLDTCR 2009b; Four Ponds Outfitting Ltd. 2010, internet site.

15.5.8.3 Central and Eastern Newfoundland

Central and Eastern Newfoundland has a total of 75 outfitting camps which are located throughout the interior and along the river systems of the Indian River, West River, South Brook, Exploits River, Gander River and Terra Nova River (Figure 15.5.8-2). No outfitting camps are located within the proposed transmission corridor (NLDTCR 2009b). Eleven outfitting camps were identified in the 30 km wide Study Area. Although outfitting camps may not be located within the transmission corridor, guides and their clients may travel through or use an area crossed by the proposed transmission corridor.

15.5.8.4 Avalon Peninsula

No outfitting camps are located on the Avalon Peninsula.

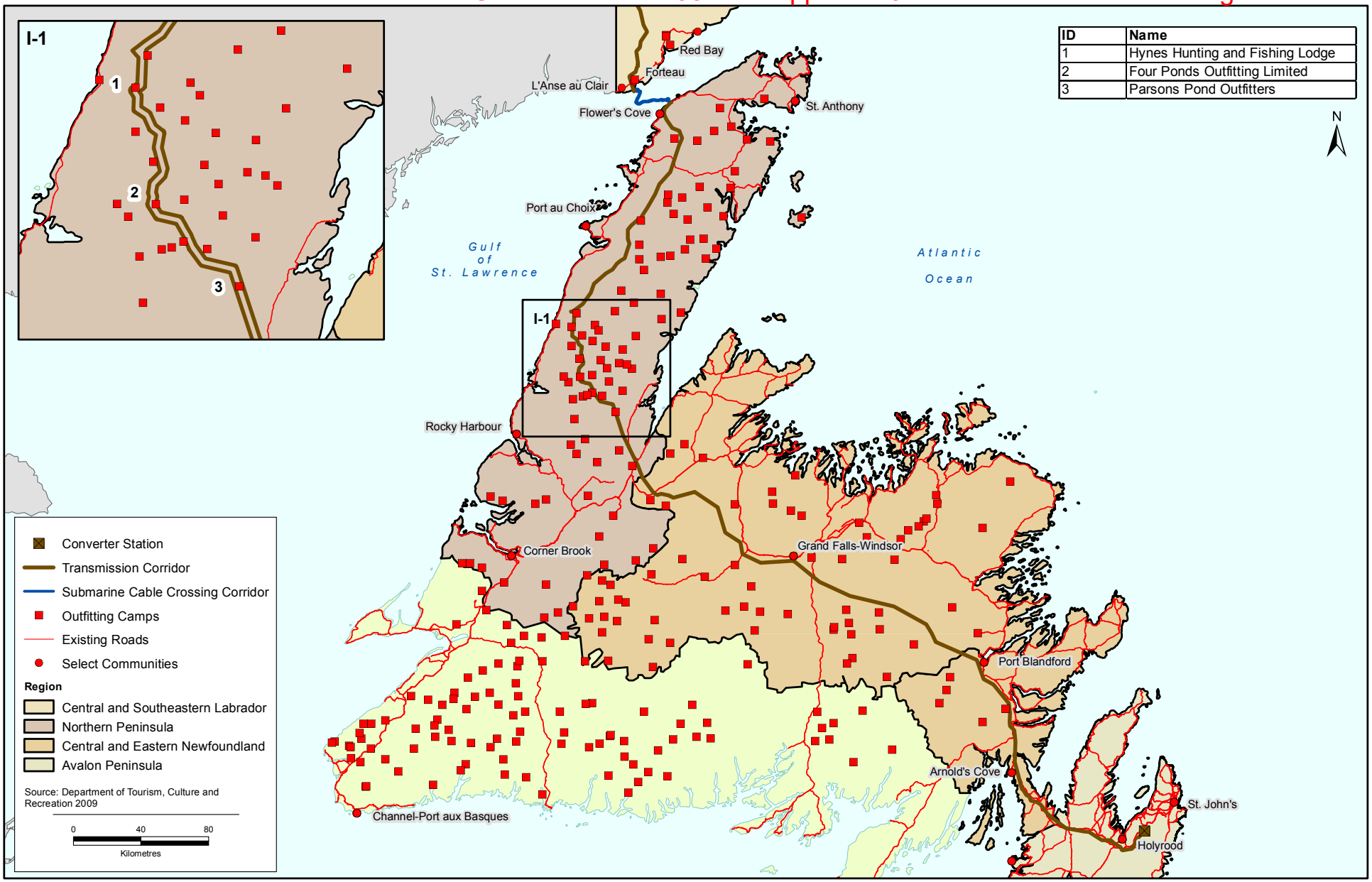


FIGURE 15.5.8-2

Land and Resource Use - Outfitting Camp Locations in Newfoundland

15.5.9 Motorized Recreational Vehicle Use

Residents and tourists participate in snowmobiling, off-road utility vehicle use (e.g., ATV, jeep, dirt bike) and boating. 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 ungroomed trails, open ground and forestry access roads, as well as on ponds, lakes and the ocean when they are frozen. The transmission corridor crosses existing snowmobile trails, particularly along the Newfoundland T'Railway Provincial Park and near populated areas (e.g., Labrador Straits, Grand Falls-Windsor, Clarenville, the Isthmus of the Avalon and Conception Bay South).

Off-road utility vehicles are used on resource roads, trails and open areas primarily outside of the winter season.

Motorized boats are used on the ocean and on suitable lakes, ponds and rivers. In areas where there are a large number of lakes and ponds with convenient road access, boating activity increases. Most people along the coast who operate boats are fishermen who may also use their boats for recreation.

The *Communities, Land and Resources Use, Tourism and Recreation Component Study* (AMEC 2011, 2010b) used available data to map areas and routes that are used for snowmobiles and off-road utility vehicles (e.g., snowmobile trails, T'Railway Provincial Park, forestry access roads).

15.5.9.1 Central and Southeastern Labrador

The Grand River Snowmobile Trail includes approximately 150 km of groomed trails on the north side of the Churchill River (Grand River Snowmobile Club 2009, internet site). The Labrador Winter Trails system, which is used for recreation and to commute between communities in winter, is comprised of more than 345 km of trails between Labrador West at the Québec border to Makkovik in Labrador north and to the Straits in southern Labrador. Shorter branch trails also connect to the main Labrador Winter Trail. The Basques Whalers Trail, which is part of this system, begins at the Québec - Labrador border in south-eastern Labrador and extends to Red Bay. Approximately 155 km in length, it passes through eight coastal communities in the Labrador Straits (NLDEC-L 2009; Labrador Winter Trails 2009, internet site). Snowmobile trails in relation to the transmission corridor are mapped in the Component Study (AMEC 2010b).

ATVs are used primarily for recreation, subsistence activities (e.g., hunting, fishing, firewood harvesting, food gathering) or to travel both intra and intercommunity on forestry access roads and snowmobile trails. Several ATV trails are located in the Straits area (NLDEC-L 2010a) and mapped in the Component Study (AMEC 2010b).

Motorized boats may be used inland at outfitter fishing camps. Recreational boats are also used along the south-eastern coast and in the Straits. Intercommunity boat traffic is common, as is using boats for recreational fishing along the coast. Approximately 25-30 recreational motor boats are based in Forteau, 15 in L'Anse au Loup and between 15 and 20 in L'Anse au Clair. Motorized recreational boats from elsewhere also use the Straits during the summer season and stop at various harbours (Fowler 2010, pers. comm.).

The transmission corridor crosses the Basques Whalers Trail and ATV trails in the Labrador Straits area north of Forteau (AMEC 2011).

15.5.9.2 Northern Peninsula

Snowmobile and ATV trails are located throughout the Northern Peninsula (NLDEC-L 2010a; NLDEC-L 2009; Newfoundland Snowmobile Federation (NSF) 2009, internet site). Residents use snowmobiles and ATVs along forestry access roads and other trails throughout the region. Recreational boats are based in coastal

communities. Intercommunity 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.

At least seven snowmobile trails are crossed by the transmission corridor (AMEC 2010b). These are mainly located in four areas: in the communities near the cable landing site on the Newfoundland side of the Strait of Belle Isle; adjacent to Route 432 which crosses the Northern Peninsula; south-east of Hawke's Bay; and near the Main River. The transmission corridor also crosses ATV trails near communities along the Strait of Belle Isle and along Route 432 (AMEC 2010b). The transmission corridor also overlaps Ten Mile Lake and Portland Creek Pond where boating occurs.

15.5.9.3 Central and Eastern Newfoundland

Snowmobile trails are located around Springdale, Badger and from Grand Falls-Windsor to Gander (NLDEC-L 2009; NSF 2009, internet site). Clubs are located in Grand Falls-Windsor (Exploits Snowmobile Association), Glovertown (Terra Nova Trail Riders) and Clarenville (East Coast Snowmobile Club) (NSF 2009, internet site). The T'Railway Provincial Park is used by clubs and independent riders during the winter months, particularly in the Badger to Grand Falls-Windsor area and from Glovertown to Long Harbour (Morrison 2009, pers. comm.; Ward 2009, pers. comm.).

ATV trails are located near the coast and near the T'Railway Provincial Park from Port Blandford to Long Harbour (NLDEC-L 2010a). Riders use the T'Railway Provincial Park from Badger to Long Harbour. Riders also use logging and forestry access roads around Deer Lake, between Badger and Grand Falls-Windsor and from Port Blandford to Long Harbour (Morrison 2009, pers. comm.; Ward 2009, pers. comm.).

Motorized boating occurs on some of the larger lakes including Birchy Lake and Thorburn Lake.

At least six segments of snowmobile trails (around Birchy Lake, Badger and Grand Falls-Windsor) are crossed by the transmission corridor. The T'Railway Provincial Park and other snowmobile and ATV routes are crossed by or are parallel to the transmission corridor at several locations, including near Badger, near Shoal Harbour, at Sunnyside and from Arnold's Cove to Bellevue (NLDEC-L 2010a; NLDEC-L 2009; NSF 2009, internet site).

15.5.9.4 Avalon Peninsula

Snowmobile trails exist in and near the T'Railway Provincial Park from the Isthmus to the St. John's area (NLDEC-L 2009; NSF 2009, internet site). Snowmobile activity is high on the Avalon Peninsula. As snow cover is unpredictable, the intense level of use may be due to the larger population rather than consistent suitable snow conditions. Due to inadequate snow cover during many winters, the T'Railway Provincial Park receives only sporadic snowmobile use (Ward 2009, pers. comm.).

ATV trails are located throughout the Avalon Peninsula near the T'Railway Provincial Park and off highways, especially in Placentia Bay, St. Mary's Bay, Trepassey Bay and the Southern Shore (NLDEC-L 2010a). ATV use is a common recreational activity, especially outside of St. John's. This is likely due to the population density in this part of the province, coupled with the fact that the activity is possible almost year-round. The T'Railway Provincial Park is a well-used ATV route as are the many forestry access roads in the region (Ward 2009, pers. comm.).

Motorized boating occurs on ponds and lakes near the TCH, in association with the cabins that are located on lakes in this region.

The transmission corridor crosses and parallels snowmobile trails, ATV trails and the T'Railway Provincial Park from the centre of the Avalon Peninsula, near the intersection of Route 71 (Makinsons), east to the intersection of Route 62 (Holyrood) (NLDEC-L 2010a; NLDEC-L 2009; NSF 2009, internet site). The transmission corridor also overlaps some of the larger ponds and lakes (e.g., Ocean Pond, Middle Gull Pond, Southwest Pond) where motorized boating occurs.

15.5.10 Cabins and Cottage Development Areas

The province has a large number of cabins located in cottage development areas, on ponds, rivers and lakes, or in outport communities. Several areas, which have extensive cottage development, become small communities of their own during the peak seasons. Use is high during holiday weekends, particularly in summer, and other specific times of the year such as hunting, fishing and snowmobiling seasons.

The land and resource use Component Study (AMEC 2010b) identifies cottages, remote cottages and cottage planning areas (i.e., locations that have been designated by the provincial government for recreational cottage development) within and near the transmission corridor. Cottages are those accessible by road and remote cottages are not accessible by conventional motor vehicle. Table 15.5.10-1 lists the total cottage planning areas in each region.

Table 15.5.10-1 Cabins and Cottage Planning Areas Newfoundland and Labrador

Region	Total Cottage Planning Areas (ha)
Central and Southeastern Labrador	10,958
Northern Peninsula	138,584
Central and Eastern Newfoundland	330,459
Avalon Peninsula	89,968
Total	**569,969**

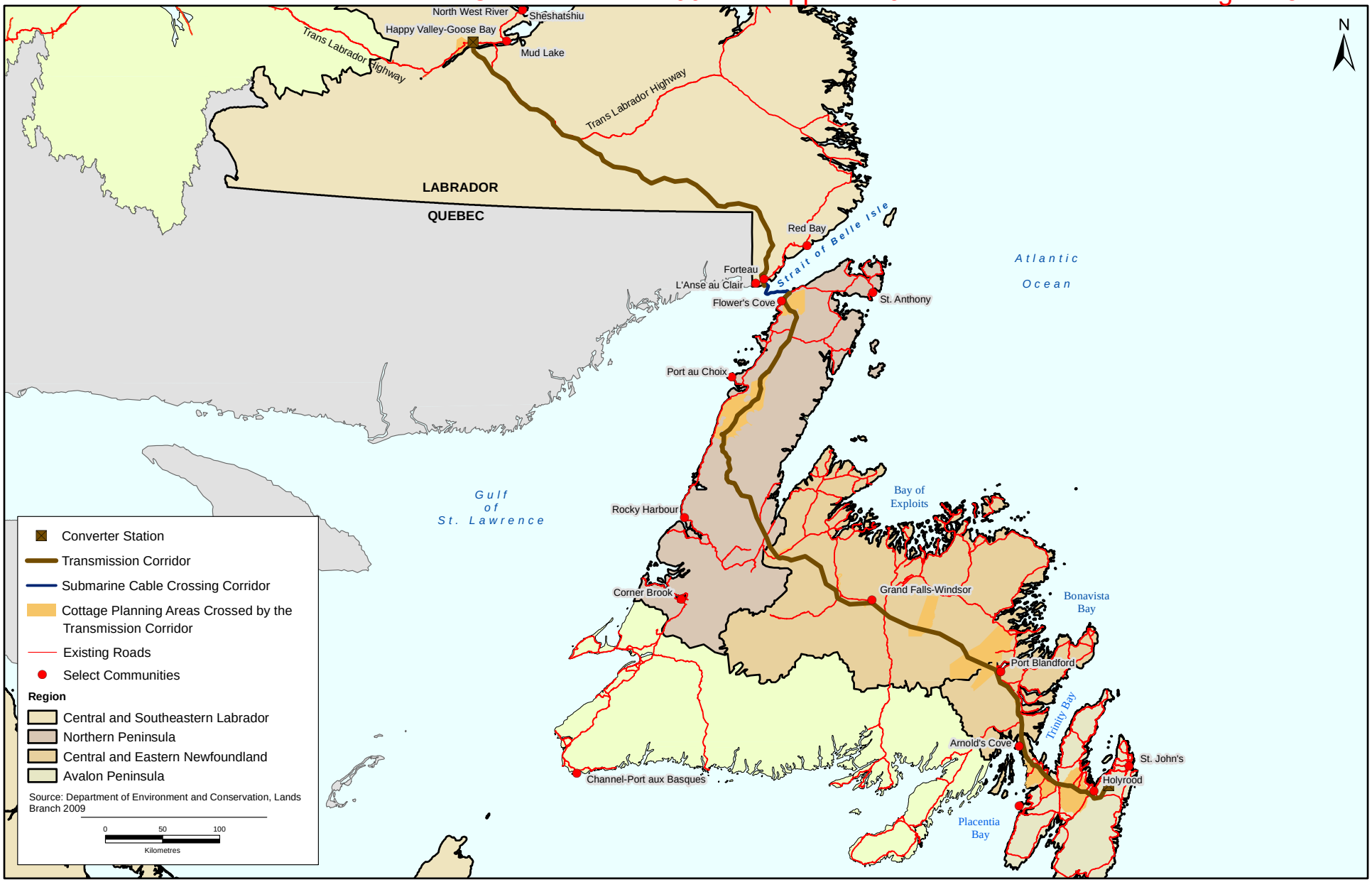
Source: NLDEC-L 2009.

Cottage planning areas are more extensive in Newfoundland than in Labrador. The largest cottage planning areas are located in Central and Eastern Newfoundland. Due to the extensive coverage of cabins in the province, Figure 15.5.10-1 only shows cottage planning areas within a 15 km wide buffer of the transmission corridor (i.e., 7.5 km either side of the centreline of the transmission corridor).

15.5.10.1 Central and Southeastern Labrador

A 10,958 ha cottage planning area is located on the north side of the Churchill River (Figure 15.5.10-1). Cabins (cottages and remote cottages) are located in the Straits area (NLDEC-L 2010a; NLDEC-L 2009). With increased access in Central and Southeastern Labrador (due to completion of TLH Phase III), cottage planning areas have been proposed along the highway (NLDMA 2011).

Seven cabins (one cottage and six remote cottages) are located within the transmission corridor in this region. The locations of these cottages in relation to the transmission corridor are shown in greater detail in Appendix B of the *Communities, Land and Resources Use, Tourism and Recreation Component Study* (AMEC 2010b).



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FIGURE 15.5.10-1

Land and Resource Use - Cottage Planning Areas

15.5.10.2 Northern Peninsula

The Northern Peninsula has three large cottage planning areas, totalling approximately 138,584 ha. One is located in the Flower's Cove area. The other two are contiguous and cover an area beginning just north of Hawke's Bay, continuing south along the coast and approximately 20 km inland south to Gros Morne National Park (NLDEC-L 2009). The three cottage planning areas are crossed by the transmission corridor (Figure 15.5.10-1).

One hundred and twenty eight cabins (59 cottages and 69 remote cottages) are located within the transmission corridor (Figure 15.5.10-1). These cabins are located on various waterbodies such as Green Island Brook, Eastern Lake, Round Lake, Pikes Feeder Pond, Eastern Blue Pond, River of Ponds, Flat Pond, Brians Pond, Portland Creek Pond and in the Upper Humber River area (NLDEC-L 2010a). The locations of these cabins in relation to the transmission corridor is provided in greater detail in Appendix A of the *Communities, Land and Resources Use, Tourism and Recreation Component Study* (AMEC 2010b).

15.5.10.3 Central and Eastern Newfoundland

Central and Eastern Newfoundland has 15 cottage planning areas (totalling approximately 330,459 ha) including large areas on Grand Lake, the Northwest and Southwest Gander Rivers, near Terra Nova National Park (Maccles Lake, Terra Nova Lake and Lake St. John), at Thorburn Lake and on the Isthmus of the Avalon (Figure 15.5.10-1). Cabins are concentrated around Grand-Falls Windsor and between Port Blandford and Long Harbour (NLDEC-L 2009). The proposed transmission corridor crosses cottage planning areas at Birchy Lake, on the Bay d'Espoir Highway, on Northwest Gander River, near Terra Nova National Park, at Thorburn Lake east of Port Blandford, near Clarenville and on the Isthmus of the Avalon Peninsula between Little Harbour and Long Harbour (Figure 15.5.10-1).

There are 167 cottages (94 cottages and 73 remote cottages) located within the transmission corridor (NLDEC-L 2010a). These are located at Birchy Lake, Three Corner Pond, on and near the Exploits River between Badger and Grand Falls-Windsor, Great Ratting Brook (Bay d'Espoir Highway), Sunday Lake, Hayne's Lake, the Northwest and Southwest Gander River area, Terra Nova River, Stephen's Pond, Holloway's Pond (near Port Blandford), Thorburn Lake, Andrews Pond, Loon Lake, John Penney Pond, Headwaters Pond, Goobies Pond, near Little Harbour Head and Grassy Point Pond (Figure 15.5.10-1). These cottages, in relation to the transmission corridor, are shown in greater detail in Appendix B of the *Communities, Land and Resources Use, Tourism and Recreation Component Study* (AMEC 2010b).

15.5.10.4 Avalon Peninsula

Several areas between Chapel Arm and Holyrood have been designated as cottage planning areas (NLDEC-L 2009). The largest is located in the centre of the Avalon and includes highly developed cabin areas such as Ocean Pond, Mahers, Makinsons, Brigus Junction, Middle Gull Pond, Deer Park and Witless Bay Line (Figure 15.5.10-1).

There are 309 cottages within the transmission corridor, located on and near Goose Pond, Hodgewater Pond, Grand Pond, Ocean Pond, Goulds Pond, Goulds Big Pond, Nine Island Pond, Colliers Big Pond, Jacks Pond, Second Junction Pond, Rocky Pond, Middle Gull Pond, Five Mile Pond West, Brigus Junction and Witless Bay Line (NLDEC-L 2010a). See Appendix B of the *Communities, Land and Resources Use, Tourism and Recreation Component Study* for details (AMEC 2010b).

15.5.11 Recreational Activities

Recreational activities occur on land, ponds, lakes, rivers and / or coastal areas throughout the province. Activities are primarily undertaken for leisure and include bicycling, bird watching, camping, canoeing, kayaking, white-water rafting, golfing and skiing - cross country and downhill (NLDTCR 2011a, internet site).

Recreational hunting, fishing and use of motorized vehicles are discussed in previous sections. Details of the information summaries provided below, are available in the AMEC (2010b) Component Study.

It is not possible to delineate the locations of all activities that do not require specific infrastructure or facilities. In addition, unregulated recreational activities are often conducted independently and it not possible to quantify the number of users. Other data limitations exist. Birdwatching and boating locations are generally unidentified. Provincial tourism data identifies trailheads but many trail routes are not available in a georeferenced format that can be located in relation to other features. Likewise, private campgrounds are identified by a single point and camping areas or individual campsites are not available in a format that can be georeferenced.

Generally these activities occur most frequently near populated areas (e.g., the Labrador Straits, Gros Morne, Grand-Falls Windsor, Clarenville, Isthmus of the Avalon and Conception Bay Centre and South) and near existing parks and protected areas such as the T'Railway Provincial Park. The following sections describe tourism and recreational activities that have been identified or located in each region.

15.5.11.1 Central and Southeastern Labrador

One public and three private campgrounds are located in the 30 km wide Study Area of Central and Southeastern Labrador (NLDTCR 2011a, internet site). Facility locations and the number of campsites are provided in Table 15.5.11-1.

Table 15.5.11-1 Campgrounds Central and Southeastern Labrador

Facility	Location	Camping and / or Recreational Vehicle Sites
Goose River Lodge RV Park	Happy Valley-Goose Bay	10
Harbour View RV Sites	Red Bay	4
Pinware River Provincial Park Campground	Pinware River	22
Northern Light Inn Campground	L'Anse au Clair	20
Total Campsites		**56**

Source: NLDTCR 2011a, internet site.

Within the Central and Southeastern Labrador region, no campgrounds are known to be located within the transmission corridor.

Hiking trails are located in the Straits area, at Forteau Bay and Point Amour (NLDTCR 2011a, internet site) and the only golf course in the region is located at Happy Valley-Goose Bay (Golf Newfoundland 2011, internet site).

Canoeing occurs on the Churchill River and possibly in proximity to some of the outfitting lodges in the region. Lack of road access to suitable areas has limited kayaking in Labrador. However, the TLH3 has improved access to rivers in Central and Southeastern Labrador. Sea kayaking occurs on an infrequent basis along the coast.

15.5.11.2 Northern Peninsula

Within the Northern Peninsula region no campgrounds overlap with the transmission corridor. There are more than 20 campgrounds including five public campgrounds at Gros Morne National Park (total of 242 campsites), Sir Richard Squires Memorial Provincial Park (157 campsites) and Pistolet Bay Provincial Park at Raleigh (30 campsites). Private campgrounds are located throughout the region (NLDTCR 2011a, internet site). The location and capacity of these campgrounds or parks are detailed in Table 15.5.11-2 and in AMEC (2010b).

Table 15.5.11-2 Campgrounds Northern Peninsula

Campground or Park	Location	Camping and / or Recreational Vehicle Sites
Pistolet Bay Provincial Park Campground	Raleigh	30
Triple Falls RV Park	St. Anthony	105
Viking RV Park	Quirpon	35
St. Barbe RV Park	St. Barbe	40
Ocean Side RV Park	Port au Choix	36
Torrent River Nature Park and Campground	Hawke's Bay	20
River of Ponds Park	River of Ponds	54
Mountain Waters Resort Park	Portland Creek Pond	50
Seabreeze RV Park and Campground	Cow Head	9
Gros Morne National Park Shallow Bay Campground	Cow Head	69
Gros Morne National Park Green Point Campground	Green Point	31
Gros Morne / Norris Point KOA	Norris Point	91
Gros Morne RV / Campground	Rocky Harbour	75
Gros Morne National Park Berry Hill Campground	Rocky Harbour	69
Gros Morne National Park Trout River Campground	Trout River	44
Lomond River Lodge Campground	Lomond River	40
Gros Morne National Park Lomond Campground	Lomond	29
Sir Richard Squires Memorial Provincial Park	Cormack	157
River Sea RV Park	Pollard's Point	20
Sop's Arm Park	Sop's Arm	25
Total Campsites		**1,029**

Source: NLDTCR 2011a, internet site.

Gros Morne Resort at St. Paul's has a golf course. Three other golf courses (Blomindon, Humber River and the River) are located around Corner Brook and Deer Lake (Golf Newfoundland 2011, internet site). These golf courses do not overlap with the corridor.

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 which connect existing trails and resource roads to create a network of backcountry trails in this area, and which continues to expand each year.

Given the overall size and geographic extent of this extensive web of existing and proposed trails across the Northern Peninsula, a degree of interaction between the transmission corridor and the IATNL's existing and / or future trail network is inevitable.

Within the 30 km wide Study Area, 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. Each year new sections of backcountry trail are added to existing trails as well as various interconnecting forestry access roads to form new long distance trail routes (Wylezol 2010; IATNL 2010, internet site). The transmission corridor crosses sections of the International Appalachian Trail south-east of River of Ponds, Portland Creek and Parson's Pond, and proposed trails between Parson's Pond and Main River (Wylezol 2010; IATNL 2010, internet site). The IAT is described in greater detail and mapped in the *Communities, Land and Resources Use, Tourism and Recreation Component Study* (AMEC 2010b).

ATV and snowmobile trails intersect the transmission corridor in several locations throughout the Northern Peninsula. Most of the ATV trails are at the northern end of the region near communities.

Canoeing, kayaking and sometimes white-water rafting occurs on ponds lakes and rivers from Shoal Cove East to the Main River area. The proposed corridor overlaps portions of canoeing, kayaking and white-water rafting areas such as 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 2009, pers. comm.).

Cross country ski trails are managed by Mount St. Margaret Ski Club in Plum Point and Deep Cove Ski Club just south of Anchor Point (Ski NL 2009, internet site). Mt. St. Margaret Ski Club 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, internet site). These trails do not overlap with the transmission corridor.

15.5.11.3 Central and Eastern Newfoundland

Central and Eastern Newfoundland campgrounds are not located within the transmission corridor. Campgrounds are located on inland lakes and rivers from the Baie Verte Peninsula to Clarenville within the 30 km wide Study Area. Campgrounds are also located in coastal areas of Notre Dame Bay, Bonavista Bay, Trinity Bay and Terra Nova National Park (NLDTCR 2011a, internet site). Central and Eastern Newfoundland campgrounds, their locations and number of campsites are included in Table 15.5.11-3.

Table 15.5.11-3 Campgrounds Central and Eastern Newfoundland

Facility	Location	Camping and / or Recreational Vehicle Sites
George Huxter Memorial Park	Springdale	24
Goodyear's Cove Park	South Brook	21
Kona Beach Park	South Brook	96
Catamaran Park	Badger	200
Mary March Wilderness Park	Buchan's Junction	35
Beothuk Family Park	Grand Falls-Windsor	72
Sanger Memorial RV Park	Grand Falls-Windsor	47
Brookdale RV Park & Campground	Bishop's Falls	19
Fallsview Municipal Park	Bishop's Falls	48
Shanawdithit Campground & RV Park	Botwood	36
Osprey Landing RV Park	Northern Arm	14

Table 15.5.11-3 Campgrounds Central and Eastern Newfoundland (continued)

Facility	Location	Camping and / or Recreational Vehicle Sites
Notre Dame Provincial Park Campground	Notre Dame Junction	100
Dildo Run Provincial Park Campground	Virgin Arm	55
Peyton's Woods RV Park & Campground	Twillingate	50
Country Inn Trailer Park	Gander	64
Jonathon's Pond Campground	Gander	140
Banting Memorial Municipal Park	Musgrave Harbour	43
David Smallwood Park	Gambo	41
Square Pond Friends and Family RV Park	Square Pond	100
Harold Duffett Shriners RV Park	Eastport	124
Terra Nova National Park Malady Head Campground	Bonavista Bay	87
Terra Nova National Park Newman Sound Campground	Bonavista Bay	343
Terra Nova National Park Primitive Campsites	Bonavista Bay	33
Lakeside at Thorburn Campground	Thorburn Lake	59
Cabot Hi-Way RV Facilities & Campground	Charleston	20
Trinity Cabins Trailer Park	Trinity	12
Lockston Path Provincial Park Campground	Port Rexton	77
Kilmory Resort Trailer Park	Swift Current	10
Putt-N-Paddle Camp Grounds	Arnold's Cove	180
Bellevue Beach Campground	Bellevue	114
Total Campsites		**2,264**

Source: NLDTCR 2011a, internet site.

Golf courses are located at Grand Falls-Windsor, Gander, Terra Nova National Park, Princeton (Bonavista Peninsula) and Hatchet Cove east of Clarenville (Golf Newfoundland 2011, internet site).

Some ATV and snowmobile trails overlap the transmission corridor, including the T'Railway Provincial Park. Hiking trails are also located in the Study Area between Badger and Grand Falls-Windsor (e.g., Exploits Valley Trail, Corduroy Brook Trail and Grand Falls-Windsor Hiking Trail). Hiking trails are also located within Terra Nova National Park, throughout the Bonavista Peninsula, and at Clarenville and Sunnyside (NLDTCR 2011a, internet site).

Riverfront Chalets which offers rafting adventures on the Exploits River near Grand Falls-Windsor (Riverfront Chalets 2010, internet site), is located outside the transmission corridor but within the Study Area. Canoeing and kayaking occurs on Birchy Lake, South Brook, Exploits River (near Badger), Northwest Gander River and Terra Nova River (Dykeman 2009, pers. comm.). Many recreational sea kayakers use coastal areas from Clarenville to Chapel Arm. The high level of activity is due to the combination of a larger population in eastern Newfoundland, scenic beauty, and the choice of paddling in Placentia Bay, Trinity Bay or Conception Bay, depending on prevailing winds (Dyer 2009, pers. comm.).

White Hills Ski Resort near Clarenville has 19 downhill ski and snowboard runs on 22 hectares of terrain (White Hills Ski Resort 2009, internet site). This facility caters to skiers, primarily from central and eastern Newfoundland and the Avalon Peninsula. Exploits Valley Ski Club in Grand Falls-Windsor, Terra Nova National Park, Clarenville Ski Club and Glenview Nordic Ski Club in Come By Chance have groomed cross country ski trails. Cross country skiing also occurs on the T'Railway Provincial Park which is located within the transmission corridor (Ski NL 2009, internet site).

15.5.11.4 Avalon Peninsula

The Avalon Peninsula has campgrounds located within the Study Area of Trinity Bay, Placentia Bay, Conception Bay on the TCH, Salmonier Line and in the St. John's area, none of which are within the transmission corridor. These include Butter Pot Provincial Park and a number of private campgrounds. Campgrounds in the Avalon Peninsula region, their location and the number of campsites are provided in Table 15.5.11-4 (NLDTCR 2011a, internet site).

Table 15.5.11-4 Campgrounds Avalon Peninsula

Facility	Location	Camping and / or Recreational Vehicle Sites
Irish Loop Resort Trailer Park	Salmonier Line	135
Golden Arm Trailer Park	Green's Harbour	134
Outside Pond Park	Winterton	113
Droghedea RV Park	Makinsons	50
Roaches Line RV Park	Roaches Line	50
The Old Mill RV Park	Avondale	77
Butter Pot Provincial Park	TCH	175
Crossroads Trailer Park	Paradise	17
Pippy Park Campground	St. John's	211
Total Campsites		**962**

Source: NLDTCR 2011a, internet site.

The Avalon Peninsula has seven golf courses. These are located at Whiteway, Trinity Bay; Salmonier (The Wilds); Holyrood (The Willows); and in St. John's (Pippy Park, Bally Haley, Glendenning and Clovelly) (Golf Newfoundland 2011, internet site).

Hiking occurs on the T'Railway Provincial Park. Hiking and cross country ski trails are located in Butter Pot Provincial Park (NLDTCR 2011a, internet site). Both the T'Railway Provincial Park and Butter Pot Provincial Park overlap with the corridor and are further discussed in Section 15.5.12.

Freshwater canoeing / kayaking occurs predominately in areas where ponds and lakes are linked (e.g., Middle Gull Pond, Peak Pond) and paddlers can avoid long portages (Dyer 2009, pers. comm.). The corridor crosses Middle Gull Pond near the TCH.

15.5.12 Parks and Other Protected Areas

Within the province, all three levels of government administer parks, reserves and protected and special areas. These include all provincial and federal lands that are designated, protected, and managed for conservation and / or recreation purposes. Details of the information summaries provided below, are available in the AMEC (2010b) Component Study.

The provincial draft of the Natural Areas Systems Plan has not yet been released, the information presented in this section focuses on existing protected areas and only those that have been formally proposed.

15.5.12.1 Central and Southeastern Labrador

The Mealy Mountains area is an important natural area of Canadian significance and a national park has been discussed since the 1970s. The Mealy Mountains are also of traditional and cultural importance to the people of the area. On February 5, 2010 the Government of Canada and the GNL announced their agreement to establish a new national park reserve in the Mealy Mountains. A preliminary boundary has been identified and the parties will work towards establishing a national park reserve that is anticipated to be substantially in keeping with that boundary (Taylor 2010, pers. comm.).

The proposed Mealy Mountains National Park (approximately 10,700 km^2) would protect the Mealy Mountains, a large portion of boreal forest, tundra landscapes and 50 km of shoreline on the Labrador Sea. The area is inhabited by a variety of wildlife, including woodland caribou, wolves, black bear, marten, fox, ducks and geese, along with trout and Atlantic salmon (Parks Canada (PC) 2010a, internet site). The Mealy Mountains area supports a herd of woodland caribou (SARA 2010, internet site).

The new national park would offer recreational opportunities including canoeing, back country camping, hiking and trekking (PC 2010a, internet site). The federal and provincial governments also recognize the importance of this area for traditional and cultural activities (including hunting, fishing and trapping) and is addressing these needs by considering traditional land uses within the national park framework and through land claims agreements (PC 2010b, internet site).

The province of Newfoundland and Labrador has also proposed the establishment of the Eagle River Waterway Provincial Park to be adjacent to the new national park. The proposed Eagle River Provincial Park would protect 3,000 km^2 of boreal ecosystems, related wildlife and culturally significant landscapes in the watershed. The park will include almost the entire length of the Eagle River from its headwaters to the Atlantic Ocean (NLDEC 2010).

Central and Southeastern Labrador has an ecological reserve, provincial park, two national historic sites and two proposed parks. Gannet Islands Ecological Reserve is located off the coast of Cartwright and Pinware River Provincial Park is located in the Labrador Straits. Red Bay National Historic Site and Battle Harbour National Historic District are also located in Central and Southeastern Labrador. The region also has two proposed parks – Mealy Mountains National Park and Eagle River Waterway Provincial Park (NLDEC 2010) (Figure 15.5.12-1).

None of the existing or proposed parks are crossed by the transmission corridor in Central and Southeastern Labrador.

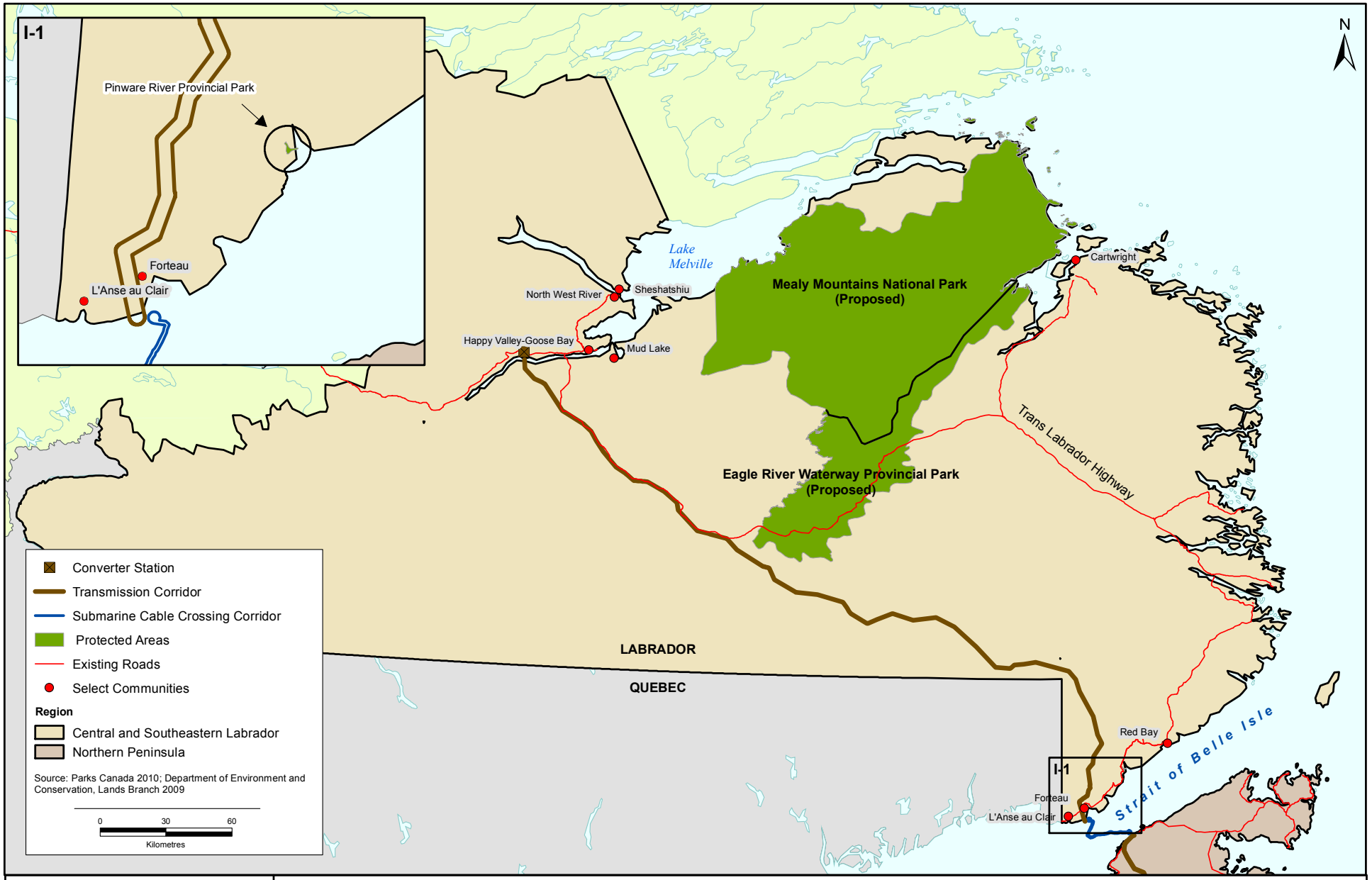


FIGURE 15.5.12-1

Land and Resource Use - Protected Areas Labrador

15.5.12.2 Northern Peninsula

The Northern Peninsula has a number of national and provincial parks. These include two United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Sites at Gros Morne National Park and L'Anse aux Meadows. Provincial parks include Pistolet Bay, the Arches, Main River, Sir Richard Squires and Blow Me Down. Wilderness and ecological reserves include those at Burnt Cape, Watt's Point, Hare Bay, Sandy Cove, Table Point and Flat Water Pond Park Reserve (NLDEC-L 2009).

The transmission corridor overlaps a small portion of the north western part of Main River Waterway Provincial Park Reserve (Figure 15.5.12-2) in the Northern Peninsula region. 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, within the river's 1,048 km^2 watershed area. The transmission corridor crosses the park at its western most point.

15.5.12.3 Central and Eastern Newfoundland

The Central and Eastern Newfoundland region includes Terra Nova National Park. Provincial parks within this region include Notre Dame, Dildo Run, Deadman's Bay, Lockston Path and the Dungeon. Park reserves are located at Jonathan's Pond (Gander), Windmill Bight (Wesleyville) and Jack's Pond and Bellevue Beach on the Isthmus of the Avalon Peninsula. Ecological reserves are located at Little Grand Lake, West Brook, the Funk Islands and Bay du Nord (NLDEC-L 2009).

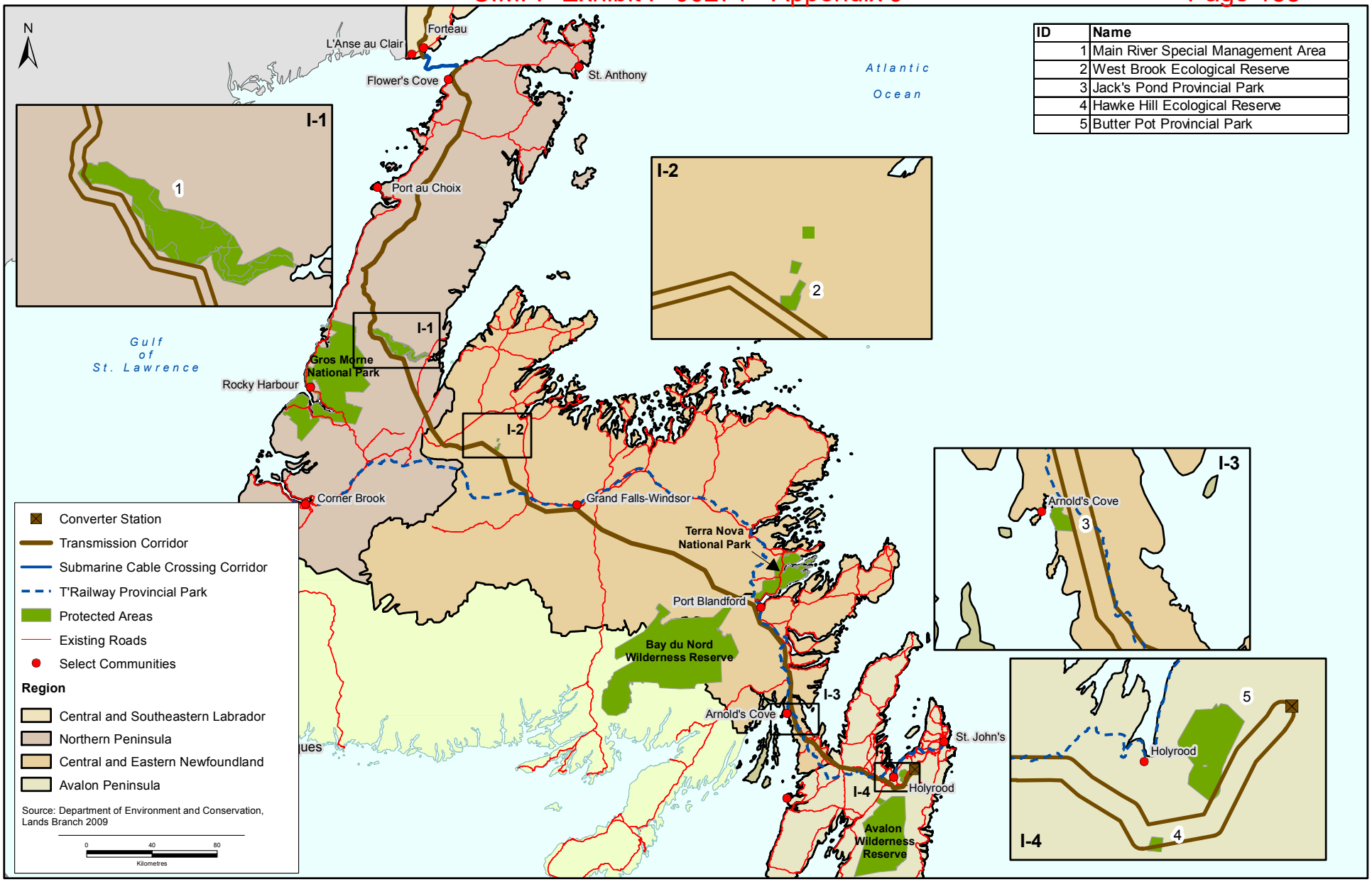
The transmission corridor overlaps portions of the West Brook Ecological Reserve, the T'Railway Provincial Park and Jack's Pond Provincial Park Reserve (Figure 15.5.12-2). The transmission corridor crosses a portion of the West Brook Ecological Reserve which was created to protect some of the largest natural stands of red pine remaining in Newfoundland.

The transmission corridor intersects with portions of the T'Railway Provincial Park several times including areas around Badger, Grand Falls-Windsor, Port Blandford and Clarenville. The transmission corridor intersects with the T'Railway Provincial Park twice about 4 km southeast of Port Blandford and then parallels it until Clarenville when it intersects with the T'Railway Provincial Park again and then parallels it until North West Brook. At that point, the corridor and the T'Railway Provincial Park overlap every few kilometres until Bellevue Beach where the T'Railway Provincial Park veers south near Route 203. Snowmobiling and ATV use are the most common uses of the T'Railway Provincial Park in this region.

15.5.12.4 Avalon Peninsula

The Avalon Peninsula region has no national parks but several national historic sites including Signal Hill in St. John's. Butter Pot Provincial Park and Salmonier Nature Park are located in the region. There are provincial park reserves at Fitzgerald's Pond and Marine Drive. Wilderness and ecological reserves are located at Baccalieu Island, Hawke Hill, Witless Bay and the large Avalon Wilderness Reserve (NLDEC-L 2009).

The transmission corridor overlaps portions of Hawke Hill Ecological Reserve, the T'Railway Provincial Park and Butter Pot Provincial Park (Figure 15.5.10-1). Hawke Hill Ecological Reserve is 2.1 km^2 and is located approximately 50 km from St. John's. Butter Pot Provincial Park is located 36 km southwest of St. John's along the TCH, Route 1. The transmission corridor overlaps slightly with the park at its most southeastern edge and is adjacent to its eastern border.



ID	Name
1	Main River Special Management Area
2	West Brook Ecological Reserve
3	Jack's Pond Provincial Park
4	Hawke Hill Ecological Reserve
5	Butter Pot Provincial Park

nalcor energy

FIGURE 15.5.12-2

Land and Resource Use - Protected Areas Newfoundland

The transmission corridor also overlaps the T'Railway Provincial Park in this region. The transmission corridor is adjacent to the T'Railway Provincial Park almost continually from east of Whitbourne to Brigus Junction. The corridor overlaps the T'Railway Provincial Park just west of and at Brigus Junction. The shoreline electrode at Dowden's Point also overlaps the T'Railway Provincial Park along the shoreline. Snowmobiling and ATV use are the most common uses of the T'Railway Provincial Park in this region.

15.5.13 Forestry

Forests are important for recreation, hunting, domestic wood supply, and as a source of raw materials for manufacturing paper and building materials. In 2007, the forestry industry contributed $126.5 million to the gross domestic product (0.5% of the provincial total). The industry provided 700 person years of employment or 0.3% of the provincial total (GNL 2009).

The pulp and paper industry has been subject to the effects of global recession. The volume of provincial newsprint shipments decreased by 4.4% in 2008 to 525,372 t. Conversely, the value of shipments increased by 12% to an estimated $390 million as a result of higher transaction prices (GNL 2009). However, the December 2009 closure of the Abitibi-Consolidated paper mill in Grand Falls-Windsor has 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 provincial volume of lumber production was estimated to have decreased by 40% in 2008 (GNL 2009).

Forestry activity occurs throughout the province (Figure 15.5.13-1). Table 15.5.13-1 describes forestry activity for the current 5 year period in forest management districts crossed by the proposed transmission corridor. Additional details of forestry within the province are provided in the AMEC Component Study (2010b).

Forestry and forest management activity in the province are subject to detailed planning processes at both the provincial and district levels, which include the preparation, regulatory review and implementation of operating plans for each district. Many of these plans will expire and be renewed prior to the commencement or completion of the construction phase of this Project. Therefore, the information is presented at a high level and does not include details of planned activities.

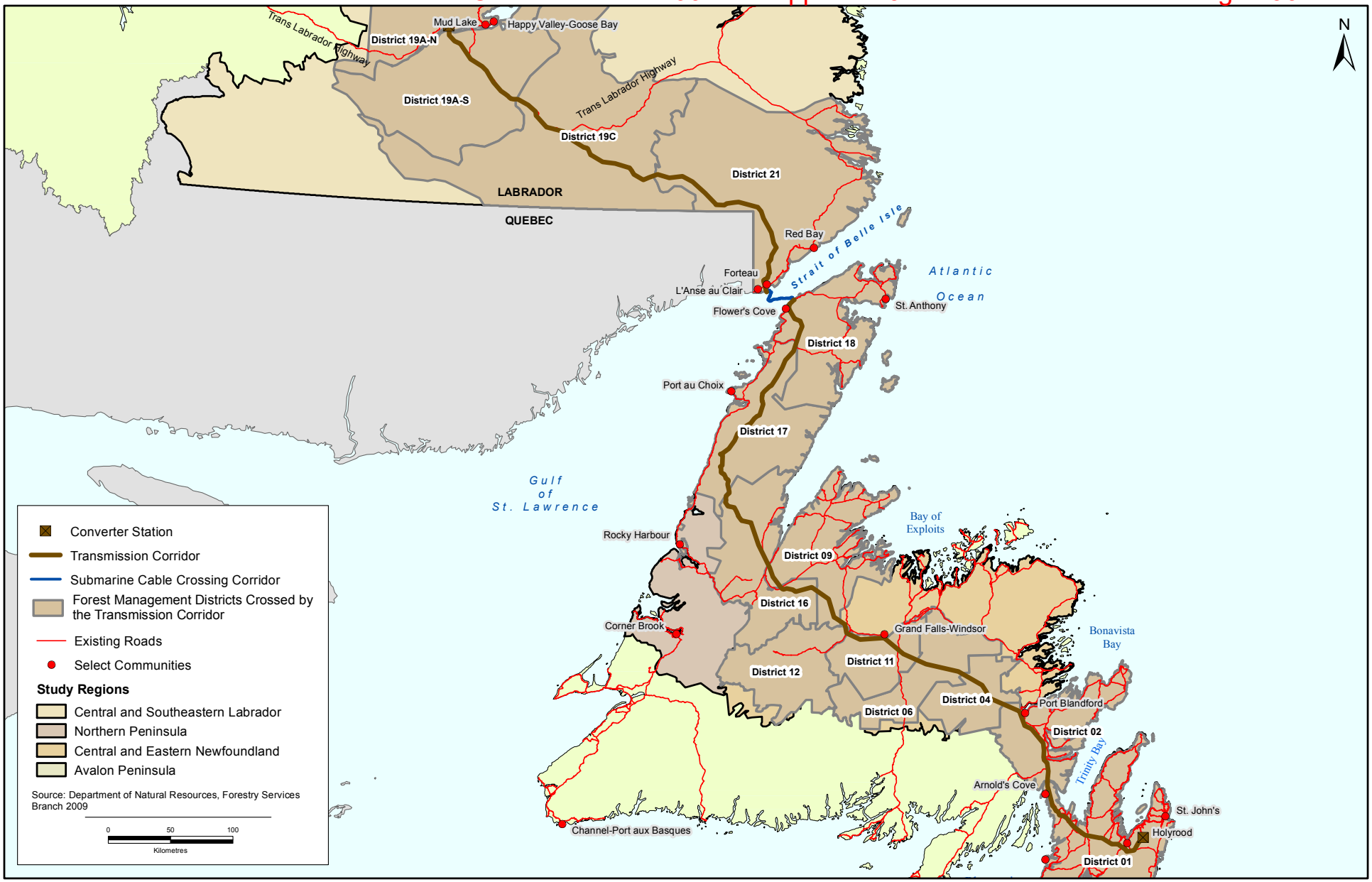


FIGURE 15.5.13-1

Land and Resource Use - Forest Management Districts Crossed by the Transmission Corridor

Table 15.5.13-1 Forestry Activity in Current 5-Year Plans, 2007 to 2012

District Number and Name	Region	Operator / Tenure[(a)]	Average Annual Volume (m^3)	Access Roads to be Constructed (km)
19A Goose Bay	Central and Southeastern Labrador	C / C	200,000	73
21 Southeastern Labrador		C / C	48,700	18.9
17 Northern Peninsula	Northern Peninsula	C and CBPPL / C and CBPPL	126,103	64
18 Straits		C / C	130,181	0
2 Bonavista	Central and Eastern Newfoundland	C / C	93,113	110.6
4 Eastern / Central		C / AB	52,582	87.6
6 Central / Eastern		C and CBPPL / AB and CBPPL	136,960	286
9 White Bay		C and CBPPL / C, CBPPL and LL	233,315	343.7
10 Central		AB / AB	107,080	10.3
11 Grand Falls-Windsor		AB / AB	272,020	71.6
12 Grand Falls-Windsor		AB / AB	294,553	106.9
16 King's Brook		C and CBPPL / C, CBPPL and LL	178,575	67
1 Avalon	Avalon Peninsula	C / C	12,912	11

Source: NLDNR-FS 2008; NLDNR-FS 2007a, b, c; NLDNR-FS 2006.

[(a)] AB = Abitibi Bowater; C = Crown; CBPPL = Corner Brook Pulp and Paper; LL = Linerboard Licences.

15.5.13.1 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. Forest Management District 19A is divided into two areas, north and south, separated by the Churchill River. The transmission corridor crosses portions of Districts 19A 19C and 21 (Figure 15.5.13-1).

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 19A is dominated by black spruce (91%) with stands generally greater than 140 years old and between 10 to 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 (NLDNR-FS 2008).

District 21 incorporates the south-eastern 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.

In addition, Labrador Innu Nation has asserted land claims within District 19A and signed a Forest Process Agreement (FPA) with the GNL in 2001. The FPA served to facilitate effective communication, information sharing, and resolution of issues between the province and Innu Nation concerning interim planning and management and to facilitate participation by Innu Nation in the development of sustainable forestry practices and ecosystem-based management plans. Under the FPA, members of Innu Nation were designated as Forest Guardians, with input into design, layout and monitoring of harvesting activities (NLDNR-FS 2007c).

In 2003, under an Interim Forest Agreement (2003-2008) a forest management committee (FMC) was established with Innu Nation to provide advice on the implementation of the forest management plan, facilitate involvement and to provide overall advice concerning the management of forest resources in the District. Subsequently, a Five Year Operating Plan for Forest Management District 19A (Management Plan) was developed for the period of 2008-2012, and covers the details of various management activities that are scheduled to occur between January 1, 2008 and December 31, 2012. Harvesting, silviculture, road construction, research, surveys / monitoring, and ecosystem protection, are part of the plan and are designed to ensure that the forest resources are utilized in a responsible and sustainable manner.

Further, a Forestry Agreement for Districts 19A, 20 and 21 with the NCC expired on March 31, 2010. However, it is Nalcor's understanding that a new Agreement has been negotiated with NCC with an implementation date sometime in the near future.

15.5.13.2 Northern Peninsula

The transmission corridor crosses portions of Forestry Management Districts 16, 17 and 18 and a small portion of District 9 (Figure 15.5.13-1). The extensive forestry access road system creates a high level of existing access for industries, commercial activity, recreation and subsistence on the Northern Peninsula.

District 16 plans to harvest 892,875 m^3 of timber. Ninety percent of forest resources in the District are harvested for commercial purposes, mostly by CBPPL, and an average of 178,575 m^3 of timber is scheduled to be harvested annually. The transmission corridor overlaps with forest land tenured to CBPPL 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 CBPPL within the five year operating plan. The transmission corridor overlaps with forest land currently tenured to CBPPL for commercial harvesting (NLDNR-FS 2008; NLDNR-FS 2007b).

15.5.13.3 Central and Eastern Newfoundland

Central and Eastern Newfoundland includes Foresty Management Districts 2, 4, 5, 6, 8, 9, 10, 11, 12 and 16 and part of Forestry Management District 1 (NLDNR-FS 2007a, b). Portions of Districts 6 and 9 are tenured to CBPPL. 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.

District 2, Bonavista Peninsula contains a land-base totalling 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.

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% 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. 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 were 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 (NLDNR-FS 2007a).

The transmission corridor passes through an area of CBPPL 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 Provincial Park between Terra Nova and Glovertown (Morrison 2009, pers. comm.).

The Five Year Operating Plans for District 9 and 16 are combined. District 9 has divided ownership between the Crown, CBPPL and Abitibi in separate annual allowable cut 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 CBPPL accounts for 70% of the total harvest (NLDNR-FS 2007b).

The transmission corridor overlaps with CBPPL 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. Forested land within all three Districts totals 629,908 ha (Abitibi-Consolidated Limited (Abitibi) 2007). Over the plan's five years, a volume of 3,368,264 m^3 is scheduled to be harvested with 44% to occur in District 12, 40% in District 11 and 16% in District 10. 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. 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. 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.

In summary, the transmission corridor overlaps with portions of Forest Management Districts 1, 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 15.5.13-1). Portions of Districts 6 and 9 are tenured to CBPPL.

15.5.13.4 Avalon Peninsula

On the Avalon Peninsula, the transmission corridor crosses Forest Management District 1, which includes the entire Avalon Peninsula and areas of the Isthmus east of Come By Chance (Figure 15.5.13-1). The land area is approximately 969,000 ha, with 628,000 ha of Crown Land. Productive forested area covers less than 20% and forest operations occur on less than 2% of the productive forest land base annually. 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 (NLDNR-FS 2006).

15.5.14 Mining and Onshore Oil and Gas Exploration

In Newfoundland and Labrador, six metal mines produce iron ore, copper, zinc, nickel, cobalt, antimony and gold. Seven non-metallic operations produce slate, anorthosite, dolomite, limestone, barite, gypsum, silica and peat. The estimated gross export value of C$5.4 billion in 2008 consisted mainly of iron ore from Labrador West and nickel from Voisey's Bay in Labrador (Mining Journal 2009). In addition, gravel is quarried throughout the province for general and road construction.

Mineral exploration spending was at record highs of $148 and $147 million in 2007 and 2008, respectively. Although reduced to an estimated $58 million in 2009 (primarily due to the global recession), this figure still represents one of the most active years in the last decade (NLDNR-ME 2009a, internet site). Onshore oil and gas exploration is occurring on the west coast of Newfoundland (NLDNR-ML 2010).

Details on the locations of mining and onshore oil and gas exploration activities are provided in the *Communities, Land and Resource use, Tourism and Recreation Component Study* (AMEC 2010b).

15.5.14.1 Central and Southeastern Labrador

As this area was recently made more easily accessible by the December 2009 connection of Route 510, mineral exploration activity is increasing in Central and Southeastern Labrador. No mines are located in the area but several staked claims exist along TLH Phase III. A number of gravel quarries were created along the highway to extract material for the new road (NLDEC-L 2009). Fifteen quarries and four staked claims are located within the transmission corridor.

15.5.14.2 Northern Peninsula

No mines are located on the Northern Peninsula but staked claims are located throughout the area. Gravel quarries are located throughout the Northern Peninsula (NLDEC-L 2009). The only onshore oil and gas activity in the province is a Nalcor oil and gas exploration lease near Parson's Pond (NLDNR-ME 2009b, c).

The transmission corridor crosses staked mineral claims located to the north-east of Daniel's Harbour, near Portland Creek, and off Route 420 in the Upper Humber River Area. Two gravel quarries near Flower's Cove are located within the corridor. It also crosses the oil and gas exploration area near Parson's Pond.

15.5.14.3 Central and Eastern Newfoundland

Central and Eastern Newfoundland has several producing mines. The Teck Mine at Duck Pond near Buchans produces zinc and copper. The Anaconda gold mine is located at Pine Cove on the Baie Verte Peninsula. Hi-Point Industries (1991) Ltd. extracts peat near Bishops Falls. Hurley Slateworks extracts material from its mine near Clarenville (Mining Journal 2009). The only producing mine identified for this region that overlaps with the Study Area is Beaver Brook Antimony Mines Inc. near Gander. The Beaver Brook antimony deposit may also lie underneath the transmission corridor.

While only one operating mine was identified which overlaps with the transmission corridor, mineral claims exist throughout the region (NLDNR-ME 2009c). The corridor overlaps portions of more than 40 staked claims around Birchy Lake, Sheffield Lake, Badger, Grand Falls-Windsor, Southwest Gander River, Deer Pond, Thorburn Lake, north of Goobies, northeast and southeast of Arnold's Cove and southeast of Chapel Arm. Twenty-five gravel quarries are located within the proposed transmission corridor; they are mainly between Badger and Grand Falls-Windsor and from Port Blandford to the Isthmus of the Avalon, associated with highway construction (NLDNR-ME 2009c).

15.5.14.4 Avalon Peninsula

The Avalon Peninsula has no active mines. Several staked claims are located near the corridor to the west and south-west of Holyrood, east and south-east of Salmonier Line (Route 90), and in the area surrounding Route 62, Holyrood and Route 60, Conception Bay South. Approximately 180 gravel quarries are located on the Avalon Peninsula. These gravel quarries, mostly serving the construction sector, are generally dispersed throughout the region, but with concentrations around Whitbourne, Holyrood and Foxtrap (Conception Bay South) areas (NLDNR-ME 2009c). Six staked claims and three gravel quarries are located within the transmission corridor on the Avalon Peninsula.

15.5.15 Agriculture

Much of Newfoundland and Labrador is unsuitable for farming and less than 0.1% (362 km^2) of the province's 405,720 km^2 of land is developed for agriculture. The provincial agriculture industry has less than 1% of Canada's farms. The number of farms (558) in 2006 was 13.2% fewer than in 2001. The number of operators in 2006 (710) also decreased by 9% over the 2001 Census of Agriculture (Statistics Canada 2010b, internet site).

Between the 2001 and 2006 Census, the size of farms and the total area planted to crops increased. Blueberry growing areas increased by 60% in size and represented the highest growth in Atlantic Canada during the

census period. Growth was seen in barley and corn for silage for the growing dairy industry (Statistics Canada 2010b, internet site). Growth is also evident in egg and cranberry production (NLDNR-A 2009a).

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 2010b, internet site). The province has also increased production of lynx and chinchilla (NLDNR-A 2009b, internet site).

The following sections discuss current agricultural activity in each region. The province has various regulations that protect areas with agricultural potential from other types of development. These include Agricultural Development Areas (ADAs) in which development must be reviewed by a government appointed authority representing various government and public interests. They also include blueberry management units that are reserved for cultivation or harvesting of blueberries, and areas where bakeapples grow abundantly enough for commercial interest and regional pastures. Details on the type and location of agricultural land use activities are provided in the Component Study (AMEC 2010b).

15.5.15.1 Central and Southeastern Labrador

Commercial agriculture activity is limited in Labrador and the only ADA surrounds Upper Lake Melville. A number of areas near the Labrador Straits are reserved for commercial and subsistence bakeapple picking (NLDEC-L 2009). The proposed transmission corridor crosses bakeapple harvesting areas near Forteau (NLDEC-L 2009).

15.5.15.2 Northern Peninsula

The Northern Peninsula has no commercial agriculture activity (NLDEC-L 2009; NLDNR-A 2009c).

15.5.15.3 Central and Eastern Newfoundland

ADAs are located near Springdale, Botwood, Comfort Cove, Wooddale, Lewisporte, Gander, Terra Nova, and on the Bonavista Peninsula (Musgravetown, Winter Brook and Lethbridge) (NLDEC-L 2009). Commercial farms are located around Badger, Grand Falls-Windsor, Campbellton, Clarenville and on the Bonavista Peninsula. Cranberry farms have been developed around Grand Falls-Windsor, Bishop's Falls and Terra Nova. Potential sites of interest for cranberry farming are located east and west of Sandy Lake and to the west of Grand Falls-Windsor (NLDNR-A 2009a). A commercial farm located at Badger is within the transmission corridor.

15.5.15.4 Avalon Peninsula

ADAs are located in the Whitbourne / Markland area and in the Goulds area of St. John's. Blueberry Management Areas are located from Clarke's Beach to Avondale. Commercial farms are mainly located near Whitbourne, Ocean Pond, Brigus Junction, Salmonier Line, Avondale and in St. John's (NLDEC-L 2009).

The transmission corridor crosses agricultural areas at Whitbourne, Brigus Junction and Salmonier Line. Three blueberry management units (areas reserved for commercial and subsistence blueberry harvesting, located in the Mahers - Brigus Junction area, are located within the corridor. A regional pasture in the Soldiers Pond area is located near the transmission corridor (NLDEC-L 2009).

15.5.16 Other Harvesting Activities

People throughout the province participate in a variety of harvesting activities including wood cutting, roadside gardening and gathering wild berries, fruits, flowers, plants, lichens and mushrooms. These activities have been an integral part of traditional subsistence and more recently, recreational activities. Fishing and hunting are discussed in previous sections.

Because these are individual and often sporadic pursuits, it is not possible to define precisely when and where they occur. Limited data are available, with the exception of licensed activities such as hunting and fishing, which have been described previously. Activities typically occur during the appropriate season when the resource is available (e.g., berries are ripe) and near access routes (e.g., T'Railway Provincial Park and forestry access roads).

Berry picking is an unregulated province-wide activity. Most of the province is Crown Land, berries are abundant and people pick wherever they wish. The primary berries picked are raspberries, bakeapples, blueberries, partridgeberries, blackberries, black crowberries and squashberries. Some areas of the province are known for particularly good growth of a berry species (e.g., Labrador Straits and the Northern Peninsula for bakeapples, and eastern Newfoundland and the Avalon Peninsula for blueberries).

In some cases, the abundance of berries supports cottage industries (e.g., Labrador Preserves Company in the Labrador Straits; Dark Tickle Company on the Northern Peninsula; and Rodrigues Winery at Whitbourne) or full scale processing facilities (e.g., Indian Bay Frozen Foods in Bonavista Bay; Natural Newfoundland Nutraceuticals in Whitbourne). Berries to supply these producers may be harvested in any area where the berries are found. Larger companies depend on berry pickers, many of whom undertake the task to supplement their income.

Wood cutting occurs throughout the province and is a regulated activity that requires a Domestic Cutting Permit. Harvested wood is used by the individual, as timber cut under a domestic cutting permit is not to be sold, bartered or used as a gift. Wood cutting, which requires suitable access, typically occurs in areas near population centres and along the T'Railway Provincial Park, particularly in the Labrador Straits and around the Glovertown to Port Blandford area (Conservation Officers 2010, pers. comm.).

15.6 Marine Fisheries

This section describes the historical and recent marine fisheries relevant to the submarine cable corridor and electrode site in the Strait of Belle Isle and to the electrode site near Dowden's Point in Conception Bay.

15.6.1 Study Areas

The Study Area for marine fisheries is defined as the marine area east and west of the cable crossing corridor fished by enterprises from local area homeports identified in the *Marine Fisheries in the Strait of Belle Isle Component Study* (Canning & Pitt Associates Inc. 2010) (Figure 15.6.1-1). To provide regional information and context, the North Atlantic Fisheries Organization (NAFO) fisheries management Unit Area (UA) 4Ra (Figure 15.6.1-1) was also considered.

The Study Area for the Dowden's Point electrode site within Conception Bay is defined as a 5 km wide area extending out from the shoreline electrode site (Figure 15.6.1-2).

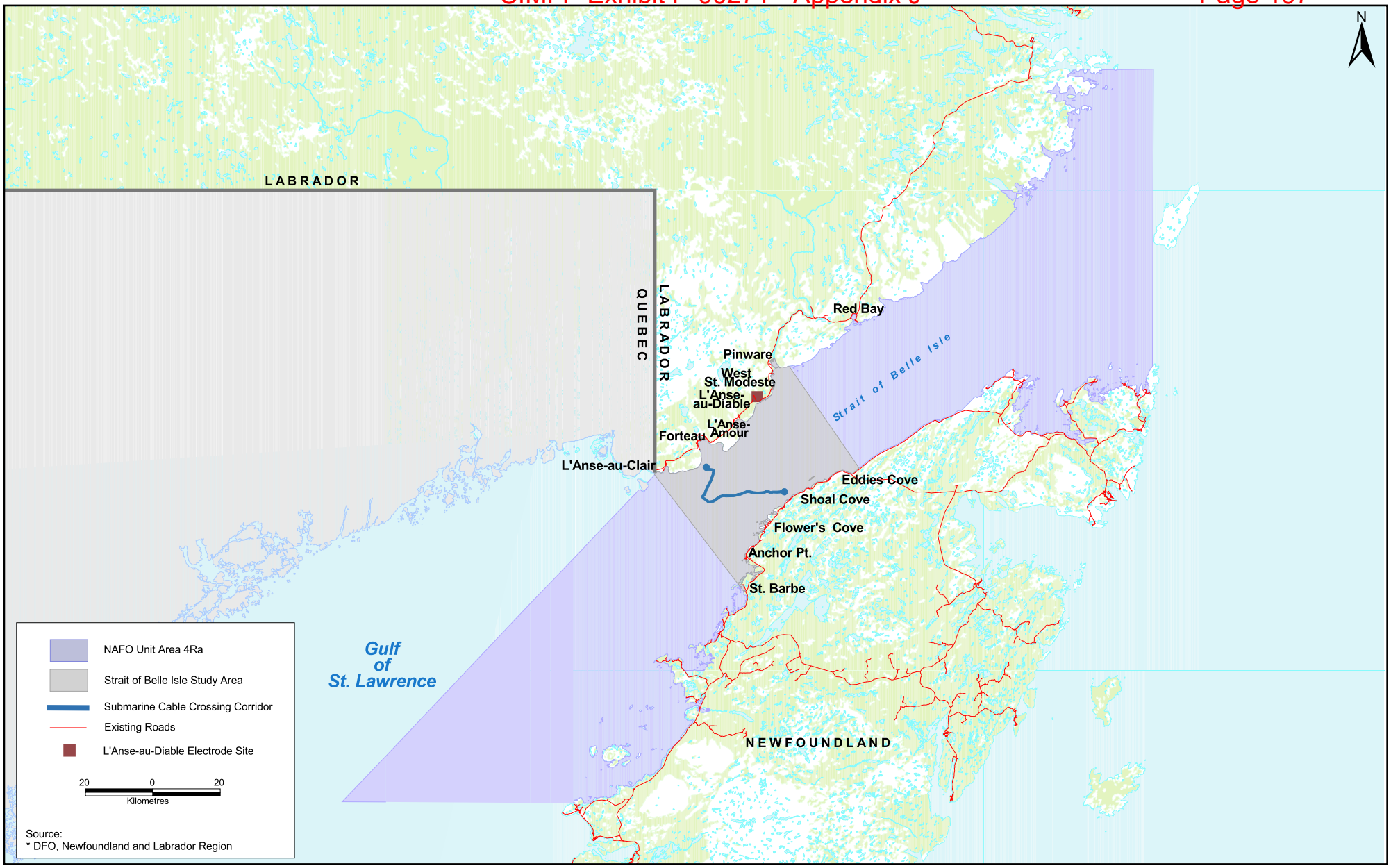


FIGURE 15.6.1-1

Marine Fisheries: Strait of Belle Isle Study Area and NAFO Unit Area 4Ra

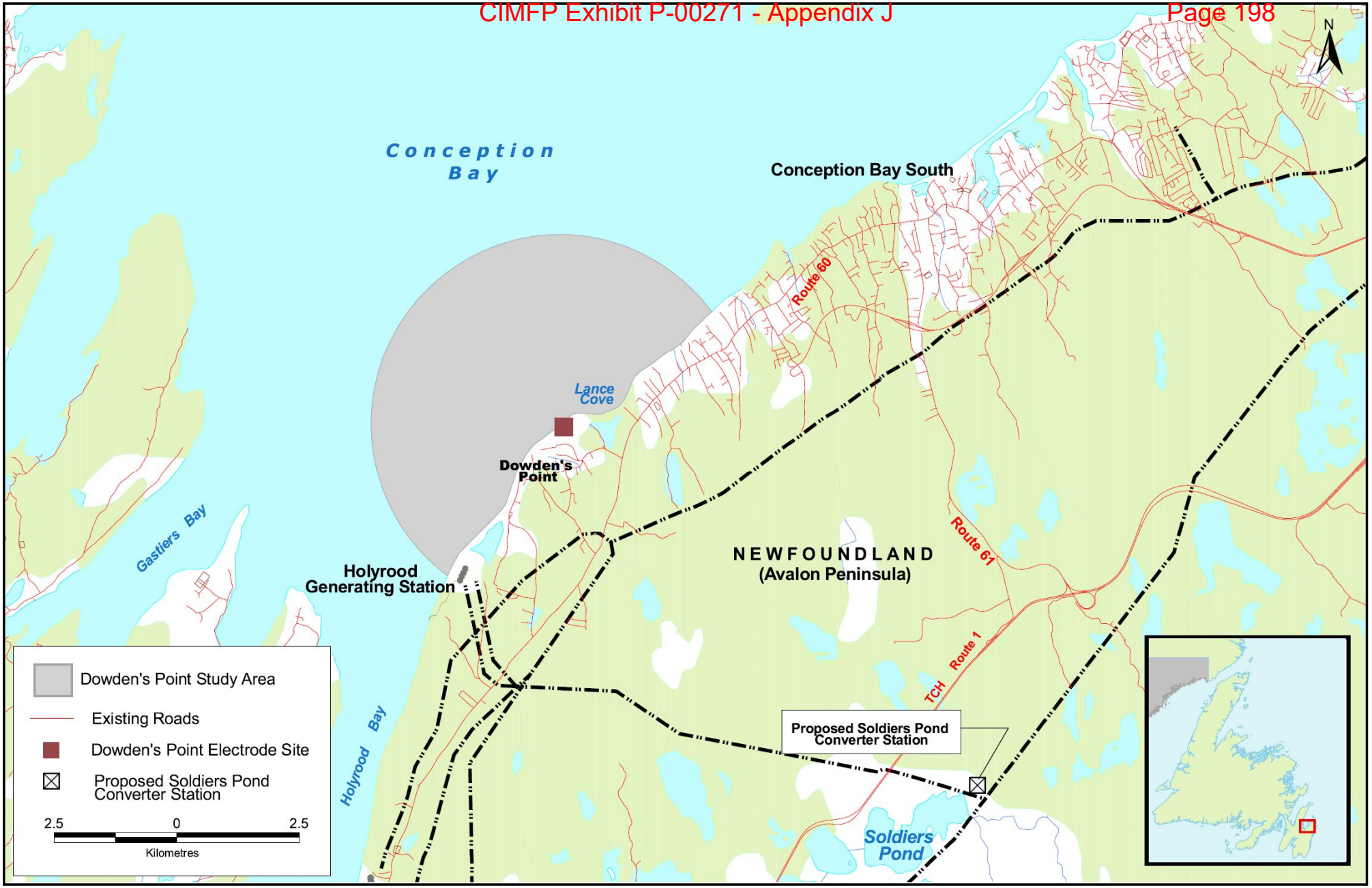


FIGURE 15.6.1-2

Marine Fisheries: Dowden's Point Study Area

15.6.2 Information Sources and Data Collection

A variety of sources were used for this section. All are included in the references for this chapter.

Labrador – Island Transmission Link: Marine Fisheries in the Strait of Belle Isle Component Study (Canning & Pitt Associates Inc. 2010) was prepared during 2009 – 2010 to establish the baseline for marine fisheries in the area of the cable crossing in the Strait of Belle Isle.

The statistical information and analysis are based on time-series data from DFO, Newfoundland and Labrador Region Statistics Division, Policy and Economics Branch, which capture the quantity, value, month, and location (by fisheries UA) of fish harvesting, as well as the fishing gear and vessels used (DFO 1990-2009). The dataset was acquired from DFO in digital form, for the period 1990 to 2009 and represent all fish landings in the Newfoundland and Labrador Region. Data analysis and consultations with area fisheries interests (described below) confirm that fishing activities in the Strait of Belle Isle are undertaken almost exclusively by fishers based in Newfoundland and Labrador and are thus captured in these data.

The discussion that follows uses data for NAFO fisheries management UA 4Ra (a sub-unit of NAFO Division 4R, which includes the waters off the entire west coast of Newfoundland from Cape Ray to Cape Bauld). These data capture species harvested from UA 4Ra waters (see UA 4Ra boundaries, Figure 15.6.1-1) wherever they were landed or processed within Newfoundland and Labrador Region. Thus, catches by fishers who are not based in the area are included, while catches made by Strait-based vessels are excluded if they were harvested beyond UA 4Ra.

While all the data indicate the UA in which the fish was caught, a smaller portion (about 20% of UA 4Ra catch by quantity in recent years) also indicates the specific location of the catch by latitude and longitude, and these data are used to generate the harvesting maps in this section using aggregated 2005-2009 data. It should be noted that the locational information is generally more readily available for offshore harvests and for larger vessels than for fish caught in inshore areas with smaller boats. For instance, in 2008 in UA 4Ra, 0% of the lobster harvest was georeferenced but 73% of the shrimp catch was. Although the georeferenced subset does not provide the location of all relevant harvesting, it establishes a general indication of some important harvesting grounds.

Much of the historical data analysis provided in this section presents quantity data – tonnes of fish landed – rather than landed value because quantities are more directly comparable from year to year. This is because value data reflect several factors other than simple resource availability or fishing effort since value differences from year to year may be the result of price changes and external market factors, such as international exchange rates. Prices may even vary within the fishing season.

Additional fisheries information comes from several other DFO sources, such as:

- DFO Science Advisory Reports series;
- DFO Research Documents series;
- Management Plans; and
- Online quota reports.

Specific references are provided where cited.

Because accurate statistical data are only available at the UA (Regional Area) level, the current baseline also draws on information collected during meetings with fishers from both sides of the Strait of Belle Isle (described in Canning & Pitt Associates Inc. 2010). A specific purpose of these meetings was to gather additional knowledge about fish harvesting activities within and near the Study Area.

Much of this section summarizes the baseline information in the Component Study (Canning & Pitt Associates Inc. 2010) and updates the statistical information (i.e., the catch and effort datasets) to include 2009 DFO data which became available after the Component Study was completed. This baseline information represents the most up-to-date data available at the time of writing the EIS.

15.6.3 UA 4Ra Commercial Marine Fisheries

This section provides overviews of the commercial fisheries (historical and current) within UA 4Ra, which includes the area of the proposed transmission corridor across the Strait of Belle Isle. Commercial fisheries are those licenced and managed by or through DFO under Canada's *Fisheries Act*. The historical overview provides a 20-year (1990 – 2009) retrospective of the commercial fisheries, while the current analysis is for more recent years (2005 – 2009). The 1990-2009 period was chosen for the historical retrospective because it captures landings both before and after the implementation of the groundfisheries moratorium (discussed below) and present-day fisheries. The 2005-2009 data range was chosen because it is representative of more current fisheries. Since fisheries are variable from year to year, a five-year average is more representative than a single year. Both overviews focus on particular species of importance within UA 4Ra and the Study Area.

15.6.3.1 Historical Overview, UA 4Ra

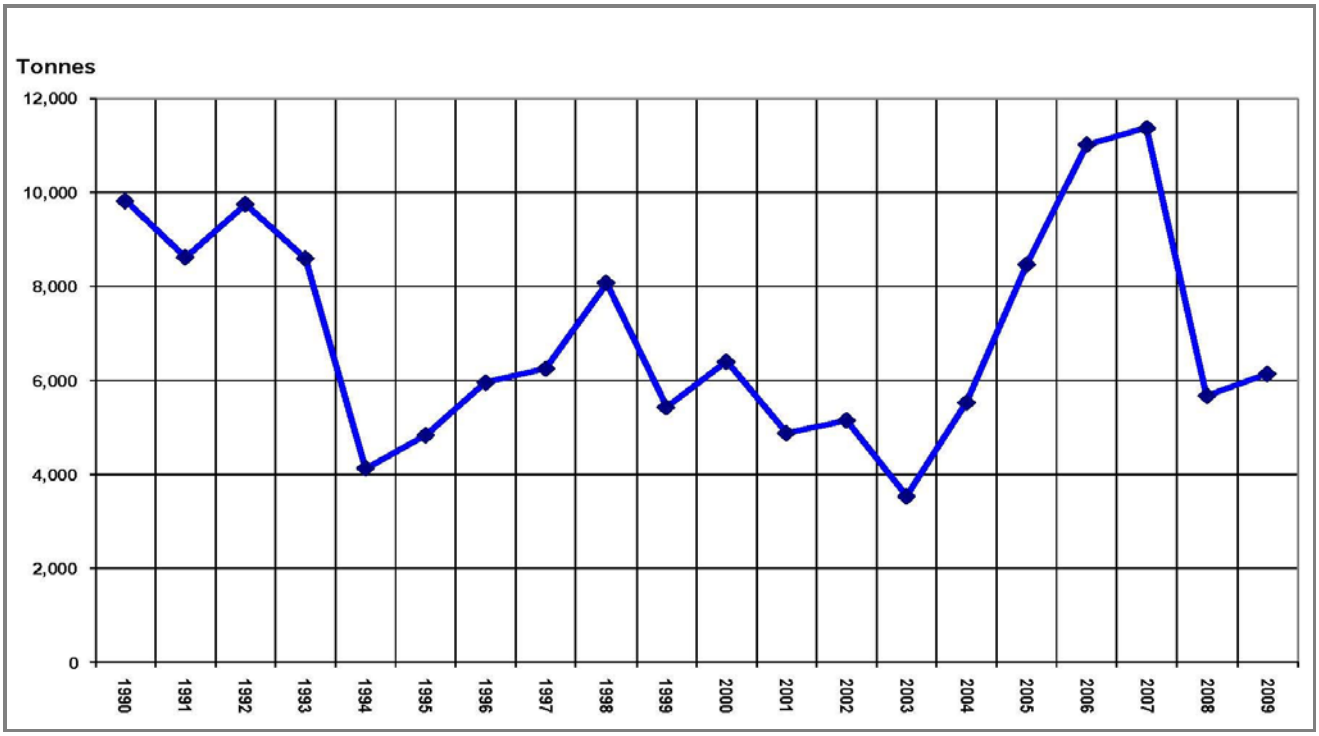
Figure 15.6.3-1 shows the trends in overall fisheries in UA 4Ra over the past two decades. During that period, the fisheries in UA 4Ra underwent significant changes, owing largely to the collapse of groundfisheries (mainly Atlantic cod), as shown in Figure 15.6.3-2 and consequent fisheries moratoria and quota reductions within the area after 1993. In 1991, groundfish (nearly all Atlantic cod) made up 75% (by quantity) of the total UA 4Ra harvest of nearly 10,000 t, but dropped to less than 4% in 1994, and to just 1.8% in 1996. Between 1990 and 1993 the harvest from UA 4Ra (average, by quantity) was primarily cod (58%), capelin (12%), scallops (10%), herring (8%), lobster (4%) and mackerel (3%) (DFO 1990-2009).

Since the partial reopening of the cod fishery in 1997, groundfish catches have slowly increased and, in the last few years, have represented just over 16% (by quantity) of the overall catch. On average, since 2005, the annual 4Ra (all species) harvest has about 8,500 t although it dropped to below 6,000 t in 2008 owing to a significant drop in the capelin catch in that year (Canning & Pitt Associates Inc. 2010).

The substantial decline since 2006 in the harvest of capelin - one of the mainstays of the area fisheries in recent years - is indicated in Figure 15.6.3-3. Other important 4Ra fisheries within the last 20 years have been scallops, shrimp, herring, snow crab and lobster.

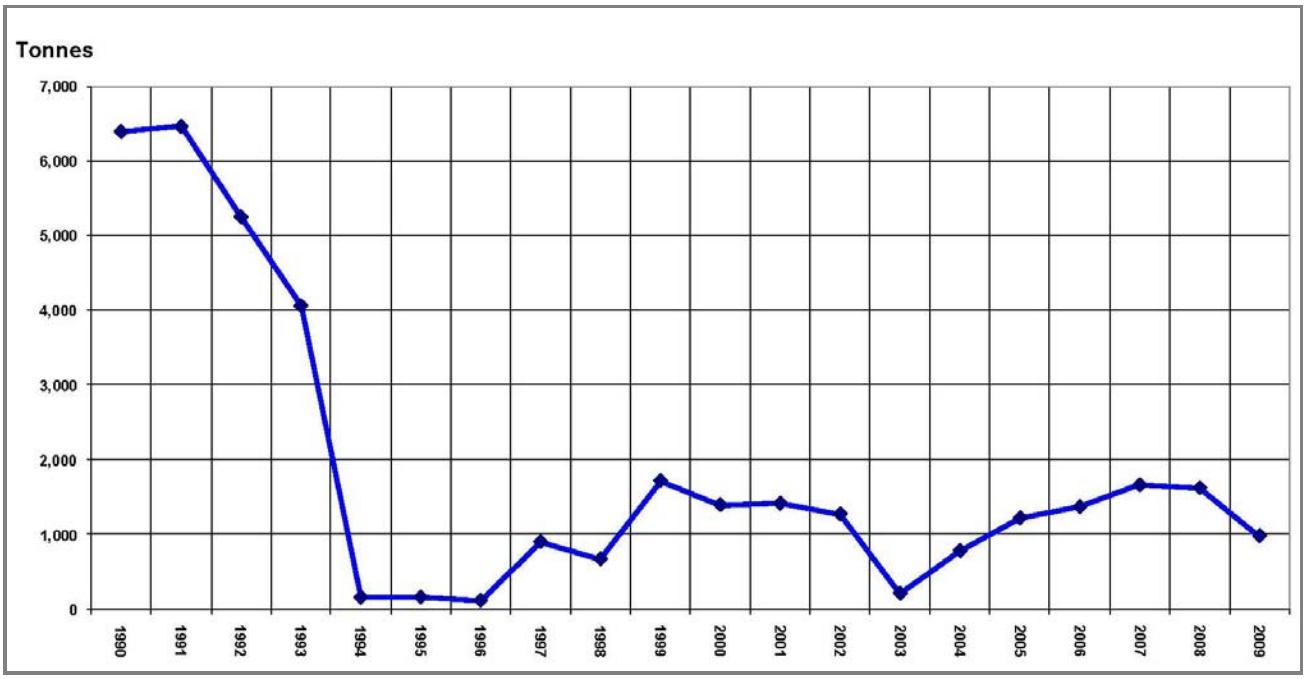
Figure 15.6.3-4 to Figure 15.6.3-8 illustrate the harvesting of these species, respectively, over the 1990 to 2009 period (DFO 1990-2009).

Figure 15.6.3-1 UA 4Ra Harvest, All Species, 1990 to 2009



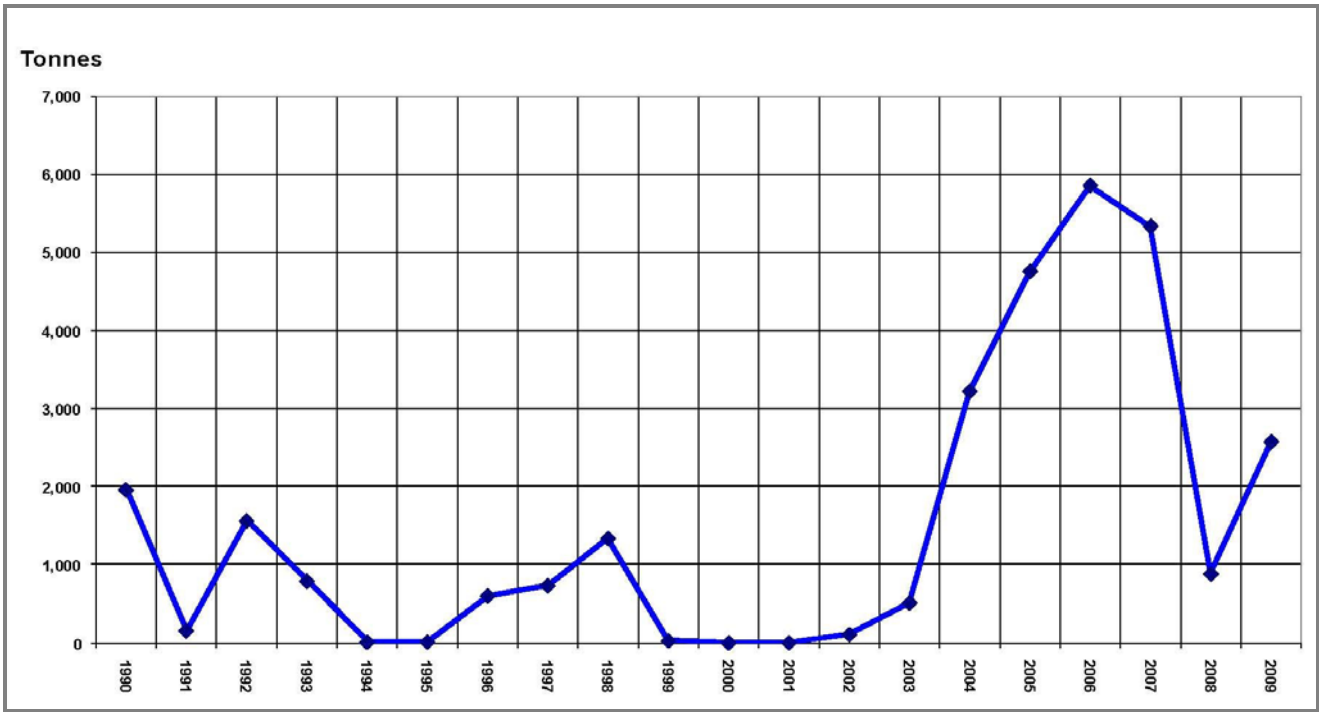
Source: DFO 1990-2009.

Figure 15.6.3-2 UA 4Ra Harvest, Groundfish Species, 1990 to 2009



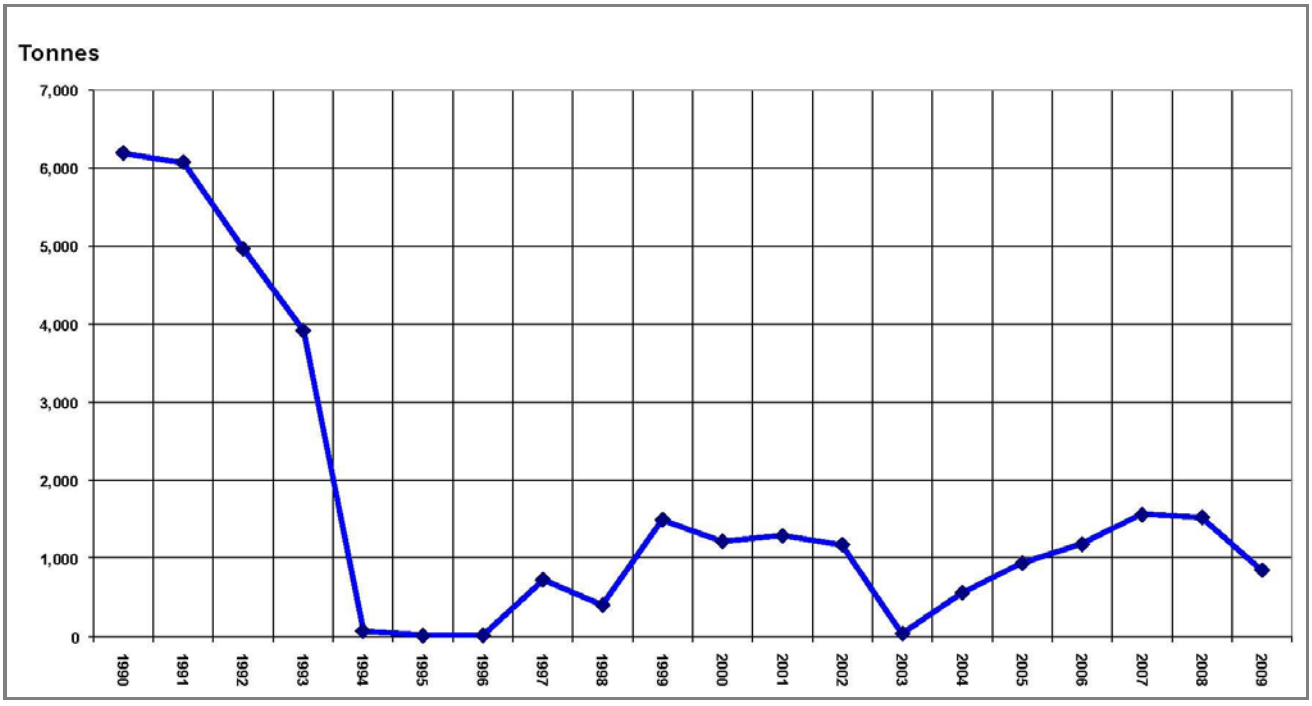
Source: DFO 1990-2009.

Figure 15.6.3-3 UA 4Ra Harvest, Capelin, 1990 to 2009



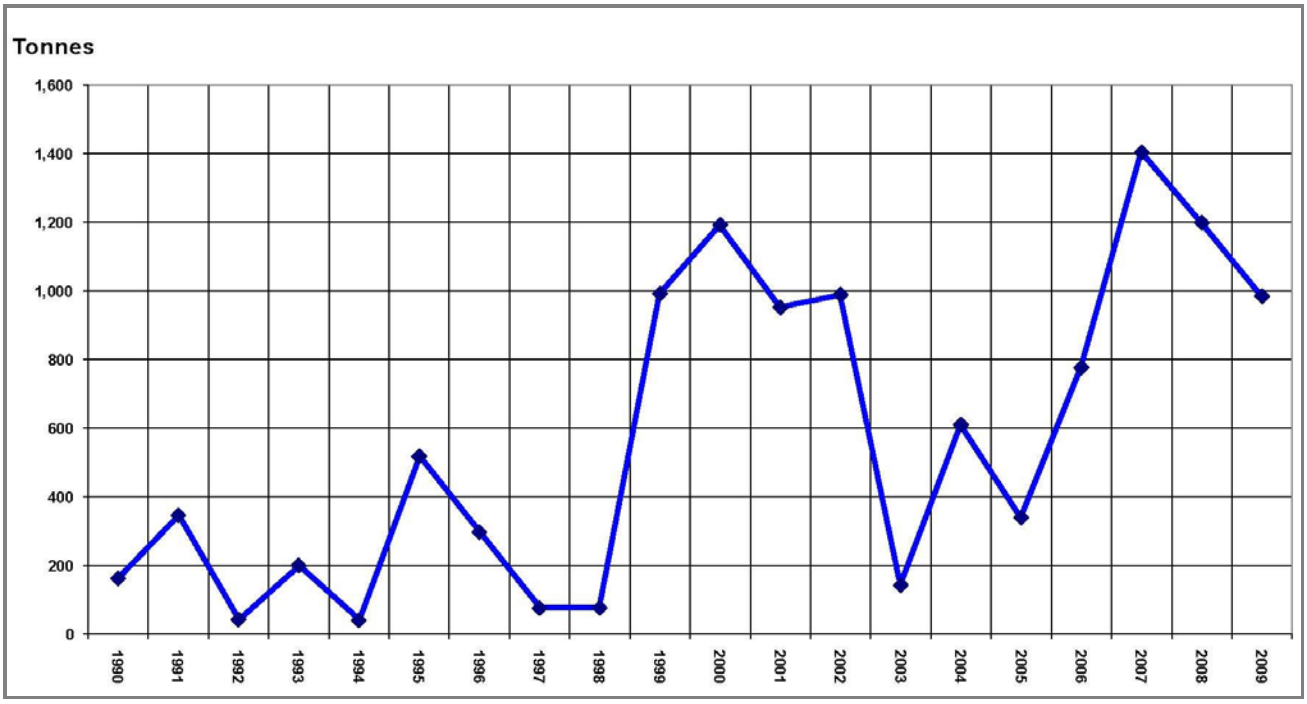
Source: DFO 1990-2009.

Figure 15.6.3-4 UA 4Ra Harvest, Cod, 1990 to 2009



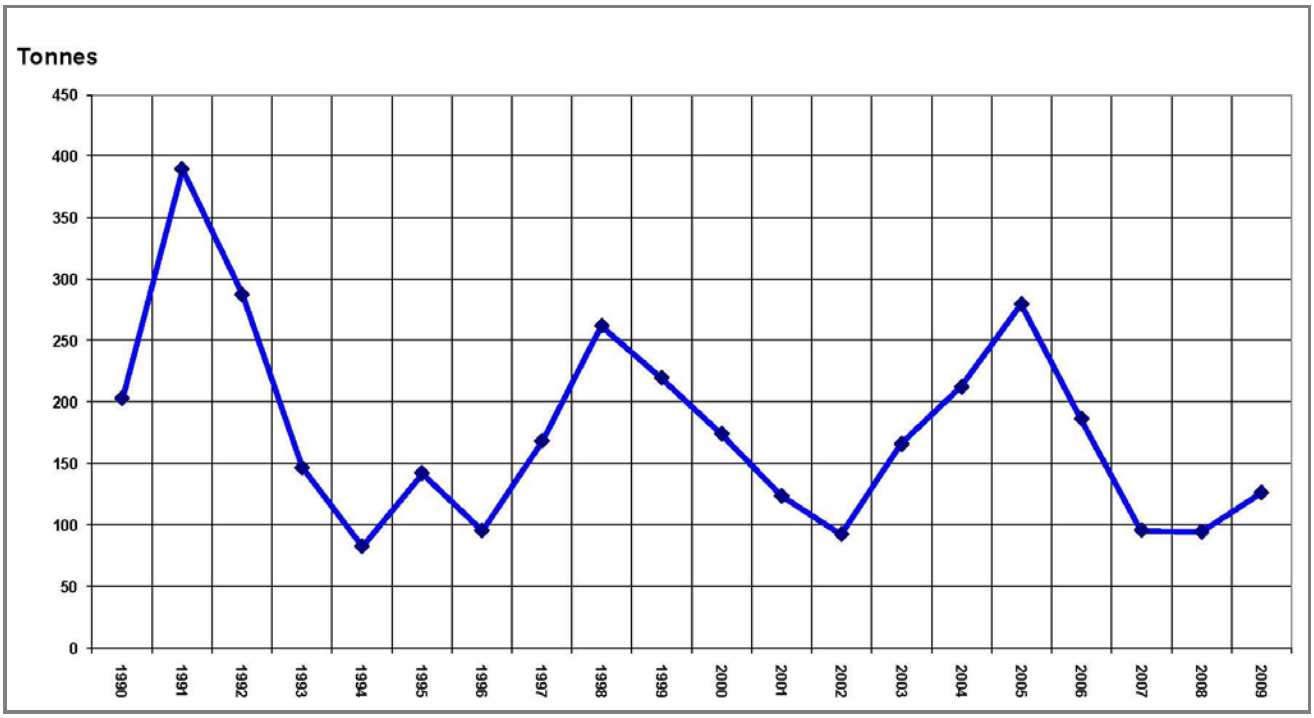
Source: DFO 1990-2009.

Figure 15.6.3-5 UA 4Ra Harvest, Northern Shrimp, 1990 to 2009



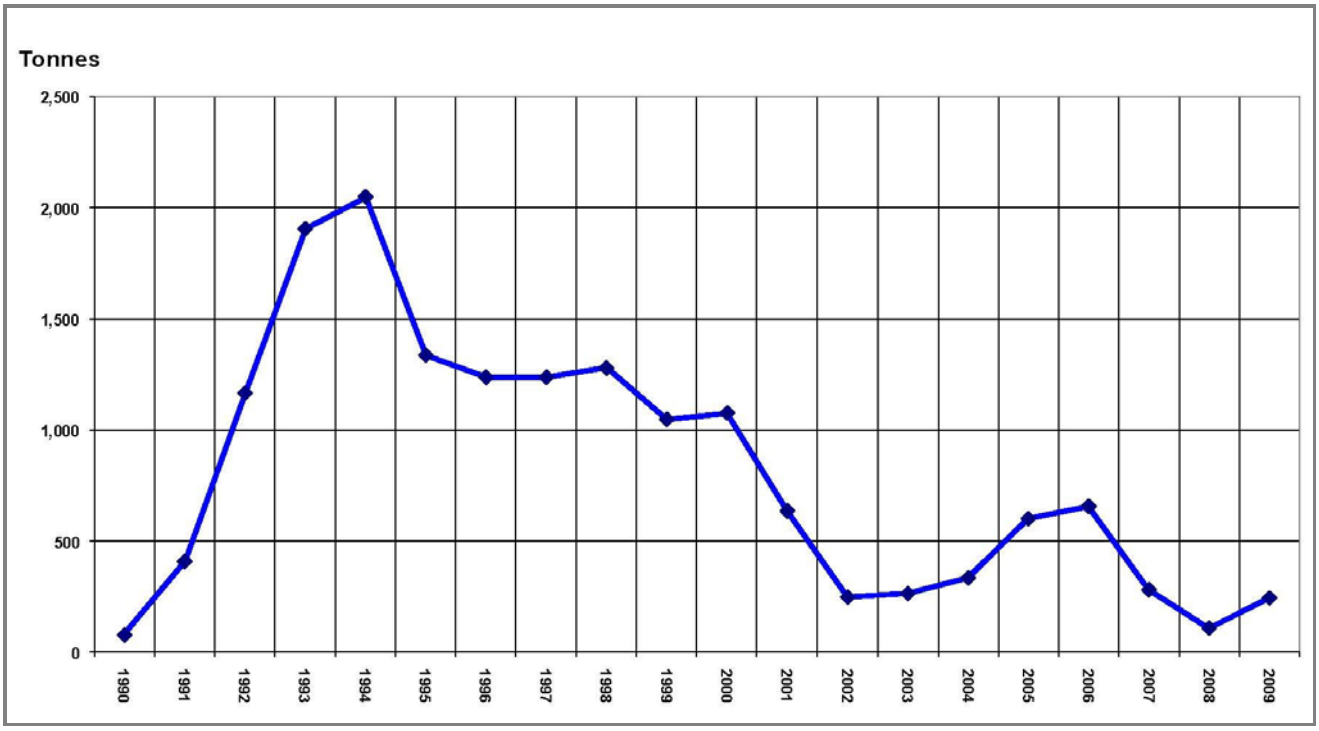
Source: DFO 1990-2009.

Figure 15.6.3-6 UA 4Ra Harvest, Herring, 1990 to 2009



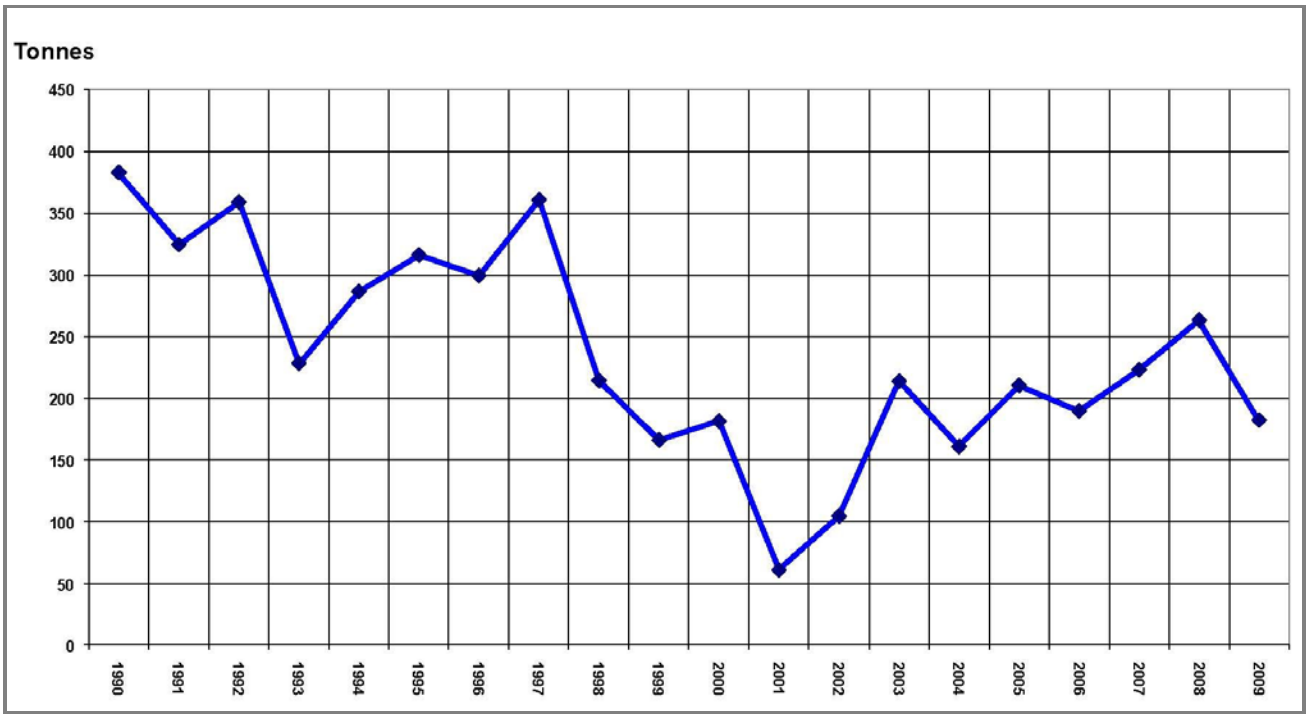
Source: DFO 1990-2009.

Figure 15.6.3-7 UA 4Ra Harvest, Scallops, 1990 to 2009



Source: DFO 1990-2009.

Figure 15.6.3-8 UA 4Ra Harvest, Lobster, 1990 to 2009



Source: DFO 1990-2009.

15.6.3.2 Current Fisheries

Table 15.6.3-1 identifies the fish species harvested by fishers from UA 4Ra, averaged over the 5-year period from 2005-2009. The key species fisheries in that area include several of the important species from 20 years earlier (e.g., lobster, cod, capelin, scallop, mackerel and herring), as well as other species that have grown in importance in more recent years, in particular shrimp and snow crab. In addition, some new fisheries are emerging and may have more economic potential in the future, such as rock crab, toad crab and sea cucumber.

Table 15.6.3-1 Commercial Fisheries Harvest from UA 4Ra by Value and Quantity, 2005 to 2009 Average

Species	Tonnes (t)	Percent of Total Tonnage	Value ($)	Percent of Average Total Value
Capelin	3,875.8	45.6	993,739	13.3
Cod, Atlantic	1,207.7	14.2	1,637,943	22.0
Shrimp, northern	938.8	11.1	887,656	11.9
Herring, Atlantic	801.8	9.4	164,108	2.2
Mackerel	792.6	9.3	266,415	3.6
Scallop, Iceland	378.9	4.5	511,371	6.9
Lobster	213.7	2.5	2,220,777	29.8
Turbot / Greenland halibut	113.4	1.3	199,671	2.7
Roe, lumpfish	51.7	0.6	272,624	3.7
Sea cucumber	44.5	0.5	28,813	0.4
Halibut	30.5	0.4	192,319	2.6
Whelks	11.8	0.1	10,782	0.1
Crab, Queen / Snow	11.5	0.1	32,386	0.4
Winter flounder	7.5	0.1	3,338	0.0
Crab, spider / toad	4.9	0.1	3,317	0.0
Eels	4.6	0.1	19,802	0.3
Crab, rock	1.2	0.0	782	0.0
Total	**8,490.8**	**100.0**	**7,445,844**	**100.0**

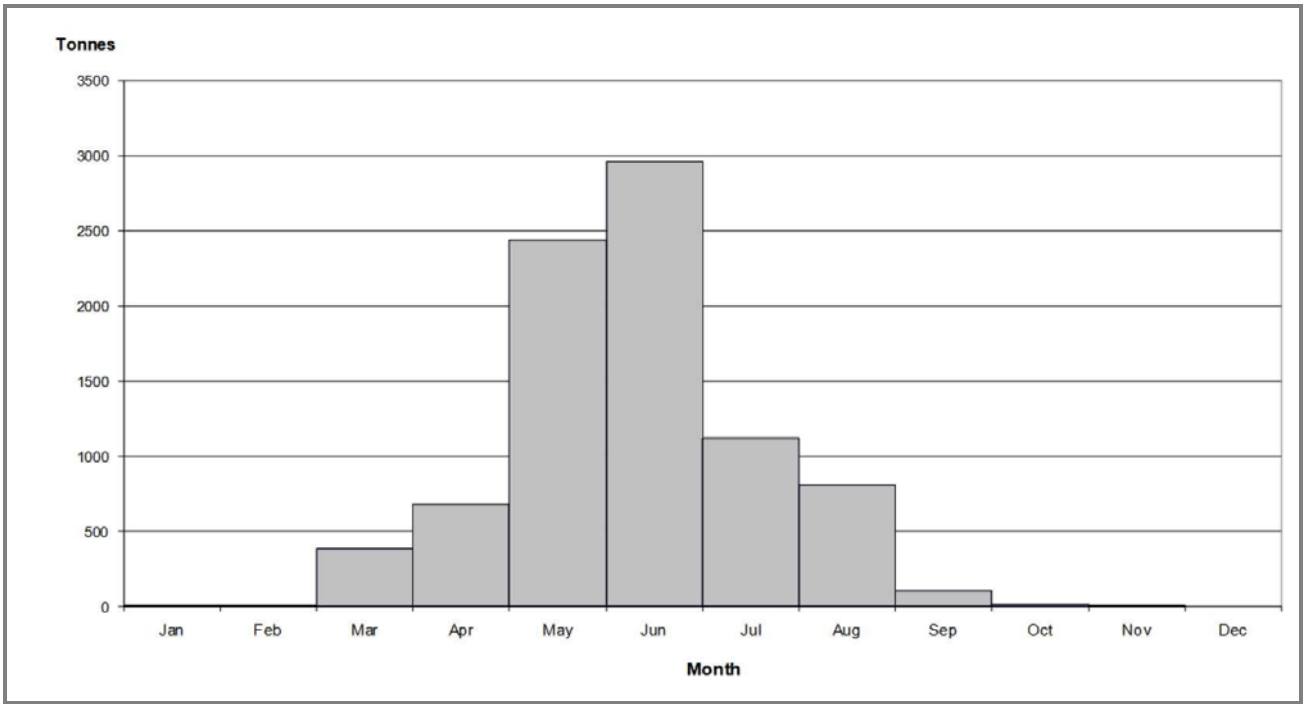
Source: DFO 1990-2009.

Seal harvesting in winter on the ice within UA 4Ra (not shown in Table 15.6.3-1) provides supplementary income mainly through the sale of harp skins for some fishers in most years. For instance, within UA 4Ra in 2005, seal skin sales totalled nearly $700,000.

Seasonality

UA 4Ra fisheries generally have different harvesting times, based on regulation, seasonality of fish presence and movements, and / or harvesting strategy (see Canning & Pitt Associates Inc. 2010). Figure 15.6.3-9 shows the overall monthly harvesting pattern for UA 4Ra, averaged for 2005-2009 for all species, by quantity. As Figure 15.6.3-9 indicates, nearly all the harvest occurred between March and August, with a peak in June.

Figure 15.6.3-9 All Species Harvest from UA 4Ra by Month, 2005 to 2009 Average



Source: DFO 1990-2009.

Harvesting Locations

Approximately 20% of the overall catch data from UA 4Ra is georeferenced with the specific latitude and longitude of the harvesting location. Though this information is typically for larger vessel fleet sectors (e.g., greater than 35 feet) and certain species (e.g., shrimp, but not lobster), it provides a good indication of some important harvesting grounds in the broader regional area.

Figure 15.6.3-9 and Figure 15.6.3-10 show these data for the entire UA 4Ra, and a smaller-scale view showing the data relative to the Study Area. The data are aggregated for all species, all months and all years from 2005 to 2009.

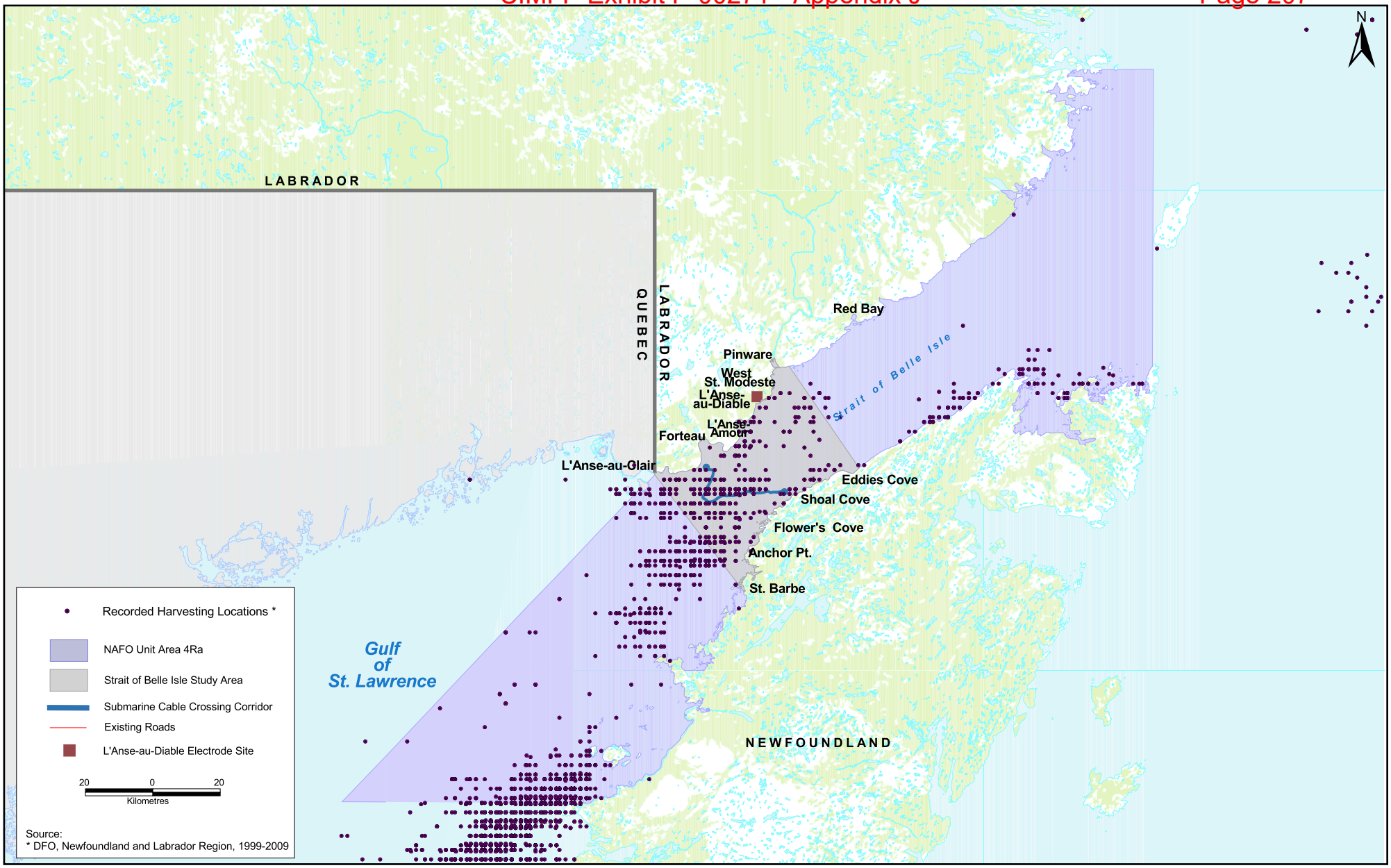


FIGURE 15.6.3-10

Recorded All Species Harvesting Locations, UA 4Ra (Georeferenced Data), 2005-2009 Aggregated

Fishing Gear and Vessels

The fishing gear used typically reflects the species fishery (e.g., pots for snow crab and lobster, or shrimp trawls for shrimp). Most groundfish in UA 4Ra are harvested using either gill nets or longlines. Pelagic species (capelin, herring and mackerel) are harvested using a variety of gear, including seines, gill nets and traps. Most of UA 4Ra harvest is taken by small-boat (under 35 feet) enterprises.

Table 15.6.3-2 and Table 15.6.3-3 quantify the average 2005-2009 harvest from UA 4Ra by fishing gear type and by vessel class (length). The fact that small boats catch the greatest share of the harvest reflects the small-boat, local inshore fisheries that predominate in this area.

Table 15.6.3-2 Harvest from UA 4Ra by Gear Type, Quantity, All Species 2005 to 2009 Average

Gear Code	Gear Type	Tonnes (t)	Percent of Total Average Annual Harvest (%)
19	Shrimp trawl	938.8	11.1
24	Beach and bar seine	29.4	0.3
25	Tuck seine	208.2	2.5
31	Purse seine	2,261.6	26.6
41	Gill net (set or fixed)	1,452.2	17.1
47	Fyke net	2.8	0.0
51	Longline	86.6	1.0
59	Hand line (baited)	185.2	2.2
61	Trap	2,661.7	31.3
62	Pot	243.1	2.9
71	Dredge (boat)	423.6	5.0
84	Eel pots	1.7	0.0

Source: DFO 1990-2009.

Table 15.6.3-3 Harvest from UA 4Ra by Vessel Class, Quantity, All Species 2005 to 2009 Average

Vessel Class Number	Vessel Length (feet)	Tonnes (t)	Percent of Total Annual Harvest (%)
0	1 - 34	4,563.7	53.6
1	35 - 44	1,213.3	14.2
2	45 - 54	500.0	5.9
3	55 - 64	1,385.9	16.3
4	65 - 74	259.3	3.0
5	75 - 99	172.0	2.0
6	100 - 124	426.3	5.0

Source: DFO 1990-2009.

15.6.4 Study Area Fisheries

The marine fisheries near the proposed submarine cable crossing (the Study Area) focus on a few traditional commercially harvested species (mainly lobster, scallops and pelagic species) as well as some newer or emerging fisheries. In this area, the fisheries are pursued by local fishers from homeports on both sides of the Strait within the Study Area, and by fishers from outside the area who come there for specific fisheries

(e.g., herring). This section focuses on key fisheries relative to the cable crossing corridor itself. Most of the locational information is based on consultations with local fishers in 2009 (Canning & Pitt Associates Inc. 2010).

Fishers from these ports fish within the Study Area at different times for different species (as described below). Between L'Anse au Clair and Pinware on the Labrador side of the Strait of Belle Isle there are a total of 56 Core and non-Core fishing enterprises. There are 21 Core enterprise vessels less than 40 feet and 12 greater than 40 feet. All the 23 non-Core enterprises on this side of the Strait of Belle Isle operate vessels larger than 40 feet. On the Newfoundland side, there are a total of 171 Core and non-Core fishing enterprises in the area between Forrester's Point and Eddies Cove East. Most (88) of the Core enterprise vessels are less than 40 feet while 35 have vessels 40 feet or greater. All 48 non-Core enterprises operate vessels less than 40 feet (Canning & Pitt Associates Inc. 2010). Core enterprises are those which are headed by a Core fisher. A Core fisher must be the head of an enterprise, hold key species licences (i.e., for Newfoundland - groundfish, capelin, lobster, snow crab, scallop, shrimp, and all species caught using purse seine), have a demonstrated attachment to the fishery, and be dependent on the fishery (DFO 1996, internet site).

15.6.4.1 Pelagics

Capelin, herring and mackerel, though relatively low in price, are important for the large quantities they contribute to the fisheries within the Study Area. Capelin harvesting activities vary in response to market demand and thus can fluctuate greatly from year to year. As Figure 15.6.3-2 shows, since 1999 there was limited amounts of capelin harvested in the Regional Area until a spike in landings between 2004 and 2007, decreasing again in 2008 and 2009. Herring landings (see Figure 15.6.3-5) experienced a rapid increase in landings during the mid to late 1990s but these levels were not sustained in subsequent years. Mackerel are taken mainly with purse seines, traps and handlines.

Fishers on the Labrador side of the Study Area harvest capelin, herring and mackerel in the same general areas along the shoreline between L'Anse au Clair and Pinware (see Figure 15.6.4-1). These species are harvested mainly with traps there, but may also be taken with nets.

Figure 15.6.4-2 shows the aggregated (2005-2009) georeferenced harvesting locations throughout the Strait of Belle Isle from the DFO catch and effort datasets for capelin, the only pelagic species with georeferenced data in or near the Study Area.

Fishers on the Newfoundland side of the Study Area harvest their capelin and herring on the same grounds used for lumpfish and lobster, but in slightly deeper water (i.e., about 50 m). These grounds are located between Anchor Point and Yankee Point (Figure 15.6.4-3). Most of the capelin are taken by traps and tuck seines; however, this species has also been harvested in some years by purse seines on grounds off Savage Cove that extend out from that location into the deeper water and across the Strait to Forteau Bay. Fishers report that few herring or mackerel are caught on the Labrador side of the Strait of Belle Isle (Canning & Pitt Associates Inc. 2010).

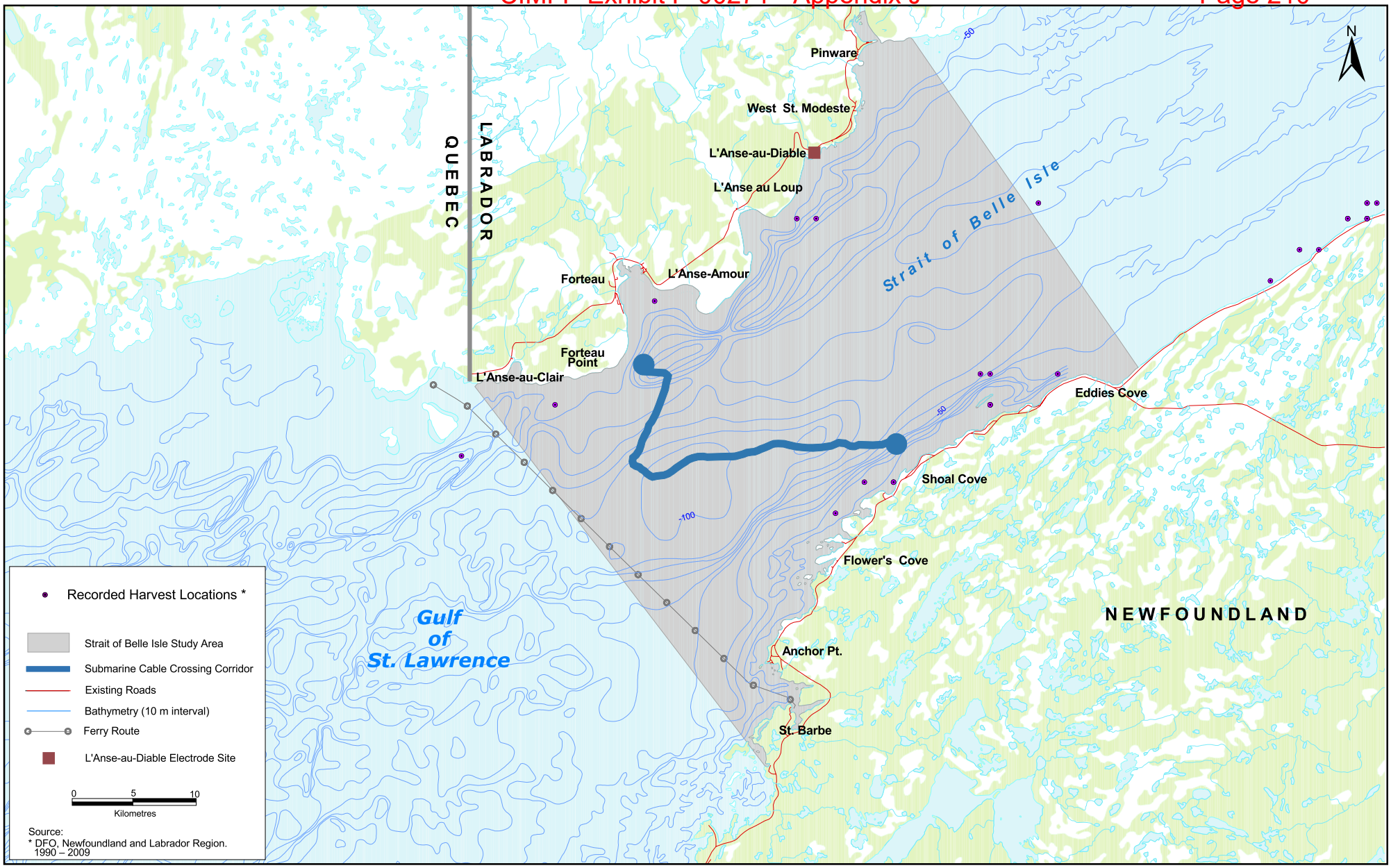
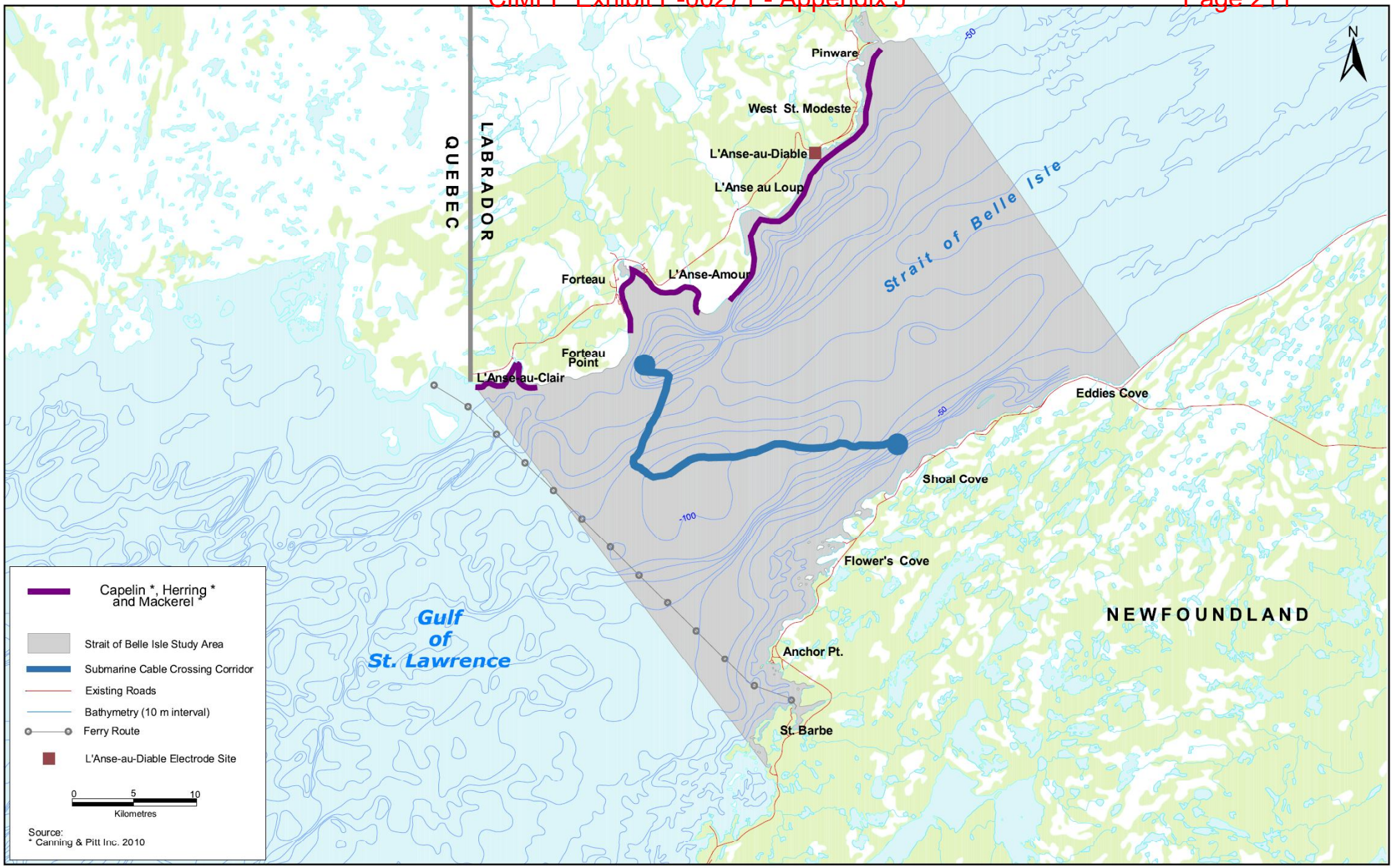


FIGURE 15.6.4-1

Reported Capelin Harvesting Locations, Strait of Belle Isle (Georeferenced Data), 2005-2009 Aggregated



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FIGURE 15.6.4-2

Reported Capelin, Herring and Mackerel Harvesting Locations, Strait of Belle Isle Study Area

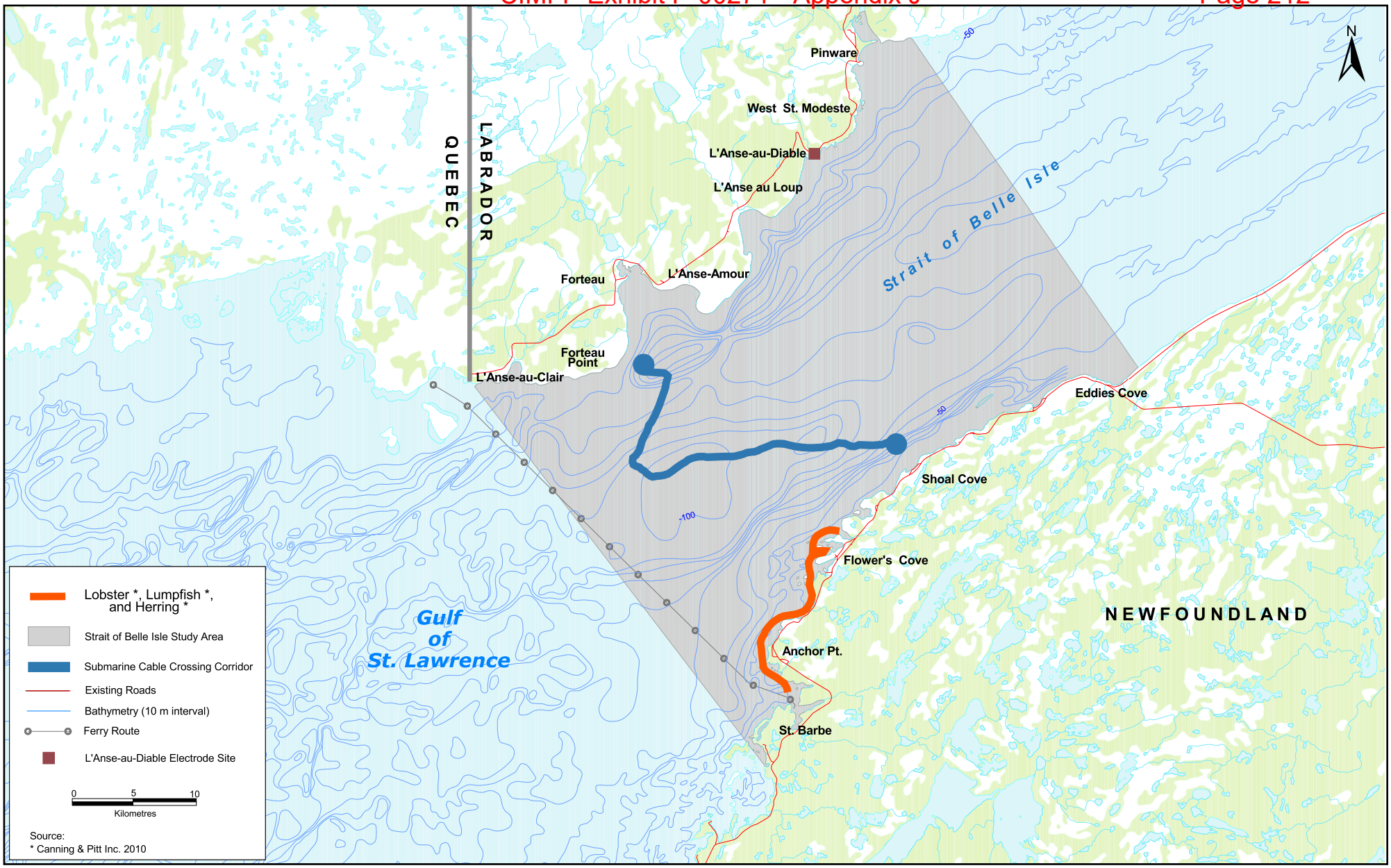


FIGURE 15.6.4-3

Reported Lobster, Lumpfish and Herring Harvesting Locations, Strait of Belle Isle Study Area

15.6.4.2 Lobster

The lobster fishery, which had been the highest value fishery in UA 4Ra in past years, has gone through a number of cycles over the last two decades, as shown in Figure 15.6.3-7. Catches in UA 4Ra have ranged from highs of more than 500 t in the late 1980s to a low of about 70 t in 2001 (DFO 1990-2009). The Study Area lies within Lobster Fishing Area (LFA) 14c, Big Brook to Cape Bauld. The fishery in LFA 14c is typically open between mid-May and early July, and occurs on the Newfoundland side of the Strait of Belle Isle, along the shoreline between Anchor Point and Yankee Point in water depths less than 30 m. Figure 15.6.4-3 shows the reported local harvesting locations for lobster (as well as lumpfish and herring). According to fishers (Canning & Pitt Associates Inc. 2010), there are no important lobster resources on the Labrador side of the Strait of Belle Isle. Fishers with licences in LFA 14c are allowed up to 300 traps per licence.

15.6.4.3 Groundfish

Figure 15.6.4-4 shows the georeferenced portion of the groundfish harvest (mainly cod) for 2005-2009, aggregated, for all months (from DFO 1990-2009). There is relatively little recorded harvest in the submarine cable corridor. Reported local cod (and scallop), lumpfish and halibut fishing grounds are mapped in Figure 15.6.4-3, Figure 15.6.4-5, Figure 15.6.4-6 and Figure 15.6.4-7.

The majority of the groundfish harvest in and near the Study Area, and in UA 4Ra as a whole, is Atlantic cod. As noted earlier, Atlantic cod harvests dropped drastically after the closure of the fisheries in the 1990s. As Figure 15.6.3-1 shows, the harvest remains relatively low. A recent science assessment of the northern Gulf of St. Lawrence cod stock (DFO 2010c) states, "Based on current productivity, the exploitation rates that have been observed in the period 2000 to 2009 have been too high (except for 2003 which was under moratorium) to allow for any significant rebuilding of this stock. Such exploitation levels are not sustainable at present productivity, and are inconsistent with a rebuilding strategy." Despite this, it is still the second most important harvest in UA 4Ra in terms of average catch value (DFO 1990-2009). In recent years the other principal groundfish species have been lumpfish and halibut.

In the past, most of the cod catch was by mobile gear (otter trawl). However, given resource conditions, the current catch is taken using fixed gear: nets, and hook and line. Fishers also report that recreational cod fishing activities can be conducted anywhere throughout UA 4Ra, on the same grounds used by commercial fishers. However, because most of the vessels involved in this “food fishery” (typically only a few days a year) are less than 20 feet, many recreational participants prefer to stay relatively close to shore. In recent years cod have been harvested primarily between July and September.

Lumpfish, which are harvested for their high-value roe, are caught using nets in waters along the shoreline between Forteau Point and Pinware on the Labrador side, and in the same area as the lobster fishery on the Newfoundland side (Figure 15.6.4-3 and Figure 15.6.4-6).

The halibut season is typically a very short one, usually lasting approximately three days. Fishers on the Labrador side travel to the Newfoundland side of the Strait to harvest their halibut. This species is fished with hook and line gear, in water depths of 12 m and deeper, on grounds located between Anchor Point and Green Island Cove (Figure 15.6.4-7).

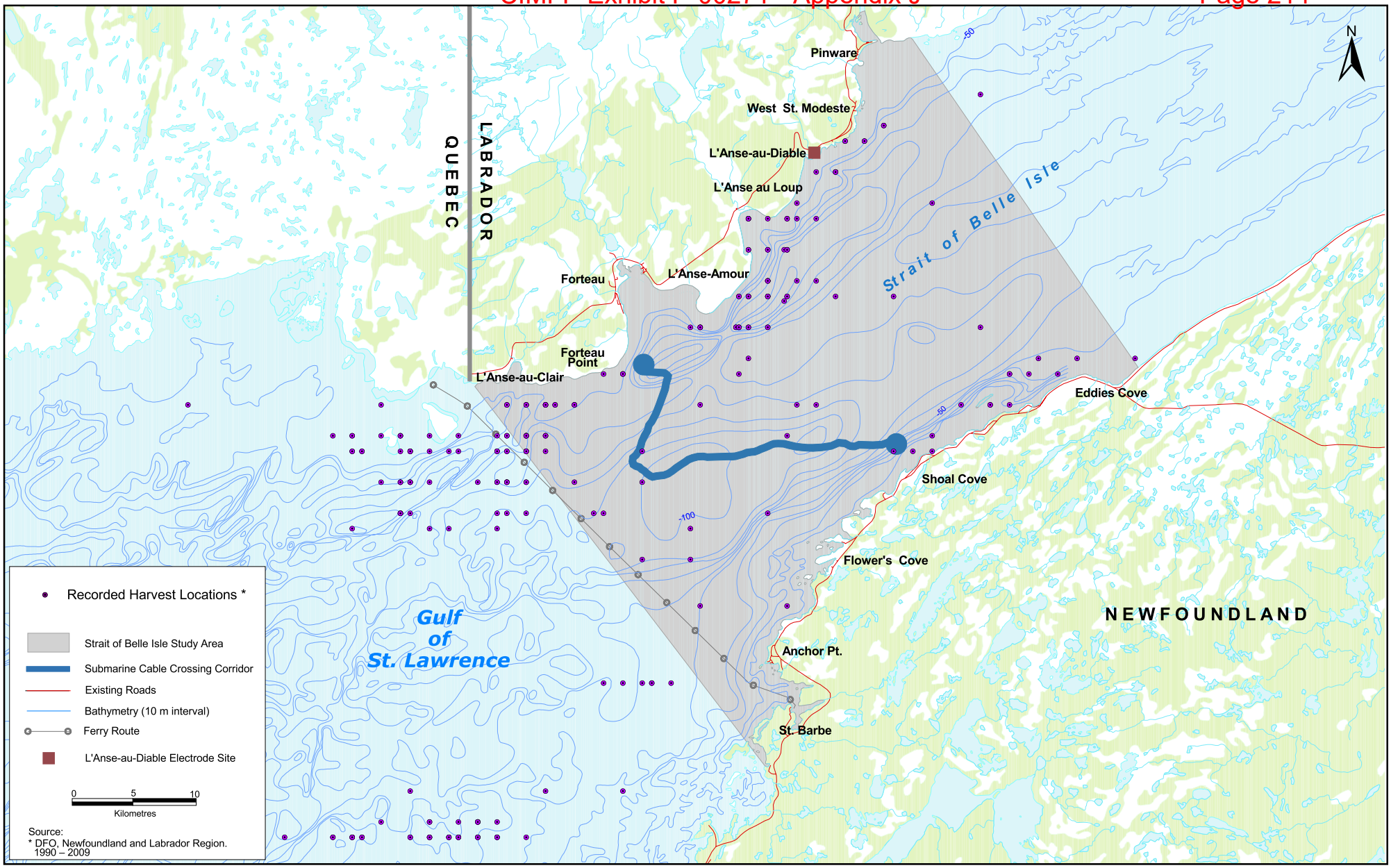


FIGURE 15.6.4-4

Reported Groundfish Harvesting Locations, Strait of Belle Isle (Georeferenced Data), 2005-2009 Aggregated

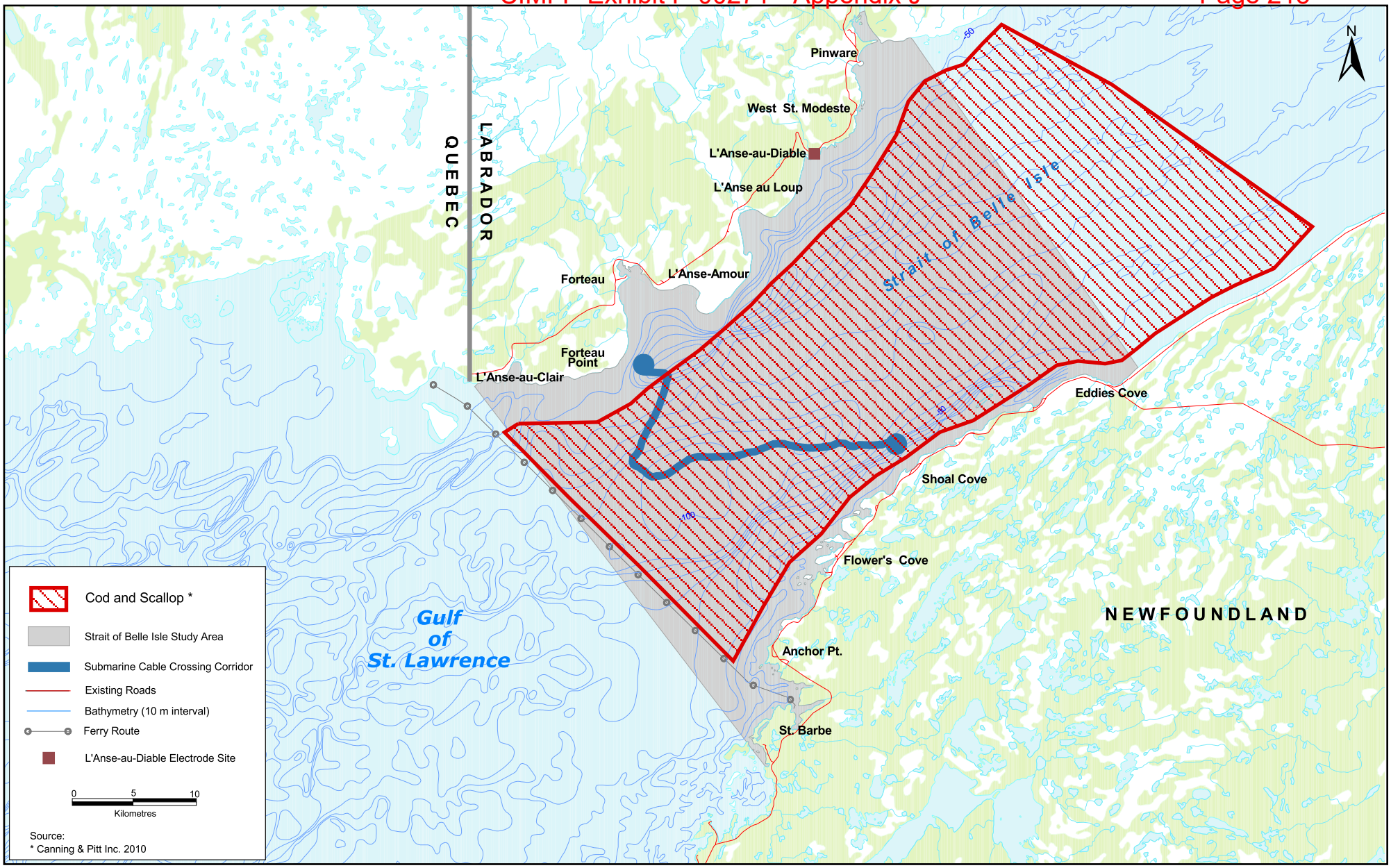


FIGURE 15.6.4-5

Reported Cod and Scallop Harvesting Area, Strait of Belle Isle Study Area

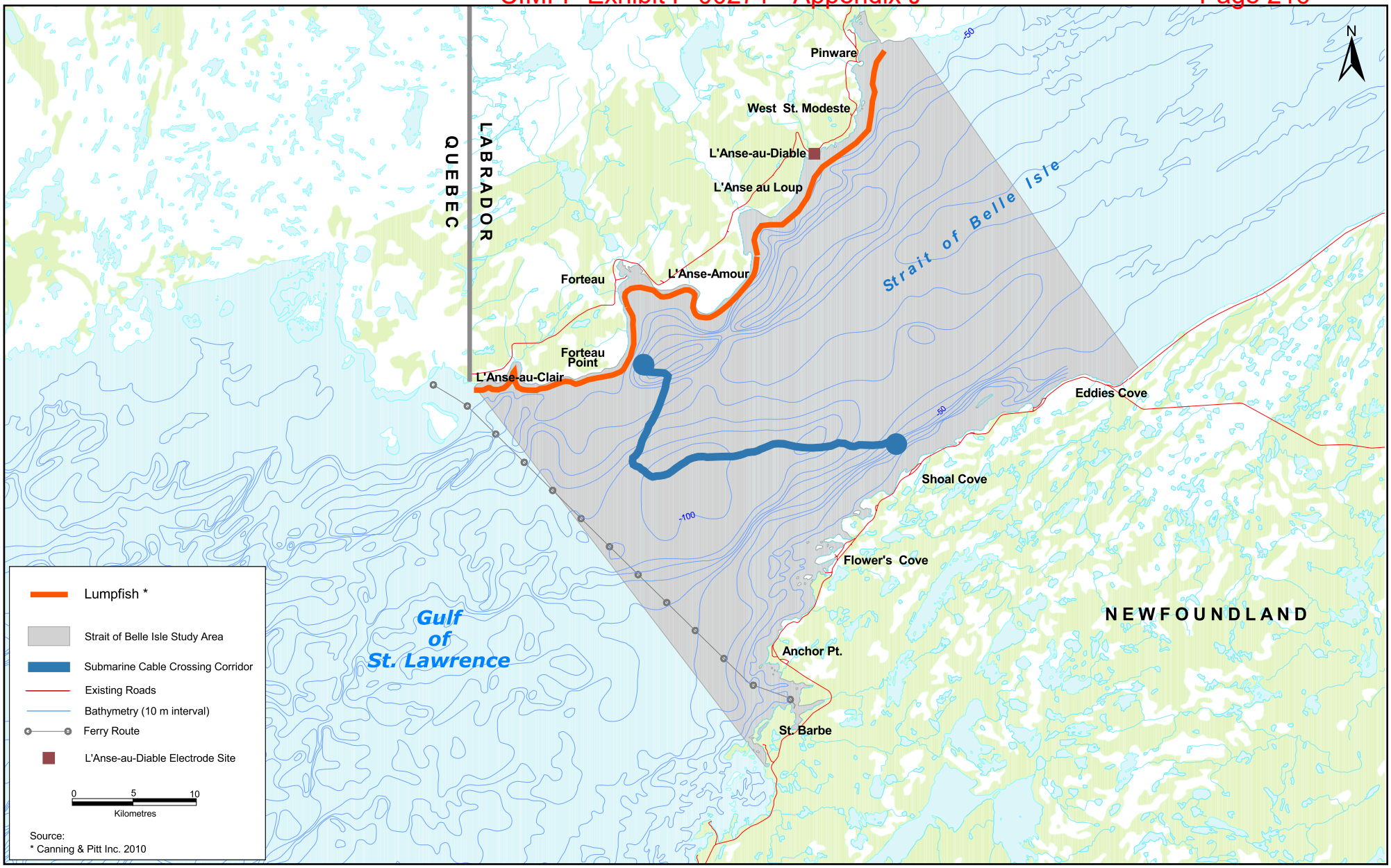


FIGURE 15.6.4-6

Reported Lumpfish Harvesting Locations, Strait of Belle Isle Study Area

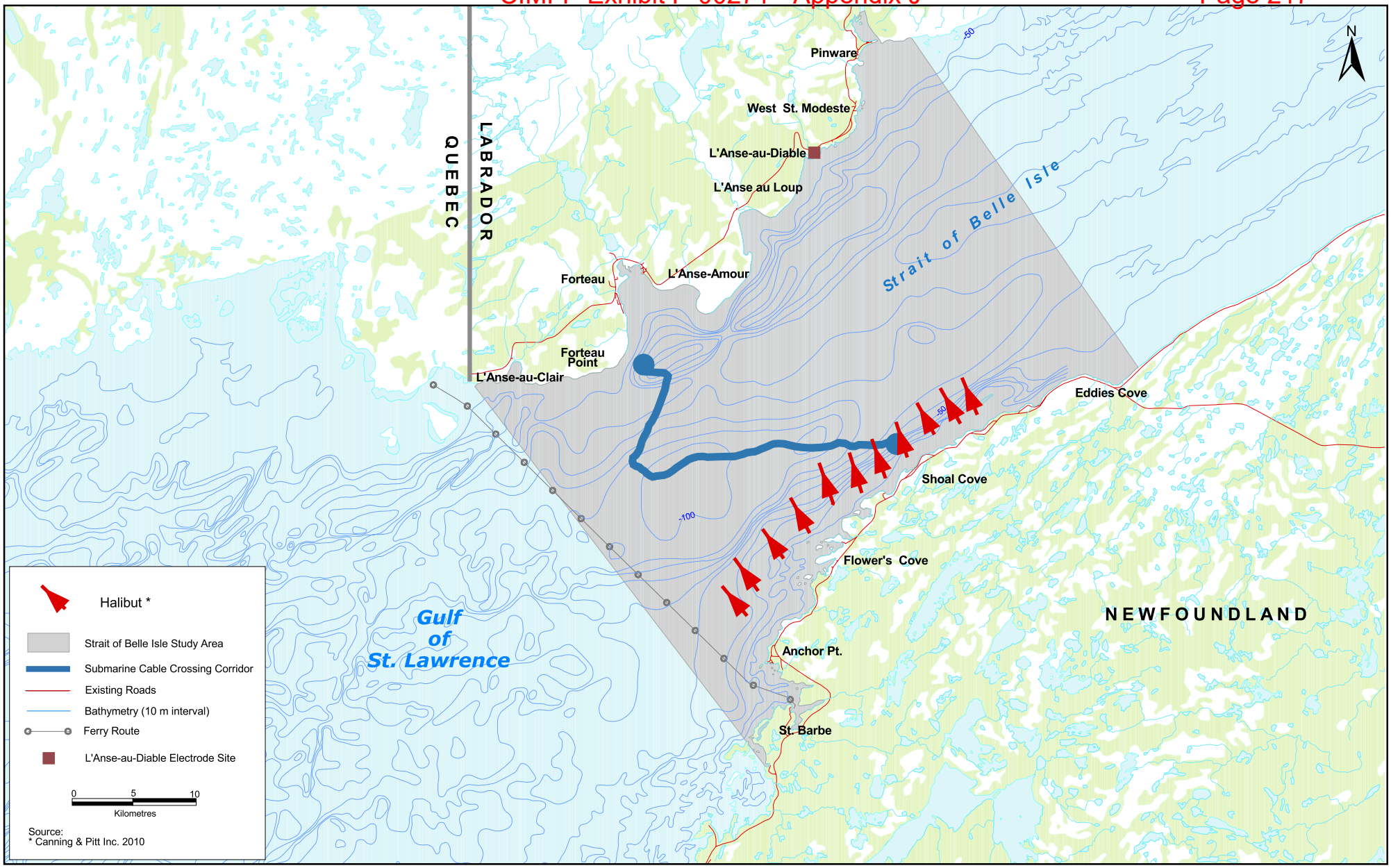


FIGURE 15.6.4-7

Reported Halibut Harvesting Locations, Strait of Belle Isle Study Area

15.6.4.4 Scallops

Within UA 4Ra generally, the Icelandic scallop fishery exhibited a rapid increase in landings during the early 1990s followed by a gradual decline, so that harvests in 2007 and 2008 were at levels similar to those in the period 1989 to 1991 (Figure 15.6.3-3). DFO records show that 56 enterprises that fish the Study Area hold scallop licences. However, fishers report that, in recent years, only 10-14 vessels (using drags, dredges or rakes) have been actively involved due to poor market conditions, regulatory restrictions and other factors (Canning & Pitt Associates Inc. 2010). The harvest typically occurs over six months from spring to fall, with the largest catches coming in July and August.

DFO (2009) notes that the Strait of Belle Isle fishery is "the longest existing scallop fishery in Newfoundland and Labrador, started in 1969 and has been prosecuted annually with the exception of four years (1975 to 1979). The number of active licenses has ranged from a high of 107 (1985) to the current low of 10. The fishery has been cyclical in nature, often driven by market considerations. The fishery has been regulated by an annual Total Allowable Catch (TAC) since 1996. Other management measures include weekly catch limits and spatial regulation of removals. The majority of vessels in this fishery are less than 45 feet LOA (length overall). They make daily excursions and land fresh product with nearly all scallops shucked at sea."

Fishers using grounds within the Study Area harvest scallop and cod on the same grounds (see Figure 15.6.4-4). Scallops are found throughout much of the Strait of Belle Isle, and grounds for this species extend as far as Red Bay. According to harvesters, the most suitable scallop beds are generally found where water depths are greater than 60 m.

For most of the last decade, scallop fishing was excluded from a refugium established by DFO in 2000 to enhance stock recruitment (see Figure 15.6.4-8). The refugium was established to test the hypothesis that the reduced number of pre-recruits (less than 60 mm shell height) in this area was due to intensive fishing which resulted in higher levels of incidental mortality. However, based on 2007 survey data, no difference in density between inside and outside the refugium was observed as natural mortality was higher and the density of predatory starfish was greater inside the refugium (Naidu et al. 2001).

Figure 15.6.4-8 also shows the scallop harvesting locations for the five years 2005-2009, aggregated, for all months from the DFO catch and effort datasets (DFO 1990-2009). The harvesting activity showing within the refugium is from 2009, the year that area was re-opened to scallop dragging.

15.6.4.5 Whelk

The whelk fishery in the Strait of Belle Isle began in the early 1990s. Harvesting usually commences in June and fishing may continue into the fall months. Labrador-based fishers report whelk are generally found in the same areas and at the same water depths (e.g., 20 m and less) in which pelagic species such as herring are taken (Canning & Pitt Associates Inc. 2010). It was noted that whelk also inhabit deeper water, but most fishers prefer to fish this species closer to shore given the size of their vessels and the strong tides found farther out in the Strait of Belle Isle. Whelk fishers on the Newfoundland side of the Strait of Belle Isle say that they generally fish whelk in water depths of 30 m or deeper (Canning & Pitt Associates Inc. 2010).

15.6.4.6 Eels

Although of minor importance in UA 4Ra, this species is harvested on the Labrador side of the Strait of Belle Isle in various freshwater locations, such as Forteau Brook and L'Anse au Loup Brook. Eels are reportedly not fished on the Newfoundland side of the Strait of Belle Isle (Canning & Pitt Associates Inc. 2010). They are harvested using eel pots or fyke nets.

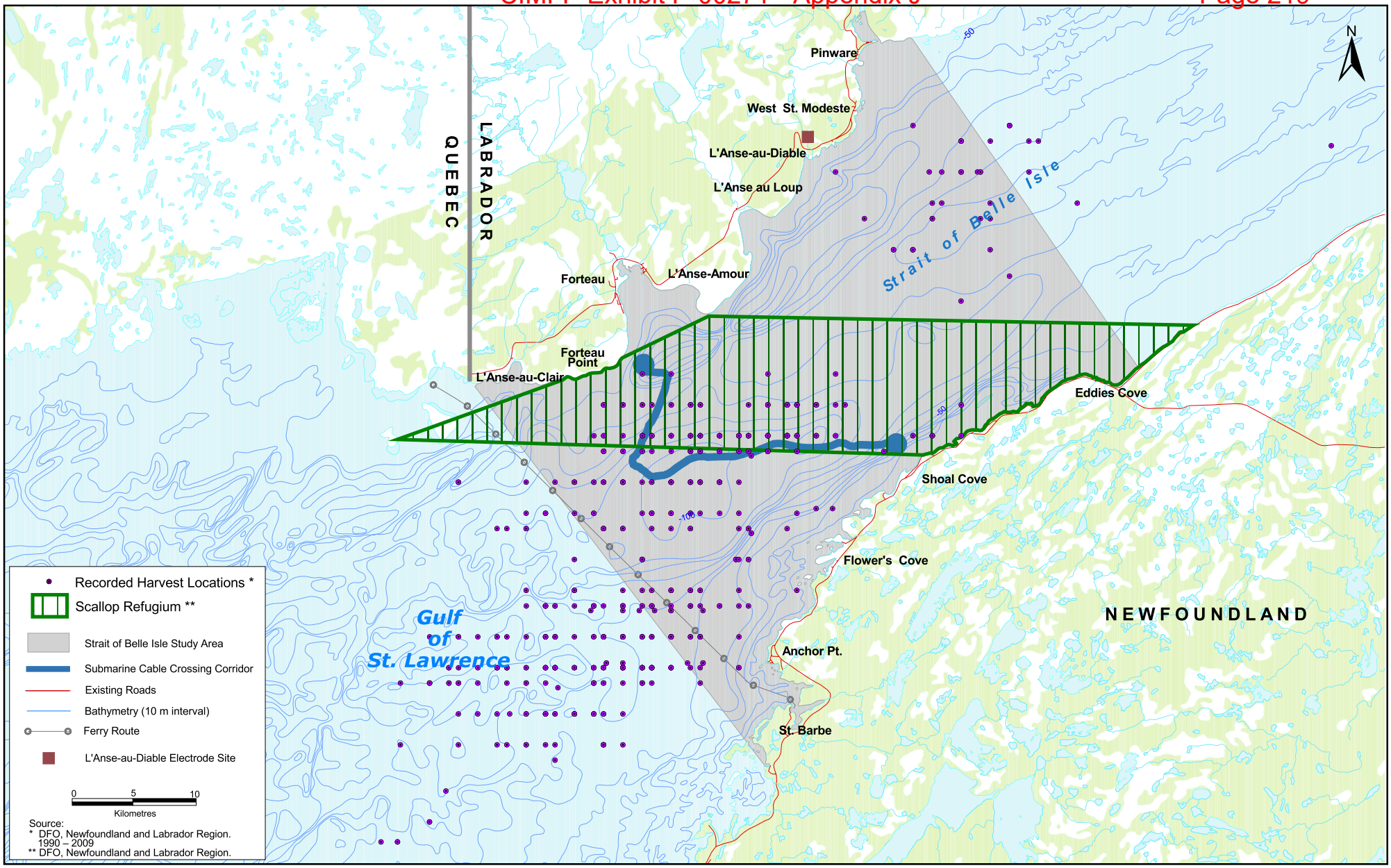


FIGURE 15.6.4-8

Reported Scallop Harvesting Locations, Strait of Belle Isle (Georeferenced Data), 2005-2009 Aggregated

15.6.4.7 Seals

Fishers based in ports on both sides of the Strait of Belle Isle are allowed to harvest seals throughout UA 4Ra as well as in other parts of the Gulf of St. Lawrence. If the seals are in the area in the spring, most fishers choose to harvest them on the ice closest to their homeports. In some years, fishers from other parts of the province, e.g., the north-east coast of Newfoundland, may also take part of their annual harvest in the same general area, especially if they have not been able to take their full quota elsewhere. However, these non-UA 4Ra enterprises are not permitted to harvest seals farther west than a line between Flower's Cove and L'Anse au Clair.

15.6.4.8 Toad and Rock Crab

Toad and rock crab are quite abundant on the Labrador side of the Strait of Belle Isle and are often caught together on the same grounds. However, fishers noted that catch quantities fluctuate from year to year depending on product market prices (Canning & Pitt Associates Inc. 2010). Toad crab are found along the same shoreline areas inhabited by lumpfish (see Figure 15.6.4-9) but are taken in deeper water, from 8 m - 10 m to about 100 m depth.

Fishers on the Newfoundland side of the Strait report that toad crab are relatively abundant on their side of the Strait of Belle Isle and are generally found in water depths between 12 m - 120 m, while rock crab tend to inhabit water depths less than 60 m (Canning & Pitt Associates Inc. 2010).

15.6.4.9 Snow Crab

Although snow crab emerged as an important economic species in the years following the groundfish closures (see Figure 15.6.3-6), snow crab catches in the north-eastern Gulf of St. Lawrence have been low since 2002. This species has accounted for less than 1% of the overall species catch value in the past several years. Even though the Division 4R quota (1,535 t) remained high after 2006, snow crab fishers were catching only about 35% of the available quota. In 2009, the Division 4R quota dropped to 902 t, but the catch that year was just 288 t for the entire Division and 217 t in 2010. The most recent DFO assessment of Newfoundland and Labrador snow crab (DFO 2010d) notes that both landings and effort in Division 4R have steadily declined since 2004, to historical lows in 2009, that the TAC has not been achieved since 2002, and that recent DFO Science Branch surveys indicate that the fishable biomass remains low. The decline in UA 4Ra crab catch since 2002 has been greater than the decline in the regional (Division 4R) crab fishery as whole.

The snow crab harvest usually begins in late May or early June. It peaks in June but may continue until the early fall in some years. Both the georeferenced snow crab data and consultations with local fishing groups indicate that most of the snow crab harvesting occurs well away from the cable crossing corridor, in other parts of the Gulf of St. Lawrence and off the Labrador coast (Canning & Pitt Associates Inc. 2010).

15.6.4.10 Shrimp

The shrimp harvested in UA 4Ra is almost all northern shrimp, which accounted for nearly 11% - 12% of the average UA 4Ra harvest (by quantity and value) for the 2005-2009 period (DFO 1990-2009). As Figure 15.6.3-4 shows, landings have been much higher in the last decade, though there has been variability over the full 20-year period. Although there may be some shrimp harvesting during most months, April to May is the key period, accounting for more than 80% of the catch in 2005-2009. Although some shrimp harvesting may occur in the general vicinity of the submarine cable corridor, the main activities in the Regional Area are concentrated 65 km or more distant, well to the south-west of the Study Area (see Canning & Pitt Associates Inc. 2010).

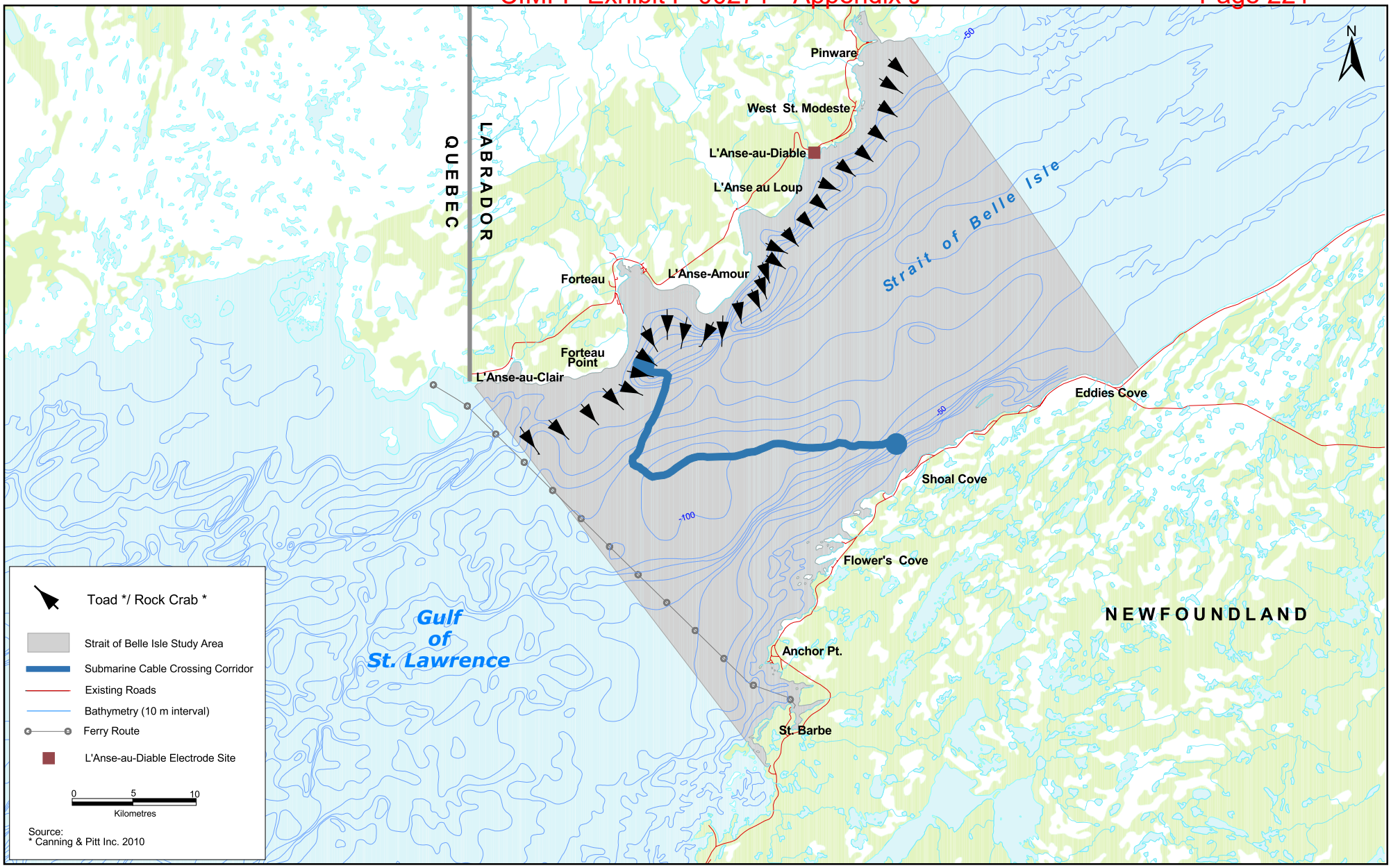


FIGURE 15.6.4-9

Reported Toad / Rock Crab Harvesting Locations, Strait of Belle Isle Study Area

15.6.4.11 Summary of Study Area Fisheries

The following table (Table 15.6.4-1) provides summary information about fisheries activities in the general vicinity of the Strait of Belle Isle Study Area, including the fishing season for various species, use of fishing gears and additional comments about fishing grounds, based on information from DFO sources and fisher meetings (Canning & Pitt Associates Inc. 2010).

Table 15.6.4-1 Summary of Fisheries in and near the Study Area: Species, Seasons, Gear and Locations

Species	Typical Season	Fishing Gear	Fishing Grounds
Scallop	May to October	Dredges / rakes	Scallops are harvested throughout the Study Area usually in water depths greater than 60 m. Most of the scallop grounds are found on gravelly – rocky bottom beds.
Cod	Early July through to September, depending on how long it takes to fill the quota.	Gillnets, and hook and line gear.	Cod are harvested throughout the Study Area.
Capelin / Herring / Mackerel	The herring season opens in mid-June, but most of the harvest takes place in late July and early August. Mackerel and capelin are harvested in the same period.	Traps and nets (vessels from outside the Study Area may occasionally fish pelagic species in the area using purse seines).	Traps (and nets) are generally set close to shore (within 300 m - 400 m) in water depths of 12 m - 14 m.
Toad / Rock Crab	June to August, and in some years into September.	Pots	Pots are set in water depths of between 8 m - 10 m and deeper.
Whelk	From early spring (i.e., June) into the fall months	Pots	Whelk are harvested in the same areas where pelagic species are fished; in areas close to shore in water depths of 12 m - 14 m.
Eels	Early fall (mainly September)	Fyke nets or eel pots	On the Labrador side of the Strait of Belle Isle in freshwater locations (brooks).
Lumpfish	May, June and July	Gillnets	Nets are set along most parts of the shoreline in water depths of about 30 m - 60 m outside (i.e., in deeper water) of the locations where herring nets are set.
Halibut	June (usually a short season, i.e., three days)	Hook and line gear	This species is harvested mainly on the Newfoundland side of the Study Area in water depths 12 m and deeper.
Lobster	Early May to end of June	Pots	Lobster are only harvested on the Newfoundland side of the Study Area.

Source: Canning & Pitt Associates Inc. 2010.

15.6.4.12 Aboriginal Fisheries

A number of Aboriginal groups reside in Labrador and Québec and some undertake land use and resource harvesting activities in the general vicinity of the Project. Several of these groups assert Aboriginal rights and / or title to portions of these areas. These claims are at varying stages of review, acceptance and / or negotiation with the Government of Newfoundland and Labrador and the Government of Canada.

The Study Area does not overlap with past or current Labrador Innu land claim areas, and Labrador Innu are not known to undertake fishing activities in this area. The Project does not extend into the marine waters or land areas covered by the Labrador Inuit Land Claims Agreement of 2005. Québec Aboriginal groups include Innu communities along the Lower North Shore (Nutashkuan, Mingan, La Romaine, Saint-Augustin, Sept-Iles) and Schefferville, and the land claims of several of these Aboriginal groups extend into Labrador. However, these have not been accepted for negotiation by the GNL. Based on the information currently available, these claims are not known to overlap with the Study Area, and Québec Aboriginal groups are not known to undertake fishing in the Study Area.

The NCC has asserted a land claim which covers much of Labrador and its coastal areas, including the Strait of Belle Isle, but this has not been accepted for negotiation by either the federal or provincial government. NCC members reside in Labrador Straits communities and are involved in the general commercial fishing activity described above. Any “NCC-specific” fishing activities and associated fishing and management arrangements with DFO are, however, reportedly in the area north of Cape Charles and do not extend into the Strait of Belle Isle. NCC members have identified during 2011 interview areas in the Strait of Belle Isle where they harvest cod (see Section 15.5.7 for further information).

DFO reports that food / social / ceremonial fishing licences have been issued to members of the Innu Nation and the NCC. These are licences to harvest trout, salmon and char within the Upper Lake Melville area and in the coastal area between Fish Cove Point (near Black Tickle) and Cape St. Charles. There are no commercial fish harvesting activities by any members of these Aboriginal communities southwest of Cape St. Charles.

15.6.4.13 Aquaculture

There are currently no licenced aquaculture sites in or near the transmission corridor area in the Strait of Belle Isle. The closest existing aquaculture operations are more than 75 km away from the submarine cable crossing, at the northeastern tip of the Northern Peninsula in the Pistolet Bay - St Lunaire-Griquet area (Department of Fisheries and Aquaculture (DFA) 2010, internet site).

15.6.4.14 Recreational Fisheries

Responsibility for managing recreational fisheries activities in the Strait of Belle Isle lies with DFO’s Corner Brook Area 3 office. The Area Chief of Resource Management (Ball 2010, pers. comm.) reports that the primary recreational fishing activity in the Strait of Belle Isle is for cod. In 2009, recreational cod fisheries took place between July 25 and August 16, and between September 26 and October 4; in 2011 recreational fisheries took place between July 23 and August 14, and from September 24 to October 2 (DFO 2011b). Future recreational cod fishing activities may have different opening and closing dates, as determined by DFO.

Other recreational / food fisheries include those for capelin (harvested by hand or with cast nets) and mackerel (taken with rod and reel gear). In addition, DFO has issued 20 recreational scallop licences for all of Division 4R. DFO managers (Ball 2010, pers. comm.) report that most of these recreational scallop harvesting activities are concentrated in the Bay of Islands - Bay St. George area.

15.6.4.15 Potential Future Fisheries

Evaluating any potential, future fisheries requires consideration of a range of biological (species presence, abundance, status) and socioeconomic (market demand and price, skills and equipment needs) factors, as well as decisions by government regulatory and resource management agencies. Apart from increases in market

demand for some of the existing non-traditional species fisheries, such as toad and rock crab, the most likely future fishery in both UA 4Ra and the Study Area could be a re-instatement of the mobile gear (i.e., otter trawl) cod fishery, but this would require a substantial improvement in the Northern Gulf cod stock and much more scientific study and assessment by DFO.

15.6.5 Dowden's Point

Geo-referenced catch data for the past five years indicate that nearshore fishing grounds within the Study Area are used primarily for the harvest of pelagic species such as capelin, herring and mackerel. Most of the catch is capelin, nearly all of which is harvested in July and August by larger 35-64 foot vessels using mobile gear such as purse seines and tuck seines. Most of these mobile gear pelagic fishing activities occur south of the Holyrood Generating Station (DFO 1990-2009).

Lobster, herring and lumpfish are harvested on suitable grounds closer to shore in the area between Lance Cove and Dowden's Point. Three lobster fishers set a total of about 20 pots in 2 m water within 30 feet from shore off Dowden's Point. Herring and lumpfish are harvested with nets 250-500 m out from this location in water depths of about 10 m. Recreational fishing activities in the immediate vicinity of the proposed electrode site include the harvest of brown trout by trolling gear close to shore, and cod using handlines, usually in water depths between 32 and 36 m (Lear 2011, pers. comm.)

15.7 Tourism

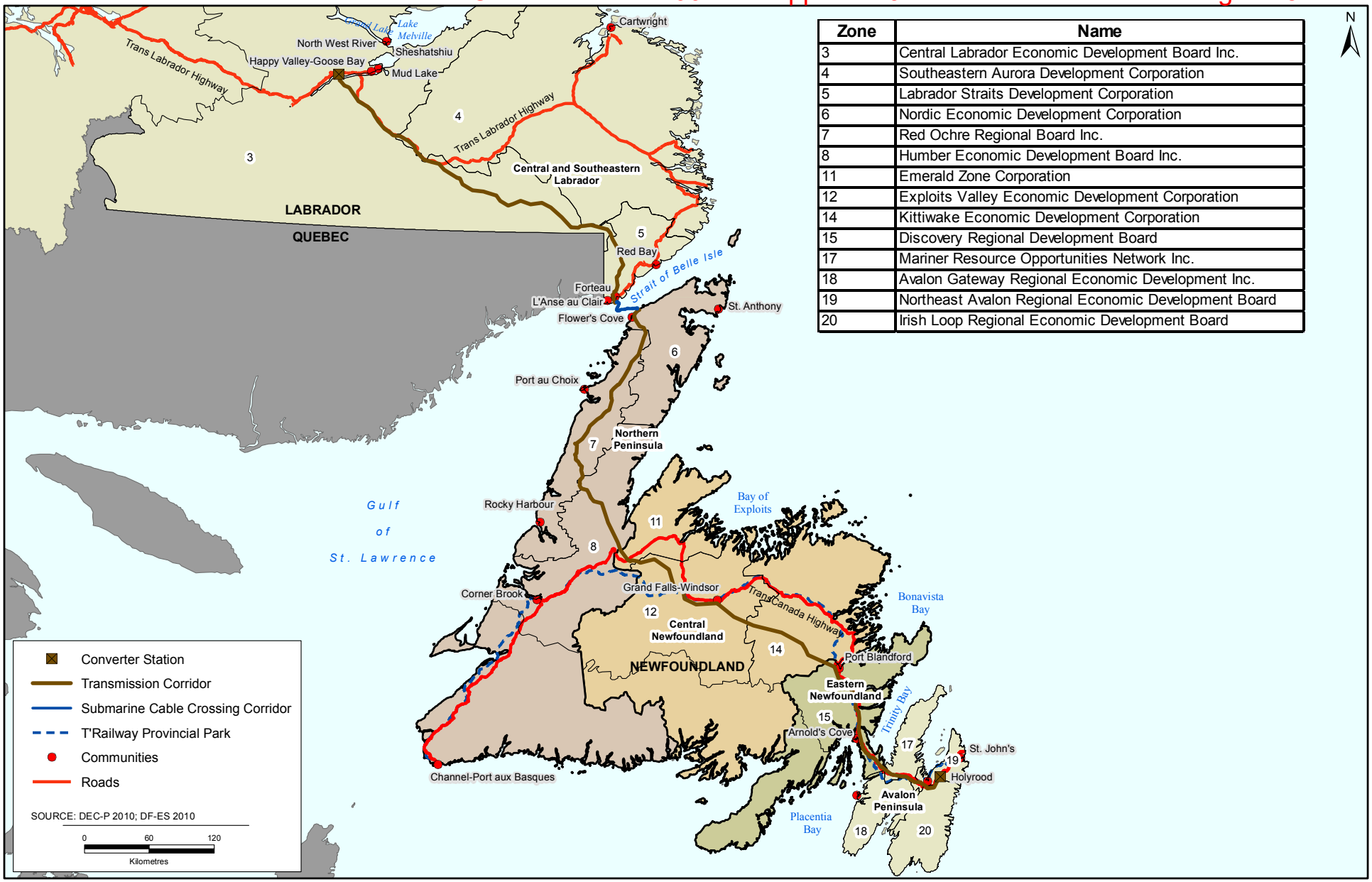
Tourism is the temporary movement of people to destinations outside their normal places of work and residence, the activities undertaken during their stay in those destinations and the facilities created to cater to their needs (Mathieson and Wall 1982). Therefore, the tourism industry is made up of three interrelated components - the destination and its attractions and activities (i.e., supply); transportation - the mode of travel people use to reach their destination; and the markets or locations where visitors come from (i.e., demand). Statistics Canada's Canadian Tourism Satellite Account (CTSA) defines the relevant distance for tourism as a trip of more than 80 km (50 miles) in one direction. This is used to help separate regular commuting or activities within one's usual environment (Katherine Kemp and Shaila Nijhowne Consultants (KKSN) 2004).

This section discusses tourism in Newfoundland and Labrador. Focus is placed on major destinations, particularly those in areas through which the transmission corridor will cross or come close to. As tourists must travel through the province to reach those destinations, focus is also placed on transportation systems by which tourists enter into and travel throughout the province.

The reader is also referred to Section 15.3 Community Infrastructure and services, which describes the highways, roads, parks, airports and railway within the province by region. Section 15.4 Economy, Employment and Business also describes the contribution of Tourism to the economy. Section 15.5 Land and Resource Use also describes tourist attractions such as parks and protected areas, campgrounds and recreational areas, hunting and angling and motorized recreational vehicles.

15.7.1 Study Area

The discussion of Tourism focuses initially and primarily on the four sub-regions: Central and Southeastern Labrador, Northern Peninsula, Central and Eastern Newfoundland and the Avalon Peninsula (Figure 15.7.1-1) through which the proposed Project would extend. These are discussed in relation to the various RED Board zones crossed by the transmission corridor, as well as other project related components and activities. Depending on the availability and type of data, it is presented from the perspective of the provincial tourism regions which are used for tourism marketing, evaluation and data management: Western, Central, Eastern and Avalon. Given the larger provincial dimensions of the tourism sector, the industry in Newfoundland and Labrador as a whole is also generally described in this section.



Zone	Name
3	Central Labrador Economic Development Board Inc.
4	Southeastern Aurora Development Corporation
5	Labrador Straits Development Corporation
6	Nordic Economic Development Corporation
7	Red Ochre Regional Board Inc.
8	Humber Economic Development Board Inc.
11	Emerald Zone Corporation
12	Exploits Valley Economic Development Corporation
14	Kittiwake Economic Development Corporation
15	Discovery Regional Development Board
17	Mariner Resource Opportunities Network Inc.
18	Avalon Gateway Regional Economic Development Inc.
19	Northeast Avalon Regional Economic Development Board
20	Irish Loop Regional Economic Development Board

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FIGURE 15.7.1-1

Tourism Study Regions

15.7.2 Information Sources and Data Collection

To gather data and information related to tourism, the study team accessed publications and web sites of tourism and transportation departments, organizations and agencies. These include:

- Government tourism departments (e.g., NL Department of Tourism, Culture and Recreation; Canadian Tourism Commission; United Nations World Tourism Organization);
- Government departments that interact with tourism (e.g., NL Department of Finance, Newfoundland and Labrador Department of Business, NL Department of Transportation and Works and NL Department of Environment and Conservation);
- Transportation agencies (e.g., Labrador Marine, Marine Atlantic, individual Newfoundland and Labrador airports);
- Tourism sector organizations (e.g., Hospitality Newfoundland and Labrador, Newfoundland and Labrador Tourism Board, Destination Labrador, Cruise Newfoundland and Labrador, Golf Newfoundland); and
- Heritage and parks organization (e.g., Parks Canada, Battle Harbour Historic Trust, International Appalachian Trail Newfoundland and Labrador).

Other sources used include media articles, tourism publications, consultants' reports and other publications related to tourism.

An extensive database of information on outdoor recreation activities was developed for the Communities, Land and Resource Use, Tourism and Recreation Component Study (AMEC 2012b) and Supplementary Report (AMEC 2011). This information is used in this chapter and augmented with further data and information on: natural, cultural and recreation sites; attractions, activities, festivals and events; accommodations and transportation and updated to ensure that the latest information was included.

To prepare a current overview of tourism in Newfoundland and Labrador, the study team used the following methodology:

- conducted a literature review of global, national and provincial tourism and transportation trends; tourism administration, tourism policies and programs and tourism marketing, markets and product development;
- undertook a tourism issues scoping exercise;
- confirmed and updated information related to locations of various sites and infrastructure;
- collected statistics on accommodations occupancy rates and number of attractions and adventures, festivals and events and most visited sites in the province; and
- identified value of tourism to province by spending, employment and visitation.

15.7.3 Tourism in Newfoundland and Labrador

Tourism is a very important sector of the Newfoundland and Labrador economy. In 2010, tourism generated approximately $850 million in resident and non-resident spending and employed 13,000 people in the province (NLDTCR 2011a, internet site). It brings new money into the province – non-residents spent approximately $400 million in 2010 (NLDTCR-S 2011a, internet site). Tourism retains money in the province when residents choose not to travel elsewhere. Tourism stimulates local and external investment of financing and expertise, distributes money throughout the province and supports amenities used by local residents (e.g., theatres, attractions and recreation facilities and activities).

Tourism has growth potential – in 2010 (despite flat performance in the other Atlantic provinces), Newfoundland and Labrador received more than 518,000 non-resident visitors for the first time (NLDTCR

2011a, internet site). Unlike natural resource industries, tourism is widely distributed throughout the province, is environmentally sustainable, renewable and largely non-consumptive. Tourism is a priority sector for the GNL which increased its marketing budget from $6 million dollars in 2003 to more than $13 million in 2010 (NLDTCR 2011a, internet site).

The tourism market is generally divided into two segments, leisure and business. The former includes both residents and non-residents who wish to explore and experience the natural and cultural sights, events, activities, accommodations and food of a region. The latter are travelers whose main motivation is to attend an activity or event associated with their business interests including conventions or incentive travel (employee rewards programs). Of the tourism revenue of $850 million spent in 2010, nearly $450 million was spent by residents, an important component of the tourism sector.

15.7.3.1 Transportation To and Within the Province

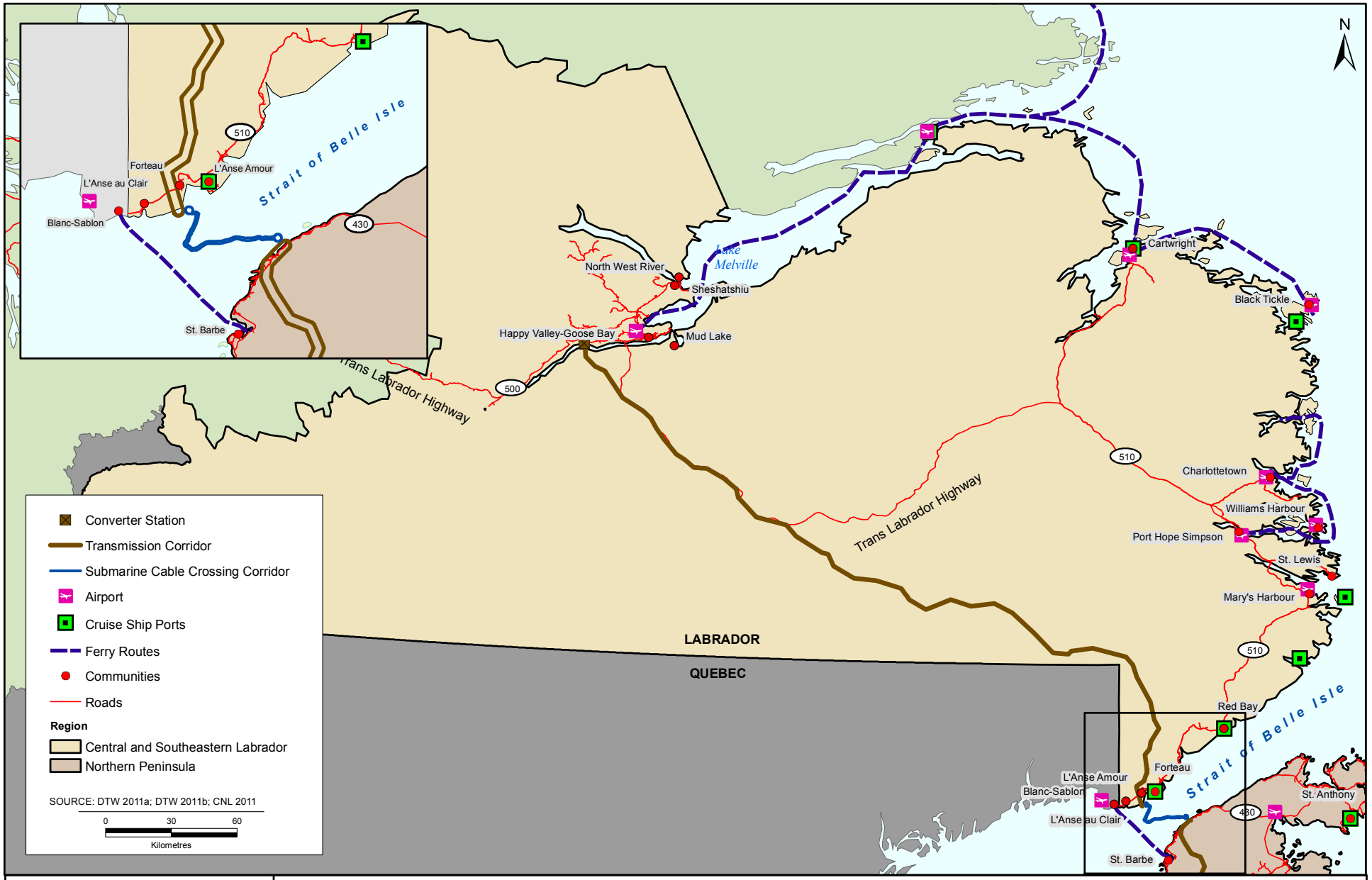
With the exception of Labrador West, Newfoundland and Labrador is accessed by air or sea. Overland passengers may also enter Labrador West from Québec via Route 389 or from Sept Îles via Tshiuetin Rail Transportation Inc. (NLDTCR 2011b, internet site). Figure 15.7.3-1 and Figure 15.7.3-2 show transportation systems to and within the province. From Labrador West, motorists may drive to the Labrador Straits. Here a marine ferry carries vehicles and passengers to and from Lourdes-de-Blanc-Sablon and Newfoundland. The Labrador Straits ferry crosses between Blanc-Sablon and St. Barbe two to three times daily in each direction in ice-free seasons. Now that a permanent road link extends from the Labrador Straits to Labrador West and into Québec via Happy Valley-Goose Bay, the GNL has committed to a year-round ferry service. During winter 2010 and 2011 a ferry service (twice-weekly in each direction) was maintained between Blanc-Sablon and Corner Brook (NLDTW 2010b).

Demand on the Straits ferry has increased since the TLH opened in December 2009 and since the ferry service to Corner Brook was available in winter of 2009-10. An increase in vehicles using the ferry in the summer of 2010 resulted in an additional ferry run (in each direction) on Fridays and Mondays in August and September (NLDTW 2010c).

Other vehicle access routes into the province include the Marine Atlantic and Relais Nordik marine ferry services. Currently, Marine Atlantic's four ferries operate daily year-round between North Sydney, Nova Scotia and Port aux Basques. In summer, one vessel is assigned to the North Sydney to Argentia route which operates twice weekly (Marine Atlantic 2011, internet site). In 2011, Marine Atlantic introduced two larger ferries, upgraded its terminal facilities and is currently rebranding the ferry service as a part of a positive tourism experience (The Telegram 2011a). Relais Nordik provides service along the Québec North Shore from Rimouski to Blanc-Sablon (Relais Nordik 2011, internet site). Passengers without vehicles may also arrive in Fortune from the French Islands of Saint Pierre and Miquelon from June to September (Saint Pierre and Miquelon 2011, internet site).

The province has an extensive highway and road network (Figure 15.7.3-1 and 15.7.3-2). In Labrador, Route 500 (the TLH) connects Labrador West to Happy Valley-Goose Bay and is currently being paved. Route 510 connects Happy Valley-Goose Bay to L'Anse au Clair by an unpaved road. The final section of Route 510 (Happy Valley-Goose Bay to Cartwright) was completed in December 2009. In Newfoundland, Route 1 or the TCH runs approximately 900 km from Port aux Basques to St. John's. Local and regional roads branch off these two main routes. Transportation infrastructure is further described in Section 15.3.5.

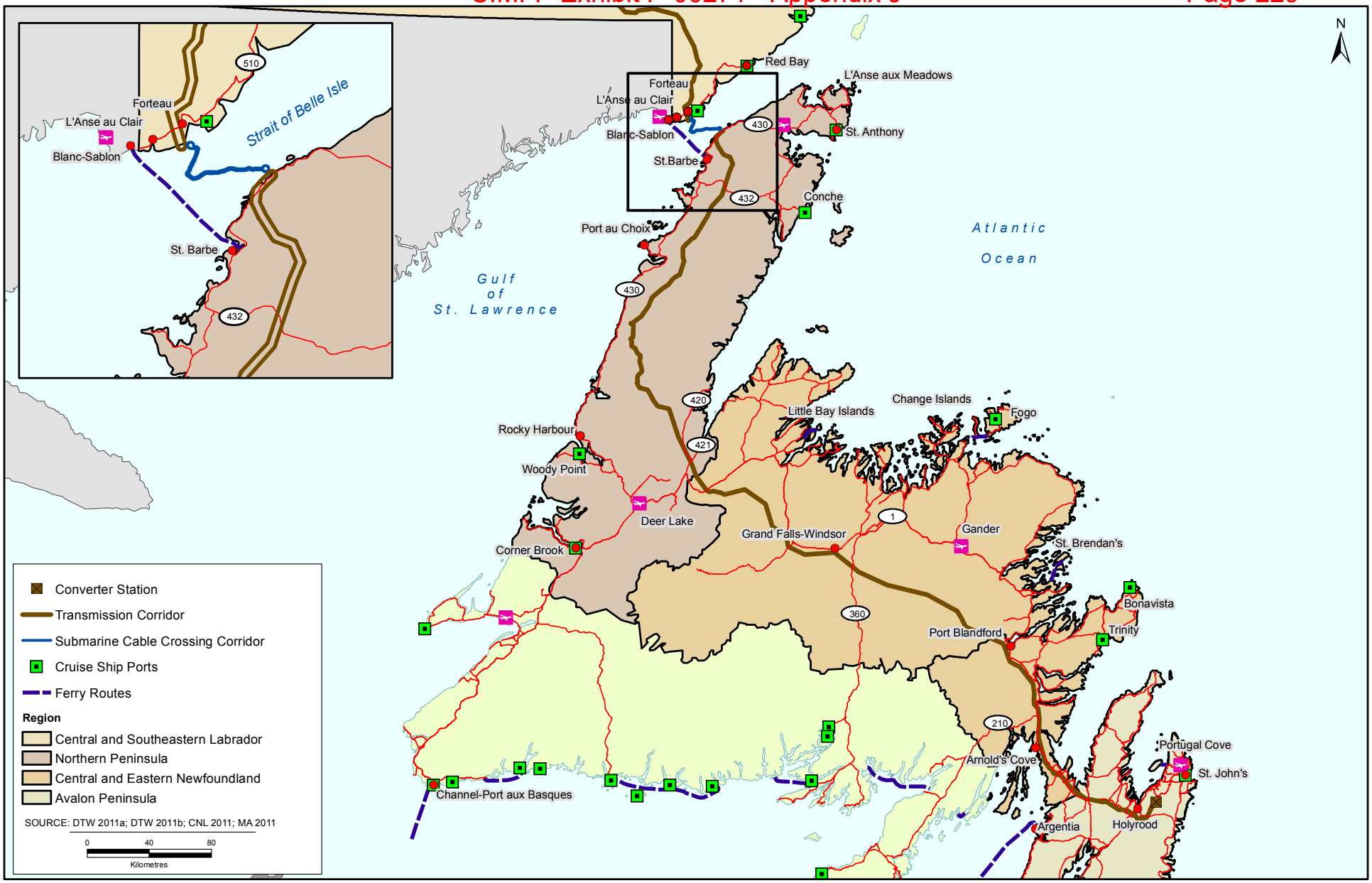
Tourism is driven by individuals and groups learning about a geographic area, attraction, event or activity that arouses their interest sufficiently enough to merit a visit. These attractions or events may be a specific purpose destination or a geographic destination with a variety of historic attractions, cultural events and outdoor activities and a range of accommodations and food services. The following provides an overview of tourism and key tourist destinations in each of the four study regions.



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FIGURE 15.7.3-1

Tourism Access and Transportation - Labrador



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FIGURE 15.7.3-2

Tourism Access and Transportation - Newfoundland

15.7.3.2 Central and Southeastern Labrador

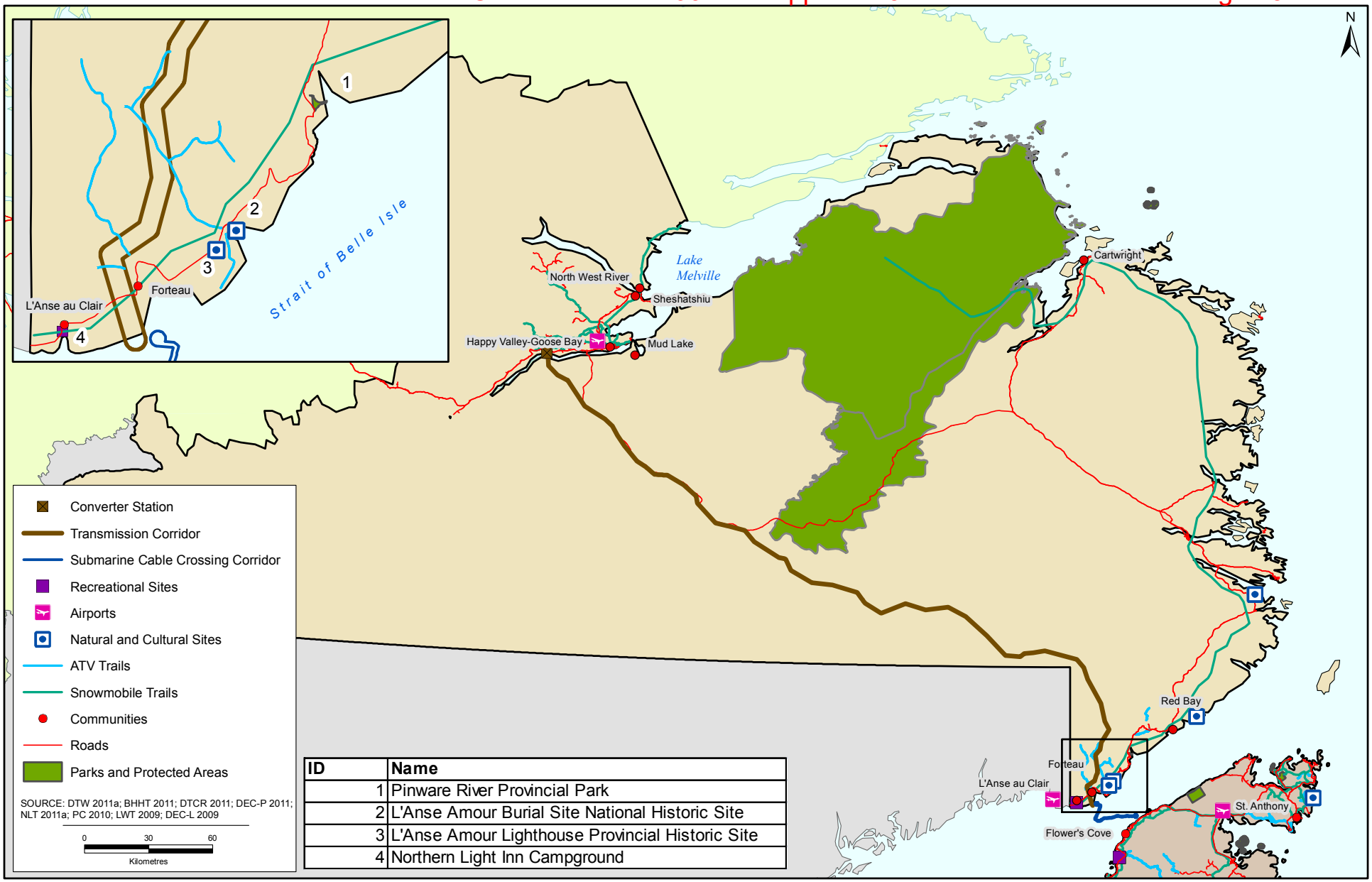
This region has large wilderness areas that are used mainly for local recreational and subsistence activities. Most tourism activity relates to outfitting, and more specifically salmon fishing. Two large parks proposed for the area, Mealy Mountains National Park and Eagle River Waterway Provincial Park, will increase tourism and recreational opportunities (NLDEC 2010). Top provincial destinations are Red Bay and Battle Harbour (Figure 15.7.3-3).

Other important sites are included in Table 15.7.3-1. The Gannet Island Ecological Reserve is located off the coast of Cartwright. Battle Harbour National Historic Site, Red Bay National Historic Site and Point Amour Lighthouse Provincial Historic Site are located along the coast. Pinware River Provincial Park offers camping facilities (Battle Harbour Historic Trust 2011, internet site; NLDEC-P 2011, internet site; NLDTCR 2011a, internet site; PC 2011, internet site). Red Bay and Battle Harbour have been identified as top destinations in the province.

Table 15.7.3-1 Other Central and Southeastern Labrador Tourism Destinations

Destinations	Description
Mealy Mountains National Park Reserve (proposed)	Encompasses ecologically significant and culturally important areas of Labrador, is home to a threatened caribou herd and will be the largest proposed national park in Eastern Canada
Eagle River Waterway Provincial Park Reserve (proposed)	Encompasses almost the entire length of the Eagle River and a significant portion of its headwaters and is well known for fishing and canoeing opportunities
Gannet Island Ecological Reserve	Protects the largest razorbill colony in North America and the third largest Atlantic puffin breeding colony
Point Amour Lighthouse Provincial Historic Site	Is the tallest lighthouse in Atlantic Canada and the second highest in Canada
L'Anse Amour Burial Ground National Historic Site	Identified as the burial mound of a Maritime Archaic adolescent who is believed to have received a ceremonial burial about 7,5000 years ago
Pinware River Provincial Park	Encompasses diverse terrain and vegetation and offers camping, picnicking, fishing and hiking opportunities

Source: NLDEC-P 2011, internet site; GNL 2009; Labrador Coastal Drive 2011, internet site; LSHDC 2011, internet site.



ID	Name
1	Pinware River Provincial Park
2	L'Anse Amour Burial Site National Historic Site
3	L'Anse Amour Lighthouse Provincial Historic Site
4	Northern Light Inn Campground

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FIGURE 15.7.3-3

Select Tourism Attractions - Central and Southeastern Labrador

Table 15.7.3-2 shows the number of attractions and adventures within the Central and Southeastern Labrador region by RED zone as listed in the 2011 provincial tourist guide (NLDTCR 2011b, internet site). Most attractions and adventures in the region are historic or cultural and include the important destinations of Red Bay and Battle Harbour.

Table 15.7.3-2 Central and Southeastern Labrador Attractions and Adventures, 2011

Attractions and Adventures	Zone 3: Happy Valley-Goose Bay, North West River	Zone 4: Mary's Harbour to Cartwright	Zone 5: Labrador Straits (L'Anse au Clair to Red Bay)	Total
Adventure Tours	0	1	0	**1**
Boat Tours	1	0	0	**1**
Family Attractions and Recreation	0	0	0	**0**
Guided Tours	0	0	0	**0**
Golf	1	0	0	**1**
Hiking and Walking	0	0	0	**0**
Historical and Cultural Attractions	2	2	4	**8**
Nature / Scenic	0	1	0	**1**
Parks, Gardens and Reserves	0	1	0	**1**
Skiing	1	0	0	**1**
Snowmobile Tours	1	1	0	**2**
Other	1	0	0	**1**
Total	**7**	**6**	**4**	**17**

Source: NLDTCR 2011b, internet site.

Table 15.7.3-3 shows the number and season of festivals and events that occur within Central and Southeastern Labrador (NLDTCR 2011b, internet site). Most festivals and events occur in the summer. Happy Valley-Goose Bay hosts the highest number of events.

Table 15.7.3-3 Central and Southeastern Labrador Festivals and Events, 2011

Festivals and Events	Zone 3: Happy Valley-Goose Bay, North West River	Zone 4: Mary's Harbour to Cartwright	Zone 5: Labrador Straits (L'Anse aux Clair to Red Bay)	Total
Winter (November to March)	4	0	0	**4**
Spring (April to May)	1	0	0	**1**
Summer (June to August)	2	5	1	**8**
Fall (September to November)	2	0	1	**3**
Total	**9**	**5**	**2**	**16**

Source: NLDTCR 2011b, internet site.

Table 15.7.3-4 outlines the types and number of accommodations facilities in the Central and Southeastern Labrador. The region has a mixture of accommodations types in bed and breakfast, cottage, inn and hotel / motel facilities. There are also several campgrounds.

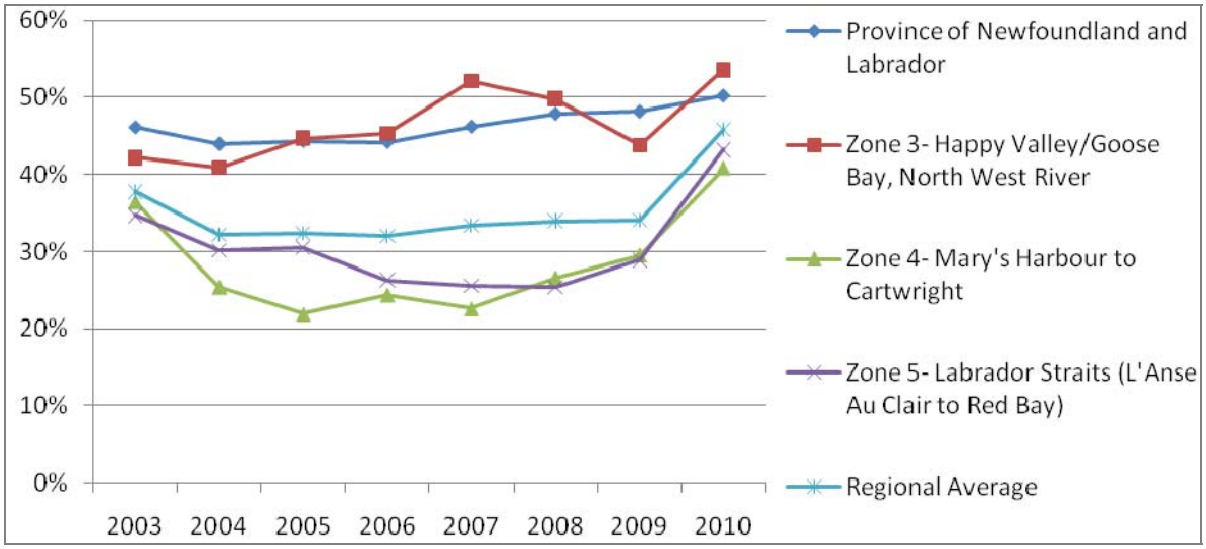
Table 15.7.3-4 Central and Southeastern Labrador Accommodations, 2011

Accommodations	Zone 3: Happy Valley-Goose Bay, North West River	Zone 4: Mary's Harbour to Cartwright	Zone 5: Labrador Straits (L'Anse au Clair to Red Bay)	Total
Bed and Breakfasts	1	1	5	**7**
Cottages	1	0	2	**3**
Inns	1	0	1	**2**
Hotels / Motels	3	4	0	**7**
Total Facilities	6	5	8	**19**
Total Rooms Available in 2010 Peak Month	6,696 (May and July)	2,325 (July)	3,751 (August)	**12,772**
Total Rooms Available in 2010 Low Month	5,783 (December)	1,140 (November)	2,884 (February)	**9,659**
Total Campgrounds	**1**	**0**	**3**	**4**

Source: NLDTCR-S 2011b, internet site; NLDTCR 2011b, internet site.

Figure 15.7.3-4 compares accommodations occupancy rates in the three zones, the Central and Southeastern Labrador region and the province from 2003 to 2010.

Figure 15.7.3-4 Central and Southeastern Labrador Accommodations Occupancy Rates, 2003 to 2010



Source: NLDTCR-S 2011b, internet site.

Accommodations occupancy throughout the region is inconsistent with that of the province which has risen at a steady rate. The Happy Valley-Goose Bay area occupancy rate is the strongest in the region and similar to that of the province except for a spike in 2007, a decrease in 2009 and a strong rise in 2010. Happy Valley-Goose Bay receives a large number of business travellers due to natural resource development activity, the creation of the Nunatsiavut government (2005) and the recent (2011) ratification of the Innu Nation's New Dawn Agreement. In 2009 and 2010, the entire region experienced an increase in accommodations occupancy which is likely a result of additional tourist, resident and commercial travel due to therecent road connection of Happy Valley-Goose Bay with Cartwright.

Table 15.7.3-5 shows the occupancy rates by month for accommodations in each of the zones within Central and Southeastern Labrador in 2010.

Table 15.7.3-5 Central and Southeastern Labrador Seasonal Accommodations Occupancy Rate, 2010

Month	Province of Newfoundland and Labrador (%)	Zone 3: Happy Valley / Goose Bay, North West River (%)	Zone 4: Mary's Harbour to Cartwright (%)	Zone 5: Labrador Straits (L'Anse au Clair to Red Bay) (%)
January	33	40	16	21
February	39	51	16	26
March	42	52	19	25
April	44	43	23	24
May	44	51	46	35
June	57	60	49	55
July	72	66	66	75
August	71	70	57	69
September	58	65	50	58
October	51	56	40	48
November	46	50	68	46
December	33	35	13	21
Annual Average	**50**	**54**	**41**	**43**

Source: NLDTCR-S 2011b, internet site.
Note: The shaded cells indicate those months when the accommodations occupancy rate was within a percentage point of, equal to or higher than the annual average in that particular zone.

Based on occupancy data, the provincial tourism season is from June to October. Happy Valley-Goose Bay occupancy rates were consistent with this. In 2010, Zones 4 and 5 experienced strong accommodations occupancy and a longer season. Happy Valley-Goose Bay experiences strong occupancy outside of tourism season. This is likely due to the road connection to year-round ferry service to / from Newfoundland, and increase of natural resource development and the creation of Aboriginal government (Inuu Nation and Nunatsiavut).

Visitors may access this region via Route 500 from Labrador West or Route 510 (both segments of the TLH) from the ferry that crosses the Labrador Straits from Newfoundland. All but three communities (Black Tickle-Domino, Norman Bay and Williams Harbour) in the region are now accessible by road.

The Labrador Straits passenger / vehicle ferry service is now available year round: from Blanc-Sablon to St. Barbe from spring to fall and to Corner Brook in winter. Seasonal passenger ferry service is provided to Happy Valley-Goose Bay, Cartwright, Black Tickle, Charlottetown, Norman Bay, Williams Harbour and Port Hope Simpson (NLDTW 2011b, internet site).

Goose Bay Airport provides scheduled commercial flights to locations within the province and to / from Halifax and Québec (Air Labrador 2011, internet site; Goose Bay Airport 2011, internet site; Innu Mikun Airlines 2011, internet site; NLDTW 2011c, internet site). Government landing strips provide in-province commercial flights to and from Cartwright, Black Tickle, Charlottetown, Port Hope Simpson, Williams Harbour, St. Lewis and Mary's Harbour (Air Labrador 2011, internet site). Travellers may fly to / from Southern Labrador from Blanc-Sablon, Québec which is located directly next to L'Anse au Clair (Air Labrador 2011, internet site; PAL 2011, internet site).

Labrador was scheduled to have 22 ports-of-call, 48 cruise ship visits and more than 5,000 passenger movements in 2011. In Central and Southern Labrador cruise ships were scheduled to visit Cartwright, Mealy

Mountains, Bateau, Battle Harbour, Red Bay and L'Anse Amour in 2011 (Cruise Newfoundland and Labrador 2011, internet site).

15.7.3.3 Northern Peninsula

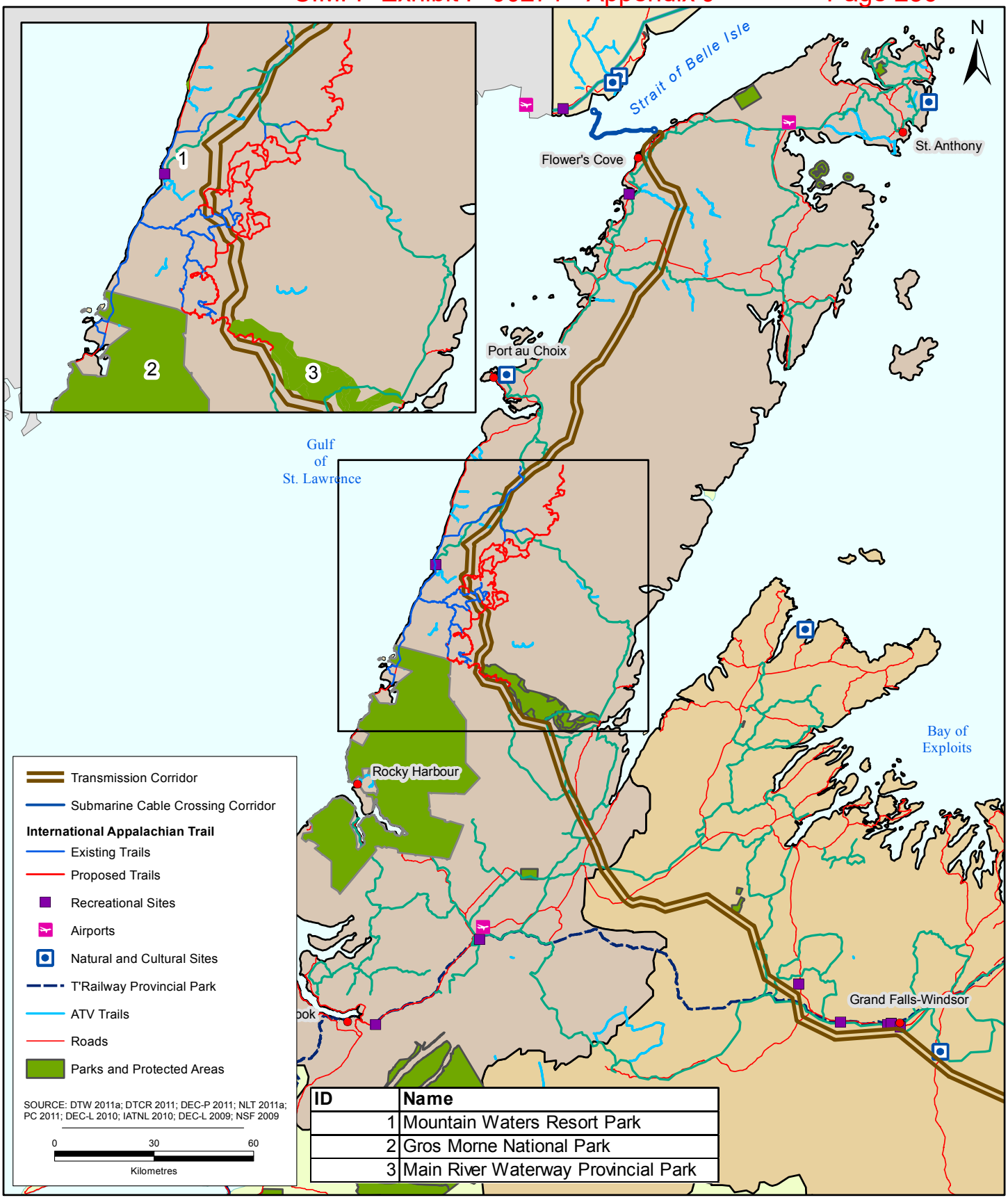
The Northern Peninsula is best known by tourists as the location of Gros Morne National Park and L'Anse au Meadows National Historic Site which are both UNESCO World Heritage Sites. Marble Mountain and the Humber River, both top recreation destinations, are located in the southern portion of the Northern Peninsula region (Figure 15.7.3-5).

The Northern Peninsula is one of the main routes to access other National Hisoric Sites such as L'Anse aux Meadows, Red Bay and Battle Harbour. Table 15.7.3-6 shows other key natural and cultural areas.

Table 15.7.3-6 Other Northern Peninsula Tourism Destinations

Destinations	Description
Watts Point Ecological Reserve	Provides geological and climatic conditions that foster a rare variety of arctic-alpine plants
Burnt Cape Ecological Reserve	Protects more than 300 species of plants, 30 of which are known to be rare on the Island of Newfoundland, on an elevated coastal site
Sandy Cove Provisional Ecological Reserve	Provides coastal barrens, harsh climatic and strong wind conditions that foster a unique arctic-alpine species
Table Point Ecological Reserve	Protects fossils and rocks that document changes to the continental shelf of an ancient ocean
Main River Waterway Provincial Park and National Heritage River	Is designated as the province's first provincial waterway park with opportunities for white water paddling, rafting, angling, hunting, snowmobiling and winter trekking
International Appalachian Trail Newfoundland and Labrador	Is being developed as a long-distance trail between Port aux Basques and Crow Head along the Appalachian Mountain range that parallels the eastern coast of North America
Port au Choix National Historic Site	Highlights both rich marine resources that have drawn people to its shores for more than 5,500 years and the remains of ancient cultures who occupied this site and have been preserved in the limestone bedrock
Pistolet Bay Provincial Park	Preserves stratified rocks , which were deposited during the Cambrian and Ordovician periods, within the low lands of the Long Range Mountains with opportunities for camping and day use
The Arches Provincial Park	Derives its name from a natural arch-shaped rock formation that was created from years of wave action and now offers opportunities for picnicking and hiking
Sir Richard Squires Memorial Provincial Park	Is the oldest provincial park in Newfoundland and Labrador , is situated on the scenic Humber River and is a popular location for salmon fishing

Source: NLDEC-P 2011, internet site; NLDEC 2010; IATNL 2010, internet site; PC 2011, internet site; NLDTCR 2011a, internet site.



ID	Name
1	Mountain Waters Resort Park
2	Gros Morne National Park
3	Main River Waterway Provincial Park

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FIGURE 15.7.3-5

Select Tourism Attractions - Northern Peninsula

Arctic and alpine plants are protected at Burnt Cape Ecological Reserve, Watt's Point Ecological Reserve and Sandy Cove Provisional Ecological Reserve. Table Point Ecological Reserve was established to protect fossils. Near Gros Morne National Park, the Main River Waterway Provincial Park Reserve limits development and activities around Main River, a National Heritage River (NLDEC-P 2011, internet site). Port au Choix National Historic Site interprets archaeological discoveries related to the Maritime Archaic Indian, Dorset and Groswater Paleoeskimo and recent Indians who have lived in the area (PC 2011, internet site).

Recreational opportunities such as hiking, camping and sea kayaking are available in Gros Morne National Park and throughout the region. Pistolet Bay Provincial Park offers camping near St. Anthony. The Arches Provincial Park just north of Gros Morne has day use facilities and Sir Richard Squires Memorial Provincial Park at the bottom of the Peninsula has camping, day use and other activities. The T'Railway Provincial Park begins in western Newfoundland and extends through the southern part of this region (NLDEC-P 2011, internet site).

Table 15.7.3-7 outlines attractions and adventures on the Northern Peninsula as listed in the 2011 tourism guide (NLDTCR 2011b, internet site). This area has a strong cluster of adventure tours, family recreation, hiking and walking, historical / cultural attractions and natural and scenic areas. Much of this activity is located in the Gros Morne area. Some sites including Marble Mountain Ski Resort are located in the southern part of the Northern Peninsula near Deer Lake, Humber Valley and Corner Book.

Table 15.7.3-7 Northern Peninsula Attractions and Adventures, 2011

Attractions and Adventures	Zone 6: Viking Trail, St. Anthony South West to Plum Point, East to Roddickton / Englee	Zone 7: Gros Morne Area, Viking Trail North to and including Plum Point	Zone 8: Deer Lake / Humber Area / Corner Brook	Total
Adventure Tours	1	4	3	**8**
Boat Tours	1	1	3	**5**
Family Attractions and Recreation	2	7	3	**12**
Guided Tours	0	0	0	**0**
Golf	0	1	2	**3**
Hiking and Walking	13	3	6	**22**
Historical and Cultural Attractions	16	17	3	**36**
Nature / Scenic	7	6	0	**13**
Parks, Gardens and Reserves	5	5	3	**13**
Skiing	0	0	1	**1**
Snowmobile Tours	0	3	0	**3**
Other	0	0	1	**1**
Total	**45**	**47**	**25**	**117**

Source: NLDTCR 2011b, internet site.

Table 15.7.3-8 shows the number and season of festivals and events on the Northern Peninsula. Most festivals and events are held in summer and in the southern part of the region. However, the Gros Morne area has several important festivals such as the Woody Point Writers Festival which is held each summer and the Tales, Trails and Tunes Festival which starts the annual tourism season in May.

Table 15.7.3-8 Northern Peninsula Festivals and Events, 2011

Festivals and Events	Zone 6: Viking Trail, St. Anthony South West to Plum Point, East to Roddickton / Englee	Zone 7: Gros Morne Area, Viking Trail North to and including Plum Point	Zone 8: Deer Lake / Humber Area / Corner Brook	Total
Winter (November to March)	1	0	3	**4**
Spring (April to May)	1	2	0	**3**
Summer (June to August)	7	3	10	**20**
Fall (September to November)	1	0	2	**3**
Total	**10**	**7**	**15**	**32**

Source: NLDTCR 2011b, internet site.

Table 15.7.3-9 shows the type and number of accommodations facilities in Zone 7 and Zone 8 and on the Northern Peninsula. The Gros Morne area has a large number of operators offering tourist accommodations. Most of these are cottages and bed and breakfasts. There are also a large number of hotels and campgrounds in this area compared to the southern part of the Peninsula.

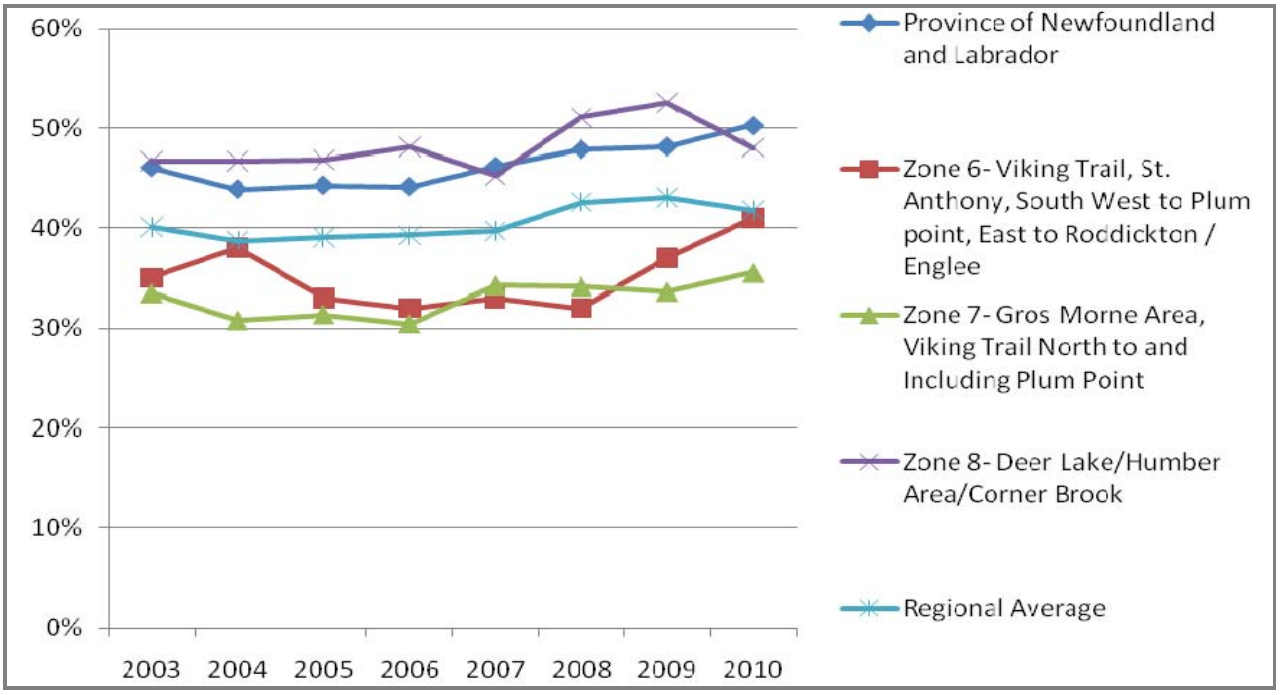
Table 15.7.3-9 Northern Peninsula Accommodations, 2011

Accommodations	Zone 6: Viking Trail, St. Anthony South West to Plum Point, East to Roddickton / Englee	Zone 7: Gros Morne Area, Viking Trail North to and including Plum Point	Zone 8: Deer Lake / Humber Area / Corner Brook	Total
Bed and Breakfasts	14	40	2	**56**
Cottages	5	46	12	**63**
Inns	5	2	0	**7**
Hotels / Motels	6	20	4	**30**
Total Facilities	30	127	21	**178**
Total Rooms Available in 2010 Peak Month	7,561 (July)	20,433 (August)	24,764 (July)	**52,758**
Total Rooms Available in 2010 Low Month	3,623 (December)	9,638 (February)	18,141 (February)	**30,802**
Total Campgrounds	**4**	**19**	**3**	**22**

Source: NLDTCR-S 2011b, internet site; NLDTCR 2011b, internet site.

Figure 15.7.3-6 shows 2010 occupancy rates for the province, the Northern Peninsula region and the economic zones from 2003 to 2010. Annual accommodations occupancy has been fairly consistent with the patterns seen in the province as a whole. However, occupancy rates are lowest in the Gros Morne area, which is likely because the area has mainly summer tourists rather than year long business travellers as does the Corner Brook area.

Figure 15.7.3-6 Northern Peninsula Accommodations Occupancy Rate, 2003 to 2010



Source: NLDTCR-S 2011b, internet site.

Table 15.7.3-10 shows 2010 occupancy rates by month for accommodations in each of the zones within the Northern Peninsula. Seasonal tourism occupancy is fairly consistent with that of the province except that the season is shorter in the Northern Peninsula. Also, Marble Mountain attracts skiers in the winter months.

Table 15.7.3-10 Northern Peninsula Seasonal Accommodations Occupancy Rate, 2010

Month	Province of Newfoundland and Labrador (%)	Zone 6: Viking Trail, St. Anthony South West to Plum Point, East to Roddickton / Englee	Zone 7: Gros Morne Area, Viking Trail North to and Including Plum Point (%)	Zone 8: Deer Lake / Humber Area / Corner Brook (%)
January	33	15	11	31
February	39	16	16	52
March	42	22	14	51
April	44	24	13	44
May	44	30	19	43
June	57	54	42	51
July	72	78	78	63
August	71	75	74	65
September	58	51	47	53
October	51	34	22	46
November	46	26	15	43
December	33	22	9	30
Annual Average	**50**	**41**	**36**	**48**

Source: NLDTCR-S 2011b, internet site.

Note: The shaded cells indicate those months in which occupancy rates were within a percentage point, equal to or above the annual average in that zone.

Gros Morne National Park is well recognized as an important tourist destination within the province, nationally and internationally. As noted in the tourist guide "It took Mother Nature 485,000,000 years to mould this UNESCO World Heritage Site into the geological and visual wonder we know today" (NLDTCR 2011b, internet site). Table 15.7.3-11 compares the number of tourism amenities in Zone 7 to the number in the Gros Morne area.

Table 15.7.3-11 Tourism Amenities in Gros Morne Area Compared with Zone 7, 2011

Tourism Amenities	Total Zone 7: Gros Morne Area, Viking Trail North to and including Plum Point	Gros Morne Area Only
Fixed Roof Accommodations	108	63
Campgrounds	19	13
Attractions	47	34
Festivals	7	7

Source: NLDTCR 2011b, internet site.

On the Northern Peninsula between half and three quarters of fixed-roof accommodations, campgrounds and attractions and all of the festivals occur within the Gros Morne area. This gives additional evidence of Gros Morne as a destination that drives tourism on the Northern Peninsula.

Gros Morne National Park surveyed visitors in 2009. Preliminary results indicate that the Park received 174,000 visitors in that year, an increase of 16,000 over the last survey in 2004. The survey also indicates that these tourists spent $37.6 million in the area, which is $2.3 million more than 2004 (The Telegram 2010b, internet site).

On the Northern Peninsula, tourism generally occurs within a four month period (June to September) with the peak months being July and August. The exceptions are business and convention travel in the Corner Brook area and Marble Mountain Ski Resort. Gros Morne is a "must see" for visitors. Whether they travel by air, boat or car to the province or are visiting from within the province, tourists (except for some cruise ship passengers) use the TLH, Route 430 and / or the TCH to visit the region.

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. On the eastern side and base of the Northern Peninsula, Routes 420 and 421 connect White Bay communities to the TCH.

Airports are located at St. Anthony and Deer Lake. St. Anthony has regularly scheduled flights within the province and to Blanc-Sablon. Along with in-province flights, Deer Lake Airport has regularly scheduled flights to Halifax and Toronto, seasonal flights to Montreal and Toronto and charters to international sun destinations (Air Labrador 2011, internet site; Deer Lake Airport 2011, internet site; NLDTW 2011c, internet site; PAL 2011, internet site).

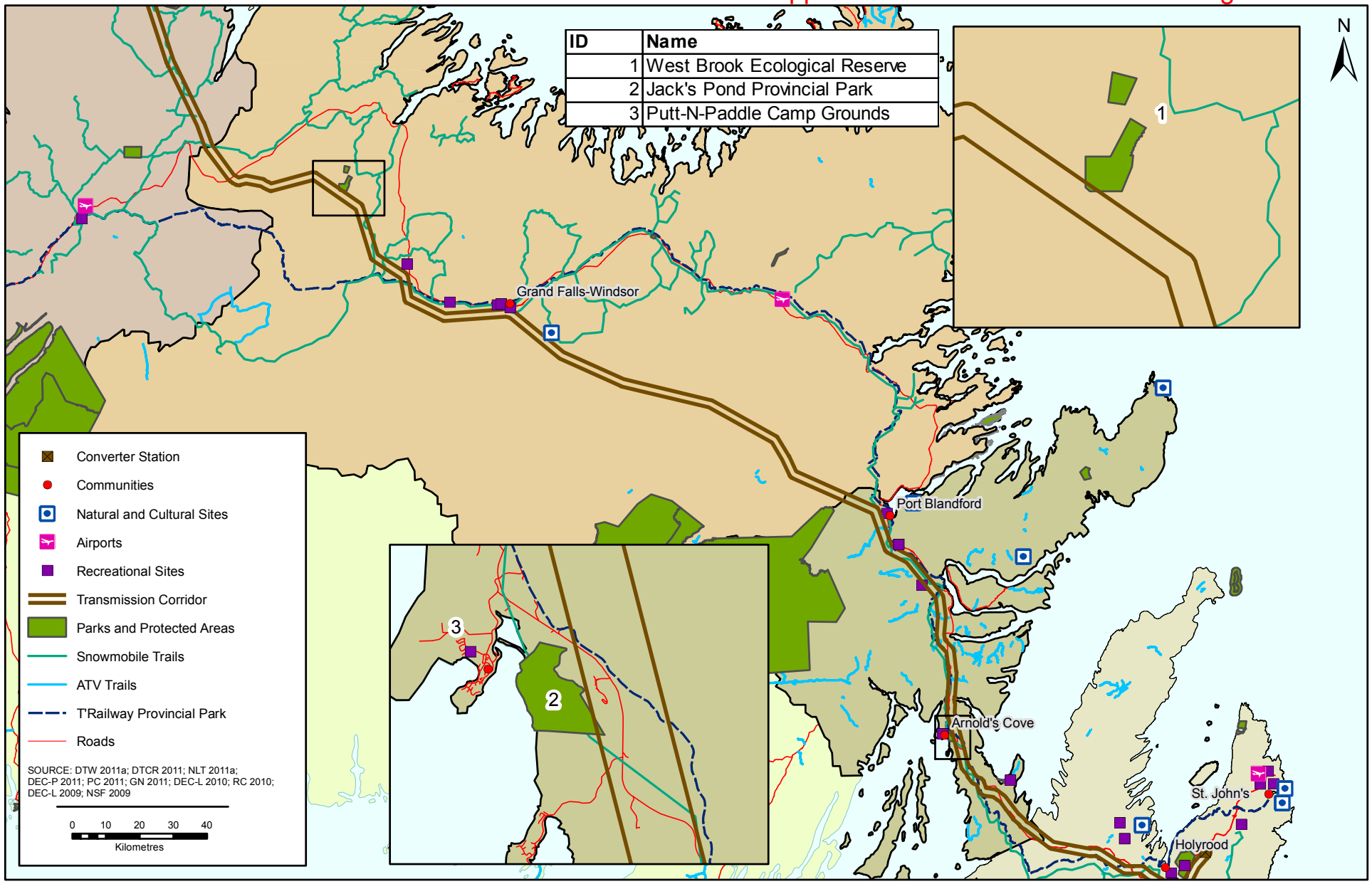
In the western part of Newfoundland, buses travel between Corner Brook and Baie Verte, Burgeo, Stephenville, Port aux Basques, Bonne Bay and Roddickton (NLDTW 2011a; NLDTW 2011c, internet site). No data is available on tourist usage of public buses but some may use the services to access destinations when rental vehicles are not available.

Cruise ships regularly visit the west coast of Newfoundland and the Northern Peninsula. In 2011, cruise ships were scheduled to visit Conche, St. Anthony, L'Anse aux Meadows, Gros Morne National Park, Woody Point and Corner Brook (Cruise Newfoundland and Labrador 2011, internet site). These ships may be part of a Newfoundland circumnavigation tour or a Newfoundland and Labrador route.

15.7.3.4 Central and Eastern Newfoundland

Central and Eastern Newfoundland is a large area that encompasses the RED zones that occupy the central and north coastal parts of Newfoundland from White Bay to Long Harbour. This region does not include the southwest, south coast, Connaigre Peninsula or Burin Peninsula and these areas are not discussed further. Top tourism destinations include Twillingate, Fogo and Change Islands, Terra Nova National Park, Bonavista, Trinity and White Hills Ski Resort (Figure 15.7.3-7).

Other parks and ecological reserves are located in the region (Table 15.7.3-12). These include Flatwater Pond Provincial Park Reserve on the Baie Verte Peninsula and West Brook Ecological Reserve which is inland near Buchans. The Funk Island Ecological Reserve is located off the northeast coast of Newfoundland, about 60 km east of Fogo Island. There is no public access to the island; visits are for scientific research only. The Bay du Nord Wilderness Reserve, located in the eastern part of the region just south of Terra Nova National Park, protects natural areas and provides recreational opportunities (NLDEC-P 2011, internet site; PC 2011, internet site).



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FIGURE 15.7.3-7

Select Tourism Attractions - Central and Eastern Newfoundland

Table 15.7.3-12 Other Central and Eastern Newfoundland Tourism Destinations

Destinations	Description
The T'Railway Provincial Park	Stretches across Newfoundland along the main line of the old abandoned Canadian National rail bed
Flatwater Pond Provincial Park Reserve	Is established to protect an example of a delta / marsh complex on the Baie Verte Peninsula
West Brook Ecological Reserve	Created to protect some of the largest natural stands of red pine remaining in Newfoundland
Funk Island Ecological Reserve	Protects a nesting ground for multiple types of sea birds and preserve former nesting ground for the now extinct Great Auk
Bay du Nord Wilderness Reserve	Provides a wilderness area with no facilities, amenities, trail markers, or public buildings but offers opportunities for canoeing, kayaking, wilderness camping, angling, hunting, bird and wildlife watching, and outdoor photography
Boyd's Cove Beothuk Interpretation Centre	Provides an exhibit and artifacts display at the site of a former Beothuk settlement
Cape Bonavista Lighthouse Provincial Historic Site	Displays a rare 19th century catoptric light apparatus
Mockbeggar Plantation Provincial Historic Site	Belonged formly to F. Gordon Bradley, a politician who worked with Joey Smallwood to lead Newfoundland from a nation to a province and is one of the oldest fish plantations in the province with buildings dating back to the 1730s
Ryan Premises National Historic Site	Showcases inshore fishery, general merchandising and other economic pursuits typical of large-scale outport merchants throughout Newfoundland in the former headquarter of James Ryan Ltd.
Hiscock House Provincial Historic Site	Preserves the restored home of Emma Hiscock who, widowed and left with 5 children in 1893, supported her family by turning the home into a post office and shop
Trinity Visitor Centre and the Mercantile Building Provincial Historic Site	Provides an interactive exhibit that orients visitors to Trinity and is housed in a Mercantile Building that allows visitors to experience the communities as a thriving 1800s seaport
Notre Dame Provincial Park	Borders Junction Pond and offers camping, day use, interpretation, swimming, winter recreation, and concessions
Lockston Path Provincial Park	Includes sheltered campsites and a freshwater beach with modern washrooms, hot showers and laundry facilities and a sewage disposal station
Dildo Run Provincial Park	Is located on New World Island within a short driving distance of Twillingate, Moretons Harbour and other small communities within the historic area
Deadman's Bay Provincial Park	Provides viewing opportunities of icebergs – a day use park
The Dungeon Provincial Park	Derives its name from a distinctive rock formation known as "the Dungeon" – a day use park
Jonathan's Pond Provincial Park Reserve	Preserves a stand of white birch in central Newfoundland
Windmill Bight Provincial Park Reserve	Provides protection for a plateau bog
Jack's Pond Provincial Park Reserve	Conserves some of the province's most rare plants and contains an area of high habitat diversity including barren vegetation, wetlands and a forested stream valley
Bellevue Beach Provincial Park Reserve	Separates the sea from a placid barachois with a sandy beach complex, saltmarsh and habitat for migrating shorebirds

Source: NLDEC-P 2011, internet site, NLDEC 2010, internet site; PC 2011, internet site; NLDTCR 2011c, internet site.

Historic and cultural sites are found throughout the region .Cultural interpretation of Beothuk Indian history is provided at Boyd's Cove Beothuk Interpretation Centre. Cape Bonavista Lighthouse Provincial Historic Site, Mockbeggar Plantation Provincial Historic Site and the Ryan Premises National Historic Site are located in Bonavista. Trinity has several historical sites: Hiscock House, Trinity Visitor Centre and the Mercantile Building (NLDTCR 2011c, internet site).

Provincial parks and provincial park reserves are located throughout the region. These are primarily for recreational purposes such as camping, swimming, hiking and picnicking. Camping and other activities are available at Notre Dame Provincial Park east of Lewisporte and Lockston Path Provincial Park at Port Rexton. Day use facilities are located at Dildo Run Provincial Park near Twillingate, Deadman's Bay Provincial Park near Lumsden and the Dungeon Provincial Park near Bonavista. The T'Railway Provincial Park is located in parts of the entire region (NLDEC-P 2011, internet site).

Provincial park reserves are located at Jonathan's Pond near Gander, Windmill Bight on the Bonavista Peninsula, Jack's Pond near Arnold's Cove and Bellevue Beach on the Isthmus of the Avalon Peninsula (NLDEC-P 2011, internet site).

Table 15.7.3-13 shows the type and number of Central and Eastern Newfoundland attractions and adventures (NLDTCR 2011b, internet site). The Gander / Twillingate East to Terra Nova Area (Zone 14) has nearly twice as many attractions and activities as any other RED zone in this region. It is followed by the Clarenville / Bonavista Peninsula Area (Zone 15). Most of these attractions and activities are walking / hiking and historical / cultural in nature. These two areas encompass the Twillingate, Fogo and Change Islands area and the Trinity and Bonavista areas which have strong tourism activity.

Table 15.7.3-13 Central and Eastern Newfoundland Attractions and Adventures, 2011

Attractions and Adventures	Zone 11: Baie Verte / La Scie / Green Bay	Zone 12: Grand Falls-Windsor Area	Zone 14: Gander / Twillingate East to Terra Nova Area	Zone 15: Clarenville / Bonavista Peninsula Area	Total
Adventure Tours	3	5	6	4	**18**
Boat Tours	1	0	6	4	**11**
Family Attractions and Recreation	2	4	6	1	**13**
Guided Tours	0	0	0	2	**2**
Golf		1	1	3	**5**
Hiking and Walking	9	6	35	5	**55**
Historical and Cultural Attractions	7	11	31	27	**76**
Nature / Scenic	8	3	5	2	**18**
Parks, Gardens and Reserves	1	2	5	1	**9**
Skiing	0	1	1	1	**3**
Snowmobile Tours	1	1	0	0	**2**
Other	0	0	1	1	**2**
Total	**32**	**34**	**97**	**51**	**214**

Source: NLDTCR 2011b, internet site.

Table 15.7.3-14 shows 2011 the number and season of scheduled festivals and events as listed in the tourism guide (NLDTCR 2011b, internet site). There are few festivals and events outside of the summer season and Zone 14 has twice as many events as any of the other zones.

Table 15.7.3-14 Central and Eastern Newfoundland Festivals and Events, 2011

Festivals and Events	Zone 11: Baie Verte / La Scie / Green Bay	Zone 12: Grand Falls-Windsor Area	Zone 14: Gander / Twillingate East to Terra Nova Area	Zone 15: Clarenville / Bonavista Peninsula Area	Total
Winter (November to March)	0	2	0	1	**3**
Spring (April to May)	0	0	0	0	**0**
Summer (June to August)	9	11	24	9	**53**
Fall (September to November)	1	1	4	1	**7**
Total	**10**	**14**	**28**	**11**	**63**

Source: NLDTCR 2011b, internet site.

Table 15.7.3-15 shows the type and number of accommodations available in the RED zones and the region. The majority of accommodations facilities are located in Zone 14 and Zone 15. These zones include Gander and Clarenville which have strong activity in business, meetings and conventions. These zones also include the popular tourism destinations of Twillingate, Fogo and Change Islands, Trinity Bight and Bonavista Peninsula.

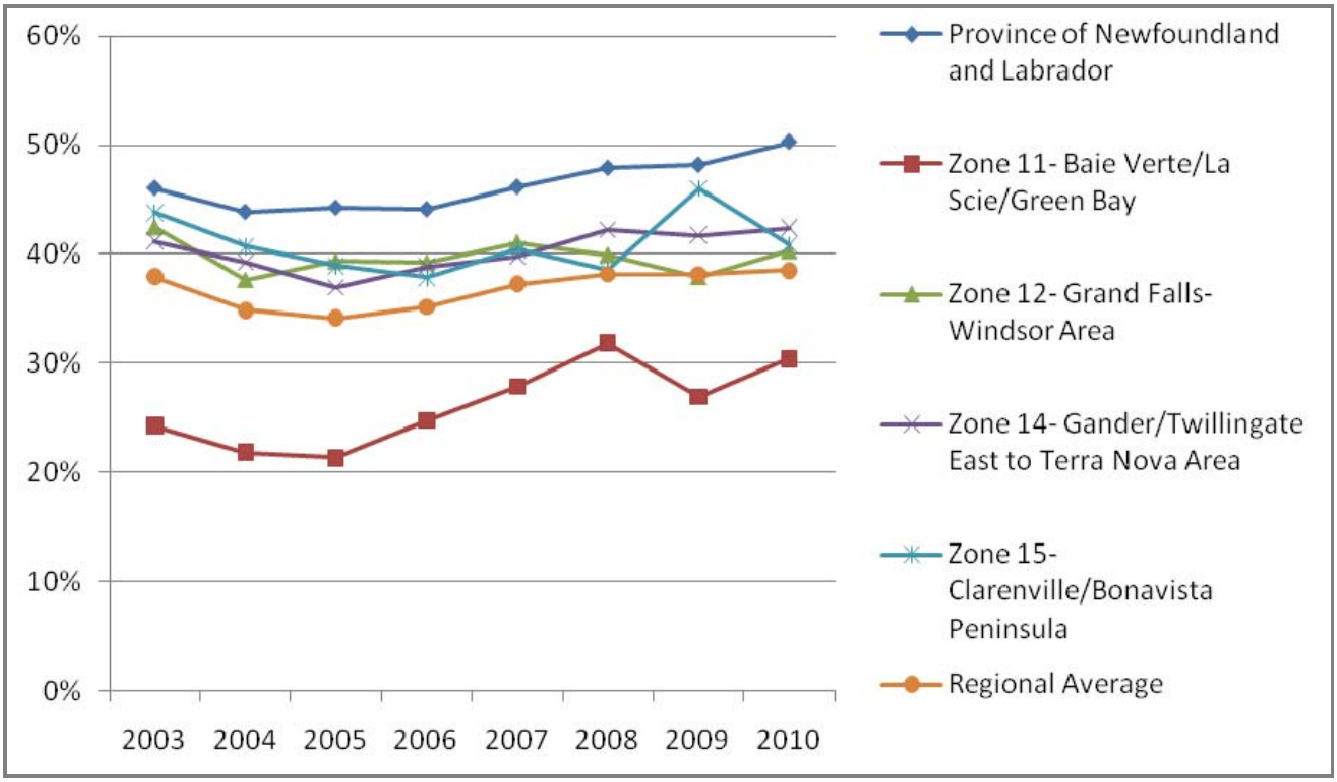
Table 15.7.3-15 Central and Eastern Newfoundland Accommodations, 2011

Accommodations	Zone 11: Baie Verte / La Scie / Green Bay	Zone 12: Grand Falls-Windsor Area	Zone 14: Gander / Twillingate East to Terra Nova Area	Zone 15: Clarenville / Bonavista Peninsula Area	Total
Bed and Breakfasts	7	8	38	26	**79**
Cottages	7	3	37	45	**92**
Inns	2	1	14	5	**22**
Hotels / Motels	5	6	14	7	**32**
Total Facilities	24	26	113	87	**250**
Total Rooms Available in 2010 Peak Month	5,171 (July)	9,052 (July and August)	30,599 (August)	20,502 (August)	**65,255**
Total Rooms Available in 2010 Low Month	4,032 (February)	7,249 (December)	19,766 (February)	9,856 (February)	**40,903**
Total Campgrounds	**3**	**8**	**10**	**4**	**25**

Source: NLDTCR-S 2011b, internet site; NLDTCR 2011b, internet site.

Figure 15.7.3-8 shows annual occupancy rates from 2003 to 2010. The annual regional average accommodations occupancy rate and the Zone 14 rate are consistent with that of the province which is rising steadily (NLDTCR-S 2011b, internet site). Most areas had a lower occupancy rate in 2005 but have recovered and have since experienced increases.

Figure 15.7.3-8 Central and Eastern Newfoundland Accommodations Occupancy Rates, 2003 to 2010



Source: NLDTCR-S 2011b, internet site.

Table 15.7.3-16 shows the occupancy rates by month for accommodations in each of the zones within Central and Eastern Newfoundland in 2010.

Accommodations occupancy rates in 2010 for the Baie Verte and Bonavista Peninsula areas were consistent with the province's high season (June to October). The season was shorter in the Grand Falls-Windsor and Gander to Terra Nova areas.

The Central and Eastern Newfoundland region includes Twillingate, Fogo and Change Islands, Terra Nova National Park, White Hills Ski Resort, Trinity and Bonavista, which are listed in the 2011 tourism guide as top destinations. "Fogo and Change Islands boast some of the most beautiful and culturally rich communities found off Newfoundland's vast coastline (NLDTCR 2011b, internet site). Twillingate, one of the most picturesque communities in Newfoundland and Labrador, boasts unrivalled iceberg and whale sightings" (NLDTCR 2011a, internet site). Table 15.7.3-17 outlines tourism amenities for this area.

Table 15.7.3-16 Central and Eastern Newfoundland Seasonal Accommodations Occupancy, 2010

Month	Province of Newfoundland and Labrador (%)	Zone 11: Baie Verte / La Scie / Green Bay (%)	Zone 12: Grand Falls-Windsor Area (%)	Zone 14: Gander / Twillingate East to Terra Nova Area (%)	Zone 15: Clarenville / Bonavista Peninsula Area (%)
January	33	16	29	28	22
February	39	16	33	28	25
March	42	24	40	40	32
April	44	27	37	37	26
May	44	24	31	37	24
June	57	31	45	45	41
July	72	54	61	60	67
August	71	43	58	66	69
September	58	35	46	48	49
October	51	34	36	40	41
November	46	28	37	34	32
December	33	23	23	25	22
Annual Average	**50**	**30**	**40**	**42**	**41**

Source: NLDTCR-S 2011b, internet site.

Note: The shaded cells indicate those months for which the occupancy rate was near or above the annual average in the relevant zone.

Table 15.7.3-17 Tourism Amenities in Twillingate / Fogo / Change Islands Area Compared with Zone 14

Tourism Amenities	Total Zone 14: Gander / Twillingate East to Terra Nova Area	Twillingate	Fogo and Change Islands
Fixed Roof Accommodations	103	26	8
Campgrounds	10	2	0
Attractions	97	15	12
Festivals	28	3	6

Source: NLDTCR 2011b, internet site.

Twillingate, Fogo and Change Islands are increasingly becoming well known tourism destinations. Twillingate, a scenic traditional outport, is a reliable location to view icebergs. The Shorefast Foundation's work in creating an artists' retreat and high end tourism facilities on Fogo Island is resulting in much acclaim and increased levels of interest in the area. "Trinity Bight allows one to step back in time in this culturally rich ocean side region containing beautifully restored fishing rooms and saltbox houses surrounded by a lovely natural environment" (NLDTCR 2011a, internet site). Table 15.7.3-18 outlines tourism amenities in the Trinity Bight area which is located within Zone 15.

Table 15.7.3-18 Tourism Amenities in the Trinity Bight Area Compared with Zone 15, 2011

Tourism Facilities	Total Zone 15: Clarenville / Bonavista Peninsula Area	Trinity Bight Only
Fixed Roof Accommodations	83	29
Campgrounds	3	0
Attractions	51	26
Festivals	11	3

Source: NLDTCR 2011b, internet site.

Trinity Bight has a cluster of attractions and accommodations. The area features the Town of Trinity which is the location of the Summer in the Bight Theatre Festival and also has historic sites and hiking trails in the vicinity. High quality accommodations and restaurants are located in Trinity and in the surrounding communities.

The tourism industry is active year round in larger communities such as Gander and Clarenville. Destinations like Twillingate, Fogo Island, Change Islands and Trinity Bight are generally active in the summer months from June to September with the greatest activity in July and August. White Hills Ski Resort in Clarenville provides opportunities for activity in the winter months. The clusters of amenities identified in Table 15.7.3-17 and Table 15.7.3-18 and the other destinations are what motivate tourists. These tourism destinations are accessed by ferry and / or from the TCH.

The TCH is the main route through Central and Eastern Newfoundland. From the TCH other highways branch off to the Baie Verte Peninsula, Notre Dame Bay, the Connaigre Peninsula, Bay of Exploits, Twillingate Islands, Bonavista Bay, Eastport Peninsula, Bonavista Peninsula, Burin Peninsula, Trinity Bay and Placentia Bay. Ferries take passengers and vehicles to Little Bay Islands, Long Island, Change Islands, Fogo Island and St. Brendan's (NLDTW 2011b, internet site).

Gander International Airport has flights to and from St. John's, Goose Bay and Halifax. Air Canada is also offering direct summer flights to Toronto. A charter company provides air service from Gander to sun destinations (GIAAI 2011b, internet site; NLDTW 2011c, internet site).

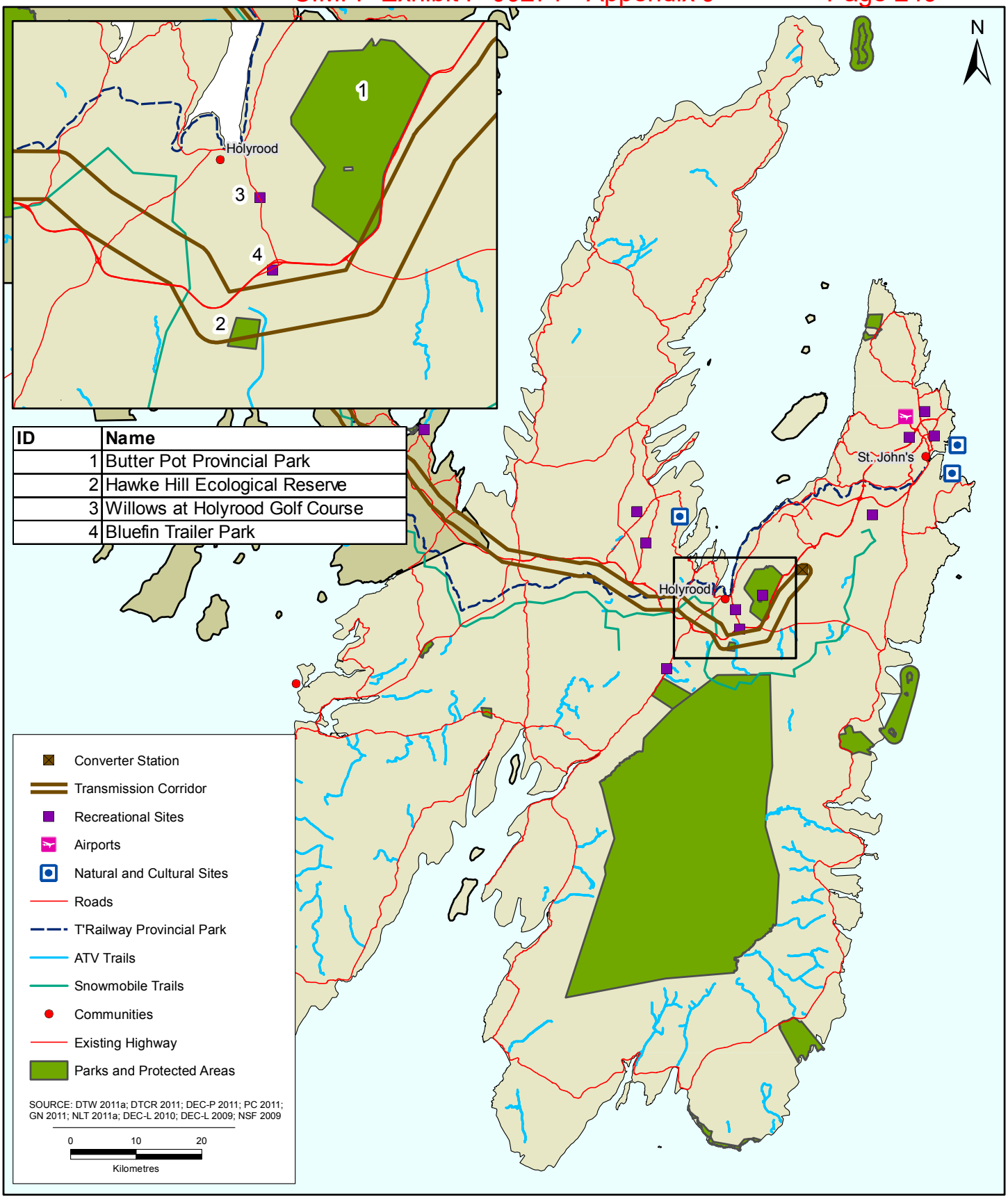
In Central and Eastern Newfoundland, local buses provide transportation between regional service centres such as Grand Falls-Windsor and St. John's. These services operate from Bay d'Espoir, the Bonavista Peninsula, the Burin Peninsula and Trinity Bay (NLDTCR 2011a, b, internet sites). Some tourists use these services.

Cruise ships will visit several Central and Eastern Newfoundland coastal areas in 2011. These include Fogo Island, Bonavista and Trinity (Cruise Newfoundland and Labrador 2011, internet site).

15.7.3.5 Avalon Peninsula

The Avalon Peninsula is the eastern most part of Newfoundland and the location of the City of St. John's. Top natural and cultural destinations (e.g., Cape St. Mary's, Cupids, Brigus, Ferryland, St. John's and George Street) are located in Conception Bay, Placentia Bay, on the Southern Shore and in St. John's) (Figure 15.7.3-9).

Natural attractions include ecological reserves at Cape St. Mary's, Baccalieu Island, Hawke Hill and Witless Bay. The region also encompasses the large Avalon Wilderness Ecological Reserve. Salmonier Nature Park is also located on the Avalon Peninsula (Table 15.7.3-19).



ID	Name
1	Butter Pot Provincial Park
2	Hawke Hill Ecological Reserve
3	Willows at Holyrood Golf Course
4	Bluefin Trailer Park

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FIGURE 15.7.3-9

Select Tourism Attractions - Avalon Peninsula

Table 15.7.3-19 Other Avalon Peninsula Tourism Destinations

Destinations	Description
Baccalieu Island Ecological Reserve	Protects the largest seabird island in Newfoundland and Labrador which, during summer, has more types of breeding seabirds than any other seabird colony in the province
Hawke Hill Ecological Reserve	Contains the most easterly alpine barrens in North America and protects a variety of rare North American arctic-alpine plants
Witless Bay Ecological Reserve	Is home to North America's largest Atlantic puffin colony who nest on four islands: Gull, Green, Great and Pee Pee
Avalon Wilderness Ecological Reserve	Protects barrens and forest ecosystems that are home to the Avalon woodland caribou herd, the most southerly such herd in Canada
Salmonier Nature Park	Offers wildlife rehabilitation, research and environmental monitoring programs at its environmental education centre
Heart's Content Provincial Historic Site	Describes how the first (1870) trans-Atlantic cable office changed outport life
Castle Hill National Historic Site	Interprets the ruins of France's 17th century fortress that are the only infrastructure remains of the French presence in Newfoundland
Hawthorne Cottage National Historic Site	Preserves the home of famous Arctic explorer , Captain Bob Bartlett, including many artifacts and memorabilia from his voyages
Cupids Cove Plantation Provincial Historic Site	Preserves the archaeological site of a former colony which was the first attempt at a permanent English settlement in North America
Cape Spear Lighthouse	Is located on the easterly most point of land in North America, is the oldest surviving lighthouse in the province and is restored to its 1830 appearance to show the lifestyle of the then light keeper and his family
Signal Hill National Historic Site	Celebrates the communications and military history of Signal Hill which was the reception point of the first transatlantic wireless signal by Guglielmo Marconi in 1901 and the site of harbour defences for St. John's from the 18th century to the end of World War II
Commissariat House Provincial Historic Site	Was built between 1818-1820 as the home and offices of the Assistant Commissary General, the supply officer for British forces in Newfoundland
Newman's Wine Vaults Provincial Historic Site	Includes ancient wine vaults where Newman's celebrated port was aged
Quidi Vidi Battery Provincial Historic Site	Recreates the day-to-day lives of soldiers posted to the gun battery on the edge of the Atlantic in the 1800s
Colonial Building Provincial Historic Site	Is home to the longest continuously-operated seat of government in Newfoundland and Labrador and the principal focus of political activity from 1850 to 1933
Butter Pot Provincial Park	Encompasses varied terrain and vegetation including forests, bogs, heaths and ponds and provides camping, hiking, and cross-country skiing opportunities
Marine Drive Provincial Park Reserve	Represents the northeastern barrens subregion and is the newest park reserve in the province

Source: NLDEC-P 2011, internet site; NLDEC 2010, internet site; PC 2011, internet site; NLDTCR 2011c, internet site.

Cultural sites are located throughout the Avalon Peninsula and include Heart's Content Provincial Historic Site in Trinity Bay and Castle Hill National Historic Site near Placentia. Hawthorne Cottage National Historic Site and
5 Cupids Cove Plantation Provincial Historic Site are located in the Cupids and Brigus area. The remaining national and provincial sites are located in St. John's and include Cape Spear Lighthouse and Signal Hill National Historic Sites and provincial historic sites at Commissariat House, Newman's Wine Vaults, Quidi Vidi Battery and the Colonial Building (NLDTCR 2011c, internet site; PC 2011, internet site).

Recreational opportunities (e.g., camping, hiking and cross-country skiing) are available at Butter Pot Provincial Park and the T'Railway Provincial Park. Marine Drive Provincial Park Reserve is located on the Atlantic coast north of St. John's (NLDEC-P 2011, internet site).

Table 15.7.3-20 shows the number of attractions and adventures on the Avalon Peninsula by the appropriate RED zones. The Northeast Avalon which includes St. John's has nearly twice as many attractions and adventures as the Northwest Avalon. The majority of attractions in either of these zones are historic and cultural.

Table 15.7.3-20 Avalon Peninsula Attractions and Adventures, 2011

Attractions and Adventures	Zone 17: North West Avalon	Zone 19: North East Avalon / St. John's	Total
Adventure Tours	0	6	**6**
Boat Tours	1	1	**2**
Family Attractions and Recreation	2	6	**8**
Guided Tours	3	9	**12**
Golf	1	4	**5**
Hiking and Walking	4	8	**12**
Historical and Cultural Attractions	40	43	**83**
Nature / Scenic	0	6	**6**
Parks, Gardens and Reserves	1	4	**5**
Skiing	0	1	**1**
Snowmobile Tours	0	0	**1**
Other	0	9	**9**
Total	**52**	**97**	**149**

Source: NLDTCR 2011a, internet site.

Table 15.7.3-21 shows the number and season of festivals and events for 2011 (NLDTCR 2011a, internet site). The St. John's area has the majority of festivals and events and also some of the largest. These are mainly held from June to August. They include the annual Newfoundland and Labrador Folk Festival, the George Street Festival, the Wreckhouse Jazz and Blues Festival, the Tuckamore Chamber Music Festival and the Royal St. John's Regatta. In 2011, St. John's hosted national and international cultural events such as Festival 500 International Choral Festival and the International Council for Traditional Music 2011 World Conference.

Table 15.7.3-21 Avalon Peninsula Festivals and Events, 2011

Festivals and Events	Zone 17: North West Avalon	Zone 19: North East Avalon / St. John's	Total
Winter (November to March)	2	8	**10**
Spring (April to May)	1	3	**4**
Summer (June to August)	14	40	**54**
Fall (September to November)	1	9	**10**
Total	**18**	**60**	**78**

Source: NLDTCR 2011a, internet site.

Table 15.7.3-22 shows the types and number of accommodations on the Avalon Peninsula. The St. John's area has about twice as many accommodations facilities as the North West Avalon. The most common type is bed and breakfasts. However, St. John's has a number of hotel chains and the largest hotels in the province.

Table 15.7.3-22 Avalon Peninsula Accommodations, 2011

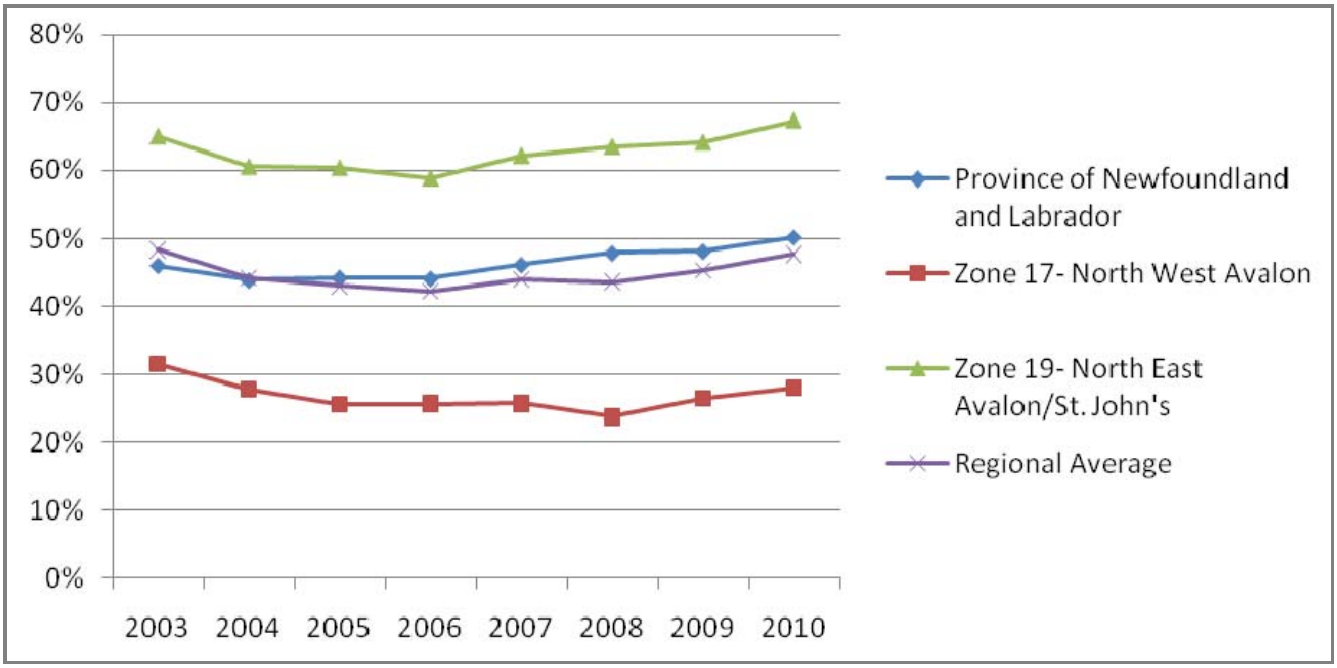
Accommodations	Zone 17: North West Avalon	Zone 19: North East Avalon / St. John's	Total
Bed and Breakfasts	19	45	**64**
Cottages	14	10	**24**
Inns	0	2	**2**
Hotels / Motels	4	19	**23**
Total Facilities	41	80	**121**
Total Rooms Available in 2010 Peak Month	7,240 (July)	77,054 (August)	**83,891**
Total Rooms Available in 3010 Low Month	4,443 (February)	67,732 (February)	**72,175**
Total Campgrounds	**4**	**4**	**8**

Source: NLDTCR-S 2011b, internet site; NLDTCR 2011b, internet site.

Figure 15.7.3-10 shows accommodations occupancy trends from 2003 to 2010 on the Avalon Peninsula. Accommodations occupancy is consistent with the province and within the region. However, the North West Avalon has lower occupancy rates. The St. John's area has a strong year-round tourism industry which is in part based on business, meetings and convention travel.

Table 15.7.3-23 shows occupancy rates by month for accommodations in each of the zones within the Avalon Peninsula in 2010. The shaded cells indicate those months for which the occupancy rate was near or above the annual average for that zone. Consistent with the province but also enhanced by business and convention travel, the Northeast Avalon tourism high season lasts from May to November.

Figure 15.7.3-10 Avalon Peninsula Accommodations Occupancy Rate, 2003 to 2010



Source: NLDTCR-S 2011b, internet site.

Table 15.7.3-23 Avalon Peninsula Seasonal Accommodations Occupancy, 2010

Month	Province of Newfoundland and Labrador (%)	Zone 17: North West Avalon (%)	Zone 15: North East Avalon / St. John's (%)
January	33	16	47
February	39	16	54
March	42	21	54
April	44	19	65
May	44	20	68
June	57	32	83
July	72	51	89
August	71	55	82
September	58	36	77
October	51	18	74
November	46	14	66
December	33	13	47
Annual Average	**50**	**28**	**67**

5 Source: NLDTCR-S 2011b, internet site.

Note: The shaded cells indicate those months for which the occupancy rate was near or above the annual average in the relevant zone.

The main highway route on the Avalon Peninsula is the TCH. A number of other highways branch off to communities in Trinity Bay, Placentia Bay, St. Mary's Bay, Conception Bay and the greater St. John's area.

In summer, the Marine Atlantic ferry service carries passengers and vehicles to and from Argentia (Marine Atlantic 2011, internet site). The Department of Transportation and Works provides passenger and vehicle service from Portugal Cove to Bell Island which is the only Avalon Peninsula community connected by ferry (NLDTW 2011b, internet site).

St. John's International Airport offers flights throughout the province with local and national carriers. Commercial airlines provide direct air services and connecting flights within Canada, to the United States and seasonally to London's Heathrow Airport. Regularly scheduled flights connect to Saint Pierre and Miquelon and charters are available to sun destinations (PAL 2011, internet site; SJIAA 2011a, internet site). In 2010, St. John's Airport broke its previous record with more than 1.3 million passengers (SJIAA 2011b, internet site).

On the Avalon Peninsula, bus services are provided between Conception Bay North, Placentia, the Southern Shore and St. John's (NLDTCR 2011a, internet site; NLDTW 2011c, internet site). No data is available but some tourists use these services to reach a desired destination when rental cars are not available.

The only Avalon Peninsula port scheduled to have cruise visits in the summer of 2011 is St. John's (Cruise Newfoundland and Labrador 2011, internet site). St. John's receives the greatest number of cruise ships and the largest cruise ships that come to the province of Newfoundland and Labrador.

15.7.3.6 Summary

Tourism is an important economic activity throughout Newfoundland and Labrador and it retains money in, and brings new money into, the province. While tourism in other Atlantic provinces is not growing, strong increases in non-resident visitation and spending are evident in Newfoundland and Labrador. The local sector offers a wide variety of tourism experiences in natural areas, cultural attractions and outdoor adventures. Newfoundland and Labrador as a tourism destination along with individual destinations within the province are receiving high profile attention nationally and internationally.

Those economic development zones with top destinations, several destinations and / or a larger number of attractions, events and accommodations (e.g., Zone 7: Gros Morne area, Zone 14: Twillingate, Fogo Island and Change Islands, Zone 15: Trinity and Bonavista and Zone 19: St. John's) have the strongest tourism activity. While tourism occurs year round on the Northeast Avalon Peninsula, visitation to other individual destinations and clusters occurs generally within a four month period (June to September) with the high months being July and August. The exception is the two skiing destinations, Marble Mountain Resort in Zone 8 at the southern part of the Northern Peninsula and White Hills Ski Resort near Clarenville in Zone 15, which provide activities in the winter months.

Economic Zones 7, 14, 15 and 19 include purpose destinations for tourists whether they travel by air, ferry or car to the province or are visiting from within the province. For the most part, all tourists regardless of place of origin use the TCH and the TLH as the main travel routes to visit these destinations (Section 15.3.5).

15.8 Visual Aesthetics

Visual aesthetics of the pre-Project scene is determined by the scenic quality of the landscape and the responses of viewers to that landscape. All landscapes have scenic quality, which varies according to the elements within but the perception of the landscape can vary greatly depending on the type of user viewing the landscape.

In this chapter the visual aesthetics of the existing landscape along the Project corridor are classified using a modified version of the Bureau of Land Management (BLM) Visual Resource Management System (USDI 1984). Twelve key observation points (KOP) were selected along the Project corridor and classified. Visual inventory classes (Classes I to IV) are determined by a scenic quality evaluation and a sensitivity level analysis. The scenic

quality rating is determined by evaluating scenic factors such as landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications that measures visual appeal of a tract of land. The sensitivity levels are the measure of public concern for scenic quality by analyzing sensitivity factors such as type of user, amount of use, public interest, adjacent land uses, and special areas. Once these are complete a classification rating is given to the existing landscapes, which indicates the appropriate level of alteration that the landscape can accommodate (USDI 1984).

Nalcor also used the results of viewshed modelling completed for the Viewscapes Component Study (Stantec 2011c) to understand the potential effects of the Project on the visual aesthetics.

This approach incorporates consideration of landscapes, landscape integrity, aesthetics and wilderness values as requested in Section 4.4.4.4 of the Guidelines. This also considers the avoidance of sensitive areas (e.g., Gros Morne National Park, the Highlands of St. John and the Soufflets Main River) during routing of the corridor, to the extent practical.

15.8.1 Study Area

The discussion of existing baseline conditions for Visual Aesthetics is focused primarily in relation to the transmission corridor from Central Labrador to the Island of Newfoundland's Avalon Peninsula, as well as considering the location of other Project related components and activities. The Study Area is a variable width buffer extending from the Project components to focus on the views from selected KOPs (Figure 15.8.1-1) and considers the 15 km wide corridor along the transmission corridor presented in the Viewscapes Component Study (Stantec 2011c).

15.8.2 Information Sources and Data Collection

The information sources used to determine the existing environment for Visual Aesthetics (i.e., before the Project) included the following:

- The United States Department of Interior (USDI), BLM Visual Resource Management (USDI 1984). The BLM Manual Handbook was the source for the information on the existing environment visual analysis technique.
- The Visual Quality Assessment Interior to Lower Mainland Transmission Project (Golder 2008) was a source for the information on the classification percentage alteration and their objectives.
- Stantec Consulting Ltd. stitched some of the images together to provide a more inclusive view of the KOP.
- The Labrador – Island Transmission Link: Viewscapes Component Study: Conceptual Illustrations and Viewshed Modelling (Stantec 2011c) provided conceptual illustrations of the Project, site-specific photosimulations, and viewshed modelling (i.e., potential number of transmission towers visible, and visual exposure).
- The Labrador – Island Transmission Link Environmental Assessment Registration Project Description report (Nalcor 2009b) was used to understand the scope of the Project.
- The Labrador – Island Transmission Link Ecological Land Classification Final Report (Stantec 2010c) provided the information on the ecological land classification.
- Labrador – Island Transmission Link: Vegetation Supplementary Report (Stantec 2011d) also provided information on the ecological land classification.
- The Labrador – Island Transmission Link: Environmental Impact Statement, Alternative Transmission Corridor Segments for Consideration in the EIS (Chapter 2 of this EIS) was used for information regarding alternative segments of the transmission corridor and alternative KOPs.
- The Labrador – Island Transmission Link: Environmental Impact Statement, Additional Environmental Questions / Issues Identified during EA open houses in April – May 2010 (Nalcor 2010a) and Chapters 7 and 8 of the EIS were used to identify issues raised with respect to the Project.



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FIGURE 15.8.1-1

Key Observation Point Locations and View Orientation

- Government Maps and Data Sets: Annual Average Daily Traffic (AADT) road survey data provided by Works Services in five districts including Labrador (Morrisey 2010, pers. comm.). Itemized lines of data identified by exit numbers or similar were useful to correlate Project transmission corridor - roadway-intersections (Morrisey 2011, pers. comm.).
- The Labrador – Island Transmission Link: Socioeconomic Environment - Communities, Land and Resource Use, Tourism and Recreation (AMEC 2010b) document was used for information related to those components from a visual perspective, including the location of habitations and to pinpoint location coordinates (e.g., latitude and longitude of outfitter camps). Similarly precise locations of highways intersecting the transmission corridor were obtained from these data. Geographic Information Systems (GIS) queries and internet searches were conducted to confirm business names (Integrated Informatics Inc. 2011).
- The Newfoundland and Labrador Statistics Agency (NLDEC-L 2010b) provided information on the location of Crown Land and land allocation.
- The Department of Environment, Lands Division's provincial Land Use Atlas (NLDEC-L 2009) was the source of information for the location of the boundary of the Town of Chapel Arm.
- The Department of Tourism, Culture and Recreation (NLDTCR 2011e, internet site; NLDTCR 2009b) provided information on outfitter destination locations.
- The IATNL (IATNL 2010, internet site) was searched for trail maps; in addition, the IATNL provided information to Nalcor through discussions and consultations.
- Existing stakeholder's (e.g., Riverfront Chalets (2010, internet site); Four Ponds Outfitting (2010, internet site)) information was collected from websites and / or publications (Riverfront Chalets 2010, internet site; Four Ponds Outfitting 2010, internet site).

Fieldwork was conducted at each of the KOPs with images collected of the existing views. Most viewpoints were photographed using a Ricoh 500SE digital camera accessorized with a digital Global Positioning System (GPS) module to record geographic coordinates. To standardize all photographs, the lens focal length was set at 50 mm (or 55 mm). Either focal length approximates the view perceived by the human eye (and is the equivalent of 35 mm film) (BCMF 2001). The camera was mounted on a sturdy, rotating tripod adjusted to 1.5 m height – matching the average adult North American eye level (Humanscale™ Henry Dreyfus Associates 1973). The entire landform image was captured at each KOP by rotating the camera through a 360° panoramic sequence. A digital compass Ricoh module was used to record horizontal view directions. For quality assurance, the team duplicated the record using a handheld GPS and made paper notes on camera latitudes and longitudes. Some images were captured using a Nikon D60 SLR digital camera, with the focal length of 50 mm and a handheld GPS was used to record location.

15.8.3 Visual Aesthetics Analysis Method

The purpose of a visual aesthetics analytical study is to pre-classify scenic landscapes in terms of their vulnerability to visual disruptions. By using a modified version of the Visual Resource Management System (USDI 1984) it is possible to classify the landscape. This describes the relative value of the visual aesthetics of the existing landscape and provides information on levels of disruption to the scenery that are likely to be acceptable. Visual classification objectives are discussed below (USDI 1984):

- Class I: The objective is to preserve the existing landscape character providing for natural ecological evolution.
- Class II: The objective is to retain existing landscape character. The level of change should be minimal and should not attract attention.
- Class III: The objective is to partially retain landscape character. The level of change to the landscape character may be moderate and could attract attention but should not dominate the view.

- Class IV: The objective is to allow for major modifications to landscape character. The level of change may dominate the view.

Once the classification of the landscape is determined this informs the analysis about the percent of alteration or disruption that is likely to be unacceptable (Table 15.8.3-1). The percent alteration can then be calculated by measuring the amount of alteration imposed on the existing landscape character. Depending of the classification of the land the amount of alteration likely to be acceptable will vary (BCMF 2001).

Table 15.8.3-1 Classification of Existing Environments

Classification	Objective	Objective Level of Disruption	Percent Alteration[(a)]
Class I	Preservation	Natural evolutions	0.0%
Class II	Retention	Minor changes	Up to 1.5%
Class III	Partial Retention	Moderate changes	Up to 7.0%
Class IV	Modification	Major changes	Up to 30.0% (not above)

Source: Modified from BCMF 2001.

(a) Percent Alteration: Percent of alteration that is likely to be acceptable (as adapted from BCMF 2001).

Visual inventory classes are represented as Class I through Class IV. Class I is assigned to areas where decisions have been made to maintain a natural landscape such as national parks, historic plaque areas, wilderness and ecological reserves and other designated areas. Classifications II, III, and IV, are assigned using a combination of scenic quality evaluation and a sensitivity level analysis (USDI 1984).

To augment this approach, Nalcor used the results of viewshed modelling completed for the Viewscapes Component Study (Stantec 2011c) to determine the potential effects of the Project on the visual aesthetics. Computer modelling (details provided in Stantec 2011c) was used to generate maps showing the potential number of transmission towers visible from a given location, and the visual exposure (i.e., figures that present the likely visibility of the proposed transmission towers). The conceptual illustrations of Project components in different regions, presented for ground level and elevated views, were also used to inform the assessment.

15.8.3.1 Scenic Quality Evaluation

Scenic quality evaluation is a measure of the visual appeal of a tract of land. This determines the relative worth of the landscape from a visual perception point of view. Although assigning values to visual aesthetics is considered a subjective process, researchers in scenic quality have found a consistent level of agreement among individuals that evaluate scenic quality when using basic design elements to describe and evaluate landscapes. These basic elements of form, line, colour, and texture are incorporated into the scenic quality evaluation to lend consistency to the process (USDI 1984).

In this evaluation existing landscapes are given a rating of A: highest scenic quality, B: moderate scenic quality or C: lowest scenic quality. This rating is determined by evaluating seven key factors: landform, vegetation, water, colour, adjacent scenery, rarity, and cultural modifications using basic design elements (USDI 1984). Key factors for the scenic quality evaluation are described below.

- **Landform**: Landforms may have minuscule or extreme differences in topography. Landforms have many forms such as cliffs with high vertical reliefs, or landscapes with interesting erosional patterns in the land or even a flat marshland. This key scenic quality factor considers the variation in size and shape of landforms.

- **Vegetation**: Plant life within the landscape can create patterns, express form and texture within the landscape. Vegetation may have recurring and spectacular displays or have interesting details such as a wind beaten tree line. This key scenic factor considers the variety of plant life that may or may not create high levels of contrast in the landscape.
- **Water**: Water may or may not add movement to a scene and may have a sense of scale. Water in a landscape can range from a large still waterbody or a flowing cascading waterfall to a small stream that is inconspicuous. This key factor considers the dominance of water in the landscape.
- **Colour:** This refers to the colour of the basic components of the landscape (e.g., water, rock, foliage, cultural interventions, etc.). Colour may be represented as intense rich colours of greens of deciduous foliage or as grey tones of rocky outcrops. This key factor considers the variety and intensity of colour in the landscape.
- **Adjacent Scenery**: The adjacent or backdrop scenery may enhance or detract from the overall impression of the view. A scenic mountain range may have a positive effect on a view whereas an industrial area may have an adverse effect. This key factor considers whether the adjacent landscape enhances or detracts from the landscape.
- **Rarity**: Rarity provides added importance to scenic features that appear to be relatively unique within a region. Rarity may refer to a landscape feature that is unique to the area and that is memorable. The level of rarity depends on the commonality of the feature throughout the region. This key factor considers how distinctive and rare landscape features are within the landscape.
- **Cultural Modifications**: Cultural modifications or manmade forms may enhance or detract from the landscape. This key factor considers whether the cultural modification adds favourably to the visual variety that promotes visual harmony in the landscape.

Once the scenic features have been placed into the seven key factors, they are then placed into one of 3 sub categories for each of the key factors. The 3 sub-categories represent high, moderate and low scenic quality of that particular key factor. Each key factor is then given a score, the higher the score the better the scenic quality of the quality factors. These scores are then added together to give the scenic quality rating. A scenic quality rating of A is the highest rating with a score of 19 or more, meaning the scenic quality is favourable. A scenic quality rating of B is a moderate rating with a score from 12 to 18, meaning the scenic quality is moderately favourable. A scenic quality rating of C is the lowest rating with a score of 11 or less, meaning the scenic quality is not favourable. These scores were taken from the rating criteria used by the USDI (1984). Table 15.8.3-2 provides the specific scores for each key factor and the rating criteria.

Table 15.8.3-2 Scenic Quality Evaluation Rating Criteria and Score

Quality Factors	Rating Criteria and Score		
Landform	Variation in size and shape of landforms with extreme changes in topography **Score: 5 or 4**	Variation in size and shape of landforms with noticeable changes in topography **Score: 3 or 2**	Little or no variation of size or shape of landforms with little or no change in topography **Score: 1 or 0**
Vegetation	A variety of types with contrasting form, texture and pattern **Score: 5 or 4**	Some variety and contrast in form, texture and pattern **Score: 3 or 2**	Little or no variety or contrast in form, texture and pattern **Score: 1 or 0**

Table 15.8.3-2 Scenic Quality Evaluation Rating Criteria and Score (continued)

Quality Factors	Rating Criteria and Score		
Water	Flowing or still, which is a dominant feature **Score: 5 or 4**	Flowing or still, but not a dominant feature **Score: 3 or 2**	Absent or present, not a noticeable feature **Score: 1 or 0**
Colour	Rich colour combination, variety or vivid colour **Score: 5 or 4**	Some intensity or variety in colours **Score: 3 or 2**	Subtle muted tones **Score: 1 or 0**
Influence of Adjacent Scenery	Adjacent scenery greatly contributes to overall visual quality **Score: 5 or 4**	Adjacent scenery moderately contributes to overall visual quality **Score: 3 or 2**	Adjacent scenery has little or no influence on overall visual quality **Score: 1 or 0**
Rarity	Distinctive and very rare within region **Score: 5+[(a)] or 4**	Distinctive but similar to others within the region **Score: 3 or 2**	Common within the region **Score: 1 or 0**
Cultural Modifications	Modifications promoting visual harmony **Score: 2 or 1**	Modifications promoting neither visual harmony nor disharmony **Score: 0 or -1[(b)]**	Modifications promoting visual disharmony **Score: -2 to -4[(b)]**

Source: USDI 1984.

(a) A rating of greater than 5 in Rarity may be given but requires exceptional justification.

(b) Quality Rating for Cultural Modifications is scored plus or minus.

15.8.3.2 Sensitivity Level Analysis

Sensitivity levels are a measure of public concern for scenic quality. Existing landscapes are given a rating of highly sensitive, moderately sensitive or low level of sensitivity. There are five key factors considered when measuring the level of public concern: type of user, amount of use, public interest, adjacent land uses and special areas. Key factors for the sensitivity level analysis are described below (USDI 1984):

- **Type of Users:** Visual sensitivity will vary with the type of user. Recreational sightseers and indigenous populations may be highly sensitive to any disruptions in natural scenery, whereas commuters / shoppers who travel a road to and from a municipal service centre regularly may take no notice of changes in the landscape along the commuter route. This key factor considers the level of sensitivity of the user group.
- **Amount of Use:** Visual sensitivity will vary with the amount of users and frequency of use. Areas seen and used by large numbers of people have a high level of visual sensitivity as opposed to a site rarely seen by the public. This key factor considers how often the area is seen and used by the public.
- **Public Interest:** Concerns about the visual quality of the landscape may be articulated by local, regional or provincial organizations. Specific concerns are presented in public meetings, controversially described in regional newspapers, provincial magazine articles, current newsletters or regulated in land use policies. This key factor considers public issues or concern for the scenic value of the landscape.

- **Adjacent Land Uses:** The interrelationship with land uses of adjacent lands can affect the visual sensitivity of an area. For example, views from a hunting lodge may be sensitive, whereas views from land neighbouring an industrial area may not be sensitive at all. This key factor considers the visual sensitivity of the public from adjacent landscapes.
- **Special Areas:** Special areas such as parks, heritage or historic sites, scenic trails, ecological reserves may or may not necessarily be scenic but still be necessary to preserve the natural landscape setting. This key factor considers if the area is a special area.

Once the sensitivity levels are addressed and have been placed into the five key factors, they are then placed into one of 3 sub categories for each of the key factors. The 3 sub-categories represent high, moderate and low sensitivity rating of that particular key factor. After this has been done for all five factors an overall value is determined by the amount of low to high values. These values were taken from the rating criteria used by the USDI (1984). See table 15.8.3-3 for each key factor and rating criteria.

Table 15.8.3-3 Sensitivity Level Analysis Rating Criteria and Score

Sensitivity Factors	Sensitivity Rating Criteria		
	High	**Moderate**	**Low**
Type of Users	Highly sensitive	Moderately sensitive	Low level of sensitivity or not sensitive
Amount of Use	Often seen and used by a large number of people	Moderately seen and used by a large number of people	Not seen or used by many people
Public Interest	Major public issue	Moderate public issue	Minor public issue or no public issue
Adjacent Land Uses	Highly sensitive	Moderately sensitive	Low level of sensitivity or not sensitive
Special Areas	Special area with specific reference to visual quality	Special area with no specific reference to scenic quality	No designated special area

Source: Modified from USDI 1984.

15.8.3.3 Classification of Landscapes

Once the scenic quality rating and the sensitivity level have been determined each landscape can be classified, by combining both values to determine which class the landscape fits into. The scenic quality rating values of A, B, C convert to 2, 1, 0. The sensitivity analysis values of high, moderate and low are converted to 2, 1, 0 as well. These scores are added together to provide a total to determine the classification. A total of 3 or more is Class II, a total of 2 is Class III, a total of 1 or 0 is Class IV. As mentioned earlier, Class I is assigned to areas where decisions have been made to maintain a natural landscape such as national parks, historic plaque areas, wilderness and ecological reserves and other designated areas (USDI 1984). None of the KOP for this report has been assigned a Class I.

15.8.4 Analysis and Interpretation of the Pre-Project Existing Environment

The visual aesthetics of the Study Area are influenced by the variations in topography, vegetation composition and related colors, and waterbody / wetland characteristics (e.g., ponds, rivers, bogs). The Project, including the transmsission corridor and the locations of other Project components (e.g., converter stations, access, shoreline electrode sites) cross areas of the province that are natural and remote from urban centres. Some of these areas offer pristine landscapes and noteworthy viewscapes. The Project components also cross areas of the province that support communities and areas that have been disturbed for forestry, transportation and

other infrastructure, and tourism and recreational facilities; details are provided in Section 15.5, Land and Resource Use.

Much of the region of Labrador crossed by the Project remains in a natural condition. The area immediately along the lower Churchill River is comprised primarily of undulating, upland topography and coastal plain, with flat river terraces. The lower Churchill River valley is highly productive, with boreal plant species assemblages including large conifers such as white and black spruce and balsam fir, and associated deciduous species and understory vegetation typical of the boreal forest.

Moving south-east, the landscape is initially characterized by rolling terrain and broad river valleys covered by drumlins and eskers. The vegetation is comprised mostly of fairly open black spruce forests, with extensive ribbed fen and string bog complexes, and sporadic hardwoods and lichen-covered wooded areas on drier sites.

The Eagle River Plateau is a flat to rolling upland area comprised of large peatlands, interrupted by glacial landforms and shallow river valleys. Extensive string bogs with considerable open water are surrounded by fen vegetation dominated by sedge grasses and moss. Patches of scrub black spruce and associated plants and mosses are also interspersed throughout. Infrastructure in this region includes the TLH3 which the transmission corridor follows for approximately 100 km.

Along the coastal strip adjacent to the Strait of Belle Isle, low hills throughout the area are covered primarily with barren vegetation and pockets of scrub spruce and bog.

The Labrador section of the proposed transmission corridor will cross and / or be located adjacent to a number of watersheds, including the Churchill, Kenamu, Mecatina, St. Augustine, St. Paul, Pinware and Forteau rivers. Watercourse crossings range in size from small, seasonal or intermittent streams to much larger rivers, each offering a characteric viewscape.

The coast along the Labrador side of the Strait of Belle Isle is steep and rises to flat-topped ridges and summits from approximately 300 to 400 metres (m) above sea level. This windswept landscape offers rugged coastline viewscapes with the waters of the Strait of Belle Isle adding contrast with blue colors and the action of the waves. In the winter, the formation of ice creates stark constrast with the water and the land. Infrastructure such as the Labrador Straits Highway is in this area, and follows the coastline. Noteworthy views within this region include the Point Amour Lighthouse. Communities also dot the coastline in this area.

The Newfoundland coast is much lower, with shorelines rising to approximately 30 m. The contrast of the coastline with the colors and the action of the water of the Strait of Belle Isle enhances the viewscapes.

The north-western edge of the Northern Peninsula, along the Strait of Belle Isle, is a rocky, flat coastal stretch. Calcareous bedrock is common, and the area is covered by shallow soils with extensive areas of exposed bedrock. The vegetation cover is comprised almost exclusively of barren and tundra-like assemblages, with alternating dry barrens and shallow fens. Communities are located along the coastline, as is Highway 430 which generally follows the coastline to Deer Lake.

Along the western side and interior portions of the Northern Peninsula, coastal, forested and barren areas are present. Much of the interior is dominated by mountainous, highland areas and plateaus associated with the Long Range Mountains, with mostly barren vegetation and shallow ribbed fen and tuckamoor dominating the landscape. Along the western edge of the Northern Peninsula, the lower portions of the Long Range Mountains are characterized by forested areas along the slopes and a flat coastal plain supporting bogs and scrub vegetation. The Highlands of St. John and the Soufflets-Main River are located in this region, as is the Gros Morne National Park, all of which were avoided during initial routing of the corridor. This region also has areas of forestry activity, including cutovers, roads and trails, as well as several outfitter camps and cottage areas.

The topography of Central and Eastern Newfoundland is predominantly low and rolling. This is also the most heavily forested and distinctly boreal of any part of Newfoundland, with pure black spruce forests, and white birch and aspen stands, as well as dwarf shrub heath. This region includes human disturbances related to highways (e.g., TCH; Highway 360), power transmission lines, the larger communities of Grand Falls-Windsor and Clarenville, forestry cutovers, roads and trails, numerous outfitter camps and cottages.

As the proposed transmission line corridor nears the Avalon Peninsula, it passes through an area of extensive maritime barrens. The isthmus and the western and northern portions of the Avalon Peninsula are characterized by undulating terrain with extensive areas of barren heath, small pockets of forest in sheltered valleys (particularly in the north), and bogs and shallow fens interspersed throughout. The transmission corridor in this region follows existing transmission lines and highways in several areas, and there are several small communities and cottage areas.

The sheltered, central portion of the Avalon Peninsula is characterized by low elevations and hilly terrain with numerous lakes and bogs. The high precipitation and frequent fog can affect the visibility in the region. The region is forested, and exhibits distinctive vegetation patterns which include pure stands of balsam fir–fern forests with a mixture of yellow birch, scrub black spruce forests with peatmoss understory and ericaceous shrubs, and convex raised bogs.

The eastern portion of the Project (e.g., transmission corridor, Soldiers Pond converter station, Dowden's Point shoreline electrode site) lies in a more densely populated area of the province, with the associated communities, cottages, highways, roads, and power transmission lines.

Recognizing the diversity of the viewscapes in the Study Area, Nalcor selected the KOPs as a representative sample of these viewscapes. In this section, the landscape classification of the images taken at each of the 12 KOPs is determined. The KOPs represent a series of points along a travel route where the Project will likely be most noticeable. The KOPs were selected to represent the regions crossed by the Project, including Central and Southeastern Labrador, Northern Peninsula, Central and Eastern Newfoundland and the Avalon Peninsula. Based on visibility and viewer sensitivity, the study team selected KOPs that offer the least obstructed view, most representative view, view likely to be seen by the greatest number of people and / or the worst-case scenario of the Project. Locations of the KOPs and why that location was chosen are provided in Table 15.8.4-1.

The KOPs listed are shown in Figure 15.8.1-1. The red dot on the map shows the location of where the images were taken from and the dashed lines show the direction of the image.

Table 15.8.4-1 Key Observation Point and Reason for Selection

KOP[(a)]	Location / Region	Reason for Selection
01	Kenamu River / Central and Southeastern Labrador	– Kenamu River crossed by the Trans-Labrador Highway, Phase 3 (TLH3) – Recreational use – Area of interest based on consultation with stakeholders
02	Trans Labrador Highway Phase 3 (TLH3) / Central and Southeastern Labrador	– TLH3 – Area of interest based on consultation with stakeholders
03	Forteau Point / Central and Southeastern Labrador	– Crossing area near existing highways and communities
04	Portland Creek Pond / Northern Peninsula Newfoundland	– Outfitters, boating, International Appalachian Trail
05	Rack Lake / Northern Peninsula Newfoundland	– Outfitters, high land, minimal tree cover

Table 15.8.4-1 Key Observation Point and Reason for Selection (continued)

KOP[(a)]	Location / Region	Reason for Selection
06	Four Ponds / Northern Peninsula Newfoundland	– Outfitters, International Appalachian Trail
07	Birchy Lake / Central and Eastern Newfoundland	– Main highway route, recreation area
08	Buchans Highway / Central and Eastern Newfoundland	– Tall tree cover, community road, Exploits River
09	Exploits River / Central and Eastern Newfoundland	– Recreational rafting, River Front Chalet, Exploits River
10	Chapel Arm / Avalon Peninsula Newfoundland	– Community entry road off Trans-Canada Highway (TCH)
11	Witless Bay Line / Avalon Peninsula Newfoundland	– Existing transmission line, silhouettes on flat expanse of land
12	Soldiers Pond / Avalon Peninsula Newfoundland	– Converter station near TCH

Source: Stantec (2011a, b).
[(a)] KOP = Key Observation Point

15.8.4.1 KOP 01, Kenamu River, Central and Southeastern Labrador

KOP 01 is at the Kenamu River in Central and Southeastern Labrador (Figure 15.8.1-1; Photograph 15.8.4-1). The view is looking south by south-west. The image is of a broad river with rapids, with black spruce forest on both sides. This area has been ecologically classified as a Low Subarctic Forest-Mecatina River Ecoregion in the Taiga Shield Ecozone. Broad river valleys and rolling hills that are covered by shallow till, drumlins and eskers are the characteristic of the region. Somewhat open black spruce forests are the dominant vegetation (Stantec 2011d; Stantec 2010c). Out of the picture to the left is a bridge for the TLH3 that crosses the river. Recreational activities (e.g., fishing, boating and hunting) occur on and in the vicinity of the Kenamu River.



Photograph 15.8.4-1 KOP 01 Kenamu River Existing Environment
Note: Photograph taken June 2011, Central and Southeastern Labrador, N 52.84615 W 60.15177.

The image of KOP 01 reveals a rugged landscape character of a distinct band of water that cuts directly through image, flanked by dense vegetative mass. The water has two parallel edges that converge and curves into a vanishing point. The flowing water is a dominant feature with rapids creating white peaks as the water flows quickly over and around slightly protruding boulders. The water ranges in colour from deep blue to light blue to white. There is a finely textured, tan to brown mix of low vegetation running along the river's edge. The dense trees stand perpendicular to the bank and are course in texture and uniform in shape. The scenic quality evaluation for KOP 01 is provided in Table 15.8.4-2.

Table 15.8.4-2 Scenic Quality Evaluation for KOP 01 Kenamu River

Quality Factors	High	Moderate	Low	Explanation
Landform	–	2	–	Some variation in landforms and changes in topography
Vegetation	–	2	–	Contrast in texture
Water	4	–	–	Flowing dominant feature
Colour	–	3	–	Some intensity and variety in colours
Adjacent Scenery	–	–	0	Adjacent scenery is not visible or has no influence
Rarity	–	3	–	Distinctive
Cultural Modifications	–	–	-2	Road and bridge promote disharmony
Subtotal	*4*	*10*	*-2*	*4 + 10 + (-2) = 12*
Scenic Quality Rating[(a)]				**B**

Source: Based on USDI 1984.
– No data necessary.
(a) Scenic quality rating: A for a score of 19 or more; B for a score from 12 to 18; and C for a score 11 or less.

The landform was given a moderate score of 2 because the variation of landforms in the image are subtle and are not considered dramatic. The vegetation was given a moderate score of 2 because there is little variety. Water was given a high score of 4, as it is the dominant feature of the space. Colour was given a moderate score of 3 because the blues, browns and greens are not that varied or dramatic. Adjacent scenery was given a low score of 0 because it is similar to that in the image. Landscape rarity was given a moderate score of 3 because the scene is distinctive but similar to others in the region. Cultural modification to the area was given a low score of -2 because the bridge that crosses the river nearby (not seen in image) creates visual disharmony. The total score is 12, which results in a scenic quality rating of B (moderate) for the KOP 01 landscape.

The sensitivity level analysis for KOP 01 is provided in Table 15.8.4-3.

Table 15.8.4-3 Sensitivity Level Analysis for KOP 01 Kenamu River

Type of User	Number	Public Interest	Adjacent Land Use	Special Area	Overall Rating
Moderate	Low	Low	High	Low	**Moderate**

Source: Based on USDI 1984.

The sensitivity level analysis was given an overall moderate rating. The level of sensitivity of type of user was given a moderate score as the user group is mixed with highway drivers and recreational users. The amount of use was given a low score as the AADT is 144 (Morrisey 2010, pers. comm.) which indicates that the area is not frequently visited by a large number of people. The public interest for this site was given a low score, as it was not raised as a point of concern during public consultation (Nalcor 2010a and Chapters 7 and 8 of the EIS). The adjacent land use was given a high score because the recreational use of the Kenamu River. The special area was given a score of low, as there is no special area designated surrounding the river. The overall sensitivity rating for KOP 01 is moderate.

The landscape classification for KOP 01 is provided in Table 15.8.4-4.

Table 15.8.4-4 Classification for KOP 01 Kenamu River

Classification Factors	Rating	Value
Scenic Quality	B	1
Sensitivity Level	Moderate	1
Total		**2**
Classification		**III**

Source: Based on USDI 1984.
Note: Quality Rating convert to values, A converts to 2, B converts to 1, C converts to 0.
Sensitivity Level values (High-Moderate-Low) are 2, 1, 0.
A total value of 3 or more is Class II; total of 2 is Class III; and total of 1 or 0 is Class IV.

The landscape for KOP 01, Kenamu River, is a Class III. This landscape should partially retain the existing landscape character and the level of change may be moderate and could attract attention but should not dominate the view.

15.8.4.2 KOP 02 Trans - Labrador Highway Phase 3, Central and Southeastern Labrador

KOP 02 along the TLH3 is located in Central and South Eastern Labrador (Figure 15.8.1-1; Photograph 15.8.4-2). The view is to the south by south-east. This area has been ecologically classified a Low Subarctic Forest – Mecatina River Ecoregion transitioning into the String Bog – Eagle River Plateau Ecoregion in the Taiga Shield Ecozone. Rolling hills covered by shallow till, drumlins and eskers in a somewhat open black spruce forest are mixed with bog hummocks and peatland expanses, dominated by Labrador tea and feathermoss (Stantec 2011d; Stantec 2010c). In 2010, the opening of the final phase of the TLH completed the connection of this highway to Happy Valley - Goose Bay in Central Labrador. This image shows the new highway in the foreground and the black spruce and peatland expanse in the background.



Photograph 15.8.4-2 KOP 02 TLH3 Existing Environment

Note: Photograph taken June 2011, Central and Southeastern Labrador, N 52.77637 W 59.94086.

The visual landscape character of KOP 02 shows a focal point of a band created by the roadway dividing the image into two contrasting spaces. The roadway crosses the image diagonally in a straight line. A course granular foreground in shades of grey butts up against the compacted smooth tan roadway and then transitions into a dense, coarse, jagged forest line. The dark vegetative mass is coarse in texture with sharp pointy edges. The vertical lines of the trees are perpendicular to the highway, in the middle ground. The jagged tips of the spruce trees silhouette against the beige backdrop of low, smooth groundcover of the peatland. The vegetation in the distance is dense but with a medium texture. The wavy horizon line has a fuzzy edge created by the trees silhouetted against the sky. A rolling landscape can be seen in the picture peaking over the edge of the ridge. The scenic quality evaluation for KOP 02 is provided in Table 15.8.4-5.

Table 15.8.4-5 Scenic Quality Evaluation for KOP 02 TLH3

Quality Factors	High	Moderate	Low	Explanation
Landform	–	–	1	Rolling hills are not dramatic
Vegetation	–	3	–	Some contrast in variety and texture
Water	–	–	0	Absent feature
Colour	–	3	–	Some intensity and variety in colours
Adjacent Scenery	–	–	1	Barely visible and is similar in character
Rarity	–	–	1	Common within region
Cultural Modifications	–	–	-2	Road promotes disharmony
Subtotal	*0*	*6*	*1*	*0 + 6 + 1 = 7*
Scenic Quality Rating[(a)]				**C**

Source: Based on USDI 1984.

– No data necessary.

(a) Scenic quality rating: A for a score of 19 or more; B for a score from 12 to 18; and C for a score 11 or less.

The landform was given a score of low score of 1 because the rolling represent changes in the topography but they are not dramatic. The vegetation was given a moderate score of 3 because of the variety in texture and pattern. Water was given a low score of 0 as none is visible in the image. Colour was given a moderate score of 3 because of the contrast of the cool hue of green trees against the warm hue of beige peatland and the grey rock from the roadway. Adjacent scenery was given a low score of 1 because it is barely visible and is similar in character. Rarity was given a low score of 1 because the scene is similar to others throughout the region. Cultural modification to the area was given a low score of -2 because the roadway dominates the picture and causes visual disharmony. The total score is 7, which results in a scenic quality rating of C (low) for the KOP 02 landscape.

The sensitivity level analysis for KOP 02 is provided in Table 15.8.4-6.

Table 15.8.4-6 Sensitivity Level Analysis for KOP 02 TLH3

Type of User	Number	Public Interest	Adjacent Land Use	Special Area	Overall Rating
Moderate	Low	Low	Low	Low	**Low**

Source: USDI 1984.

The sensitivity level analysis was given an overall low rating. The level of sensitivity of type of user was given a moderate score as the user group is mixed travellers on TLH3. The amount of use was given a low score, as the daily AADT is 144 (Morrisey 2010, pers. comm.) which indicates that the area is not frequented by a large number of people. The public interest for this site was given a low score, as it has not been raised as a point of concern (Nalcor 2010a and Chapters 7 and 8 of the EIS). The adjacent land use was given a low score, as it is a

similar view. The special area was given a low score, as this is not a sensitive area. The overall sensitivity rating for KOP 02 is low.

The landscape classification for KOP 02 is provided in Table 15.8.4-7.

Table 15.8.4-7 Classification for KOP 02 TLH3

Classification Factors	Rating	Value
Scenic Quality	C	0
Sensitivity Level	Low	0
Total		**0**
Classification		**IV**

Source: Based on USDI 1984.
Note: Quality Rating convert to values, A converts to 2, B converts to 1, C converts to 0.
Sensitivity Level values (High-Moderate-Low) are 2, 1, 0.
A total value of 3 or more is Class II; total of 2 is Class III; and total of 1 or 0 is Class IV.

The landscape for KOP 02, TLH3 is a Class IV. This landscape can accommodate major modifications (no more than 30%) to the landscape character and the level of change may dominate the view.

15.8.4.3 KOP 03 Highway 530 near Forteau Point, Central and Southeastern Labrador

KOP 03 is of Highway 530 near Forteau Point in Central and Southeastern Labrador (Figure 15.8.1-1; Photograph 15.8.4-3). This view is to the north. This area has been ecologically classified as the Forteau Barrens Ecoregion in the Boreal Shield Ecozone. It is located at the southern-most tip of Labrador, near the Straight of Belle Isle. There are low hills covered in scrub spruce, crowberry barren and slope bogs (Stantec 2011d; Stantec 2010c). Tree growth is limited because of strong winds, wet soil, and a history of repeated burns. This image shows that the terrain is flat, rising slightly to the north. The existing landscape is enveloped in a dense growth of low foliage and is almost treeless. An existing transmission line ROW supporting wooden power poles runs parallel to Highway 530. Highway 530 in the foreground carries all the vehicle traffic (i.e., domestic, freight and tourism) in both directions along the coast. In 2010, the opening of the final phase of the TLH completed the connection of this highway to Happy Valley-Goose Bay in Central Labrador.



Photograph 15.8.4-3 KOP 03 Highway 530 near Forteau Point Existing Environment

Note: Photograph taken September 2010, Central and Southeastern Labrador, N 51.46387 W 56.97446.

The image of KOP 03 reveals is a landscape character consisting of a roadway and two dense vegetative blocks that are separated by the existing transmission line ROW. Landform is nearly flat and the horizon line dominates. The roadway line cuts the bottom of the view diagonally and there are five vertical line power poles. In the distance, sparse trees create a fuzzy silhouette outline against the sky. There is beige vegetation and grey pavement with yellow and white lines. The landform is uneven in texture with a smooth roadway and coarse vegetation mass broken up by fine textured vegetation. The vegetation hugs the ground and takes a form of rounded shapes of sharp dense shrubs that are separated by low, flat, dried grass patches. The vegetative horizon line undulates slightly. The scenic quality evaluation for KOP 03 is provided in Table 15.8.4-8.

Table 15.8.4-8 Scenic Quality Evaluation for KOP 03 Forteau Point

Quality Factors	High	Moderate	Low	Explanation
Landform	–	–	1	Little variation and topography
Vegetation	–	2	–	Some contrast in variety and texture
Water	–	–	0	Absent feature
Colour	–	2	–	Some intensity and variety in colours
Adjacent Scenery	–	–	0	Moderately contributes
Rarity	–	–	1	Common within region
Cultural Modifications	–	–	-3	Promotes disharmony
Subtotal	*0*	*4*	*-1*	*0 + 4 + (-1) = 3*
Scenic Quality Rating[(a)]				**C**

Source: Based on USDI 1984.

– No data necessary.

(a) Scenic quality rating: A for a score of 19 or more; B for a score from 12 to 18; and C for a score 11 or less.

The landform was given a low score of 1 because there is little change in topography. The vegetation was given a moderate score of 2 because there is some variety in form and pattern. Water was given a low score of 0 as none is visible in the image. Colour was given a moderate score of 2 because of the contrast of the cool hue of green shrubbery to the warm hue of the beige grasses. Adjacent scenery was given a low score of 0 because there are similar views throughout the landscape. Rarity was given a low score of 1 because the scene is common in the region. Cultural modification to the area was given a low score of -3 because the transmission poles and roadway dominate the picture and cause visual disharmony. The total score is 3, which results in a scenic quality rating of C (low) for the KOP 03 landscape.

The sensitivity level analysis for KOP 03 is provided in Table 15.8-4-9

Table 15.8.4-9 Sensitivity Level Analysis for KOP 03 Forteau Point

Type of User	Number	Public Interest	Adjacent Land Use	Special Area	Overall Rating
Moderate	Low	Low	Low	Low	**Low**

Source: Based on USDI 1984.

The sensitivity level analysis was given an overall low rating. The level of sensitivity of type of user was given a moderate score as the user group is mixed travellers on Highway 530. The amount of use was given a low score, as the daily AADT is 170 (Morrisey 2010, pers. comm.), which indicates that it is not frequently visited by a large number of people. The public interest for this site was given a low score, as it was not raised as a point of concern (Nalcor 2010a and Chapters 7 and 8 of the EIS). The adjacent land use was given a low score, as the adjacent land use is same as in the image. The special area was given a score of low, as this is not a sensitive area. The overall sensitivity rating for KOP 03 is low.

The landscape classification for KOP 03 is provided in Table 15.8.4-10.

Table 15.8.4-10 Classification for KOP 03 Forteau Point

Classification Factors	Rating	Value
Scenic Quality	C	0
Sensitivity Level	Low	0
Total		**0**
Classification		**IV**

Source: Based on USDI 1984.

Note: Quality Rating convert to values, A converts to 2, B converts to 1, C converts to 0.
Sensitivity Level values (High-Moderate-Low) are 2, 1, 0.
A total value of 3 or more is Class II; total of 2 is Class III; and total of 1 or 0 is Class IV.

The landscape for KOP 03, Highway 530 near Forteau Point, is a Class IV. This landscape can accommodate major modifications (no more than 30%) to the landscape character and the level of change may dominate the view.

15.8.4.4 KOP 04 Portland Creek Pond and Inner Pond, Northern Peninsula of Newfoundland

KOP 04 of Portland Creek Pond and Inner Pond is on the Northern Peninsula of Newfoundland (Figure 15.8.1-1; Photograph 15.8.4-4). This view is to the north-east. This area has been ecologically classified as the Northern Long Range Subregion of the Long Range Barrens Ecoregion in the Boreal Shield Ecozone. This subregion encompasses a mountainous area above the tree line. Stunted larch and black spruce dominate the area. Vegetation is primarily alpine barren, dominated by arctic-alpine plants. Shallow ribbed fen and slope bogs cover extensive areas (Stantec 2010c).

This image was taken from the top of a cliff overlooking Portland Creek Pond (on the left, west) and Inner Pond, with the western edge of the Long Range Mountains as a backdrop. The Long Range Mountains on the horizon have eroded into rolling, rugged hills supporting a boreal forest cover. The middle ground has a series of bogs dotting the space and is surrounded by dense treed vegetation. Portland Creek Pond (on the left, west) is a notable expanse of open water that is linked by narrows to Inner Pond. There are spaces to the right (not seen in picture) around the ponds with dramatic 60 m high rock cliff edges. The naturalistic scenery appears pristine. There is no obvious sign of habitation or settlements but Hynes' Camp (non-remote hunting lodge) is more than 50 m below the foreground cliff (not seen in image).



Photograph 15.8.4-4 KOP 04 Portland Creek Pond and Inner Pond Existing Environment

Note: Photograph taken June 2010, Northern Peninsula of Newfoundland, N 50.16545 W 57.48345.

The image of KOP 04 shows a landscape character of waterbodies, mountains and rolling landforms. Landform in this area is a mix of asymmetrical convex bumps as the terrain rises to rounded mountains. A channel links two open water bodies with a reflective expanse of the sky. Wavy lines of the mountains mimic the wavy lines of the edge of the waterbodies. The mountains are hazy dark blue and the sky and water is pale blue. There are a variety of textures in the image with velvety vegetation, glossy smooth waterbodies and rough mountains. Medium-textured vegetative cover has small, spiky shapes with dense growth up to the water's edge. The colour is a mix of greens and some gold and blue. The scenic quality evaluation for KOP 04 is provided in Table 15.8.4-11.

Table 15.8.4-11 Scenic Quality Evaluation for KOP 04 Portland Creek Pond and Inner Pond

Quality Factors	High	Moderate	Low	Explanation
Landform	4	–	–	Variation is size and shape with extreme changes in topography
Vegetation	–	3	–	Variety of vegetation creating pattern
Water	4	–	–	Defined, large, dominant still water
Colour		3	–	Variety of colours with some contrast
Adjacent Scenery		3	–	View of ponds and mountains enhances visual quality, but is similar to the scene
Rarity	-	3	–	Similar to others in the region
Cultural Modifications	–	0	–	Nestled camp adds no visual variety
Subtotal	*8*	*12*	*0*	*8 +12 + 0 = 20*
Scenic Quality Rating[(a)]				**A**

Source: Based on USDI 1984.

– No data necessary.

(a) Scenic quality rating: A for a score of 19 or more; B for a score from 12 to 18; and C for a score 11 or less.

The landform was given a high score of 4 due to the variety of landforms (waterbodies, bogs, mountains) with extreme changes in topography. The vegetation was given a moderate score of 3 because there is some variety in form and pattern. Water was given a high score of 4 because the sinuous lines of the ponds dominate and enhance the visual quality of the image. Colour was given a moderate score of 3 because of the somewhat contrasting cool shades of blues against a range of greens. Adjacent scenery was given a moderate score of 3 because of its similarity. Rarity was given a moderate score of 3 because the scene is similar to others in the region. Cultural modification to the area was given a moderate score of 0 because the nestled camp does not add or detract from the visual quality of the scene. The total score is 20, which results in a scenic quality rating of A (high) for the KOP 04 landscape.

The sensitivity level evaluation for KOP 04 is provided in Table 15.8.4-12.

Table 15.8.4-12 Sensitivity Level Evaluation for KOP 04 Portland Creek Pond and Inner Pond

Type of User	Number	Public Interest	Adjacent Land Use	Special Area	Overall Rating
High	Low	High	High	Low	**Moderate**

Source: Based on USDI 1984.

The level of sensitivity of type of user was given a high score, as the user group is many hunters and hikers. The amount of use was given a low score, as the area is not frequently visited by a large number of people as access is via trails and forest roads. The public interest was given a high score as the area was discussed in meetings with outfitters and the IATNL. The adjacent land use was given a high score as the adjacent land use is used for outfitting and hiking. The special area was given a low score, as no designated special areas are present. All together the overall sensitivity rating for KOP 04 is moderate.

The landscape classification for KOP 04 is provided in Table 15.8.4-13.

Table 15.8.4-13 Classification for KOP 04 Portland Creek Pond and Inner Pond

Classification Factors	Rating	Value
Scenic Quality	A	2
Sensitivity Level	Moderate	1
Total		**3**
Classification		**II**

Source: Based on USDI 1984.

Note: Quality Rating convert to values, A converts to 2, B converts to 1, C converts to 0.
Sensitivity Level values (High-Moderate-Low) are 2, 1, 0.
A total value of 3 or more is Class II; total of 2 is Class III; and total of 1 or 0 is Class IV.

The landscape for KOP 04, Portland Creek Pond and Inner Pond, is a Class II. This landscape should retain the existing landscape character and the level of change may be minimal but should not attract attention.

15.8.4.5 KOP 05, Rack Lake, Northern Peninsula of Newfoundland

KOP 05 of Rack Lake is on the Northern Peninsula of Newfoundland (Figure 15.8.1-1; Photograph 15.8.4-5). This view is to the south-west looking onto an alternate segment of the transmission corridor. This area has been ecologically classified as the Northern Long Range Subregion of the Long Range Barrens Ecoregion in the Boreal Shield Ecozone. This subregion encompasses a mountainous area above the tree line. Stunted larch and black spruce dominate the area. Vegetation is primarily alpine barren, dominated by arctic - alpine plants. Shallow ribbed fen and slope bogs cover extensive areas (Stantec 2010c).

Located on the western edge of the Long Range Mountains, this area is a rugged, rocky, windswept landscape on the flat top of mountainous terrain. Due to the high elevation tree cover is sparse, present only on the lee of slopes, in valleys and low areas, such as along the side of the lake. This area is dominated by arctic - alpine plants among bare areas of coarse, exposed bedrock. Rack Lake is a boomerang-shape of open water.



Photograph 15.8.4-5 KOP 05 Rack Lake Existing Environment

Note: Photograph taken June 2010, Northern Peninsula of Newfoundland, N 50.178060 W 57.28128.

The image of KOP 05 reveals a landscape character of a gentle rolling landform without peaks. The horizon line is uneven with slight dents in a slight curve. In the foreground there are views of bedrock scattered with jagged boulders on an open barren. The smooth waterbody in the middle ground has a simple, sharp, wavy edge and reflects the blue sky. The trees are spiky triangular silhouettes against the blue lake. The vegetation is coarse and uneven with spiky dwarf shrubs in the foreground and dense vegetation in the background. The bright green shrubs surround the edges of the grey rocks. Green hues flow from light green to dark green at the horizon line. The grey rocks have an uneven surface of black splotches from the lichens. The texture is coarse in the foreground with softer appearing texture in the background. The scenic quality evaluation for KOP 05 is provided in Table 15.8.4-14.

Table 15.8.4-14 Scenic Quality Evaluation for KOP 05 Rack Lake

Quality Factors	High	Moderate	Low	Explanation
Landform	–	3	–	Variation is shape with changes in topography
Vegetation	–	3	–	Some variety in texture
Water	–	2	–	Still waterbody, not dominant feature
Colour	–	3	–	Some variety and intensity in colour
Adjacent Scenery	–	2	–	Moderately enhances view, similar landscape
Rarity	–	2	–	Common within region
Cultural Modifications	1	–	–	Promotes visual harmony
Subtotal	*1*	*15*	*0*	*1 + 15 + 0 = 16*
Scenic Quality Rating[(a)]				**B**

Source: Based on USDI 1984.
– No data necessary.
(a) Scenic quality rating: A for a score of 19 or more; B for a score from 12 to 18; and C for a score 11 or less.

The landform was given a moderate score of score of 3 because of the variety of landforms (waterbody, mountains, rock outcrops) with noticeable changes in topography. The vegetation was given a moderate score of 3 because there is some variety in form and texture and pattern. Water was given a moderate score of 2 because it does not dominate the view. Colour was given a moderate score of 3 because of the variety of muted grey rock outcrops combined with greens that transition from light to dark. Rarity was given a moderate score of 2 because the scene is similar to others in the region. Cultural modification to the area was given a high score of 1 because the nestled camp adds to the visual quality of the scene (not seen in image). The total score is 16, which results in a scenic quality rating of B (moderate) for the KOP 05 landscape.

The sensitivity level analysis for KOP 05 is provided in Table 15.8.4-15.

Table 15.8.4-15 Sensitivity Level Analysis for KOP 05 Rack Lake

Type of User	Number	Public Interest	Adjacent Land Use	Special Area	Overall Rating
High	Low	High	Moderate	Low	**Moderate**

Source: Based on USDI 1984.

The level of sensitivity of type of user was given a high score, as the user group is generally hunters. The amount of use was given a low score, as the area is not frequently visited by a large number of people as access is fly-in only. The public interest was given a high score as the area was discussed in meetings with outfitters (Nalcor 2010a and Chapters 7 and 8 of the EIS). The lodge is located at the base of the hill in the foreground; this hill would obstruct any views of the transmission line from the lodge. The adjacent land use was given a moderate score as the area is used for outfitting and boating. The special area was given a low score, as no designated special areas are present. The overall sensitivity rating for KOP 05 is moderate.

The landscape classification for KOP 05 is presented in Table 15.8.4-16.

Table 15.8.4-16 Classification for KOP 05 Rack Lake

Classification Factors	Rating	Value
Scenic Quality	B	1
Sensitivity Level	Moderate	1
Total		**2**
Classification		**III**

Source: Based on USDI 1984.
Note: Quality Rating convert to values, A converts to 2, B converts to 1, C converts to 0.
Sensitivity Level values (High-Moderate-Low) are 2, 1, 0.
A total value of 3 or more is Class II; total of 2 is Class III; and total of 1 or 0 is Class IV.

The landscape for KOP 05, Rack Lake, is Class III. This landscape should partially retain the existing landscape character and the level of change may be moderate and could attract attention but should not dominate the view.

15.8.4.6 KOP 06 Four Ponds, Northern Peninsula of Newfoundland

KOP 06 of Four Ponds is in the Northern Peninsula of Newfoundland (Figure 15.8.1-1; Photograph 15.8.4-6). This view is to the north-west. This area has been ecologically classified as the Northern Long Range Subregion of the Long Range Barrens Ecoregion in the Boreal Shield Ecozone. This subregion encompasses a mountainous area above the tree line. Stunted larch and black spruce dominate the area. Vegetation is primarily alpine barren, dominated by arctic-alpine plants. Shallow ribbed fen and slope bogs cover extensive areas (Stantec 2010c). It is a remote mountain top area on the Long Range Mountains. The area is mainly rolling hills covered in a thick mat of vegetation. The bog is cupped by the rolling hills and is filled with a variety of alpine plants. There are pockets of water throughout the area. The Four Ponds Outfitters Lodge is outside the image. A proposed section of the IATNL crosses this area of the Long Range Mountains. The Main River Provincial Park is to the east of the KOP.



Photograph 15.8.4-6 KOP 06 Four Ponds Existing Environment

Note: Photograph taken June 2010, Northern Peninsula of Newfoundland, N 49.90654 W 57.41250.

The image for KOP 06 reveals a landscape character of rolling ridges of hills separated by marshland. Landforms are rounded bulky hills with a low rolling range beyond acting as layered silhouettes. The rolling hills transition into a wide slightly undulating concave spongy bog or barren foreground. The gradation is soft between the two. There are thin slivers of water. The vegetation on the background hills is dense and the middle and foreground is filled with a variety of spongy, knee-high plants. The light green and beige in the foreground transitions to dark green and on to dark blue on the hills. The texture is medium in the foreground and rough and coarse in the background. The scenic quality evaluation for KOP 06 is provided in Table 15.8.4-17.

Table 15.8.4-17 Scenic Quality Evaluation for KOP 06 Four Ponds

Quality Factors	High	Moderate	Low	Explanation
Landform	–	3	–	Variation in size and shapes of landform
Vegetation	–	3	–	Variety and contrast in texture
Water	–	–	1	Present but not a noticeable feature
Colour	–	2	–	Variety in greens
Adjacent Scenery	–	2	–	Similar in character or not barely visible
Rarity	–	–	1	Common within region
Cultural Modifications	–	0	–	Lodge neither adds nor detracts from visual harmony
Subtotal	*0*	*10*	*2*	*10 + 2 = 12*
Scenic Quality Rating[(a)]				**B**

Source: Based on USDI 1984.

– No data necessary.

(a) Scenic quality rating: A for a score of 19 or more; B for a score from 12 to 18; and C for a score 11 or less.

The landform was given a moderate score of 3 because of noticeable changes in topography. The vegetation was given a moderate score of 3 because there is some variety in vegetation texture and pattern. Water was given a low score of 1 because it is not a noticeable feature. Colour was given a moderate score of 2 because of the variety of greens that transition from light to dark. Adjacent scenery was given a moderate score of 2 as the adjacent scenery is similar in character. Rarity was given a low score of 1 because the scene is similar to others in the region. Cultural modification to the area was given a moderate score of 0 because the lodge neither adds nor detracts from the visual harmony. The total score is 12, which results in a scenic quality rating of B (moderate) for the KOP 06 landscape.

The sensitivity level analysis for KOP 06 is provided in Table 15.8.4-18.

Table 15.8.4-18 Sensitivity Level Analysis for KOP 06 Four Ponds

Type of User	Number	Public Interest	Adjacent Land Use	Special Area	Overall Rating
High	Low	High	Moderate	Moderate	**Moderate**

Source: Based on USDI 1984.

The level of sensitivity of type of user was given a high score, as the user groups are generally hunters and backcountry hikers. The amount of use was given a low score, as the area is not frequently visited by a large number of people, as access is fly-in only. The public interest was given a high score as the area was discussed in meetings with the Outfitters Association and the IATNL. The adjacent land use was given a moderate score as the adjacent land use of the area is used for outfitting and boating. The special area was given a moderate score due to the proximity of the Main River Provincial Park. The overall sensitivity rating for KOP 06 is moderate.

The landscape classification for KOP 06 is provided in Table 15.8.4-19.

Table 15.8.4-19 Classification for KOP 06 Four Ponds

Classification Factors	Rating	Value
Scenic Quality	B	1
Sensitivity Level	Moderate	1
Total		**2**
Classification		**III**

Source: Based on USDI 1984.

Note: Quality Rating convert to values, A converts to 2, B converts to 1, C converts to 0.
Sensitivity Level values (High-Moderate-Low) are 2, 1, 0.
A total value of 3 or more is Class II; total of 2 is Class III; and total of 1 or 0 is Class IV.

The landscape for KOP 06, Four Ponds, is Class III. This landscape should partially retain the landscape character and the level of change may be moderate and could attract attention but should not dominate the view.

15.8.4.7 KOP 07 Birchy Lake, Central and Eastern Newfoundland

KOP 07 of Birchy Lake is in Central and Eastern Newfoundland (Figure 15.8.1-1; Photograph 15.8.4-7). The view is to the west. This area has been ecologically classified as the Northcentral Subregion of the Central Newfoundland Forest Ecoregion in the Boreal Shield Ecozone. This region has rolling topography with aspen stands and black spruce forests that dominate the area (Stantec 2010c). The image portrays a scenic drive down the TCH that is flanked by rolling hills and the elongated waterbody of Birchy Lake. The TCH parallels the lake on the south side and tapers into a curve to the west as it wraps around the end of the lake. Parallel to the roadway, on the south side (left, centre in the photograph), is an H-frame power transmission line. At the sandy beach at the lake narrows there is a campground, Fort Birchy Park and Campground (not seen in image).



Photograph 15.8.4-7 KOP 07 Birchy Lake Existing Environment

Note: Photograph taken June 2010, Central and Eastern Newfoundland, N 49.29126 W 56.78918.

The image of KOP 07 reveals a landscape character of rolling mountains, a roadway, vegetation and a waterbody. The Landform transitions from curved to flat. Narrow parallel bands form the image flowing off

into the distance dividing the image into sections. From left to right a band of rolling mountains is followed by vegetation, followed by the roadway band, and then a granular band, and then vegetation, a waterbody and finally a rolling vegetation covered hill band. These lines seem to converge to a centre point drawing the eye down the lines. The image shows a pallet of blues, greens and greys. The band of the grey roadway and the band of water create sharp edges between the colour blocks. The texture of the image flows in bands as well. The rough, dark blue, hazy mountains transition to dense medium textured vegetation to the rough matte strips of the roadway that transition to a soft and fluffy bright green strip, which transitions into a smooth glossy waterbody that reflects the sky and on to a smooth strip of hills. The scenic quality evaluation for KOP 07 is presented in Table 15.8.4-20.

Table 15.8.4-20 Scenic Quality Evaluation for KOP 07 Birchy Lake

Quality Factors	High	Moderate	Low	Explanation
Landform	–	3	–	Noticeable changes in topography
Vegetation	–	3	–	Some variety in texture and pattern
Water	–	3	–	Waterbody is still but not a dominant feature
Colour	–	3	–	Intense greens
Adjacent Scenery	–	–	1	Little influence on visual quality
Rarity	–	3	–	Lake is distinctive but similar to others in region
Cultural Modifications	–	–	-2	Roadway dominate acting discordantly to visual variety
Subtotal	–	*15*	*-1*	*15 + (– 1) = 14*
Scenic Quality Rating[(a)]				**B**

Source: Based on USDI 1984.
– No data necessary.
(a) Scenic quality rating: A for a score of 19 or more; B for a score from 12 to 18; and C for a score 11 or less.

The landform was given a moderate score of score of 3 because the variety of landforms (waterbody, mountains) with noticeable changes in topography. The vegetation was given a moderate score of 3 because there is some variety in texture and pattern. Water was given a moderate score of 3 because it is large but does not dominate the image. Colour was given a moderate score of 3 because of the limited contrasts and intensities of the colours. Adjacent landscape was given a low score of 1 because the area is similar. Rarity was given a moderate score of 3 because the lake is distinctive but similar to others in the region. Cultural modifications to the area was given a low score of -2 because the dominant roadway does not add to the visual quality of the scene. The total is 14, which results in a scenic quality rating of B (moderate) for the KOP 07 landscape.

The sensitivity level analysis for KOP 07 is provided in Table 15.8.4-21.

Table 15.8.4-21 Sensitivity Level Analysis for KOP 07 Birchy Lake

Type of User	Number	Public Interest	Adjacent Land Use	Special Area	Overall Rating
Moderate	Moderate	High	High	Low	**Moderate**

Source: Based on USDI 1984.

The level of sensitivity of type of user was given a moderate score, as the user group is a mix of highway drivers and some recreational users. The amount of use was given a moderate score, as the AADT is 3,153 users (Morrisey 2010, pers. comm.). The public interest was given a high score, as it was flagged as an issue for cabin owners during a public open house (Nalcor 2010a and Chapters 7 and 8 of the EIS). The adjacent land use was given a high score as the adjacent land use includes recreational camping and boating. The special area was given a low score, as there are no designated special areas present. The overall sensitivity rating for KOP 07 is moderate.

The landscape classification for KOP 07 is provided in Table 15.8.4-22.

Table 15.8.4-22 Classification for KOP 07 Birchy Lake

Classification Factors	Rating	Value
Scenic Quality	B	1
Sensitivity Level	Moderate	1
Total		**2**
Classification		**III**

Source: Based on USDI 1984.

Notes: Quality Rating convert to values, A converts to 2, B converts to 1, C converts to 0.
Sensitivity Level values (High-Moderate-Low) are 2, 1, 0.
A total value of 3 or more is Class II; total of 2 is Class III; and total of 1 or 0 is Class IV.

The landscape for KOP 07, Birchy Lake, is Class III. This landscape should partially retain the landscape character and the level of change may be moderate and could attract attention but should not dominate the view.

15.8.4.8 KOP 08 Buchans Highway, Central and Eastern Newfoundland

KOP 08 of the Buchans Highway is in Central and Eastern Newfoundland (Figure 15.8.1-1; Photograph 15.8.4-8). This view is to the north by north-east. This area has been ecologically classified as the Northcentral Subregion of the Central Newfoundland Forest Ecoregion in the Boreal Shield Ecozone. This region has rolling topography with aspen stands and black spruce forests that dominate the area (Stantec 2010c). The image features Highway 370 and the vegetation along the roadway. This highway runs along the along the Exploits River. A mixed composition of pointed conifers and lush round deciduous trees and shrubs flank each side of the roadway screening views to the flowing Exploits River. The alder shrubs along the edge of the road are well above eye level. The topography dips from west to east towards the Exploits River.



Photograph 15.8.4-8 KOP 08 Buchans Highway Existing Environment

Note: Photograph taken June 2010, Central and Eastern Newfoundland, N 48.95657 W 56.07592.

The image of KOP 08 reveals a landscape character, which is dominated by a band of rough roadway dividing the dense vegetation into two. The contrasting linear form of the roadway has two parallel edges that

converge and curve into a vanishing point in the distance. The guardrail, with timber posts and steel railing parallels the roadway. The sharp, triangular edges of the vegetation silhouette the skyline on the left, with more of a rounded form on the right. A mixed palette of patchy dark and light greens have consistent form throughout the vegetation with moments of vertical white and pale tan lines of tree trunks. The solid grey roadway has bright white and yellow lines that stand out visually. The texture is mixed, with dense, soft and fluffy vegetation and a matte, rough roadway with a granular edge. The scenic quality evaluation for KOP 08 is provided in Table 15.8.4-23.

Table 15.8.4-23 Scenic Quality Evaluation for KOP 08 Buchans Highway

Quality Factors	High	Moderate	Low	Explanation
Landform	–	–	1	Little variation in landforms and topography
Vegetation	–	2	–	Some variety in form and texture
Water	–	2	–	Flowing water, not dominant feature (screened)
Colour	–	2	–	Some intensity and limited variety
Adjacent Scenery	–	2	–	Screened, moderately enhances overall visual quality
Rarity	–	–	1	Common within region
Cultural Modifications	1	–	–	Curved roadway adds favourably drawing the eye to a focal
Subtotal	*1*	*8*	*2*	*1 + 8 + 2 = 11*
Scenic Quality Rating[(a)]				**C**

Source: Based on USDI 1984.
– No data necessary.
(a) Scenic quality rating: A for a score of 19 or more; B for a score from 12 to 18; and C for a score 11 or less.

The landform was given a low score of 1 because there is no variety of landforms and no noticeable changes in topography. The vegetation was given a moderate score of 2 because there is some variety in form and texture. Water was given a moderate score of 2 because there is flowing water but it does not dominate the area (not seen in image). Colour was given a moderate score of 2 because of the variety of greens. Rarity was given a low score of 1 because the site is similar to others in the region. Cultural modifications to the area was given a high score of 1 because the winding, dominant roadway adds to the visual quality of the scene creating a focal point. The total is 11, which results in a scenic quality rating of C (low) for the KOP 08 landscape.

The sensitivity level analysis for KOP 08 is provided in Table 15.8.4-24.

Table 15.8.4-24 Sensitivity Level Analysis KOP 08 Buchans Highway

Type of User	Number	Public Interest	Adjacent Land Use	Special Area	Overall Rating
Moderate	Low	Low	Moderate	Low	**Moderate**

Source: Based on USDI 1984.

The level of sensitivity of type of user was given a moderate score, as the user group is a mix of highway drivers. The amount of use was given a low score, as the AADT is 484 users (Morrisey 2010, pers. comm.). The public interest was given a low score, as the area was not flagged has public concern (Nalcor 2010a and Chapters 7 and 8 of the EIS). The adjacent land use was given a moderate score as the river is used recreationally. The special area was given a low score, as there are no designated special areas present. The overall sensitivity rating for KOP 08 is moderate.

The landscape classification for KOP 08 is provided in Table 15.8.4-25.

Table 15.8.4-25 Classification for KOP 08 Buchans Highway

Classification Factors	Rating	Value
Scenic Quality	C	0
Sensitivity Level	Moderate	1
Total		**1**
Classification		**IV**

Source: Based on USDI 1984.

Note: Quality Rating convert to values, A converts to 2, B converts to 1, C converts to 0.
Sensitivity Level values (High-Moderate-Low) are 2, 1, 0.
A total value of 3 or more is Class II; total of 2 is Class III; and total of 1 or 0 is Class IV.

The landscape for KOP 08, Buchans Highway, is Class IV. This landscape allows for major modifications to the landscape character and the level of change can dominate the view.

15.8.4.9 KOP 09 Exploits River, Central and Eastern Newfoundland

KOP 09 of the Exploits River is in Central and Eastern Newfoundland (Figure 15.8.1-1; Photo 15.8.4-1). The view is to the south. This area has been ecologically classified as the Northcentral Subregion of the Central Newfoundland Forest Ecoregion in the Boreal Shield Ecozone. This region has rolling topography with aspen stands and black spruce forests that dominate the area (Stantec 2010c). This image was taken near Grand Falls-Windsor Riverfront Chalets along the TCH. The landscape view features the Exploits River and the adjacent dense forest, with the Gaff Topsails (hills) in the far (right) background. The Exploits River is a slow moving river that for several kilometres both to the east and the west runs parallel to the TCH. The Riverfront Chalet (a tourism lodge) is in this area as well (not seen in image). Barely visible on the southern horizon is an existing transmission line.



Photograph 15.8.4-9 KOP 09 Exploits River Existing Environment

Note: Photograph taken June 2010, Central and Eastern Newfoundland, N 48.95 W 55.91 (approximate).
This photograph was taken from a helicopter and therefore presents an enhanced view of the horizon.

The image of KOP 09 reveals a landscape character divided into 3 sections, a band of water, a band of vegetation and a band of sky. The wide expanse of intense blue water of the Exploits River dominates the view in the foreground reflecting the sky. The middle ground is layered with alternating low and tall vegetation. The slightly wavy horizontal lines throughout the image contrasts with the vertical lines of the tree trunks in the middle ground. The horizon line, slightly undulating, is blurred with silhouettes of fuzzy foliage in the distance. The pale bark of tree trunks in the middle ground is highlighted against the dark green vegetation behind it. The green middle ground is sandwiched between the light blue sky and dark blue water. The texture of the rippling river contrasts with the soft, fuzzy texture of the dense vegetation. The scenic quality evaluation for KOP 09 is provided in Table 15.8.4-26.

Table 15.8.4-26 Scenic Quality Evaluation for KOP 09 Exploits River

Quality Factors	High	Moderate	Low	Explanation
Landform	–	–	1	Variation in landforms is limited
Vegetation	–	2	–	Some variety in form and pattern
Water	–	3	–	Flowing river is equal dominance to vegetative band
Colour	–	3	–	Some intensity and variety in colours
Adjacent Scenery	–	–	1	Little effect on overall quality
Rarity	–	3	–	Distinct but somewhat common within region
Cultural Modifications	–	0	–	Lodge unseen does not add or detract
Subtotal	–	*11*	*2*	*11 +2 = 13*
Scenic Quality Rating[(a)]				**B**

Source: Based on USDI 1984.

– No data necessary.

(a) Scenic quality rating: A for a score of 19 or more; B for a score from 12 to 18; and C for a score 11 or less.

The landform was given a low score of 1 because of the limited variety of landforms with minimal changes in topography. The vegetation was given a moderate score of 2 because there is some variety in form and pattern. Water was given a moderate score of 3 because the flowing water is of equal dominance with the vegetation band. Colour was given a moderate score of 3 because of the intensity of blues and bright greens. Adjacent scenery was given a low score of 1 as it has little effect on overall quality. Rarity was given a moderate score of 3 because the view is distinct but similar to others in the region along the river. Cultural modifications to the area were given a moderate score of 0 because the Riverfront Chalet does not add nor detract from the visual quality of the scene. The total is 13, which results in a scenic quality rating of B (moderate) for the KOP 09 landscape.

The sensitivity level analysis for KOP 09 is provided in Table 15.8.4-27.

Table 15.8.4-27 Sensitivity Level Analysis for KOP 09 Exploits River

Type of User	Number	Public Interest	Adjacent Land Use	Special Area	Overall Rating
Moderate	Low	High	High	Low	**Moderate**

Source: Based on USDI 1984.

The level of sensitivity of type of user was given a moderate score, as the user group is mixed, with mainly highway drivers and recreational users. The amount of use was given a low score although the AADT is high at 4,969 users (Morrisey 2010, pers. comm.), as the buffer of trees along the roadway screens views to the area. The public interest was given a high score as the area was identified as an issue during the public open house (Nalcor 2010a and Chapters 7 and 8 of the EIS). The adjacent land use was given a high score as the river is used recreationally for river rafting. The special area was given a low score, as there is no designated special area present. The overall sensitivity rating for KOP 09 is moderate.

The landscape classification for KOP 09 is provided in Table 15.8.4-28.

Table 15.8.4-28 Classification for KOP 09 Exploits River

Classification Rating	Rating	Value
Scenic Quality	B	1
Sensitivity Level	Moderate	1
Total		**2**
Classification		**III**

Source: Based on USDI 1984.

Note: Quality Rating convert to values, A converts to 2, B converts to 1, C converts to 0.
Sensitivity Level values (High-Moderate-Low) are 2, 1, 0.
A total value of 3 or more is Class II; total of 2 is Class III; and total of 1 or 0 is Class IV.

The landscape for KOP 09, Exploits River, is Class III. This landscape should partially retain the landscape character and the level of change may be moderate and could attract attention but should not dominate the view.

15.8.4.10 KOP 10 Chapel Arm, Avalon Peninsula

KOP 10 of Chapel Arm is on the Avalon Peninsula of Newfoundland (Figure 15.8.1-1; Photograph 15.8.4-10). The view is to the north-east. This area has been ecologically classified as the Southeastern Barrens Subregion of the Maritime Barrens in the Boreal Shield Ecozone. This area typically consists of stunted balsam fir interspersed with extensive, open barrens. The topography is typically undulating. Forest growth is restricted to long slopes of a few protected valleys. Slope and basin bogs are the most common wetland type (Stantec 2010c). The image shows Highway 201 on the isthmus of the Avalon Peninsula. The image is the view of the highway leading into the residential community of Chapel Arm. The highway has access roads extending from it. There is a substation in this area as well (not seen in the image). There is a waterbody in the background.



Photograph 15.8.4-10 KOP 10 Chapel Arm Existing Environment

Note: Photograph taken July 2010, Avalon Peninsula of Newfoundland, N 47.51298 W53.68761.

The image of KOP 10 reveals a landscape character of a sloping landform that is cut by a roadway. On the left, the land moderately slopes toward the road and continues to slope slightly on the right side of the road. In the background there is a mountain range with a straight bottom edge that is defined by water. Converging edges of the road draws the eye to a waterbody in the background. The roadway and transmission lines wave slightly and meet the water and mountains in the background. The vertical transmission poles extend above the vegetation and converge towards the centre of the image. The roadway draws the eye to a series of overlaps at the centre of the image. The grey roadway is lined by green vegetation, that is lined by the light blue waterbody, that is lined by a dark blue mountain range. The cool shades of grey and blue divides the green vegetation into two portions. The treeline is jagged and pointed in the foreground, and then curves to gentle bumps in the middle / background. The horizon line has triangular shape silhouettes against the sky. There is a range of textures in the image. The vegetation is dense. The deciduous foliage is bright green and soft next to the roadway, with dark green and coarse evergreen foliage backing it. The rough roadway is patchy in two shades of grey with a granular strip of tan and grey gravel along it. The scenic quality evaluation for KOP 10 is provided in Table 15.8.4-29.

Table 15.8.4-29 Scenic Quality Evaluation for KOP 10 Chapel Arm

Quality Factors	High	Moderate	Low	Explanation
Landform	–	3	–	Variation is size and shape with noticeable changes in topography
Vegetation	–	2	–	Variety in form and texture
Water	–	2	–	Creates focal point but not a dominant feature
Colour	–	2	–	Variety in colour
Adjacent Scenery	–	3	–	Views moderately enhances visual quality
Rarity	–	–	1	Common within region
Cultural Modifications	–	–	-3	Roadway and transmission poles and lines promote visual disharmony
Subtotal	*0*	*12*	*-2*	*0 +12+ (-2) = 10*
Scenic Quality Rating[(a)]				**C**

Source: Based on USDI 1984.
– No data necessary.
(a) Scenic quality rating: A for a score of 19 or more; B for a score from 12 to 18; and C for a score 11 or less.

The landform was given a moderate score of 3 because there is variety of landforms with noticeable changes in topography. The vegetation was given a moderate score of 2 because there is some variety in form and texture. Water was given a moderate score of 2; although it is a focal point it is not a dominant feature. Colour was given a moderate score of 2 because of the variety in colours. Adjacent scenery was given a moderate score of 3 because the surrounding views moderately enhance the visual quality. Rarity was given a low score of 1 because the view is common in the region. Cultural modifications was given a low score of -3 because the patchy roadway and the transmission towers promote visual disharmony. The total is 10, which results in a scenic quality rating of C (low) for the KOP 10 landscape.

The sensitivity level analysis for KOP 10 is provided in Table 15.8.4-30.

Table 15.8.4-30 Sensitivity Level Analysis for KOP 10 Chapel Arm

Type of User	Number	Public Interest	Adjacent Land Use	Special Area	Overall Rating
Moderate	Moderate	Low	High	Low	**Moderate**

Source: Based on USDI 1984.

The level of sensitivity of type of user was given a moderate score, as the user group is a mix of residential and recreational users. The amount of use was given a moderate score, as the AADT is 1,461 (Morrisey 2010, pers. comm.) users through a cottage and residential area. The public interest was given a low score, as the area was not raised as an issue in public meetings (Nalcor 2010a and Chapters 7 and 8 of the EIS). The adjacent land use

was given a high score, as the neighbouring area is residential. The special area was given a low score, as there is no designated special area present. The overall sensitivity rating for KOP 10 is moderate.

The landscape classification for KOP 10 is provided in Table 15.8.4-31.

Table 15.8.4-31 Classification for KOP 10 Chapel Arm

Classification Factors	Rating	Value
Scenic Quality	C	0
Sensitivity Level	Moderate	1
Total		**1**
Classification		**IV**

Source: Based on USDI 1984.
Note: Quality Rating convert to values, A converts to 2, B converts to 1, C converts to 0.
Sensitivity Level values (High-Moderate-Low) are 2, 1, 0.
A total value of 3 or more is Class II; total of 2 is Class III; and total of 1 or 0 is Class IV.

The landscape for KOP 10, Chapel Arm, Highway 202, is Class IV. This landscape allows for major modifications to the landscape character and the level of change can dominate the view.

15.8.4.11 KOP 11 Witless Bay Line, Avalon Peninsula of Newfoundland

KOP 11 of the Witless Bay Line is on the Avalon Peninsula of Newfoundland (Figure 15.8.1-1; Photograph 15.8.4-11). The view is to the north-west. This area has been ecologically classified as the Southeastern Barrens Subregion of the Maritime Barrens in the Boreal Shield Ecozone. This area typically consists of stunted balsam fir interspersed with extensive open barrens. The topography is typically undulating (Stantec 2010c). In this view of Highway 13, 1 km south of the TCH, there is an expanse of an open, windswept landform. The landscape, virtually treeless, has a cover of low, green shrubs. Silhouetted against the sky in the background are the towers of a power transmission line that crosses Highway 13. The far middle ground of the scene includes two bungalows and the rooflines extend above the distant horizon. A yellow gate is located in the centre of the scene, on the access road leading to the closest building.



Photograph 15.8.4-11 KOP 11 Witless Bay Line Existing Environment
Note: Photograph taken July 2010, Avalon Peninsula of Newfoundland, N 47.33768 W 53.06134.

The image of KOP 11 reveals a landscape character of a roadway and vegetated area that is simple and flat. The slightly curved, smooth horizon line intersects with the perpendicular vanishing point of the converging road lines. The roadway is a band through the landscape creating a simple sharp edge dividing the space. An access road is visible that creates a waving line off the highway. A small, still wetland reflects the vegetation growth on the edge and the sky. The vegetation is dense and low, hugging the ground. The texture of the roadway is rough, and transitions to granular on the side of the pavement and then to spongy in the vegetation. There are structures in the image that add to visual clutter. The existing transmission towers and houses are silhouettes in the sky. The yellow gateway contrasts the green and grey roadway, and stands out to become a focal point, as do the houses and the towers. The scenic quality evaluation for KOP 11 is provided in Table 15.8.4-32.

Table 15.8.4-32 Scenic Quality Evaluation for KOP 11 Witless Bay Line

Quality Factors	High	Moderate	Low	Explanation
Landform	–	–	1	Little change in topography
Vegetation	–	2	–	Some variety in texture
Water	–	–	1	Small pond, not dominant
Colour	–	2	–	Limited variety in colours
Adjacent Scenery	–	–	1	Similar, adds little influence to overall visual quality
Rarity	–	–	0	Common within region
Cultural Modifications	–	–	-2	Promotes some visual disharmony
Subtotal	*0*	*4*	*1*	*0 + 4 + 1 = 5*
Scenic Quality Rating[(a)]				**C**

Source: Based on USDI 1984.
– No data necessary.
(a) Scenic quality rating: A for a score of 19 or more; B for a score from 12 to 18; and C for a score 11 or less.

The landform was given a low score of 1 because there is no variety of landforms, with little change in topography. The vegetation was given a moderate score of 2 because there is some variety in texture. Water was given a low score of 1 because the small pond is visible but not dominant. Colour was given a moderate score of 2 because of the limited variety in colours. Adjacent scenery was given a low score of 1 as it adds little to overall visual quality. Rarity was given a low score of 0 because the view is similar to others in the region. Cultural modifications to the area was given a low score of -2 because the structures dominate the view and promote some visual disharmony. The total is 5, which results in a scenic quality rating of C (low) for the KOP 11 landscape.

The sensitivity level analysis for KOP 11 is provided in Table 15.8.4-33.

Table 15.8.4-33 Sensitivity Level Analysis for KOP 11 Witless Bay Line

Type of User	Number	Public Interest	Adjacent Land Use	Special Area	Overall Rating Low
Moderate	Low	Low	Moderate	Low	**Low**

Source: Based on USDI 1984.

The level of sensitivity of type of user was given a moderate score, as the user group is a mix of highway drivers and recreational users. The amount of use was given a low score, as the AADT is low at 751 users (Morrisey 2010, pers. comm.). The public interest was given a low score, as the area has not been identified as an area of public concern (Nalcor 2010a and Chapters 7 and 8 of the EIS). The adjacent land use was given a moderate score as the area is inhabited and currently supports transmission towers. The special area was given a low score, as there is no designated special area present. The overall sensitivity rating for KOP 11 is low.

The landscape classification for KOP 11 is provided in Table 15.8.4-34.

Table 15.8.4-34 Classification for KOP 11 Witless Bay Line

Classification Factors	Rating	Value
Scenic Quality	C	0
Sensitivity Level	Low	0
Total		**0**
Classification		**IV**

Source: Based on USDI 1984.

Notes: Quality Rating convert to values, A converts to 2, B converts to 1, C converts to 0.

Sensitivity Level values (High-Moderate-Low) are 2, 1, 0.

A total value of 3 or more is Class II; total of 2 is Class III; and total of 1 or 0 is Class IV.

The landscape for KOP 11, Witless Bay Line, is Class IV. This landscape can accommodate major modifications (no more than 30%) to the landscape character and the level of change may dominate the view.

15.8.4.12 KOP 12 Soldiers Pond, Avalon Peninsula of Newfoundland

KOP 12 of Soldiers Pond is on the Avalon Peninsula of Newfoundland (Figure 15.8.1-1; Photograph 15.8.4-12). This view is to the east. This area has been ecologically classified as the Southeastern Barrens Subregion of the Maritime Barrens in the Boreal Shield Ecozone. This area typically consists of stunted balsam fir interspersed with extensive, open barrens. The topography is typically undulating (Stantec 2010c). This image is from the shoulder of the TCH and the view features a power transmission line that crosses the TCH. The primary vegetative cover is short shrubs with sparse, moderately taller trees. Soldiers Pond is the proposed location for the converter station at the eastern terminus of the Project. The TCH is heavily used by commuters and travellers.



Photograph 15.8.4-12 KOP 12 Soldiers Pond Existing Environment

Note: Photograph taken July 2010, Avalon Peninsula of Newfoundland, N 47.41588 W 53.00123.

The image of KOP 12 has a landscape character that is primarily flat, and dipping into a wide shallow valley that contains water. Faint vertical lines of transmission towers are apparent as silhouettes against the sky in the distance. The exposed rock contrasts, popping out from the surrounding green foliage. The foreground and

middle ground are consistent in colour and texture, and filled with a variety of plant species. Short trees are sporadic in the soft foliage as the eye transitions to the background horizon line. There are a variety of colours, dark and light greens and blue in the distance. The focal points are the isolated, small trees that silhouette the sky. Grey crushed gravel, with a rough texture, is visible along the side of the TCH. The scenic quality evaluation for KOP 12 is provided in Table 15.8.4-35.

Table 15.8.4-35 Scenic Quality Evaluation for KOP 12 Soldiers Pond

Quality Factors	High	Moderate	Low	Explanation
Landform	–	2	–	Some change in topography
Vegetation	–	2	–	Some variety in texture
Water	–	–	1	Present but not a noticeable feature
Colour	–	2	–	Some variety in colours
Adjacent Scenery	–	2	–	Similar, adds little influence to overall visual quality
Rarity	–	–	1	Common within region
Cultural Modifications	–	–	-2	Transmission towers and the edge of the TCH detract from the visual harmony
Subtotal	*0*	*8*	*0*	*0 + 8 + 0 = 8*
Scenic Quality Rating[(a)]				**C**

Source: Based on USDI 1984.
– No data necessary.
(a) Scenic quality rating: A for a score of 19 or more; B for a score from 12 to 18; and C for a score 11 or less.

The landform was given a moderate score of 2 because there is some variety of landforms, with changes in topography. The vegetation was given a moderate score of 2 because there is some variety and contrast in form and texture. Water was given a low score of 1 because the small pond in the distance is not a noticeable feature. Colour was given a moderate score of 2 because of the limited variety in the greens and blues. Adjacent landscape was given a moderate score of 2 because it adds little influence to the overall visual quality. Rarity was given a low score of 1 because the view is similar to others in the region. Cultural modifications was given a low score of -2 because the structures promote disharmony. The total is 8, which results in a scenic quality rating of C (low) for the KOP 12 landscape.

The sensitivity level analysis for KOP 12 is provided in Table 15.8.4-36.

Table 15.8.4-36 Sensitivity Level Analysis for KOP 12 Soldiers Pond

Type of User	Number	Public Interest	Adjacent Land Use	Special Area	Overall Rating Low
Moderate	High	Low	Low	Low	**Moderate**

Source: Based on USDI 1984.

The level of sensitivity of type of user was given a moderate score, as the user group is a mix of commuters and tourists. The amount of use was given a high score, as the AADT is 16,033 users (Morrisey 2010, pers. comm.); this is the most travelled of all the highways within or adjacent to any of the KOPs. The public interest was given a low score, as the area was not identified as an area of concern at public meetings (Nalcor 2010a and Chapters 7 and 8 of the EIS). The adjacent land use was given a low score, as it currently supports existing transmission towers. The special area was given a low score, as there is no designated special area present. The overall sensitivity rating for KOP 12 is moderate.

The landscape classification for KOP 12 is provided in Table 15.8.4-37.

Table 15.8.4-37 Classification for KOP 12 Soldiers Pond

Classification Factors	Rating	Value
Scenic Quality	C	0
Sensitivity Level	Moderate	1
Total		**1**
Classification		**IV**

Source: Based on USDI 1984.

Notes: Quality Rating convert to values, A converts to 2, B converts to 1, C converts to 0.
Sensitivity Level values (High-Moderate-Low) are 2, 1, 0.
A total value of 3 or more is Class II; total of 2 is Class III; and total of 1 or 0 is Class IV.

The landscape for KOP 12, Witless Bay Line, is Class IV. This landscape can accommodate major modifications (no more than 30%) to the landscape character and the level of change may dominate view.

15.8.4.13 Summary of 12 KOP Classification and Objectives

The 12 KOP fit in Classes II, III and IV. The classification of each landscape is summarized in Table 15.8.4-38.

Table 15.8.4-38 Summary of 12 KOP Classification and Objectives

KOP[(a)]	Location / Region	Scenic Quality Evaluation (Score)	Sensitivity Level Analysis	Class	Comment
01	Kenamu River / Central and Southeastern Labrador	Moderate B (12)	Moderate	**III**	Should partially retain the existing landscape character; level of change may be moderate and could attract attention but should not dominate the view
02	TLH3 / Central and Southeastern Labrador	Low C (7)	Low	**IV**	Can accommodate major modifications to the landscape character; level of change may dominate the view
03	Forteau Point / Central and Southeastern Labrador	Low C (3)	Low	**IV**	Can accommodate major modifications to the landscape character; level of change may dominate the view
04	Portland Creek Pond / Northern Peninsula Newfoundland	High A (20)	Moderate	**II**	Should retain the existing landscape character; level of change may be minimal and should not attract attention
05	Rack Lake / Northern Peninsula Newfoundland	Moderate B (16)	Moderate	**III**	Should partially retain the existing landscape character; level of change may be moderate and could attract attention but should not dominate the view
06	Four Ponds / Northern Peninsula Newfoundland	Moderate B (12)	Moderate	**III**	Should partially retain the existing landscape character; level of change may be moderate and could attract attention but should not dominate the view

Table 15.8.4-38 Summary of 12 KOP Classification and Objectives (continued)

KOP[(a)]	Location / Region	Scenic Quality Evaluation (Score)	Sensitivity Level Analysis	Class	Comment
07	Birchy Lake / Central and Eastern Newfoundland	Moderate B (14)	Moderate	**III**	Should partially retain the existing landscape character; level of change may be moderate and could attract attention but should not dominate the view
08	Buchans Highway / Central and Eastern Newfoundland	Low C (11)	Moderate	**IV**	Can accommodate major modifications to the landscape character; level of change may dominate the view
09	Exploits River / Central and Eastern Newfoundland	Moderate B (13)	Moderate	**III**	Should partially retain the existing landscape character; level of change may be moderate and could attract attention but should not dominate the view
10	Chapel Arm / Avalon Peninsula Newfoundland	Low C (10)	Moderate	**IV**	Can accommodate major modifications to the landscape character; level of change may dominate the view
11	Witless Bay Line / Avalon Peninsula Newfoundland	Low C (5)	Low	**IV**	Can accommodate major modifications to the landscape character; level of change may dominate the view
12	Soldiers Pond / Avalon Peninsula Newfoundland	Low C (8)	Moderate	**IV**	Can accommodate major modifications to the landscape character; level of change may dominate the view

(a) KOP = Key Observation Point.

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NALCOR ENERGY

LABRADOR-ISLAND TRANSMISSION LINK

ENVIRONMENTAL IMPACT STATEMENT

Chapter 16

Socioeconomic Environment: Environmental Effects Assessment

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LIST OF ACRONYMS

Acronym	Description
%	Percent
AAC	Annual Allowable Cut
ATV	All terrain vehicle
BLM	Bureau of Land Management
capex	capital expenditures
CAR	Canadian Aviation Regulations
CCG	Canadian Coast Guard
CEAA	*Canadian Environmental Assessment Agency*
CSA	Canadian Standards Association
CSC	Construction Sector Council
dBA	A-weighted decibels
DFO	Fisheries and Oceans Canada
DND	Department of National Defense
e.g.,	for example
EA	Environmental Assessment
EAP	Employee Assistance Program
EIS	Environmental Impact Statement
ELF	extremely low frequency
EMF	Electromagnetic Field
EMI	electromagnetic interference
EPP	Environmental Protection Plan
EPRI	Electric Power Research Institute
FFAW	Fish, Food and Allied Workers
FLC	Fisheries Liaison Commitee
GDP	Gross Domestic Product
GIS	geographic information system
GNL	Government of Newfoundland and Labrador
HDD	Horizontal directional drilling
HNL	Hospitality Newfoundland and Labrador
HRSDC	Human Resources and Skills Development Canada
HST	Harmonized Sales Tax
HVdc	High Voltage direct current
i.e.,	that is

Acronym	Description
IATNL	International Appalachian Trail – Newfoundland and Labrador
IBA	Impacts and Benefits Agreement
ICD	implantable cardioverter defibrillator
IMD	Implantable Medical Device
kg	kilogram
KI	Key Indicator
km	kilometre
km^2	square kilometres
KOP	Key Observation Point
kV	kilovolt
kV/m	kilovolts per metre
LATP	Labrador Aboriginal Training Partnership
LSA	Local Study Area
m	metre
m^2	square metre
MP	Measurable Parameter
nA/m^2	100 amperes x 10^{-9} per square metre
NASP	Natural Areas Systems Plan
NCC	NunatuKavut Community Council
NLDEC	Newfoundland and Labrador Department of Environmental and Conservation
NLDNR	Newfoundland and Labrador Department of Natural Resources
NLDTCR	Newfoundland and Labrador Department of Tourism, Culture and Recreation
NLDTW	Newfoundland and Labrador Department of Transportation and Works
NLEPA	*Newfoundland and Labrador Environmental Protection Plan*
NLH	Newfoundland and Labrador Hydro
NLOA	Newfoundland and Labrador Outfitters Association
NOC	National Occupation Classification
NSA	noise sensitive area
OHSP	Occupational Health and Safety Plan
OHV	off highway vehicle
OPGW	Optical overhead groundwire
PAO	Provincial Archaeology Office
QNS-L	Québec North Shore and Labrador
ROV	remotely operated vehicle

Acronym	Description
ROW	right-of-way
RSA	Regional Study Area
SHERP	Safety, Health and Environmental Emergency Response Plan
TCH	Trans-Canada Highway
TLH	Trans-Labrador Highway; # indicates phase when applicable
TLH2	Trans-Labrador Highway (Phase 2)
TLH3	Trans-Labrador Highway (Phase 3)
UNESCO	United Nations Educational, Scientific and Cultural Organziation
USDI	United States Department of Interior
VEC	Valued Environmental Component
VTMP	Vessel Traffic Management Plan
WEP	Women's Employment Plan

16 SOCIOECONOMIC ENVIRONMENT: ENVIRONMENTAL EFFECTS ASSESSMENT

This Chapter of the Environmental Impact Statement (EIS) presents the environmental assessment (EA) for the Socioeconomic Environment, which includes Historic and Heritage Resources, Communities, Economy, Employment and Business, Land and Resource Use, Marine Fisheries, Tourism, and Visual Aesthetics.

To assess the effects of the Labrador-Island Transmission Link (the Project) on the Socioeconomic Environment, a number of Valued Environmental Components (VECs) were identified and have been assessed in the following sections.

16.1 Valued Environmental Component Selection

VECs are aspects of the biophysical and socioeconomic environments which are of particular ecological and / or social importance, and which have the potential to be affected (adversely or positively) by the proposed Project. VECs reflect identified scientific and community concerns regarding the Project and its potential effects, and reflect the questions and issues raised through consultation with governments, Aboriginal and stakeholder groups, and the general public.

Initial direction and input into VEC selection for this EIS was obtained through the EIS Guidelines and Scoping Document (Government of Newfoundland and Labrador (GNL) and the Government of Canada 2011) that were issued to Nalcor Energy (Nalcor) following Aboriginal and public review. Following additional analysis by the EIS study team and Nalcor's own consultation activities, the initial list of VECs has been expanded and refined to include and reflect the key environmental components and issues that require detailed consideration in the EIS.

The VECs that have been selected as the focus for the EA for the Socioeconomic Environment, as well as the rationale for their selection, are described below.

Historic and Heritage Resources has been identified as a VEC because of their historic, cultural, spiritual, natural, scientific and aesthetic importance. In Newfoundland and Labrador, such resources are protected under the *Historic Resources Act* (1985) and are administered through the Provincial Archaeology Office (PAO) of the Newfoundland and Labrador Department of Tourism, Culture and Recreation (NLDTCR). Historic and Heritage Resources are also often inherently valued by Aboriginal people and the general public as they may contain the only physical information on Aboriginal peoples and their activities prior to the arrival of Europeans in North America. These resources may also provide information about the early history of a region and the relationships between cultures.

Communities has been identified as a VEC because of the importance of strong and healthy communities in contributing to quality of life in the province. There is concern that the Project may put undue pressures on the existing infrastructure and services of communities located near the Project, as well as beneficially or adversely affecting the general health and well-being of individuals and the overall quality of life in those communities.

Economy, Employment and Business has been identified as a VEC because of its importance to the lives and livelihoods of the people of Newfoundland and Labrador. The Project will have direct and indirect effects on these economic parameters by creating opportunities for new employment and training, increasing the province's roster of skilled and experienced workers, creating new business opportunities, increasing government revenue, and influencing economic growth throughout the province.

Land and Resource Use has been identified as a VEC because it is an important and integral component of Newfoundland and Labrador's human environment and overall cultural landscape, and reflects the characteristics, traditions and values of its people; the communities they live in; how they travel from place to place; the manner in which they make a living or supplement their incomes; the outdoor activities that they partake in and enjoy for recreational purposes; and, their resolve to protect the natural and cultural heritage of the areas in which they live.

Marine Fisheries has been identified as a VEC because of the importance of marine fish harvesting activities in Newfoundland and Labrador for economic, social and cultural reasons. Both the Strait of Belle Isle and Conception Bay, locations of Project components, provide accessible fisheries primaily for commercial enterprises and, to a lesser extent, for the enjoyment of recreational fishers.

Tourism has been identified and considered as a separate VEC because it plays a key role in the provincial economy, and because it may be affected both directly and indirectly by the proposed Project. Attractions (e.g., parks, historic sites), events or activities (e.g., plays, festivals, boat tours) and related services (e.g., accommodations and restaurants) are important economic generators in Newfoundland and Labrador, particularly in rural areas.

Visual Aesthetics has been selected as a VEC because much of Newfoundland and Labrador is forested and remote from urban centres, with areas of pristine landscapes and many noteworthy viewscapes. Project activities (e.g., clearing) and components (e.g., right-of-way (ROW), towers) will provide visual contrast to the natural surroundings, and this VEC assesses the potential changes to the visual landscape and scenic quality as a result of the Project.

The effects of the Project on these VECs are assessed in the following sections of this chapter.

16.2 Historic and Heritage Resources

16.2.1 Introduction

Historic and Heritage Resources include sites, objects or other materials of historic and archaeological, palaeontological, architectural, cultural and / or spiritual importance. Such resources include sites and materials dating to the Pre-contact Period (defined as the time prior to the arrival of Europeans in North America and their first "contact" with Aboriginal peoples) as well as from the Historic Period (the time following Aboriginal peoples' first contact with Europeans and the beginning of written histories).

Typically, Historic and Heritage Resources include four broad categories, including:

- Archaeological Resources (such as stone tools, remains of camp sites and shipwrecks);
- Other Sites of Cultural / Historical Importance (such as burials and / or spiritual sites);
- Palaeontological Resources (fossils); and
- Architectural Resources (historic buildings and properties).

Archaeological Resources occur throughout Newfoundland and Labrador. The majority of sites and materials have been recorded in coastal locations, but they have also been identified in near-coastal and interior portions of the province. Eighteen archaeological sites are registered within the Project area, with the majority situated in Central Newfoundland (Section 15.2.3). Other known sites are present on the Labrador side of the Strait of Belle Isle, at a number of interior waterway crossings, including the Torrent River and Portland Creek Pond on the Northern Peninsula, and at Birchy Lake north-east of Corner Brook. No marine archaeological sites are registered within the cable crossing corridor in the Strait of Belle Isle or at either of the proposed electrode sites. As well, no marine archaeological sites or remains were identified during the marine survey work that was conducted by Nalcor between 2006 and 2011.

As specified in the Environmental Impact Statement Guidelines and Scoping Document (the Guidelines) (Government of Newfoundland and Labrador and the Government of Canada 2011), the EA for Historic and Heritage Resources also considers other sites of cultural / historical importance, including any known burial, cultural, spiritual and / or heritage sites. No known locations of cultural or spiritual importance to the Labrador Innu described in Armitage (2010) are located within the proposed Project area. Available information and the results of consultation with other Aboriginal groups in Labrador and Québec have also not identified any cultural or spiritual sites within the Project area (Nalcor Energy (Nalcor) et al. 2011). Any additional relevant information that is obtained through further consultation with Aboriginal groups will be considered and used to inform Project planning.

One location within the proposed Project area, namely Chapel Arm in Newfoundland, is known to contain Palaeontological Resources. All other areas where Project activities are proposed to occur are considered to have low potential to contain fossils.

There are no registered heritage buildings, structures or sites within the Project area that meet the necessary criteria for protection under the *Historic Resources Act*. The 19th century lighthouse at Point Amour in the Labrador Straits is a registered historic structure, but is on a parcel of land currently owned by the federal government and not the site of planned Project activity. Therefore, Architectural Resources are not assessed further in this EIS.

The existing environment for Historic and Heritage Resources is described in detail in Chapter 15 of this EIS.

16.2.2 Environmental Assessment Study Areas

16.2.2.1 Spatial Boundaries

Local Study Area

Historic and Heritage Resources are stationary and, therefore, any potential Project-VEC interactions are restricted to zones of physical ground disturbance. The Local Study Area (LSA) is the area where Project-related components and activities that may affect Historic and Heritage Resources will occur (Figure 16.2.2-1). The LSA therefore includes the 2 km wide transmission corridor while also considering the general nature and location of other Project activities and elements (e.g., access, electrode sites, electrode lines, camps, storage areas). Also included is the proposed 500 m wide submarine cable crossing corridor across the Strait of Belle Isle, from Labrador to the Island of Newfoundland.

Regional Study Area

Since Historic and Heritage Resources are stationary and any effects of the Project on these resources will not extend beyond the LSA, the concept of a Regional Study Area (RSA) is less relevant for the EA of this VEC. Nevertheless, the assessment of Historic and Heritage Resources does take on a larger "regional" perspective, by considering the overall cultural history of the regions in the Project area and in the province as a whole (as described in Section 15.2), as well as how any Historic and Heritage Resources that may be affected by the Project relate to this larger regional context.

16.2.2.2 Temporal Boundaries

The temporal boundaries for this VEC encompass the Construction, and Operations and Maintenance phases of the Project, with a primary focus on construction activities, which will involve the majority of ground disturbance associated with the Project.

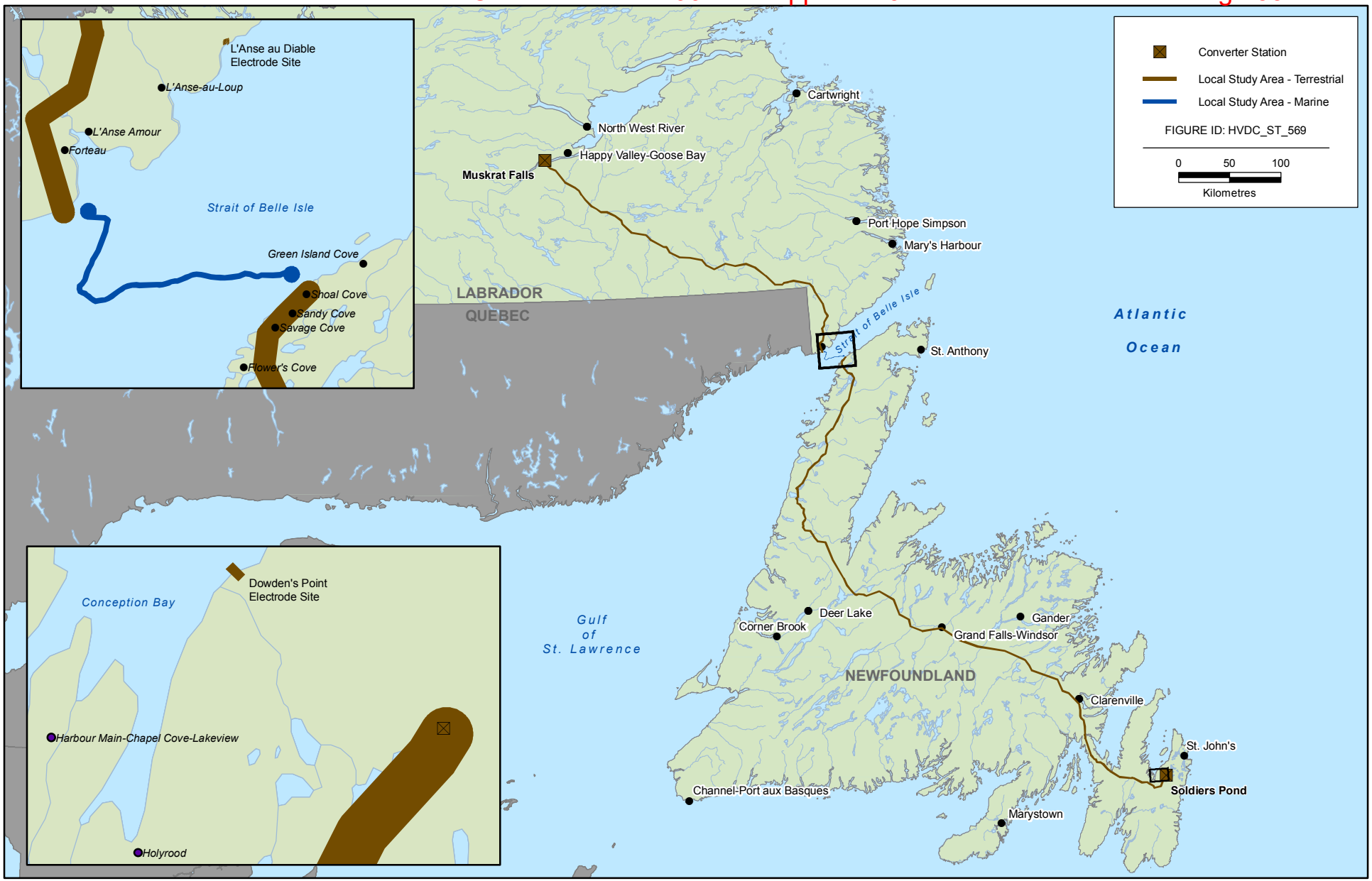


FIGURE 16.2.2-1

Historic and Heritage Resources: Local Study Area

16.2.3 Potential Environmental Issues, Indicators and Interactions

16.2.3.1 Potential Environmental Issues

Any activities involving ground disturbance can result in disturbance to or damage of Historic and Heritage Resources and the loss of any information they contain. In the case of cultural / historical resources, disturbance can occur to a site and / or the adjacent landscape of which it is considered a part, potentially diminishing its integrity and cultural value. Conversely, palaeontologists often welcome the opportunity to examine and gain additional scientific information on fossils in areas where construction activities expose underlying geological deposits (Savannah Environmental 2010).

A summary of the key identified issues and considerations related to Historic and Heritage Resources are summarized in Table 16.2.3-1 below.

Table 16.2.3-1 Identified Issues and Questions: Historic and Heritage Resources

Issue / Question	Nature and Rationale	Specific Considerations
Damage to or loss of Archaeological Resources during Project Construction and / or Operations and Maintenance.	Archaeological Resources are protected by legislation, valued by society and non-renewable.	Archaeological Resources are found in higher densities on the Labrador side of the Strait of Belle Isle and at major interior waterway crossings, including Torrent River, Portland Creek Pond, Birchy Lake and the Exploits River in insular Newfoundland. Known sites and areas of high archaeological potential have been identified at various locations along the LSA.
Damage to or loss of Palaeontological Resources during Project Construction and / or Operations and Maintenance.	Palaeontological Resources provide important information and are non-renewable.	Palaeontological Resources are known to occur within the LSA near Chapel Arm, Newfoundland.
Damage to or loss of sites of cultural-historical importance (including known burial, cultural, spiritual and heritage sites) during Project Construction and / or Operations and Maintenance.	Such features often form a key part of the history and culture of a people, particularly Aboriginal groups.	Muskrat Falls is a known site of cultural importance for the Labrador Innu.

16.2.3.2 Key Indicators and Measurable Parameters

Key Indicators (KIs) and Measurable Parameters (MPs) were identified for the Historic and Heritage Resources VEC to frame and focus the associated environmental effects analysis. Their selection was based on the four categories of Historic and Heritage Resources listed in Section 16.2.1, as well as those resources known to occur within the LSA based on available information. The likely effects of the Project on the KIs may be measured through associated changes in the identified MPs. The general rationale for the selection of these KIs and MPs is summarized in Table 16.2.3-2.

Table 16.2.3-2 Key Indicators and Associated Measurable Parameters: Historic and Heritage Resources

Key Indicator	Rationale for Key Indicator[a]	Measurable Parameter[b]	Rationale for Measurable Parameter
Archaeological Resources	– There are known archaeological sites and areas with high archaeological potential present in the LSA – Protected by legislation – Cultural and scientific importance – Potential for interactions / effects as a result of Project-related ground disturbance	– Number of archaeological sites present	– Losses of known sites would be an adverse effect on archaeological resources
Palaeontological Resources	– There is potential for fossils to be present in the LSA – Scientific importance (information) – Potential for interactions / effects as a result of Project-related ground disturbance	– Number of palaeontological specimens present	– Losses of palaeontological specimens would be an adverse effect on palaeontological resources
Sites of Cultural-Historical Importance	– Key aspect of the history and culture of a people, particularly Aboriginal groups	– Number of sites present – Integrity of a site and its value to people	– Disturbance to the site and / or its adjacent landscape will likely diminish the integrity and cultural value of a site

(a) Key Indicator: An aspect or characteristic of the VEC and / or its environment which, if changed as a result of the Project, may result in an effect on the VEC.

(b) Measurable Parameter: A characteristic that is related to the status of the KI. Project effects to an MP can be detected and measured.

16.2.3.3 Potential Project-Historic and Heritage Resources Interactions

The main potential for interaction between the Project and Historic and Heritage Resources will occur during those activities which result in ground disturbance. Interactions with Historic and Heritage Resources may therefore occur during the following activities:

- clearing of vegetation during the construction of Project components (e.g., access trails, temporary and permanent bridges, construction camps, ROW, electrode sites, converter stations, drill pad for the directional drill rig) and associated use and movements of equipment through these areas; and
- grubbing, excavation of soil and rock and quarrying during construction of certain Project components (e.g., transmission towers, permanent or temporary access infrastructure, camp sites, electrode sites, converter stations, drill rig placement).

As there are no registered or known archaeological resources within the marine LSA (Strait of Belle Isle cable corridor and both electrode sites), there will be no likely effects of the Project on marine archaeological resources.

Increased human presence throughout the Project area during Construction and Operations and Maintenance, as a result of improved road or trail access or along the ROW, can also lead to interactions with Historic and Heritage Resources (e.g., such travel can contribute to surface rutting and erosion and potential pilfering of exposed materials). Accidental events, such as fires or spills, can also affect sites or materials by disturbing or destroying organic materials or structural remains associated with a site (see Section 16.9.2).

A summary of Project activities that may interact with Historic and Heritage Resources is provided in Table 16.2.3-3.

Table 16.2.3-3 Potential Project Interactions: Historic and Heritage Resources

Project Phase / Activity	Key Indicators		
	Archaeological Resources	**Palaeontological Resources**	**Sites of Cultural-Historical Importance**
Construction			
Construction of access trails and roads	Loss of or disturbance to a site through ground disturbance	Loss of or disturbance to specimens through ground disturbance	Potential disturbance of sites and / or their adjacent landscape
Movement and presence of personnel, equipment and materials			
Construction camps			
Marshalling yards and staging areas			
Right-of-way clearing and preparation			
Quarrying and borrowing			
Transmission tower assembly and installation			
Conductor installation	—	—	—
Converter station site preparation and construction	Loss of or disturbance to a site through ground disturbance	Loss of or disturbance to specimens through ground disturbance	Potential disturbance of sites and / or their adjacent landscape
Preparation and construction of submarine cable landing sites (on-land works)	—	—	—
Construction and installation of submarine cables (marine works)			
Electrode site preparation and installation			
Island system upgrades	Loss of or disturbance to a site through ground disturbance	Loss of or disturbance to specimens through ground disturbance	Potential disturbance of sites and / or their adjacent landscape
Employment / presence of workers	—	—	—
Contracting / expenditures			
System commissioning			
Operations and Maintenance			
Access trails and roads	Loss of or disturbance to a site through ground disturbance	Loss of or disturbance to specimens through ground disturbance	Potential disturbance of sites and / or their adjacent landscape
Operation of the High Voltage direct current (HVdc) system	—	—	—
Routine line inspections and repairs	Loss of or disturbance to a site through ground disturbance	Loss of or disturbance to specimens through ground disturbance	Potential disturbance of sites and / or their adjacent landscape
Vegetation management			
Potential major system repairs			
Operation of the electrodes	—	—	—
Employment / presence of workers			
Contracting / expenditures			

— No likely or detectable interaction identified.

16.2.4 Approach to the Environmental Effects Analysis

16.2.4.1 Analytical Methods

The information sources and methods used to understand and describe the existing environment for Historic and Heritage Resources are outlined in Section 15.2.2. To assess the potential effects of the Project on this VEC, geo-referenced Project information was examined to determine where proposed Project components and activities could overlap with known archaeological sites, areas of identified high archaeological potential, fossil-bearing geological deposits and sites of known cultural-historical importance.

The EA, and ongoing Project planning, adopts a "preventative and mitigation-centered" approach, where the intent is first to attempt to avoid all known Historic and Heritage resources sites. This will include further (post-EA) information-gathering in select sites as Project design continues, as well as the implementation of contingency measures in the event of an accidental discovery of such resources in the field. The results of the environmental effects assessment for Historic and Heritage Resources is outlined further in the sections that follow.

16.2.4.2 Environmental Effects Descriptors

The likely effects of the Project on Historic and Heritage Resources, including each of its associated KIs, are described using the following attributes, which are based on standard EA practice as well as the provisions of the Newfoundland and Labrador *Historic Resources Act (1985)* and associated guidance material. These descriptors, and definitions for each of their associated ratings, are included in Table 16.2.4-1 below.

Table 16.2.4-1 Environmental Effects Descriptors: Historic and Heritage Resources

Effects Descriptor	Definition
Direction	
Adverse	The loss or disturbance of archaeological or palaeontological resources or of a known site of cultural-historical importance.
Neutral	No effect on archaeological or palaeontological resources or on a known site of cultural-historical importance.
Beneficial	Discovery of a previously unrecorded archaeological site and / or exposure of unknown / unrecorded fossils for research and information collection.
Magnitude	
No effect	No likely effect on archaeological or palaeontological resources or on known sites of cultural-historical importance.
Low	Disturbance of an archaeological or palaeontological resource but with prior retrieval of the resource and associated information, and with all necessary regulatory approvals. A change to the landscape immediately adjacent to a known site of cultural-historical importance, but with no direct effect on the site itself.
Moderate	The disturbance or loss of all or a portion of an archaeological or palaeontological resource, with retrieval of a portion of the resource and its associated information. A direct effect on a known site of cultural-historical importance which is of interest and concern to the associated community, but which does not reduce the overall integrity and cultural value of the site.
High	The disturbance or loss of an archaeological or palaeontological resource, with no retrieval of the resource and its associated information. A direct effect on a known site of cultural-historical importance which reduces the overall integrity and cultural value of the site.

Table 16.2.4-1 Environmental Effects Descriptors: Historic and Heritage Resources (continued)

Effects Descriptor	Definition
Geographic Extent	
Local	Any effect will be limited to the LSA.
Regional	Effects may extend beyond the LSA.
Duration	
Temporary	Effect will occur but measures are taken to salvage and retrieve information from the resources, and / or move / rehabilitate the site.
Permanent	Effect will be permanent and irreversible.
Frequency	
Intermittent	Effect will occur at various, intermittent times.
Continuous	Effect will occur continuously.

16.2.5 Construction

16.2.5.1 Overview of Project Construction and Associated Effects Management

Any Project activity involving disturbance of the ground surface or subsurface can result in disturbance or loss of archaeological or palaeontological resources. For archaeological resources, a loss occurs when structural remains, artifacts or any other materials associated with a site, cultural feature or landscape are dispersed, displaced, altered or destroyed and meaningful information regarding the object, the site's purpose and age, or its occupants or builders, is not retrieved. Similarly, the loss of palaeontological resources occurs when fossils and / or the geological deposit in which they are contained are altered or destroyed without study (and possibly retrieval) of the materials and information they provide.

Interactions with archaeological resources may occur during clearing of the ROW and construction of permanent or temporary access roads, temporary camps, and temporary or permanent bridges and watercourse crossings. Other Project activities, including excavation, grubbing and potential blasting for installation of electrical towers, converter stations and electrode sites may also result in effects on such resources. As well, more intensive human use of the area resulting from increased access on roads, trails and / or along the ROW, could lead to interactions with archaeological sites or materials. Accidental events, such as fuel spills, could also affect these resources. For palaeontological resources, quarrying, blasting, borrowing and drilling associated with the Project may result in adverse effects. Sites of cultural-historical importance can be affected by any Project activities that may occur at these sites and / or their adjacent landscapes.

Mitigation will be applied to avoid or reduce the potential effects of the Project on Historic and Heritage Resources. As indicated, the key and initial objective will be to avoid potential interactions and effects through Project planning and design. Known Historic and Heritage Resources within the LSA have been identified and mapped, and detailed Historic Resources Potential Mapping has been completed for the Project (Stantec 2011a, 2010) to identify areas of high, moderate and low potential for Historic and Heritage Resources that have not yet been discovered. Such a planning and avoidance approach is consistent with provincial guidelines (GNL 1992).

The key mitigation measures being proposed by Nalcor to avoid or reduce potential Project effects on Historic and Heritage Resources are summarized below:

- Information on known Historic and Heritage Resources will be mapped and included in the planning and design phase of the Project, including in eventual transmission line ROW selection. Nalcor will consult with the PAO on this issue during such detailed design.
- Once the transmission line ROW is defined, Nalcor will conduct an historic resources field survey of those sections of the ROW that cross through areas identified as high potential for undiscovered Historic and Heritage Resources. The specific nature and locations of such surveys will be planned in consultation with the PAO.
- Nalcor and its contractors will apply for and adhere to all provincial and federal permits required for Project Construction, and Operations and Maintenance, including for the transmission system and for all associated and ancillary infrastructure and activities (e.g., access trails, camps, quarries, marshalling yards). The permit application and review process will provide regulatory agencies, including the PAO, with the opportunity to review detailed information on the specific location and design of Project component, and to request additional information collection and / or analysis as required and appropriate.
- Nalcor or its contractors will identify any known Historic and Heritage Resources within 100 m of planned Project activities, and these sites will be made known to supervisory personnel. A 50 m “no work” buffer will be maintained around all known Historic and Heritage Resources sites to avoid interactions between Project activities and these resources.
- The orientation and training programs provided to construction personnel will include briefings related to Historic and Heritage Resources, including the avoidance of known sites, site and artefact recognition, the importance and value of such resources and their preservation, and the protection and contingency measures to be implemented in the event of an accidental discovery of Historic and Heritage Resources (as outlined below).
- Standard precautionary and reporting procedures will apply throughout Project Construction, and Operations and Maintenance. In the event that unregistered Historic and Heritage Resources are discovered, work will be halted immediately at that location, the PAO will be notified, and a Stage 1 Historic Resources Overview Assessment will be initiated by Nalcor in accordance with provincial guidelines. This assessment would include completion of a field survey (with necessary authorization from the PAO) of the find location and surrounding area to identify the nature and extent of the remains, the cultural group or groups represented and the time period involved. As well, recommendations regarding avoidance of the site or systematic retrieval of the materials and information it contains would be conducted in accordance with PAO guidelines. A report on the find would then be completed and submitted to the PAO. Project activity at that site would recommence only if and when approved by the PAO.
- If Historic and Heritage Resources are encountered and cannot be avoided through Project design, mitigation in the form of Systematic Data Recovery (i.e., appropriate excavation, documentation, salvage and retrieval and conservation of materials, followed by analysis and report preparation) would be undertaken in accordance with provincial guidelines (GNL 1992) and in full consultation with the PAO.
- Where Project components are constructed in any area known to have high potential to contain palaeontological resources, periodic inspections of disturbed areas will be undertaken by qualified palaeontologists to limit the potential for disturbance of fossils and the loss of any information they may provide.
- Nalcor will continue to consult with relevant Aboriginal communities and organizations, to further understand any sites of cultural-historical importance or other Historic and Heritage Resources that may be located within or near planned Project activities. Any such information that is made available to the proponent will be considered throughout ongoing Project design and eventual implementation, and Aboriginal groups will be kept informed as Project work progresses.

These mitigation measures will be clearly laid out in the Environmental Protection Plan(s) (EPP) prepared and used for all Project activities, so that all Project personnel are aware of the above-noted procedures related to the discovery of Historic and Heritage Resources.

16.2.5.2 Existing Knowledge

There is little available published "existing knowledge" which has evaluated and measured the actual and known effects of similar projects and activities on Historic and Heritage Resources. Several key sources which reference the effectiveness of avoidance, other mitigation measures and the systematic data recovery of archaeological sites and materials are outlined below (Table 16.2.5-1). Also included are sources referencing the use of archaeological potential mapping, as well as a number of key issues to consider in assessing likely effects of the Project on archaeological and palaeontological resources.

Table 16.2.5-1 Existing Knowledge (Construction): Effects of Similar Projects on Historic and Heritage Resources

Reference	Study / Project Context	Summary of Findings
PSC Wisconsin (2010, internet site)	This overview reviews the environmental issues and concerns raised by the construction of electric transmission facilities. The first part of the overview provides a general summary of the methods to measure and identify environmental impacts. The second part of the overview is an A to Z directory of specific environmental issues and techniques to minimize or mitigate the impacts.	– Discussion of potential impacts and methods to minimize or mitigate the impacts on archaeological and historical resources.
California Energy Commission (2008, internet site)	Canyon Power Plan Licensing Case AFC Files – Palaeontology	– Distinguishes differences between archaeological resources and palaeontological resources - the quality or quantity of fossils within the rock unit cannot be known until it is exposed as a result of natural erosion processes or earth-moving activities. – Fossils are rarely distributed evenly within a rock unit, making it difficult to predict where they may occur. – Mitigation measures such as pre-construction surveys may not be effective in reducing impacts on fossils as sites may not be present at the surface. – Monitoring of excavations by an experienced palaeontologist during construction increases the probability that fossils will be discovered and preserved.
Tetra Tech (2006)	North Baja Pipeline Expansion Project, Appendix K Palaeontological Resource Mitigation and Monitoring Plan	– Palaeontological Resources Mitigation and Monitoring Plan was developed for a pipeline project that passed through low to moderate potential areas. – Mitigation program had an emphasis on construction-worker education to increase

Table 16.2.5-1 Existing Knowledge (Construction): Effects of Similar Projects on Historic and Heritage Resources (continued)

Reference	Study / Project Context	Summary of Findings
		– potential of identifying fossils and following proper procedures if fossils were encountered, and spot monitoring by palaeontologists of selected sections of the pipeline ROW during excavation to salvage any significant fossil remains encountered during construction involving ground-disturbing and earth-moving activities.
Minaskuat Limited Partnership (2004)	A proposed electrical power line in southern Labrador by Newfoundland and Labrador Hydro (NLH)	– Historic and Heritage Resources research was completed in 2004 at Red Bay, Labrador, for NLH who were proposing to install 20 new transmission poles within an approximately 7 m wide ROW. – Background and field research determined that the proposed ROW was situated in close proximity to three historic archaeological sites and that installation of the transmission poles and maintenance of the line could result in adverse effects to cultural remains. – Consequently, a mitigation plan of site avoidance by re-routing the line was recommended, and accepted and implemented by NLH. – No adverse environmental effects were identified for known Historic and Heritage Resources as a result of the development.
Voisey's Bay Nickel Company Limited (1997, internet site)	Proposed Mining and Mill Project in Northern Labrador	– Historic and Heritage Resources research completed in the mid-1990s in relation to the proposed development of the Voisey's Bay mine and mill site in northern Labrador resulted in the identification of 134 archaeological and contemporary sites within the assessment area. – To reduce the likelihood of effects on the known sites, site fencing and avoidance was implemented in consultation with the proponent and Aboriginal groups. – In areas where sites could not be avoided due to project requirements, systematic data recovery and recording of remains was implemented. – Construction was completed without any unplanned disturbance to archaeological resources and mitigation for any planned disturbance (i.e., systematic data recovery) was completed to the satisfaction of the provincial government.

Table 16.2.5-1 Existing Knowledge (Construction): Effects of Similar Projects on Historic and Heritage Resources (continued)

Reference	Study / Project Context	Summary of Findings
Society of Vertebrate Palaeontology (1995, internet site)	Assessment and Mitigation of Adverse Impacts to Non-renewable Palaeontological Resources: Standard Guidelines	– First step is to map palaeontological potential based on pertinent geological and palaeontological literature, specimen records and field surveys if required. – Rock units are divided into three categories: high potential, undetermined potential, and low potential. – In areas of high potential, recommended mitigation includes: a preliminary survey and surface salvage prior to construction; monitoring and salvage during excavation; preparation, including screen washing to recover small specimens (if applicable), and specimen preparation to a point of stabilization and identification; identification, cataloguing, curation and storage; and, a final report of the finds and their significance after all operations are completed. – Mitigation measures generally need not be developed for areas of low palaeontological potential, unless fossils are unearthed in the course of excavation.
GNL (1992)	Historic Resources Impact Assessment Guidelines	– Outlines that mitigation can refer to a range of strategies including: project redesign, various types of active site protection or preservation, as well as different intensities of and approaches to systematic data recovery. – Avoidance ensures the complete, in situ protection of the resource from development and thus is considered the preferred mitigative option. – Avoidance may require erecting a fence or other suitable barrier around the site to ensure its protection if construction activities are to occur in close proximity. – Where it is not possible to avoid a site, active site protection can be used, including site stabilization and capping to minimize project effects. – Systematic data recovery is the least desirable mitigation strategy. It requires scientific and systematic investigation of unavoidable historic resource losses using accepted data recovery techniques.

16.2.5.3 Construction Effects: Archaeological Resources

Historic and Heritage Resources research completed to date indicates that 18 archaeological sites registered with the PAO are located within the LSA (Table 16.2.5-2). These sites include those identified during past research not associated with the Project, as well as during Nalcor studies completed between 1998 and 2011. There are nine identified archaeological sites within the LSA in Labrador and nine on the Island of Newfoundland. The locations of these sites are illustrated in Section 15.2.3 (Figures 15.2.3-1 and 15.2.3-3) and described in further detail in the *Historic and Heritage Resources Component Study* (Stantec 2010) and *Historic and Heritage Resources Component Study Supplementary Report* (Stantec 2011a).

Table 16.2.5-2 Known Archaeological Sites Present within the LSA

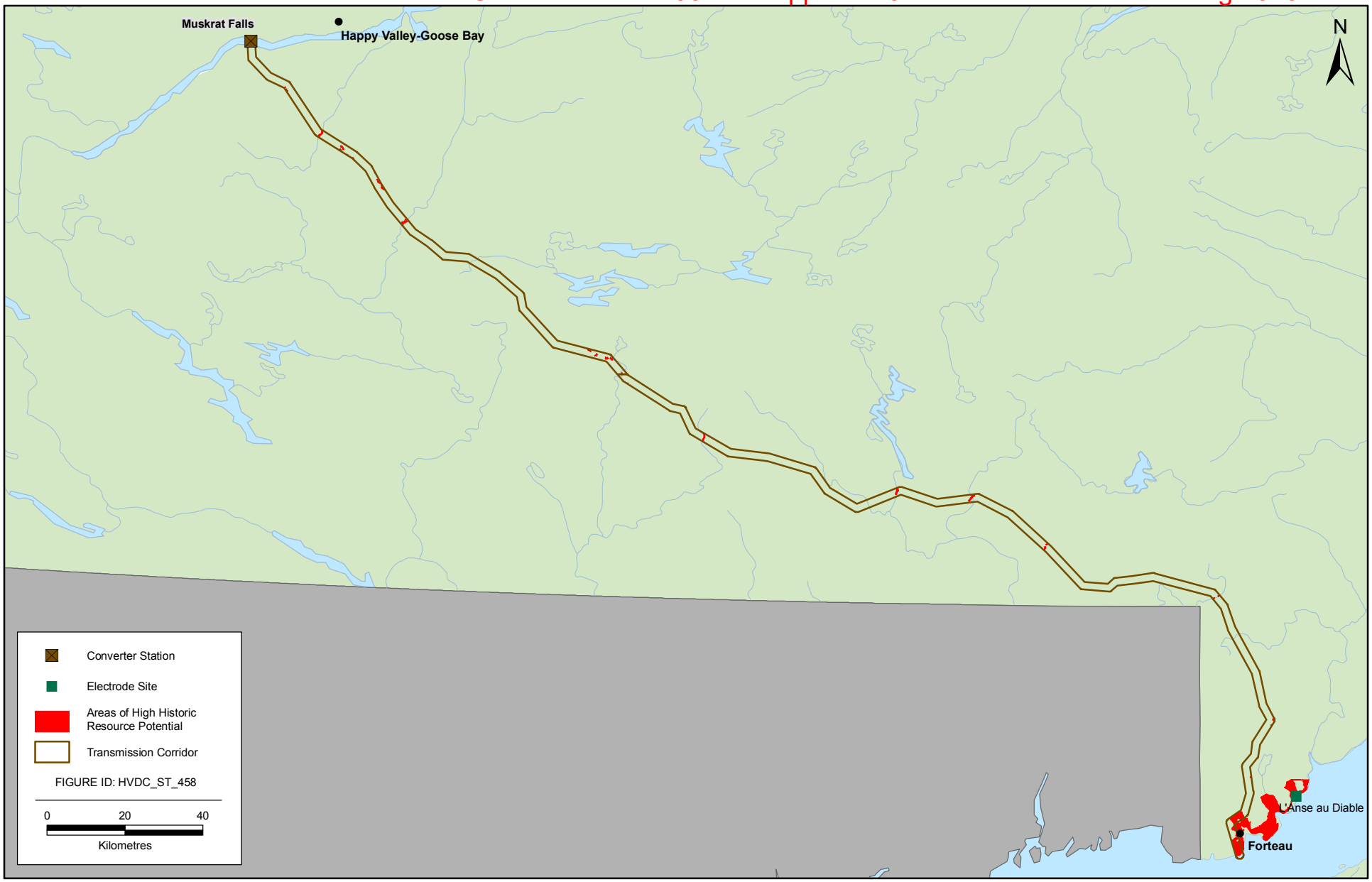
Number of Sites[(a)]	Central and Southeastern Labrador	Newfoundland
Discovered by Nalcor Surveys (1998-2011)	5	5
Discovered by Others	4	4
Total	**9**	**9**

[(a)] The number of sites represent those within the corridor (marine and on-land) and the electrode sites.

Of the 18 known archaeological sites registered with the PAO within the LSA in Labrador, five are situated at the L'Anse au Diable electrode location, one is within the 2 km wide corridor at Forteau Point, and three are within the 2 km wide corridor further north toward Churchill River. On the Island of Newfoundland, one archaeological site is situated at the Shoal Cove landing site, while the remaining eight sites are located along the 2 km wide transmission corridor further south and east. No archaeological sites were identified at Dowden's Point in Conception Bay.

As detailed engineering work continues, other Project components and activities – and their locations and footprints – will become further defined. Consideration of known and potential Historic and Heritage Resources will continue to be an aspect of Project planning and design work for Historic and Heritage Reosurces, including avoidance of known sites and further work in areas of identified high potential to further inform Project design and / or implementation.

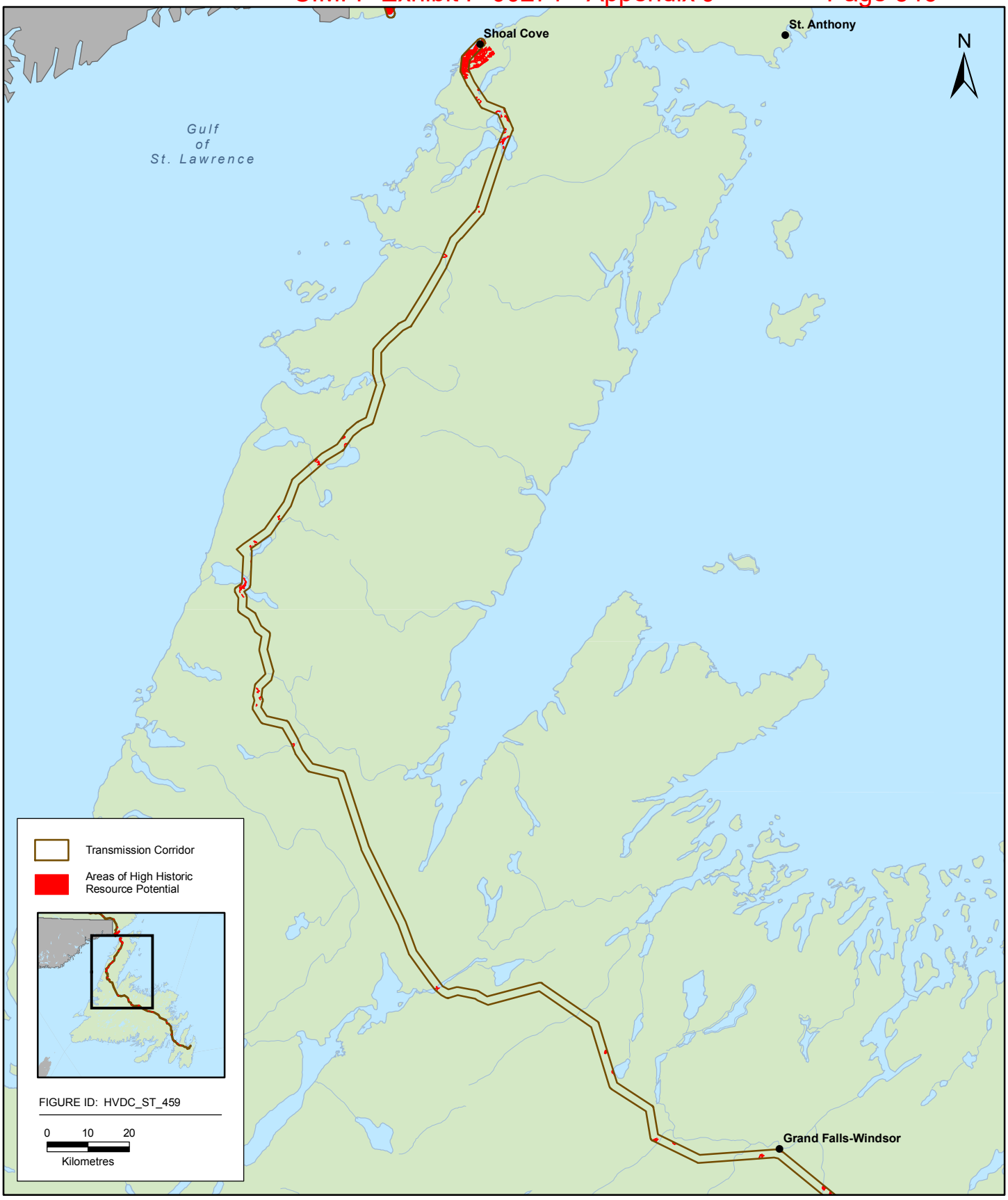
The Historic and Heritage Resources baseline study completed for the Project as part of the EA process (Stantec 2011a, 2010) has included archaeological potential mapping of the transmission corridor to identify areas of low, moderate or high potential to contain such resources. The results of the archaeological potential-mapping indicate that the proposed LSA in Labrador has a total of 66 high potential areas, covering a total area of approximately 23.57 square kilometres (km^2) (Figure 16.2.5-1). The section of the proposed LSA on the Island of Newfoundland has a total of 123 areas of high potential covering an area of approximately 25.56 km^2 (Figures 16.2.5-2 and 16.2.5-3). The information contained in the Historic and Heritage Resources Component Study (Stantec 2011a, 2010) and the archaeological potential mapping of the LSA will be used to select a transmission ROW and other Project sites to avoid known archaeological sites and areas of high archaeological potential where possible, and / or to plan further field investigations and mitigation procedures as Project planning progresses. In addition, as outlined earlier, many aspects of the Project will be the subject of detailed post-EA permitting, which will allow for detailed review of these activities and any potential effect on this VEC.



nalcor energy

FIGURE 16.2.5-1

Areas of High Potential for Archaeological Resources, Labrador



nalcor energy

FIGURE 16.2.5-2

Areas of High Potential for Archaeological Resources, Newfoundland

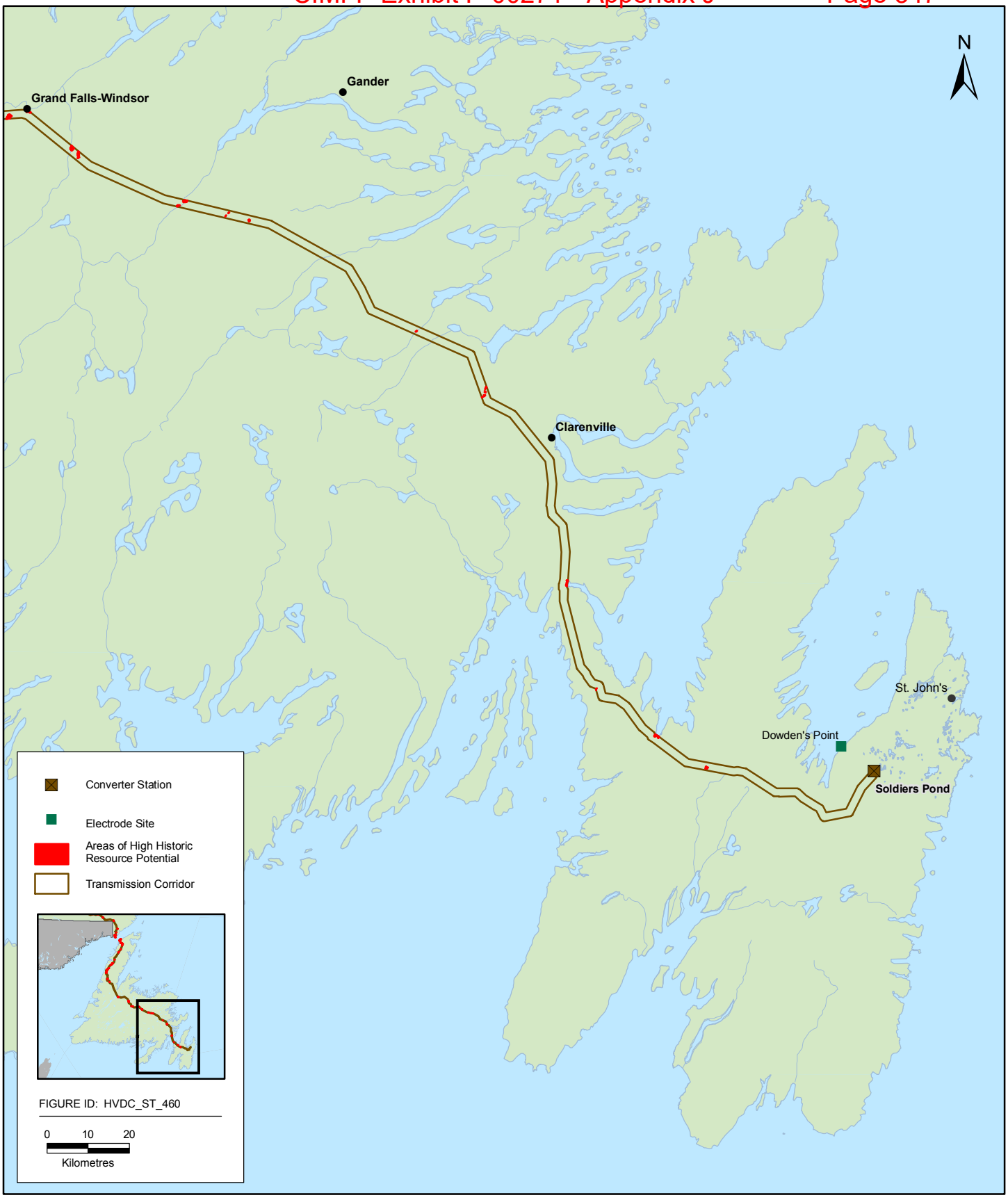


FIGURE 16.2.5-3

Areas of High Potential for Archaeological Resources, Newfoundland (continued)

Considering the studies completed to date related to Historic and Heritage Resources and the mitigation measures proposed by Nalcor for this Project, it is expected that all known Historic and Heritage Resources sites can and will be avoided, and any new sites discovered can be either avoided or mitigated through Systematic Data Recovery.

Summary of Likely Residual Environmental Effects

The likely residual effects of Project Construction on the Archaeological Resources KI are as follows:

- Adverse but of very low probability, as known sites will be avoided and future work and mitigation procedures will minimize the potential for presently unknown sites to be inadvertently disturbed or lost.
- No effect or of low magnitude, because sites will be avoided where possible, and information will be retrieved and / or the site salvaged where Project-VEC interactions are unavoidable.
- Limited to the LSA, and particularly, to any areas of Project-related ground disturbance.
- Temporary, because all sites that cannot be avoided will be salvaged (effects will occur intermittently during Construction, if at all).
- Intermittent frequency, because an effect, if one occurs, would occur at various intermittent times.

There is a high degree of confidence that the actual effects of the Project on the Archaeological Resources KI will not be greater than predicted because of the extensive Historic and Heritage Resources baseline studies conducted in relation to the Project, the low potential for interaction with unidentified sites, and the nature and effectiveness of the planned effects management measures.

16.2.5.4 Construction Effects: Palaeontological Resources

A review of the geological mapping and literature relevant to the LSA indicates that, due to the age and type of geological formations, the potential for encountering Palaeontological Resources during the Project is very low. One area of potential importance with respect to Palaeontological Resources – located at Chapel Arm on the Avalon Peninsula (in Figure 15.2.4-2) – has been identified within the LSA. Other than this, the LSA avoids all important fossiliferous outcrops located in the province.

Summary of Likely Residual Environmental Effects

The likely residual effects of Project Construction on the Palaeontological Resources KI are as follows:

- Adverse but of very low probability, as known fossiliferous sites will be avoided and future work and mitigation procedures will minimize the potential for presently unknown sites to be inadvertently disturbed or lost.
- No effect or of low magnitude, because fossiliferous sites will be avoided where possible, and information will be retrieved and / or the site salvaged where Project-VEC interactions are unavoidable.
- Limited to the LSA, and particularly, to any areas of Project-related ground (rock) disturbance.
- Temporary, because all sites that cannot be avoided will be salvaged (effects will occur intermittently during Construction, if at all).
- Intermittent frequency, because an effect, if one occurs, would occur at various intermittent times.

There is a high degree of confidence that the actual effect of the Project on the Palaeontological Resources KI will not be greater than predicted because of the low potential for interaction with unidentified sites and the nature and effectiveness of the planned effects management measures.

16.2.5.5 Construction Effects: Sites of Cultural-Historical Importance

One site of cultural and spiritual importance to the Labrador Innu identified in Armitage (2010) is located within or near the LSA. The *Manitu-utshu*, or rock knoll, is located on the north side of the Churchill River, on the edge of the LSA, and will not be physically disturbed or affected by the Project.

No other sites of cultural-historical importance in or near the LSA have been identified through review of available information and the results of Nalcor's consultation and information gathering activities to date with other Aboriginal groups in Labrador and Québec (Nalcor et al. 2011; Figure 15.5.7-3a). Any additional and relevant information that is obtained through such consultation activities will be considered, as it becomes available, in ongoing Project planning.

Considering the above information, Project Construction will not likely have an effect on or physically disturb sites of Cultural-Historical Importance.

16.2.6 Operations and Maintenance

16.2.6.1 Overview of Project Operations and Maintenance and Associated Effects Management

During Project Operations and Maintenance, there will be little or no additional ground disturbance beyond those areas affected during Project Construction. Activities such as maintenance, inspections and vegetation management will occur primarily within the existing ROW, access roads and locations of Project infrastructure / facilities developed during the Construction phase. Some potential exists for disturbance to archaeological resources during Operations and Maintenance due to increased access to formerly inaccessible and remote locations.

In the event that Historic and Heritage Resources are identified / reported by Nalcor staff or contractors or by a member of the public during Operations and Maintenance, the specific precautionary and reporting measures identified in Section 16.2.5.1 (and included in the EPP) will be followed, including:

- implementation of a Stage 1 Historic Resources Assessment in accordance with provincial guidelines; and
- cessation of any Project activities at this location until an appropriate approach is developed and approved by the PAO.

16.2.6.2 Existing Knowledge

The existing knowledge base pertaining to the potential effects of the Project during Operations and Maintenance is the same as that presented for Construction in Table 16.2.5-1.

16.2.6.3 Operations and Maintenance Effects (All Historic and Heritage Resources KIs)

During Project Operations and Maintenance, there will be little or no additional ground disturbance beyond those areas already affected during Project Construction. More intensive human use of previously remote locations (for recreational, subsistence or commercial purposes) as a result of improved access by road or along the ROW could lead to inadvertent (e.g., ground disturbance by all terrain vehicles (ATVs)) or purposeful (i.e., unauthorized artefact collection) interactions with archaeological resources.

Given the types of Project activities likely to occur during this phase of the Project (with no significant new disturbance of rock materials), effects on palaeontological resources and sites of cultural-historical importance during Project Operations and Maintenance are not likely (as shown in Table 16.2.3-3).

Summary of Likely Residual Environmental Effects

The likely residual effects of Project Operations and Maintenance on the Archaeological Resources and Palaeontological Resources KIs are as follows:

- Adverse but of very low probability, as there will be little if any new ground disturbance associated with this phase of the Project, and known sites will continue to be avoided and standard precautionary and reporting procedures will be implemented through the EPP(s).
- No effect or of low magnitude, because sites will be avoided where possible, and information will be retrieved and / or the site salvaged where Project-VEC interactions are unavoidable.
- Limited to the LSA and, particularly, to any areas of Project-related ground disturbance.
- Temporary, because all sites that cannot be avoided will be salvaged (effects will occur intermittently during Operations and Maintenance, if at all).
- Intermittent frequency, because an effect, if one occurs, would occur at various intermittent times.

As the rock knoll has been avoided by Project components during planning and planned Construction, and will not be disturbed during Operations and Maintenance, no likely effects on sites of Cultural-Historical significance are predicted.

There is a high degree of confidence that the actual effects of the Project Operations and Maintenance on Historical and Heritage Resources will not be greater than predicted because of the low potential for interaction with unidentified sites and the nature and effectiveness of the planned effects management measures.

16.2.7 Environmental Effects Summary and Evaluation of Significance

16.2.7.1 Summary of Environmental Effects

As a result of the baseline work completed to date, the planned avoidance of known Historic and Heritage Resources in Project design and planning, further study in areas of high potential of unidentified Historic and Heritage Resources prior to Construction, and the implementation of standard and proven mitigation and reporting procedures the likely effects on Historic and Heritage Resources are predicted to be of very low probability, and limited to any currently unknown sites that may be inadvertently discovered during Project activities. If any such resources are discovered during the pre-construction assessment of high potential areas, or during Construction or Operations and Maintenance activities, measures will be implemented to avoid or minimize the effects of the Project on these resources, the finding will be reported to the PAO and Nalcor, and the issue will be addressed in accordance with provincial regulations. The effects of the Project, for each phase, are summarized in Table 16.2.7-1.

16.2.7.2 Definition and Determination of Significance

A significant residual adverse effect on Historic and Heritage Resources would include the loss or permanent disturbance of identified archaeological resources and / or palaeontological resources without the appropriate documentation or salvage and retrieval of the material-culture and / or the scientific information it contains, and without prior approval from the PAO.

Recognizing that there is also at least some potential that Project activities could unknowingly affect such resources, significant adverse effects would also include the loss of unidentified archaeological and /or palaeontological resources to a degree that would negatively affect the overall understanding of the history of the region.

For sites of cultural-historical importance, a significant residual adverse effect is the disturbance of a known site such that its integrity and cultural value is fundamentally and irrevocably diminished.

An effect that does not meet the above definitions is not significant.

With the implementation of the mitigation measures listed in Section 16.2.5.1, the Project is not likely to result in significant adverse effects on Historic and Heritage Resources.

Table 16.2.7-1 Environmental Effects Analysis Summary: Historic and Heritage Resources

Project Phase / Key Indicator	Likely Residual Environmental Effects Summary Descriptors				
	Direction	**Magnitude**	**Geographic Extent**	**Duration**	**Frequency**
Construction					
Archaeological Resources	**Adverse (but very low probability)** – Potential for unknown sites to be lost or disturbed	**Low** – Known sites will not be affected. High potential areas crossed by the ROW will be assessed. Information will be retrieved or sites will be salvaged for any newly discovered, inadvertently disturbed sites	**Local** – Effects limited to the Project footprint within the LSA	**Temporary** – While considered unlikely to occur, sites that will be disturbed will be salvaged and the information retrieved	– Intermittent disturbances, if at all
Palaeontological Resources	**Adverse (but very low probability)** – Potential for unknown sites to be lost or disturbed	**Low** – Known sites will not be affected. Information will be retrieved for newly discovered, inadvertently disturbed sites	**Local** – Effects limited to the Project footprint within the LSA	**Temporary** – While considered unlikely to occur, sites that will be disturbed will be salvaged and the information retrieved	– Intermittent disturbances, if at all
Sites of Cultural-Historical Importance	– No likely effect	– n/a	– n/a	– n/a	– n/a
Summary of Likely Residual Construction Effects on Historic and Heritage Resources: Likely effects on Historic and Heritage Resources are expected to be avoided or mitigated during Construction. As such, likely residual effects of the Project on the VEC during Construction are not predicted.					

Table 16.2.7-1 Environmental Effects Analysis Summary: Historic and Heritage Resources (continued)

Project Phase / Key Indicator	Likely Residual Environmental Effects Summary Descriptors				
	Direction	**Magnitude**	**Geographic Extent**	**Duration**	**Frequency**
Operations and Maintenance					
Archaeological Resources	**Adverse (but very low probability)**	**Low** – Known sites will not be affected. Information will be retrieved or sites will be salvaged for undiscovered, inadvertently disturbed sites	**Local** – Effects limited to the LSA	**Temporary** – While considered unlikely to occur, sites that will be disturbed will be salvaged and the information retrieved	– Intermittent disturbances, if at all
Palaeontological Resources	**Adverse (but very low probability)**	**Low** – Known sites will not be affected. Information will be retrieved or sites will be salvaged for undiscovered, inadvertently disturbed sites	**Local** – Effects limited to the LSA	**Temporary** – While considered unlikely to occur, sites that will be disturbed will be salvaged and the information retrieved	– Intermittent disturbances, if at all
Sites of Cultural-Historical Importance	– No likely effect	– n/a	– n/a	– n/a	– n/a
Summary of Likely Residual Operations and Maintenance Effects on Historic and Heritage Resources: Very limited potential for further disturbance during Project Operations and Maintenance that would cause effects on Historic and Heritage Resources.					

n/a Not applicable.

16.2.8 Evaluation of Project Alternatives

A number of alternative transmission corridor segments (Section 2.12.6) have been identified by Nalcor for consideration for the Project. Several of these alternative corridor segments have been the subject of Historic and Heritage Resources research (Stantec 2010) and others are located in general proximity to the proposed transmission corridor, or pass through environmental settings that were determined through past research to have varying degrees of Historic and Heritage Resources potential (Stantec 2010, 2011a). Regarding Palaeontological Resources, the methods used to determine areas of potential involved a review of provincial geological mapping to highlight locations where fossils could potentially occur.

An overview of the results of the alternatives evaluation for transmission corridor segments is presented in Table 16.2.8-1 below. As indicated in the table, there are no significant differences between the proposed corridor and each alternative segment in terms of their potential effects on Historic and Heritage Resources. Again, avoidance of known sites and further pre-construction work would be required to mitigate these effects. As appropriate, a Historic and Heritage Resources assessment of any selected alternative corridor segment would be conducted, as required under the *Historic Resources Act* (1985). If any sites or materials of archaeological or palaeontological importance were identified, these areas would be subject to the same mitigation measures currently proposed for the Project. A comparative summary of the effects on Historic and Heritage Resources for each alternative segment is provided in Table 16.2.8-1.

Table 16.2.8-1 Summary Evaluation of Project Alternative Means: Historic and Heritage Resources

Project Alternative Means[(a)]	Environmental Implications Compared to the Proposed Transmission Corridor		
	Archaeological Resources	**Palaeontological Resources**	**Sites of Cultural-Historical Importance**
A2: North-west of Strait of Belle Isle Alternative Segment	No known difference. Any known or newly discovered sites can be avoided.	No known difference. Any known or newly discovered sites can be avoided.	No known difference. Any known or newly discovered sites can be avoided.
A3: Point Amour Alternative Segment	Assessment not completed. Several known sites in the area. Area of high archaeological potential. Known or newly discovered sites can be avoided.	Area of high potential for fossils. Known or newly discovered sites can be avoided.	No known difference. Any known or newly discovered sites can be avoided.
A4: Strait of Belle Isle Newfoundland Side Alternative Segment	No known difference. Any known or newly discovered sites can be avoided.	No known difference. Any known or newly discovered sites can be avoided.	No known difference. Any known or newly discovered sites can be avoided.
A5: GNP NE Segment	No known difference. Any known or newly discovered sites can be avoided.	No known difference. Any known or newly discovered sites can be avoided.	No known difference. Any known or newly discovered sites can be avoided.
A6: GNP West Central Segment	No known difference. Any known or newly discovered sites can be avoided.	No known difference. Any known or newly discovered sites can be avoided.	No known difference. Any known or newly discovered sites can be avoided.
A7: GNP Eastern LRM Crossing	No known difference. Any known or newly discovered sites can be avoided.	No known difference. Any known or newly discovered sites can be avoided.	No known difference. Any known or newly discovered sites can be avoided.

Table 16.2.8-1 Summary Evaluation of Project Alternative Segments: Historic and Heritage Resources (continued)

Project Alternative Means[(a)]	Environmental Implications Compared to the Proposed Transmission Corridor		
	Archaeological Resources	**Palaeontological Resources**	**Sites of Cultural-Historical Importance**
A8: GNP IATNL Segment	No known difference. Any known or newly discovered sites can be avoided.	No known difference. Any known or newly discovered sites can be avoided.	No known difference. Any known or newly discovered sites can be avoided.
A9: Birchy Lake Segment	No known difference. Any known or newly discovered sites can be avoided.	No known difference. Any known or newly discovered sites can be avoided.	No known difference. Any known or newly discovered sites can be avoided.
A10: NLOA Segment	No known difference. Any known or newly discovered sites can be avoided.	No known difference. Any known or newly discovered sites can be avoided.	No known difference. Any known or newly discovered sites can be avoided.
A11: Avalon Alternative	No known difference. Any known or newly discovered sites can be avoided.	No known difference. Any known or newly discovered sites can be avoided.	No known difference. Any known or newly discovered sites can be avoided.

(a) As identified and described in Chapter 2, Project Rationale and Planning.

No technically and economically feasible alternatives for the submarine cable crossing or the shoreline electrode sites were identified (see Chapter 2, Sections 2.12.3 and 2.12.5), and therefore marine Project alternatives are not evaluated for Historic and Heritage Resources.

16.2.9 Cumulative Environmental Effects

Newfoundland and Labrador has a rich and complex cultural history, which extends over a time period of up to 9,000 years. There are many known and yet to be discovered Historic and Heritage Resources throughout the province, with different regions being characterized by different histories and cultural landscapes, as well as having varying degrees of potential to contain such resources.

Several parts of the province that will be crossed by the proposed Project, such as the interior of Central and Southeastern Labrador, remain remote and undeveloped, and so the Historic and Heritage Resources these areas contain likely remain undisturbed. Other areas, however, have experienced considerable past and ongoing human activities and associated ground disturbance that have had effects on Historic and Heritage Resources.

As described above, any potential adverse effects of the Project on archaeological and palaeontological resources would occur primarily, if not exclusively, as a result of ground disturbance during Project Construction. Any such effects, if they did occur, would therefore be restricted to the immediate Project footprint within the LSA. Other sites of cultural-historical importance may be indirectly affected by disturbance due to activities in immediately adjacent landscapes. As explained in Section 16.2.7, the Project is not likely to result in any significant adverse effects on Historic and Heritage Resources.

Any potential for cumulative effects of the Project would be limited to instances where the physical zones of disturbance of the Project would overlap directly with those of other projects and activities that affect Historic and Heritage Resources. The greatest likelihood for geographic overlap will be close to communities and existing infrastructure. As the potential for the Project to affect such resources is low, given the very small size and localized nature of any such sites / effects, and because it is unlikely that a single site would be affected more than once and by multiple disturbances, the potential for cumulative environmental effects on this VEC is low.

On a more regional scale, other reasonably foreseeable projects and activities also have the potential to affect this VEC, to varying degrees, in the various regions through which the Project will extend. The future construction of the Lower Churchill Hydroelectric Generation Project, for example, will involve surface disturbance and flooding and consequential disturbance of archaeological sites within that project's footprint. However, appropriate mitigation is planned for that project prior to construction, including Systematic Data Recovery (i.e., excavation, documentation, salvage and retrieval and conservation of materials, followed by analysis and report preparation) in accordance with provincial guidelines (GNL 1992). Future forestry activities and practices throughout Newfoundland and Labrador may also result in the disturbance of archaeological sites. Also, infrastructure projects, such as road maintenance / construction, municipal works, and industrial construction, often have very localized, short-term construction periods, but could disturb undiscovered Historic and Heritage Resources if these activities require ground disturbance in previously undisturbed areas.

All development activities in the province are subject to the Newfoundland and Labrador *Historic Resources Act* (1985), as well as other applicable regulations and guidelines designed to help protect the biophysical and socioeconomic environments. Any new projects and activities will therefore be governed by routine application of the assessment and mitigation policies in accordance with the Newfoundland and Labrador *Historic Resources Act* (1985), which would serve to minimize any potential adverse effects on Historic and Heritage Resources. The potential for any effects on this VEC from other projects and activities that will overlap spatially with the Project is very low. Also, any effects on Historic and Heritage Resources resulting from the Project and other projects and activities are not likely to negatively affect the overall understanding of the history of a region or the province as a whole.

As a result of the above factors, the likely cumulative effects of the Project in combination with effects from other reasonably foreseeable projects and activities on Historic and Heritage Resources are not significant (Table 16.2.9-1).

16.2.10 Monitoring and Follow-up

As indicated in Section 16.2.5.1, a number of post-EA studies and / or planning initiatives related to Historic and Heritage Resources are proposed, including archaeological field surveys along those sections of the eventual ROW that cross identified high potential areas. Nalcor will consult with the PAO regarding post-EA initiatives during detailed Project design, as well as on the specific nature and locations of field surveys.

As a result of these initiatives, and the other mitigation measures identified in Section 16.2.5.1, as well as the consequently very low potential for Project effects on Historic and Heritage Resources, no specific monitoring and follow-up activities are recommended or proposed for this VEC.

However, to ensure that appropriate and effective environmental mitigation measures are employed during Construction, Nalcor will have full-time On-Site Environmental Monitors at various construction sites. These individuals will continually be inspecting worksites and activities for conformance with the EPP and mitigation measures required by design, and compliance with government regulations and permits.

Table 16.2.9-1 Cumulative Environmental Effects Summary: Historic and Heritage Resources

Cumulative Effects Analysis	Central and Southeastern Labrador	Strait of Belle Isle	Northern Peninsula	Central and Eastern Newfoundland	Avalon Peninsula
Current (Baseline) VEC Condition	Four registered Archaeological Resources are within the LSA in this region. No Palaeontological Resources are situated within the LSA in this region. One site of cultural-historical importance (rock knoll) is physical known within the LSA, however no disturbance will occur to the site. The inland area crossed by the transmission corridor is remote, with limited past development to affect Historic and Heritage Resources.	No marine Archaeological sites are known within the cable corridor (LSA) in the Strait of Belle Isle. No sites of cultural-historical importance are known within the LSA in this region.	Four archaeological sites are known within the LSA in this region. No Palaeontological Resources are known within the LSA in this region.	Four archaeological sites are known within the LSA in this region. No Palaeontological Resources are known within the LSA in this region. No sites of cultural-historical importance are known within the LSA in this region.	Two archaeological sites are known within the LSA in this region. One location with Palaeontological Resources (i.e., Chapel Arm) is known within the LSA in this region. No sites of cultural-historical importance are known within the LSA in this region.
Likely Residual Environmental Effects of Labrador - Island Transmission Link	No disturbance or loss to Historic and Heritage Resources are predicted for this region.	No disturbance or loss to Historic and Heritage Resources are predicted for this region.	No disturbance or loss to Historic and Heritage Resources are predicted for this region.	No disturbance or loss to Historic and Heritage Resources are predicted for this region.	No disturbance or loss to Historic and Heritage Resources are predicted for this region.
Likely Cumulative Environmental Effects of Other Future Projects and Activities	Limited potential for overlapping (cumulative effects) within the LSA. Loss or disturbance to Archaeological sites will occur in association with the Lower Churchill Hydroelectric Generation Project although mitigation will be in place to recover data from the sites. Increased off highway vehicle (OHV) access associated with the Trans-Labrador Highway (TLH) and forestry roads, and ground disturbance from general infrastructure work could contribute to cumulative effects near the Strait of Belle Isle.	Limited potential for overlapping (cumulative effects) within the LSA. Seabed disturbance from fishing activities could contribute to cumulative effects on any Archaeological Resources in the region (such as shipwrecks).	Limited potential for overlapping (cumulative effects) within the LSA. Ground disturbance from general infrastructure work and increased OHV access associated with forestry roads could contribute to cumulative effects near communities.	Limited potential for overlapping (cumulative effects) within the LSA. Ground disturbance from general infrastructure work and increased OHV access associated with forestry roads could contribute to cumulative effects near communities.	Limited potential for overlapping (cumulative effects) within the LSA. Ground disturbance from general infrastructure work and increased OHV access associated with forestry roads could contribute to cumulative effects near communities.
Cumulative Environmental Effects Summary[(a)]	**Not Significant** Very low potential for Project effects on the Historic and Heritage Resources VEC. This Project and all other development activities are subject to the Newfoundland and Labrador *Historic Resources Act* (1985) and will be governed by application of the assessment and mitigation policies. In addition, the Project and all other existing and known future projects that will overlap with the proposed Project will not likely affect the overall understanding of the history of the region or the province as a whole.				

(a) Total (cumulative) change from the existing environment. Significance of cumulative environmental effects is evaluated using the same definitions as for the Project environmental effects analysis.

16.3 Communities

16.3.1 Introduction

The key questions addressed in the Communities VEC are whether and how the proposed Project will affect the communities in which people live, and the lives of people in those communities.

Strong and healthy communities are reflected in the physical, emotional and mental health of their residents, the availability and quality of physical and social infrastructure and services, and the characteristics of their local economies. The Communities VEC focuses on infrastructure and services, health and well-being, and overall quality of life. Potential economic benefits and effects that may occur as a result of the Project are discussed in the Economy, Employment and Business VEC (Section 16.4).

The Project may directly affect communities where it leads to changes in the nature and quality of local infrastructure and services, and / or where it causes changes in health and well-being of community members. These effects may be beneficial or adverse in different areas and / or for different segments of the population.

16.3.2 Environmental Assessment Study Areas

16.3.2.1 Spatial Boundaries

The components and activities associated with the Project will be located within and adjacent to a number of regions and communities throughout Newfoundland and Labrador.

The LSA for the Communities VEC is defined as the area within which Project-related elements and activities that affect communities and their residents are likely to occur. This includes the Project area itself (e.g., transmission corridor, access, camps, electrode sites), as well as other locations where people and communities may be directly affected by the Project (such as through direct interaction with Project personnel and works, and related demands for infrastructure and services).

The RSA for this VEC encompasses the regions that overlap with and extend beyond the LSA (see Figure 15.3.1-1). Where relevant and as required, the environmental effects assessment for Communities also takes a larger, provincial perspective.

16.3.2.2 Temporal Boundaries

The temporal boundaries of the assessment for the Communities VEC encompass the Project's Construction phase, as well as the Operations and Maintenance phase that will extend through the life of the Project.

16.3.3 Potential Environmental Issues, Indicators and Interactions

16.3.3.1 Potential Environmental Issues

Potential issues and questions associated with the Communities VEC were identified in the *Environmental Impact Statement Guidelines and Scoping Document* for the Project (Government of Newfoundland and Labrador and Government of Canada 2011), as well as through regulatory, Aboriginal and stakeholder consultation by Nalcor, and by the EIS study team for the Communities VEC.

The considerations that form the main focus of the assessment are summarized in Table 16.3.3-1. As indicated, the issues and questions raised to date have focused on various aspects and elements from within the overall theme of "communities". This has served to scope and focus the Communities VEC on a number of specific and relevant components.

Table 16.3.3-1 Identified Issues and Questions: Communities

Issue / Question	Nature and Rationale	Specific Considerations
Possible use of transportation infrastructure and services during Project Construction (especially roads and ports), and potential disruption of existing users, safety implications and effects on the overall quality of such infrastructure	– Project could place demands on community infrastructure and services that exceed the capacity of those systems – Could adversely affect the quality of life of community residents if that infrastructure and those services become less available, more costly, and / or of poorer quality as a result of Project-related uses and demands	– Large ports in strategic areas throughout the province may be used. Some port facilities, such as that located at Goose Bay, Labrador, may require upgrading to handle additional traffic by this and other projects – There is public concern about the current condition of roads in some areas, particularly the Labrador Straits. Increased use associated with the Project could result in further adverse effects on these roads – Concerns about types and volume of traffic from safety, service and potential interference (nuisance) considerations
Possible use of and demands for municipal infrastructure and services (e.g., waste disposal, safety and security, health, housing) as Project activities and crews move through an area during Construction		– Waste disposal facilities in some areas, e.g., Labrador Straits, have little or no capacity to accommodate additional waste material – Any potential Project-related accidents and malfunctions (e.g., fires, hazardous spills) will require adequate response mechanisms to be in place, which must not reduce the ability of existing response mechanisms to respond to other needs
Possible social issues in communities due to Project activity	– The Project could affect the health and / or quality of life of community members if it adversely affects their physical and mental health and safety, general sense of well-being and / or economic security	– May occur due to worker participation in the wage economy, and / or possible interaction of theconstruction workforce with local communities
Possible effects on human health from noise, electromagnetic fields (EMF) and / or other “emissions” during the Operation of the transmission system		– Noise associated with Construction and with the Operation of the transmission system could have adverse effects on general well-being – EMF is perceived by some to have implications for various human health issues
Perceived reduction in property values adjacent to the transmission line and / or other components		– Property values could be adversely affected by the presence of the transmission line or other Project components
Possible effects of transmission system operation on television and radio signals		– High voltage transmission systems may have localized effects on television and radio signals in their immediate vicinity

16.3.3.2 Key Indicators and Measurable Parameters

The KIs listed in Table 16.3.3-2 have been selected to reflect concerns expressed about potential Project effects on communities and their residents. Each KI has associated MPs, which represent aspects of the KI for which changes could be detected / measured.

Again, the issues and questions raised to date have focused on various, specific aspects and elements of communities, which has served to scope and focus the Communities VEC environmental effects assessment,

and "screen out" aspects of the large theme of communities, for which little or no potential for Project interaction or concern has been identified.

Table 16.3.3-2 Key Indicators and Associated Measurable Parameters: Communities

Key Indicator	Rationale for Key Indicator[(a)]	Measurable Parameter[(b)]	Rationale for Measurable Parameter
Transportation Infrastructure and Services	Concern has been expressed about the use of transportation infrastructure for the movement of materials, goods and equipment to and within the Project area, and potential effects on their use and quality (particularly roads and ports during Construction)	– Traffic volumes / types – Design capacity – Travel times – Quality of physical infrastructure and services	Comparison of normal traffic plus Project traffic with the designed capacity of highway / port infrastructure components allows for the determination of any capacity issues and constraints, and allows relevant authorities and Nalcor to determine appropriate follow-up actions
Waste Disposal Infrastructure and Services	Concern has been expressed that community or regional landfill facilities will not be able to accommodate Project-related waste (particularly during Construction)	– Volume of waste requiring disposal and capacity of existing facilities	Comparison of waste volumes potentially generated and the capacity of landfill sites highlights requirements and allows relevant authorities and Nalcor to determine appropriate follow-up actions
Safety and Security Services	Concern has been expressed about potential demands on safety and security services arising from potential Project accidents and malfunctions	– Use levels and capacity of existing safety and security services	Comparison of likely demands on services and current capacities allows relevant authorities and Nalcor to determine appropriate follow-up actions
Health Conditions	Concern has been expressed about Project-related issues that could affect the health of individuals (physical, emotional, mental) and communities	– Numbers of transportation-related accidents – Disease rates – Incidences of social issues (crime, domestic incidents) – Use levels of health and social services	Comparison of projected levels with existing / natural levels allows Project effects to be determined and relevant authorities and Nalcor to determine appropriate follow-up actions
Community Well-being	Concern has been expressed that the Project will affect quality of life of community residents	– Interference / annoyance / nuisance levels and tolerance – Property values	Comparison of projected levels with existing / natural levels allows Project effects to be determined and relevant authorities and Nalcor to determine appropriate follow-up actions

(a) Key Indicator: An aspect or characteristic of the VEC and / or its environment which, if changed as a result of the Project, may result in an effect on the VEC.

(b) Measurable Parameter: An environmental characteristic that is related to the status of a KI. Project effects to an MP can be detected and measured.

16.3.3.3 Potential Project-Communities Interactions

Many of the types of interactions that may occur between large development projects and communities are avoided due to the nature and characteristics of the Project, and can be avoided or reduced through appropriate Project planning and design considerations. As such, Project design can be used for effects management purposes where interactions leading to potential adverse effects are recognized at the outset,

thereby eliminating many possible causes for concern. These and other effects management approaches for the proposed Project are discussed in further detail in Section 16.3.5. The proactive identification and management of social issues through Project design has been an important aspect of Nalcor's planning to date.

The key potential interactions between Project components / activities and the KIs for the Communities VEC are identified in Table 16.3.3-3. Each Project Construction, and Operations and Maintenance element that could affect infrastructure and services and / or health and well-being aspects of the general public to some detectable degree, and which cannot be avoided through Project planning and design measures, is considered.

Project Construction will require a large workforce, and will involve the movement of a large amount of material and equipment to a number of marshalling yards near or along the transmission corridor (Chapter 3, Project Description). As such, there will be interactions between Project components / activities, and port and road / highway infrastructure and services that cannot be avoided.

Interaction is not expected to occur between the Project and certain municipal and regional infrastructure and services such as local water and sewer, housing, education and other components, because the Construction workforce for the Project will be accommodated in a series of largely self-contained construction camps located along the transmission corridor. The mobile nature of the work and the accommodation arrangements will mean that workers are unlikely to be accompanied by their families and so interaction between the Project and local school systems, for example, is not anticipated.

Table 16.3.3-3 Potential Project Interactions: Communities

Project Phase / Activity	Key Indicator				
	Transportation Infrastructure and Services	**Waste Disposal Infrastructure and Services**	**Safety and Security Services**	**Health Conditions**	**Community Well-being**
Construction					
Construction access trails and roads	Upgrading of some roads and a general increase in traffic on roads and highways	Generation of Construction waste	Risk of accidental events involving persons and / or property	—	Potential nuisance effects (e.g., noise, visual, interference)
Movement and presence of personnel, equipment and materials	Additional traffic, especially at ports and on roads			Potential accidents (e.g., transportation)	
Construction camps	—			—	
Marshalling yards and staging areas	Movement of materials to and from marshalling yards and staging areas				
ROW clearing and preparation	—				
Quarrying and borrowing	Movement of quarry materials to / from ports				
Transmission tower assembly and installation	—				
Conductor installation					
Converter station site preparation and construction					
Preparation and construction of submarine cable landing sites (on-land works)					
Construction and installation of submarine cables (marine works)					
Electrode site preparation and installation					

Table 16.3.3-3 Potential Project Interactions: Communities (continued)

Project Phase / Activity	Key Indicator				
	Transportation Infrastructure and Services	**Waste Disposal Infrastructure and Services**	**Safety and Security Services**	**Health Conditions**	**Community Well-being**
Island system upgrades	—	Generation of Construction waste	Risk of accidental events involving persons and / or property	—	Potential nuisance effects (e.g., noise, visual, interference)
Employment / presence of workers				Interactions between Construction workforce and local communities; effects of wage employment	
Contracting / expenditures		—	—	Effects of wage employment	—
System commissioning			Risk of accidental events involving persons and / or property	—	—
Operations and Maintenance					
Access trails and roads	A small increase in traffic on roads and highways	—	—	—	—
Presence and operations of the transmission system			Risk of accidental events involving persons and / or property	Transmission system "emissions" (e.g., MF, noise); risk of accidental events or malfunctions	Potential nuisance effects (e.g., noise, visual, interference, property value)
Routine line inspections and repairs			—	—	—
Vegetation management				Potential effects of herbicide use	
Potential major system repairs	Additional traffic, especially at ports and on roads	Generation of waste	Risk of accidental events involving persons and / or property	—	Potential nuisance effects (e.g., noise, visual, interference)

Table 16.3.3-3 Potential Project Interactions: Communities (continued)

Project Phase / Activity	Key Indicator				
	Transportation Infrastructure and Services	**Waste Disposal Infrastructure and Services**	**Safety and Security Services**	**Health Conditions**	**Community Well-being**
Operation of the electrodes	—	—	—	Transmission system "emissions"; risk of accidental events or malfunctions	—
Employment / presence of workers				Effects of wage employment	
Contracting / expenditures					

— Indicates no likely or detectable interaction identified.

16.3.4 Approach to the Environmental Effects Analysis

16.3.4.1 Analytical Methods

The environmental effects analysis uses the approach commonly adopted for the socioeconomic assessments of other projects. Relatively precise predictions of certain interactions arising from the Project, such as noise and EMF, can be made through specific modelling techniques (Chapter 3, Project Description; Chapter 11, Atmospheric Environment). For other potential social effects, such as effects on health or other social issues, quantitative predictions are often neither possible nor particularly meaningful. In such cases, an objectives-based approach is adopted in which Project design and other effects management techniques are used with the objective of avoiding, reducing or, at a minimum, not increasing the level of a particular issue and parameter.

16.3.4.2 Environmental Effects Descriptors

The potential effects of Project activities on the various aspects of the Communities VEC are generally described in terms of a set of descriptors summarized in Table 16.3.4-1.

Table 16.3.4-1 Effects Descriptors: Communities

Effects Descriptor	Definition
Direction	
Adverse	Effect is negative and undesirable
Neutral	Effect does not change existing (baseline) socioeconomic conditions or trends
Beneficial	Effect is positive and desirable
Magnitude	
No effect	Project results in no change in the existing condition / baseline value
Low	Project results in a small change in the existing condition / baseline value, which is well within the capacity of the infrastructure or service element in question, or is in keeping with the natural condition / variability or accepted threshold of the parameter in question
Moderate	Project results in a clear change in the existing condition / baseline value, which is within the capacity of the infrastructure or service element in question, or is in keeping with the natural condition / variability or accepted threshold of the parameter in question
High	Project results in a major change in the existing condition / baseline value, that exceeds the capacity of the infrastructure or service element in question or is outside the natural condition / variability or accepted threshold for the parameter in question
Geographic Extent	
Local	Effect will be evident within the LSA
Regional	Effect will be evident within the RSA
Beyond regional	Effect will be evident throughout the province and potentially beyond
Duration	
Short-term	Effect will be evident for less than one year
Medium-term	Effect will be evident for between one and four years
Long-term	Effect will be evident for from four to ten years
Far future	Effect will be evident throughout the life of the Project
Frequency	
Continuous	Effect continues uninterrupted throughout Construction and / or Operations and Maintenance
Intermittent	Effect occurs sporadically during Construction and / or Operations and Maintenance

16.3.5 Construction

16.3.5.1 Overview of Project Construction and Associated Effects Management

The Project, for the purposes of this EA, consists of the Construction, and Operations and Maintenance phases, as described in Chapter 3, Project Description. Of particular relevance to the Communities VEC and its associated KIs are the proposed construction methods and arrangements for the Project.

The transmission system will be similar to other existing transmission infrastructure in the province, and Nalcor will use standard practices and procedures and will comply with applicable regulatory requirements during Project Construction. The Project will be constructed under the guidance of internal policies, regulatory authorities and government departments and agencies. Nalcor will work with government departments and agencies before and during Project Construction to facilitate planning and preparation for Project activities.

Access to and within the Project area for the transportation and distribution of personnel, equipment and materials to the work areas is a key requirement. Ports and other transportation infrastructure will be used throughout the province as required. In Labrador, the TLH and other existing roads in the area will provide access to the western half of the transmission corridor. The Labrador Straits Highway (Route 510) will provide access to the eastern end. On the Island of Newfoundland, considerable access is available through the existing provincial highway system, resource road networks and trails. Access to the Project area will be via access trails and roads established from existing roadways to select points along the ROW and other sites. At strategic points along the ROW and at other key sites, marshalling yards will be established to receive and temporarily store materials and equipment for use in Project Construction.

Lodging for the construction workforce will be provided through the use of small, temporary, self-contained construction camps established at strategic points along or near the ROW (Chapter 3, Project Description), which will typically be occupied by a sequence of sets of workers. For example, once those responsible for clearing the ROW in a particular area have completed their tasks, they will move on and be replaced by those involved in the next stages of the Project, such as tower foundation installation. When this group of workers completes its work, those assembling and erecting the towers will replace them. While the size of the workforce at any one camp may be relatively constant, the membership of the work crews at each location will change with each phase / activity. Crews will follow a roster system (yet to be finalized), with a given number of days on the job followed by a number of days of rest.

Construction workers will primarily be housed in camps and there will be limited demand placed on local housing or other accommodations. In-migration of workers and their families to communities near the transmission corridor during the Construction phase is unlikely, due to the relatively short construction period (four years), the highly mobile nature of much of the work (with periodic changes of camp locations by various task groups as work in a particular area is completed), and the roster work arrangements that allow workers to return to their homes between work cycles.

In contrast to transmission line construction, the work on other Project components (i.e., converter stations at Muskrat Falls and Soldiers Pond, the cable crossings of the Strait of Belle Isle, and the electrode sites) will be of comparatively longer duration. For these other Project components, individual workers will not typically be involved for the duration of the Construction phase. Considering this, as well as the use of camps and the work roster system, it is unlikely that workers will choose to relocate themselves or their families to local communities. This situation is supported by experience with even longer-term projects in the province and elsewhere. For example, the original intention of the operators of the Duck Pond copper-zinc mine at Millertown, Newfoundland and Labrador was to have workers reside in nearby local communities. Workers objected to these proposed arrangements and, instead, a commute operation with a roster work system was established and a camp constructed near to the mine site (Aur Resources 2006, internet site).

In the absence of Project-related in-migration, limited demand will be placed on local infrastructure and services such as education, recreation and social services. The presence of paramedic, firefighting and security personnel on-site at the camps will also serve to minimize any effects of the Project on health, fire and security services, except in the case of serious incidents and emergencies.

Extended work-days, the rotational work system and the secured nature of the camps will also help to minimize worker-community interactions. The use of construction camps will thus help to isolate Project workers from the community and to insulate the community from Project workforce demands for many local facilities and services and, thereby, minimize any potential adverse effects of the Project on local communities.

16.3.5.2 Existing Knowledge

The construction of electrical transmission systems is common throughout North America and worldwide. The potential effects of transmission line construction on Communities are similar to those that may be experienced with any large construction project, and particularly comparable with those of other linear projects such as pipeline, road and railway construction. Long, linear developments will typically interact with a range of types of communities, such as large and small municipalities, and those with and without prior experience of transmission line or other major infrastructure construction projects.

There is little available published "existing knowledge" which has evaluated and measured the actual and known effects of similar projects and activities on Communities. Some key findings from a selection of recently published literature that is specific to transmission line construction, and which relates primarily to known and perceived social issues that are often associated with such projects, and / or to the management of their associated effects, are summarized in Table 16.3.5-1.

More generally, the province has experienced a large number of major construction projects over the last 25 years. While there were concerns about community effects of the megaproject Hibernia, studies of its actual effects showed that they were small and in some cases positive effects, due largely to successful management initiatives. This also appears to have been the case with subsequent projects such as the Newfoundland Transhipment Terminal, the Terra Nova and White Rose floating oil production facilities, and the Voisey's Bay mine / mill.

Table 16.3.5-1 Existing Knowledge (Construction): Effects of Similar Projects on Communities

Reference	Study / Project Context	Summary of Findings
Bembani Sustainability Training (Pty) Ltd. (2011, internet site)	Assessment of construction of a 400 kilovolt (kV) transmission line in KwaZulu Natal province, South Africa	– Study considered demographic, land use, socio-cultural and economic changes for the construction and operational phases of the project. – Main effects expected during the construction phase included in-migration of construction workers, resettlement of landowners, disruption of agriculture, and effects on roads and airstrips. – No issues of major significance were identified that could not be mitigated such that the proposed project was not acceptable from a social perspective. – In addition, the proposed project is expected to result in positive impacts, which might benefit the local people.

Table 16.3.5-1 Existing Knowledge (Construction): Effects of Similar Projects on Communities (continued)

Reference	Study / Project Context	Summary of Findings
British Columbia Transmission Corporation (BCTC) (2010, internet site)	North-west Transmission Line Project BC. Environmental Assessment Application	– Workers to be accommodated at existing and new construction camps along the proposed project route. This is not expected to result in increased pressure on locally available housing or emergency services in Terrace and the surrounding region. – Private properties along the proposed route are likely to experience a low-level decrease in property market values. BCTC to seek agreements with private property owners directly in the path of the ROW. – Residents of private properties in proximity to the project could experience a temporary decrease in quality of life during construction, as a result of increased industrial activity. These effects would be short-term and are predicted to be not significant. – Project approved in February 2011.
PSC Wisconsin (2010, internet site)	Overview of environmental issues and concerns raised by the construction / operation of electric transmission facilities	– Findings on changes in property values are highly variable, tend to be context-specific, and not readily project-to-project transferrable. – The policy of corridor sharing favours the placement of new transmission lines within or next to existing infrastructure, which may cause some landowners to be burdened by multiple easements. These hardships must be balanced against the potential to reduce environmental effects caused by the development of new transmission corridors. – Appraisers, utility consultants and academic researchers have studied the potential change in property values due to the proximity to a new transmission line since the 1950s. Data from these studies are often inconclusive and have not been able to provide a basis for specific predictions in other locations for other projects (see, for example, PSC Wisconsin 2010, internet site; Elliott and Wadley 2002, internet site). – Transmission lines may have general effects on property values; estimated reduction in sale price for single-family homes has ranged from 0 percent (%) to 15%. – Adverse effects on the sale price of smaller properties can be greater than effects on larger properties. – Other factors, such as schools, jobs, lot size, house size, neighbourhood characteristics and recreational facilities tend to have a greater effect on sale price than the presence of a transmission line. – Sale prices can increase where the transmission corridor is landscaped or developed for recreation (e.g., hiking, hunting and snowmobiling). – The effects on price and value appear to be greatest immediately after a new transmission line is built or an existing ROW is expanded, these effects appear to diminish over time and over generations of property owners. – The effects on sale price have most often been observed on property crossed by or adjacent to a transmission line, but effects have been observed for properties farther away from a line.

Table 16.3.5-1 Existing Knowledge (Construction): Effects of Similar Projects on Communities (continued)

Reference	Study / Project Context	Summary of Findings
Sims and Dent (2005)	UK based study of the effect of high-voltage overhead transmission lines, on the value of residential property	– Studies based on perceptions of buyers are questioned due to differences between buyer attitudes and buyer behaviour. Accuracy is improved when survey data are compared with transaction data from the same location. – Where transaction data are available, results suggest that presence of distribution equipment may have a negative effect on property values. Results are mixed, with some studies suggesting no real value effects and others finding significant value diminution. – Studies of negative effects tend to suggest that it was not the health and safety issues that influenced the market, but other factors such as unsightliness, visual and aural pollution.
Elliott and Wadley (2002, internet site)	Literature review of effects on property values and a model of the stigma apparently attached to power lines	– Authors argue that the effects on property values are insufficiently explored and inconclusively theorized. – Analysis of 30 years of case studies shows negative effects on property values of 1% to 9%, but results are open to interpretation based on distances from the ROW at which effects are observed.

16.3.5.3 Construction Effects: Transportation Infrastructure and Services

The following provides a high level and initial estimate of some of the heavy equipment, materials and supplies that may be required to be shipped to and within the province during Project Construction:

- excavators, cranes and bulldozers;
- large electrical components, such as sync condensers;
- 2,200,000 m of conductor (2,700 reels);
- 450,000 insulators (6,250 pallets);
- 3,150 steel towers and 12,000 steel lattice foundations (76,000 metric tonnes of steel);
- 1,100,000 m each of optical overhead groundwire (OPGW) and counterpoise wire (2,750 reels);
- 800,000 m of guy wire (1,000 reels);
- 830,000 m of electrode conductor (1,000 reels);
- 120,000 m of submarine cable; and
- 60 million litres of diesel fuel.

Bulk materials, heavy equipment and other Project requirements from outside the province will be shipped to the Québec North Shore and Labrador (QNS-L) main ports (e.g., Happy Valley-Goose Bay, Corner Brook and St. John's) and then moved by truck to marshalling yards that will located at strategic points on or near the Project sites. In Labrador, some of the required materials could also be shipped to Blanc Sablon and then via Route 510, or to Sept-Îles in Québec and then via the QNS-L railway and the TLH. On the Island of Newfoundland, some use may be made of the Gulf ferry to Port-aux-Basques or Argentia. However, while the provincial ferry system has been identified as a potential means of transport for construction materials, the Project will not make substantial use of the Gulf or Strait of Belle Isle ferry services, both of which have identified capacity issues.

The ports in Corner Brook and St. John's operate year-round and are well-equipped to handle the volumes of material that will be required for the Project. The shipping season for the Port of Goose Bay is typically five months, from June to November, which has implications for the temporal flow of materials into the area. Also, the Goose Bay dock requires upgrading to handle the larger and heavier loads associated with the Lower Churchill Hydroelectric Generation Project (Nalcor 2009, internet site). Nalcor has and will continue to liaise with the relevant planning authorities and be involved to the extent appropriate and necessary to upgrade the dock.

There will be a substantial requirement for aggregate for the Strait of Belle Isle crossing. Rock will be loaded on to a specialized vessel at a port and the vessel will then travel to the submarine cable corridor to deposit the rock. The vessel will return to port, re-load, and repeat the process. There are a number of operational quarries and associated port sites in Newfoundland. Those selected for the Project will be determined by the rock supply and installation contractor and will be reviewed and approved by Nalcor, but in all cases the facilities are expected to have the capacity to meet Project requirements.

Smaller local ports will be used as necessary and appropriate for the Project. Activities in the Strait of Belle Isle will likely make use of one or more port facilities. Ports will be evaluated on an as needed basis and will only be used following consultation with owners and stakeholders, and if it is determined that the adjacent infrastructure (e.g., area roads) have the capacity to support Project requirements.

From the ports, equipment, goods and materials will be moved to the Project marshalling yards along the main highways. In Labrador, yards will likely be established at Muskrat Falls, at a midway point along the route, and in the Labrador Straits area. On the Island of Newfoundland, marshalling yards will be established at Deer Lake and Witless Bay Line, with an auxiliary yard at Plum Point. Approximate locations of the Project marshalling yards are described in Table 16.3.5-2.

Table 16.3.5-2 Approximate Marshalling Yard Locations and Proposed Route of Material and Equipment Delivery

Marshalling Yard	Location	Material and Equipment Delivery
A	Located approximately 150 km south-east of Happy Valley-Goose Bay near the southern most point of the TLH3	Material can be transported by road, either from Goose Bay or Québec, to the marshalling yard.
B	Located on the Labrador side of the Strait of Belle Isle, near the intersection of Route 510 (Labrador Straits Highway) and the secondary road that leads to Point Amour.	Transmission line materials can be transported by ship or barge, or via the TLH3.
C	Located near the community of Plum Point on the Northern Peninsula. This is considered an auxiliary yard as it will be used for relatively short-term storage only.	Materials can be transported to the marshalling yard via Route 432. Materials and equipment that are brought in from off-Island will either be sent via boat to Corner Brook or on the Trans-Canada Highway (TCH) via the Marine Atlantic Ferry at Port aux Basques.
D	Located near Deer Lake. This will be the main marshalling yard for the Island portion of the Project and will include an administration building and a security office.	Materials can be transported to the marshalling yard via the TCH. Materials and equipment that are brought in from off-Island will either be sent via boat to Corner Brook or on the TCH via the Marine Atlantic Ferry at Port aux Basques.
E	Located at the eastern end of the transmission corridor, on the Witless Bay Line (Route 13), near the existing transmission line.	Materials can be transported to the marshalling yard by road. Materials and equipment that are brought in from off-Island will be either sent via boat to Corner Brook and St. John's or by road (TCH or Route 13) via the Marine Atlantic Ferry at Port aux Basques. Alternate docking locations may be available.

In addition to these locations, the contractor will select a number of staging or temporary laydown areas along the ROW. Wherever possible, existing clearings, such as pits, will be used as staging areas.

All goods and materials will be delivered as standard truckload units (approximately 12 tonnes). Infrequent movements of equipment involving extra heavy or wide loads are also anticipated. In St. John's and Corner Brook, roads from the respective ports to the main highways are designed to accommodate the type and volume of traffic that will be generated by the Project. However, in Happy Valley-Goose Bay there is already some congestion on Hamilton River Road and construction activity associated with this and other projects will add to this (see the cumulative effects discussion, below). Widening this road would reduce congestion or, alternatively, access from the port of Happy Valley-Goose Bay to the TLH could be achieved by upgrading South Branch Road or by extending an existing road around the west side of the airport to the TLH (Nalcor 2009, internet site). To reduce any adverse socioeconomic effects of additional road traffic within the community, Nalcor has met with various authorities, such as the Newfoundland and Labrador Department of Transportation and Works (NLDTW) and the Town of Happy Valley-Goose Bay, to discuss possible mitigation strategies, and Nalcor will continue to consult regularly with these authorities.

During the public consultation process for the Project, residents of the Labrador Straits expressed concern about the current condition of the road surface of Route 510 and the potential for Project-related traffic to result in further road surface deterioration. Nalcor recognizes the concern and will liaise with the responsible authority (NLDTW), local stakeholders and surrounding communities to explore ways to minimize and address Project issues relating to Route 510.

Particular concern was expressed about any substantial increase in the use of the Trans-Labrador Highway Phase 2 (TLH2) between Red Bay and Cartwright in southern Labrador to move equipment and materials during Project Construction. The Project plans do not, however, indicate that Project activities will take place in or near the communities in this part of southern Labrador (north of Red Bay). No lay down areas, camps or other construction infrastructure are planned in or near these communities, and it is unlikely that there will be large and / or repeated movements of personnel, equipment or materials to or through these communities. While the port at Cartwright could potentially be used to bring in some large Project components, this is not currently planned, and if this were to occur, it would be limited in terms of the scale and frequency of activity. No effects on the quality of the TLH in this region are likely as a result of the Project.

Throughout Project Construction, equipment, goods and materials will be distributed from the marshalling yards directly to the staging areas along the ROW and then to the worksites, with the bulk of the heavy equipment being moved in Year 1. To access the ROW from the main highways, existing access roads will be used wherever possible, with upgrades as required. However, some new access roads and trails will be required (Chapter 3, Project Description). Once the equipment is on the ROW, most of it will remain there and be transported along the ROW, rather than being brought to another location via the highway system. Supplies will be trucked to the temporary camps on a regular basis.

Traffic generated on the Island of Newfoundland may originate at St. John's, Corner Brook, or possibly other ports from where the materials, goods and equipment will be distributed across the Island. Project-related traffic effects will be mainly experienced at the port arrival points, but roads in these areas are designed to accommodate higher truck traffic volumes with good access to main highways. Elsewhere, incremental traffic volumes on particular highway legs will decrease the further from the arrival points that vehicles must travel (i.e., items arriving in Corner Brook and destined for various areas in western and central Newfoundland must all use the Corner Brook-Deer Lake section of the TCH, but at that point some traffic will terminate, some will be diverted towards St. Anthony, while other vehicles will continue to marshalling yards further east along the TCH).

It is anticipated that the highest proportion of the traffic movements generated will be in the first two years of the Construction period. These volumes are associated with the movement of steel, of which some 76,000 metric tonnes is required for the Project. Detailed information on materials delivery by time, location and quantity cannot be determined at this stage of Project planning and design. However, in Labrador, for example, if it were assumed that half of the peak-year trips are made from Happy Valley-Goose Bay and half from the Labrador Straits area, and that all trips for the year are concentrated in a one month (30 day) period, the daily incremental truck traffic in each of these areas for that month would be approximately 13 trips. The concentration of traffic activity for the year into a single month is highly unlikely, but even under this condition, in the context of normal daily traffic on these transportation route segments, Project-generated traffic increases will be relatively minor.

As a percentage of current traffic volumes, Project-generated incremental traffic volumes will be highest on low volume highway legs, such as Route 430 on the Northern Peninsula, but the absolute volume of traffic generated will still be relatively small. Table 16.3.5-3 provides annual average daily traffic counts at select locations along the main highways likely to be used to move equipment, materials and goods for the Project in Labrador and on the Island of Newfoundland. Data are provided for the TLH (Route 500 and Route 510), Route 430 on the Northern Peninsula, and the TCH between Corner Brook and St. John's.

There are no published capacities data for these highway segments. For the most part, average travel speeds on highways in provincial jurisdictions are described as being in the higher category, given that there are opportunities for passing that lowers the percentage of time vehicles must follow other, slower vehicles and thus giving a high level of service on these highways (A to B range). When highway volume exceeds 12,000 vehicles per day, it usually warrants upgrading to a divided highway standard, thereby giving a higher level of service (Morrissey 2011, pers. comm.). As indicated in Table 16.3.5-3, annual average daily traffic counts for all highway sections other than the TCH near St. John's (Whitbourne to St. John's is a divided highway), and the TCH at Gander are well below the 12,000 vehicles per day level.

Table 16.3.5-3 Highway Traffic Counts Selected Locations, Major Highways, Study Area Regions

Survey Location	Survey Year	Direction	Leg Destination[(a)]	Leg AADT[(b)]
TLH Route 500 Lab West km 30	2010	East West	Wabush Goose Bay	545 545
TLH Route 500 Route 510 Intersection Goose Bay km 539	2010	East West	Cartwright Wabush	153 341
TLH at Chateau Pond Depot between Red Bay and Lodge Bay	2010	North South	Lodge Bay Red Bay	238 238
Route 430 Intersection Route 435 Cook's Harbour	2007	East West	St. Anthony Deer Lake	5,741 5,741
Route 430 at St Barbe	2007	North South	St. Anthony Deer Lake	1,232 1,172
Route 430 at Port au Choix	2007	North South	St. Anthony Deer Lake	1,271 1,660
TCH at Route 430 Deer Lake	2007	East West North	Grand Falls Corner Brook St. Anthony	5,143 8,451 7,937
TCH at Massey Dr. Corner Brook	2007	East	Deer Lake	5,224

Table 16.3.5-3 Highway Traffic Counts Selected Locations, Major Highways, Study Area Regions (continued)

Survey Location	Survey Year	Direction	Leg Destination[(a)]	Leg AADT[(b)]
TCH at Route 410 to Baie Verte	2007	East West	Grand Falls Deer Lake	3,221 3,153
TCH at Route 350 to Botwood and Bishop's Falls	2007	East West	Gander Grand Falls	6,190 8,996
TCH at Caldwell St. Gander	2007	East West	Clarenville Grand Falls	10,587 13,661
TCH at Clarenville Inn	2007	East West	St. John's Gander	8,157 5,796
TCH at Route 61 Foxtrap	2007	East West	St. John's Clarenville	16,033 15,776

Source: Morrissey 2011, pers. comm.

(a) "Destination" refers here to the next major centre along the highway in the direction specified, and cited in the highway leg description.

(b) AADT = Annual Average Daily (24 hours) Traffic Count.

While the Project will generate additional traffic, it is expected to be only a small percentage of the total annual traffic for any one highway segment, and is not expected to result in a substantially lower level of service on the highways used.

To reduce any adverse socioeconomic effects of additional road traffic resulting from the Project, Nalcor will liaise with provincial and local authorities to provide them with the necessary information to plan and manage the expected traffic volumes. Nalcor has met with various authorities, such as the NLDTW, and will continue to meet regularly with these authorities. Where there is potential for traffic slowdowns as a result of a temporary increase in Project activity, Nalcor will advertise these details to advise motorists of potential slowdowns and, where possible, these activities will be conducted to avoid periods of peak traffic. All traffic operations will be conducted in accordance with provincial legislation, including the *Uniform Highway Transport Vehicle Regulations*, which regulate the weight and dimensions of highway vehicles operating in Atlantic Canada.

Summary of Likely Residual Environmental Effects

The likely residual effects of Project Construction on the Transportation Infrastructure and Services KI are as follows:

- Direction:
  - Project effects on highways will be adverse because increased demands on highway infrastructure may contribute to additional maintenance requirements and costs, possible safety concerns for highway users, and nuisance effects (e.g., noise, dust, user inconvenience). Beneficial effects will result from the upgrading of roads in areas where capacity issues have been identified.
  - Use of ports will be beneficial from a revenue-generating perspective for those ports with the capacity to handle Project-related traffic. For Goose Bay, the cost of upgrading facilities could be considered an adverse effect in the short-term, but Project-related activity and the overall improved dock infrastructure will provide long-term benefits.

- Magnitude:
  - Project effects on highways will be moderate and within the capacities of the highway segments affected.
  - Decisions have not been made on which ports will be used for the receipt and distribution of materials, equipment and goods for the Project. The effects of the Project on Corner Brook and St. John's will be moderate, and within the current capacities of those ports. If upgrades to the port at Goose Bay are undertaken, the effect of the Project there will also be moderate.
- Geographic Extent:
  - Project effects on highways will be regional and experienced on major highways within all regions, and on some community roads between ports and the major highways. In addition, effects will be local where they are experienced on existing or purpose-built tote roads, or resource roads between the main highways and the transmission corridor ROW.
  - Project effects on ports will be regional, experienced in specific communities in those regions with the required port facilities, including Central and Southeastern Labrador (Happy Valley-Goose Bay), the Northern Peninsula (Corner Brook) and the Avalon Peninsula (St. John's).
- Duration:
  - Project effects will be of medium-term duration throughout Construction.
  - Beneficial effects from road improvements will be far future in duration.
- Frequency:
  - Project effects will be intermittent throughout Construction.
  - Beneficial effects of road improvements will be continuous throughout Construction.

There is a high degree of confidence that the level of effects of the Project on the Transportation Infrastructure and Services KI will be as predicted because the types and volumes of equipment, goods and materials required have been estimated based on past experience with similar transmission line and other project construction requirements.

16.3.5.4 Construction Effects: Waste Disposal Infrastructure and Services

Waste from the Project will include waste from packaging of materials and equipment, and domestic waste from the Construction camps. Most of the Construction waste will be generated in Year 1 to Year 3 of the Project. All solid waste disposal will be in compliance with the Project EPP(s).

Large volumes of packaging materials will be associated with transmission tower components, conductors and insulators, and other Project requirements listed above (Section 16.3.5.3). The amount of domestic waste from the temporary Construction camps is estimated to be 2.2 kilograms (kg) per person per day (Murphy 2010, pers. comm.). At this rate, a 150-person camp would produce 9,900 kg or 9.9 metric tonnes per month. It is anticipated that 11 camps will be established along, but outside, the ROW. Four will be located between Muskrat Falls and Forteau Point, three will be located between Shoal Cove and Taylors Brook, and four will be located between Taylors Brook and Soldiers Pond. Whenever possible, waste materials will be reused and / or recycled. The domestic waste and other potential waste attractants will be temporarily stored in bear-proof containers before being transported to an approved disposal site.

Waste disposal for the Project will be permit-based, and with the approval of waste management authorities or municipalities across the province. Where local waste management facilities do not have the capacity or authority to accept Project waste, as may be the case in the Labrador Straits area, Nalcor and its contractors will be required to remove the waste from the area and make arrangements to dispose of it elsewhere. Early and ongoing communication and consultation regarding Project plans and likely requirements between Nalcor

and local communities and stakeholders will be key, as will appropriate infrastructure planning by the responsible authorities.

Summary of Likely Residual Environmental Effects

The likely residual effects of Project Construction on the Waste Disposal Infrastructure and Services KI are as follows:

- Direction:
  - Project effects may be considered adverse because waste will be generated, but as the Project can and will only use those sites that have the capacity and are authorized to accept such waste, there may be no adverse effects on waste infrastructure and services. Disposal of Project waste will be beneficial from a revenue generation perspective for some municipalities.
- Magnitude:
  - If they occur, adverse effects on the Project will be low to moderate, as waste can and will be disposed of only at those sites with the capacity to accept that waste.
- Geographic Extent:
  - Project effects will be regional and limited to a few landfill sites in some regions.
- Duration:
  - Project effects will be of medium-term duration throughout Construction.
- Frequency:
  - Project effects will be continuous throughout Construction.

There is a high degree of confidence that the actual effects of the Project on the Waste Disposal Infrastructure and Services KI will be as predicted based on previous transmission line construction experience, and existing knowledge of the characteristics of goods and materials required for the Project, together with their waste-generating potentials.

16.3.5.5 Construction Effects: Safety and Security Services

Accidents or other unplanned events are possible during the construction of any large project, which may affect human health and safety and thereby place additional demands on local safety and security services including fire, emergency response and policing. Potential accidents and malfunctions are described in detail in Chapter 5, Accidents and Malfunctions. Worker health and safety issues are not addressed specifically in this VEC, which focuses on potential issues and effects that relate to the general public. The types of community and regional services that could be called upon in the event of an accident or malfunction (e.g., forest fire services and policing) are described in Section 15.3.5.

A number of potential, though unlikely, types of accidents and malfunctions may occur, of which the following are the most likely to have community-related implications:

- fires occurring at marshalling yards, camps and converter station sites;
- forest fires; and
- spills and leaks of hazardous materials.

In Chapter 5, Accidents and Malfunctions, the nature of these potential incidents is discussed, together with incident prevention measures and responses. Risk evaluations are then carried out for 'Most Likely' and 'Worst Case' scenarios. The conclusions drawn with respect to the probability, consequences and level of risk associated with the potential incidents are based on 50 years of Nalcor experience with construction and

maintenance of transmission and distribution lines, industry knowledge, and government statistics. In both its Occupational Health and Safety Guidelines and Emergency Response Plans, Nalcor conforms to both provincial and federal legislation with the intent of meeting both its legal and corporate responsibilities.

To minimize the likelihood of accidents and malfunctions and to mitigate the effects of those incidents, Nalcor will develop Safety, Health and Environmental Emergency Response Plans (SHERP) to address potential unplanned incidents and emergency situations. All Project personnel will be made aware of the SHERP and designated staff will receive SHERP training. Among other elements, these plans will address handling and storage of materials, driving safety, animal encounters, emergency response communications, spill response, personnel injury response and vehicle accidents. The plans will describe response measures for major medical emergencies and include procedures for emergency response coordination with local emergency response personnel and local medical facilities.

Details on the Incident Risk Evaluation Matrix are provided in Table 16.3.5-4, and Table 16.3.5-5 summarizes the conclusions from this analysis. Further details on the nature of Worst Case Scenarios can be found in Chapter 5, Accidents and Malfunctions, Table 5.15-1. Further discussion of specific incidents can also be found in the biophysical effects assessments.

Table 16.3.5-4 Incident Risk Evaluation Matrix

Incident Risk Evaluation			Consequence		
			Low	**Moderate**	**High**
			Incident could result in a slight decline in the resource in the Study Area during the life of the Project. Research, monitoring, and / or recovery initiatives would not normally be required	Incident could result in a decline in the resource to lower-than-baseline but stable levels after Project closure and into the foreseeable future. Regional management actions such as research, monitoring and / or recovery initiatives may be required	Incident could threaten sustainability of the resource and should be considered a management concern. Research, monitoring and / or recovery initiatives should be considered
Probability	**Low**	This type of incident has rarely been reported for electricity transmission projects	Low	Low	Moderate
	Moderate	Evidence supports the occurrence of this type of incident in some, but less than half, of electricity projects	Low	Moderate	High
	High	This type of incident is considered common for electricity transmission projects	Low	High	High

Source: Table 5.1.3-1, Chapter 5, Accidents and Malfunctions.

Table 16.3.5-5 Summary of Selected Causes of Safety and Security Service Requirements: Communities

Potential Incident	Most Likely Scenario			Worst Case Scenario		
	Probability	Consequence	Risk Level	Probability	Consequence	Risk Level
Fire	Low	Low	Low	Addressed as separate incident – forest fire		
Forest Fire	Moderate	Low	Low	Low	Moderate-High	Moderate
Spills / Leaks of Hazardous Materials	High	Low		Low	Moderate-High	Moderate

Source: Based on Table 5.15-1 Chapter 5, Accidents and Malfunctions.

In the event of forest and other fires caused by the Project, provincial and local firefighting forces could be called upon. Similarly, fire, police and other emergency responders could be called upon in the event of a spill or leak of hazardous materials caused by the Project. With incident prevention and response mechanisms in place, the consequences and risk levels associated with the Most Likely Scenarios for each potential incident are low. In the unlikely event of a Worst Case Scenario situation, the community consequences of forest fires or spills of hazardous materials could be more serious, ranging from moderate to high, depending on the type of incident. However, the low probability of any of these incidents occurring suggests that the associated risk is, at worst, moderate. Nalcor will develop a SHERP to address potential unplanned incidents and emergency situations. This includes coordinating communications with local emergency management officials.

Summary of Likely Residual Environmental Effects

The likely residual effects of Project Construction on the Safety and Security Services KI are as follows:

- Direction:
  - Project Construction effects will be adverse, because of increased demand on local emergency services.
- Magnitude:
  - Under the most likely scenarios, the effects of the Project will be low or moderate**.** Only in the case of a highly unlikely worst case major incident would there be high magnitude effects.
- Geographic Extent:
  - Increased demand on local emergency services will likely be local or regional in extent.
- Duration:
  - Project effects on Safety and Security Services are likely to be of short-term duration.
- Frequency:
  - Incidents will likely be intermittent, as they may occur sporadically throughout Project Construction.

There is a moderate degree of confidence that the level of effects of the Project on the Safety and Security Services KI will be as predicted. While Nalcor has considerable experience with construction and maintenance of transmission and distribution lines and there is a substantial amount of industry knowledge to support these effects predictions, the nature and scale of most unanticipated events by their very nature cannot be predicted with a high level of certainty.

16.3.5.6 Construction Effects: Health Conditions

The main Project driver with the potential to affect health conditions is employment, including both direct employment and employment generated by Project expenditures. The potential socioeconomic effects will be

experienced by residents involved with the Project and worker-community interactions. These effects will occur primarily during Project Construction.

While in some cases, the socioeconomic effects of the Project on health are direct (e.g., the benefits of employment income), in most cases effects on health will be indirect. The socioeconomic effects of the Project on health determinants are dependent on social responses, health practices and coping skills, and the availability of social support networks, particularly that of the family. The prediction of Project effects on many of the underlying determinants of health is complex and is a factor of personal choice and underlying social conditions.

For those who obtain employment with the Project, there is the possibility of increased income, self-esteem and social status which, in turn, may positively affect other aspects of health and well-being such as improved personal health practices and coping skills. For some, increased income and any community-worker interactions may have adverse effects in terms of poor personal health practices (e.g., alcohol and substance abuse, gambling, prostitution) and coping skills.

Both positive and adverse residual effects of the Project are likely. Effects management measures focus on minimizing the potential for increased stress on communities and individuals, and on providing the supportive frameworks necessary to enhance the existing health and underlying determinant conditions. The likely socioeconomic effects of the Project on health services will be addressed through liaison with health authorities, as part of Nalcor's planning process.

Summary of Likely Residual Environmental Effects

The likely residual effects of Project Construction on the Health Conditions KI are as follows:

- Direction:
  - Project effects will be both adverse and positive. While increased income and any community interactions may have adverse effects in terms of poor personal health practices and coping skills, for others, changes in employment and income will result in increased self-esteem, improved social status, and development of coping skills.
- Magnitude:
  - Project effects will be of low magnitude.
- Geographic Extent:
  - Project effects will be regional and potentially beyond regional, depending on the home community of those employed during Project Construction.
- Duration:
  - Project effects will be of medium-term duration, throughout Construction.
- Frequency:
  - Effects will be continuous in certain areas throughout Project Construction.

There is a moderate degree of confidence that the actual effects of the Project on the Health Conditions KI will be as predicted. While Nalcor has considerable experience with construction and maintenance of transmission and distribution lines, and there are industry standards, the nature of the effects cannot be predicted with a high level of certainty.

16.3.5.7 Construction Effects: Community Well-being

Construction can affect Community Well-being through its noise and visual effects, its effects on property values, and nuisance effects such as traffic delays.

The noise effects associated with Project Operations and Maintenance are discussed in greater detail in Chapter 3 (Project Description) and Chapter 11 (Atmospheric Environment). A brief summary of the key findings as they relate to individuals and communities is also provided in this section.

Potential noise sensitive receptors include residences, daycares, schools, hospitals, places of worship, nursing homes and any sites where socially significant Aboriginal cultural or religious ceremonies take place (Health Canada 2009). The majority of the transmission corridor is distant from communities, towns and cities. However, residential areas, communities, towns or cities within the 2 km transmission corridor and within 1 km on either side of the corridor boundary were characterized as noise sensitive area (NSAs). These NSAs include the following: Forteau, Shoal Cove, Sandy Cove, Savage Cove, Mistaken Cove, Flower's Cove, Grand Falls-Windsor, Clarenville, Deep Bight, North West Brook-Ivany's Cove, Sunnyside, Chapel Arm, Whitbourne, Blaketown and Holyrood.

Concerns expressed during community consultations include the possibility of sleep disturbance and annoyance to community residents as a result of heavy equipment being operated nearby. However, sound modelling for transmission corridor ROW clearing indicates that the value for the predicted construction noise plus background noise will not exceed 62 A-weighted decibels (dBA) (Health Canada 2009) at any of the NSAs. The higher sound pressure levels generated during Project Construction will be transient as equipment is moved along the ROW; therefore, any nearby residents will not be affected for prolonged periods. Noise levels at NSAs during the night will also remain unchanged from the existing conditions, as Construction activities related to the assembly and installation of towers will only occur during the day. Construction activities will also be conducted in accordance with municipal by-laws regarding noise. If it is determined that there are locations of concern within the NSAs as designated by Health Canada, mitigation measures will be implemented.

Drilling for the installation of the submarine cables will result in localized noise generation at Forteau Point on the north side of the Strait of Belle Isle, and Shoal Cove on the south side. However, after the incorporation of the mitigation measures indicated in Chapter 11, Atmospheric Environment, the sound pressure levels during Project Construction at the NSAs are unlikely to cause more than brief annoyance during periods of particularly intensive activity. Further, in light of planned mitigation measures, frequent exceedances of Health Canada noise level criteria are not anticipated.

The effects of the Project on visual aesthetics will be limited to a small number of communities relatively close to the Project. This will include many of the communities identified as NSAs above with respect to noise except that effects of the Project on visual aesthetics will be dependent on topography and view-planes, and will therefore be experienced by some communities more than 1 km from Construction activities and will not be experienced by some communities close to the Project. The degree of visual effects will generally decline with increased distance from the Project.

Effects of the Project on land use are discussed in detail in Section 16.5, Land and Resource Use. Readers are encouraged to review Section 16.5.5.1 with reference to effects on property ownership.

Individuals or community authorities along the proposed transmission corridor may raise property ownership issues. Easement payments are issued when there are direct land issues with the ROW placement. Current market values are determined by independent qualified property appraisers, and are negotiated between the landowner and Nalcor.

People living near the ROW but not on the ROW, who feel that they might be affected, may be concerned if they do not receive an easement payment. Research on property values associated with other transmission line projects has shown that small effects on values sometimes occur immediately after construction but diminish over time, with no long-term effects. Effects of the Project on property values are dependent on factors such as the distance from the ROW and the availability of the ROW for recreational activities. Nalcor will consult with property owners on any issues related to use of their property. Any potential adverse effects of the Project will be managed through a combination of:

- avoiding physical infrastructure (e.g., parks, cottages and outfitting lodges) to the extent practical;

- using existing access wherever possible;
- compliance with laws and regulations; and
- negotiated damage claim settlements.

There are other potential effects of the Project on Community Well-being that relate to nuisance, including traffic delays resulting from the movement of vehicles carrying Project equipment, supplies and personnel. However, as discussed earlier (Section 16.3.5.3), such effects will be only moderate and intermittent.

It is anticipated that Construction effects of the Project on Community Well-being will affect different segments of local populations, such as youth, the elderly, women and Aboriginal peoples, in different ways. All community residents will be similarly exposed to any noise and visual effects, and while there may be some minor differences between the attitudes of different groups to such effects, these are expected to be minor. To the degree that there are variations in property and vehicle ownership between different population groups in different communities, the effects will also vary, but again the variations will be minor and inconsistent within any one group. In the case of Aboriginal peoples, it should also be noted that the nature and location of the Project and associated work are such that they will not interact strongly with Aboriginal communities.

Overall, the routing of the Project is such that there will be limited interaction between the Project and Communities.

Summary of Likely Residual Environmental Effects

Where there is an interaction, the likely residual effects of Project Construction on the Community Well-being KI are as follows:

- Direction:
  - Project noise and visual effects will be adverse because there will be increased disturbance of and annoyance to residents as a result of Construction activity. The effects on property owners could be adverse or beneficial: some properties near the ROW may decline in value, and some landowners may be willing to sell and benefit financially from the sale. The effects of Project traffic will be adverse.
- Magnitude:
  - Project noise effects will range from no effect to low magnitude, and then only during working hours; any increase in sound levels will not likely be detectable beyond the 2 km transmission corridor and will be within the normal range of variability. Visual effects will range from no effect to low magnitude. Effects on property values will be low to moderate, and effects on traffic will be low.
- Geographic Extent:
  - Project effects will be local, limited to communities along or in close proximity to the ROW.
- Duration:
  - Project noise and visual effects will be of medium-term duration, throughout Construction. Project effects on property values will be short to long-term (up to ten years) for any market adjustments to be made. Effects on traffic will be of medium-term duration throughout Project Construction.
- Frequency:
  - Noise and visual effects will be continuous in certain areas throughout Project Construction during working hours. Effects on property market values may be continuous throughout Construction. Traffic effects will be intermittent throughout Construction.

There is a high degree of confidence that the actual effects of the Project on noise and visual aesthetics will be as predicted given the location of the Project relative to the location of residences and other community facilities and since Construction activities will be conducted in accordance with municipal by-laws regarding noise. There is a moderate level of confidence that the actual effects of the Project on property values will be as predicted. Past experience with other projects does not always provide a good basis for predicting property value effects; however, general findings from previous experience do suggest that any adverse effects on property values are more likely to be influenced by other factors unrelated to the Project than the presence of the transmission line itself. There is a high degree of confidence that the traffic effects of the Project will be as predicted.

16.3.5.8 Construction Effects: Summary

The majority of the likely effects of Project Construction on Communities are expected to be on ports and highways, waste disposal sites, property values, and noise receptors. These effects will be caused by both anticipated Construction activities and accidents and malfunctions. In all cases, appropriate Project design and effects managementmeasures will be adopted to prevent and minimize potential adverse effects.

With few exceptions (e.g., the Port of Goose Bay), the capacities of existing transportation infrastructure required are likely adequate to meet Project needs. Where existing transportation infrastructure is insufficient or where the Project is likely to negatively affect the quality of existing infrastructure, Nalcor will continue to liaise with the appropriate authorities and key stakeholders to mitigate these matters. Where additional demands will be placed on local infrastructure, e.g., local port facilities used for transport of quarry materials, these sites and adjacent infrastructure will be evaluated prior to use.

Increased demands of the Project on highway infrastructure may contribute to additional maintenance requirements and costs, traffic delays, and an increase in safety concerns for other highway users. The magnitude of these effects will vary depending on the capacities of the highway segments affected. Project effects will likely be experienced on major highways within all regions of the Project area. Where the Project will result in upgrades to local transportation infrastructure, this will be a positive, far-future effect.

Although the Project will generate waste, the Project will only use those disposal sites that have the capacity and are authorized to accept such waste. As a result, there may be no adverse effects on Waste Disposal Infrastructure and Services. However, some municipalities may experience a positive effect of additional revenue generation.

Project Construction will result in an increase in the probability, consequences, and risk to communities from fires and spills of hazardous materials, with resultant demands on Safety and Security Services. The effects on Safety and Security Services are expected to be low magnitude, local or regional in extent and of short-term duration.

The Project will likely have both positive and negative effects on Health Conditions as a result of increased employment and income; however, the magnitude of these effects is expected to be low and of medium-term duration.

In terms of effects on Community Well-being, Project effects will likely be limited to communities along or in close proximity to the ROW. Project noise and visual effects will be of medium-term duration, throughout Construction, and will be continuous during working hours in certain areas. Project effects on property values will be short to long-term (up to ten years) for any market adjustments to be made.

Nalcor and its subsidiaries have a long history of constructing transmission lines within the province and there is a high degree of confidence, based on this experience, that the likely residual effects of the Project will be as predicted.

16.3.6 Operations and Maintenance

16.3.6.1 Overview of Project Operations and Maintenance and Associated Effects Management

Once Construction of the Project is completed, and following Project commissioning, the Project will be operated on a continuous basis. Maintenance activities will include regular inspection of all Project components, repairs to the system as required, and periodic vegetation management along the cleared ROW (Chapter 3, Project Description). This will involve much reduced activity levels as compared with the Construction phase of the Project.

The entire transmission line will be inspected by helicopter each year, and a portion each year will be inspected by foot. The submarine cables and electrodes will be inspected through remotely operated vehicle (ROV) surveys and / or other relevant means. Activities associated with the operation of the High Voltage direct current (HVdc) system will be integrated into Nalcor's existing system-wide inspection and maintenance program.

Vegetation management will commence eight years after Construction is completed and will be conducted every seven years thereafter during Project Operations and Maintenance. Nalcor will incorporate the Project into its established vegetation management program for its transmission and distribution system. The management schedule for the Project will vary with the habitat type crossed and the resulting re-vegetation, the extent of ground disturbance during Construction, and the terrain.

The Project will be operated indefinitely, and decommissioning is not contemplated at this time. Should decommissioning activities eventually be considered for all or part of the HVdc system, these will be planned and conducted in accordance with the relevant standards and regulatory requirements in place at that time.

Project Operations and Maintenance activities will be carried out in accordance with standard procedures and in accordance with required and relevant environmental protection measures. These are discussed integrally in the following sections of the environmental effects assessment.

16.3.6.2 Existing Knowledge

Much of the public concern regarding the operation of electrical transmission systems surrounds their perceived health effects. There is a substantial body of information on this subject, recent examples of which are summarized in Table 16.3.6-1.

While specific study conclusions vary, surveys of the literature typically conclude that a causal link between power-line EMF exposure and demonstrated health effects has not been established, even after considerable research in the U.S. and abroad (e.g., PSC Wisconsin 2010, internet site; Connecticut Siting Council 2007, intenet site). While the data on health effects may be inconclusive, and even though there are often no regulations pertaining to EMF emissions, many regulatory authorities with responsibility for electricity transmission have adopted 'good management practice' approaches to try to minimize any potential health risk from electricity transmission systems.

As discussed in detail in Chapter 3, Project Description, the proposed HVdc system is being designed and will be constructed and operated in accordance with relevant standards. That chapter has also provided detailed modelling for EMF and other emissions that may be associated with the Project, the results of which have been brought forward into the analysis that follows.

Table 16.3.6-1 Existing Knowledge (Operations and Maintenance): Effects of Similar Projects on Communities

Reference	Study / Project Context	Summary of Findings
PSC Wisconsin (2010, internet site)	Overview of environmental issues and concerns raised by the construction / operation of electric transmission facilities	– EMF: Weak and inconsistent associations between exposures and human health. Design of line configuration can reduce EMF. – Implantable Medical Devices (IMD): EMF can cause electromagnetic interference (EMI) with pacemakers and implantable cardioverter defibrillators (ICDs). Transmission lines are only one source of EMI. ICD patients must adjust behaviour. Moving away from an EMI source is a standard response. – Noise: Sizzles, crackles and hissing, can occur during periods of high humidity. Noise quickly dissipates with distance from the lines, usually overshadowed by other background noises. – Property owner impacts: Findings on changes in property values are inconclusive and not project-transferrable. – Radio and television reception: Transmission lines do not usually interfere with normal radio and television reception. – Safety: State Electric Code sets minimum safety standards; utility construction standards are generally more stringent.
World Health Organization (2007, internet site)	Review of health effects of extremely low frequency (ELF) electromagnetic field (EMF)	– Concludes that evidence for a link between ELF EMF fields and childhood leukemia "is not strong enough to be considered causal but sufficiently strong to remain a concern." "Virtually all of the laboratory evidence and the mechanistic evidence fail to support" this reported association. For all other diseases, there is inadequate or no evidence of health effects at low exposure levels. – The report emphasizes that, given the weakness of the evidence for health effects, the health benefits of exposure reduction are unclear and policies based on the adoption of arbitrary low exposure limits are not warranted.
World Bank Group (2007, internet site)	Environmental, Health and Safety Guidelines and examples of Good International Industry Practice re: Electric Power Transmission and Distribution	Recommends: – Evaluation of EMF exposure against reference levels developed by the International Commission on Non-Ionizing Radiation Protection. – Facility siting to avoid / minimize exposure to the public. – If EMF levels are anticipated to be higher than recommended, example engineering techniques are suggested to reduce EMF. – Most occupational health and safety guidelines are common to most large industrial facilities. Provides recommendations specific to power transmission including: live power lines; working at height; electric and magnetic fields; exposure to chemicals. – Community health and safety issue recommendations include those relating to electrocution, electromagnetic interference (EMI), visual amenity, noise and ozone, and aircraft navigation safety.
Connecticut Siting Council (2007, internet site)	Best management practices for construction of electric transmission lines	– Recognizes that a causal link between power-line magnetic field exposure and demonstrated health effects has not been established, even after much scientific investigation in the U.S. and abroad. – Develops a “best management practices” approach including requiring utility companies to develop no cost / low cost EMF mitigation plans to reduce EMF by 15% at the edge of the ROW as part of their development application.

16.3.6.3 Operations and Maintenance Effects: Transportation and Waste Disposal Infrastructure and Services

Transmission line inspections will be conducted annually using a combination of ATVs, snowmobiles and helicopters. Additionally, vegetation management will be required within the ROW. These activities will require relatively few materials and small numbers of workers, which will therefore result in minimal traffic and waste generation. These activities will be integrated into Nalcor's existing transmission system inspection and maintenance program. All Project Operations and Maintenance activities will be conducted in accordance with applicable permits and regulations (Chapter 3, Project Description). Activities associated with potential major system repair will affect transportation and waste disposal infrastructure and services. However, this activity is unlikely to occur and is discussed in Section 5.4.1, and therefore is not considered in the Operations and Maintenance phase assessment.

Summary of Likely Residual Environmental Effects

The likely residual effects of Project Operations and Maintenance on the Transportation and Waste Disposal Infrastructure and Services KIs are as follows:

- Direction:
  - Neutral as the effects do not change the existing baseline for Transportation and Waste Disposal Infrastructure and Services.
- Magnitude:
  - Not applicable.
- Geographic Extent:
  - Not applicable.
- Duration:
  - Not applicable.
- Frequency:
  - Not applicable.

There is a high degree of confidence that the likely / effects of Project Operations and Maintenance on the Transportation and Waste Disposal Infrastructure and Services KIs will be as expected given that the activities requiring these services will be integrated into Nalcor's existing transmission system inspection and maintenance programs, and thus the levels of incremental activity associated with Project Operations and Maintenance, and the associated effects are within Nalcor's control.

16.3.6.4 Operations and Maintenance Effects: Safety and Security Services

Forest fires and spills of hazardous materials could occur during Project Operations and Maintenance, thereby placing additional demands on Safety and Security Services including fire response, emergency measures and policing. However, the frequency and level of activity (number of personnel and amount and type of equipment) will be much less than that required during Project Construction. As such, the probability of such incidents and the associated risk levels will be lower during Operations and Maintenance.

As discussed, Nalcor will develop a SHERP to address potential unplanned incidents and emergency situations. The SHERP will include response measures for major medical emergencies, and procedures for emergency response coordination with local response personnel and local medical facilities. All Project personnel will be made aware of the SHERP and designated staff will receive SHERP training.

Summary of Likely Residual Environmental Effects

The likely residual effects of Project Operations and Maintenance on the Safety and Security Services KI are as follows:

- Direction:
  - The effect on Safety and Security Services will be adverse, because increased demands will be placed on local emergency services.
- Magnitude:
  - Activity levels will be much lower during Project Operations and Maintenance compared with Construction, and the probability of unanticipated incidents and associated effects on services will be much lower. The magnitude of likely effects is low.
- Geographic Extent:
  - Accidents and Malfunctions could be experienced at various locations within the Project area, affecting local and / or regional services according to the scale of the incident, but limited to the RSA.
- Duration:
  - Likely incidents would have only short-term effects on Safety and Security Services.
- Frequency:
  - Effects of Project Operations and Maintenance on Safety and Security Services would be intermittent as accidents and malfunctions may occur sporadically throughout this phase of the Project.

There is a moderate degree of confidence that the level of effects of Project Operations and Maintenance on the Safety and Security Services KI will be as predicted because, while Nalcor has considerable experience with construction and maintenance of transmission and distribution lines and there is a substantial amount of industry knowledge to support these effects predictions, the nature and scale of most unanticipated events and hence their effects on safety and security services by their very nature cannot be predicted with a high level of certainty.

16.3.6.5 Operations and Maintenance Effects: Health Conditions

During the operation of HVdc systems, there are low levels of emissions and discharges, including electromagnetic fields (EMF) and electric fields that can potentially have health effects. Vegetation control also has the potential to cause effects on health conditions.

Electromagnetic Fields

A number of Project components, including the transmission lines, converter stations, electrodes and wood pole electrode lines, will produce EMF. EMF are a combination of electric and magnetic fields produced by electrically charged objects. EMF are strongest near the source, and the strength of the field diminishes rapidly with distance (Health Canada 2010, internet site). When EMF interact with conductors, they can affect the distribution of charge and induce a current to flow within the conductor. The direct current in an HVdc system travels in one direction only and thus produces a static magnetic field. Because HVdc systems do not emit time-varying EMF, they cannot induce currents in nearby objects including people and wildlife (Canadian Electricity Association 2010, internet site).

Research findings to date on the health effects of EMF are often conflicting and have uncovered only weak and inconsistent associations between exposures to EMF and human health (see, for example, Connecticut Siting Council 2007, internet site; Feychting et al. 2005). The research has not established a causal relationship between exposure to magnetic fields and human disease, nor a plausible biological mechanism by which

exposure to EMF could cause disease. The magnetic fields produced by electricity do not have the energy necessary to break chemical bonds and cause DNA mutations (PSC Wisconsin 2010, internet site).

There are currently no Canadian regulations regarding EMF emissions, nor are there any Canadian guidelines for EMF exposure (Canadian Electricity Association 2010, internet site). The Electrical Power Research Institute (EPRI) in the United States, however, recommends a limit of 25 kilovolts per metre (kV/m) for electric fields from an HVdc transmission line and 100 amperes x 10^{-9} per square metre (nA/m^2) for the ion current density limit at ground level (EPRI 2008). EMF and ion current density for the Project will be within the limits recommended by the EPRI.

Use of Implanted Medical Devices (IMD) is becoming increasingly common in the general population. Two such devices, pacemakers and implantable cardioverter defibrillators (ICD), have been found to encounter problems when exposed to EMI from EMF such as the devices being inappropriately triggered or inhibited from responding appropriately.

Transmission lines are only one of a number of external EMI sources, but manufacturers' recommended threshold for modulated magnetic fields is 1 gauss, which is five to ten times greater than the magnetic field likely to be produced by a high voltage transmission line. All pacemaker and ICD patients are informed of potential problems associated with exposure to EMI and must adjust their behaviour accordingly. Moving away from a source is a standard response to the effects of exposure to EMI and patients can shield themselves from EMI with a car, a building, or the enclosed cab of a truck (PSC Wisconsin 2010, internet site).

Vegetation Management

Nalcor conducts an integrated vegetation management program along its transmission corridor ROWs and within its terminal station yards. Methods of vegetation management include the selective application of herbicides and manual clearing.

As discussed in Chapter 12, Terrestrial Environment (Table 12.6.1-2), Nalcor will not use sterilants as a means of vegetation control for the Project, but will rely on non-residual herbicides and mechanical methods, where practical. The requirements of all applicable regulations will be met or exceeded, and all herbicide application will be conducted in accordance with the *Pesticides Control Regulations 1996* under the *Environmental Protection Act* SNL 2002 and will be performed by applicators certified with an Industrial Vegetation license issued by the Newfoundland and Labrador Department of Environment. The vegetation maintenance will allow root systems to remain intact, permitting the soil to bind. This encourages rapid colonization of low-growing plant species which in turn reduces the requirement for future vegetation management.

Herbicide applications will not be undertaken in Protected Water Supply Areas, private or provincial parks, ecological reserves, or on private lands without permission of the owner. Vegetation buffer zones, established at environmentally sensitive areas during transmission line construction, will be maintained during vegetation management activities, with only danger trees being removed from these areas.

Summary of Likely Residual Environmental Effects

The likely residual effects of Project Operations and Maintenance on the Health Conditions KI are as follows:

- Direction:
  - Effects will be adverse because of an increase in EMF and effects on IMD, all of which have potential health implications.
- Magnitude:
  - EMF and IMD health effects will be low in magnitude and affect small numbers of people for short durations.

- Geographic Extent:
  - EMF and IMD health effects will be local, and limited to persons spending time in the transmission ROW.
- Duration:
  - EMF and IMD health effects will be experienced into the far future, throughout Operations and Maintenance.
- Frequency:
  - EMF and IMD health effects will be experience infrequently, whenever people spend time in the transmission ROW during Operations and Maintenance.

There is a high degree of confidence that the level of effects of Project Operations and Maintenance on the Health Conditions KI will be as predicted because Nalcor has considerable experience with Construction, and Operations and Maintenance of transmission and distribution lines and there is a substantial amount of industry knowledge and government statistics to support the effects predictions. More detailed discussion of the levels of confidence associated with particular effects (e.g., EMF and noise effects), can be found in Chapter 3 (Project Description) and Chapter 11 (Atmospheric Environment).

16.3.6.6 Operations and Maintenance Effects: Community Well-being

Project Operations and Maintenance has the potential to affect Community Well-being by generating noise, interfering with radio and television reception and interfering with visual aesthetics, as discussed below.

Noise

Noise outputs that may be associated with Project Operations and Maintenance activities are discussed in greater detail in Chapter 3 (Project Description) and Chapter 11 (Acoustic Environment). A brief summary of the findings presented in those sections is included here.

A transmission line emits audible noise when electrical energy within the conductor interacts with the air surrounding the conductor surface. These reactions, or corona, depend on ambient conditions such as temperature, humidity, and wind speed and direction. The noise emitted typically resembles a crackling or sizzling sound.

There are currently no Canadian noise control regulations applicable to HVdc transmission lines. Suggested thresholds for audible noise levels associated with HVdc lines, of 51 dBA (Maruvada et al. 1982) or an average level of 55 dBA outdoors and 45 dBA indoors (EPRI 2006) have been adopted in other jurisdictions (e.g., the United States Environmental Protection Agency follows the latter guidelines). Nalcor has adopted the threshold of 50 dBA at the edge of the ROW, as recommended by the EPRI in the United States for HVdc transmission lines (EPRI 2008). Noise effects associated with operation of the proposed HVdc transmission lines would not exceed this adopted threshold of 50 dBA at the edge of the ROW.

Radio and Television Reception

Transmission lines do not usually interfere with television and radio reception, but interference can be caused by arcing discharges that may occur on insulators and by corona discharges on conductors. Maximum radio interference levels are specified by Industry Canada (Industry Canada 2001, internet site). The proposed HVdc system will be designed and constructed to comply with Canadian Standards Association Standard CAN3-C108.3.1-M84, the same standard that is applied to HVac transmission lines. This standard limits worst-case radio interference levels to 69 dB at a distance of 15 m from the high voltage conductors. The maximum radio interference levels specified by Industry Canada as part of its spectrum management and telecommunications policy (Industry Canada 2001, internet site) will not be exceeded by the Project.

Visual Aesthetics and Land Use

Power transmission and distribution systems are necessary to transport energy from power facilities to users, but the associated physical infrastructure may be visually intrusive and undesirable to local residents. Community Sell-being issues relating to land users and visual aesthetics are addressed separately and specifically in Chapter 16.5 (Land and Resource Use) and Chapter 16.8 (Visual Aesthetics). Readers are also encouraged to read these sections in respect to likely Project effects on Community Well-being.

Summary of Likely Residual Environmental Effects

The likely residual effects of Project Operations and Maintenance on the Community Well-being KI are as follows:

- Direction:
  - Effects will be adverse as there will be an increase in noise disturbance, radio / television interference, and stray voltage.
- Magnitude:
  - Effects will be of low magnitude, because they will be below or within acceptable levels.
- Geographic Extent:
  - Effects will be local and limited to the LSA.
- Duration:
  - Effects will be experienced into the far future, throughout Operations and Maintenance.
- Frequency:
  - Effects will be continuous throughout Operations and Maintenance.

There is a high degree of confidence that the level of effects of Project Operations and Maintenance on the Community Well-being KI will be as predicted because Nalcor has considerable experience with construction and maintenance of transmission and distribution lines and there is substantial industry knowledge and government statistics to support the effects predictions.

16.3.7 Environmental Effects Summary and Evaluation of Significance

16.3.7.1 Summary of Environmental Effects

Environmental effects are assessed in terms of their direction (adverse or beneficial), magnitude, spatial and temporal extent, duration and frequency of occurrence. The assessment of significance of an effect considers all these factors. The likely environmental effects of the Project on the Communities VEC are summarized in Table 16.3.7-1.

Table 16.3.7-1 Environmental Effects Analysis Summary: Communities

Project Phase / Key Indicator	Likely Residual Environmental Effects Summary Descriptors				
	Direction	**Magnitude**	**Geographic Extent**	**Duration**	**Frequency**
Construction					
Transportation Infrastructure and Services	**Beneficial / Adverse** – Increased highway demands will result in maintenance requirements and have safety and nuisance effects, and upgrading ports will be costly. However, any upgrading of transportation infrastructure will be beneficial.	**Moderate** – The magnitude of effects on highways will be moderate. – The magnitude of effects on ports will depend in part on the ports that are selected for the Project. – The magnitude of effects on the ports in Corner Brook and St. John's will likely be moderate and within the current capacity of these ports. If upgrades to the port at Goose Bay are required, the magnitude of effects on that port will likely be moderate.	**Local to Regional** – Effects on highways will be regional on major highways and roads connecting ports to highways. There will be local effects associated with tote and resource roads connecting the Project ROW to the highway system. – Effects on ports will be regional around the required facilities.	**Medium-term to Far future** – Adverse effects on transportation will be medium-term, while the beneficial effects will last into the far future.	**Intermittent to Continuous** – The adverse effects will be intermittent, while the beneficial effects will be continuous once infrastructure has been upgraded.
Waste Disposal Infrastructure and Services	**Adverse / Beneficial** – Increased generation of waste, but disposal revenue will benefit some communities.	**Moderate** – The magnitude of effects will be low to moderate, because waste will only be disposed of at sites with spare capacity.	**Regional** – Regional, limited to a few landfill sites.	**Medium-term** – Project effects will be medium-term.	**Continuous** – The effects will be continuous through Construction.
Safety and Security Services	**Adverse** – Likely increased demand for local emergency services resulting from Project-related incidents.	**Moderate** – Under likely risk scenarios, the magnitude of effects would be low or moderate.	**Local to Regional** – Unanticipated incidents could have local or regional effects on services.	**Short-term** – Project effects on Safety and Security Services will be short-term.	**Intermittent** – Incidents and their effects will be intermittent.

Table 16.3.7-1 Environmental Effects Analysis Summary: Communities (continued)

Project Phase / Key Indicator	Likely Residual Environmental Effects Summary Descriptors				
	Direction	**Magnitude**	**Geographic Extent**	**Duration**	**Frequency**
Health Conditions	**Adverse / Beneficial** – Income and community interactions may result in adverse effects depending on skills and practices, but effects on income and employment will also be positive.	**Low** – The numbers of workers and worker / community interactions is limited, with the scale of the likely effects also being low.	**Regional to Beyond Regional** – The effects on health will mostly be regional, but could extend further depending on the home community of workers employed on the Project.	**Medium-term** – Project effects on health conditions will be of medium-term duration throughout Construction.	**Continuous** – Effects on health condition will be continuous throughout Construction.
Community Well-being	**Adverse / Beneficial** – Noise, visual and traffic effects will be negative, while property value effects will vary according to circumstances and owner responses.	**Low** – Project noise will have no to low effects. – Visual-related effects will range from none to low. – Effects on property values will be low to moderate. – The effects on traffic will be low.	**Local** – Project effects will be local, limited to communities along or close to the ROW.	**Short- to Long-term** – Project effects related to noise, visual and traffic will be of medium-term duration throughout Construction. – Effects on property values may be short- to long-term.	**Continuous** – Project effects related to noise, visual and property effects will be continuous throughout Construction, while effects on traffic will be intermittent.
Summary of Likely Residual Construction Effects on Communities: Given the scale and distribution of Project Construction activities, the adverse effects will mostly be local and of short duration. There will also be some localized beneficial effects, some of which (e.g., transportation infrastructure improvements) will be long lasting.					
Operations and Maintenance					
Transportation and Waste Disposal Infrastructure and Services	**Neutral** – Operations and Maintenance activities will be incorporated into existing activities.	– No effect.	– n/a.	– n/a.	– n/a.

Table 16.3.7-1 Environmental Effects Analysis Summary: Communities (continued)

Project Phase / Key Indicator	Likely Residual Environmental Effects Summary Descriptors				
	Direction	**Magnitude**	**Geographic Extent**	**Duration**	**Frequency**
Safety and Security Services	**Adverse** – Likely increased demands on local emergency services.	**Low** – Activity levels will be much lower during Operations and Maintenance compared with Construction and the magnitude of effects will be low.	**Local to Regional** – Unanticipated incidents could have local or regional effects on services.	**Short-term** – Most potential incidents would have only short-term effects.	**Intermittent** – Effects on safety and security services will be intermittent given the sporadic nature of incidents.
Health Conditions	**Adverse** – An increase in EMF and effects on IMD have adverse health implications.	**Low** – Effects will be of low magnitude and will affect small numbers of people.	**Local** – EMF and IMD health effects will be local, limited to persons in the LSA.	**Far Future** – EMF and IMD health effects will be experienced into the far future, throughout Operations and Maintenance.	**Intermittent** – Intermittent, as people spend time in the transmission corridor.
Community Well-being	**Adverse** – Effects from increased noise disturbance, radio and television interference, and stray voltage.	**Low** – Effects will be of low magnitude, within acceptable limits.	**Local** – Effects will be local, limited to the LSA.	**Far Future** – Effects on community well-being will be experienced into the far future, throughout Operations and Maintenance.	**Continuous** – These effects will be continuous throughout Operations and Maintenance.
Summary of Likely Residual Operations and Maintenance Effects on Communities: The effects of Operations and Maintenance will be of a longer duration but much smaller scale than those from Construction. They will also generally be highly localized within and around the transmission corridor.					

n/a not applicable, as no effect is predicted.

16.3.7.2 Definition and Determination of Significance

Residual socioeconomic effects of the Project are those adverse effects remaining after effects management strategies have been implemented. Significant residual adverse effects of the Project on Communities are defined here as those with the following characteristics:

- A change in the overall availability and quality of infrastructure and services for current users and / or in the health and well-being of affected individuals or communities, resulting in, detectable and sustained decreases in the overall quality of life and / or health of a population.

As the summary provided in Table 16.3.7-1 suggests, and considering the significance definition above, no likely significant residual effects on any of the KIs for the Communities VEC are anticipated. While most effects are adverse, the magnitudes of those effects are low to moderate, meaning that the effect is within the capacity of the infrastructure component or the accepted threshold value of the parameter in question. The KI for which there is greatest concern is that related to Safety and Security Services where Worst Case unanticipated events could cause substantial harm to communities and their residents. The likelihood of such an event occurring, however, is low, and unlikely, therefore the effect is predicted to be not significant.

16.3.8 Evaluation of Project Alternatives

Project alternatives considered are associated with alternative segments for the transmission corridor in particular areas, as influenced by terrain, ecology, settlement, land use and other physical and human environment factors. The alternative segments, and the environmental implications compared to the proposed transmission corridor, are summarized in Table 16.3.8-1.

Table 16.3.8-1 Summary Evaluation of Project Alternative Means: Communities

Project Alternative Means[a]	Environmental Implications (Compared to the Proposed Alternative)[b]				
	Transportation Infrastructure and Services	**Waste Disposal Infrastructure and Services**	**Safety and Security Services**	**Health Conditions**	**Community Well-being**
A2 to A11	No difference in the ports and highways used to distribute equipment, goods and materials. No significant difference in the types or volumes of equipment, goods and materials to be moved. No difference in the effects management strategies required.	No difference in the type, amount or general location of waste generation. No difference in the effects management strategies required.	No difference in the nature or magnitude of potential incidents anticipated or services required. Only minor differences in potential locations where such incidents might occur. No difference in the effects management strategies required.	No additional communities or individuals affected by the alternatives. No substantial difference in effects between the prospect transmission corridor and the proposed alternatives or in the risks associated with accidents and malfunctions. No difference in the effects management strategies required.	No difference in property value issues, or radio-television interference. No difference in the effects management strategies required.

(a) As identified and described in Chapter 2, Project Rationale and Planning.

(b) Namely, the proposed Project described in Chapter 3, Project Description, and assessed in the preceding Environmental Effects Analysis.

None of the identified alternatives considered would have substantially different implications for the Communities VEC, including each of the associated KIs. The same types, and approximately the same volumes, of goods, equipment and materials will have to be transported, using the same ports and along the same highways, using the same general approaches. Similarly, Construction, and Operations and Maintenance activities and the characteristics of the Project once in place would be essentially the same, and none of the alternatives bring the Project closer to local communities, or increase the potential for interaction with residents and communities or otherwise occupied areas such that there would be an increase in any potential or perceived health risks or potential changes in property value issues. Similarly, the same planning and mitigation measures would be applied.

No technically and economically feasible alternatives for the submarine cable crossing or the shoreline electrode sites were identified (see Chapter 2, Section 2.12.3), and therefore marine Project alternatives are not evaluated for the Communities VEC.

16.3.9 Cumulative Environmental Effects

This section evaluates the effects of the Project on the Communities VEC in combination with the effects of other projects or activities whose socioeconomic effects will likely overlap spatially and temporally with those of the Project. Examples of such projects include the:

- Lower Churchill Hydroelectric Generation Project;
- Hebron offshore oilfield development;
- Long Harbour Processing Plant; and
- Iron Ore Company of Canada expansion.

Other projects, such as the Hibernia Southern Extension, are not expected to overlap with the Project, but ongoing investment in infrastructure, commercial forestry projects and other oil and gas developments, for example, could increase activity at particular locations throughout the Project Construction period, increasing demands on similar community infrastructure and service elements.

From the perspective of the Project, cumulative effects on Community infrastructure KIs will be greatest during Construction because this is when demand on those facilities will be greatest. While there may be some cumulative effects on health-related infrastructure and services during Construction associated with workers from a variety of projects requiring medical attention as a result of illness or injury, most health-related concerns are associated with Project Operations, are long-term (life of the Project) in nature, and unique to this type of project (associated with EMF).

The change in the overall availability and quality of infrastructure and services for current users and / or in the health and well-being of affected individuals or communities resulting from the effects of the Project in combination with other projects and activities will not result in detectable and sustained decreases in the overall quality of life and / or health of a population. Therefore, significant adverse cumulative effects on Communities are not likely to occur.

Cumulative effects associated with the Project are summarized in Table 16.3.9-1.

Table 16.3.9-1 Cumulative Effects Summary: Communities

Cumulative Effects Analysis	Central and Southeastern Labrador	Northern Peninsula	Central and Eastern Newfoundland	Avalon Peninsula
Current (Baseline) VEC Condition				
Transportation Infrastructure and Services	– Ports – Major ports (St. John's, Corner Brook) likely to be used have sufficient capacity to accommodate current and additional traffic. The Port of Goose Bay can accommodate current traffic levels, but only limited additional traffic. – Highways – Highway capacities are adequate to meet current demands. Some congestion is already evident on Hamilton River Road (local road) in Happy Valley-Goose Bay.			
Waste Disposal Infrastructure and Services	– The 2002 Newfoundland and Labrador Waste Management Strategy provides a basis for the modernization of the province's waste management program. Eighty percent of current disposal sites will be phased out and three full service disposal facilities will be established. Currently 8 of 15 Regional Waste Management Authorities and one central disposal facility (St. John's) are operating.			
Safety and Security Services	– Safety and security services are in place to deal with accidental events such as forest and other fires and spills of hazardous materials. These services are considered adequate to meet anticipated needs.			
Health Conditions	– Health infrastructure and services are considered adequate or better to meet most needs of the provincial population.			
Community Well-being	– Community well-being as reflected in self-assessed physical health, emotional health, health practices, preventative behaviours and health issues, varies widely across the province. In some cases this is a reflection of high sampling variability. In the case of Aboriginal groups the underlying reasons are a complex mix of economic, social, political and cultural factors.			
Likely Residual Environmental Effects of Labrador - Island Transmission Link				
Transportation Infrastructure and Services	– Ports – The Project will place demands on infrastructure in the Port of Goose Bay beyond its current capacity unless the port infrastructure is upgraded. – Highways – Highways in Labrador and on the Island have sufficient capacity to accommodate Project traffic. Widening of Hamilton River Road or upgrades of other local roads in Happy Valley-Goose Bay will mitigate adverse effects during Construction and provide improved access post-Construction.			
Waste Disposal Infrastructure and Services	– There will be no likely adverse residual effects of the Project as all landfill waste will be disposed of under permits and in facilities where it can be accommodated.			
Safety and Security Services	– Project may increase demands on community services to respond to certain incidents, but no significant adverse residual effects are likely or anticipated.			
Health Conditions	– During Project Construction, on-site medical personnel will be able to deal with minor health issues, and demands on regional medical facilities are not expected to be substantial. Any health effects that do occur will be spread across the regions. – Construction and operational health effects from noise, EMF and IMD interference are anticipated to be low and within accepted levels.			
Community Well-being	– Some individuals will benefit from Project employment and income (see Chapter 16.7, Economy, Employment and Business). Some others may choose to spend that income in ways not conducive to a healthy lifestyle, but overall employment effects are viewed as positive on Community Well-being. Other effects (e.g., property values, radio / television interference) are anticipated to be not significant.			

Table 16.3.9-1 Cumulative Effects Summary: Communities (continued)

Cumulative Effects Analysis	Central and Southeastern Labrador	Northern Peninsula	Central and Eastern Newfoundland	Avalon Peninsula
Potential Cumulative Environmental Effects (within RSA) of Other Future Projects and Activities				
Transportation Infrastructure and Services	– Ports – The Lower Churchill Generation Project will place greater demands on infrastructure in the Port of Goose Bay than the proposed Project. Discussions concerning port requirements are ongoing between the Port operator, Transport Canada, and Nalcor as the proponent of both the Lower Churchill Generation Project and the proposed Project. Current infrastructure, together with any necessary infrastructure upgrades, is expected to be adequate to meet any cumulative demands. – Highways – The Lower Churchill Generation Project will be the source of overlapping effects in the area between Happy Valley-Goose Bay and Muskrat Falls. In addition, the Long Harbour Nickel Processing Plant and Hebron Project will contribute to additional traffic on the TCH in the Isthmus of Avalon area. Other projects will have negligible effects on highway infrastructure. Current infrastructure, together with any necessary infrastructure upgrades, is expected to be adequate to meet any cumulative demands.			
Waste Disposal Infrastructure and Services	– During construction other projects may generate some waste, but not to the same degree as the Project and not at the same locations. The exception is the Lower Churchill Generation Project. As the proponent for both projects, Nalcor will plan joint waste disposal strategies for its Labrador-based activities. Current waste disposal infrastructure is anticipated to be adequate to meet cumulative demands.			
Safety and Security Services	– Accidental events could occur at locations where projects overlap, e.g., Happy Valley-Goose Bay. Others could occur associated with transportation through areas where other projects are occurring, e.g., accidental spills associated with the Project on the TCH near the Long Harbour processing plant. All such events could place additional demands on services.			
Health Conditions	– During Project Construction there may be some overlap in demand for health services in Happy Valley- Goose Bay with the Lower Churchill Hydroelectric Generation project. There is unlikely to be any overlap of effects with other projects. The dispersed nature of Construction of the Project will also reduce any substantial demands on health facilities in any one location. – The potential health issues associated with Project Operations and Maintenance (e.g., noise, EMF) are unique to the Project and will not overlap with other existing or known future activities.			
Community Well-being	– Cumulative employment effects are seen as generally beneficial to Community Well-being (see Chapter 16.4, Economy, Employment and Business). – Other effects such as radio reception and noise are unique to the Project and are not expected to generate any cumulative effects.			
Cumulative Environmental Effects Summary				
Transportation Infrastructure and Services	– Ports – Any cumulative adverse effects will be negligible and not significant if appropriate planning for and development of the Port of Goose Bay is undertaken. – Highways – Mitigative action will be undertaken to minimize cumulative adverse effects on highway traffic in Happy Valley-Goose Bay. Cumulative affects on highway traffic elsewhere will be within the capacities of the main highways to be used and any adverse effects will be **not significant**.			
Waste Disposal Infrastructure and Services	– Any cumulative adverse effects from the Project and the Lower Churchill Hydroelectic Generation Project will be avoided by adopting the same effects management strategy for each. Other cumulative effects are likely to be negligible in terms of quantities of waste generated and any temporal overlap with the Project, and **not significant**.			

Table 16.3.9-1 Cumulative Effects Summary: Communities (continued)

Cumulative Effects Analysis	Central and Southeastern Labrador	Northern Peninsula	Central and Eastern Newfoundland	Avalon Peninsula
Safety and Security Services	– Cumulative effects of accidents and malfunctions have a low probability of occurrence, but pose risks to communities and individuals and increase demands on services. In likely scenarios, the cumulative effects of the Project will be **not significant**.			
Health Conditions	– Any cumulative effects on health are expected to be negligible and therefore likely to be **not significant**.			
Community Well-being	– Cumulative effects on Community Well-being as a result of employment and income opportunities from multiple projects will be generally beneficial. Any potential adverse cumulative effects are anticipated to be **not significant**.			

16.3.10 Monitoring and Follow-up

With respect to community infrastructure and services and community health and well-being, these components, services and social characteristics are typically the responsibility of municipal, Aboriginal, provincial and / or federal authorities with the necessary mandate and expertise. Monitoring demand on infrastructure and services and increasing or decreasing capacity as required are activities that those authorities typically undertake as part of their normal business – for example, highway use statistics, waste volumes and remaining landfill capacities are regularly monitored by government and upgraded as necessary. Similarly, the monitoring of health and other social issues and phenomena is the responsibility of community and government organizations and agencies. Nalcor has neither the mandate nor the expertise to monitor activity in these areas. Nalcor has provided and will continue to provide Project information to relevant authorities as input to their monitoring and decision-making processes, and will continue to consult with relevant stakeholders throughout the life of the Project.

16.4 Economy, Employment and Business

16.4.1 Introduction

The term “environment” is interpreted and applied comprehensively in this EIS to include the economic and social environments within which the Project will take place and where its potential effects will occur. How people maintain their livelihoods, and how those livelihoods may be affected positively or negatively by the proposed Project, are the primary questions addressed in this Economy, Employment and Business VEC. Strong economies are typically associated with employment and income-earning opportunities, which in turn bring self-esteem and economic security to workers and business owners and, as such, are valued by those individuals and the general population as key components of their overall quality of life and general well-being.

The Project will directly affect the lives of people living throughout Newfoundland and Labrador and elsewhere through the creation of new employment and earned income, opportunities for training skills development and work experience, and enhanced business opportunities related to the supply of goods and services to the Project. Indirect effects of the Project include increased revenue to governments and the subsequent benefits associated with how that revenue is spent on public goods and services. Additional induced effects of the Project will be felt with successive rounds of spending of personal and business incomes, which in turn will generate additional jobs and government revenues through the overall economy.

The economy of Newfoundland and Labrador has seen substantial growth over the last decade, associated primarily with the development of offshore oil and mineral resources. Employment, business activity levels and government revenues have increased to make the province one of the most important growth regions in Canada. Although the recession of 2008 interrupted this to some degree, the economy has since rebounded and is expected to once again show strong performance throughout 2012. This growth will be substantially enhanced with the development of the Lower Churchill Hydroelectric Generation Project and the Labrador-Island Transmission Link, as well as other ongoing and imminent projects, and additional economic development activities throughout the province.

The Economy, Employment and Business VEC assesses these potential socioeconomic benefits, as well as any adverse effects that may occur as a result of the Project, during the Construction phase and during future Operations and Maintenance of the Project. This VEC does not discuss or assess the likely economic benefits of the general operation of the transmission system, particularly with regard to revenue generation or other economic issues and outcomes. These are discussed separately as part of the overall need, purpose and rationale for the Project (see Chapter 2 of this EIS).

It is worth noting that Nalcor has considered potential job loss resulting from the closure of the Holyrood Thermal Generating Station. Nalcor will work with its staff to minimize any effect and find solutions that work for the employees and Nalcor.

16.4.2 Environmental Assessment Study Areas

16.4.2.1 Spatial Boundaries

The Project's likely effects on Economy, Employment and Business are assessed primarily at the provincial level, given the provincial nature and scale of the Project, which will include components and activities (and associated expenditures) throughout Newfoundland and Labrador and elsewhere.

Workers for the Project will be drawn from various regions throughout the province and beyond. At the current stage of Project planning it is not possible, however, to know the particular areas from which these workers will come, and thus the specific geographic and temporal distribution of such employment benefits. Similarly, the awarding of contracts to provide goods and services to the Project will be based on commercial and technical requirements, while also taking into account factors such as experience, creditworthiness, price, quality, service, safety and delivery. Which companies will bid, meet these criteria, and be successful in winning contracts for the Project likewise cannot be known at this time.

The assessment of the Project's likely effects on Economy, Employment and Business that is presented in the following sections is focused primarily at the overall provincial level. While some regions of the province may experience greater involvement in Project activities by virtue of the size, skills and availability of their labour forces, number and types of businesses, and proximity to the Project components, the regional distribution of those economic benefits cannot be accurately or meaningfully evaluated at this stage. Therefore, revenues from employment and business incomes that accrue to government are assessed only at the provincial level.

A key focus of the following analysis is the identification and discussion of ongoing and planned Nalcor measures to help optimize the participation of, and benefits to, Newfoundland and Labrador workers and businesses throughout the life of the Project.

16.4.2.2 Temporal Boundaries

The temporal boundaries of the assessment for the Economy, Employment and Business VEC encompass the Project's Construction phase, which is the period of greatest employment and expenditures and the primary focus of the assessment, as well as the Operations and Maintenance phase, which will extend through the life of the Project.

16.4.3 Potential Environmental Issues, Indicators and Interactions

16.4.3.1 Potential Environmental Issues

Potential issues and questions associated with the Economy, Employment and Business VEC were identified in the *Environmental Impact Statement Guidelines and Scoping Document* (Government of Newfoundland and Labrador and Government of Canada 2011) for the Project, through a review of regulatory requirements, through Aboriginal and stakeholder consultation by Nalcor, and by the EIS study team.

The issues and questions raised are associated primarily with how the economy, employment and business levels will be affected by the Construction, and Operations and Maintenance of the Project. More specifically, given the substantial construction requirements of the Project, there has been considerable interest in the levels and potential share of expenditures, employment and business activities that will accrue to Newfoundland and Labrador. These considerations form the main focus of the assessment for this VEC, and are summarized in Table 16.4.3-1.

Table 16.4.3-1 Identified Issues and Questions: Economy, Employment and Business

Issue / Question	Nature and Rationale	Specific Considerations
How will the Construction, and Operations and Maintenance of the Project affect / benefit the Newfoundland and Labrador economy?	– Economic benefits of the Project to Newfoundland and Labrador are an important aspect of, and consideration for, the Project – Individuals, companies and governments are interested in having opportunities to receive income and revenue benefits from the Project, contributing to further economic growth and development in the province	– The proportion of Project activities / expenditures in Newfoundland and Labrador, including direct, indirect and induced benefits
How will Newfoundland and Labrador be affected by / benefit from employment generated by the Construction, and Operations and Maintenance of the Project?	– The Project will generate substantial employment, particularly during the Construction phase – The Newfoundland and Labrador labour force has a strong interest in Project-related employment opportunities as a source of income, training and work experience	– The presence of a skilled construction labour force in Newfoundland and Labrador, with extensive recent experience related to major development projects in the province and elsewhere – Labour force competition from other projects both within the province and elsewhere, potentially resulting in insufficient labour supply to meet Project needs – The potential for / value of training to meet employment needs
How will Newfoundland and Labrador businesses be affected by / benefit from the Construction, and Operations and Maintenance of the Project?	– The Project will generate substantial business opportunities related to the supply of goods and services, particularly during the Construction phase – Newfoundland and Labrador companies can benefit from Project-related business opportunities, with associated business growth and development	– The capability and capacity of Newfoundland and Labrador businesses to provide required goods and services, and bid competitively

16.4.3.2 Key Indicators and Measurable Parameters

Various KIs and MPs were identified for this VEC to frame and focus the associated environmental effects analysis. The selection of these KIs and MPs was based on consideration of the various key elements of the VEC as well as the questions and issues that have been identified about associated Project effects, including job creation / income earning and revenue generating opportunities generated by the Project for the province generally (Economy), the provincial labour force (Employment) and the provincial business community (Business). Each KI has associated MPs, which represent aspects of the KI to which Project-related changes could be detected / measured. These include consideration of direct, indirect and induced effects (Table 16.4.3-2).

Table 16.4.3-2 Key Indicators and Associated Measurable Parameters: Economy, Employment and Business

Key Indicator	Rationale for Key Indicator[(a)]	Measurable Parameter[(b)]	Rationale for Measurable Parameter
Economy	– The state of the economy is important to and valued by society, and a key contributor to the overall well-being of a population – Assessing changes to the economy as a consequence of the Project is indicative of potential changes in economic and social well-being	– Income levels in Newfoundland and Labrador – Annual tax revenues (These may be affected by the Project through direct[(c)], indirect[(d)] and / or induced[(e)] effects)	– Standard units, measurable from Project costs / expenditure data
Employment	– Employment is valued for, among other things, the income earning opportunities and associated economic and social benefits that it brings – Assessing changes in employment as a consequence of the Project is indicative of potential changes in economic and social well-being	– Employment levels in Newfoundland and Labrador (These may be affected by the Project through direct[(c)], indirect[(d)] and / or induced[(e)] effects)	– Standard unit, measurable from Project employment data
Business	– Business activity creates wealth and employment and is a major contributor to the economic health of a region – Assessing changes to the level of business activity as a consequence of the Project is an indicator of potential changes to the health and strength of the economy	– Business activity levels and revenues in Newfoundland and Labrador (These may be affected by the Project through direct[(c)], indirect[(d)] and / or induced[(e)] effects)	– Standard units, measurable from Project costs / expenditure data

(a) Key Indicator: An aspect or characteristic of the VEC and / or its environment, which, if changed as a result of the Project, may result in an effect on the VEC.

(b) Measurable Parameter: An environmental characteristic that is related to the status of a KI. Project effects on a MP can be detected and measured.

(c) Direct effects: Result from the direct hire of persons, and include employment and labour income effects.

(d) Indirect effects: Result from the supply of goods and services, and are measured in terms of employment, labour income and business income.

(e) Induced effects: Result from the expenditures of money in the economy by those employed directly or indirectly on the Project, and are measured in terms of employment, labour income and business income.

16.4.3.3 Potential Project-Economy, Employment and Business Interactions

Potential interactions between Project components / activities (phases) and the KIs for the Economy, Employment and Business VEC are identified in Table 16.4.3-3. Both the Construction and the Operations and Maintenance phases of the Project will involve activities and expenditures that will:

- have direct, indirect and induced income and tax revenue effects on the Economy;
- require workers that will generate direct, indirect and induced effects on Employment; and
- generate effects on Business as a result of Project expenditures.

Table 16.4.3-3 Potential Project Interactions: Economy, Employment and Business

Project Phase / Activity	Key Indicator		
	Economy	Employment	Business
Construction[(a)]	Project work and expenditures will result in the creation of employment and business income and government tax revenue (measured in Canadian dollars)	Project expenditures will result in direct, indirect and induced employment (measured in person years of employment)	Project expenditures will result in contracts with businesses to provide required goods and services (measured in Canadian dollars)
Operations and Maintenance[(b)]			

(a) Construction activities that could interact with the Economy, Employment and Business VEC include: construction of access trails and roads; movement and presence of personnel, equipment and materials; construction camps; marshalling yards and staging areas; ROW clearing and preparation; quarrying and borrowing; transmission tower assembly and installation; conductor installation; converter station site preparation and construction; preparation and construction of submarine cable landing sites (on-land works); construction and installation of submarine cables (marine works); electrode site preparation and installation; Island system upgrades; employment / presence of workers; contracting / expenditures; and system commissioning.

(b) Operations and Maintenance activities that could interact with the Economy, Employment and Business VEC include: maintenance of access trails and roads; presence and operation of the transmission system; routine line inspections and repairs; vegetation management; potential major system repairs; operation of the electrodes; employment / presence of workers; and contracting / expenditures.

16.4.4 Approach to the Environmental Effects Analysis

16.4.4.1 Analytical Methods

The environmental effects analysis for Economy, Employment and Business is based on similar approaches adopted for other project EAs and involves tracking expenditures through the economy and applying coefficients to estimate direct, indirect and induced effects on employment, incomes, gross domestic product (GDP) and taxation.

The primary source of information used in the analysis was Construction, and Operations and Maintenance labour force and cost estimates and cash flow forecasts (expenditures) developed by Nalcor for the Project (see Chapter 3, Project Description).

The results of this analysis should be considered illustrative rather than definitive. The labour and cost estimates used in the assessment, while appropriate and typical for the current stage of Project design and planning, will be subject to continued refinement and increasing precision as Project engineering and other work progress. This is typical of any major development project at the EA stage, and can be considered to

provide a reasonable and illustrative assessment of the likely socioeconomic outcomes of the Project, at an appropriate scale of analysis for EA purposes.

The underlying concept is that socioeconomic effects flow through the economy from Project expenditures during each phase of activity. These effects are magnified as incomes earned by labour and businesses are re-spent throughout the economy.

Information on the composition of capital expenditures (capex) for each component of the Project during Construction and expenditures during Operations and Maintenance provides information for the estimates of direct income and employment effects in the province.

Indirect income and employment are estimated based on estimated capture rates that reflect the types of goods and services required and the likely (predicted) ability of Newfoundland and Labrador businesses to supply them. The discussion of optimization strategies (i.e., approaches to maximizing business and employment benefits to the province) is based on Nalcor's benefits philosophy and approaches to benefits planning (see discussion below and GNL 2010, internet site).

Induced income and employment effects are estimated by applying an income multiplier appropriate to the province. This income multiplier reflects estimates of how much of the income that people receive is actually spent, how much of that income goes to government through taxation, and how much of the income spent in the community is on imported goods and services.

Project expenditures allow for an estimation of the effects of the Project on provincial incomes, employment and government revenues. However, there are no comparable data upon which to base detailed projections for Project-related business effects. Which companies will secure contracts to supply services, materials or equipment to the Project will be determined through a competitive bidding process (see Section 16.4.5.1), the outcome of which cannot be known or even meaningfully predicted at this time. The focus of this section is thus on the effects management process that will be in place to optimize the potential for business benefits to accrue to the province.

The actual effects on each of the Economy, Employment and Business KIs will be addressed by Nalcor through its adaptive management process, as outlined in Section 16.4.10.

16.4.4.2 Environmental Effects Descriptors

The potential effects of Project activities on the various aspects of the Economy, Employment and Business VEC are presented in terms of a set of descriptors and summarized in Table 16.4.4-1.

Project effects on the Economy, Employment and Business VEC and its associated KIs will likely occur continuously throughout the Construction, and Operations and Maintenance phases once they begin, therefore, "frequency" does not help to describe or characterize such effects. The amount / level of effect varies between and during Construction, and Operations and Maintenance, and is captured in Sections 16.4.5 and 16.4.6. The level of confidence for the effects predictions is indicated for each.

Table 16.4.4-1 Effects Descriptors: Economy, Employment and Business

Effects Descriptor	Definition
Direction	
Adverse	Effect is negative and undesirable
Neutral	Effect is neither adverse nor beneficial
Beneficial	Effect is positive and desirable
Magnitude	
No Detectable Effect	Project does not change existing socioeconomic (baseline) conditions for the parameter, or any effect is within the normal range of variability / trends for the parameter
Reduction	Effect results in a detectable overall reduction in the existing value of the parameter
Increase	Effect results in a detectable overall increase in the existing value of the parameter
Geographic Extent	
Local	Effect is evident within the region(s) where the associated Project activities occur
Regional	Effect is evident throughout Newfoundland and Labrador
Beyond regional	Effect is evident elsewhere in Canada and / or internationally
Duration	
Short-term	Effect will be evident for less than one year
Medium-term	Effect will be evident for between one and four years
Long-term	Effect will be evident for from four to ten years
Far future	Effect will be evident throughout the life of the Project

16.4.5 Construction

16.4.5.1 Overview of Project Construction and Associated Effects Management

The Economy, Employment and Business VEC and its KIs focus on Project expenditures on labour, goods and services and equipment associated with any of the Project components / activities and the degree to which they can and will likely be provided by Newfoundland and Labrador individuals and companies.

The Project's socioeconomic benefits can be optimized if the residents and firms of the province take advantage of the employment and business opportunities that arise. The more people and businesses that are involved in these opportunities, the greater the revenues to government from personal, corporate and other types of tax, which, when reinvested in the province, benefits the overall population.

In July 2010 the GNL announced a Benefits Strategy that will apply to both the Labrador-Island Transmission Link and the Lower Churchill Hydroelectric Generation Project to help enhance the potential for, and degree of, such socioeconomic benefits (Nalcor 2010, internet site; NLDNR 2010, internet site). The Benefits Strategy outlines the work to be performed in the province for the benefit of provincial businesses and workers, as well as the principles and procedures to be followed by Nalcor and its contractors and sub-contractors regarding employment, business activities and benefits. It is also intended to assist with the development and implementation of Gender Equity and Diversity programs during all phases of the projects. Additional information on the Benefits Strategy was provided in Chapter 2, Project Rationale and Planning, with specific and relevant details also described in the sections that follow.

Economic benefits specific to the Project include requirements for at least one million person-hours of engineering and Project management employment, and 2.5 million person-hours of construction employment in the province. Project management activities will be executed within the province, with the appropriate site management offices set up in Labrador and other areas of the province as required. Local contractors, service

providers, consultants and suppliers will be made aware of business opportunities associated with the Project and these groups will have full and fair access to participate on a competitive basis for such opportunities as outlined by the Benefits Strategy.

Although Nalcor will make efforts to optimize economic, employment and business opportunities to Newfoundland and Labrador workers and companies, there will inevitably be some economic leakages to other areas of Canada and beyond. Some of the required materials, equipment and specialized labour will have to come from manufacturers, suppliers and sources outside the province and country.

As an example, there are no steel producers in Newfoundland and Labrador, and the quantity of steel required for the transmission towers is expected to be well beyond the capacity of Canadian steel producers; some or all of the supply of tower material is likely to be contracted to an international supplier(s). With respect to employment, there are some specialized trades, such as line installers, of which there are insufficient skilled workers in Newfoundland and Labrador, and possibly Canada, to meet Project needs. The manufacture and installation of the Strait of Belle Isle submarine cables are highly specialized activities and the contract to perform this work likely will be awarded to an international company with the appropriate equipment and experience, as there are no subsea cable suppliers in Canada. Notwithstanding these types of economic leakages, the potential income, employment and business benefits to Newfoundland and Labrador are expected to be substantial, as illustrated below.

Project-related employment within the province will be influenced by ongoing changes in the construction labour supply environment, which is characterized by an aging workforce, an increase in the number of those retiring, and a shrinking pool of potential new entrants in Newfoundland and Labrador and in Canada. This issue is further discussed as part of the effects management strategies for employment (below). In addition, labour issues may be compounded by concurrent and competing projects both within the province and elsewhere in Canada. These and other aspects of the cumulative effects of multiple projects on this VEC are further discussed in Section 16.4.9.

Effects Management Measures: Employment

Under the Benefits Strategy (Nalcor 2010, internet site), a construction hiring protocol will be established for Project Construction. This protocol will be consistent with the Canadian Charter of Human Rights and Freedoms, as well as any associated terms and conditions of governmental approvals for the Project. Nalcor will implement commitments made in any executed Impacts and Benefits Agreement (IBA) (GNL 2010, internet site), followed by first consideration for employment of qualified Newfoundland and Labrador residents, considering the gender equity and diversity provisions discussed below. Any collective agreements entered into by Nalcor or its primary contractors will contain provisions consistent with this protocol.

Prior to Project sanction, Nalcor will consult with relevant stakeholder organizations and provincial departments and agencies to develop and implement a Gender Equity Program and a Diversity Program for the Project. The objectives of these programs will be to optimize employment equity for the Project, including access to employment opportunities for and employment of qualified women and qualified members of disadvantaged groups, with an emphasis on continuous improvement. These programs will implement proactive programs and practices that contribute to the creation of an inclusive work environment and corporate culture, and will promote accountability and responsibility for equity.

The Gender Equity Program will include a Women's Employment Plan (WEP) and Business Access Strategy, which will have goals for the employment of women in Project Construction, and Operations and Maintenance. Nalcor will initially establish these targets by considering the availability of women in particular occupational categories as identified by Statistics Canada in its Employment Equity Data Report (HRSDC 2006, internet site). The WEP will include programs and processes to facilitate employment and participation for women in both phases of the Project, and at all facilities, sites and offices in the province where Project work is performed by Nalcor and its primary contractors. Specific provisions for the WEP are outlined in the Benefits Strategy prepared for the Lower Churchill Hydroelectric Generation Project (Nalcor 2010, internet site).

The Diversity Program will include a business access strategy for disadvantaged groups (Diversity Plan) in which Nalcor will establish specific goals. The Diversity Plan will institute ongoing programs and processes to facilitate employment and participation for disadvantaged groups in both phases of the Project, and at all facilities, sites and offices in the province where Project work performed by Nalcor and primary contractors is taking place. Specific aspects of the Diversity Plan are also outlined in the Benefits Strategy prepared for the Lower Churchill Hydroelectric Generation Project (GNL 2010, internet site).

Nalcor understands that training is an important component of the commitments identified above. Project training requirements will cover a broad spectrum, including health and safety requirements, work place protocols and skills development programs. Nalcor has worked and will continue to work with governments, Aboriginal groups, women's organizations, training institutions and labour organizations to discuss Project labour requirements, identify existing or anticipated gaps in the labour supply pool, and will explore and discuss potential approaches to address gaps.

As part of its strategy to address labour supply concerns, NLH (now Nalcor) was a participant in the Newfoundland and Labrador Skills Task Force, which was established by the provincial government in March 2006. The Skills Task Force is mandated to advise government about future skills requirements (labour supply and demand by occupation), particularly those associated with large-scale development projects, and to assess the within-province ability to respond to these needs. The Skills Task Force was also asked to identify and develop strategies for an appropriate and responsive training, education and support system to meet these demands. The report and associated recommendations were submitted to government in March 2007 (Skills Task Force 2007, internet site).

Nalcor participates in an informal working group with a number of relevant government departments on an ongoing basis. The group facilitates dialogue, and cooperates in identifying issues and planning to meet the Project's labour force requirements. The working group facilitates ongoing discussions and information sharing regarding the anticipated occupational requirements of the Project, as well as measures to train, recruit and retain workers.

As part of the hiring and training process, Nalcor has developed resource demand profiles at the National Occupation Classification (NOC) level. These data will be made available to appropriate stakeholders to help identify labour supply gaps so that government agencies and organizations can also take the appropriate action.

Nalcor is committed to:

- Encouraging pre-construction training initiatives to enable people in the province to participate fully in the Project.
- Working with successful contractors to provide adequate workplace training for employees. This training will include health and safety, cultural awareness, gender sensitivity, environmental awareness and respectful workplace programs, as well as specialized skills training.
- Working with contractors who have the responsibility to develop and implement apprenticeship programs for the Project.
- Working with training institutions and government agencies throughout the province to offer technical advice and expertise where appropriate and to assist in coordinating training for Project-related work with relevant stakeholders.

Nalcor will also engage employees and potential employees through a variety of programs and practices including:

- Maintaining a work environment that facilitates the achievement of their career goals and provides the training and support they need to meet Nalcor's business objectives.
- Encouraging employed journeypersons to participate in post-journeyperson training.

- Supporting initiatives to increase the number of women who have the skills required to support the Project, including supporting post-secondary education institution efforts that encourage the participation of women in trades and other occupations required by the Project.
- Providing or encouraging contractors and sub-contractors to provide on-the-job-training opportunities for qualified participants during the Construction phase of the Project.
- Communicating with school staff and students about career options, participating in career fairs and supporting training efforts.
- Contributing to and participating in activities and initiatives designed to help students become aware of and interested in the skilled trades in general, as well as upcoming Project employment opportunities, and associated training opportunities and requirements. This will include participating in career fairs and career counselling activities in schools, publicizing successful trades role models from the local area and encouraging and facilitating a mentorship program.
- Contributing to student achievement awards and providing summer student employment opportunities and work-term placement opportunities on the Project.
- Nalcor and Innu Nation have agreed to co-operate in the development of a specific Innu Training Plan to encourage and assist Innu to participate in and become qualified for employment on the Project. This will include training programs to assist Innu to become qualified for applicable employment opportunities prior to the commencement of the Construction phase, and will be undertaken in consultation with appropriate government departments and educational institutions.

The provincial and federal governments, along with Labrador's three Aboriginal groups and Nalcor, are contributing $30 million towards increasing employment opportunities for Labrador's Aboriginal people who wish to get involved in the region's major development projects.

The successful partnership has led to the formation of the Labrador Aboriginal Training Partnership (LATP), an incorporated, not-for-profit organization. The LATP is overseeing a comprehensive training-to-employment plan that will help prepare members of Labrador's Innu Nation, the Nunatsiavut Government and NunatuKavut for employment opportunities in resource development throughout Labrador, including the Project.

Nalcor will support employees through:

- Access to an Employee Assistance Program (EAP), which will provide counselling for employees and their families who are experiencing problems in their work or personal lives. EAP services will be available for such issues as depression, loneliness, interpersonal relationships, stress, anxiety, financial problems and money management. Employees will also be informed about and referred to other relevant social and community services as required.
- Establishment of a workplace committee that serves as a discussion forum to identify and discuss perceived or potential workplace issues and make recommendations to Nalcor and its contractors on any requirements and measures for improvement.

Effects Management Measures: Business

Nalcor is committed to optimizing Project benefits and communicating with the business community regarding procurement opportunities. This includes commitments made in the Project's Benefits Strategy with the Government of Newfoundland and Labrador, and in the Lower Churchill Innu Impacts and Benefits Agreement with Innu Nation.

On a competitive basis, Nalcor will give full and fair opportunity to provincial suppliers and contractors who wish to participate in the supply of goods and services to the Project. These opportunities will include direct supply relationships with Nalcor, and relationships with the Project's main contractors and suppliers.

To communicate these opportunities, Nalcor has conducted supplier information sessions, one-on-one meetings with suppliers, participated at trade shows, and presented at numerous chamber of commerce, board of trade, regional economic development board, rotary club, municipal and professional association functions. A complete list of these engagements is provided in Chapter 8. The Nalcor Energy-Lower Churchill Project website also provides information on the procurement process, including vender registration questionnaire, information sheets, Powerpoint presentations, and contact information for members of the procurement team. The same information applies to this Project.

Contracts for the provision of goods and services for the Project will be awarded through a competitive bidding process. The procurement and contracting philosophy for the Project will provide for full and fair opportunity for all suppliers. Goods and services will be acquired on a Best Value basis, which is defined as a blend of total cost, quality, technical suitability, creditworthiness, delivery and continuity of supply and services

Newfoundland and Labrador content and benefits, as well as technical and commercial considerations, will be selection factors in evaluating bids and awarding Project contracts. Bid evaluations will be structured on a case-by-case basis to meet specific contract requirements, and the weighing of criteria may therefore vary accordingly.

Nalcor is committed to investigating the capabilities of businesses in communities near the Project, and information on the scope of the Project will be disseminated as details are developed (Nalcor / Labrador North Chamber of Commerce 2010, internet site). There will be open communication with all persons and companies requesting non-proprietary information. Supplier information sessions will take place throughout the province.

Nalcor is committed to sustained communication with the business community in Newfoundland and Labrador. Nalcor has a proactive approach to supplier engagement focused on ensuring businesses have up-to-date information and are Project-ready. Nalcor has been meeting with members of the local business community since 2009 to discuss their companies and capabilities to meet the needs of the Project.

Supplier information meetings in September and October 2009 provided the first opportunity for suppliers in the Happy Valley-Goose Bay region to talk one-on-one with a member of the Project procurement team. Nalcor's Supply Chain Lead met with 42 local suppliers to understand their capabilities and interests and to identify and discuss any joint ventures and partnerships they had formed. Further one-on-one supplier meetings were held during Expo Labrador in June 2010. In October 2011, more than 250 businesses attended Nalcor supplier information sessions in Happy Valley-Goose Bay, St. John's, Grand Falls-Windsor, Corner Brook, Flower's Cove and L'Anse au Loup. In addition to supplier information sessions, the Lower Churchill Project hosted 17 open houses across Newfoundland and Labrador from April to June 2011 (see Chapter 8). Project staff and information were available for people interested in learning more about the procurement process for the Project.

Where goods and services are not available locally on a competitive basis, successful companies will be encouraged to involve Newfoundland and Labrador-based firms. This collaboration would assist in the development of local companies, capacity and expertise and would transfer technology toward long-term opportunities.

Nalcor's Contracting and Purchasing policy for the Project requires that the Lower Churchill Project and its primary contractors:

- become familiar with Newfoundland and Labrador supplier capabilities;
- size and design bid packages, where appropriate, to fit the capabilities of Newfoundland and Labrador companies;
- communicate with Newfoundland and Labrador suppliers and manufacturers and, when requested, make reasonable efforts to guide them in qualifying for future bids and contracts;

- make the names and locations of key personnel available to potential suppliers and manufacturers involved in the bidding process, where appropriate; and
- request benefits information as part of the bid solicitation process in sufficient detail to assess the benefits to be derived from individual bids (a Bidders Benefit Questionnaire will be completed).

To further encourage dialogue on its Industrial Benefits Planning activities, a Business Opportunities Committee will be established during Project Construction. This committee will involve Nalcor, key Project contractors and representatives of the provincial business community. This forum for ongoing information sharing and discussion about upcoming Project requirements and contracting opportunities will enable Nalcor to explore means to help provincial businesses to plan effectively and pursue these opportunities.

Effects Management Measures: Labrador Innu Impacts and Benefits Agreement

In addition to the above-described measures and processes, Nalcor and Innu Nation have negotiated and concluded the Lower Churchill Innu IBA which pertains to both the Lower Churchill Hydroelectric Generation Project and the Labrador portion of the Labrador-Island Transmission Link (see Chapter 7).

The IBA is the outcome of several periods and processes of discussion and negotiation over 10 years between Innu Nation and Nalcor and its predecessors. On September 26, 2008, Innu Nation and the GNL announced the signing of the *Tshash Petapen Agreement* (which translates as the "New Dawn Agreement"), which resolved key issues relating to matters between the province and Innu Nation surrounding the Innu Rights Agreement, the Lower Churchill IBA and Innu redress for the Upper Churchill Hydroelectric development. On February 16, 2010, Innu Nation leaders and the GNL initialled an agreement that completed the outstanding issues associated with the New Dawn Agreement. The agreements, including the IBA, were subsequently ratified by a vote of the Innu Nation membership on June 30, 2011 and signed on November 18, 2011.

The IBA defines how the Labrador Innu will participate in and benefit from the Project. The specific nature and provisions of the IBA are, and will remain, confidential. The agreement does, however, include processes for continued consultation and cooperation throughout the planning, Construction, and Operations and Maintenance phases of the Project. The IBA also includes mechanisms intended to avoid or reduce potential adverse effects on Innu and Innu communities, and particularly relevant to this VEC, to create and enhance potential benefits of the Project. This includes processes and provisions related to Innu employment, training and business opportunities for the Labrador-components of the Project, workplace policies and conditions, and Innu commercial participation in the Project.

16.4.5.2 Existing Knowledge

The construction of electrical transmission systems is a common activity throughout North America and worldwide. The potential effects of transmission line construction on Economy, Employment and Business are, in many respects, similar to those which may be experienced with any large construction project, and particularly comparable with those of other large linear projects such as pipeline, road and railway construction.

There is, however, little available published "existing knowledge" which has evaluated and measured the known economic effects of similar projects and activities. Some key findings from a selection of recent literature that is available are summarized in Table 16.4.5-1.

Table 16.4.5-1 Existing Knowledge (Construction): Effects of Similar Projects on Economy, Employment and Business

Reference	Study / Project Context	Summary of Findings
Wagner (2010, internet site)	Employment and economic effects of transmission line construction in Montana	Concludes that in-state contracting generates 2.45 direct jobs/$million of capex and 4.70 total jobs, as compared with 1.20 direct and a total of 1.95 jobs/$million for out-of-state contractors.
North Star Economics (2009, internet site)	Report on the economic effect of transmission line construction in the United States of America Midwest	The authors demonstrate that the economic benefits per mile of transmission line construction included: – Direct economic effects of US$1.5 million – 11.6 (per mile) jobs generated / supported – Tax revenues of US$45,000 annually – A total economic effect of US$2.1 million.
Voisey's Bay Nickel Company Limited (2005)	Employment and economic effects of Voisey's Bay Mine / Mill Construction in Newfoundland and Labrador	– Between 2002 and 2005, more than 4,500 people supported construction of the mine and concentrator in Labrador, of which 92% were residents of the province. During 2005, expenditures in Newfoundland and Labrador totalled approximately $396 million or 80% of total expenditures.

16.4.5.3 Construction Effects: Economy

The economic outcomes of the Project will include direct, indirect and induced effects, which are generally defined as follows:

- *Direct effects* result from the direct hire of persons, and include employment and labour income effects;
- *Indirect effects* result from the supply of goods and services, and are measured in terms of employment, labour income and business income; and
- *Induced effects* result from the expenditures of money in the economy by those employed directly or indirectly on the Project, and are measured in terms of employment, labour income and business income.

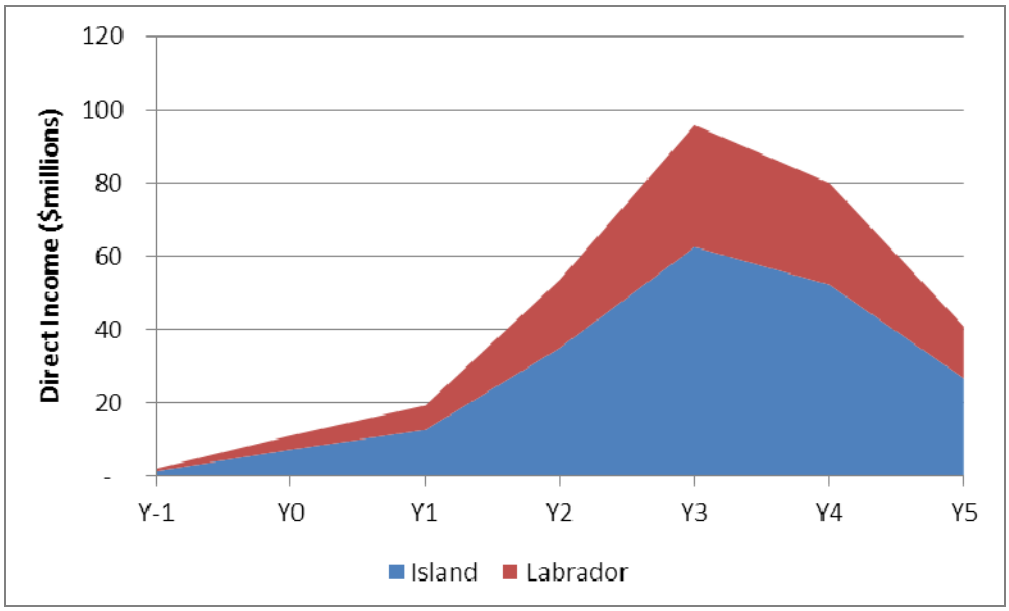
The predicted annual direct labour and business income effects are illustrated in Figure 16.4.5-1. Unless otherwise indicated, all estimates are in 2010 Canadian dollars.

The nature of Project requirements, particularly in terms of goods and materials, equipment and specialized services, makes it inevitable that a portion of the approximately $2.1 billion in total Project capital expenditures will be made outside of the province. Materials and services from outside the province will include several that comprise key and significant Project requirements, such as steel for the transmission towers, submarine cables, converter station equipment and other items, that cannot be sourced from within the province.

Based on previous analysis undertaken for Nalcor relative to economic impacts of transmission line construction, it was estimated that direct income in Newfoundland and Labrador accounts for 16.7% of total capital expenditures. As illustrated in Figure 16.4.5-1, total direct income generated in the province during the Project Construction period is estimated to be approximately $300 million, of which $95 million is expected in Year 3, the peak of Construction activity.

Of this total, approximately $195 million in direct income will be generated on the Island of Newfoundland and $105 million will occur in Labrador.

Figure 16.4.5-1 Annual Profile of Direct Project-related Income: Construction, Newfoundland and Labrador

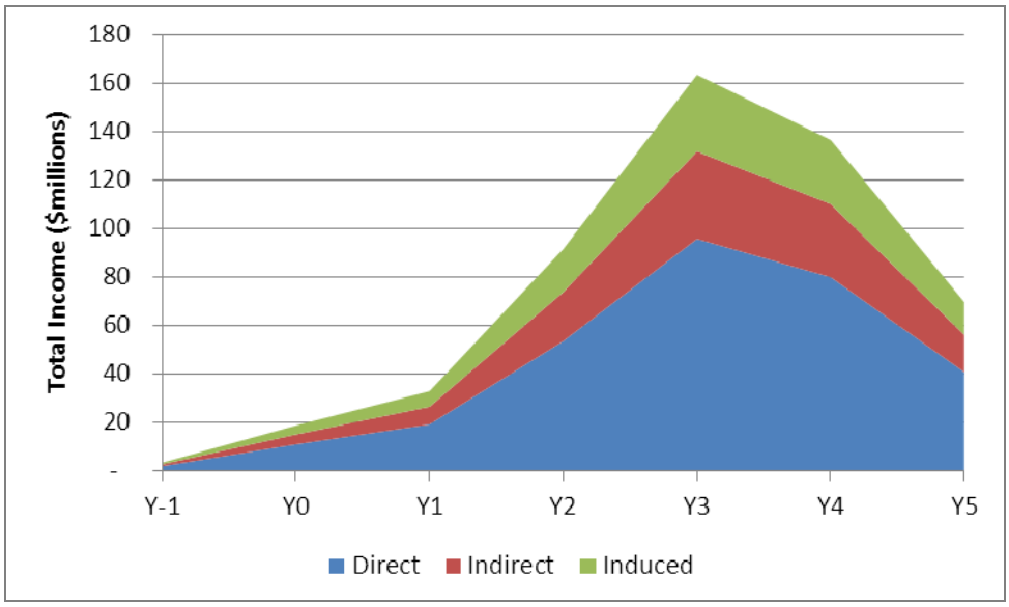


In addition to the above-described direct income effects of the Project, indirect and induced income will also be generated by Project expenditures.

The annual profile of total provincial Project-related income from direct, indirect and induced expenditures is illustrated in Figure 16.4.5-2. Total provincial income is estimated at approximately $520 million, peaking in Year 3 of Project Construction at approximately $160 million.

Approximately $385 million of the Project-related income will be generated on the Island of Newfoundland and $135 million will be generated in Labrador. Much of the difference between incomes generated on the Island and in Labrador is attributable to the differences in the size and complexity of the respective economies and the greater resulting leakage from the Labrador economy.

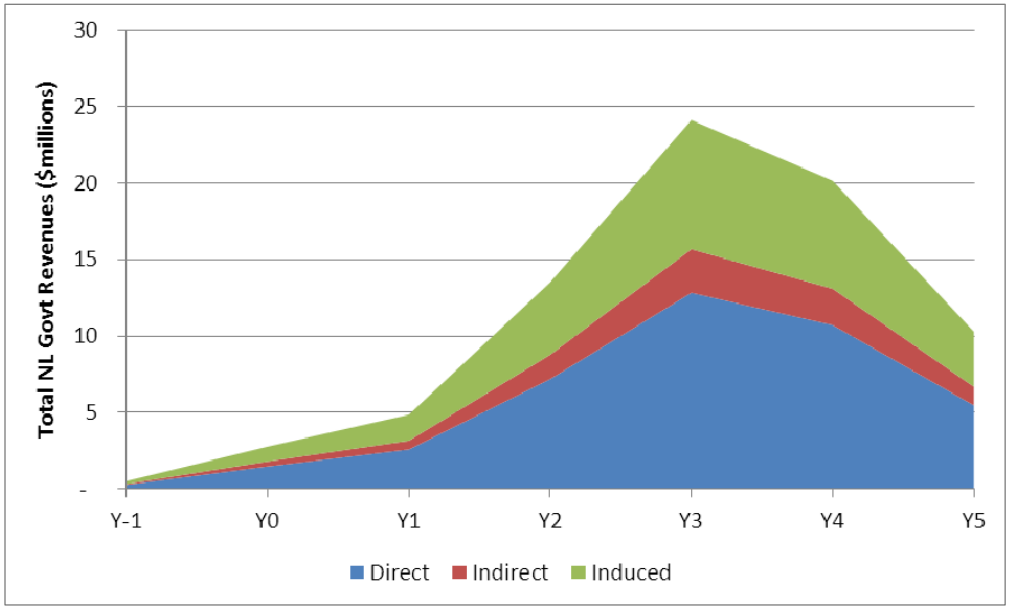
Figure 16.4.5-2 Annual Profile of Total Project-related Income: Construction, Newfoundland and Labrador



Government revenues during the Construction phase of the Project will be derived from direct income taxes, primarily those paid by workers, indirect taxes paid by the owners of companies supplying goods and services to the Project, and induced taxes that result from increased economic activity that can be traced to the incomes earned as a result of the Project.

The annual tax revenues generated from direct, indirect and induced Project incomes are illustrated in Figure 16.4.5-3. For the Project Construction phase, provincial government revenues will be approximately $76 million, peaking in Year 3 at $24 million.

Figure 16.4.5-3 Annual Profile of Project-related Government Tax Revenues: Construction, Newfoundland and Labrador



Summary of Likely Residual Environmental Effects

The likely residual effects of Project Construction on the Economy KI are as follows:

- Direction: Beneficial, because the Project will help to further strengthen the economy through its direct, indirect and induced labour and business income and government revenue generating effects.
- Magnitude: The Project will serve to increase total income levels to individuals and companies beyond existing levels by an estimated $520 million during Construction, with a peak of $160 million in Year 3 of the Project. The Project will also contribute an estimated $76 million in taxes and other revenues to government during this phase, with a peak of $24 million in Year 2 of the Project.
- Geographic Extent: Regional, because the effects of the Project will be experienced across the province. There will also be effects beyond the province (elsewhere in Canada and internationally).
- Duration: Medium-term, because these effects will occur throughout the Project's Construction phase.

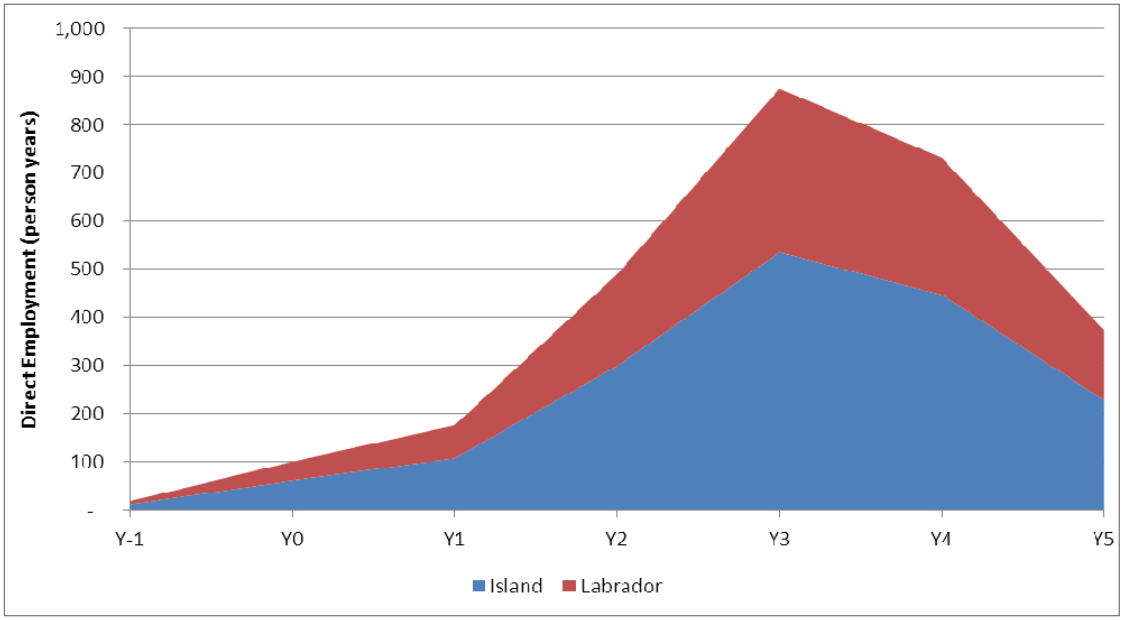
There is a high degree of confidence that the actual effects of Project Construction on the Economy KI will be as predicted because Project expenditures will result in the injection of a substantial level of new investment into the economy that in turn will result in new direct income and employment effects and further new, additional, indirect and induced income and revenue effects resulting from successive rounds of spending.

16.4.5.4 Construction Effects: Employment

A detailed overview of the estimated labour force requirements associated with Project Construction, and Operations and Maintenance was provided previously, in Chapter 3, Project Description.

Total direct employment during Project Construction is expected to be approximately 3,070 person-years (Figure 16.4.5-4). Of this total, approximately 2,760 is expected to occur in Newfoundland and Labrador, including 1,690 on the Island of Newfoundland and 1,080 in Labrador. Peak direct construction employment is expected in Year 3, with 540 person-years of work occurring on the Island and 340 person-years in Labrador.

Figure 16.4.5-4 Annual Profile of Project-related Direct Employment (Person-years): Construction, Newfoundland and Labrador



The main occupations required are listed in Table 16.4.5-2. These ten categories are estimated to account for nearly 70% of the required workforce during Project Construction (see Chapter 3, Project Description, Section 3.7 for additional information on the Project workforce, and Section 3.7.3 for additional details regarding labour demand by NOCCode).

Table 16.4.5-2 Main Occupations Required During Construction (in Descending Order of Estimated Requirements)

National Occupation Classification Code	Description
H611	Heavy Equipment Operators
H822	Construction Trades Labourers and Helpers
C031	Civil Engineers
C033	Electrical Engineers
H324	Ironworkers
J216	Mechanical Assemblers and Inspectors
A371	Construction Managers
H214	Electric Powerline and Cable Workers
C032	Mechanical Engineers
H017	Construction Supervisors (Heavy Equipment)

Labour in several of these and other categories may be in insufficient supply during peak Project Construction, as described below.

According to the Canadian Construction Sector Council (CSC), across the 2011 to 2019 scenario, overall Canadian labour requirements for residential and non-residential new construction will reach 111,000 workers – an increase of 12%. The CSC is a national industry-led organization that produces annual forecasts of the labour force requirements in each province and for Canada as a whole for the construction industry. While growth exceeds 20% for the non-residential workforce, these are not huge gains in comparison to the strength of the last decade. Demographic changes will drive requirements related to retirements and mortality to 208,000 workers – double the need resulting from new construction.

In terms of the supply response to the overall labour requirements of 320,000 workers for new construction, retirements and mortality across the 2011 to 2019 scenario, half of the total requirements are estimated to be met with 163,000 first-time new entrants to the workforce, leaving a net-in mobility requirement of 157,000 workers. This will necessitate expanded recruitment efforts to meet this demand for skilled workers.

For Newfoundland and Labrador, the CSC projects that shortages are expected, particularly in the 2012 to 2015 period, in key engineering and industrial trades including:

- boilermakers;
- non-residential construction managers;
- construction estimators;
- contractors and supervisors;
- crane operators;
- heavy equipment operators / mechanics;
- electricians;
- ironworkers;
- truck drivers; and
- welders.

To the extent that these trades will be required for the Project, there is a potential for labour shortages. The CSC's supply-side analysis (Canadian Construction Sector Council 2010, internet site) indicates that tight market conditions will require extensive labour mobility, with movement across trades, industries and provinces all being important. Addressing this problem also requires investment to expand and train the construction workforce, which remains a priority for the construction sector through such initiatives as:

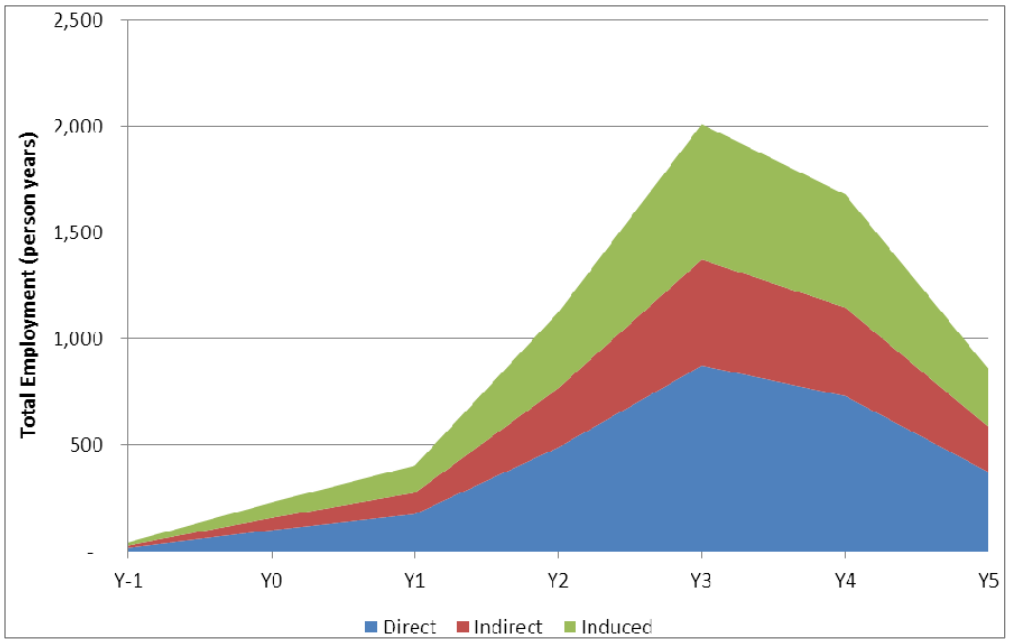
- apprenticeship, college, safety, supervisory skills and management programs;
- career promotions and events targeting all labour sources;
- promotion of inter-provincial labour mobility; and
- programs to integrate and train new Canadians entering construction (Canadian Construction Sector Council 2010, internet site).

Nalcor will make efforts to hire qualified people from within the province and encourage training for residents of Newfoundland and Labrador in those occupational categories in which it is warranted and feasible.

In addition to the direct employment generated, indirect employment will be generated in those companies supplying goods and services to the Project and in other businesses throughout the economy as a consequence of expenditures by individuals and businesses directly or indirectly associated with Project Construction.

The total direct, indirect and induced employment in Newfoundland and Labrador is estimated at approximately 6,350 person-years during Project Construction (Figure 16.4.5-5). Peak employment is in Year 3 of Construction at approximately 2,000 person-years.

Figure 16.4.5-5 Annual Profile of Total Project-related Employment (Person-years): Construction, Newfoundland and Labrador



Summary of Likely Residual Environmental Effects

The likely residual effects of Project Construction on the Employment KI are as follows:

- Direction: Project Construction effects will be beneficial, because the Project will help to further strengthen the economy through its direct, indirect and induced employment effects, which has the potential to improve the quality of life of those employed through income earning, training and work experience opportunities and to reduce unemployment / under-employment levels within the province.
- Magnitude: The Project will serve to increase current overall levels of employment within the province, adding an estimated total of 6,350 person-years of employment during Project Construction, with a peak of 2,000 person-years in Year 3.
- Geographic Extent: Regional, because the effects of the Project will be experienced across the province. There will also be effects beyond the province.
- Duration: Medium-term, because these effects will occur throughout the Project Construction phase.

There is a high degree of confidence that the actual effects of Project Construction on the Employment KI will be as predicted because Project expenditures will result in the injection of a substantial level of new investment into the economy that in turn will result in new direct employment and further new, additional, indirect and induced employment resulting from successive rounds of spending.

16.4.5.5 Construction Effects: Business

Of the total Project cost of approximately $2.1 billion, an estimated 60 to 70% will be spent on goods, materials, permanent equipment, services and construction equipment. Newfoundland and Labrador

businesses will have full and fair opportunity to provide supplies and services to the Project. Some of the key supplies and services required during Project Construction include, for example:

- accommodation and lodging;
- aggregate supply (for cable protection in the Strait of Belle Isle);
- catering;
- communications network services;
- construction quarry material;
- fire and emergency response services;
- freight forwarding and transport;
- ground and air transportation;
- health and medical services;
- helicopter charters;
- land acquisition services;
- machinery and equipment services (including tires);
- marine observers / consultants;
- port facilities;
- ROV supply and operation;
- ROW clearing;
- security services;
- snow clearing and road maintenance;
- supply and erection of structural steel;
- supply of bulk fuels, lubes and grease;
- supply of construction consumables, tools and temporary power supply;
- supply of lumber and formwork;
- supply of specialty construction equipment;
- supply of Portland cement and rebar;
- survey and mapping services;
- vehicle rentals and maintenance;
- warehouse and marshalling yard management;
- waste and garbage disposal;
- weather and ice forecasting services; and
- wire fence supply and erection.

The type and magnitude of effects of the Project on Business will be a function of the degree to which companies in the province secure contracts to provide materials, services and equipment to the Project. As noted earlier, goods and services will be acquired on a Best Value basis, and the procurement and contracting

philosophy for the Project will provide for full and fair opportunity for all suppliers. Previous experience with other large-scale projects in the province indicates that businesses in Newfoundland and Labrador have the capability to provide many of the key goods and services listed above.

However, businesses in the province, or even Canada, will not be able to provide some of these requirements. For example, in terms of commodities required, specialized electrical equipment, structural steel, conductors and insulators represent a significant amount of the overall capital costs. Most of these items will not be available from either Newfoundland and Labrador or Canada and the nature, scale and duration of demand associated with the Project is such that this supply picture will not change. There will, however, be opportunities for local companies that act as agents, distributors or stockists for the manufacturers, and from transportation, installation, commissioning and maintenance activities related to these commodities.

The provision of required services for the Project is expected to follow the same pattern. Companies in the province will have the opportunity to provide such services as accommodations, catering, freight forwarding or security. However, large-scale and specialist services such as transmission tower installation and subsea cable installation, may require non-local resources either because such service providers do not exist within the province or because local service providers do not have the capacity to undertake all the work involved.

Given the nature and extensive geographic scale of the proposed Project, Project activity will be spread across much of the province, helping to enhance the potential for local enterprises to participate in Project Construction activities, especially where local capabilities and capacities are aligned with Project needs. Geographic proximity plays a key role in service provision and competitiveness. Local business opportunities will be enhanced through the application of the Benefits Strategy and Nalcor's contracting policies and practices, as described above.

Business opportunities arising from the Project will be beneficial to firms across the province because of the associated income earning, potential expansion and development opportunities and experience-related effects. Some companies may, however, be adversely affected if skilled and experienced workers are lost to the Project and if replacement personnel are difficult to find. Similarly, companies may be adversely affected if competition for labour results in wage inflation, which reduces their competitive capability. While workers will benefit from increased demand for their labour, labour shortages and increased costs could adversely affect the type, cost and quality of some services provided by employers in both the corporate and government sectors, thereby reducing the overall benefits that the Project could bring to the business sector and the provincial economy in general.

In the recent past the economy of Newfoundland and Labrador has been based on the development of, and worker participation in, large-scale projects such as Hibernia and the Trans-Labrador Highway. This Project will require and use a range of skilled trades and other occupations, likely drawing upon a provincial labour force and business community that is increasingly experienced with and involved in large-scale projects.

Overall, therefore, the Project will provide substantial and positive opportunities for the Newfoundland and Labrador business community.

Summary of Likely Residual Environmental Effects

The likely residual effects of Project Construction on the Business KI are as follows:

- Direction: Project effects will be beneficial, because the Project will help to further strengthen the economy through its business revenue generation, as well as increased growth and experience for provincial businesses;
- Magnitude: Some 60-70% of the $2.1 billion in total Project expenditures will be spent on goods, materials, equipment and services. Project contracts for these items will be awarded on a competitive bidding basis. As such, the specific value of Project-related business effects cannot be estimated at this time. However, given local business capabilities and experience with many of the goods and services that will be required during Project Construction, the Project is expected to lead to an increase in revenues from existing levels

for provincial businesses. The magnitude of these benefits will be enhanced by the consideration of Newfoundland and Labrador content in the evaluation of bids, but will be primarily dependent upon the ability of provincial companies to bid for and provide the required goods and services on a competitive basis;

- Geographic Extent: Regional, because the economic effects of the Project will be experienced throughout Newfoundland and Labrador within the regions that see Project-related activity. There will also be effects beyond the province.
- Duration: Medium-term, because these effects will occur throughout the Project Construction phase.

There is a high degree of confidence that the actual effects of Project Construction on the Business KI will be as predicted because Project expenditures will result in the injection of a substantial level of new investment into the provincial economy that will result in new business opportunities to directly supply labour, materials, goods and services. In addition, there will be indirect and induced business opportunities generated from successive rounds of spending.

16.4.5.6 Construction Effects: Summary

Accidents and malfunctions could occur during Construction, as discussed in Chapter 5. The effects of the low-risk incidents (e.g., small brush fire, motor vehicle collisions or waste spill) on Economy, Employment and Business are likely to be positive, by creating emergency response, repair and clean-up work for companies and their workers. These effects may be local or, to the degree that specialist resources are required, provincial or even national. They will result in some indirect and induced positive effects.

Overall, the Project will result in benefits for the Newfoundland and Labrador economy, including direct, indirect and induced economic effects through the substantial employment and business opportunities that will be generated throughout the Project Construction phase.

Although it is inevitable that some required goods and services will have to be sourced from outside the province, the nature of the Project and its requirements, along with the employment and procurement initiatives and measures outlined above, including the Benefits Strategy, will help to optimize benefits to Newfoundland and Labrador workers and businesses, and thus to the overall provincial tax base.

16.4.6 Operations and Maintenance

16.4.6.1 Overview of Project Operations and Maintenance and Associated Effects Management

Once Project Construction is completed, and following Project commissioning, the Project will be operated on a continuous basis. Project maintenance activities will include regular inspection of all Project components, repair of the system as required, and vegetation management along the ROW (Chapter 3).

The transmission lines will be 100% inspected each year. The inspections for the on-land portions of the lines will be completed from the air (fixed-wing aircraft or helicopter) or from the ground (ATVs during summer or snowmobiles in the winter). A further 10% to 20% of the transmission line will be inspected via climbing inspections on a yearly basis by Nalcor personnel. The submarine cables and electrodes will be inspected through ROV surveys and / or appropriate relevant means. Vegetation management will commence eight years after Project Construction is completed and will be conducted every seven years thereafter during the Project Operations and Maintenance phase. Activities associated with the operation of the HVdc system will be integrated into Nalcor's existing inspection and maintenance program.

The Project will be operated indefinitely, and decommissioning is not contemplated at this time. Should decommissioning activities eventually be considered for all or part of the HVdc system, these will be planned and conducted in accordance with the relevant standards and regulatory requirements in place at that time.

Compared to the activities and economic effects associated with the Construction phase of the Project, those associated with Operations and Maintenance are likely to be relatively small, particularly when considered on an annual basis. Over the life of the Project, however, total expenditures, employment and business contracts will be considerable. Nalcor will adopt similar hiring and business contract protocols during the Operations and Maintenance phase as for Construction.

The following sections assess the effects of Project Operations and Maintenance on Economy, Employment and Business, with a focus on the activities outlined above. This VEC does not assess the likely economic benefits that will be associated with the operation of the transmission system, particularly with regard to revenue generation or other such economic outcomes, as these are outlined as part of the overall need, purpose and rationale for the Project (Chapter 2, Project Rationale and Planning).

16.4.6.2 Existing Knowledge

As discussed previously, the Construction, and Operations and Maintenance of electrical transmission systems is common throughout North America and worldwide. However, there is little available published "existing knowledge" which has measured and evaluated the actual economic effects and benefits of similar projects and their operation, likely because of the relatively minor nature and degree of such activities from an economic perspective.

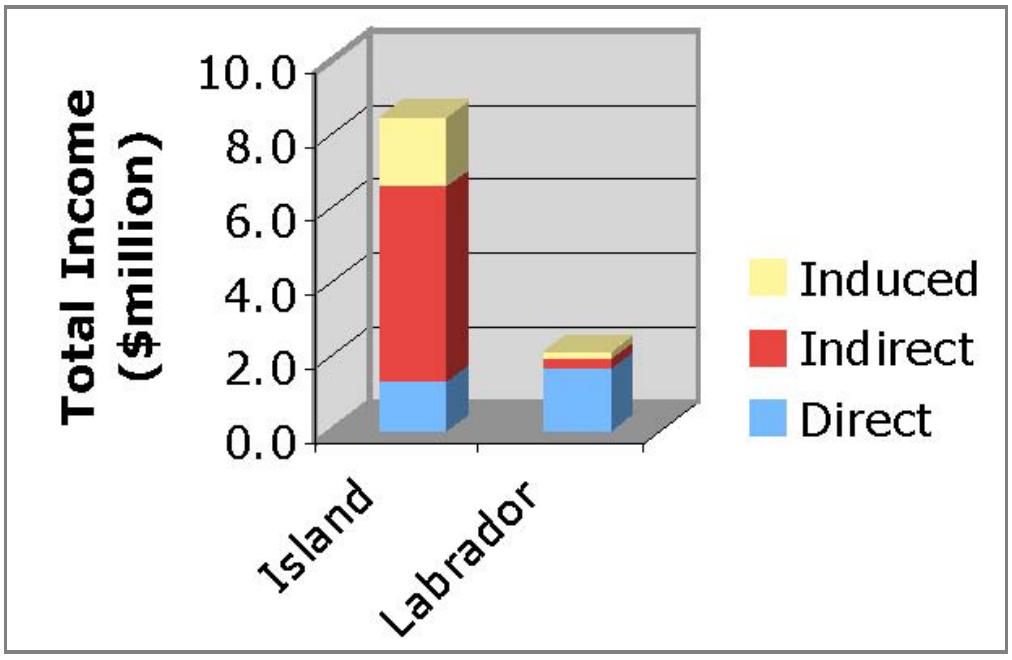
Operations and Maintenance activities for the Project will be integrated into the overall operations and maintenance programs currently undertaken by Nalcor within the province. As such, this assessment considers the knowledge and experience of Nalcor personnel in operating and maintaining transmission lines and associated components throughout the province.

16.4.6.3 Operations and Maintenance Effects: Economy

As with Project Construction, Project Operations and Maintenance will generate labour and business income and government revenue effects. The annual Project-related effects are relatively small compared to those from Construction, but they will continue for the life of the Project. To illustrate the likely effects of Project Operations and Maintenance on Economy, the Project-related income and government revenues are estimated for a typical year.

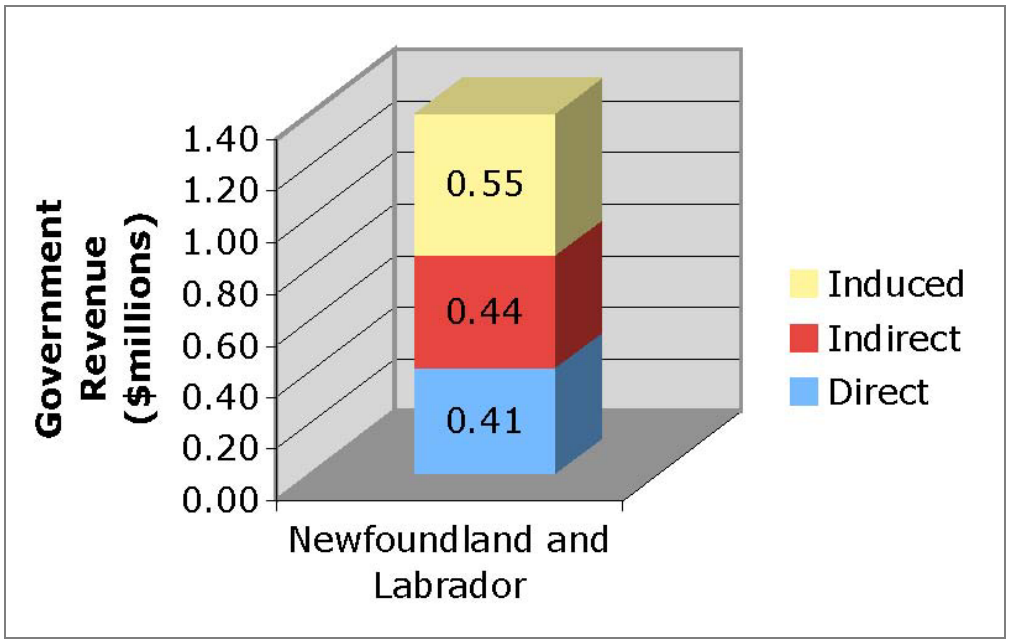
Total annual Operations and Maintenance expenditures in a typical year are estimated to be approximately $18 million. Direct, indirect and induced income effects in Newfoundland and Labrador as a result of these expenditures will generate total income of approximately $10.6 million in a typical year (Figure 16.4.6-1). While direct incomes generated on the Island of Newfoundland and in Labrador are generally comparable, as discussed earlier, more of the indirect and induced income will likely be generated on the Island because of its larger and relatively more diverse economy.

Figure 16.4.6-1 Total Project-related Income: Operations and Maintenance, Typical Year, Newfoundland and Labrador



Projected revenues to government from Project Operations and Maintenance activities are shown in Figure 16.4.6-2. In a typical year, government revenues are anticipated to be approximately $1.4 million, generated from personal income taxes, corporate income taxes, payroll taxes and Harmonized Sales Tax (HST), directly, indirectly or from induced individual or business incomes, which stem from direct, indirect and induced incomes.

Figure 16.4.6-2 Government Revenues: Operations and Maintenance, Typical Year, Newfoundland and Labrador



Summary of Likely Residual Environmental Effects

The likely residual effects of Project Operations and Maintenance on the Economy KI are as follows:

- Direction: Project effects will be beneficial because the Project will help to further strengthen the economy through its direct, indirect and induced labour and business income and government revenue generating effect.
- Magnitude: The Project will serve to increase pre-Project labour and business incomes beyond existing levels by approximately $10.6 million in a typical year and government revenues by an estimated $1.4 million annually.
- Geographic Extent: Regional, because the effects of the Project will be experienced across the province. In some cases there will be effects beyond the province.
- Duration: Far future, as these effects will occur throughout the Project's Operations and Maintenance phase.

There is a high degree of confidence that the actual effects of Project Operations and Maintenance on the Economy KI will be as predicted because Project expenditures will result in the injection of an ongoing investment into the economy that in turn will result in new direct income and employment effects and further new, additional, indirect and induced income and revenue effects resulting from successive rounds of spending.

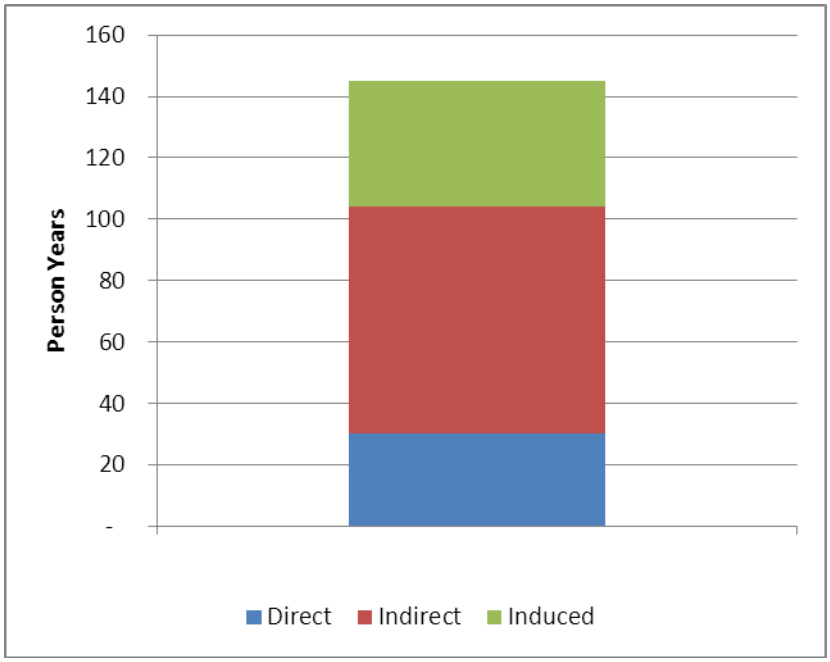
16.4.6.4 Operations and Maintenance Effects: Employment

During a typical year, total employment generated during Operations and Maintenance is estimated at 145 person-years as illustrated in Figure 16.4.6-3. In addition to direct employment of 30 person-years, an estimated 74 person-years of indirect and 41 person-years of induced employment will be generated. Of this, 12 person-years of direct employment will be in Labrador, but only a relatively small proportion (7 person-years) of indirect and induced employment will be generated in Labrador.

A range of administrative, supervisory and technical skills will be required for Project Operations and Maintenance, with many of these positions being of the same general type as those currently required in the operations and maintenance of other Nalcor transmission facilities.

The occupational categories requiring the largest numbers of workers are line-persons and electricians / electrical maintenance personnel.

Figure 16.4.6-3 Total Employment (Person-years): Operations and Maintenance, Typical Year, Newfoundland and Labrador



Nalcor's hiring and training policies described in Section 16.4.5 will apply to the Operations and Maintenance of the Project. The number of personnel required for Project Operations and Maintenance is relatively small; however, the available lead-time and the long-term nature of the permanent positions will help facilitate local hiring and any associated training requirements.

Summary of Likely Residual Environmental Effects

The likely residual effects of Project Operations and Maintenance on the Employment KI are as follows:

- Direction: Project effects on employment will be beneficial as Operations and Maintenance will require that a number of permanent jobs are created, which will benefit those securing employment through, among other things, from the income earned, the security of long-term employment and the experience gained.
- Magnitude: The Project will serve to increase pre-Project annual existing levels of employment by a total of 145 person-years.
- Geographic Extent: Regional, because the effects of the Project will be experienced across the province. In some cases there will be effects beyond the province.
- Duration: Far future, as these effects will occur throughout the Project Operations and Maintenance phase.

There is a high degree of confidence that the actual effects of Project Operations and Maintenance on the Employment KI will be as predicted because Project expenditures will result in the injection of an ongoing investment into the economy that in turn will result in new direct employment effects and new indirect and induced employment resulting from successive rounds of spending.

16.4.6.5 Operations and Maintenance Effects: Business

Nalcor will undertake much of the Operations and Maintenance activities for the Project as part of its normal operations and maintenance programs. There will be opportunities for businesses within the province to supply goods, services and equipment to the Project. As described previously, inspections and maintenance activities will be performed annually and on a rotational basis for different sections of the transmission line and its components.

Business opportunities resulting from Project Operations and Maintenance have the potential to be long-term in nature. Services required during Project Operations and Maintenance are primarily associated with vegetation management and would include provision of specialized equipment and services such as helicopter rentals. There will also be opportunities associated with maintenance, equipment repair and replacement at the converter stations over the long-term, and ROV surveys of the cable will be required; however, as indicated earlier, these activities will only occur intermittently. Any potential major repairs that may be required to aspects of the transmissions system have the potential to involve considerable work activity, and thus, greater degrees of economic effect.

Nalcor's contracting and purchasing practices, described in Section 16.4.5, will apply to the Operations and Maintenance phase of the Project, with full and fair opportunity given to all suppliers, and with goods and services being acquired on a Best Value basis.

Summary of Likely Residual Environmental Effects

The likely residual effects of Project Operations and Maintenance on the Business KI are as follows:

- Direction: The effects of the Project will be beneficial, because the Project will help to further strengthen the economy through its income, employment and revenue generating effects, which is viewed as a desirable outcome.
- Magnitude: The Project will serve to increase pre-Project levels of business revenues. Nalcor's contracting and purchasing practices (see Section 16.4.5) will apply to Project Operations and Maintenance, with full and fair opportunity given to all suppliers, and with goods and services being acquired on a Best Value basis and with Newfoundland and Labrador benefits included in the selection factors for contract awards. Compared to annual Project expenditures during Construction, annual expenditures and business effects during Operations and Maintenance are small, however, the effects are continuous.
- Geographic Extent: Regional, because the effects of the Project will be experienced across the province. In some cases there will be effects beyond the province.
- Duration: Far future, as these effects will occur throughout the Project Operations and Maintenance phase.

There is a high degree of confidence that the actual effects of Project Operations and Maintenance on the Business KI will be as predicted because Project expenditures will result in the injection of an ongoing investment into the economy that in turn will result in new direct business opportunities and consequent business revenues together with additional new indirect and induced business revenues from successive rounds of spending.

16.4.6.6 Operations and Maintenance Effects – Summary

Accidents and malfunctions could occur during Operations and Maintenance, as discussed in Chapter 5. The effects of the low-risk incidents (e.g., small brush fire, motor vehicle collisions or waste spill) on Economy, Employment and Business would likely be the same as during Construction, and similarly positive. However, a multiple tower failure would result in an interruption in the supply of power, with the possibility of disruption of business and other activity. Nalcor's Emergency Response Plan will be implemented as the main mitigation measure in the case of a multiple tower failure or other interruption to power transmission. The geographic

extent of the interruption, and the time and effort required to correct it, however, will be variable, and hence the extent and duration of the interruption of economic activity is unknown.

As during Construction, the Project will have an overall beneficial effect on the Newfoundland and Labrador economy during the Operations and Maintenance phase. Although numbers and levels will be smaller, permanent and occasional employment and business opportunities to supply goods and services will continue through the ongoing requirement to operate and maintain the transmission system.

16.4.7 Environmental Effects Summary and Evaluation of Significance

16.4.7.1 Summary of Environmental Effects

The likely effects of the Project on the Economy, Employment and Business VEC are summarized in Table 16.4.7-1. For each of the associated KIs, the outcomes are beneficial overall, with anticipated increases occurring in measures that reflect the strength of the economy, employment and business. These effects will benefit the province and beyond throughout both Construction, and Operations and Maintenance of the Project.

16.4.7.2 Definition and Determination of Significance

Significant residual adverse socioeconomic effects on the Economy, Employment and Business VEC would result if the Project caused an overall, detectable and sustained decrease in one or more of the KIs / MPs throughout any phase of the Project. An effect that does not meet these criteria is not significant.

The effects of Project Construction on Economy, Employment and Business are predicted to be primarily positive, and will be substantial. The provincial economy will benefit from the injection of approximately $570 million in individual and business incomes and another $84 million in government revenues. Individuals will also benefit from Project-related training and experience, and businesses from Project-related growth and development. Project-generated government revenues will benefit the province when reinvested in infrastructure and services. Similar benefits will also be experienced beyond the province, elsewhere in Canada and internationally, where Project labour, materials, goods and services cannot be supplied from within the province.

Annual Project Operations and Maintenance expenditures within the province are estimated at $17.6 million, which will translate to over $10 million in income to businesses and individuals in the province. Individual and business income effects, government revenues, employment and business contract opportunities are similar in type, but smaller in magnitude, when compared to those associated with Project Construction, but they are continuous throughout the life of the Project. Similar benefits will also be experienced beyond the province, elsewhere in Canada and internationally, where Project labour, materials, goods and services cannot be supplied within Newfoundland and Labrador.

Although effects of the Project on Economy, Employment and Business will be positive, there is some potential for adverse effects to local businesses, due to possible labour force competition and wage inflation due to Project-related employment, particularly during Construction.

As described above, however, given the occupations and skill set requirements of the Project workforce, and the characteristics of the current provincial labour supply and recent experience in large scale construction projects, the Project is not anticipated to result in such effects. The Project will require and use a range of skilled trades and other occupations, likely drawing upon a provincial labour force and business community that is increasingly experienced with and involved in large scale development projects.

The overall (net) economic outcomes of the Project are predicted to be overwhelmingly positive, and no significant adverse effects to this VEC are therefore likely to occur.

Table 16.4.7-1 Environmental Effects Analysis Summary: Economy, Employment and Business

Project Phase / Key Indicator	Likely Residual Environmental Effects Summary Descriptors			
	Direction	**Magnitude**	**Geographic Extent**	**Duration**
Construction Phase				
Economy	– Beneficial: Project will result in increased incomes and tax revenues to the province	– Increase in income levels of $520 million during construction, with peak of $160 million in Year 3 – Increase in government revenues of $76 million during construction, with peak of $24 million in Year 3	– Effects on incomes and tax revenues will be experienced throughout the province	– Effects will be experienced throughout construction
Employment	– Beneficial: Project will lead to increased employment within the province	– Increase in employment levels adding estimated 6,350 person-years of employment during construction, with a peak of 2,000 person-years in Year 3	– Effects on employment will be experienced throughout the province	– Effects will be experienced throughout construction
Business	– Beneficial: Project will lead to increased business activity within the province	– Increase in business with 60 to 70% of the $2.1 billion in total Project expenditures to be spent on goods, materials, equipment, and services	– Effects on the business sector will be experienced throughout the province	– Effects will be experienced throughout construction
Summary of Likely Residual Construction Effects on Economy, Employment and Business: Project Construction expenditures will be experienced for approximately four years, peaking in Year 2. Construction will result in an increase in all MPs for all KIs over the medium-term. Effects will be experienced throughout the province.				
Operations and Maintenance				
Economy	– Beneficial: Project will result in increased incomes and tax revenues to the province	– Increase in pre-Project labour and business incomes beyond existing levels by approximately $10.6 million in a typical year and government revenues by an estimated $1.4 million annually	– Effects on incomes and tax revenues will be experienced throughout the province	– Effects will be experienced throughout the life of the Project
Employment	– Beneficial: Project will lead to increased employment levels within the province	– Increase in pre-Project annual existing levels of employment by a total of 145 person-years	– Effects on employment will be experienced throughout the province	– Effects will be experienced throughout the life of the Project
Business	– Beneficial: Project will lead to increased business activity within the province	– Increase in pre-Project levels of business revenues; however, compared to construction, annual expenditures will be small	– Effects on business will be experienced throughout the province	– Effects will be experienced throughout the life of the Project
Summary of Likely Residual Operations and Maintenance Environmental Effects on Economy, Employment and Business: Operations and Maintenance effects will be beneficial for the VEC and each of the KIs, although not to the same level as likely Project Construction effects. Effects will, however, be consistent and throughout the life of the Project. Effects will be experienced throughout the province.				

16.4.8 Evaluation of Project Alternatives

Project alternatives considered by Nalcor include alternative segments for the transmission corridor in particular areas, as influenced by terrain, ecology, land use and other physical and human environment factors. The alternative segments, and any environmental implications of these alternative segments as compared to the proposed transmission corridor, are summarized in Table 16.4.8-1.

The main differences between the proposed and alternative corridor segments are that alternative segments may be somewhat longer or shorter in length than those segments which they would replace, and therefore cost somewhat more or less to construct, employ more or less labour in construction, or result in somewhat larger or smaller value contracts for businesses.

The combination of alternatives yields a large number of potentially different outcomes. However, the overall effect of adoption of any or all of these alternatives on the Economy, Employment and Business KIs is not anticipated to be substantially different in nature, direction, magnitude, geographic extent or duration from those discussed above for the proposed corridor. Any such changes are not expected to measurably change the predicted level of effects / benefits as a result of the Project, or their significance.

Table 16.4.8-1 Summary Evaluation of Project Alternative Means: Economy, Employment and Business

Project Alternative Means[(a)]	Environmental Implications (compared to the proposed Transmission Corridor)[(b)]		
	Economy	**Employment**	**Business**
A2 to A11	– Potential differences (increases or decreases) in labour and business activities during construction where alternative segments involve greater or less overall Project expenditures. – However, any such differences are not expected to measurably change the predicted level of effects / benefits as a result of the Project, or their significance. – Any differences associated with alternative segments regarding Operations and Maintenance are anticipated to be negligible.	– Potential differences (increases or decreases) in labour during construction where alternative segments involve greater or less overall Project expenditures. – However, any such differences are not expected to measurably change the predicted level of effects / benefits as a result of the Project, or their significance. – Any differences associated with alternative segments regarding Operations and Maintenance are anticipated to be negligible.	– Potential differences (increases or decreases) in business activities during construction where alternative segments involve greater or less overall Project expenditures. – However, any such differences are not expected to measurably change the predicted level of effects / benefits as a result of the Project, or their significance. – Any differences associated with alternative segments regarding Operations and Maintenance are anticipated to be negligible.

(a) As identified and described in Chapter 2, Project Rationale and Planning.

(b) Namely, the proposed Project described in Chapter 3, Project Description, and assessed in the preceding Environmental Effects Analysis.

No technically and economically feasible alternatives for the submarine cable crossing or the shoreline electrode sites were identified (see Chapter 2, Section 2.12.3), and therefore marine Project alternatives are not evaluated for Economy, Employment and Business.

16.4.9 Cumulative Environmental Effects

This section assesses and evaluates the likely cumulative effects on the Economy, Employment and Business VEC as a result of the Project in combination with the effects of other past, present and reasonably foreseeable

future projects or activities that overlap with those of the Project. This includes other projects and activities that will draw upon the same labour and business resources and contribute to the same government tax base as those that will be affected by the Project, with a particular focus on the Newfoundland and Labrador economy.

The Newfoundland and Labrador economy has performed well since the mid-1990s, with substantial growth in GDP, average employment, and an overall decline in unemployment. This change in the province's economic circumstances was illustrated in April 2008 when the provincial government declared a budget surplus of $1.4 billion, the largest in its history. This growth path was set back somewhat by the economic recession of 2008. Despite robust growth of capital spending in the first-quarter of 2009, plunging energy prices plus declining petroleum production caused the value of the province's energy exports to drop by 36% from the previous year and total manufacturing exports to fall by 29%, each of which contributed to a negative effect on provincial GDP, total employment and overall business activity.

Despite the weakening in Newfoundland's employment growth in 2009, housing demand has continued to remain robust, due in part to a reversal of the province's chronic pattern of out-migration that started in the first-quarter of 2008 and which has continued through 2010, together with low interest rates and consumer confidence in the economy. Consumer confidence continues to be bolstered by the current strength of the economy and future prospects. Spending on the $3-billion Vale nickel processing facility, the Hibernia South Extension and an increase in mining investment is expected to push annual major project investment in the province to over $4 billion in 2011 (Atlantic Provinces Economic Council 2010). This major project forecast did not include the Hebron Project.

Overall, therefore, the economy of Newfoundland and Labrador is relatively strong at present, showing substantial growth over the last decade and again in 2011. This growth will be substantially enhanced with the development of the Project, as well as other ongoing and imminent projects and other economic development activities throughout the province. As discussed in earlier sections, the Project will generate benefits to the province in terms of increased total incomes, employment and business opportunities. Other ongoing and future projects will have similar positive economic effects on Economy, Employment and Business throughout the province.

Where the capacity exists or can be developed in the province to expand employment and business activity in light of these concurrent development projects, the result will be the generation of higher individual and business income levels and government revenues, increased employment and training opportunities and opportunities for business activity and growth. The cumulative outcome will generate immediate direct benefits to the economy, but also lead to longer-term indirect changes. For example, a labour force with higher skills and experience levels can command higher wages and employment opportunities in an economy where labour shortages in the construction sector are likely to continue for some time. Similarly, project experience can help provincial businesses to become more competitive locally, nationally and internationally. However, where overlapping projects result in the inability of provincial labour and business to meet input requirements because of lack of capacity, overall benefits to the province may be less than would be the case if projects were temporally sequenced.

The current Project schedule involves an approximately four year construction phase commencing after EA approval and Project sanctioning, followed by commissioning and system operation. Other major proposed development projects in Newfoundland and Labrador that could overlap temporally with the Project include:

- Lower Churchill Hydroelectric Generation Project (assuming construction begins in 2012, peak employment would occur in 2017);
- Hebron offshore oilfield development (assuming construction begins in 2012, peak employment would occur in 2014);
- Long Harbour Processing Plant (construction began in 2009 and employment is expected to peak in 2011; a permanent workforce of approximately 450 people will be required to operate the plant);

- Iron Ore Company of Canada expansion (construction began in 2010 and is expected to be completed by 2013, other iron ore projects might extend such activity beyond this date); and
- Maritime Link (construction is expected to begin in 2014 and end in 2016).

Other projects, such as the Hibernia Southern Extension, are not expected to overlap with the Project, but ongoing investment in economic infrastructure, commercial forestry projects and other oil and gas developments, for example, could also increase demands on labour during the Project Construction period.

The major issue from a cumulative effects perspective for this VEC is having multiple competing sources of demands for local labour, which may reduce the full realization of potential socioeconomic benefits of this and other projects in the province in the coming years.

A number of factors could affect the labour supply for the Project, such as a shrinking construction labour supply pool associated with expected retirements and mortality in the province (discussed in Section 16.4.5), and competing demands for labour from other projects in the province and elsewhere. For example, the Project will require heavy equipment operators and construction trades labourers and helpers for forest-clearing work along the transmission line ROW, the same occupational groups that will be required to clear forest in the proposed reservoir area for the Lower Churchill Hydroelectric Generation Project and the Maritime Link. Demands for construction labour may also be exacerbated if tradespersons change their occupation sector or job categorization (e.g., to become operations personnel at the Long Harbour nickel processing facility or at the expanded iron ore operations in Labrador). Furthermore, construction projects in the province may have difficulty attracting workers who presently travel outside of the province for employment (e.g., to oil sands projects in Alberta), if wage differentials are perceived by those workers to be significant.

The availability of skilled labour is also an issue. While the recession through 2009 provided temporary relief from labour pressures, it is believed that labour force requirements for major projects in Newfoundland and Labrador will peak in 2014-2015, with possible shortages in a number of key trades.

Competition for labour between projects can also tend to drive up the cost of labour. As a result, some businesses might be adversely affected if skilled and experienced workers are lost to other projects, particularly in a highly competitive labour supply environment. Replacing personnel might be difficult, and wage inflation could increase operating costs, reducing the competitive capabilities of those firms. While workers will benefit from increased demand for their labour, labour shortages and increased costs could adversely affect the type, cost and quality of some services provided by employers in both the corporate and government sectors, thereby reducing the overall benefits that multiple projects could bring to the business sector and the provincial economy generally. Cumulative effects on labour supply and business capacity are most likely to occur during Construction as this is when Project demand for labour is greatest and when demands from other projects are anticipated to be highest (Canadian Construction Sector Council 2010, internet site).

Concern over potential labour shortages are not unique to the Project and, as discussed in Section 16.4.5, a variety of measures at both the provincial, national and individual project levels have been initiated to address this issue. Initiatives include training, labour attraction and retention, and labour in-migration programs.

The potential cumulative effects on the Economy, Employment and Business VEC as a result of the Project in combination with the effects of other past, present and reasonably foreseeable future projects or activities are summarized in Table 16.4.9-1. As indicated in Table 16.4.9-1, these cumulative effects will be positive given the nature and health of the provincial economy at present, the economic benefits that will be realized through the Project, and similar outcomes from other projects and activities. Therefore, significant adverse cumulative effects on the Economy, Employment and Business VEC are not likely to occur.

Table 16.4.9-1 Cumulative Environmental Effects Summary: Economy, Employment and Business

Cumulative Effects Analysis	Economy	Employment	Business
Current (Baseline) VEC Condition	– The provincial economy is characterized by recent strong performance and a high potential for further growth, with offshore oil and mining being primary drivers. – Regionally, rural economies have generally performed less well than the urban economy of St. John's and its region.	– Provincial employment rates are relatively high given the recent growth in the provincial economy. – The availability of skilled labour is a concern. While the recession through 2009 provided temporary relief from labour pressures, it is believed that labour force requirements for major projects in Newfoundland and Labrador will peak in 2014-2015, with possible shortages in a number of key trades.	– Between 2001 and 2005, the total number of businesses in the province declined from 17,707 to 16,812. – Although the number of businesses has rebounded, it has not returned to 2001 levels. This decline has been offset somewhat by an increase in the size of some operations.
Likely Residual Environmental Effects of Labrador - Island Transmission Link	– The Project will result in a provincial increase in personal and business incomes, and government tax revenues. – Approximately $520 million in individual and business incomes and another $76 million in government revenues will serve to increase individual and business incomes and government revenues directly, indirectly and through additional rounds of spending. – Benefits will be regional and provincial.	– The Project will result in a provincial increase in employment, particularly during construction. – Individuals will also benefit from Project-related training and experience. – Benefits will be regional and provincial. – Project Construction labour effects will be experienced for approximately four years, peaking in Year 3.	– The Project will result in a provincial increase in business activity, and businesses will benefit from Project-related growth and development. – Benefits will be regional and provincial. – Project construction effects will be experienced for approximately four years, peaking in Year 3.

Table 16.4.9-1 Cumulative Environmental Effects Summary: Economy, Employment and Business (continued)

Cumulative Effects Analysis	Economy	Employment	Business
Likely Cumulative Environmental Effects (within RSA) of Other Future Projects and Activities	– Given the extensive and dynamic nature of socioeconomic systems, any project which requires labour or goods and services and generates revenue may overlap with the effects of the Project. – Provincial revenue will benefit from the cumulative effects of this and other projects throughout the province.	– Given the extensive and dynamic nature of socioeconomic systems, any project which requires labour or goods and services and generates revenue may overlap with the effects of the Project. – The adverse consequences of overlapping future projects will be associated with competition for construction labour among projects that may increase the price of labour.	– Given the extensive and dynamic nature of socioeconomic systems, any project which requires labour or goods and services and generates revenue may overlap with the effects of the Project. – For those businesses or agencies unable to afford or otherwise secure labour, as a result of increased labour shortages and high labour prices there could be adverse effects on production or service delivery and as a consequence the long-term sustainability of affected businesses. – Other effects are associated with the capacity of provincial companies to supply materials, goods and services to overlapping projects; opportunities may be missed that might not be the case if projects were sequential.
Cumulative Environmental Effects Summary	**Not Significant** – Substantial overall economic benefits to Newfoundland and Labrador as a result of this Project and others. – Any adverse effects will not be significant, individually or cumulatively.	**Not Significant** – Substantial overall employment benefits to Newfoundland and Labrador as a result of this Project and others. – Any adverse effects will not be significant as there will be an overall increase in employment. – Potential labour shortages are being and will continue to be addressed through a variety of effects management strategies to mitigate potential effects both by Nalcor in terms of the Project and the construction industry generally.	**Not Significant** – Substantial overall business benefits to Newfoundland and Labrador as a result of this Project and others – Any adverse effects will not be significant as there will be an overall increase in business activity. The cumulative effects of multiple projects with respect to business capacity are not unique to the Project.

16.4.10 Monitoring and Follow-up

Monitoring programs are those implemented to meet regulatory requirements and / or demonstrate compliance to commitments made in the EA. Follow-up programs are those implemented to verify EIS predictions and / or deal with issues of uncertainty, such as the effectiveness of effects management measures.

Under the terms of the Benefits Strategy (GNL 2010, internet site), Nalcor will, on a monthly basis from the date of sanction of the Project and throughout the Construction phase, provide information to the GNL on the following (broken out by National Occupation Classification Code, location, contractor, Aboriginal affiliation and gender relating to the Project for the period):

- total number of person-hours of all work on the Project in that month and to date;
- number of person-hours of Project management in the province in that month and to date;
- number of person-hours of engineering design work in the province in that month and to date;
- number of person-hours of construction and assembly in the province in that month and to date;
- number of provincial residents hired for the Project Team and the percentage of Project Team members who are provincial residents;
- number of provincial residents hired for engineering design work and the percentage of engineering design workers who are provincial residents;
- number of provincial residents hired for construction and the percentage of construction workers who are provincial residents; and
- number of person-hours of specialized engineering performed outside the province (if any) by component.

Monthly reports will also provide the following information:

- total value of goods and services purchased;
- total value of services purchased from businesses in the province by geographic location;
- total value of purchases by industry category (e.g., transportation, fuel, equipment);
- cumulative total value of goods and services referred to above for the year to date; and
- details of contracts awarded in that month.

Nalcor will report on hiring and employment objectives and targets on a quarterly basis. In addition, quarterly reports will be provided on:

- the level of compliance with the Benefits Strategy over the reporting period;
- information regarding supplier development workshops performed during the reporting period;
- activities carried out pursuant to the Gender Equity Program;
- activities carried out pursuant to the Diversity Program; and
- procurement forecasts.

In addition to the above, Nalcor will continue to provide information and updates on Project activities and effects related to Economy, Employment and Business on a regular basis as part of its ongoing governmental, Aboriginal, stakeholder and public consultation activities throughout the Project. Such information and consultation will also be used, as necessary, to facilitate planning and continuous improvement through modification of Nalcor strategies to optimize Project benefits to Newfoundland and Labrador.

16.5 Land and Resource Use

16.5.1 Introduction

The lands and resources within and adjacent to the proposed Project areas are used for a variety of commercial, recreational and traditional purposes, and some are protected by provincial and / or federal legislation for their particular ecological and cultural importance. Land and resource use is an important and integral component of Newfoundland and Labrador's human environment and overall cultural landscape, and reflects the characteristics, traditions and values of its people; the communities they live in, how they travel from place to place, the manner in which they make a living or supplement their incomes, the outdoor activities that they partake in and enjoy for recreational purposes, and their resolve to protect the natural and cultural heritage of the areas in which they live.

Newfoundland and Labrador's population of over 500,000 residents is widely distributed in more than 600 communities of varying sizes, ranging from several large urban centres to numerous small settlements along the province's extensive coastline and throughout its interior. The province's economy has long been focused on natural resource-based industries. These industries remain key economic components and important revenue generators in the province, particularly in more rural areas, and include forestry, mining, agriculture and outfitting. Residents of the province also have a long tradition of participating in outdoor activities including traditional and recreational activities such as fishing, hunting and gathering, snowmobiling and ATV use, boating and hiking, as well as building cabins and other infrastructure from which to undertake these pursuits.

In recent years there have been important changes in many land and resource use activities, as reflected in, for example, the difficulties being experienced in the forestry (lumber and newsprint) industry, the rapid expansion of mineral exploration and mining activities in various areas, and conservation concern for the health and status of particular wildlife populations such as caribou. The success, enjoyment and sustainability of many land and resource use activities are related to the availability and quality of, and access to, land and resources.

This section assesses and evaluates the potential effects of the Project on current land and resource use activities. As a relatively long, linear development that crosses much of the province and a wide range of socioeconomic landscapes, the Project has the potential to interact with a number of land and resource uses and users throughout Newfoundland and Labrador. Questions and concerns regarding possible interactions and environmental effects were identified through consultation with government departments and agencies, Aboriginal communities, stakeholder groups and the general public.

As a result of its nature, the Land and Resource Use VEC overlaps strongly with other components of the natural and socioeconomic environments, including several of the other VECs and KIs considered elsewhere in the EIS. Potential effects on land and resource use activities, and particularly the overall enjoyment and quality of the activities, may result from changes in air quality and noise levels in an area (Chapter 11), the availability and quality of vegetation, wildlife, water and / or fish resources (Chapter 12, Chapter 13, Chapter 14), or effects on viewscapes and the remoteness and wilderness character of an area (Visual Aesthetics VEC, Section 16.8). These potential interactions and overlaps are considered integrally within the environmental effects assessment for Land and Resource Use.

16.5.2 Environmental Assessment Study Areas

The following spatial and temporal boundaries have been established for the environmental effects assessment for the Land and Resource Use VEC.

16.5.2.1 Spatial Boundaries

The various components and activities that will be associated with the Construction, and Operations and Maintenance of the Project are located within and adjacent to a number of regions and communities throughout Newfoundland and Labrador. For purposes of this assessment, several geographical sub-regions are considered as relevant: Central and Southeastern Labrador, Northern Peninsula, Strait of Belle Isle, Central and Eastern Newfoundland and the Avalon Peninsula.

The LSA for Land and Resource Use is defined as the area within which Project-related elements and activities that may affect components of this VEC will occur. The LSA focuses on the 2 km wide proposed transmission corridor extending from Muskrat Falls on the Churchill River to the Strait of Belle Isle in Labrador, and from the cable landing point on the Northern Peninsula to Soldiers Pond on the Avalon Peninsula in Newfoundland. Although the eventual ROW for the transmission line will occupy a much smaller cleared footprint (averaging approximately 60 m) selected from within this larger corridor, the ROW and associated Project activities could occur anywhere within this corridor, and so the entire corridor is conservatively used to define the LSA. Also included in the LSA is the proposed 500 m wide submarine cable crossing corridor in the Strait of Belle Isle. The LSA also considers known and potential areas and locations where other Project activities may occur (e.g., the footprints of the electrode sites, access trails, marshalling yards and laydown areas, construction camps) as described in Chapter 3, Project Description.

The RSA extends beyond the above described areas to capture the land and resource use activities that overlap with, but extend beyond, the LSA (e.g., outfitting, hunting, trapping, angling, forestry). The assessment of Project effects on Land and Resource Use takes on a regional perspective by considering the land use activities that occur in the regions through which the Project extends.

16.5.2.2 Temporal Boundaries

The temporal boundaries of the assessment for the Land and Resource Use VEC encompass the Project's Construction phase, as well as the Operations and Maintenance phase that will extend through the life of the Project.

16.5.3 Potential Environmental Issues, Indicators and Interactions

This section describes potential issues, KIs and likely interactions of the Project on Land and Resource Use.

16.5.3.1 Potential Environmental Issues

Potential issues and questions associated with the potential effects of the Project on Land and Resource Use were identified in the *Environmental Impact Statement Guidelines and Scoping Document* for the Project (Government of Newfoundland and Labrador and Government of Canada 2011), as well as through regulatory, Aboriginal and stakeholder consultation by Nalcor and the EIS study team.

Relevant issues are associated primarily with how construction-related activities and the eventual presence of the transmission system, may overlap physically with existing land uses on the landscape, as well as how Project activities and components may generally disturb and affect the quality and enjoyment of outdoor pursuits.

Transmission lines have the potential for both negative and positive implications for Land and Resource Use. Land and resource use activities may also be affected by development projects both directly and indirectly. Direct effects occur where established activities are disturbed or otherwise interfered with by project-related components or activities during the construction, or operations phases (e.g., reduced access to harvesting areas). Indirect effects can occur when a project adversely affects fish or wildlife resources themselves which, then results in reduced opportunities or success rates for resource users.

The potential effects of the Project on fish and wildlife resources have been assessed in Chapter 12, which concluded that the Project will likely cause no significant adverse environmental effects on these aspects of the biophysical environment. It is therefore considered unlikely that the Project would result in significant effects on the commercial, recreational or traditional users of these resources. The Land and Resource Use VEC focuses primarily on the potential effects of the Project that may occur through any overlaps with other land users, interference and disturbances or other such interactions during the Construction and / or Operations and Maintenance phases of the Project.

The questions and issues identified by government and stakeholders to date concerning Land and Resource Use are summarized in Table 16.5.3-1.

Table 16.5.3-1 Identified Issues and Questions: Land and Resource Use

Issue / Question	Nature and Rationale	Specific Considerations
Municipalities and their associated planning areas and other development zones and infrastructure	– Various segments of the transmission corridor and other Project components cross, or are in close proximity to, communities.	– Strait of Belle Isle, Central Newfoundland, Avalon Peninsula and Isthmus.
Forest harvesting and management	– Transmission line ROW clearing and maintenance will result in some productive forest areas being permanently removed.	– Commercially productive forests in Labrador are restricted primarily to the western end of the Project area. Forest areas (timber rights, history of logging, extensive road networks) also exist on the Northern Peninsula and in central Newfoundland.
Commercial outfitting (hunting and fishing camps)	– Potential property issues, disturbance and aesthetic / wilderness issues. The outfitting industry is already in a relatively vulnerable condition overall (e.g., due to decreased numbers of caribou and licences).	– The transmission corridor is located in general proximity to several outfitters in the south-central portion of the Northern Peninsula. This proximity is unavoidable given the high density of camps and the adjacent federal / provincial park areas.
Military flight training activity in Labrador	– Potential disturbance of such activities during Project construction and the presence of transmission towers.	– The transmission corridor passes through a small portion of the east-central part of the defined flight training area.
Hunting, trapping, fishing, cabin use	– Construction and operation of the Project may result in direct interactions with existing properties (e.g., cabins) and / or increased access to them. May also reduce harvesting areas, opportunities, success, and enjoyment. – Any new access created by the Project or other infrastructure may be generally beneficial to some resource users (especially snowmobilers, cabin owners).	– Beneficial effects of increased access will be experienced particularly in areas where no development activity and / or access exists.
Recreational vehicle use	– Project crosses or occurs in proximity to snowmobile / ATV trails.	– Labrador Straits, Northern Peninsula, Central and Eastern Newfoundland.

Table 16.5.3-1 Identified Issues and Questions: Land and Resource Use (continued)

Issue / Question	Nature and Rationale	Specific Considerations
Use of watercourses for navigation	– Project-related components and vessel traffic in the Strait of Belle Isle. On-land conductors required for the Project will also span several rivers and streams across the province.	– Strait of Belle Isle, major inland waterways.
Hiking trails	– Project crosses or occurs in proximity to existing and proposed hiking trails. No specific land use conflict, but may affect visual aesthetics / remoteness qualities and overall enjoyment or use.	– Northern Peninsula (including International Appalachian Trail).
Aboriginal contemporary hunting, trapping, and gathering for traditional purposes	– Construction of transmission system may result in direct interactions with resource harvesting areas. – Vegetation management may result in direct interaction with harvestable resources. – Any new access created by the Project or other infrastructure may be generally beneficial to some resource users.	– Central and Southeastern Labrador. – Gathering includes resource collection of wood for domestic, purposes, berries and medicinal plants.
Aboriginal contemporary campsites and travel routes for traditional purposes	– Construction and operation of transmission system may result in direct interaction with existing campsites and travel routes. – Any new access created by the Project or other infrastructure may be generally beneficial to some resource users.	– Central and Southeastern Labrador. – Travel routes for traditional purposes, including the use of vehicles, snowmobiles and motorized boats.
Protected areas	– Special and valued places, protected by legislation. – Potential direct interaction (Project crossing over existing protected areas) or disturbance and aesthetic / wilderness issues due to proximity of the Project to protected areas.	– Existing and formally proposed protected areas in Labrador, Northern Peninsula (Main River), central Newfoundland and Avalon Peninsula.

16.5.3.2 Key Indicators and Measurable Parameters

Various KIs and MPs were identified for this VEC to frame and focus the associated environmental effects analysis (Table 16.5.3-2). Their selection was based on consideration of the various key elements of the VEC as well as the questions and issues that have been identified about potential Project effects.

Given the overall size and scale of the Land and Resource Use VEC, including the number and diversity of the various uses that comprise it, the selected KIs represent key subsets of the overall VEC. Each of the KIs include activities that occur in the LSA and / or RSA, are important for cultural, economic or other societal reasons, may be protected by legislation, and for which questions and issues have been raised regarding the potential effects of the Project.

The Commercial and Municipal Land and Resource Use KI considers the Project effects on communities, outfitting, commercial hunting and trapping, forestry, mining and mineral exploration and agriculture. The Recreational Land and Resource Use KI considers the effects of the Project on activities that are undertaken in leisure or to provide food or fuel for personal or family use. These activities include hunting, fishing, canoeing, kayaking, hiking, camping, wood cutting, berry picking, and use of cabins and motorized recreational vehicles. The Aboriginal Contemporary Traditional Land Use KI includes traditional Aboriginal land use activities that overlap with the Project-related components. This KI includes travel routes and camp sites, hunting and trapping, fishing, plant harvesting and places of cultural significance. The Protected Areas KI considers the effect of the Project on existing parks, ecological reserves and other such areas that are protected through legislation.

Based on the information available, contemporary traditional land use activities of the Innu Nation of Labrador, NunatuKavut Community Council (NCC) members, and Innu of Pakua Shipi may overlap with Project-related components. Therefore, effects of the Project on contemporary traditional land use activities of the Innu Nation of Labrador, NCC members and Innu of Pakua Shipi are discussed further in this assessment.

Based on available information, there is no evidence of Labrador Inuit contemporary land use overlapping with Project-related components, as described in Section 15.5.7.2 and illustrated in Figure 15.5.7-2. Therefore, effects of the Project on contemporary land use activities of the Labrador Inuit are not discussed further in this assessment.

Based on available information, as presented in Section 15.5.7.5, and Figure 15.5.7.5, available data indicate that contemporary traditional land use activities by the Innu of Unamen Shipu do not overlap with Project-related components. Therefore, effects of the Project on contemporary traditional land use activities of the Innu of Unamen Shipu are not discussed further in this assessment. Detailed maps derived from the data collected under the community engagement agreement will be considered by Nalcor and incorporated where relevant.

Based on available information, as presented in Section 15.5.7.6, and Figure 15.5.7-6, available data indicate that contemporary traditional land use activities by the Innu of Nutashkuan do not overlap with Project-related components. Therefore, effects of the Project on contemporary traditional land use activities of the Innu of Nutashkuan are not discussed further in this assessment.

Based on available information, as presented in Section 15.5.7.7, and Figure 15.5.7-7, available data indicate that contemporary traditional land use activities by the Innu of Ekuanitshit do not overlap with Project-related components. Therefore, effects of the Project on contemporary traditional land use activities of the Innu of Ekuanitshit are not discussed further in this assessment.

Based on available information, as presented in Section 15.5.7.8, and Figure 15.5.7-8, available data indicate that contemporary traditional land use activities by the Innu of Uashat mak Mani-Utenam do not overlap with Project-related components. Therefore, effects of the Project on contemporary traditional land use activities of the Innu of Uashat mak Mani-Utenam are not discussed further in this assessment.

Based on available information, as presented in Section 15.5.7.9, and Figure 15.5.7-9 and Figure 15.5.7-10, available data indicate that contemporary traditional land use activities by the Innu of Matimekush-Lac John do not overlap with Project-related components. Therefore, effects of the Project on contemporary traditional land use activities of the Innu of Matimekush-Lac John are not discussed further in this assessment.

Based on available information, as presented in Section 15.5.7.10, and Figure 15.5.7-11, available data indicate that contemporary traditional land use activities by the Naskapi Nation of Kawawachikamach do not overlap with Project-related components. Therefore, effects of the Project on contemporary traditional land use activities of the Naskapi Nation of Kawawachikamach are not discussed further in this assessment.

Each KI for Land and Resource Use has associated MPs, which represent aspects of the KI for which changes could possibly be detected or measured. Some Project effects may be "measured" (e.g., overlap or intersection between the LSA and communities, mineral areas, cabins, protected areas). For other potential social effects, such as decreased enjoyment of a hunting experience, quantitative predictions are neither possible nor particularly meaningful. In these cases, the identified MPs are primarily used as key concepts upon which to focus the effects assessment, rather than to generate quantitative predictions.

The KIs and MPs identified for the Land and Resource Use VEC along with the rationales for their selection are provided in Table 16.5.3-2.

Table 16.5.3-2 Key Indicators and Associated Measurable Parameters: Land and Resource Use

Key Indicator	Rationale for Key Indicator	Measurable Parameter	Rationale for Measurable Parameter
Commercial / Municipal Land and Resource Use	– Present within LSA and RSA – Socioeconomic importance	– Land area used and available – Economic revenues	– Overlap between identifiable land and resource use components / areas and Project can be defined and measured – Any Project-related disturbances of commercial activities will be important if they translate into a change in overall revenues / income
Recreational Land and Resource Use (General)	– Present within LSA and RSA – Socio-cultural importance	– Land area / resources used and available – Participation rates – Quality of experience	– Overlap between identifiable spatial land and resource use areas and transmission corridor or ROW can be determined
Aboriginal Contemporary Traditional Land Use	– Present within LSA and RSA (Labrador) – Socio-cultural importance – Aboriginal rights, where they exist, are constitutionally protected	– Land area / resources used and available – Participation rates – Quality of experience	– Overlap between identifiable spatial land and resource use areas and transmission corridor or ROW can be determined
Protected Areas	– Present within LSA and RSA – Protected by legislation – Ecological importance – Valued by society	– Undisturbed land within Protected Area – Ecological integrity – Societal / cultural value	– Overlap between Project and existing protected areas can be defined and measured – Potential Project-related disturbances (proximity, noise, visual intrusion) may affect ecological integrity or other values associated with existing protected areas

16.5.3.3 Potential Project-Land and Resource Use Interactions

Potential Project-Land and Resource Use interactions have been identified through consultation, literature review and analysis of the existing environment and Project description. These potential interactions have been organized by KI (i.e., Commercial / Municipal, Recreational, Aboriginal Contemporary Traditional Land Use, Protected Areas) and are listed by key Project component and activity in Table 16.5.3-3.

Table 16.5.3-3 Potential Project Interactions: Land and Resource Use

Project Phase / Activity	Key Indicator			
	Commercial / Municipal	**Recreational**	**Aboriginal Contemporary Traditional Land Use**	**Protected Areas**
Construction				
Construction access trails and roads	Potential disturbances (component footprints, activity, visual, noise, dust, human presence)	Potential disturbances (component footprints, activity, visual, noise, dust, human presence)	Potential disturbances (component footprints, activity, visual, noise, dust, human presence)	Potential disturbances (component footprints, activity, visual, noise, dust, human presence)
Movement and presence of personnel, equipment and materials				
Construction camps				
Marshalling yards and staging areas				
ROW clearing and preparation				
Quarrying and borrowing				
Transmission tower assembly and installation				
Conductor installation				
Converter station site preparation and construction				
Preparation and construction of submarine cable landing sites (on-land works)	Potential disturbances (component footprints, activity, visual, noise, dust, human presence)	Potential disturbances (component footprints, activity, visual, noise, dust, human presence)	Potential disturbances (component footprints, activity, visual, noise, dust, human presence)	—
Construction and installation of submarine cables (Marine works)				
Electrode site preparation and installation				

Table 16.5.3-3 Potential Project Interactions: Land and Resource Use (continued)

Project Phase / Activity	Key Indicator			
	Commercial / Municipal	**Recreational**	**Aboriginal Contemporary Traditional Land Use**	**Protected Areas**
Island system upgrades	—	—	—	—
Employment / presence of workers	Potential disturbances (component footprints, activity, visual, noise, dust, human presence)	Potential disturbances (component footprints, activity, visual, noise, dust, human presence)	Potential disturbances (component footprints, activity, visual, noise, dust, human presence)	Potential disturbances (component footprints, activity, visual, noise, dust, human presence)
Contracting / expenditures	—	—	—	—
System commissioning				
Operations and Maintenance				
Operations and maintenance access trails and roads	Potential disturbances (component footprints, activity, visual, noise, dust, human presence)	Potential disturbances (component footprints, activity, visual, noise, dust, human presence)	Potential disturbances (component footprints, activity, visual, noise, dust, human presence)	Potential disturbances (component footprints, activity, visual, noise, dust, human presence)
Presence and Operation of the transmission system	Potential disturbance (structures, footprints, visual)	Potential disturbance (structures, footprints, visual)	Potential disturbance (structures, footprints, visual)	Potential disturbance (structures, footprints, visual)
Routine line inspections and repairs	—	—	—	—
Vegetation management	Potential disturbances (component footprints, activity, visual, noise, dust, human presence)	Potential disturbances (component footprints, activity, visual, noise, dust, human presence)	Potential disturbances (component footprints, activity, visual, noise, dust, human presence)	Potential disturbances (component footprints, activity, visual, noise, dust, human presence)
Potential major system repairs				
Operation of the electrodes	—	—	—	—
Employment / presence of workers				
Contracting / expenditures				

— No likely or detectable interaction identified.

16.5.4 Approach to the Environmental Effects Analysis

16.5.4.1 Analytical Methods

The various information sources and methods used to describe and understand current Land and Resource Use in Newfoundland and Labrador that are relevant to the Project and its EA were described in detail in Chapter 15, Existing Socioeconomic Environment.

The assessment of potential Project effects on this VEC involved a general approach of "overlaying" what is known about existing commercial / municipal, recreational and Aboriginal activities and protected areas in the LSA and RSA with the nature of planned Project components and activities (Chapter 3, Project Description), to identify likely interactions and resulting effects on the VEC and its various KIs. This included a mapping approach utilizing a geographic information system (GIS) database where applicable. The mapping approach identified and illustrated areas where the LSA, including the 2 km wide transmission corridor, may overlap with existing Land and Resource Use elements. This represents a conservative approach, given that the eventual ROW will be considerably smaller than this, averaging approximately 60 m wide. The assessment of potential Project effects on this VEC also made use of Nalcor's recent analysis of existing types and levels of human access within and near the transmission corridor (Integrated Informatics Inc. 2011), as described earlier.

For Aboriginal Contemporary Traditional Land Use, a comprehensive list of information sources was identified, compiled and reviewed. Sources included published and unpublished literature, information and data provided to Nalcor by the Aboriginal communities and organizations, and the results of recent consultation activities and socioeconomic data collection initiatives completed for the EA by Aboriginal communities and organizations in cooperation with, and through funding and resources provided by, Nalcor.

Data presented in the Socioeconomic Environment: Aboriginal Communities and Land Use Component Study (Nalcor et al. 2011) were mapped in relation to the Project components and areas of potential overlap were identified. Project activities were considered in relation to how they might affect Aboriginal contemporary traditional land use. For example, vegetation management procedures and products used (e.g., herbicides) were reviewed to determine any effects these might have on land use activities (e.g., berry harvesting, hunting). The land use activities of the Labrador Innu, Labrador Inuit,NCC, Pakua Shipi, Unamen Shipu, Nutashkuan, Ekuanitshit, Uashat mak Mani-Utenam, Matimekush-Lac John, and Naskapi Nation of Kawawachikamach were considered for this assessment. At present, consultation activities with several Aboriginal communities and organizations are ongoing. The assessment in this section is based upon information that has been collected as of the time of preparation of this assessment.

Mitigation is an integral element of the Project design and implementation, and the effects assessment is based on the Project with identified mitigation measures in place.

16.5.4.2 Environmental Effects Descriptors

The potential effects of Project activities on the various aspects of the Land and Resource Use VEC are generally described in terms of a set of descriptors which are summarized in Table 16.5.4-1.

Table 16.5.4-1 Effects Descriptors: Land and Resource Use

Effects Descriptor	Definition
Direction	
Adverse	Effect is negative and undesirable, reducing land and resource use revenues, opportunities, success, participation and / or enjoyment.
Neutral	Effect is neither adverse nor positive.
Positive	Effect is beneficial and desirable, enhancing land and resource use revenues, opportunities, success, participation and / or enjoyment.

Table 16.5.4-1 Effects Descriptors: Land and Resource Use (continued)

Effects Descriptor	Definition
Magnitude	
No effect	Project results in no change in the existing (baseline) condition.
Low	Project results in a small change in the existing condition that may or may not be detectable.
Moderate	Project results in a clear change in the existing condition, but this is generally in keeping with the natural variability of the parameter in question. Clearly an effect but unlikely to result in a risk to overall income stability, or overall participation rates, enjoyment or societal values, and / or to become a management issue.
High	Project results in a major change in the existing condition / baseline value, that is well outside the natural variability of the parameter in question. Effect is likely to result in a risk to overall income stability, or overall participation rates, enjoyment or societal values, and / or to become a management issue.
Geographic Extent	
Local	Effect will be evident within the LSA.
Regional	Effect will be evident within the RSA.
Beyond regional	Effect will be evident beyond the RSA.
Duration	
Short-term	Effect will be evident for less than one year.
Medium-term	Effect will be evident for between one and four years.
Long-term	Effect will be evident for from four to ten years.
Far future	Effect will be evident throughout the life of the Project.
Frequency	
Low	Effect occurs no more than once per year.
Moderate	Effect occurs 2 to 10 times per year.
High	Effect occurs more than 10 times per year.
Continuous	Effect is continuous.

16.5.5 Construction

This section describes the potential effects of proposed Project Construction activities on Land and Resource Use, including each of the identified KIs.

16.5.5.1 Overview of Project Construction and Associated Effects Management

Project Construction will take place over an approximately four year period at locations throughout Newfoundland and Labrador, with different types of activities taking place at different sites, and with varying intensities over time.

The proposed Project is comprised of a number of components that will be constructed from central Labrador to the Avalon Peninsula, including converter stations at Muskrat Falls and Soldiers Pond, a cleared ROW with transmission towers and conductors over the approximately 1,100 km long area between these sites, submarine cable landing areas and subsea cables and berms across the Strait of Belle Isle, shoreline electrodes at L'Anse au Diable and Dowden's Point in Conception Bay and their associated transmission connections and other components. Construction activities such as vegetation clearing, transmission tower installation, movement of equipment and materials and the development of construction infrastructure such as access trails, camps, quarries and lay down areas will result in noise, dust, small leaks and spills, general human presence and other disturbances that may interact with land and resource use activities at these locations. Land and Resource Use may be affected both through direct interactions (physical overlap) and indirectly, as a result of visual and other perceptual issues.

During Project planning and design, Nalcor has sought to proactively anticipate and avoid the potential for adverse interaction between the Project and existing land and resource uses, including any associated adverse socioeconomic effects that may result from such interactions. The transmission system will be similar to other existing transmission infrastructure in the province, and Nalcor will use standard practices and procedures and will follow applicable regulatory requirements during the Construction phase of the Project.

Some key environmental effects management measures that relate to this VEC include the following:

- The avoidance of known land and resource use components and activities where possible during Project planning to date, including in the selection of the proposed transmission corridor, and in the identification of locations for other key Project components (e.g., electrodes, submarine cable landing sites, converter stations).
- This planning approach will be carried forward into the detailed route selection process for the transmission line ROW within this corridor, which will involve additional future consultation with government departments, Aboriginal and stakeholder groups and the public.
- The selection of the transmission corridor and planning of other Project components has been based on an approach to maximize the use of existing access roads and trails wherever possible, use existing industrial sites and other developed areas, use existing quarries and extract borrow material from within the ROW wherever practical, and follow existing transmission lines where possible (including for several hundred kilometres from Port Blandford in Eastern Newfoundland to Soldiers Pond on the Avalon Peninsula), while respecting technical design requirements.
- Designing, planning and scheduling Project-related elements and activities in specific areas to avoid interactions with land and resource users to the extent practical, and conducting regular communication and consultation with relevant agencies, organizations and representatives as part of such planning and eventual implementation.
- Nalcor has negotiated and concluded an IBA with the Labrador Innu, which was ratified by the Innu people in June 2011 and signed in November 2011 (Chapter 7, Aboriginal Consultation and Issues Scoping). The IBA covers both the Labrador-Island Transmission Link and the Lower Churchill Hydroelectric Generation Project, and defines how the Labrador Innu will participate in and benefit from these developments. The specific nature and provisions of the IBAs are and will remain confidential. However, the IBA will provide benefits to address any adverse effects on Labrador Innu as a result of these projects, including effects on Innu communities and their land and resource use and other activities. The IBA includes processes for continued consultation and cooperation throughout the construction and operations phases of both projects, including on environmental matters.
- Nalcor will continue to consult appropriately with other relevant Aboriginal communities and organizations in Labrador and Québec, particularly those with demonstrated contemporary land use near the Project. This will include the provision of Project information and updates on ongoing and planned activities, as well as discussion of any issues communities and groups may have and potential means of addressing them.

- Nalcor will work directly with any commercial outfitter with an existing and active hunting or fishing camp located within the proposed transmission corridor, or within 5 km of the corridor or of the planned location of any other permanent Project component. This will include consultation (e.g., regarding ROW selection, tower design and placement, scheduling) during detailed design and planning for sections of the proposed transmission line within the identified limit, to seek to avoid or reduce any potential issues or interactions during construction or operation of the Project. Nalcor will also explore possible routing approaches to help minimize the eventual use of the ROW by ATVs and snowmobiles in areas that are currently remote and inaccessible. This process will include meeting and consulting generally with the Newfoundland and Labrador Outfitters Association (NLOA) and other industry representatives to discuss general issues and potential effects management measures.

- Project components and activities will be routed and designed to avoid direct, physical interaction with existing protected areas in the province. Nalcor will work directly with the GNL Natural Heritage Branch, Parks and Natural Areas Division (and other organizations as applicable) during detailed engineering design and planning for those sections of the proposed transmission line that will occur within 1 km of the boundaries of an existing protected area, including for example with regard to ROW selection, tower design and placement, and scheduling, to seek to avoid or reduce any potential visual or other such interactions.

- Nalcor will consult directly with the Department of National Defense (DND) during detailed design and planning for sections of the proposed transmission line that will occur within the designated low level flight training area in Labrador, including with regard to ROW selection, tower design and placement, and scheduling. Nalcor will cooperate with DND to develop appropriate communication procedures for flight activity in the designated low level flight training area, as well as help to ensure that Project infrastructure is included on relevant DND maps and navigational charts.

- The application of other standard effects management measures used by Nalcor and its subsidiaries during past and ongoing transmission line construction and maintenance activities (e.g., discussion with private property owners regarding issues related to any intrusion on property both prior to and after such intrusion; limitation of noise along the transmission line by using only essential vehicles; limiting access to approved routes and specific vehicles).

- Wood (timber) cleared from the ROW will be limbed and stacked within the ROW, and will be available for removal by local residents.

- Nalcor and its contractors will identify, obtain and comply with all authorizations, approvals and permits from relevant provincial and federal agencies that are required in relation to its Project Construction, and Operations and Maintenance activities.

It is anticipated that many potential land use issues and interactions associated with the Project can and will be addressed through the planning and consultation measures outlined above. However, it is inevitable that a development project of this size and scale will overlap and interact with land uses and properties in specific areas, which will be unavoidable for technical, economic and / or environmental reasons. In such cases, it may be necessary for Nalcor to acquire property or other assets through one of a number of potential means.

When seeking to acquire property rights that are required for the Project, Nalcor's goal is to treat all property owners with respect and in a fair, transparent and consistent manner. Nalcor's *Property Acquisition Policy* seeks to provide a fair balance between the needs of property owners, Nalcor and the ratepayers and citizens of the province. The objective is to secure voluntary property settlements in a timely manner at a reasonable cost.

Where a need to acquire property is identified, Nalcor will seek to identify, contact and communicate with the owner in a timely manner. Nalcor will conduct negotiations for the purchase of property rights and present the property owner with an offer based on fair market value as indicated in a property valuation prepared by independent accredited appraisers. Signing incentives may also be offered to encourage early resolution of property acquisition interests. Upon reaching a negotiated agreement, the property owner will be required to execute an easement document, which Nalcor will have registered at the Registry of Deeds Office. Upon registration, Nalcor will direct the award of compensation to the property owner.

While most negotiations are settled amicably, there are instances where Nalcor is compelled to exercise its rights to secure land interests for public projects through the process of expropriation. This option is exercised only when all other avenues are exhausted. Expropriation will follow specific procedures as set out in provincial legislation and will include compensation to the property owner. Even after an expropriation is filed, Nalcor will continue to attempt to secure a negotiated settlement with affected property owners.

Other effects management measures that have been identified and proposed in relation to the natural and / or socioeconomic environments, as discussed in other VEC sections throughout this EIS, are also relevant to avoiding or reducing potential effects on Land and Resource Use (e.g., those relating to general landscape, visual issues, infrastructure and services).

16.5.5.2 Existing Knowledge

The construction of electrical transmission systems is common throughout North America and worldwide. The potential effects of transmission line construction on Land and Resource Use are, in many respects, similar to those which may be experienced with any large construction project, and particularly comparable with those of other large linear projects such as pipeline, road and railway construction.

There is little available published "existing knowledge" which has evaluated and measured the actual and known effects of similar projects and activities on this VEC. Some key findings from a selection of recent published literature that is relevant to transmission line construction, and which relate primarily to known and perceived land use issues often associated with such projects, and / or to the management of their associated effects are summarized in Table 16.5.5-1.

Table 16.5.5-1 Existing Knowledge (Construction): Effects of Similar Projects on Land and Resource Use

Reference	Study / Project Context	Summary of Findings
PSC Wisconsin (2010, internet site)	This overview reviews the environmental issues and concerns raised by the construction of electric transmission facilities. The first part of the overview provides a general summary of the methods to measure and identify environmental impacts. The second part of the overview is an A to Z directory of specific environmental issues and techniques to minimize or mitigate the impacts.	– Discussion of potential impacts and methods to minimize or mitigate the impacts on various land and resource use activities.

Table 16.5.5-1 Existing Knowledge (Construction): Effects of Similar Projects on Land and Resource Use (continued)

Reference	Study / Project Context	Summary of Findings
Taku Wilderness Association (2001)	The Impact of Resource Developments on Traditional Land-based Economies	– Resource developments have had many impacts on traditional land-based economies in the north. – Effects include increased competition for natural resources, theft and vandalism of property, and disproportionate impacts on family areas. – The report suggests that post impact studies of resource developments and traditional land-based economies means little is known about the short and long-term impacts on traditional economies, and therefore the cultures, of Aboriginal communities. This low level of knowledge about the range of impacts and their duration, and the corresponding uncertainty, demands that a precautionary approach be adopted.

16.5.5.3 Construction Effects: Commercial / Municipal Land and Resource Use

This section assesses the potential effects of Project Construction activities on commercial and municipal land and resource uses and users. The analysis is based on the nature and distribution of planned Project construction work, with integral consideration of the effects management strategies and measures that Nalcor will employ during this phase of the Project, as well as its experience with similar development projects.

The proposed transmission corridor and other Project components cross through or occur within or near the municipal boundaries, municipal planning areas, infilling lmits or protected road zones of various communities, particularly in the Strait of Belle Isle area (e.g., Forteau on the Labrador side and Shoal Cove East and neighbouring communities on the Northern Peninsula), Central and Eastern Newfoundland (e.g., Grand Falls-Windsor, Clarenville, Sunnyside, Arnold's Cove and Chapel Arm) and on the Avalon Peninsula (e.g., Whitbourne and Holyrood). The planning and engineering design of the Project, including route selection for the ROW, tower placement and conductor spanning will seek to avoid any adverse interactions with community lands and infrastructure. Nalcor will consult with all relevant communities in or near the Project area as part of such planning, as well as during Project Construction, to provide information and updates on ongoing and planned construction activities, identify questions or concerns, and to seek to address any issues through design and scheduling. Development within each type of community boundary named above requires permits and approvals from municipalities and / or provincial departments and agencies. Any construction or maintenance activities occurring within Protected Public Water Supply Areas will be subject to special and specific environmental protection and regulatory requirements, as discussed in Chapter 13, Freshwater Environment (Section 13.2.1).

The Project will cross over or along numerous public roadways and other public infrastructure throughout the province, as described in Chapter 15, Existing Socioeconomic Environment. These crossings will be designed and built to relevant standards, and conductor clearance (the distance between the ground and the closest point of the transmission line span) will be a minimum of 7.4 m, which will increase to approximately 9.2 m at highway crossings. Such crossings and other Project components will also be undertaken in accordance with required approvals and permits from applicable government agencies.

No airports, landing strips, heliports or aerodromes are located within the LSA, although the transmission corridor does occur in the general vicinity of several existing airports. The corridor also crosses a small portion of the east-central part of the defined military flight training area in central Labrador (although military flight training in Labrador has decreased over the past decade). Nalcor will work directly with Transport Canada, DND and other relevant authorities to ensure that the presence and characteristics of any transmission towers in the general vicinity of these facilities are in keeping with required guidelines and regulatory standards, so as to not interfere with the operations and safety of aircraft. Nalcor will cooperate with these authorities to include Project infrastructure on maps and navigational charts through the provision of information, and will coordinate and communicate regarding any Project-related aircraft activities in these areas during Project Construction.

Nalcor is aware of an existing float plane base at Long Pond within the LSA near Forteau in the Labrador Straits region, which is owned and used by several local operators and which serves as a refuelling stop for other aircraft. Nalcor has had extensive discussions and a site visit with the operator of this facility, to fully understand the nature of the existing operations at this site, and to explore possible means to address any potential for safety issues or restrictions that may occur with the presence of transmission towers and conductors in this area. These discussions have covered topics such as applicable aviation standards and regulations, as well as potential tower characteristics and placement, and topography in this area. Nalcor anticipates that these cooperative discussions will continue as the detailed engineering and design of the Project activities in this area progress, with the goal to avoid or reduce any adverse effect of the Project on this operation.

The proposed transmission corridor also passes through various regions of the province which have established commercial outfitting operations. In the interior of Central and Southeastern Labrador, no outfitting camps are located in the LSA but one is located within the RSA. Several camps in the Labrador Straits area, all of which are currently accessible by road, are situated in the general vicinity of proposed Project infrastructure. In Central and Eastern Newfoundland, the proposed transmission corridor does not overlap with any known outfitting camps, and the few camps that are located in the RSA are in locations that are characterized by existing access and / or other previous human development such as forest harvesting or existing transmission lines and, accordingly, the likely effects of the Project on these camps will be minimal.

The main potential for interaction between existing outfitting camps and the Project occurs on the Northern Peninsula, where several existing camps are located within the proposed Project corridor in the Portland Creek and Main River areas, or in relatively close proximity to it (Chapter 15, Existing Socioeconomic Environment). The large number and spatial density of outfitting camps in this region, coupled with the area's topographic and meteorological characteristics and the presence of national and provincial parks on both sides of the Peninsula, have made it inevitable that interactions between outfitting camps and the Project will occur. Indeed, local outfitters have confirmed in discussions with Nalcor that as a result of these factors, there is likely no better transmission corridor option which would completely avoid any interactions with outfitting camps in this area. In addition, while specific information is not available on the areas used by hunters and guides based at these camps, hunting activities can also extend considerably beyond the camp locations themselves. Although several camps are located in relatively remote areas (especially those on the high elevation barrens in the area where the transmission line will cross the Long Range Mountains), others are located in areas which already have considerable human access through networks of resource roads and trails.

In selecting a specific route for the transmission line ROW within the 2 km wide corridor during detailed engineering design, Nalcor will attempt to maximize its distance from existing and commercially active outfitting camps in this area. Nalcor will also work directly with any active commercial outfitter with an existing camp located within the transmission corridor or within 5 km of it or of any other planned permanent Project component. This will include consultation regarding ROW selection, tower design and placement, and scheduling during detailed design and planning for sections of the proposed transmission line within these limits, with the goal to avoid or reduce any potential issues or interactions during construction and / or operations. These discussions will involve exploring possible transmission line routing approaches (e.g., spanning natural topographic features which may serve as natural access barriers) in the Long Range

Mountains and possibly other areas to minimize the eventual use of the ROW by ATVs and other means of public access. Consultation activities will also include meeting and consulting generally with the Newfoundland and Labrador Outfitters Association (NLOA) and other industry representatives to discuss issues and potential effects management measures.

The proposed Project will overlap with various Forest Management Districts across Newfoundland and Labrador, as well as areas of particular forest tenure / timber rights and various types and intensities of ongoing forest harvesting activity. Although still an important industry and economic component overall, commercial forestry has declined significantly in recent years as a result of the closure of two of the province's pulp and paper mills. Forestry and forest management activity are subject to detailed planning processes at provincial and district levels, including the preparation, regulatory review and implementation of operating plans for each district. Many of these operating plans will expire and be renewed prior to the commencement or completion of the Project Construction phase. Nalcor will cooperate with provincial forest planners and managers by providing Project information and updates so that future operational plans (5 year or annual) can incorporate the Project ROW and any associated forest clearing.

As calculated in the Vegetation VEC environmental effects assessment (Section 12.2), the total volume of timber resource estimated to be harvested as a result of ROW clearing for the Project is 171,432 m^3, which represents less than 7% of the current annual allowable cut (AAC) in the province (Section 12.2), and less than 4% of the total volume of timber approved to be harvested under the most recent 5-year forestry operating plans in the 13 forest management districts crossed by the Project (AMEC 2010). The footprints of those sections of the transmission line ROW and other permanent Project components that occur within productive forest areas will be removed from potential use for future forestry activities. However, this land area is small relative to the remainder of available productive forest areas. Consequently, the Project is not likely to have an effect on the overall level of forestry activity in the province or on the economic revenue associated with Newfoundland and Labrador's forestry industry.

The proposed transmission corridor and other Project components similarly overlap with various other commercial land and resource use activities across the province, including existing quarries, staked claims, oil and gas exploration parcels, impost land, mining leases, agricultural areas and Crown titles. During detailed routing for the transmission line ROW, Nalcor will attempt to avoid interactions with these activities where possible, and Nalcor will consult with operators and land owners throughout this process as required, as well as during Construction to ensure that adjacent operations have up to date information on planned Construction activities and to optimize planning and scheduling. The land permitting process for the Project will serve to highlight and address potential land use conflicts. The creation of the ROW and access trails may in fact have a beneficial effect for some land uses, such as mineral exploration and commercial berry harvesting industries, by providing additional access into some areas.

The Strait of Belle Isle is an important shipping lane, which experiences considerable marine vessel traffic during the ice-free period, as well as ferry service across the Strait between St. Barbe / Corner Brook and Blanc Sablon. Project Construction in the Strait of Belle Isle will involve vessel traffic and work activity associated with the installation of the submarine cables and associated rock-laying / berming components, which will require restrictions on vessel movements in the active marine work areas and on anchoring in the area immediately around the submarine cables once these are laid on the seabed. The overall "zone of influence" of this disturbance will be reflected by a Safety Zone of 500 m radius around the marine construction activities, within which no other vessels will be permitted to operate. The primary purpose of the Safety Zone will be to minimize the potential for physical contact between Project Construction and other vessels and activities, thereby ensuring a safe and efficient operating environment for all parties. All Project-related vessels will be required to stay within the Safety Zone except when transiting to and from their home port or service base or, in the case of rock-laying (fallpipe) vessels, to any onshore supply facilities. When transiting to and through the Strait of Belle Isle, these Project vessels will follow the existing Canadian Coast Guard (CCG) voluntary traffic separation scheme. Beyond the Safety Zone(s), marine vessels unrelated to the Project will be able to transit the Strait of Belle Isle in accordance with the relevant regulations and vessel traffic procedures.

A Vessel Traffic Management Plan (VTMP) developed for the Project will outline the "rules of the road" for marine traffic activities associated with the Project during Construction, including communications protocols and the prescribed routes that all Project vessels will be expected to follow when operating outside the Safety Zone. The VTMP will help to minimize the "footprint" of Project marine activities that might interfere with vessel traffic by ensuring their containment within relatively focused and prescribed areas. Through mechanisms such as the CCG's Notices to Shipping and the Canadian Broadcasting Corporation's Fisheries Broadcast, Nalcor will ensure that all non-Project vessels operating in the Strait of Belle Isle are given advanced notice of planned construction work. These standard and proven effects management measures will help to avoid interactions and issues between the Project and general vessel traffic in the Strait of Belle Isle area, and are further described under the Marine Fisheries VEC (Section 16.6).

As a result of the relatively small area that will be subject to Project-related marine construction work at any one time, the overall size of the Strait of Belle Isle area, the relatively short-term duration of cable construction activities in the marine environment (likely one season), and the proposed effects management measures outlined above, Project Construction is not likely to result in measurably adverse effects on marine vessel activity in the Strait. Similarly, activities associated with construction work at the L'Anse au Diable and Dowden's Point electrode sites, given their nature (i.e., small areas and on-land work) are not expected to disrupt or otherwise adversely affect existing marine activities in these areas.

Summary of Likely Residual Environmental Effects

The likely residual effects of Project Construction on the Commercial / Municipal Land and Resource Use KI are as follows:

- Adverse, as construction activities may cause disruptions to existing land and resource users and will occupy land areas that may prevent or restrict their use by others. The creation of access in certain areas may prove beneficial for some uses as well;
- Of low to moderate magnitude, as in many cases the land area occupied by the Project will be small compared to that used by or available to existing users, and because Project design, associated consultation and / or permitting procedures will serve to identify and address most issues;
- Local in geographic extent, as most if not all relevant interactions will occur within the LSA, and particularly, at the site of construction activity as it occurs;
- Of short to medium-term duration, as many disturbances will end relatively quickly, whereas others (such as ROW clearing or infrastructure placement) will continue throughout the Construction phase of the Project (and then beyond, see Operations and Maintenance); and
- Of low to continuous frequency, as some disruptions will occur only once or occasionally whereas others will extend throughout the Construction phase and beyond.

Despite the lack of detailed Project design information for some aspects at this stage of the EA process (e.g., specific ROW and tower locations) there is a high degree of certainty in these effects predictions given the general nature of the Project, the effects management approaches and measures proposed, and experience with similar projects.

16.5.5.4 Construction Effects: Recreational Land and Resource Use

Project Construction activity will occur throughout the province in areas used for a variety of recreational land and resource use activities. These activities include hunting for large and small game at various times of the year, angling in lakes, ponds and streams within and near the Project area, berry picking, firewood cutting, ATV use and snowmobiling, hiking, bird watching, camping, skiing and various other consumptive and non-consumptive outdoor recreational activities, many of which are focused in particular locations and / or seasons.

During Project Construction, the presence of personnel and the use of equipment in the LSA, including during vegetation clearing along the transmission line ROW, installation of tower foundations and tower assembly and erection, and the establishment and use of access trails, camps, laydown areas and quarries, will create noise, dust and a visual human presence in Project areas. For some recreational users, this may detract from the experience of going into the country, causing them to reduce their use of or stop using certain areas near Project work sites during periods of construction activity. In addition, access to some areas will be restricted at certain times by the nature of the work undertaken or for safety reasons (e.g., during blasting). Hunters, anglers, cabin owners or other users that normally engage in recreational activities in these areas may therefore be disturbed.

As described in Chapter 3, Project Description, Project Construction will progress as a sequence of activities at each location, with crews clearing the ROW passing through a given area, followed by crews installing towers, crews stringing conductors, and so on. As a result, the intensity and particularly, the duration of work activity at any one location will be relatively low over the four year construction period. In addition, the construction activities will occur in defined, localized areas representing a small portion of the land area available for recreational activities in any given region. Recreational resource users that feel disturbed by the presence of construction work activity at a given location may therefore use other areas during these times.

Nalcor will provide information and updates to organizations and the general public as appropriate regarding ongoing and planned construction activities, with the goal to facilitate good communication and planning to proactively avoid interactions with recreational uses and any safety issues. Therefore, while construction-related activities and disturbances may alter the geographic distribution of certain land and resource use activities in a region at specific times, an overall decrease in the levels of recreational activities or their enjoyment in any region is not anticipated as a result of the Project.

Project construction activities will occur near and, in many cases will cross over, watercourses and waterbodies of varying sizes and other physical and hydrological characteristics within the transmission corridor. Although specific information on the current navigational use of each watercourse that will be crossed by the transmission line is not available, this assessment is conservatively based on an assumption that any watercourse that could support navigation may indeed be used for such purpose at the location where the Project crosses that watercourse. As described in Chapter 3, Project Description, Project construction work will be planned and implemented to avoid or minimize any direct interaction with waterbodies and watercourses, and a vegetative buffer will be maintained along both sides of waterbodies and watercourses during ROW clearing. Direct interaction with the freshwater environment during Project Construction will occur primarily during periodic fording where it is required, and during the installation of culverts or bridges to establish access trails or roads. These are both regulated activities, and will be undertaken in accordance with all applicable permits and approval conditions. In addition, the transmission towers and conductors will be designed and built to meet applicable Canadian standards (Section 3.3), which ensure that overhead transmission lines have sufficient clearance to allow navigation on water and road crossings. No issues related to the navigational use of inland waters by boats or snowmobiles are therefore anticipated.

Marine activities in the Strait of Belle Isle and Conception Bay areas include the use of small vessels and larger pleasure craft for recreational purposes. Given the nature and location of both Project Construction activities in the marine environments and marine recreational activities (each of which is limited in extent and time), little if any likely interaction or disturbance is anticipated. Any recreational activity that would occur in the proposed Project Construction areas and times can easily be transferred to other locations during the short time period of Project Construction activities, with no consequent reduction in marine recreational participation rates or overall enjoyment levels. The effects management measures discussed in Section 16.5.5.3 (i.e., Safety Zones, VTMP, communications) will also apply to recreational activities.

Many individuals and families in Newfoundland and Labrador have cabins which are used as retreats during weekends, holidays or vacation periods. These cabins range from isolated, simple structures in the woods to large dwellings accessed by road and located in areas with considerable cottage development. The proposed transmission corridor will cross through several designated cottage planning and development areas in various

parts of the Island of Newfoundland, and many existing cabins are located in various parts of the proposed Project corridor. This includes pockets of cabins in areas such as north of Forteau on the Labrador Straits; on Northern Peninsula lakes (e.g., Ten Mile Lake) near the submarine cable landing location and inland of communities from Hawke's Bay to River of Ponds; on the Gander River and Terra Nova River systems and on the Avalon Isthmus in Central and Eastern Newfoundland; and, through several extensive cottage areas around Placentia Junction and in the centre of the Avalon Peninsula. Many cabins located within or near the LSA are in areas where human activities have occurred or are ongoing, including existing forest roads or other access infrastructure such as the T'Railway Provincial Park. Others are accessed primarily by snowmobile in the winter months, by boat and / or on foot.

Although cabins and their use are more stationary in nature than other types of recreational land and resource use activities, the presence of short-term and intermittent Project construction activities is unlikely to affect their overall use or user enjoyment levels. As described in Chapter 15, Existing Socioeconomic Environment, some of the more concentrated cabin development in the LSA occurs on or near the Avalon Peninsula, where a relatively large population and limited land space have resulted in a relatively high density of cabins in particular areas. In this region, the proposed transmission line will parallel existing large, high voltage transmission systems (from approximately Port Blandford to Soldiers Pond) for several hundred kilometres, which will further minimize any disruptions to existing cabins and their users in that region.

Nalcor will select the eventual route for the approximately 60 m wide ROW within the transmission corridor with the goal to avoid direct interactions between Project activities and existing cabins. In the event that such an interaction cannot be avoided through Project planning and design or other means, Nalcor will acquire these properties, in accordance with the processes outlined in Section 16.5.5.1 Acquisitions will be conducted with the goal to achieve a fair balance between the needs of property owners, Nalcor and the ratepayers and citizens of the province.

Summary of Likely Residual Environmental Effects

The likely residual effects of Project Construction on the Recreational Land and Resource Use KI are as follows:

- Adverse, as construction activities may cause disruptions to existing land and resource users and will occupy land areas that may prevent or restrict their use by others. The creation of access in certain areas may prove beneficial for some recreational land uses and users.
- Of low to moderate magnitude, as in many cases the land area occupied by the Project will be small compared to that used by or available to existing recreational users, and because Project design, consultation and / or other effects management measures will identify and address most issues.
- Local in geographic extent, as most if not all interactions with recreational land users will occur within the LSA, and particularly, at the site of construction activity as it occurs, with regional effects potentially occurring due to an expanded zone of influence (e.g., in relation to visual or noise issues).
- Of short to medium-term duration, as many potential disturbances end quickly, whereas others (such as clearing or infrastructure placement) will continue throughout the Construction phase (and then beyond, see Operations and Maintenance).
- Of low to continuous frequency, as some disruptions will occur only once or occasionally, whereas others will extend throughout Construction and beyond.

There is a high degree of certainty in these effects predictions given the general nature of the Project, the effects management approaches and measures planned, and experience with similar projects.

16.5.5.5 Construction Effects: Aboriginal Contemporary Traditional Land Use

This section assesses potential interactions between Project Construction activities and their possible effects on Aboriginal Contemporary Traditional Land Use within Central and Southeastern Labrador where a number

of Aboriginal groups reside and / or claim Aboriginal rights. Aboriginal contemporary traditional land use activities take place at travel routes and campsites which are used, at times, for hunting and trapping and gathering at various times of the year, fishing within and near the LSA and travelling on the land to places of cultural significance.

During the Construction phase of the Project, the presence of personnel and the use of equipment in the LSA, including during vegetation clearing along the transmission line ROW, the installation of tower foundations and tower assembly and erection, and the establishment and use of access trails, camps, laydown areas and quarries, will create noise, dust and a visual human presence in Project areas. For some Aboriginal users, this may detract from the experience of going into the country, causing them to reduce their use of or stop using certain areas near Project work sites during periods of construction activity. In addition, access to some areas will be restricted at certain times by the nature of the work undertaken or for safety reasons (e.g., during blasting). Any land use activities in these areas may therefore be disturbed. As described in Chapter 3, Project Description, however, construction work activity will progress as a sequence of activities at each location, with crews involved in clearing the ROW passing through a given area, followed by those involved in tower installation, conductor stringing, and so on. As a result, the intensity and duration, of work activity at any one location will be relatively low over the four year construction period. In addition, construction activities will occur in defined, localized areas representing a small portion of the land area available for land use activities in any given region. Any member(s) of an Aboriginal group or community that feels disturbed by the presence of construction work activity at a given location may therefore use other areas during these times.

Nalcor will provide information and updates to Aboriginal groups and organizations, as appropriate, regarding ongoing and planned construction activities, with the goal to facilitate good communication and planning to proactively avoid interactions between the Project and Aboriginal land users and any safety issues. Therefore, while construction-related activities and disturbances may alter the geographic distribution of certain Aboriginal contemporary traditional land and resource use activities in a region at specific times, an overall decrease in the levels of such activities or their enjoyment in any region is not anticipated.

Through currently available information and data collection, it is known that members of Aboriginal communities and organizations have campsites or cabins that are used in several or all seasons of the year to carry out various land use activities. These campsites or cabins range from isolated, simple structures in the woods to larger dwellings accessed by road. Over the past decade the trend for members of Innu Nation has been to use road-based camps which allow people to commute between their camps and their homes and engage in harvesting activities of a shorter duration, such as on weekends and during vacation.

Data collected at the time of this submission indicates that there are areas, primarily along the TLH, which are used for campsites and contemporary travel routes. Current information indicates the cabins located within or near the LSA are in areas where activities have occurred or are ongoing, including existing forest roads or other access infrastructure, while other locations are accessed primarily by snowmobile in the winter months and / or on foot. Based on the information provided by Innu Nation, most campsite / cabin activity on the land occurs outside the LSA and pertains to Outpost Programme cabin locations. Outpost camps potentially within the LSA, noted as “A” and “B” on Figure 15.5.7-1 have not been used since 1993 and 1984, respectively (Armitage 2010).

Innu Nation travel routes, which include road, snowmobile, walking, canoe and motorboat routes, were recorded outside the LSA, along the Churchill River and TLH. Other documented routes range in distances 65 km or greater from the LSA.

The members of NCC who reside in communities throughout Central and Southeastern Labrador travel along many routes, in particular from the coast and along the TLH. Based on information obtained by Nalcor through the Phase II Community Engagement Agreement contemporary land and resource use study involving interviews with NCC members, travel routes were identified that follow the TLH3, and branch off. Some of these travel routes overlap, or intersect with the LSA in the area where the transmission corridor follows the

TLH3. Travel routes also intersect with the LSA near the Labrador Straits and approximately 50 km north of the Strait of Belle Isle. These travel routes are primarily accessed during the winter via snowmobile.

Based on the data and reports collected at the time of this submission, some travel routes and camp sites used by Innu of Pakua Shipi are in the LSA and more broadly in the RSA. Based on the data collected and mapped under the Phase I Community Engagement Agreement between Nalcor and Pakua Shipi, Pakua Shipi indicated polygons of contemporary land use; however, these polygons do not provide specific details as to whether the area is used for a travel route or campsite, since both are plotted together and are not detailed in their location. The ongoing data collection and resulting report under the Phase II Community Engagement Agreement with the community is expected to result in more detailed mapping and information. Nalcor will consider and incorporate information where relevant, including the potential for mitigation and adaptive management.

Nalcor will select the eventual route for the approximately 60 m wide ROW within the transmission corridor with the goal to avoid interaction with existing Aboriginal campsites and cabins. In the event that such an interaction cannot be avoided through Project planning and design or other means, Nalcor will acquire these properties in accordance with the processes outlined in Section 16.5.5.1.

Project Construction activity will generate disturbances related to noise, dust, presence of people, equipment and materials that could affect the overall quality (aesthetics, tranquility) of the traditional land use experience, including gathering of plants for medicinal purposes. The majority of land use and resource harvesting by members of Innu Nation within the general Project area remains centred on a series of lakes situated at the headwaters of the Eagle River and on the Eagle River plateau outside the LSA and RSA. Some sources have identified harvesting locations distributed across Central and Southeastern Labrador; however, in the area of the Mealy Mountains, the majority of the group's activities occur outside the LSA and RSA and it is unlikely that there would be any decrease in harvesting by Innu Nation as a result of the Project.

Data from Innu Nation indicates that medicinal plants are harvested near Gull Island. None of the references provided by Innu Nation in regard to medicinal plant gathering occur in the LSA or RSA.

Based on the data obtained from interviews conducted with NCC members in 2011 through the Phase II Community Engagement Agreement, NCC members identified areas in the LSA and the RSA used for harvesting large animals, furbearers and birds. The harvesting areas in the LSA and RSA are primarily in the area where the transmission corridor follows the TLH3, and near the Labrador Straits (Figure 15.5.7-3b, c).

A large area identified as being used for hunting large animals near the headwaters of the Eagle River extends to, and overlaps with, a section of the transmission corridor (Figure 15.5.7-3c). In the area where the transmission corridor follows the TLH3, locations were identified by NCC members where they have hunted birds, and trapped furbearers (e.g., marten, fox, and beaver). Several linear areas for trapping were identified along the TLH3 where the transmission corridor follows the TLH3 (Figure 15.5.7-3c). A small portion of the areas identified for harvesting large animals, overlap with the transmission corridor (Figure 15.5.7-3c).

NCC members identified areas in the southern section of the corridor, in the area near the Labrador Straits including the Strait of Belle Isle, used for hunting birds. Members of NCC also identified locations in this area where they have trapped furbearers (e.g., foxes, beaver, marten), and two areas which partially overlap with the LSA were identified as areas used for hunting large animals (Figure 15.5.7-3c).

Marine activities in the Strait of Belle Isle include the use of small vessels and larger pleasure craft by Aboriginals for resource harvesting (e.g., hunting birds and fishing). Given the nature and location of both Project construction activities in the marine environments and these resource harvesting activities (each of which is limited in geographical extent and time), little if any likely interaction or disturbance is anticipated. Any activity that may overlap spatially and temporally with the proposed construction activities can easily be transferred to other locations during the short time period of construction activity, with no consequent reduction in participation rates or overall enjoyment levels of Aboriginal resource users. The effects

management measures discussed in Section 16.5.5.3 (e.g., safety zones, VTMP, communications) will also help to avoid or reduce effects on these Aboriginal resource use activities.

Within the Strait of Belle Isle, seal hunting areas were identified (Figure 15.5.7-3c); these areas overlap with the submarine cable corridor, and are therefore in the LSA. However, interaction between this resource harvesting activity and Project Construction in the Strait of Belle Isle is not likely due to the scheduling of Project activities during the ice-free months. Therefore, a temporal overlap of marine Project and seal harvesting activities is not likely to occur, and it is not discussed further in this assessment.

Berry harvesting areas were identified in three locations along the transmission corridor where the corridor follows the TLH3 (Figure 15.5.7-3c), and therefore occur in the LSA. Two locations along the TLH3 were identified as areas used for wood harvesting.

Berry harvesting areas that overlap with the transmission corridor were also identified in the Forteau Point area, including the general area near the Strait of Belle Isle extending north for approximately 25 km; portions of this area overlap with the LSA (Figure 15.5.7-3c).

In the southern section of the corridor, near the Strait of Belle Isle, two wood harvesting areas that overlap with the LSA were identified (Figure 15.5.7-3c).

Information obtained from the Phase II Community Engagement Agreement with NCC identified one location in the LSA where plants were harvested for medicinal purposes. This location was near the Labrador Straits (Figure 15.5.7-3c).

Maps produced under the Phase I Agreement with Pakua Shipi indicate that members of the community carry out resource harvesting in the RSA. One location was identified within the LSA in the area to the east of the Saint-Augustin River. No temporal designation was given to this location, therefore, further details on this area will be extracted from ongoing data collection with the community to ascertain whether it is a current resource harvesting area. Other hunting and trapping activities have been identified in the RSA near the Traverspine River and Kenamu River. As well, hunting and trapping activities have been identified outside the RSA west of Gull Island and in the area south of Lake Melville. More detailed information regarding specific locations of Innu of Pakua Shipi's land and resource use and the frequency of this use will be provided in the reports and data collected under the Phase II Community Engagement Agreement. Nalcor will consider and incorporate any information obtained under the Phase II Community Engagement Agreement, including the potential for mitigation and adaptive management during detailed design and routing, where relevant.

Places of cultural significance for Innu Nation have been identified within the LSA. *Manitu-utshu*, or the rock knoll, is located on the north side of Muskrat Falls and within the proposed transmission corridor. One birth place was recorded approximately 10 km from Muskrat Falls, outside the LSA and RSA. Muskrat Falls is also the known location of a former shaking tent ceremony, located within the LSA. No construction is planned on the north side of the river and therefore, no interaction between the Project and these places of cultural significance is expected.

Birth and death places, gathering places, shaking tent locations, burial grounds and a place of religious significance were recorded along the Churchill River between Gull Island and Muskrat Falls, and near Happy Valley-Goose Bay and Mud Lake, and elsewhere in the Central and Southeastern Labrador region; all are outside the RSA.

During interviews conducted with Pakua Shipi community members in 2010, four birth places and five burial grounds were identified. One of the burial grounds identified is potentially located within the LSA, near the area where the St. Paul River overlaps with the transmission corridor. Two other places of cultural significance were identified north-east of the St. Augustin River, east of the transmission corridor and outside the RSA. Additional details on places of cultural significance are being collected as part of the Phase II Community Engagement Agreement and will be considered and incorporated, including the potential for mitigation and adaptive management, where relevant.

Based on the information gathered during interviews with members of NCC, places of cultural significance were not identified within the LSA or RSA.

Project Construction activities will also occur near, and in many cases will cross over, watercourses and waterbodies of varying sizes and other physical and hydrological characteristics. Specific information on the current navigational use by Aboriginal groups and communities of the hundreds of watercourses that will be crossed by the transmission line is limited, thus this assessment is conservatively based on an assumption that any watercourse that could support such travel may indeed be used for such purposes at the eventual Project crossing point. As described in Chapter 3, Project Description, Nalcor will plan and implement Project Construction work with the goal to avoid or minimize any direct interaction with waterbodies and watercourses, and will maintain a vegetative buffer along both sides of watercourses and waterbodies during ROW clearing. Direct interaction with the freshwater environment during Project Construction will occur primarily during periodic fording, where required, and during the installation of culverts or bridges to establish access trails or roads. These are both regulated activities, and will be undertaken in accordance with all applicable permits and approval conditions. In addition, the transmission towers and conductors will be designed and built to meet applicable Canadian standards (Section 3.3.2.1), which ensure that overhead transmission lines have sufficient clearance to allow navigation on water and road crossings. Issues related to the navigational use of inland waters by boats or snowmobiles are therefore not anticipated.

Summary of Likely Residual Environmental Effects

The likely residual effects of Project Construction on the Aboriginal Contemporary Traditional Land Use KI are as follows:

- Adverse, as construction activities may cause disruptions to or restrictions on existing land and resource use by members of Aboriginal communities or organizations. The creation of access in certain areas may prove beneficial for some land uses where members of Aboriginal communities and organizations can pursue contemporary land use activities for traditional purposes.
- Of low to moderate magnitude, as in many cases the land area occupied by the Project will be small compared to that used by or available to members of Aboriginal communities or organizations to carry out contemporary activities for traditional purposes, and because Project design, consultation and / or other effects management measures will serve to identify and address most issues. The effect is unlikely to result in a risk to overall participation rates, user enjoyment or societal values.
- Local in geographic extent, as most if not all interactions between the Project and Aboriginal land use will occur within the LSA, and particularly, at the site of construction activity as it occurs, with regional effects potentially occurring due to an expanded zone of influence.
- Of short to medium-term duration, as many potential disturbances will end quickly, whereas others (such as ROW clearing or infrastructure placement) will continue throughout the Construction phase of the Project (and then beyond, see Operations and Maintenance).
- Of low to continuous frequency, as some disruptions will occur only once or occasionally whereas others will extend throughout Construction and beyond.

Based on a comprehensive review of available literature and data collected from Aboriginal communities and organizations to date, there is a moderate to high degree of certainty in these effects predictions given the general nature of the Project, the effects management approaches and measures planned, and experience with similar projects. The amount of land that will be affected or removed from use as a result of the Project is a small percentage of the land available for any one of the land uses in the region.

In addition, Nalcor will continue to use information collected during past and ongoing discussions with potentially affected Aboriginal groups and communities to avoid conflicts with contemporary land use for traditional purposes to the extent practical. Where an overlap of the Project and Aboriginal land use occurs, adverse effects can be addressed through mitigation (e.g., adherence to regulations, avoidance, limited access

and communication). The information pertaining to the contemporary traditional land use of Innu Nation and the Nunatsiavut Government in the LSA and RSA is considered complete. Nalcor has a continued commitment to support information gathering and land and resource use studies under the current community engagement agreements with NunatuKavut, Pakua Shipu and Unamen Shipu. Nalcor will consider and incorporate information where relevant, including the potential for mitigation and adaptive management.

16.5.5.6 Construction Effects: Protected Areas

Land areas across Newfoundland and Labrador have been identified as being special and particularly important or representative for ecological and / or cultural reasons, and have therefore been afforded protection under provincial or federal legislation or through other means. An important principle and objective of Project planning to date has been to avoid existing protected areas during transmission corridor selection and in the placement and design of other components of the Project, and this will continue into detailed engineering and design.

As described in Section 15.5.12, the proposed Project completely avoids most protected areas across the province. However, there are a number of locations where the currently identified 2 km wide transmission corridor does overlap slightly with the edges of protected areas. This is due solely to the fact that topographical constraints and Nalcor's objective to follow existing transmission lines or other developments have restricted transmission line placement to specific areas. However, this "interaction" is purely artificial and Nalcor commits to completely avoiding existing protected areas in the eventual selection of a specific routing for the transmission line ROW and the siting of other Project infrastructure. Consequently, direct effects on these existing protected areas in Newfoundland and Labrador will not occur.

The proposed transmission line will also cross the Newfoundland T'Railway Provincial Park at multiple locations in Central and Eastern Newfoundland and on the Avalon Peninsula. In these locations, the T'Railway Provincial Park can be easily and completely spanned and direct interactions or issues are not anticipated. Nalcor and its contactors may also seek to use a portion of the T'Railway Provincial Park to provide construction access for specific worksites, and would do so only following discussions with the GNL Natural Heritage Branch, Parks and Natural Areas Division and the Newfoundland T'Railway Council and with the necessary approvals. The most important likely interaction between the Project and the T'Railway Provincial Park will occur in the Conception Bay South area, where the site of the proposed electrode structure at Dowden's Point overlaps with the T'Railway Provicial Park. Nalcor has discussed this with the GNL Natural Heritage Branch, Parks and Natural Areas Division, and will continue to explore options to address the interaction, including the possible modification of the small section of the railbed around the Project site. This section of the T'Railway Provincial Park is reportedly prone to effects by wave action, and such minor relocations have reportedly occurred in other areas. Nalcor will continue to work with the provincial government to arrive at a mutually acceptable approach, which will be implemented in compliance with the necessary approvals.

In locations where proposed Project sites and associated construction activities occur in close proximity to protected areas, there is the potential that the Project may be perceived to affect the overall integrity and enjoyment of these areas during times of active construction. Issues and interactions relating to protected areas would be similar to those discussed above under the Recreational Land and Resource Use KI; for example, potential effects of the Project on the wilderness character and aesthetic quality of existing areas and their use due to Project related equipment use, noise, human presence, or other perceived disturbance. These issues would be particularly relevant to protected areas, given that the designation, protection and use of protected areas is often based on their undisturbed nature.

In Central and Southeastern Labrador, the transmission corridor avoids the proposed Mealy Mountain National Park area and the proposed Eagle River Waterway Provincial Park. The edge of the corridor is over 5 km from the southwestern portion of the proposed Eagle River Waterway Provincial Park, through which the existing highway passes. The proposed transmission line, Strait of Belle Isle cable landing site and proposed shore electrode are also more than 10 km from the Pinware River Provincial Park in the Labrador Straits. However,

on the Northern Peninsula, the transmission corridor skirts the western edge of the Main River Provincial Park; in Central Newfoundland it skirts the edge of the West Brook Ecological Reserve. The transmission corridor also overlaps slightly with the Jack's Pond and Butterpot Provincial Parks and the Hawke Hill Ecological Reserve which are located on the Avalon Peninsula or Isthmus, but in this area the transmission line will be constructed adjacent to existing high voltage transmission lines and / or the highway.

Project Construction will progress as a sequence of activities at each location, where the intensity and duration of work activity at any one location will be low. The nature and low number of Project sites near existing protected areas, as well as the distances and topographies involved and the timing and intensity of human presence in these areas, will make the likelihood of any effects on these sites and their use low, and of short duration. Adverse effects on the ecological integrity or cultural value of any existing protected area in Newfoundland and Labrador are not likely to occur as a result of Project construction activity.

Summary of Likely Residual Environmental Effects

The likely residual effects of Project Construction on the Protected Areas KI are as follows:

- Adverse, as the Newfoundland T'Railway Provincial Park will be spanned, and may be relocated in one segment, with the approval of and in cooperation with the province and the Newfoundland and T'Railway Council. The Project has and will be planned and designed so that no Project components occur within existing protected areas. However, the Project will be visible from some protected areas.
- Of low magnitude, because only users in locations of protected areas near construction sites during Project Construction activities may experience effects.
- Local in geographic extent, as most interactions will occur within or near the LSA, and near the periphery of protected areas.
- Of short to medium-term duration, as many potential disturbances will last for only a short time, whereas others (such as clearing or infrastructure placement) will continue throughout the Construction phase of the Project and beyond (see Operations and Maintenance).
- Of low to continuous frequency, as some disruptions will occur only once or occasionally, whereas others will extend throughout Construction and beyond.

Based on the known locations of protected areas discussed in this section, there is a high degree of confidence in these effects predictions given the nature of the effects management measures and approvals and Nalcor`s experience with similar projects.

It should be reiterated that this assessment has, of necessity, focused on existing and known protected areas in Newfoundland and Labrador, as well as those which have been formally proposed and publicly announced by governments. Nalcor understands that the Government of Newfoundland has also developed a new Natural Areas Systems Plan (NASP) which identifies various other proposed protected areas throughout the province. The NASP has not been released for public review, and as such, these proposed protected areas cannot be presented or assessed for the VEC in this EIS.

Nalcor will continue to work and consult with the GNL Natural Heritage Branch, Parks and Natural Areas Division and other relevant organizations as it proceeds with Project planning, and incorporate any information on these proposed protected areas that becomes available during ongoing Project planning, design and implementation. Nalcor expects this process to build on their approach to avoid protected areas, and other pristine areas, such as the Highlands of St. John and the Soufflets – Main River areas, to the extent practical.

16.5.6 Operations and Maintenance

This section describes the potential effects of Project Operations and Maintenance on the Land and Resource Use VEC.

16.5.6.1 Overview of Project Operations and Maintenance and Associated Effects Management

Once the construction of the Project is completed, levels of activity along the Project components will decrease substantially, and temporary construction infrastructure such as construction camps, marshalling yards and staging areas, and most access roads and trails will be decommissioned.

Following Project commissioning, the Project will be operated on a continuous basis. Project maintenance activities will include regular inspection of all Project components, repairs to the system as required, and periodic vegetation management along the cleared ROW (Chapter 3, Project Description). The transmission lines will be 100% inspected through ground and / or aerial patrols, with 10% to 20% of the line being inspected via climbing inspections each year. The inspections for the on-land portions of the lines will be completed from the air (helicopter) or from the ground (ATVs during summer or snowmobiles in winter). The submarine cables and electrodes will be inspected through ROV surveys and / or other appropriate means. Vegetation management will commence eight years after construction is completed and will be conducted every seven years thereafter during Project operations. Activities associated with the operation of the HVdc system will be integrated into Nalcor's existing system-wide inspection and maintenance program. Project Operations and Maintenance activities will be carried out in accordance with standard procedures and relevant environmental protection measures. These are discussed in the environmental effects assessment sections that follow.

The aspect of the Operations and Maintenance phase of the Project that will be most relevant to land and resource use activities is the ongoing presence of the Project, including the cleared ROW, transmission towers and conductors, submarine cables, electrodes and other elements on the landscape.

Environmental effects management strategies and measures for Project Operations and Maintenance will be similar to those summarized for the Construction phase above. Of particular relevance will be ongoing communications about upcoming maintenance activities and the overall operation of the transmission system, as well as general planning and scheduling of Operations and Maintenance activities to avoid interfering with adjacent land and resource uses and users within or adjacent to the ROW as much as possible.

16.5.6.2 Existing Knowledge

The presence and operation of high voltage electrical transmission systems is common worldwide, and the potential effects of transmission lines on land and resource use are, in many respects, similar to those which may be experienced with any large project, and particularly comparable with those of other linear projects such as pipeline, road and railway construction.

However, little available published "existing knowledge" which has evaluated and measured the actual and known effects of similar projects and activities. Some key findings from a selection of recent published literature that is relevant to transmission line operation are provided in Table 16.5.6-1.

Table 16.5.6-1 Existing Knowledge (Operations and Maintenance): Effects of Similar Projects on Land and Resource Use

Reference	Study / Project Context	Summary of Findings
PSC Wisconsin (2010, internet site)	This overview reviews the environmental issues and concerns raised by the construction of electric transmission facilities. The first part of the overview provides a general summary of the methods to measure and identify environmental impacts. The second part of the overview is an A to Z directory of specific environmental issues and techniques to minimize or mitigate the impacts.	– Discussion of potential impacts and methods to minimize or mitigate the impacts on various land and resource use activities.
Soini et al. (2009)	Article identifies and describes factors that are assumed to contribute to local residents' perceptions of power transmission lines as a part of their everyday landscape. It analyses how transmission lines are perceived in comparison to other landscape elements and examines whether in their present location they are perceived as landscape damage.	– Transmission lines are generally perceived as negative, both as existing and new landscape elements. – Negative perceptions of transmission lines are particularly strong among people with positive environmental attitudes and nature orientation in leisure activities.
Taku Wilderness Association (2001)	The Impact of Resource Developments on Traditional Land-based Economies	– Resource developments have had many impacts on traditional land-based economies in the north. – Effects include increased competition for natural resources, theft and vandalism of property, and disproportionate impacts on family areas. – The report suggests that post impact studies of resource developments and traditional land-based economies means little is known about the short and long-term impacts on traditional economies, and therefore the cultures, of Aboriginal communities. This low level of knowledge about the range of impacts and their duration, and the corresponding uncertainty, demands that a precautionary approach be adopted.

16.5.6.3 Operations and Maintenance Effects: Commercial / Municipal and Recreational Land and Resource Use

This section examines the potential effects of Project Operations and Maintenance activities on the Commercial / Municipal Land and Resource Use KI and the Recreational Land and Resource Use KI within the regions crossed by the Project. These KIs are discussed in a common section, given that relevant Project elements and potential issues and interactions for both are similar. Any important differences between these KIs are highlighted where relevant.

In terms of direct interaction (overlap) between Project Operations and Maintenance and existing land and resource uses, many effects will be a continuation of those that originated during Construction. Little or no

new land or ground disturbance will be required during operations, and decommissioning of some Project infrastructure will occur upon completion of construction (e.g., most access trails, camps, marshalling yards). Any direct effects on land will have already occurred or been avoided or addressed through the planning and other mitigation measures implemented prior to and during Project Construction.

Most "mobile" land and resource use activities (e.g., forestry, mineral exploration, marine vessel traffic and other similar activities) will be able to continue uninterrupted in or near the Project throughout the life of the Project. This is the case except at specific areas and times when some activities (e.g., forest harvesting along the cleared ROW) will not be able to continue at a given location when system maintenance, repairs and vegetation management activities are occurring. However, the relatively small scale, intermittent and short-term duration of these Project activities will limit the potential for any interactions or likely effects to occur.

A key issue raised through consultation relates to the potential effects of the presence of the Project transmission towers and cleared ROW on commercial outfitters and their operations, particularly on the Northern Peninsula. Although several outfitter camps are located in areas with ground access and other existing human activities, several are fly-in operations situated in relatively remote and pristine areas. For these outfitters, the remoteness and wilderness character of their camps are important factors to their clients.

Transmission line routing in the Long Range Mountains area and possibly other areas will be explored during Project planning and detailed route selection to limit the potential for the eventual use of the ROW by ATVs and other modes of public access, to help reduce human access to these areas and any associated harvesting which may have an effect on the wildlife populations that the outfitters depend upon.

During Project Operations and Maintenance, Nalcor will work directly with any active commercial outfitter with an existing camp located within the transmission corridor, or within 5 km of the corridor or of any other permanent Project component, to schedule Project activities to avoid or reduce any potential issues or interactions resulting from Operations and Maintenance activities.

It is anticipated that these planning and consultation measures will help to address the issues and concerns of those active and remote outfitters that the transmission line will pass close to or in the general vicinity of. Good resource management and active regulatory enforcement by relevant government agencies will also be a key measure to address any such effects.

Based on viewshed modelling produced for the Project (Stantec 2011b), the transmission line will be visible from Hynes Hunting and Fishing Lodge on Portland Creek Pond, and from Parsons Pond Outfitting (Snowy Lake Lodge). It is possible that the transmission line will not be visible from Four Ponds Outfitting, which is located at the headwaters of the Main River. Whether and to what degree the hunters who visit these camps either notice or dislike the presence of the transmission line will likely vary, and this is a personal and subjective matter. However, it is anticipated that outfitters will be able to eventually incorporate the presence of the Project into their operations, and adjust the specific areas in which they take any guests to avoid areas where the transmission line is visible.

Various components of the Project will be located in areas used for other recreational activities, including hunting, trapping, angling, ATV and snowmobile use, boating, berry picking, firewood cutting, hiking, bird watching, camping, skiing and other consumptive and non-consumptive outdoor recreational activities.

As described above, the presence of the Project will generally not prevent or otherwise restrict the conduct of these activities in or near the Project areas. For some recreational users, the visible presence of large transmission towers, a cleared ROW and / or other Project elements may detract from the experience of going into the country, and cause them to access certain areas less often or stop using certain areas where the Project is located or visible from. Whether and to what degree these land users are aware of and concerned by the presence of the transmission line is a personal and subjective matter. This will vary between individuals, as will the degree to which the Project will affect their use of certain areas and / or overall participation and enjoyment levels.

Any recreational resource users that feel disturbed by the presence of the Project at a given location will be able to use other areas, given the overall land area available for such recreational activities in any given region. Therefore, an overall decrease in the levels of recreational land use activities or their enjoyment in any region is not anticipated.

International Appalachian Trail Newfoundland and Labrador (IATNL) is developing a system of hiking trails from southwestern to northern Newfoundland (Chapter 15, Existing Socioeconomic Environment). This includes an extensive network of existing and proposed trails in the south-central portion of the Northern Peninsula (Section 15.5), which connect existing trails and resource roads to create a network of backcountry trails that expands each year. 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. New trail connections are proposed from Eastern Blue Pond in the north to the Main River area in the south. Based on the most recent mapping information provided by the IATNL, the existing trail system crosses the proposed transmission corridor along parts of the existing Indian Lookout Trail and the proposed trails in that area and near the Main River. Given the overall size and geographic extent of existing and proposed trails across the Island's Northern Peninsula, some degree of interaction between the Project and IATNL's existing and / or future trail network is inevitable. However, this will not result in a direct land use conflict as the transmission towers and conductors can easily span trails as required. The most likely potential interaction between the IATNL's trail system and the Project will be visual in nature, since the transmission line will be visible from some points along this large network of hiking trails. Nalcor has met and will continue to meet with the IATNL as engineering progresses, to discuss the specific Project routing and tower placement to reduce visual affects in key areas where technical and cost considerations will facilitate this.

The Project has the potential to be used by local residents and resource users as a transportation corridor. As described in Chapter 3, Project Description, vegetation will be cleared along the ROW during Construction, and ongoing vegetation management will keep vegetation to below 2 m in height over the life of the Project. Therefore, while the ROW will not be accessible to automobile traffic, an access trail along the ROW to facilitate ongoing inspection and maintenance (similar to existing transmission lines throughout the province) will likely be used by operators of ATVs and snowmobiles. Although Nalcor does not condone or promote the use of its transmission line ROWs for this purpose, it is aware that these activities occur elsewhere in the province and considers prevention of such activities difficult, if not impossible. It has been noted through public consultation and in other forums that such access may have an overall positive effect on some land and resource users, as it will provide better or new access to currently remote areas, for general passage (such as snowmobile travel) and to access new areas for activities such as hunting and fishing.

Whether and to what degree, and for what purpose, persons will use portions of the transmission ROW as a transportation corridor cannot be known with certainty, and will vary considerably by region. A detailed analysis of existing access within and adjacent to the proposed transmission corridor was completed as part of its Socioeconomic Environment Component Study for this EA (Nalcor et al. 2011). The analysis determined that while certain parts of the corridor have little or no existing access (for example, the eastern half of the corridor in Central and Southeastern Labrador, after it leaves the TLH; and, the area where it crosses the Long Range Mountains on the southern part of the Island's Northern Peninsula), most parts of the corridor already have considerable existing accessibility due to forest access roads and other trails. Indeed, the presence of existing access was a key consideration in the selection of the transmission corridor, including decisions to route the corridor along the western portion of the TLH in Labrador, use existing forest access road networks wherever possible and, while respecting technical design requirements, follow existing transmission lines from Port Blandford to Soldiers Pond, both to allow for better construction access and to avoid opening up new areas for human activities and use. Therefore, in many instances the Project will likely not create or enhance access to any particular wilderness area. In other areas, people may choose to use the ROW to access cabins or other sites rather than using existing routes, with little or no change in the nature or intensity of human presence or activities.

Nalcor will consult with government departments, Aboriginal groups, outfitters and other groups and individuals to explore possible transmission line routing approaches (e.g., spanning natural topographic

features which would serve as natural access barriers) in currently remote areas and identified sensitive areas to minimize the eventual use of the ROW by ATVs and other modes of public access. This will help to reduce human access and any associated harvesting in currently less accessible areas. The management of improved access into previously remote areas will be primarily achieved through sound resource management and active regulatory enforcement by relevant government agencies.

Summary of Likely Residual Environmental Effects

The likely residual effects of Project Operations and Maintenance on the Commercial / Municipal and Recreational Land and Resource Use KIs are as follows:

- Adverse, as maintenance activities and / or the presence of Project infrastructure will disrupt existing land and resource users. Ongoing access in certain areas will likely prove beneficial for some.
- Of low to moderate magnitude, as in many cases the land area occupied by the Project will be small compared to that used by or available to existing users, and because Project design, consultation and / or other effects management measures will serve to identify and address most issues.
- Local in geographic extent, as most if not all Project interactions will occur within the LSA, and particularly, at the Project sites and adjacent areas, with regional effects potentially occurring due to an expanded zone of influence (e.g., visual).
- Of short-term to far future duration, as maintenance-related disturbances will end quickly, whereas others (such as the presence of the ROW and transmission towers) will continue throughout the life of the Project.
- Of low to continuous frequency, as some disruptions will occur only once or occasionally, whereas others will extend throughout the life of the Project.

There is a high degree of certainty in these effects predictions given the general nature of the Project, the effects management approaches and measures proposed, and experiences with similar projects.

16.5.6.4 Operations and Maintenance Effects: Aboriginal Contemporary Traditional Land Use

This section examines the potential effects of Project Operations and Maintenance activities on the Aboriginal Contemporary Traditional Land and Resource Use KI within the Central and Southeastern Labrador region crossed by the Project.

In terms of direct interaction (overlap) between Project Operations and Maintenance and existing land and resource use by members of Aboriginal communities and organizations, most effects will be a continuation of those that originated during Project Construction. Little or no new land or ground disturbance will be required during operations, and in some areas Project infrastructure will be decommissioned (e.g., access trails, camps, marshalling yards) upon completion of construction. Any direct effects on land will have already occurred, or been avoided or addressed through the planning and other mitigation measures implemented prior to and during construction.

Various components of the Project will be located in areas used by members of Aboriginal communities and organizations for the purpose of hunting, trapping, gathering and fishing at various times of the year, and travelling on the land to places of cultural significance.

The presence of the Project will generally not prevent or otherwise restrict the conduct of these activities in or near the LSA. For some Aboriginal users, the visible presence of large transmission towers, or a cleared ROW and / or other Project elements may detract from the experience of going into the country, and cause them to reduce their use of or stop using certain areas where the Project is located or visible. Again, whether and to what degree Aboriginal land users are aware of and concerned by the presence of the transmission line is a

personal and subjective matter. This will vary considerably between individuals, as will the degree to which the Project will affect their use of certain areas and / or overall participation and enjoyment levels.

In addition, the Project will be located in a defined, localized area representing a small portion of the land area available for Aboriginal contemporary traditional land use activities in any given region. Any member of an Aboriginal group or community that feels disturbed by the presence of the Project at a given location may use other areas. Therefore, an overall decrease in the level of Aboriginal activities for traditional purposes on the land is not anticipated.

The proposed transmission line has the potential to be used by Aboriginal users as a travel route. As described in Chapter 3, Project Description, vegetation will be cleared along the ROW during construction, and ongoing vegetation management will keep vegetation below 2 m in height over the life of the Project. The ROW will therefore not be accessible to automobile traffic, although an access trail along the ROW to facilitate ongoing inspection and maintenance (similar to existing transmission lines throughout the province) will likely be used as an access route by Aboriginal users at various times of the year. Although Nalcor does not condone or promote the use of its transmission lines for this purpose, it is aware that this activity occurs elsewhere in the province and considers prevention of such activities difficult if not impossible. Through Nalcor's ongoing engagement with Aboriginal communities and organizations, some members have indicated that such access may have an overall positive effect on some Aboriginal land and resource users, as it will provide better or new access to currently remote areas, both for general passage (such as snowmobile travel) and to access areas for activities such as hunting and fishing. Whether and to what degree, and for what purpose, Aboriginal persons will use portions of the ROW as a transportation corridor cannot be known with certainty and will likely vary by group. As noted previously, Nalcor will consult with Aboriginal communities and organizations to explore possible approaches to transmission line routing. Nalcor has a continued commitment to undertake and finalize land and resource use studies under the current community engagement agreements with NunatuKavut, Pakua Shipu and Unamen Shipu. Nalcor will consider and incorporate information where relevant, including the potential for mitigation and adaptive management during detailed design and routing.

Vegetation management during Project Operations and Maintenance will include herbicide application, which could adversely affect areas currently available for berry picking or harvesting of medicinal plants. Vegetation management (i.e., via mechanical and herbicide application) will be undertaken on the ROW to remove trees greater than 2 m in height. The herbicide to be used is Tordon 101 mixed with Sylgard 309; it will be applied in accordance with appropriate regulations and procedures by approved personnel. Vegetation management will likely start in year eight of operations and will be repeated every seven years thereafter, or as required for safety. As such, only a portion of the ROW would be managed every seven years, and only appropriate plants (i.e., tall growing species) will be treated. In addition, the herbicide is considered to be non residual and non toxic to wildlife or humans in the doses that would be applied to plants on the ROW. In any event, communities and Aboriginal groups would be advised of locations of the ROW scheduled for vegetation management, so that plant and berry harvesting would not occur in that location for a given time period.

Summary of Likely Residual Environmental Effects

The likely residual effects of Project Operations and Maintenance on the Aboriginal Contemporary Traditional Land Use KI are as follows:

- Adverse, as maintenance activities and / or the presence of Project infrastructure may disrupt Aboriginal contemporary traditional land and resource users. The creation of access in certain areas may prove beneficial for some.
- Of low to moderate magnitude, as in many cases the land area occupied by the Project will be small compared to that used by or available to members of Aboriginal communities or organizations and because Project design, consultation and / or other effects management measures will identify and address most issues.

- Local in geographic extent, as most if not all Project interactions will occur within the LSA, and particularly, at the Project sites and adjacent areas, with regional effects potentially occurring due to an expanded zone of influence (e.g., visual effects).
- Of short-term to far future duration, as maintenance-related disturbances will end quickly, whereas others (such as the presence of the ROW and transmission towers) will continue throughout the life of the Project.
- Of low to continuous frequency, as some disruptions will occur only once or occasionally, whereas others will extend throughout the life of the Project.

Based on a comprehensive review of available literature and data collected from Aboriginal communities and organizations to date, there is a moderate to high degree of certainty in these effects predictions given the general nature of the Project, the effects management approaches and measures proposed, and experience with similar projects. The amount of land that will be affected or removed from use is a small percentage of the land available for any specific land use in the region. Nalcor will continue to use information collected during past and ongoing discussions with potentially affected Aboriginal groups and communities to avoid conflicts with contemporary land use for traditional purposes to the extent practical. Where an overlap of the Project and traditional land use occurs, adverse effects can be addressed through mitigation (e.g., adherence to regulations, avoidance, limited access and communication). The information pertaining to the contemporary land use of Innu Nation and the Nunatsiavut Government in the LSA is considered complete. Nalcor has a continued commitment to undertake and finalize land and resource use studies under the current community engagement agreements with NunatuKavut, Pakua Shipu and Unamen Shipu. Nalcor will consider and incorporate information, including the potential for mitigation and adaptive management during detailed design and routing, where relevant.

16.5.6.5 Operations and Maintenance Effects: Protected Areas

This section examines the potential effects of Project Operations and Maintenance activities on existing protected areas.

As described previously, the planning and engineering design for the Project, including the specific routing of the ROW and the siting of all Project components and activities, will be completed with the goal to avoid any direct overlap with existing protected areas in Newfoundland and Labrador. The required transmission line crossings, access use and possible interaction of the Dowden`s Point electrode site with the Newfoundland T'Railway Provincial Park will be addressed through the planning and design measures discussed under Construction effects in Section 16.5.5.6. No effects will extend into the period of Project Operations and Maintenance. Maintenance and repair activities will occur at times in portions of the Project area close to existing protected areas, but these activities will be infrequent and of relatively short-term duration, and will not likely affect the integrity or use of protected areas.

The primary potential interaction between the Project during operations and the Protected Areas KI relates to the potential presence and visibility of the transmission towers and cleared ROW from nearby protected areas. This is particularly relevant for the Main River Provincial Park, the West Brook Ecological Reserve in central Newfoundland, and the Jack's Pond and Butterpot Provincial Parks, and Hawke Hill Ecological Reserve which are located on the Avalon Peninsula and its Isthmus.

Even with routing design to avoid these protected areas, the transmission towers will still likely be visible from some locations (depending on topography and vegetation cover). As described in Section 16.8 of this EIS, elements in the landscape may be discernable up to 4.8 km (i.e., at this distance, Project components lose detail and blend into the surrounding landscape). Other protected areas such as proposed parks in Central and Southeastern Labrador, Gros Morne National Park and Avalon Wilderness Reserve are located more than 4.8 km from the Project transmission corridor. Transmission towers may be visible from parts of Bay du Nord Wilderness Reserve and Terra Nova National Park as these are less than 5 km from the corridor. However, these locations are presently adjacent to the TCH and an existing transmission corridor.

Summary of Likely Residual Environmental Effects

The likely residual effects of Project Operations and Maintenance on the Protected Areas KI are as follows:

- Adverse, because although the Project has and will be planned and designed so that no Project components occur within existing protected areas, the transmission towers and construction activities will be visible from some protected areas. The presence of the Project is not likely to result in any change in the ecological integrity, cultural value or societal use and enjoyment of these protected areas.
- Of low magnitude, because users in locations of protected areas near Operations and Maintenance activities may experience effects. Users within most protected areas will not be able to see the Project. From within a few protected areas users may see portions of the Project from limited locations within the protected area.
- Local in geographic extent, as most interactions will occur within or near the LSA, near the periphery of protected areas.
- Of short-term to far future duration, as many potential disturbances will last for only a short time, whereas others (such as ongoing maintenance and repairs and the visual presence of the towers) will continue throughout the life of the Project.
- Of low to continuous frequency, as some disruptions will occur only once or occasionally, whereas others will extend throughout the life of the Project.

Nalcor will continue to work and consult with the GNL Natural Heritage Branch, Parks and Natural Areas Division and other relevant organizations as it proceeds with Project planning, to seek to incorporate any available information on proposed protected areas into its planning, design and implementation of the Project.

Based on the known locations of protected areas discussed in this section, there is a high degree of certainty in these effects predictions given the nature of the Project, the effects management measures and approaches, and experience with similar projects.

16.5.7 Environmental Effects Summary and Evaluation of Significance

16.5.7.1 Summary of Environmental Effects

A summary of likely Project-related effects are presented in Table 16.5.7-1. The information is organized by KI.

Table 16.5.7-1 Environmental Effects Analysis Summary: Land and Resource Use

Project Phase / Key Indicator	Likely Residual Environmental Effects Summary Descriptors				
	Direction	**Magnitude**	**Geographic Extent**	**Duration**	**Frequency**
Construction					
Commercial / Municipal and Recreational Land Use	**Adverse** – Construction will disrupt existing users and will occupy areas that may prevent or restrict use – Creation of access in certain areas will be beneficial for some uses	**Low to Moderate** – In many cases, the land area occupied by the Project will be small compared to that used by or available to existing users – Design, consultation, permitting and / or other effects management will identify and address most issues	**Local** – Most interactions will occur within the LSA and at the site of construction activity as it occurs	**Short-term to Medium-term** – Many potential disturbances will end quickly – Others will continue throughout Construction, and Operations and Maintenance	**Low to Continuous** – Some potential disruptions will occur only once or occasionally – Others will extend throughout Construction and beyond
Aboriginal Contemporary Traditional Land Use	**Adverse** – May cause disruptions of land use – Increase in access will likey be beneficial for some land users	**Low to Moderate** – Land area occupied by the Project is small compared to that available for the same traditional purposes	**Local to Regional** – Most disturbances will occur within the LSA, with visual issues potentially extending into the RSA	**Short-term to Medium** – Many disturbances will occur quickly (e.g., clearing) while others will continue through Project Construction	**Low to Continuous** – Some disruptions will occur only once or occasionally whereas others will be continuous

Table 16.5.7-1 Environmental Effects Analysis Summary: Land and Resource Use (continued)

Project Phase / Key Indicator	Likely Residual Environmental Effects Summary Descriptors				
	Direction	**Magnitude**	**Geographic Extent**	**Duration**	**Frequency**
Protected Areas	**Adverse** – No Project components are within existing protected areas – The T'Railway Provincial Park will be spanned a number of times and a small section may be relocated – The Project will be visible from some protected areas	**Low** – Only users in locations of protected areas near construction sites during construction activities may experience effects – Most issues will be identified and addressed through consultation and communications	**Local** – Most interactions will occur within or near the LSA, and near the periphery of protected areas	**Short-term to Medium-term** – Many potential disturbances will last for only a short time – Others will continue throughout Construction and beyond	**Low to Continuous** – Some disruptions will occur only once or occasionally – Others will extend throughout Construction and beyond
Summary of Likely Residual Construction Effects on Land and Resource Use: Although Project components will occupy areas that may prevent or restrict land and resource use, the land area occupied by the Project will be small compared to that used by or available to existing users. Creation of access in certain areas may be beneficial for some land users. Project-related effects may occasionally and temporarily disrupt existing users as it occurs and only at or near the site of construction activity (including in particular locations of protected areas). However, most issues will be identified and addressed through design, consultation, permitting, communications and / or other effects management. No Project components will be located within existing protected areas, but the T'Railway Provincial Park will be spanned a number of times and a small section may be relocated.					

Table 16.5.7-1 Environmental Effects Analysis Summary: Land and Resource Use (continued)

Project Phase / Key Indicator	Likely Residual Environmental Effects Summary Descriptors				
	Direction	**Magnitude**	**Geographic Extent**	**Duration**	**Frequency**
Operations and Maintenance					
Commercial / Municipal and Recreational Land Use	**Adverse** – Maintenance activities and / or the presence of Project infrastructure may disrupt existing land and resource users – Ongoing access in certain areas may be beneficial for some land users	**Low to Moderate** – Land area occupied by the Project will be small compared to that used by or available to existing users – Design, consultation, permitting and / or other effects management will identify and address most issues	**Local** – Most if not all interactions will occur within the LSA, and particularly at the Project sites and adjacent areas	**Short-term to Far Future** – Maintenance-related disturbances will end quickly – Others will continue throughout the life of the Project	**Low to Continuous** – Some disruptions will occur only once or occasionally – Others will extend throughout the life of the Project
Aboriginal Contemporary Traditional Land Use	**Adverse** – May cause disruptions of land use – Increase in access may prove to be beneficial for some land users	**Low to Moderate** – Land area occupied by the Project is very small compared to that available to Aboriginal land and resource users for traditional purposes	**Local to Regional** – Most disturbances will occur within the LSA, with visual issues potentially extending into the RSA	**Short-term to Far Future** – Many disturbances will occur quickly (e.g., clearing) while others will continue throughout the life of the Project	**Low to Continuous** – Some disruptions will occur only once or occasionally whereas others will occur throughout the life of the Project

Table 16.5.7-1 Environmental Effects Analysis Summary: Land and Resource Use (continued)

Project Phase / Key Indicator	Likely Residual Environmental Effects Summary Descriptors				
	Direction	**Magnitude**	**Geographic Extent**	**Duration**	**Frequency**
Protected Areas	**Adverse** – No Project components occur within existing protected areas – The transmission towers will likely be visible from some locations in protected areas – The presence of the Project is not likely to change the ecological integrity, cultural value or societal use and enjoyment of protected areas	**Low** – Only users in locations of protected areas near Operations and Maintenance activities may experience Project-related effects – Consultation and communications will identify and address most issues	**Local** – Most interactions will occur within or near the LSA, and near the periphery of protected areas	**Short-term to Far Future** – Many disturbances will last for only a short time – Others will continue throughout the life of the Project	**Low to Continuous** – Some disruptions will occur only once or occasionally – Others will extend throughout the life of the Project
Summary of Likely Residual Operations and Maintenance Effects on Land and Resource Use: Project maintenance activities may occasionally and temporarily disrupt existing land and resource users as they occur and only at or near work sites (including in particular locations of protected areas). Design, consultation, permitting, communications and / or other effects management will identify and address most issues. The Project components (particularly the ROW and towers) will be visible to some users including those in parts of some protected areas. However, the presence of the Project is not likely to change the ecological integrity, cultural value or societal use and enjoyment of protected areas.					

16.5.7.2 Definition and Determination of Significance

Significant effects are considered to be those that cause a change in the VEC that will alter its status, integrity and future viability / sustainability beyond an acceptable level. For the Land and Resource Use VEC, significant adverse environmental effects as a result of the Project are defined as follows:

- *Commercial Land and Resource Use*: An effect causing a detectable decrease in activity levels and overall revenues over several years for one or more commercial enterprises which currently operate in the RSA, which challenges the successful operation and overall economic viability of these enterprises.
- *Municipal Land and Resource Use*: The occurrence of Project components and activities within the boundaries of a community without the required approval(s) from the relevant authorities, and which prevents or substantially restricts overall levels of ongoing development and planned growth in the community.
- *Aboriginal Contemporary Traditional Land Use*: An effect causing an overall decrease in levels of contemporary land use for traditional purposes by those Aboriginal communities and organizations that currently undertake such activities within the RSA, resulting in a negative change in the nature and / or cultural value of such activities.
- *Recreational Land and Resource Use*: An effect causing an overall decrease in levels of recreational land and resource use by those who currently undertake such activities within the RSA.
- *Protected Areas*: The occurrence of Project components and activities within the boundaries of an existing protected area and / or adjacent to an existing protected area such that the overall ecological integrity, cultural value and / or societal use and enjoyment of that protected area is compromised.

An environmental effect on the VEC or its KIs that does not meet the above criteria is considered not significant.

Project components will occupy areas currently used for Commercial / Municipal Land and Resource Use purposes but these occupied areas will be a small proportion of the total land available to land users. Creation of new access will be minimal in most areas and in particular areas will be a benefit to some users. Project activities will likely disrupt some types of users and affect their quality of experience but users will be able to use alternative areas in the RSA. Project design, consultation, permitting, communications and other effects management measures will identify and address issues by avoiding sensitive areas as much as possible and complying with development regulations and guidelines. Given the large and alternative areas available to users and the effects management measures planned, it is anticipated that the Project will not result in a decrease in activity, compromise successful operation and overall economic viability of commercial enterprises, or substantially restrict ongoing or planned growth of any community. Therefore, the effects of the Project on the Commercial / Municipal Land and Resource Use KI are not likely to be significant.

Project components will occupy areas currently used for Recreational Land and Resource Use purposes but these occupied areas will be a small proportion of the total land available. Creation of new access will be minimal in most areas and in particular areas will be a benefit to some users. Project activities are likely to disrupt some types of users and affect their quality of experience but users will be able to use alternative areas in the RSA. Project design, consultation, permitting, communications and other effects management measures will identify and address issues by avoiding sensitive areas as much as possible and complying with development regulations and guidelines. Given the large and alternative areas available to users and effects management measures planned by Nalcor, it is anticipated that the Project will not result in a decrease in the current level of recreational activity in any area. Therefore, the effects of the Project on the Recreational Land and Resource Use KI are not likely to be significant.

Project components will occupy areas currently used by Aboriginal groups and organizations for land and resource use purposes but these areas will be a small proportion of the total land available. Creation of new access will be minimal, and the new access that is created will be a benefit to some users. Project activities will likely disrupt some types of users and affect their quality of experience but users will be able to use alternative areas in the RSA. Project design, consultation, permitting, communications and other effects management measures will identify and address issues by avoiding sensitive areas as much as possible and complying with development regulations and guidelines. Given the large and alternative areas available to Aboriginal users and the effects management measures planned by Nalcor, it is anticipated that the Project will not result in a decrease in the current level of land and resource use by Aboriginal groups and organizations for traditional purposes in any area. Therefore, the effects of the Project on the Aboriginal Contemporary Traditional Land Use KI are not likely to be significant.

Project activities will likely disrupt users in protected areas and affect their quality of experience. However, this will occur only in locations on the edge of protected areas which are for the most part currently located near highways and transmission lines. Project design, consultation, permitting, communications and other effects management measures will identify and address issues by avoiding sensitive areas as much as possible and complying with development regulations and guidelines. Given that no Project components or activities will be located within protected areas as well as the large and alternative areas available to users and the effects management measures proposed by Nalcor, it is anticipated that the Project will not result in effects that compromise the overall ecological integrity, cultural value and / or societal use and enjoyment of any protected areas. Therefore, the effects of the Project on the Protected Areas KI are not likely to be significant.

Therefore, the Project is not likely to result in significant adverse environmental effects to Land and Resource Use.

16.5.8 Evaluation of Project Alternatives

This section compares alternative transmission corridor segments with relevant portions of the preferred corridor alignment for the Project. The alternative transmission corridor segments cross the same geographic areas as those of the proposed corridor alignment. The comparison is illustrated in Table 16.5.8-1.

The alternative transmission corridor segments will not likely result in measurably different effects than the proposed transmission corridor with two exceptions. The alternative corridor recommended by the IATNL would mean that the transmission line would be more distant from IATNL trails. The alternative corridor segment suggested by the NLOA would mean that the transmission corridor would follow part of the Newfoundland T'Railway Provincial Park. Neither of these alternatives would result in a change in the overall prediction that the Project is not likely to have significant effects on Land and Resource Use.

Table 16.5.8-1 Summary Evaluation of Project Means: Land and Resource Use

Project Alternative Means[a]	Environmental Implications (Compared to the Proposed Transmission Corridor)[b]			
	Commercial / Municipal	Recreational	Aboriginal Contemporary Traditional Land Use	Protected Areas
A2: North-west of Strait of Belle Isle Alternative Segment	No difference	No difference	No difference	No difference
A3: Point Amour Alternative Segment	No difference	No difference	No difference	No difference

Table 16.5.8-1 Summary Evaluation of Project Alternatives: Land and Resource Use (continued)

Project Alternative Means[a]	Environmental Implications (Compared to the Proposed Transmission Corridor)[b]			
	Commercial / Municipal	**Recreational**	**Aboriginal Contemporary Traditional Land Use**	**Protected Areas**
A4: Strait of Belle Isle Newfoundland Side Alternative Segment	No difference	No difference	—	No difference
A5: GNP North-east Alternative Segment	No difference	No difference	—	No difference
A6: GNP West-central Alternative Segment	No difference	No difference	—	No difference
A7: GNP Eastern LRM Crossing Alternative Segment	No difference	No difference	—	No difference
A8: GNP IATNL Alternative Segment	No difference	Alternative route suggested by IATNL would be further away from trails	—	No difference
A9: Birchy Lake Alternative Segment	No difference	No difference	—	No difference
A10: NLOA Alternative Segment	No difference	No difference	—	Alternative suggested by NLOA partly aligns with the T'Railway Provincial Park
A11: Avalon Alternative Segment	No difference	No difference	—	No difference

— Not applicable to this KI as these alternatives are not within the Central and Southeastern Labrador region.

(a) As identified and described in Chapter 2, Project Rationale and Planning.

(b) Namely, the proposed Project described in the EIS Project Description, Chapter 3, and assessed in the preceding Environmental Effects Analysis.

5 No technically and economically feasible alternatives for the submarine cable crossing or the shoreline electrode sites were identified (see Chapter 2, Section 2.12.3), and therefore marine Project alternatives are not evaluated for Land and Resource Use.

16.5.9 Cumulative Environmental Effects

Cumulative environmental effects occur when the effects of a project interact and accumulate with those of other past, ongoing or reasonably foreseeable future projects. A number of other development projects or activities have affected, or may affect Land and Resource Use in the various regions that are included in the LSA and RSA for this VEC. This includes activities which occur in particular areas or times only (e.g., military flight training activity in Labrador), those which are relatively common and widespread throughout many areas of the province (e.g., hunting, mineral exploration) and several of which have experienced substantial change in their nature and intensity over recent years (e.g., commercial forestry). In the case of the Land and Resource Use VEC, these human activities comprise both the key elements of the VEC / KIs that may be affected, as well as the "other projects and activities" that are assessed for the purpose of the cumulative effects assessment.

Given the diversity and regional nature of such land and resource uses and the other relevant projects and activities, the following discussion is organized by region.

16.5.9.1 Central and Southeastern Labrador

Current land and resource use activity in the Central and Southeastern Labrador region is characterized by the presence of communities, infrastructure and human activities primarily at the western (Upper Lake Melville) and eastern (Labrador Straits) ends of the LSA / RSA, with a vast wilderness area throughout much of the central portion in which human activity (primarily recreational / traditional) has traditionally been limited. The presence of the TLH3 from Happy Valley-Goose Bay to Cartwright Junction and the TLH2 (Red Bay to Cartwright) has changed the character of this area in recent years, including influencing the land and resource patterns in the region. Changes are reflected in the existing (baseline) biophysical and socioeconomic environments, as well as in resource management and regulatory systems in the region.

As discussed in Section 16.5.7, the proposed Project will likely have no significant adverse environmental effects on land and resource use in this region. During Project Construction, any adverse effects are expected to be limited to minor and short-term disruptions to existing activities, with no likely change in the overall nature, intensity, value or enjoyment of land use activities. The Project will not overlap or interact directly with communities in the central Labrador area, and once leaving the Churchill River, will follow along a portion of the TLH3, which will avoid or minimize the adverse effects on existing land and resource activities (e.g., outfitting operations, cabin use) and on the existing and proposed protected areas in this area of Labrador. The southeastern half of the transmission line will pass through an area with no existing ground access and limited development activity, and may be used as a travel corridor for certain activities in that region. Where it approaches and passes through the Labrador Straits, the Project will interact with several communities and existing infrastructure, the potential effects of which will be addressed through good planning, communication and associated regulatory and permitting processes.

The construction and operation of the Lower Churchill Hydroelectric Generation Project will likely overlap in time with the phases and activities of this Project. However, with the exception of proposed work in the Muskrat Falls area, and the associated movement of personnel and materials to and through this region of Labrador, there is limited potential for direct geographic overlap between the effects of these two developments. Other potential future development activities, such as commercial forestry in Forest Management Districts 19 and 21, are subject to comprehensive planning and management processes, which will likely accommodate the presence of the Project. These and other commercial and municipal developments, the designation of new federal and provincial parks in the region, changes in land ownership and rights due to the future finalization and implementation of the Labrador Innu Land Claims Agreement and other future developments in combination with the effects of this Project, are unlikely to significantly affect land use activities given population levels, the nature and intensity of land and resource use and the overall vastness of the region.

16.5.9.2 Strait of Belle Isle

Other marine activities that are relevant to the Land and Resource Use VEC include Marine Fisheries (commercial and recreational, see Section 16.6) and general marine vessel (shipping) activities. These common and long established activities are reflected in the existing biophysical and socioeconomic environments and will not likely be significantly affected by the Project. There are no other identified and reasonably foreseeable development projects in the area that will overlap with the Project, nor are there any known or likely changes to the nature and intensity of fishing activity or other marine activities vessel traffic in these areas.

16.5.9.3 Island of Newfoundland

On the Island of Newfoundland's Northern Peninsula and in its Central and Eastern region, land and resource use is characterized by communities of various sizes along the coastlines, highways and roadways. The local economies of many areas are characterized by commercial activities such as forestry, mining and exploration, as well as various activities that are linked to the province's natural environment. such as commercial outfitting, recreational hunting and fishing, snowmobiling and various parks and protected areas. On the Avalon Peninsula, the population – and thus the diversity and intensity of land uses – is considerably larger, but land and resource use on the peninsula similarly includes industrial, commercial and municipal uses and recreational activities such as extensive cottage development areas. Types and levels of human land use activities in these regions are relatively stable overall, although some activities (such as forestry) have been the subject of considerable change in recent years, and others (such as outfitting) have experienced challenges due to fluctuations in wildlife populations and other pressures.

The proposed Project will likely have no significant adverse environmental effects on land and resource use on the Island of Newfoundland. During Project Construction, adverse effects are expected to be limited to minor and short-term disruptions; and, changes in overall participation rates, quality or revenues associated with land and resource use are not likely. While the Project will overlap or occur in proximity to some communities (particularly in the Strait of Belle Isle area, in Central Newfoundland and along the Avalon Isthmus), and various land uses (e.g., cabins, quarries, trail systems), appropriate planning, ongoing communication, and associated land and resource management and regulatory processes will address any potential conflicts. A large proportion of the proposed transmission corridor follows existing transmission lines and associated Project components are adjacent to other existing access or human activities, which will serve to further reduce any potential for adverse effects. The Project will not pass through, or affect the overall integrity or value, of any existing or formally proposed protected areas.

There are limited known development proposals whose effects will likely overlap spatially and temporally with effects of this Project. Ongoing activities such as forestry, mineral and energy exploration, quarrying, cabin developments, general industrial and residential developments will continue, likely in a similar manner and intensity as that experienced in recent years (although some have recently experienced decline), and will be subject to applicable resource management, planning, regulatory and enforcement measures which will help to avoid or reduce potential conflicts with current land and resource use. Similarly, the legislation and regulatory processes that restrict development activities within existing protected areas will also apply to other, future projects in the province. These activities may, to varying degrees, result in some areas being made unavailable or unsuitable for certain uses and / or users (even temporarily). However, significant effects on the nature, intensity or value of land and resource uses in Newfoundland are not expected, either as a result of the Project or in combination with other likely projects and activities.

Table 16.5.9-1 Cumulative Environmental Effects Summary: Land and Resource Use

Cumulative Effects Analysis	Central and Southeastern Labrador	Strait of Belle Isle[(a)]	Northern Peninsula	Central and Eastern Newfoundland	Avalon Peninsula
Current (Baseline) VEC Condition (Reflecting the Effects of Past and Ongoing Projects and Activities)	– Primarily remote area; human presence and activity is focused in and near communities at each end of the LSA / RSA and along the recently constructed TLH – Interior portion of LSA is not subject to substantial activity	– Marine vessel traffic (commercial and recreational) is well established and reflected in the baseline	– Wide and varied range of past and ongoing land and resource use activities (commercial, municipal, recreational) varies somewhat in type and intensity between regions – Well established and relatively stable overall level and type of activities, although some (e.g., forestry, outfitting) have experienced recent challenges and / or declines		
Likely Residual Environmental Effects of Labrador-Island Transmission Link (Reflecting Current VEC Condition, As Above)	– Likely minor and short-term disruptions during Construction – No significant and sustained adverse effects to overall land and resource use during Construction or Operations and Maintenance				
Likely Cumulative Environmental Effects (within RSA) of Other Future Projects and Activities	– Limited proposed development activity and / or potential for overlapping effects	– Limited proposed development activity or likely changes in nature and intensity of existing activities	– Limited proposed new development activity and / or potential for overlapping effects – Nature of Project helps avoid potential for cumulative effects (e.g., following existing transmission lines) – Minimal Project influence on / contribution to future nature and condition of adjacent land and resource uses (such as outfitting)		
Cumulative Environmental Effects Summary	**Not Significant** – Project-related environmental effects management measures and appropriate management, regulation and enforcement of other ongoing and future developments and activities will minimize cumulative effects – Significant adverse cumulative environmental effects on Land and Resource Use are not likely to occur as a result of the Project in combination with other projects and activities that have been or will be carried out				

(a) Marine environment.

Of particular note in relation to the Land and Resource Use VEC is the commercial outfitting industry in the province, which has been raised as a key issue for the EIS and in general. The proposed Project does not occur in proximity to existing outfitters in Labrador, or in the Central and Eastern or Avalon regions of Newfoundland. However, it will inevitably be located in the general vicinity of several commercial outfitters in the southern portion of the Island's Northern Peninsula. As described earlier, this will be a key consideration in Project design, and through good communication, consultation and planning on the part of Nalcor and by outfitters and industry representatives, it is anticipated that Project Construction, and Operations and Maintenance will not significantly affect the overall nature, level or economic value of the commercial outfitting industry in the province. Although it is recognized that the outfitting industry in the province is experiencing challenges, other pressures such as the condition of caribou populations and resulting licence quotas, will be more relevant to the future condition and viability of this industry, and the Project is not likely to contribute in any measurable degree to the future viability of this industry.

In summary, significant adverse cumulative environmental effects on Land and Resource Use are not likely to occur as a result of the Project in combination with other projects and activities that have been or will be carried out. The planning, consultative and other effects management measures identified in this chapter will serve to avoid or reduce potential interactions and adverse effects as result of the Project. Avoiding or managing potential land and resource use conflicts resulting from other ongoing and future projects and activities will require that appropriate resource management, planning, regulatory and enforcement measures are in place and implemented by the relevant agencies.

16.5.10 Monitoring and Follow-up

Land and resource use activities in Newfoundland and Labrador are the subject of ongoing planning, management, regulatory enforcement and monitoring by the federal, provincial and municipal governments and their respective departments and agencies. This includes regular monitoring and the collection of information and statistics on, for example, municipal land use, hunting and angling activity, cabin development, outfitting, resource exploration and development, for the purpose of licensing, enforcement and resource management. Nalcor has neither the mandate nor the expertise to monitor land and resource use activities in the Project area, but has provided and will continue to provide Project information to relevant agencies and organizations as required and requested.

As described earlier, a number of the effects management measures planned by Nalcor include initiatives related to ongoing communication and cooperation with communities, government departments, stakeholder groups and individual land and resource users. This will serve as a means to identify and help address any Project-related issues and effects as they arise throughout Project planning, Construction and into Operations and Maintenance.

Nalcor will continue to use information collected during past and ongoing discussions with potentially affected Aboriginal groups and communities to avoid conflicts with contemporary land use for traditional purposes, to the extent practical. Where an overlap of the Project and traditional land use occurs, adverse effects can be addressed through mitigation (e.g., adherence to regulations, avoidance, limited access and communication). Nalcor is committed to undertake and finalize land and resource use studies under the current community engagement agreements with NunatuKavut Community Council, Pakua Shipu and Unamen Shipu. Nalcor will consider and incorporate information where relevant, including the potential for mitigation and adaptive management during detailed design and routing.

Should any new relevant information regarding contemporary land use activities of the Labrador Inuit, Québec Innu of Uashat mak Mani-Utenam, Matimekush-Lac John, Nutashkuan, Ekuanitshit or the Naskapi Nation of Kawawachikamach become available, Nalcor will assess this information in relation to the Project-related components.

16.6 Marine Fisheries

16.6.1 Introduction

The Marine Fisheries VEC assesses the potential effects of the Project on marine fish harvesting activities throughout all Project phases. For commercial marine fisheries, this includes all activities conducted to generate fishing income, such as accessing fishing grounds, deploying and retrieving / hauling fishing gear to harvest the fish, getting the catch back to port, and selling the fish to buyers. For marine recreational fisheries this includes accessing fishing areas during designated periods and taking fish for food and / or leisure purposes. As discussed in Section 15.6, there is no known Aboriginal-specific fish harvesting within or adjacent to the proposed Project area, although it is recognized that members of Aboriginal organizations do participate in the general commercial and recreational fisheries undertaken in the Strait of Belle Isle area. There are no aquaculture developments in the general vicinity of, and which may be affected by, the Project.

Marine fisheries have a high degree of importance and value in Newfoundland and Labrador for economic, social and cultural reasons. Fishing for food, social and / or ceremonial purposes started with the earliest human occupation of Newfoundland and Labrador's coasts, and the history of its first use by Europeans (dating from ca. 1000 AD) and the later permanent settlement of the land (dating from the 1500s) is inextricably interwoven with fish and fishing. The same is true for many aspects of Newfoundland and Labrador's customs, art, music and other social and cultural characteristics.

For several centuries, fish harvesting was the mainstay of Newfoundland and Labrador's economy, and although in recent years it has been somewhat displaced by other industries, fisheries continue to play a key role in the livelihood of the provinces residents, particularly in rural areas. In 2010, `fisheries accounted for 1.5% of the goods producing sector of the provincial GDP, compared to about 8.5% in the late 1980s (The Economy 2011, internet site; The Economy 1989). In the 1990s, the province's fisheries underwent significant changes, due largely to the collapse of several demersal fisheries (mainly Atlantic cod), and consequent fisheries moratoria and quota reductions after 1993. Since then, the former groundfish-dominated industry has been replaced to a large extent by higher value shellfish harvesting, which employ fewer people. In terms of employment, fish harvesters made up about 18% of the province`s labour force in the early 1950s, but just 5% by 2010. Present day commercial fisheries in many areas are characterized by the participation of licensed enterprises, holding licences for particular species, involving certified professional fish harvesters.

Despite these changes, fishing continues to be an important component of the economy of the Strait of Belle Isle area. Fishing is the sole or primary occupation of many individuals and enterprises along its shores, and is also a source of work for fish processing plant employees. In the Conception Bay area of Newfoundland, fishing occurs together with a much greater level of economic diversification, particularly in the St. John's metropolitan area.

In both the Strait of Belle Isle and the Dowden's Point areas the primary marine fisheries have been commercial fish harvesting through capture fisheries. Marine recreational fisheries are limited in extent, consisting almost entirely of an annual recreational food (cod) fishery for two to three weeks a year and a maximum of five fish per person per day.

As described in Section 15.6, the key Strait of Belle Isle commercial fisheries at present are for lobster, scallops, herring and capelin, as well as a small amount of recently renewed cod harvesting. Maps in Section 15.6 also outline the general locations of relevant harvesting activities in relation to proposed Project activities. Although the Dowden`s Point shoreline electrode site is not situated on grounds where commercial fisheries usually occur, there is nearby harvesting of lobster and some pelagic species, as well as some recreational fishing.

16.6.2 Environmental Assessment Study Areas

16.6.2.1 Spatial Boundaries

For the Marine Fisheries VEC EA, the LSA has multiple components:

- the proposed 500 m wide submarine cable crossing corridor in the Strait of Belle Isle which will fully encompass the three proposed power cables and their associated rock berms (Figure 16.6.2-1); and
- the two marine areas defined by arcs of 500 m radius from the proposed shoreline electrode sites at L'Anse au Diable in the Strait of Belle Isle (Figure 16.6.2-1) and Dowden`s Point in Conception Bay (Figure 16.6.2-2).

The RSA for the Marine Fisheries VEC encompasses the Strait of Belle Isle area to the east and west of the cable corridor that represents the likely extent of fishing activity by enterprises from local area homeports. This area also encompasses the L'Anse au Diable shoreline electrode site (Figure 16.6.2-1).

Marine construction work in the Strait of Belle Isle will include considerable activity along the submarine cable routes within the corridor (LSA), as well as transits of construction and other supporting vessels to and from the work locations (including throughout the RSA). As noted, the RSA has been defined to reflect the geographic extent of fishing activity by local fishers, as well as to encompass the presence of vessels and their activities during cable construction and the movements of these and other construction vessels within this area. It does not, however, include the full geographic extent of all vessel movements to and from the Strait of Belle Isle, such as those associated with the delivery of the submarine cables and other components from their suppliers or the delivery of rock for the berms, as these vessel movements are considered to be part of the overall national and international shipping industry, and subject to applicable regulations.

The Conception Bay RSA consists of the marine area within a 2.5 km radius from the proposed shoreline electrode site (Figure 16.6.2-2).

16.6.2.2 Temporal Boundaries

The temporal boundaries of the assessment for the Marine Fisheries VEC encompass the Project's Construction phase, as well as the Operations and Maintenance phase that will extend through the life of the Project.

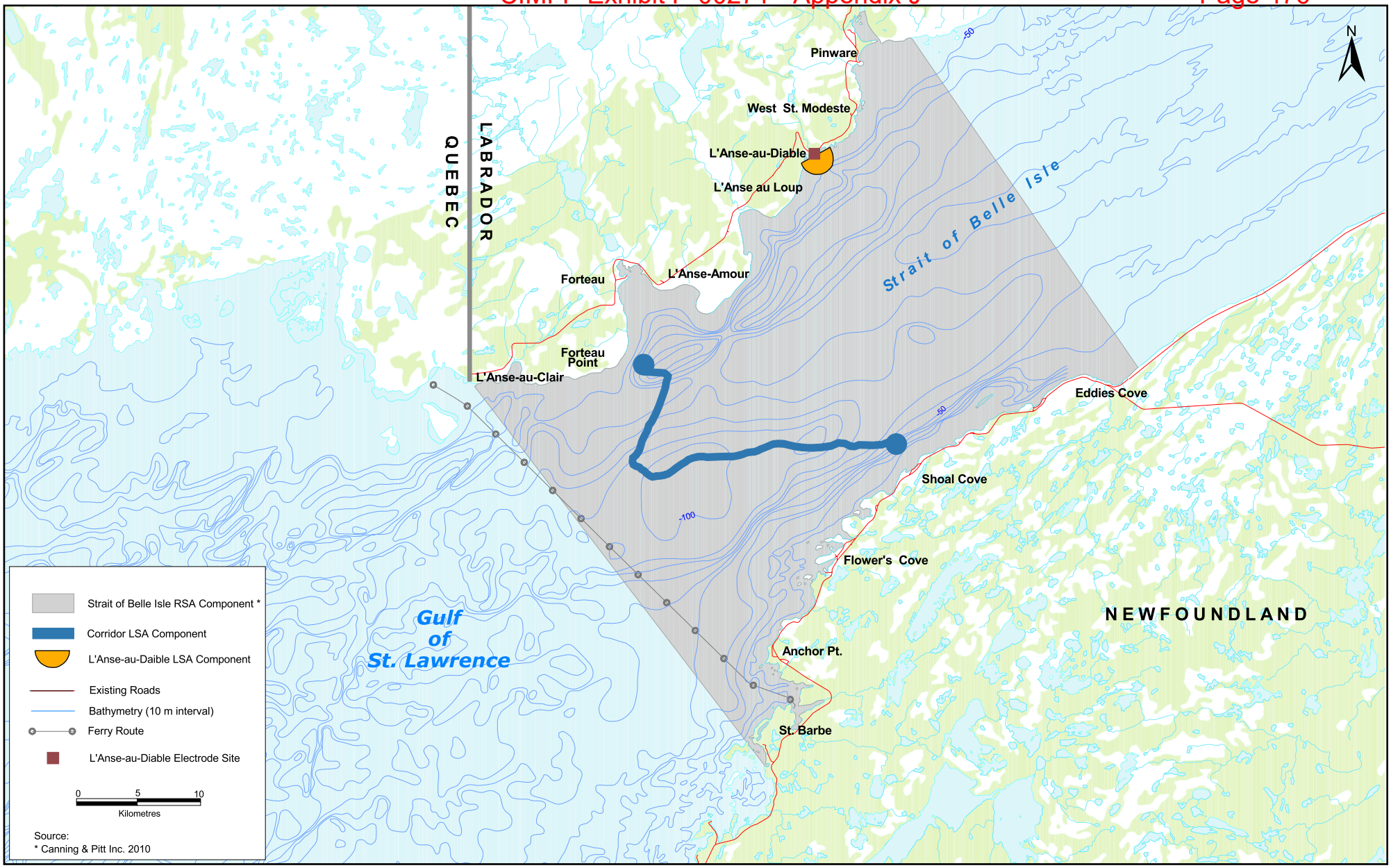


FIGURE 16.6.2-1

Strait of Belle Isle: Regional Study Area (RSA) and Local Study Area (LSA) Components, Marine Fisheries

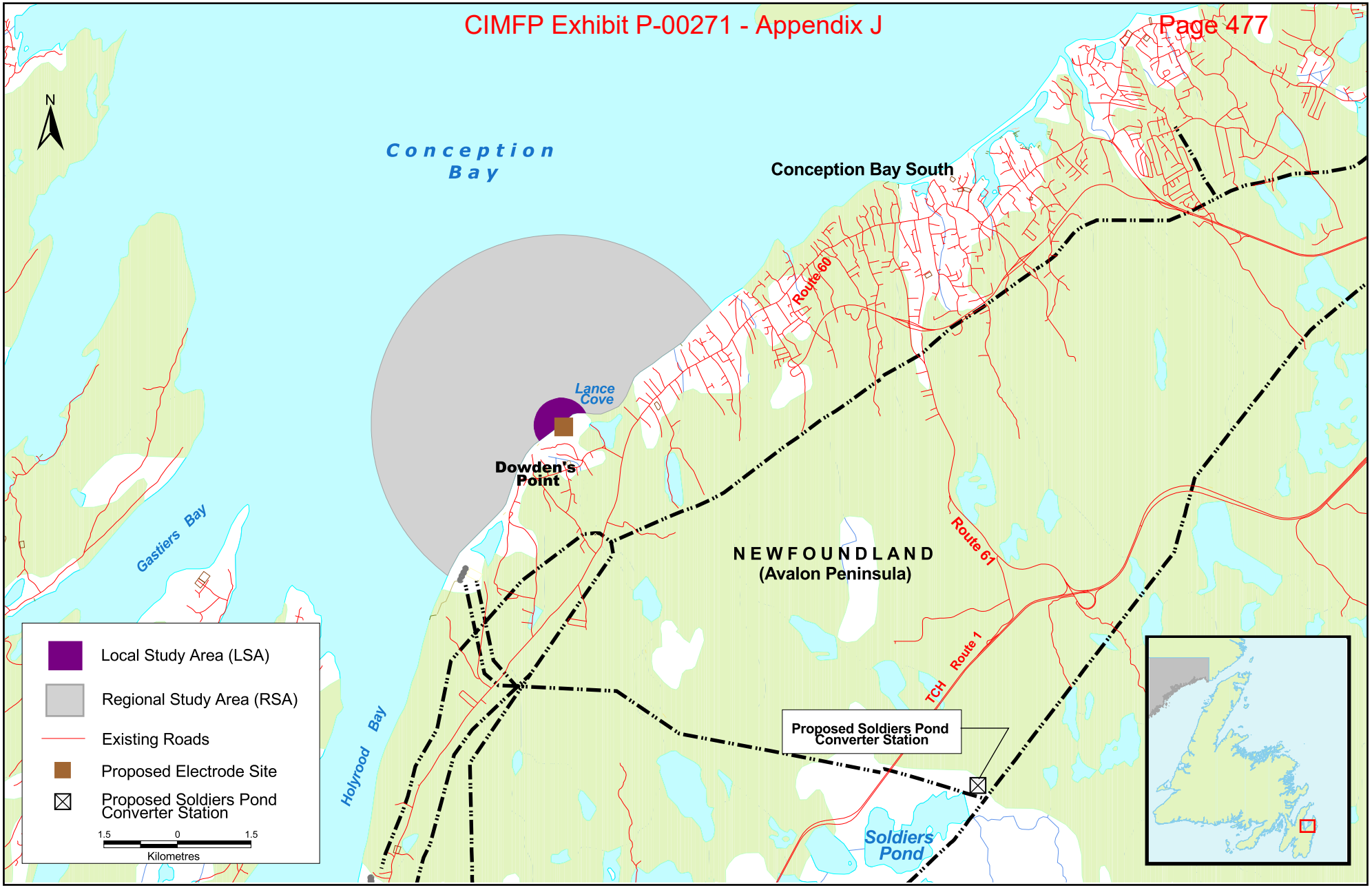


FIGURE 16.6.2-2

Dowden's Point Electrode Site: Regional Study Area (RSA) and Local Study Area (LSA), Marine Fisheries

16.6.3 Potential Environmental Issues, Indicators and Interactions

16.6.3.1 Potential Environmental Issues

Marine fisheries may be affected by development projects both directly and indirectly. Direct effects occur where established fishing activities are disturbed or otherwise interfered with by project-related components or activities during their construction or operations phases (e.g., reduced access to fishing areas, damage to fishing gear).

The potential effects of the Project for Marine Fish and Fish Habitat have been assessed in detail in Section 14.2 of this EIS, which concluded that the Project will not likely cause significant adverse environmental effects on the marine environment. It is therefore not considered likely that there will be any significant adverse effect on the users of these biophysical resources. The Marine Fisheries VEC therefore focuses on the potential direct effects of the Project on fishing activities, such as through disturbance or other direct interactions during the Construction and / or Operations and Maintenance phases.

Questions and issues related to the Marine Fisheries VEC were identified based on an analysis of the existing environment (such as harvesting data and fishing locations) and through consultations with area fishers and industry and government representatives. In general, fishing industry representatives have expressed concern that various aspects of Project activities, including construction works and the eventual permanent presence of the submarine cables and berms after construction, might affect fishing opportunities and thus reduce commercial fishing income. No specific concerns were raised about potential effects on recreational fisheries.

The questions and issues that have been raised about how fish harvesting could be affected during each Project phase, as well as the rationale for these concerns and specific considerations (where relevant), are provided in Table 16.6.3-1.

Table 16.6.3-1 Identified Issues and Questions: Marine Fisheries

Issue / Question	Nature and Rationale	Specific Considerations
Construction		
Potential loss of access to fishing grounds and other disturbances	Construction activities within the LSAs may prevent fishing in those areas, and / or result in other interferences due to vessel traffic, or other marine activity	– Fishing for all species will not be possible within or near active areas while construction activities are occurring – Possible restrictions on particular fishing activities / gear types (e.g., bottom dragging gear) in the LSA – Using alternative fishing grounds and avoiding interactions with Project works could result in increased expenses (more fuel) and lower efficiency (increased transit time) – Delays in transits could affect product quality and price
Possible lost or damaged fishing gear	Project vessels will be traversing areas near where fishing gear is normally used or set	– Gear might be damaged or lost because of Project vessel conflicts (Project vessels coming in contact with fixed gear)
Safety issues and risks	Project vessel presence and activities in the LSAs and on marine access routes to these areas might pose a safety risk for commercial / recreational fishing vessels and gear	– Personal safety – Concerns about safety might prevent fishers from reaching preferred fishing grounds, which might reduce catches and / or increase expenses
Operations and Maintenance		
Potential permanent loss of access to fishing grounds	The presence of permanent Project infrastructure in the marine environment may prevent fishing in those areas for certain species / gear types	– Even if the submarine cables are covered, otter trawls and scallop dredges may not be able to fish over or along the cable berms – Using alternative fishing grounds could result in increased expenses (more fuel) and lower efficiency (increased transit time)

16.6.3.2 Key Indicators and Measurable Parameters

Various KIs and MPs were identified for this VEC to frame and focus the associated environmental effects analysis. Their selection was based on consideration of the various key elements of the VEC as well as the questions and issues that have been identified about associated Project effects.

Two KIs have been selected for the Marine Fisheries VEC: (i) Commercial Fisheries and, (ii) Recreational Fisheries. These components of the Marine Fisheries VEC have commercial economic importance, and / or social / recreational importance. Additional rationale for the selection of these KIs is provided in Table 16.6.3-2. In addition, Table 16.6.3-2 indicates various MPs for each KI and the rationale for their selection. These MPs are relevant to and indicative of the potential changes to the KIs that may occur as a result of the Project.

Table 16.6.3-2 Key Indicators and Associated Measurable Parameters: Marine Fisheries

Key Indicator	Rationale for Key Indicator	Measurable Parameters	Rationale for Measurable Parameter
Commercial Fisheries	Important from a cultural and economic perspective	– Net income from fishing	– Effort expended by fishers can be affected by Project activities through change in access to fishing grounds, need to retrieve and relocate gear, and change in transit time to fishing grounds – Associated expenses incurred by fishers can be affected by Project activities through gear / vessel damage, gear fouling, and increased transit distance to fishing grounds – Landed value can be affected by Project activities through reduced catches, change in fish quality due to longer transit times, and perceived changes to fish quality – Any Project-related disturbances to marine fishing activity will be important if they translate into a change in overall income to fishery participants
Recreational Fisheries	Important from a cultural and supplementary economic perspective	– Quality of experience – Participation rates	– Recreational fishers may not be able to fish in preferred areas, or there may be a change in the catchability of recreational fish species, which may affect the quality of experience – This may in turn result in changes in participation rates

16.6.3.3 Potential Project-Marine Fisheries Interactions

This section describes potential interactions between the Marine Fisheries VEC and Project activities in each phase, which are summarized in Table 16.6.3-3. While some of these interactions will likely occur (e.g., for safety reasons, no fishing can occur around any Project vessels involved in Construction), others are of relatively low probability or likely degree (e.g., disruption of / interference with recreational fisheries). The nature of the effects that will likely occur as a result of the Project are assessed in detail in later sections.

Table 16.6.3-3 Potential Project Interactions: Marine Fisheries

Project Phase / Activity	Key Indicator	
	Commercial Fisheries	**Recreational Fisheries**
Construction		
Construction access trails and roads	—	—
Movement and presence of personnel, equipment and materials	—	—
Construction camps	—	—
Marshalling yards and staging areas	—	—
ROW clearing and preparation	—	—
Quarrying and borrowing	—	—
Transmission tower assembly and installation	—	—
Conductor installation	—	—
Converter station site preparation and construction	—	—
Preparation and construction of submarine cable landing sites (on-land works)	—	—
Construction and installation of submarine cables (Marine works)	Potential interference from construction activities / vessels with fishing activities (disturbance, restricted access, gear damage, safety considerations)	
Electrode site preparation and installation	—	—
Island system upgrades	—	—
Employment / presence of workers	—	—
Contracting / expenditures	Project expenditures could enhance employment opportunities / vessel service contracts for fisheries industry workers in the off-season	
System commissioning	—	—
Operations and Maintenance		
Operations / maintenance access trails and roads	—	—
Presence and operation of the transmission system	Possible restrictions on some fishing activities / gear types in the area of Project cables and other components	—
Routine line inspections and repairs	—	—
Vegetation management	—	—
Potential major system repairs	Potential interference of repair activities / vessels with fishing activities (disturbance, restricted access, gear damage, safety considerations)	
Operation of the electrodes	—	—
Employment / presence of workers	—	—
Contracting / expenditures	Ongoing operations could enhance employment opportunities / vessel service contracts for fisheries industry workers in the off-season	

— No likely or detectable interaction identified.

16.6.4 Approach to the Environmental Effects Analysis

16.6.4.1 Analytical Methods

The assessment of potential Project effects on Marine Fisheries was based on an approach of "overlaying" the nature of planned Project components and activities on what is known about existing fishing activity and patterns in the LSA and RSA to identify likely interactions and resulting effects on the VEC and its various KIs.

As described in Chapter 15, baseline conditions for Marine Fisheries were derived from Fisheries and Oceans Canada (DFO) geo-referenced catch and effort data, information provided by industry participants during consultations, and an analysis of potential interactions between types of fishing gear used in the area and specific Project components (e.g., interaction between scallop dredges and the rock berms constructed to protect submarine transmission cables, as determined by Nalcor). These baseline data and other information were used to identify, map and describe current fisheries resource harvesting activities, including usual locations, species, and catch success, which were then related to the proposed location(s) of key Project activities and components. Potential interactions between the location of Project activities and existing fishing operations, and the potential effects due to such interactions were identified. Specific issues related to the Marine Fisheries VEC were identified through consultations with area fishers and others, supplemented by the experience of the EIS study team who have worked on other cognate marine development projects throughout Atlantic Canada and elsewhere.

The effects assessment involves both quantitative analysis (e.g., review of DFO historical catch and effort data, historical trends and the distribution of catches, using GIS and other mapping methods) and qualitative considerations (e.g., discussions with fishers and fisheries managers). For the most part, the quantitative data identifies actual species and catch amounts and locations, and the qualitative information identifies cases of perceived potential loss of opportunity and / or income reported by individual commercial fishers or groups of fishers. Mitigation measures to address the potential adverse effects are then identified and the residual effects are assessed accordingly, assuming that mitigation is in place.

16.6.4.2 Environmental Effects Descriptors

The potential effects of Project activities on the various aspects of the Marine Fisheries VEC are described in terms of a set of descriptors which are summarized in Table 16.6.4-1.

Table 16.6.4-1 Effects Descriptors: Marine Fisheries

Effects Descriptor	Definition
Direction	
Adverse	Effect is negative and undesirable, reducing fishing income, opportunities, success, participation and / or enjoyment.
Neutral	Effect is neither adverse nor positive.
Positive	Effect is beneficial and desirable, enhancing fishing income, opportunities, success, participation and / or enjoyment.
Magnitude	
No effect	Project results in no change in the existing (baseline) condition.
Low	Project results in a small change in the existing condition / baseline value that may or may not be detectable, but is well within the natural condition / normal variability of the parameter in question (e.g., within the typical range of variability in the fishery within and between seasons).
Moderate	Project results in a clear change in the existing condition / baseline value, but is generally in keeping with the normal variability of the parameter in question. Clearly an effect but unlikely to pose a risk to overall fishing income stability or opportunities.

Table 16.6.4-1 Effects Descriptors: Marine Fisheries (continued)

Effects Descriptor	Definition
High	Project results in a major change in the existing condition / baseline value, that is well outside the natural condition / variability of the parameter in question. Effect is likely to pose a risk to overall fishing income stability or opportunities, and represents a challenge to the successful operation of fishing enterprises / recreational opportunities in the area.
Geographic Extent	
Local	Effect will be evident within the LSA.
Regional	Effect will be evident within the RSA.
Beyond regional	Effect will be evident beyond the RSA.
Duration	
Short-term	Effect will be evident for less than one year.
Medium-term	Effect will be evident for between one and four years.
Long-term	Effect will be evident for from four to ten years.
Far future	Effect will be evident throughout the life of the Project.
Frequency	
Low	Effect occurs no more than once per year.
Moderate	Effect occurs 2 to 10 times per year.
High	Effect occurs more than 10 times per year.
Continuous	Effect is continuous.

16.6.5 Construction

16.6.5.1 Overview of Construction and Associated Effects Management

Project Construction activities in the Strait of Belle Isle will include vessel activity associated with the installation of the three submarine cables and the placement of rock to create the protective berm for each cable. As described in Chapter 3, Project Description, marine construction work will likely take place over a single season, with cable placement commencing at or near the beginning of the ice-free period (approximately June) that year and continuing for several months, with the rock placement vessel commencing work within that period and continuing until later in the same year (likely November). Over this period, Project marine vessel work in the Strait of Belle Isle will include considerable activity along the submarine cable routes within the corridor, as well as transits to and from the work locations (including throughout the RSA). The presence of a Safety Zone around Project marine construction activities (as described below) will create a zone of influence of these Project components and activities during cable installation and berm creation.

Construction of the electrodes at L'Anse au Diable and Dowden's Point will include the development of a near shore structure with associated excavation and / or dredging activity and the installation of associated electrode components. Work in the marine environment will be completed primarily, if not exclusively, from on-land, and will occur within a relatively small area during the 13 to 17 month period of electrode construction.

The following effects management measures have been identified and proposed by Nalcor to avoid or reduce potential adverse interactions between Project Construction activities and Marine Fisheries in the Strait of Belle Isle and in Conception Bay (as identified in Table 16.6.3-3). Several of these measures will, in practice, be applicable to more than one of the possible interactions identified, for either KI or both.

Strait of Belle Isle

Continuing Consultations with Fishers

Before the start of construction activities in the Strait of Belle Isle, Nalcor representatives will consult further with local fishers and other interested parties. This will include the provision of information on proposed construction activities, as well as a discussion of any questions, concerns or suggestions from these fishers regarding the construction activities.

Fisheries Liaison Committee

Nalcor will establish a Fisheries Liaison Committee (FLC) for the Construction phase to facilitate its ongoing fisheries consultation and advisory process during construction. The FLC will be the primary mechanism for facilitating information exchange and communications between the Project and fisheries representatives and for identifying and resolving any issues that arise. In addition to Nalcor and fishers based on both shores of the RSA, the FLC will include a representative of the Labrador Fishermen's Shrimp Company Ltd. and of the Fish, Food and Allied Workers (FFAW).

Safety Zones

A 500 m radius (1,000 m wide) Safety Zone will be established around all active construction areas within the marine environment (specifically, vessels at construction locations within the Strait of Belle Isle). Except for any Project support and service vessels, no other marine craft will be permitted within any Project vessel Safety Zone.

The Safety Zone will serve to prevent or reduce direct interactions, particularly contact between construction activities and equipment and fishing activities. This will protect personal safety, reduce the potential for gear and vessel damage in these areas, and allow a more efficient operating environment for both fisheries and Project activities. Nalcor will consult with relevant Transport Canada personnel to determine the most appropriate means for boundary demarcation and communication. The Safety Zone will be in accordance with Rule 43 of the Collision Regulations under the *Canadian Shipping Act.*

All vessels transiting the corridor, or operating in the general vicinity of the cable / rock laying vessels, will be required to exercise caution and to abide by the "rules of the road" (such as those described in the Collision Regulations) as well as by any specific protocols that are established and included in the VTMP (see below).

Vessel Traffic Management Plan

Before the start of marine construction activities in the Strait of Belle Isle, Nalcor will develop a VTMP to promote the safe and efficient operation of Project construction-related marine traffic and fishing vessel operations near all construction activities and in other areas of the Strait of Belle Isle where Project vessels might be operating.

The VTMP will be developed in consultation with applicable agencies and organizations, including advice and guidance from experts with the Ship Safety Branch of Transport Canada and the CCG. The purpose of the VTMP will be to establish a safe and efficient working environment during marine construction activities and to minimize or avoid potential construction-related vessel traffic interference with established commercial fisheries harvesting operations.

The VTMP will describe the "rules of the road" (e.g., those in the Collision Regulations for shared waterways and any special considerations related to the circumstances of the Project), vessel communications and contact information, reporting protocols, traffic / transit routes, and other relevant vessel traffic management procedures. This will include the measures that Project-related vessels (including small service boats) will follow when operating in the area, and that all fishing vessels should follow when they are involved in harvesting operations close to, or transiting, the general vicinity of Project activities.

Working with the CCG's Notices to Shipping and the Canadian Broadcasting Corporation's Fisheries Broadcast, Nalcor will ensure that all fishing vessels operating in the Strait of Belle Isle are given advance notice of planned construction work.

Fishing Gear and Vessel Damage Compensation

Nalcor will make available Fishing Gear Loss or Damage Compensation to cover any damage to commercial fishing gear or other equipment if an incident occurs that involves contact with a Project vessel outside the Safety Zones. This will be in place for the Project Construction phase and will be similar to programs currently in use within the province's offshore area for petroleum exploration and development.

Compensation for Economic Loss

Nalcor will provide economic compensation for any Strait of Belle Isle commercial fishing enterprise that experiences a loss of fishing income as a result of Project marine construction activities. This compensation will be available to licence holders who have been actively involved in harvesting scallop in the relevant area in recent years, and will compensate for any demonstrated actual loss of net commercial fishing income. Further principles and operational components will be developed jointly by Nalcor through discussions with the FLC.

Dowden's Point

Consultations with Fishers

Prior to the start of electrode construction activities in Conception Bay, Nalcor representatives will meet with local fishers and other interested parties, particularly those who use any fishing grounds along the shoreline near the Dowden's Point shoreline electrode site. This will include the provision of information on proposed construction activities, as well as a discussion of any questions, concerns or suggestions from these fishers regarding these activities.

16.6.5.2 Existing Knowledge

Over the past several decades there have been various, often very large-scale, marine construction projects in Newfoundland and Labrador (onshore and offshore) and elsewhere in Atlantic Canada that have involved components and activities which have interacted with marine fisheries. These projects are typically subject to extensive EA and governmental and public reviews under the *Canadian Environmental Assessment Act* (*CEAA*) or other legislation, and / or provincial reviews, and have included the development of comprehensive effects management plans similar to those proposed for this Project.

These past projects include major developments such as the Hibernia Gravity Base Structure construction site in Trinity Bay, Newfoundland; the Newfoundland Transhipment Ltd. facility in Placentia Bay, Newfoundland; the construction and operation of the Confederation Bridge between Prince Edward Island and New Brunswick; and the construction and operation of the Sable Offshore Energy Project submarine gas pipeline from the Scotian Shelf offshore to Country Harbour, Nova Scotia. In addition, there have been numerous shorter-term petroleum exploration projects and long-term petroleum development projects in marine areas in offshore Newfoundland and Labrador and Nova Scotia which have assessed and effectively mitigated effects for potential displacement or interference with fisheries as a result of their associated activities.

Collectively and individually, these past projects have addressed loss of access to fishing grounds, vessel traffic interference, gear and vessel damage and other potential issues similar to those identified for this Project. The experience and success of these real-world precedents demonstrates that marine project construction activities can co-exist with marine fisheries, particularly with appropriate mitigation in place. The knowledge derived from these past experiences has contributed to the selection and design of the mitigation measures proposed for this VEC and the analysis and assessment of any likely adverse effects of the Project.

16.6.5.3 Construction Effects: Commercial Fisheries

Project Construction activities including the installation of submarine cables and associated rock-laying / berming components in the Strait of Belle Isle will affect commercial fishing activities in the LSA, as there will be restrictions of vessel movements and fishing activity at the active marine work areas, as well as restrictions on the use of dragged gear over the submarine cables once these are laid on the seabed.

The overall "zone of influence" of Project-related marine disturbance will consist of a Safety Zone around all marine construction activities. This Safety Zone will be 500 m in radius around all Project-related marine construction activities, and no fishing boats or other vessels will be permitted to operate within the Safety Zone pursuant to the relevant regulations. The Safety Zone's primary purpose will be to minimize the potential for physical contact between construction vessels and activities and fishing, thereby ensuring a safe and efficient operating environment for both. All Project-related vessels will be required to stay within the Safety Zone except when transiting to and from their home port or service base or, in the case of rock laying vessels, to any onshore supply facilities. When transiting to the Safey Zone and through the RSA, these Project vessels will follow the existing CCG Strait of Belle Isle voluntary traffic separation scheme. Beyond the Safety Zone(s), fishing vessels will be able to transit the Strait of Belle Isle RSA as usual.

The potential for Project activities to disrupt commercial fishing in the area will depend on timing as well as location. Available information on the existing commercial fishery in the Strait of Belle Isle (Section 15.6) suggests that the main species harvested near the submarine cable crossing LSA is scallops, using bottom dredges or drags, and cod, fished with gillnets or hooks and lines. When cable installation commences (likely in June of Construction Year 3), scallop dragging activities within the Strait of Belle Isle will be required to avoid areas where the cable has been laid. Although scallop harvesting occurs from May to October, more than half of the catch from Unit Area 4Ra typically occurs in July and August, and the majority (roughly 90%) of the cod harvesting takes place in May and June. The actual extent of any construction-related interference with these fisheries in the LSA will depend on the specific timing of construction events and the fishery for that year. For the purposes of this assessment, however, it is assumed that marine construction activities will occur during the active fishing periods for these species.

The VTMP will lay out the "rules of the road" for marine traffic activities associated with the Project area during Construction, including communications protocols and the routes that all Project vessels will be expected to follow when operating outside the Safety Zone. This will help to minimize the "footprint" of Project marine activities that might interfere with fishing by containing these marine activities within relatively focused and prescribed areas, which will be communicated to fishers. This will also help fishers plan their activities more efficiently and safely during the Construction phase of the Project. The FLC will facilitate information exchange and communication between the Project and the fishing industry and identify any concerns or issues that might arise during Construction. These measures will be implemented to avoid potential interactions and issues between the Project and marine fisheries in the Strait of Belle Isle area, promote the safety of fishers, the public and Project personnel, as well as ongoing communication and good planning to minimize potential interference with fish harvesting. Provisions for fishing gear loss or damage and economic loss compensation will also be in place to address any unanticipated loss caused by Project-related construction activities.

As a result of the relatively small area that will be subject to Project-related marine construction work at any one time, the overall size of the Strait of Belle Isle area (and thus, the range of alternative fishing grounds available), the relatively short-term duration of cable construction activities in the marine environment (likely one season), and the proposed effects management measures outlined above, Project Construction is not

likely to result in adverse effects on commercial fishing activities. Despite some potential for localized and short-term disruptions, fishing activities in the Strait of Belle Isle are not expected to be affected to the extent that would result in any decrease in overall fish landings by local enterprises or in net fishing incomes.

Activities associated with construction work at the L'Anse au Diable and Dowden's Point electrode sites, given their nature (small areas and on-land work), are not expected to disrupt or otherwise adversely affect existing fishing grounds and harvesting activities in these areas.

Summary of Likely Residual Environmental Effects

As a result the likely residual effects of Project Construction on the Commercial Fisheries KI are as follows:

- The direction is adverse as there will be some Project-related interference with fishing activities in the Strait of Belle Isle. As noted, however, this is not expected to result in any decrease in overall landings or fishing income. Commercial fisheries are not expected to be substantially affected during construction activities with the identified effects management measures in place.
- The magnitude of the effect of Project Construction on commercial fisheries will be low. A degree of interference will occur and some adjustments will be required, but given the relatively small areas involved, the short-term nature of any individual disruptions, and the effects management measures planned, any such interference during Construction is not expected to result in a decrease in overall landings or fishing income as compared to pre-Project levels. If unanticipated effects occur during construction, resulting in actual economic loss, including damage to fishing gear, appropriate compensation will be provided.
- Project Construction effects will be local in geographic extent, as they will occur within the Strait of Belle Isle LSA.
- Effects will be of short to medium-term duration, as the marine construction activities will likely be limited to a single construction season.
- Effects will be continuous in frequency as the Safety Zones will be maintained throughout the period of in-water construction.

There is a high degree of confidence that the actual effects of Project Construction on Commercial Fisheries will not be greater than predicted, based on recent and considerable experience with other marine projects, and the standard and proven nature of the effects management plans proposed.

16.6.5.4 Construction Effects: Recreational Fisheries

Marine recreational fishing activities in the Strait of Belle Isle and Conception Bay areas (LSAs and RSAs) are limited, and consist almost entirely of an annual food (cod) fishery for several days each year. Given the nature and location of Project construction activities in the marine environments and these recreational activities (limited in extent and time, usually close to shore), little if any potential interaction or disturbance is anticipated.

Recreational fishing that currently occurs in the proposed construction areas and times can easily be conducted in other locations during that short time period, with no consequent reduction in recreational fishing participation rates or overall enjoyment levels.

Likely Project effects on marine Recreational Fisheries activities are therefore predicted to be neutral. There is a high degree of confidence that the actual effect of Project Construction on Recreational Fisheries will not be greater than predicted based on the standard and proven nature of the effects management plans proposed, and experience with other marine projects.

16.6.6 Operations and Maintenance

16.6.6.1 Overview of Operations and Maintenance and Associated Effects Management

The aspects of Project Operations and Maintenance that are most relevant to the Marine Fisheries VEC include the presence of submarine cables and their associated berms, and any routine inspections that may be required in the Strait of Belle Isle.

In addition, during periodic cable inspections and maintenance activities, and in the unlikely event of any major system repair requirements, Safety Zone restrictions similar to those implemented during Project Construction will be required. Project vessels involved in maintenance and repair work could interfere with commercial and recreational fishing activities, or come into physical contact with and potentially damage fixed gear (e.g., gillnets), depending on timing and locations.

As with the Construction phase of the Project, the presence and general Project Operations and Maintenance of the L'Anse au Diable and Dowden's Point electrodes are not expected to interfere with fishing activity in these areas.

Nalcor will apply the following measures to avoid or reduce any potential adverse effects of the Project on the Marine Fisheries VEC during Project Operations and Maintenance in the Strait of Belle Isle.

Fisheries Liaison Committee / Consultation

Through ongoing consultation, Nalcor will continue to address any concerns and issues on fisheries in the Strait of Belle Isle that arise from Project interactions.

The FLC established for the Project's Construction phase will continue to function during at least the initial years of the Project Operations and Maintenance phase, if all parties consider it to be useful and necessary. Again, the role of the FLC will be to facilitate information exchange and communications between Nalcor and the fishing industry, and to identify and seek to resolve any concerns or issues that arise during Project Operations and Maintenance.

Safety Zones, Marine Notifications, Vessel Traffic Management Plan

A Safety Zone (500 m radius) will be in place around any vessel(s) engaged in routine maintenance or major system repair work for the submarine cables during the Operations and Maintenance phase of the Project. With the exception of Project support and service vessels, no other marine craft will be permitted anywhere within the 500 m Safety Zone surrounding maintenance and repair vessels during such activities.

Working with the FLC, CCG's Notices to Shipping and the Canadian Broadcasting Corporation's Fisheries Broadcast, Nalcor will ensure that all fishing vessels operating in the Strait of Belle Isle are given advance notice of planned maintenance or repair programs for the Project.

The VTMP developed for Project marine construction activities in the Strait of Belle Isle will be adapted and applied to any cable maintenance and / or repair activities.

16.6.6.2 Existing Knowledge

Existing knowledge related to the potential effects of the Operations and Maintenance phase of the Project on Marine Fisheries, including the nature and likely effectiveness of mitigation, is similar to that provided for the Construction phase.

16.6.6.3 Operations and Maintenance Effects: Commercial Fisheries

Fisheries scientists have identified five distinct scallop beds in the Strait of Belle Isle area (Section 10.5), although resource managers and fishers have indicated that most harvesting is concentrated on only a few of

these beds. The approximately 17.5 km^2 seabed area within the marine cable corridor represents less than two percent of the total seabed area within the RSA, and about five percent of the seabed area that was closed to scallop fishing via the Refugium (refer to Section 15.6.4.4). Analysis of geo-referenced fisheries data (Section 15.6) indicates that there are important and alternative scallop fishing grounds adjacent to the submarine cable corridor, and extensive, well-established grounds for this species within both the Strait of Belle Isle RSA and the larger fishing zone – Unit Area 4Ra.

During the past decade, scallop catches have comprised approximately 17% of the total annual value of all-species catch by RSA fishing enterprises. According to DFO (2009), the Strait of Belle Isle scallop fishery has always been cyclical in nature and is often driven by market considerations. Since the mid 1990s, the scallop fishery has been regulated by an annual Total Allowable Catch, and by other management measures including weekly catch limits and spatial regulation of removals. Fishers report that, in recent years, only a small number of vessels have been actively involved because of poor market conditions, regulatory restrictions and other factors (Canning & Pitt Inc. 2010). Indeed, roughly 56 enterprises currently hold scallop licences in the Strait of Belle Isle area, but only 12 vessels have been actively fishing this species in the past 4 to 5 years. The number of active participants may also decline further in the next few years as older enterprise operators exit the fishery, either for financial reasons or retirement. The 2010 Total Allowable Catch was 1,000 tonnes (for all of Division 4R, see Section 15.6). DFO reports that in recent years the annual catch has not been more that 35% of the Total Allowable Catch.

Considering the size of the area involved, current participation rates and catch trends, it is reasonable to conclude that harvesting levels in the RSA will not be significantly affected by the potential loss of scallop habitat within the marine cable corridor. Scallop operators who now take part of their annual scallop catch within the Strait of Belle Isle LSA should be able to re-direct their efforts to alternative, equally productive scallop grounds. Although most scallop fishers have their preferred / favourite fishing location(s), the nature of the scallop fishery is such that fishers have to fish extensively over a relatively large area during the course of the season. There is a limit to the number of times a scallop vessel can drag its gear over a particular seabed area and continue to have a good payload; at some point, the catch level will fall and the operator will find it necessary to move on to a new area, leaving the previous area time to replenish itself.

All existing scallop fishers in the Strait of Belle Isle were involved in the scallop industry during the ten-year period (1999 to 2008) when DFO closed a much larger (approximately 350 km^2) portion of the Strait of Belle Isle to scallop harvesting as a Refugium (which included most of the Strit of Belle Isle LSA and beyond), with the goal to enhance scallop recruitment by removing fishing pressure in that area. Scallop vessel operators stayed outside of this area for a decade, and did not report any significant drop in their annual scallop catch as a result of the exclusion. Some fishers did, however, indicate some increase in operating costs (e.g., more time spent traveling from their home port to their scallop grounds) because of the Refugium.

Fishing vessels will also not be able to set their gear in, or transit through, any 500 m radius Safety Zone established around Project vessels involved in ongoing maintenance operations or major system repairs during the Operations and Maintenance phase. During maintenance or repairs, all Project-related vessels will be required to stay within the 500 m radius Safety Zone when working. When operating outside this zone (e.g., transits), these vessels will stay within the established CCG Strait of Belle Isle (voluntary) traffic separation scheme, or any traffic route to ports within the area recommended by the FLC and / or established in the VTMP. As described above (Construction Effects), the potential for interference with commercial fisheries in the Strait of Belle Isle LSA (scallop dragging and cod fishing in particular) will depend on timing of maintenance activities. The infrequent and localized nature of such activities and associated restrictions will reduce the likelihood of any potential interference. If maintenance activities occur outside the main fishing periods, there will be no or very little likelihood of any adverse effect on commercial fisheries.

Through ongoing consultation (e.g., via the FLC), Nalcor will continue to address any concerns and issues on Marine Fisheries in the Strait of Belle Isle that arise from Project interactions.

Summary of Likely Residual Environmental Effects

Considering the above, and with the application of the identified effects management measures, the likely residual effects of Project Operations and Maintenance on the Commercial Fisheries KI are as follows:

- The direction is adverse because there will be some Project-related interference with fishing activities in the Strait of Belle Isle, due to any vessel movement restrictions during inspection and repair work.
- The magnitude of likely adverse effects will be low, as a degree of interference and required adjustment will occur, but given the relatively small areas involved, this is not expected to translate into a decrease in overall landings or fishing income as compared to pre-Project levels.
- Any likely Project-related adverse effects will be local in geographic extent, as they will occur within the Strait of Belle Isle LSA.
- Effects will extend into the far future, as the cables and berms will be permanent, although it is expected that scallop fishers and others will eventually adjust to these new conditions.
- The effect will be low to continuous in frequency as the interaction with Project vessels is expected to be less than once a year, but the cables and berms will be in place throughout the life of the Project.

There is a high degree of confidence that the actual effects of Project Operations and Maintenance on Commercial Fisheries will not be greater than predicted, based on recent and considerable experience with other marine projects, and the standard and proven nature of the effects management plans proposed.

16.6.6.4 Operations and Maintenance Effects: Recreational Fisheries

Recreational fisheries will not likely be affected by the gear restrictions associated with the presence of the submarine cables, periodic inspection and maintenance activities occurring at some distance from shore, or during the operation of the electrodes. Effects on marine recreational fishing activities are therefore not predicted as a result of Project Operations and Maintenance, based on the standard and proven nature of the effects management plans proposed and experience with other marine projects. There is a high degree of confidence that the actual effects of Project Operations and Maintenance on Recreational Fisheries will not be greater than predicted.

16.6.7 Environmental Effects Summary and Evaluation of Significance

The preceding assessment of potential Project interactions and effects has focused on the individual KIs that comprise the Marine Fisheries VEC, the results of which are summarized and compiled below for the KIs and VEC overall.

16.6.7.1 Summary of Environmental Effects

The summary of the Marine Fisheries environmental effects analysis is presented in Table 16.6.7-1.

Table 16.6.7-1 Environmental Effects Analysis Summary: Marine Fisheries

Project Phase / Key Indicator	Likely Residual Environmental Effects Summary Descriptors				
	Direction	**Magnitude**	**Geographic Extent**	**Duration**	**Frequency**
Construction					
Commercial Fisheries	**Adverse / Neutral** – There will be some Project-related interference with fishing activities in the Strait of Belle Isle, but for limited duration and small areas at any one time. – Effects management measures will be implemented (including consultation, liaison, and compensation provisions if required). – The Project is not expected to result in a decrease in overall landings or fishing income.		**Local** – Confined to the Strait of Belle Isle LSA	**Short- to Medium-term** – Marine construction activities planned for one year	**Continuous** – Safety Zones will be maintained throughout construction
Recreational Fisheries	**Neutral** – Although recreational fishing will be prohibited within active construction zones, these areas are most likely to be several kilometres off shore, the immediate area of Dowden's Point and L'Anse au Diable electrode sites are not unique areas for recreational catches, and many alternative grounds are available in the local area. – There will be no measurable loss of overall recreational fishing opportunity or decrease in quality of the experience as a result of the Project.		**Local** – Confined to the Strait of Belle Isle LSA – L'Anse au Diable LSA	**Short- to Medium-term** – Marine construction activities planned for one year	**Low (if at all)** – Limited recreational fishing periods
Summary of Likely Residual Construction Effects on Marine Fisheries: Although there will be some Project-related interference with fishing activities in the Strait of Belle Isle during Project Construction and some adjustments will be required during this period, the relatively small areas involved, short-term nature of any such individual disruptions, and the planned consultation with fishers, will ensure that any likely adverse effects of the Project will not result in a decrease in overall landings or fishing income as compared to pre-Project levels. Any direct damages to fishing gear during construction, should they occur, will be the subject of compensation. There is expected to be no loss of overall recreational fishing opportunity or decrease in quality of the experience.					
Operations and Maintenance					
Commercial Fisheries	**Adverse / Low Magnitude** – Fishing restrictions as a result of Safety Zones; a small area will be restricted (i.e., 500 m radius around the marine construction activities)		**Local** – Confined to the Strait of Belle Isle LSA	**Far Future** – The area of scallop habitat lost will likely extend over the life of the Project	**Low to Continuous** – Project vessels are expected to be present less than once a year – Cables and berms will be in place throughout the life of the Project
Recreational Fisheries	–	–	–	–	–
Summary of Likely Residual Operations and Maintenance Effects on Marine Fisheries: A degree of interference and required adjustment will occur but, given the relatively small areas involved, the Project is not expected to result in a decrease in overall landings or fishing income as compared to pre-Project levels. The effects management measures planned will fully address any adverse effects. Effects on marine recreational fishing activities are not predicted as a result of Operations and Maintenance activities.					

16.6.7.2 Definition and Determination of Significance

Significant effects are considered to be those that cause a change in the VEC that will alter its status, integrity and future viability / sustainability beyond an acceptable level. For commercial marine fisheries, a significant adverse environmental effect is defined as one which would result in a measurable decrease in overall net fishing incomes for one or more fishing enterprises that operate in the RSA, in such a way as to challenge the successful operation and overall economic viability of one or more fishing enterprises in the area. A significant adverse environmental effect on recreational fisheries is one that would result in a measurable decrease in overall participation levels. An environmental effect that does not meet either of these criteria is considered not significant.

Project activities and infrastructure will permanently occupy a portion of the seabed within the RSA. Currently, several commercial fishing enterprises harvest a portion of their annual catch from scallop grounds within this area. After Construction, and excluding temporary maintenance / repair periods, scallop will be the only fishery affected by the Project; established harvesting activities and fishing grounds associated with other existing commercial or recreational activities will not be affected as there will be no areas unavailable for harvesting as a result of the Project.

Considering the extent of the affected scallop fishing area, it is reasonable to conclude that the loss of scallop habitat will not result in a significant change from baseline conditions in the RSA. For example, it is not expected that the Project will result in any noticeable drop in the annual, all-vessel catch, or any change in the average annual catch of a particular scallop enterprise.

With regard to recreational fisheries, most activities take place close to shore and, as such, are well away from the Strait of Belle Isle LSA where construction activities will be concentrated. Recreational fisheries occur for only few weeks during the fishing season, and there are many alternate fishing areas in the Strait of Belle Isle and in Conception Bay. As such, the presence of the Project will not have a noticeable effect on either the number of participants nor on the level of enjoyment recreational fishing provides.

Based on the above, the Project, including its Construction, and Operations and Maintenance phases, is not likely to result in significant adverse environmental effects on the Marine Fisheries VEC.

16.6.8 Evaluation of Project Alternatives

No technically and economically feasible alternatives for the submarine cable crossing or the shoreline electrode sites were identified (see Chapter 2, Section 2.12.3), and therefore marine Project alternatives are not evaluated for Marine Fisheries.

16.6.9 Cumulative Environmental Effects

The only other marine activities within the Strait of Belle Isle and Conception Bay RSAs that are relevant to the Marine Fisheries VEC include general shipping activities. These are common and long established activities in these areas, which are reflected in the existing biophysical and socioeconomic environments. There are no other identified and reasonably foreseeable development projects or activities in these areas that will overlap with the Project, nor are there any known or likely changes to the nature and intensity of non-Project vessel traffic in these areas.

Significant adverse cumulative environmental effects on the Marine Fisheries VEC are not likely to occur as a result of the Project in combination with other projects and activities that have been or will be carried out. Potential cumulative environmental effects for the Marine Fisheries VEC are summarized in Table 16.6.9-1.

Table 16.6.9-1 Cumulative Environmental Effects Summary: Marine Fisheries

Cumulative Effects Analysis	Central and Southeastern Labrador	Strait of Belle Isle[a]	Northern Peninsula	Central and Eastern Newfoundland	Avalon Peninsula[b]
Current (Baseline) VEC Condition (Reflecting the Effects of Past and Ongoing Projects and Activities)	n/a	– The current condition of the Marine Fisheries VEC in the Strait of Belle Isle RSA can be described as stable but somewhat marginal from an economic perspective. – Past and ongoing anthropogenic projects and activities that may affect the Marine Fisheries in the Strait of Belle Isle RSA include commercial fishing, and vessel traffic (e.g., shipping, ferries and fishing boat traffic).	n/a	n/a	– The current condition of the Marine Fisheries VEC in the Dowden's Point RSA can be described as stable. – Past and ongoing anthropogenic projects and activities that affect Marine Fisheries in the Dowden's Point RSA include commercial fishing, vessel traffic (e.g., shipping, fishing boats and recreational craft), and relatively dense human habitation in non-marine areas adjacent to the coast. There are no other known activities or projects in this RSA.
Likely Residual Environmental Effects of Labrador-Island Transmission Link (Reflecting Current VEC Condition, as above)	n/a	– The Project is not likely to result in a significant adverse environmental effect on the Marine Fisheries VEC in the Strait of Belle Isle RSA.	n/a	n/a	– The Project is not likely to result in any significant adverse environmental effects on the Marine Fisheries VEC in the Dowden's Point RSA.
Likely Cumulative Environmental Effects (within RSA) of Other Future Projects and Activities	n/a	– General shipping activity is a common and long established activity in the area. There are no known or likely changes to the nature and intensity of such vessel traffic, or any other proposed development projects in the area.	n/a	n/a	– General shipping activity is a common and long established activity in the area. There are no known or likely changes to the nature and intensity of such vessel traffic, or any other proposed development projects in the area.
Cumulative Environmental Effects Summary[c]	n/a	**Not Significant** – Project effects on Marine Fisheries are evaluated as not significant, and there are few if any other projects and activities in the area to contribute to cumulative effects.	n/a	n/a	**Not Significant** – Project effects on Marine Fisheries are evaluated as not significant, and there are few if any other projects and activities in the area to contribute to cumulative effects.

n/a Not applicable.
[a] Marine environment. Applicable to the Marine Fisheries VEC only.
[b] For the Marine VECs, this area comprises the Island of Newfoundland shoreline electrode site only.
[c] Total (cumulative) change from the existing environment. Significance of cumulative effects is evaluated using the same definitions as for the Project Environmental Effects Analysis.

16.6.10 Monitoring and Follow-up

Commercial and recreational marine fisheries in Newfoundland and Labrador are the subject of ongoing management, regulatory enforcement and monitoring (through, for example, the collection of statistical data on catch quantities, locations, and values) by the appropriate federal government agencies. Nalcor has neither the mandate nor the expertise to monitor the fishing industry in the Project areas, but has provided and will continue to provide Project information to such agencies as required and requested.

The effects management measures proposed by Nalcor include consultation and communications with area fishers and other provisions, which will serve as a means to identify and address any Project-related issues and effects as they arise throughout Construction and into Operations and Maintenance.

16.7 Tourism

16.7.1 Introduction

This section of the EIS assesses and describes the potential effects of the Project on the Newfoundland and Labrador tourism industry. This Tourism VEC includes attractions, activities and events, and regional infrastructure and services that support the tourism industry within each of the study area regions in which Project components and activities will take place. Tourism has been identified and considered as a separate VEC in this EIS as it plays a key role in the provincial economy, and because it may be affected both directly and indirectly by the proposed Project.

The tourism industry is an important consideration because attractions (e.g., parks, historic sites), events or activities (e.g., plays, festivals, boat tours) and related services (e.g., accommodations and restaurants) are important economic generators in Newfoundland and Labrador, particularly in rural areas. The tourism sector has experienced a compound annual growth rate of approximately 3% since 2003, resulting in a record number of visitors in 2010 (i.e., 519,000). Total non-resident expenditures have also grown steadily at a compound annual growth rate of 4.6% over the same period, also reaching an all-time high of almost $411 million in 2010. The sector is also important because non-resident visitation brings new money into the province and residents who choose not to travel elsewhere help to retain existing money within the province. The province is attracting growing numbers of non-resident visitors with increased expenditures, and at a time when other regions of Canada are not experiencing similar growth.

Tourism in Newfoundland and Labrador is based on particular well-recognized icons (e.g., natural and cultural attractions including L'Anse aux Meadows National Historic Site, Gros Morne National Park, icebergs, bird colonies and whales). The challenges for Newfoundland and Labrador tourism are, in many ways, also its strengths. The province is off the beaten track, and transportation and weather create challenges for potential visitors. These attributes make the province a special and genuine place of interest because it lacks mass tourism characteristics (e.g., over-crowded venues, impersonal service and inauthentic commercial attractions). To continue to attract non-residents and to retain vacationing residents, the province must maintain its distinctive heritage, strong cultural identity, clean air, quiet and friendly communities, unspoiled natural environments, and uninterrupted viewscapes. In general, areas that have favourable transportation networks and access (e.g., airports, looped roads, rental cars), clusters of cultural or natural tourism products (e.g., attractions, events, activities, destinations) and a range of facilities and services (e.g., food and accommodations) are likely to be more viable than those regions with limited access and fewer cultural or natural opportunities and services.

Tourism-related questions and concerns were identified through Project consultations with stakeholders and government officials as well as with the general public. For some tourists, construction work and the operations (presence) and maintenance of the proposed Project will not make any real difference to their enjoyment of the province. For many, the Project represents clean renewable energy and a sign of economic progress. For other users, who anticipate seeing a pristine environment devoid of development, it may affect their enjoyment of a site or activity. This is especially true of individuals who spend a substantial amount of money and time to travel to the province and expect a pristine environment.

As with other components of the economy, tourism visitation levels and revenues often fluctuate widely, and may be affected by non Project-related occurrences (e.g., quality of the tourism product, new or reduced travel options, currency exchange rates, fuel prices, alternative destinations and marketing campaigns). This effects assessment, therefore, focuses on Project-related changes to the existing environment with consideration of the likely natural variability in the tourism industry over time. The overall effect on tourism due to the Project and other likely projects and activities is addressed in the cumulative effects assessment (Section 16.7.9).

As a result of its very nature, the Tourism VEC overlaps and interacts strongly with other components of the natural and socioeconomic environments, including several of the other VECs and KIs considered elsewhere in this assessment. Effects on tourism, and particularly the enjoyment and quality of the tourist experience, may be due to changes in viewscapes and the remoteness and wilderness character of an area (Visual Aesthetics VEC, Section 16.8). In addition, effects on the tourism industry may stem from changes in the availability of transportation services, local accommodations or other infrastructure and services as a result of Project-related demands (Communities VEC, Section 16.3). Certain recreational activities that are or may be undertaken as part of the tourism experience (e.g., outfitting, hunting and angling, camping, boating, bicycling and hiking) and areas where they take place (e.g., parks and protected areas, and hunting and fishing management areas) were considered in the Land and Resource Use VEC (Section 16.5).

16.7.2 Environmental Assessment Study Areas

16.7.2.1 Spatial Boundaries

The various components and activities that will be associated with the Construction, and Operations and Maintenance of the Project are located within and adjacent to a number of regions and communities throughout Newfoundland and Labrador.

The LSA for the Tourism VEC is defined as the area within which Project-related elements and activities that may affect the tourism industry will occur. This includes the 2 km wide transmission corridor while also considering the nature and location of other Project activities and elements (e.g., access, electrode sites, electrode lines, camps, storage areas). Also included is the proposed 500 m wide submarine cable crossing corridor across the Strait of Belle Isle, from Labrador to the Island of Newfoundland. It also considers any communities or other locations where tourism attractions, activities and / or supporting infrastructure and services may be directly affected by the Project.

The RSA encompasses the overall tourism industry in Newfoundland and Labrador.

16.7.2.2 Temporal Boundaries

The temporal boundaries of the assessment for the Tourism VEC encompass the Project's Construction phase, as well as the Operations and Maintenance phase that will extend through the life of the Project.

16.7.3 Potential Environmental Issues, Indicators and Interactions

16.7.3.1 Potential Environmental Issues

Potential issues and questions associated with the Tourism VEC were identified in the *EIS Guidelines and Scoping Document* issued for the Project (Government of Newfoundland and Labrador and the Government of Canada 2011), and through regulatory, Aboriginal and stakeholder consultation by Nalcor, and by the EIS study team. These issues are associated primarily with how construction-related activities and disturbances and the use of local infrastructure and services, as well as the physical presence of the transmission system, may affect the tourism industry. These items are summarized in Table 16.7.3-1.

Table 16.7.3-1 Identified Issues and Questions: Tourism

Issue / Question	Nature and Rationale	Specific Considerations
Potential decrease in quality of tourism experience and thus, eventually, in visitation levels / industry revenues - due to Project-related disturbances during construction (e.g., noise, dust, presence of workers and use of equipment)	– Through good messaging and marketing, the province has become known for its outdoor tourism activities and unspoiled natural environment. – Interaction with or sight of Project construction work may be perceived as disruptive and negative.	– Labrador, particularly the populated areas at the western and eastern ends of the Project (central Labrador, Labrador Straits). – Throughout the Island of Newfoundland, particularly in areas where the Project is near existing communities, attractions and infrastructure. – Summer tourist season, particularly for the Construction phase and, to a lesser degree, spring and fall shoulder seasons.
Potential decrease in quality of tourism experience and thus, eventually, in visitation levels / industry revenues - due to Project-related uses of, for example, roads, other transportation services, accommodations, as this may be disruptive to tourists seeking to travel to and within the province	– Project vehicles on primary and secondary roads may cause inconvenience and delays for resident and non-resident tourists who may be constrained by time and cost considerations (e.g., vacation days, plane, ferry and rental car reservations). – Use of local accommodations by Project personnel may result in tourists not being able to secure accommodations, which may affect visitation (and thus revenues) in that and future years.	
Potential decrease in quality of tourism experience and thus, eventually, in visitation levels / industry revenues - due to the presence of the transmission system (especially, towers and cleared ROW) during Project operations	– Through good messaging and marketing, the province has become known for its outdoor tourism activities and unspoiled natural environment. – Interaction with or sight of Project infrastructure may be perceived as disruptive and negative.	

16.7.3.2 Key Indicators and Measurable Parameters

The KIs and associated MPs that are relevant to and reflect the potential effects of the Project on the Tourism VEC are identified and described in Table 16.7.3-2.

Table 16.7.3-2 Key Indicators and Associated Measurable Parameters: Tourism

Key Indicator	Rationale for Key Indicator	Measurable Parameter	Rationale for Measurable Parameter
Quality of Tourism Experience	– A key aspect of the tourism product, linked strongly to why people choose to visit an area, and / or whether to return – This may, in turn, affect visitation and revenue levels	– Expectations regarding the nature and quality of the tourism experience vs. actual outcomes – Interference / nuisance levels and tolerance	– Degree of difference between expected and actual tourism experiences, overlain by tolerance or aversion to Project-related disturbances (e.g., transportation, noise, visual) will influence perceptions of tourism experience quality
Tourism Visitation and Expenditures	– Important aspect of the tourism industry that reflects the overall activity levels and value	– Annual visitation levels – Accommodation occupancy rates – Tourism industry revenue levels (may be provincial, regional and / or by attraction / event)	– Project Construction activities could cause a decrease in visitation levels and expenditures by non-resident and resident tourists – Perceived or real Project Construction transportation delays could cause a decrease in tourism activity

16.7.3.3 Potential Project-Tourism Interactions

Potential interactions between Tourism and Project components and activities have been identified for the Quality of Tourism Experience KI and Tourism Visitation and Expenditures KI, and are listed in Table 16.7.3-3. These interactions are associated primarily with how construction-related activities and disturbances, the use of local infrastructure and services, and the eventual presence of the transmission system, may affect the tourism industry. While each Project component and activity listed in Table 16.7.3-3 has some potential to interact with individual tourists or their activities, the focus is on highlighting those which are most relevant to the industry as a whole. The key focus of this assessment is on whether, and the degree to which, any such interactions and resulting effects may translate into overall changes in the nature and status of one or both KIs, materially affecting the tourism industry in Newfoundland and Labrador.

Many potential interactions that may occur between large development projects and tourism can be avoided due to the nature and characteristics of the project itself, and / or can be avoided or reduced through appropriate project planning and design considerations. Project design can be used for effects management purposes where interactions leading to potential adverse effects are recognized at the outset, thereby eliminating many possible causes for concern. These and other effects management approaches are discussed in the sections that follow. The proactive identification and management of potential adverse effects through Project design has been an important aspect of Nalcor's planning to date.

Tourists to the province have been profiled as part of the "touring / explorer" market (NLDTCR 2010) based on their interests, income, education and age. Since these tourists prefer to travel "off the beaten track", it is difficult to identify and measure their complete travel routes and destinations. However, most seek to participate in specific activities (e.g., viewing icebergs, birds or whales) or to visit specific iconic destinations (e.g., L'Anse aux Meadows, Gros Morne National Park) or other destinations that may be related to natural or cultural features (e.g., Twillingate, Cape St. Mary's, Southern Shore), many of which maintain visitation records. This, combined with accommodation occupancy data and tourism expenditures, helps to identify the major travel destinations that residents and non-residents visit. This, in turn, helps to determine whether the proposed transmission corridor or system would intersect with important tourist travel routes to major destinations or would be visible from tourism destinations, and whether these statistics would change if an adverse interaction were to occur. Tourism expenditures, which are reported for the province as a whole, indicate the overall economic health of the tourism industry.

Table 16.7.3-3 Potential Project Interactions: Tourism

Project Phase / Activity	Key Indicator	
	Quality of Tourism Experience	**Tourism Visitation and Expenditures**
Construction		
Construction access trails and roads	–	–
Movement and presence of personnel, equipment and materials	– Potential decrease in quality of tourism experience due to interference with the movement of visitors to and from tourism destinations as a result of increased traffic caused by transport of Project personnel, equipment and materials – Use of local accommodations by Project personnel may result in tourists not being able to secure accommodations, which may affect visitation (and thus revenues) in that and future years	– Decrease in quality of tourism experience may, in turn, affect visitation and revenue levels
Construction camps	– Noise, dust and visibility of Project construction activities may affect tourist enjoyment	—
Marshalling yards and staging areas		
ROW clearing and preparation		
Quarrying and borrowing		
Transmission tower assembly and installation		
Conductor installation		
Converter station site preparation and construction		
Preparation and construction of submarine cable landing sites (on-land works)		
Construction and installation of submarine cables (Marine works)		
Electrode site preparation and installation		
Island system upgrades		
Employment / presence of workers		
Contracting / expenditures	—	
System commissioning		

Table 16.7.3-3 Potential Project Interactions: Tourism (continued)

Project Phase / Activity	Key Indicator	
	Quality of Tourism Experience	**Tourism Visitation and Expenditures**
Operations and Maintenance		
Operations and Maintenance access trails and roads	—	—
Presence and operation of the transmission system	– Potential decrease in quality of tourism experience and thus, eventually, in visitation levels / industry revenues - due to the presence of the transmission system (especially, towers and cleared ROW) during Project operations	– Potential decrease in quality of tourism experience and thus, eventually, in visitation levels / industry revenues - due to the presence of the transmission system (especially, towers and cleared ROW) during Project operations
Routine line inspections and repairs	—	—
Vegetation management		
Potential major system repairs	– Decrease in quality of tourism experience due to Project-related congestion on travel routes and / or in accommodations and other services	– Any decrease in quality of tourism experience may, in turn, affect visitation and revenue levels
Operation of the electrodes	—	—
Employment / presence of workers		
Contracting / expenditures		

— No likely or detectable interaction identified.

16.7.4 Approach to the Environmental Effects Analysis

16.7.4.1 Analytical Methods

The information sources and methods used to describe and understand the existing tourism industry in Newfoundland and Labrador were provided in Section 15.7. The assessment of potential Project effects on Tourism was based on a general approach of "overlaying" what is known about existing tourism attractions, activities and events, and the use of existing infrastructure and services by tourists in the LSA and RSA, with the nature of planned Project components and activities, to identify likely interactions and resulting effects on the VEC and its KIs. The primary focus of this assessment is on whether, and the degree to which, any such interactions may translate into measurable effects (e.g., increase / decrease in visitation or expenditures) on the Newfoundland and Labrador tourism industry.

16.7.4.2 Environmental Effects Descriptors

The potential effects of Project activities on the Tourism VEC are generally described in terms of a set of descriptors which are summarized in Table 16.7.4-1.

Table 16.7.4-1 Effects Descriptors: Tourism

Effects Descriptor	Definition
Direction	
Adverse	Effect is negative and undesirable
Neutral	Effect is neither adverse nor beneficial
Beneficial	Effect is positive and desirable
Magnitude	
No effect	Project results in no change in the existing condition / baseline value
Low	Project results in a small change in the existing condition / baseline value, but this is well within the capacity of the element in question, or is in keeping with the natural condition / variability or accepted threshold of the parameter
Moderate	Project results in a clear change in the existing condition / baseline value, but this is within the capacity of the element in question, or is in keeping with the natural condition / variability or accepted threshold of the parameter
High	Project results in a major change in the existing condition / baseline value, that exceeds the capacity of the element in question or is outside the natural condition / variability or accepted threshold for the parameter
Geographic Extent	
Local	Effect will be evident within the LSA
Regional	Effect will be evident within the RSA
Beyond regional	Effect will be evident beyond the RSA
Duration	
Short-term	Effect will be evident for less than one year
Medium-term	Effect will be evident for between one and four years
Long-term	Effect will be evident for from four to ten years
Far future	Effect will be evident throughout the life of the Project
Frequency	
Low	Effect will occur once or occasionally
Moderate	Effect will occur frequently but it could be sporadically
High	Effect will occur continuously

16.7.5 Construction

16.7.5.1 Overview of Project Construction and Associated Effects Management

Of particular relevance to the Tourism VEC and its associated KIs are the proposed construction methods and arrangements for the Project. Project Construction will take place over an approximately four year period at locations throughout Newfoundland and Labrador, with different types of activities taking place at different sites and at varying intensities over time.

Construction activities such as land clearing and transmission tower erection as well as development of construction infrastructure such as access trails, camps, quarries and lay down areas, will result in noise, dust,

general human presence and other activities and disturbances that may interact with tourism activities at these locations, through visual and other perceptual issues and / or disturbances.

As described in Chapter 3, Project Description, and elsewhere in this EIS, the Project involves substantial requirements for the transportation and movement of construction materials, equipment and workers to and across Project areas throughout the Construction phase. Ports, highways and other transportation infrastructure will be used throughout the province as required. At strategic points along the ROW and at other key sites, marshalling yards will be established to receive and temporarily store materials and equipment for use in Project Construction. The movement of materials and personnel throughout the province over the Construction phase, using existing regional and local transportation infrastructure, represents the key potential interaction between Project works and the tourism industry during that phase of the Project.

Project Construction will also require a significant workforce, that will move across the province as construction tasks progress in sequence, and for which accommodations will be required. Lodging for the construction workforce will be provided through small, temporary, self-contained construction camps established at strategic points along or near the ROW (Chapter 3, Project Description), which will typically be occupied by a sequence of sets of workers. Crews will work on a roster system (yet to be finalized), with a given number of days on the job followed by a number of days off work.

In its Project planning and design, Nalcor has sought to proactively anticipate and avoid the potential for interactions between the Project and the tourism industry, including any associated adverse socioeconomic effects that may result from such interactions. Key environmental effects management measures that relate to the Tourism VEC include:

- the avoidance of known and key tourism attractions and sites during Project planning, including in the selection of the proposed transmission corridor for the transmission line, and in the identification of locations for other key Project components (e.g., electrodes, submarine cable landing sites, converter stations);
- a decision by Nalcor that construction workers will be housed in temporary construction camps rather than in local hotels, B&Bs and other accommodations, so as to avoid placing demands on these services, especially during peak tourism seasons; and
- the coordination and scheduling of Project-related transportation of significant equipment and materials to avoid heavy seasonal tourism traffic to the extent practical, as well as regular communication and consultation with relevant agencies and tourism industry organizations and representatives as part of Project planning.

Other effects management measures that have been identified and proposed in relation to the natural and / or socioeconomic environments, as discussed throughout this EIS, are also relevant to avoiding or reducing potential effects on the Tourism VEC (e.g., the general landscape, visual issues, infrastructure and services).

16.7.5.2 Existing Knowledge

The potential effects of transmission line construction on tourism are, in many respects, similar to those which may be experienced with any large construction project, and particularly comparable with those of other large linear projects such as pipeline, road and railway construction. Unfortunately, there is little available published "existing knowledge" that evaluates and measures the actual and known effects of similar projects and activities on the tourism industry.

Key findings from a selection of recently published literature specific to transmission line construction, and which relates primarily to known and perceived effects on tourism that are often associated with such projects, and / or to the management of their effects on tourism are summarized in Table 16.7.5-1.

Table 16.7.5-1 Existing Knowledge (Construction): Effects of Similar Projects on Tourism

Reference	Study / Project Context	Summary of Findings
PSC Wisconsin (2010, internet site)	This overview reviews the environmental issues and concerns raised by the construction of electric transmission facilities. The first part of the overview provides a general summary of the methods to measure and identify environmental impacts. The second part of the overview is an A to Z directory of specific environmental issues and techniques to minimize or mitigate the impacts.	Tourism was not considered as being specifically affected, but recreation and aesthetics were.

The following sections describe potential effects of Project Construction, and Operations and Maintenance on tourism in Newfoundland and Labrador, and Nalcor's effects management strategies. These strategies are an integral element of the Project design and implementation. The resulting effects assessment is based on residual effects following implementation of the effects management strategies.

16.7.5.3 Construction Effects: Quality of Tourism Experience

Construction activity will occur throughout the province at various stages / times, causing noise, dust, visual intrusion, traffic, or the occasional small leak or spill. However, in most cases work at any particular location will be short-term. As part of Nalcor's effects management strategy, the Project will avoid key tourism attractions and Project activities will occur for the most part in remote interior areas of the province that are away from communities and major roads. Therefore, limited potential exists for direct interaction (visual, respiratory, audible) between the Project and the enjoyment of a tourism experience.

The following describes key issues and effects management strategies relevant to the Quality of Tourism Experience KI:

- Use of transportation infrastructure by the Project during construction will be spread out over four years, and throughout the province. As described in the Communities VEC (Section 16.3), Project use will still be within the overall capacity of existing services and roadways. Some potential for minor and short-term disruptions exists, but these will be similar to normal road construction and other increased construction uses in the province, which routinely occur during the peak tourism season (summer). The main potential for an increased use of public roadways will occur during the transportation of large scale Project components, but these will be infrequent. For any such traffic disruptions, Nalcor will follow standard safety and notification procedures as do other owner / operators of large scale construction projects in Newfoundland and Labrador (e.g., Vale, ExxonMobil).
- Nalcor and its contractors will coordinate and schedule Project-related transportation of large equipment and materials to avoid heavy seasonal tourism traffic to the extent practical. Nalcor will also regularly communicate and consult with relevant agencies and tourism industry organizations and representatives as part of its coordination and scheduling efforts.
- As part of its effects management strategy, Nalcor will house construction workers in camps rather than hotels to avoid occupying Newfoundland and Labrador accommodations during the summer tourism season.
- In addition to these effects management measures, capacity to meet tourist needs can also be increased when demand is apparent. Airlines and car rental companies increase capacity in July and August and capacity has been increased where warranted (e.g., St. John's airport). NLDTCR, Hospitality Newfoundland and Labrador (HNL) and industry are also working together to address air and rental car capacity issues. Where ferry demand has increased (i.e., Labrador Straits), the Department of Transportation and Works added additional crossings in the 2010 high season.

The only areas where Project Construction may affect the tourism quality of experience are along the Labrador Straits near Forteau, on the Northern Peninsula and in central Newfoundland near Deer Lake.

In Central and Southeastern Labrador between Forteau and L'Anse au Diable, some Project Construction activities could affect the overall quality of tourism experience. Construction activities would be most visible (e.g., accommodation camps, submarine cable landing sites, electrode site preparation and marshalling yard) to tourists travelling along the Labrador Straits on Route 510 or some of its side roads between Forteau and L'Anse aux Diable. Occasionally, issues related to movement and presence of personnel, equipment and materials could delay tourists wishing to visit Red Bay National Historic Site and Battle Harbour, the top tourism destinations in Central and Southeastern Labrador. Construction activity and increased demand for travel services on either side of the Strait of Belle Isle may create irritants for tourists and cause delays in meeting ferry and plane schedules and / or finding available or suitable rental vehicles and accommodations, especially during peak travel months (July and August). However, with suitable communications in place in advance to notify tourists and given that most of these delays are within the normal range of construction activities, the effects will not be sufficient to spoil an overall quality of tourism experience.

On the Northern Peninsula, movement and presence of personnel, equipment and materials from Shoal Cove East to Deer Lake may result in occasional traffic delays along Route 430, which is the only access route through the Northern Peninsula and to and from the Strait of Belle Isle ferry, Gros Morne National Park and L'Anse Aux Meadows National Historic Site. The latter two sites are important tourist destinations in the province. However, these effects, which might be a part of a travel experience in any year with or without this Project, are not anticipated to be measurable.

In Central and Eastern Newfoundland, the Deer Lake marshalling yards will support construction-related activities to the north and east of that town. The movement of large-scale Project components could cause short-term traffic delays on the TCH during high tourism season (July and August) for residents and non-residents heading north on Route 430 to Gros Morne National Park, L'Anse aux Meadows National Historic Site and across the Labrador Straits ferry to the two historic sites in southern Labrador, Red Bay National Historic Site and Battle Harbour. It could also temporarily delay tourists accessing the eastern tourism destinations of Twillingate, Fogo and Change Islands, and Terra Nova National Park from the TCH. However, temporary delays are within the range of normal summer construction season traffic, can be managed through scheduling and good communication, and will be avoided during peak travel periods, where possible.

Accidents and malfunctions could occur during Construction, as discussed in Chapter 5. The effect of the low-risk incidents (e.g., small brush fire, release of drilling mud, multiple tower failure, localized slope failure, waste spill) on Quality of Tourism Experience may result in temporary delays or visual distraction along tourist travel routes and destinations. Considering that these events would occur primarily away from major tourist areas and would be limited, the proposed mitigation will likely limit the effect. The accident most likely to occur is a small spill or leak of fuel or lubricants.

Accidental release of hydrocarbons or other contaminants from spills or leaks may result in vegetation alteration and loss, and result in temporary delays and visual distraction during Project Construction if along a tourist travel route. The remediation of a spill would likely require the excavation and disposal of contaminated soils, resulting in additional direct loss of vegetation. The proposed spill prevention mitigation measures will limit the likelihood of a release of hydrocarbon or other contaminant into the natural environment, and the effects management strategies identified above will limit the extent of disruptuion to the tourism experience.

In summary, the nature and quality of the tourism experience both in terms of expectations and potential satisfaction is subjective and personal. Nonetheless, the Project is likely to cause only short-term disturbance effects, and the Project is not expected to have a material adverse effect on the Quality of Tourism Experience in the province.

Summary of Likely Residual Environmental Effects

The likely residual effects of the Project Construction on the Quality of Tourism Experience KI are as follows:

- Adverse, because Project-related Construction work will result in interferences with some tourism activities, thereby potentially diminishing the quality of tourism experience.
- Of low magnitude, because most tourists anticipate a certain amount of road construction and, with the proliferation of websites and smart phones, tourists can schedule their travel to avoid delays, find suitable accommodations or make alternate travel arrangements. Nalcor will schedule certain Project-related movement and presence of personnel, equipment and materials to avoid heavy seasonal tourism traffic and will communicate with its contractors about alternate travel and living arrangements during high tourism season.
- Primarily local and occasionally in the RSA, because Project-related disturbances may occasionally extend beyond Project work areas.
- Of medium-term duration, as Project Construction will occur for one to four years, but not all activities will occur continuously in any one location.
- Of moderate frequency, as any such disturbances may occur intermittently throughout Project Construction.

There is a high degree of confidence that the actual effects of the Project Construction on Quality of Tourism Experience will not be greater than predicted given recent and long-term experience in the province with routine and major construction activities throughout the tourism seasons.

16.7.5.4 Construction Effects: Tourism Visitation and Expenditures

This section examines effects of Construction activities on tourism visitation and expenditures within the four on-land regions crossed by the proposed Project. Movement and presence of Project personnel, equipment and materials will occur in all four regions during the four-year Construction phase and will cause some minor and short-term disruptions during peak tourism travel months (i.e., summer); but, these disruptions will be similar to those from other linear-type construction projects (e.g., roads). Most construction activity will occur away from communities and will avoid major tourism areas. Detours or delays in movement of visitors to and from tourist destinations will likely occur during the transportation of large scale Project components, but these delays will be infrequent and, therefore, unlikely to result in non-visitation or cause direct loss of revenue to tourism operators.

As is the case for maintaining a quality of tourism experience, coordinating and scheduling Project-related transportation of significant equipment and materials and ongoing communications with relevant agencies and tourism industry organizations to avoid heavy seasonal tourism traffic will help avoid loss of revenue to tourism operators.

Construction workers will be housed and fed in temporary camps and will use company transportation when and where available. This will allow the Project to avoid competing with tourists for limited accommodations, which would otherwise affect tourism visitation, but not revenues.

The two areas where Project Construction has the potential to result in measurable effects on tourism are along the Labrador Straits and on the Northern Peninsula, where limited access routes exist. In Labrador, many tourists are constrained by tight schedules; travel to and from the Straits is time sensitive (i.e., ferry, airplane), weather- and seasonally-dependent, and alternative highway and plane routes are unavailable. Therefore, traffic delays along a travel route could negatively affect Labrador travel to some tourist destinations (e.g., Red Bay National Historic Site or Battle Harbour). However, activities associated with this Project are within the normal range of summer construction activity. Sufficient knowledge of previous similar construction projects, as well as proper planning, scheduling and communicating with appropriate agencies in relation to the Project should result in avoidance of most problems and prevent loss of revenue to tourism operators.

On the Northern Peninsula, movement and presence of Project personnel, equipment and materials could result in traffic delays to two important provincial tourism destinations, Gros Morne National Park and L'Anse aux Meadows National Historic Site. Traffic on Route 430 can be slower on the Northern Peninsula (e.g., as compared to the TCH) since the highway has only two lanes, limited passing ability and a lower speed limit; in summer, slow moving traffic such as camper trailers and construction vehicles exacerbate this problem. On the Northern Peninsula, traffic issues resulting from Project-related activities may interfere with tourists' schedules. However, this should not prevent them from reaching their destinations, although perhaps later than anticipated. Therefore, the effect is not expected to be measurable in terms of loss of revenue to tourism operators.

Project-related personnel may use a variety of transportation modes to reach remote or distant Project sites (e.g., Labrador or the Northern Peninsula). Throughout the year, this should not pose a capacity problem; however, during the high tourism season when airplane seats and rental cars are in shorter supply, especially on the Northern Peninsula and along the Labrador Straits, some competition for these transportation modes may occur. Both rental car companies and flight providers have improved their capacity in recent years, and this trend is expected to continue in an effort to meet growing demands. Thus, visitation, expenditures and occupancy rates should not be diminished nor should the overall revenue to tourism operators.

Accidents and malfunctions could occur during Construction, as discussed in Chapter 5. The effect of the low-risk incidents (e.g., small brush fire, release of drilling mud, multiple tower failure, localized slope failure, waste spill) on Tourism Visitation and Expenditures may result in temporary, local disruption or delays. As indicated in the Quality of Tourism Experience KI, considering that these events would occur primarily away from major tourist areas and would be limited, the proposed mitigation will likely limit the effect.

Because these disruptions are temporary, localized and for the most part, away from major tourism areas, they are unlikely to diminish the overall tourism experience and are unlikely to affect current or future visitation and tourism revenues. Therefore, the Project is unlikely to measurably affect tourism visitation levels or expenditures.

Summary of Likely Residual Environmental Effects

The likely residual effects of Project Construction on the Tourism Visitation and Expenditures KI are as follows:

- Adverse, because Project-related Construction will result in interferences with tourism activities, thereby potentially decreasing visitation and revenue to tourist operators.
- Of low magnitude, because construction traffic delays are a normal part of summer highway travel. Nalcor will schedule certain Project-related movements and presence of personnel, equipment and materials to avoid high volume seasonal tourism traffic; communicate to appropriate agencies about non-routine Project-related movement; and, communicate with contractors about alternative travel and living arrangements during high tourism season to avoid loss of income to tourism operators.
- Primarily local and occasionally regional, because Project-related disturbances may occasionally extend beyond Project work areas.
- Of medium-term duration, as Construction traffic will occur for one to four years.
- Of moderate frequency, as any such disturbances may occur intermittently throughout Project Construction.

There is a high degree of confidence that the actual effects of Project Construction on Tourism Visitation and Expenditures will not be greater than predicted given recent and long-term experience in the province with routine and major construction activities throughout the tourism season.

16.7.6 Operations and Maintenance

16.7.6.1 Overview of Project Operations and Maintenance and Associated Effects Management

This Project phase will involve operating and maintaining the transmission system. Most Operations and Maintenance Project components and activities will have effects similar to those of other existing transmission systems and will not likely result in effects on tourism, although this may vary by region (e.g., if major system repairs are required in the Straits area of Central and Southeastern Labrador during the peak tourism months of July and August, suitable accommodations and rental cars might be difficult to find).

From a tourism perspective, the primary focus of this assessment is on the presence and operation of the transmission system in the landscape and how this may affect the quality of the tourism experience and, eventually, tourism visitation and revenues in the province. Potential major system repairs and presence of workers (e.g., prolonged repairs could result in traffic delays) are also considered. Effects management strategies and approaches related to Operations and Maintenance will be similar to these developed for Construction, as applicable.

16.7.6.2 Existing Knowledge

As stated in the existing knowledge section for construction effects on tourism, effects on land use, visual landscape, and property values are the primary socioeconomic focus (Table 16.7.6-1). With the exception of effects on visual amenity, land use and recreation, limited available literature focuses on the actual effects of the operations and maintenance phase of transmission projects on tourism, but rather the focus is on the overall effect of the transmission corridor.

Table 16.7.6-1 Existing Knowledge (Operations and Maintenance): Effects of Similar Projects on Tourism

Reference	Study / Project Context	Summary of Findings
PSC Wisconsin (2010, internet site)	This overview reviews the environmental issues and concerns raised by the construction of electric transmission facilities. The first part of the overview provides a general summary of the methods to measure and identify environmental impacts. The second part of the overview is an A to Z directory of specific environmental issues and techniques to minimize or mitigate the impacts.	– Tourism was not considered as being specifically affected, but recreation and aesthetics were.
Marshall and Baxter (2002)	High-voltage, high-capacity overhead lines are the economic and reliable choice for the bulk transmission of electricity throughout the world. The routing of transmission lines is a complex process, and in the UK requires that a balance is struck between statutory obligations, engineering requirements, economic viability, land use and the environment. Transmission line routing can rightly generate considerable public interest and debate, but issues often focus on local effects such as visual amenity rather than the wider benefits of the project to society as a whole.	– In general, the main potential effects of an overhead transmission line are the effects on visual amenity (e.g., people living and working in the area) and on the landscape resource. The degree of visual intrusion can be reduced through careful routing. Towers and conductors may be visible from tourist attractions and may alter the character of the landscape in which they are sited. – Interactions between effects may exist for specific topics (e.g., effects on visual amenity and cultural heritage) and may interact to highlight an indirect effect on tourism and thus on the tourism economy of the area. – Authors suggest to follow the Holford Rules and avoid major areas of highest amenity value even if total mileage is somewhat increased in consequence.

16.7.6.3 Operations and Maintenance Effects

This section examines the effect of Project Operations and Maintenance activities on the Quality of the Tourism Experience as well as on Tourism Visitation and Expenditures. Tourism is a growing industry. The province appeals to tourists who seek outdoor adventures on the ocean, in wide open landscapes and in the small friendly communities of Newfoundland and Labrador.

During this phase of the Project, construction infrastructure not required during Project operations will be removed, and construction activity will not occur; routine maintenance will be similar to current routine maintenance of other transmission lines within the province, and is unlikely to affect most tourists' quality of experience. For occurrences during routine maintenance and repairs where tourist experience is affected and, in particular, for major planned and unplanned (e.g., hurricanes) system repairs, similar procedures will be followed as during Project Construction (e.g., coordinating and scheduling with appropriate agencies, avoidance of high tourism periods and emergency planning), but unlike Construction, these repairs would occur only at specific locations. Further, the transmission line avoids all tourism infrastructure, is similar to the many transmission lines currently crossing the province and, because of its location away from major highways (except on the Avalon Peninsula where it parallels existing transmission lines) and communities, it will not be visible to most travelers and tourists.

Presence and operation of the transmission system, potential major system repairs, and presence of workers could affect the quality of the tourism experience in several ways. Depending on the nature and seasonal occurrence of major system repairs and presence of workers, Project Operations and Maintenance may result in traffic delays and detours that affect the quality of tourism experience. Traffic delays can prevent tourists from reaching destinations as planned (particularly when using airplanes or ferries) and possibly not being able to visit some areas when schedules are inflexible. Changing reservations or missing bookings could result in change fees or lost deposits.

The months of July and August are high tourism season throughout the province and at that time of year it can be difficult for tourists to find airplane seats and vehicle rentals. Excess accommodations capacity existed in all regions in 2010 but this remaining capacity might not be suitable to meet the needs of Newfoundland and Labrador's typically high income non-resident tourists.

Viewing of permanent towers is one of the main ways in which the quality of tourism might be affected by the Project. In total, approximately 910 to 1,305 towers will be constructed between the Muskrat Falls converter station and the Forteau Point transition compound. However, only one tower, at Forteau Point, will likely be visible to the average tourist. Between Shoal Cove East and Soldiers Pond approximately 2,148 towers will be constructed, almost all of which will not be visible from the TCH or smaller feeder roads, except on the Avalon Peninsula and near Clarenville where they will be built along existing transmission ROWs.

The main consideration for the Tourism VEC is the viewing of towers by nature-based tourists in wilderness areas, particularly near the Labrador Straits, on the Northern Peninsula and in Central Newfoundland. In Labrador, tourists expect to experience an unspoiled wilderness. If they arrive by ferry there is a potential they will see the transmission towers at Forteau Point. On the Northern Peninsula, a popular hiking, kayaking / canoeing and outfitting area, tourist enjoyment of the areas near Shoal Cove East, Portland Creek, Rack Lake, Four Ponds and IATNL may be affected by the visibility of the transmission towers. In Central Newfoundland, the ROW is unlikely to affect the quality of tourism experience near the Riverfront Chalet (Stantec 2011). However, in many situations, the actual visibility of the transmission line is confined to a small area of a large panorama and away from the main highway. The visibility of the Project by tourists is highly dependent on environmental conditions such as weather, terrain, and vantage point. Further, transmission towers are common occurrences and represent modern conveniences (e.g., heat and light), even in rural areas. For many tourists, transmission ROWs and towers do not affect enjoyment of a region as long as they are isolated occurrences. Therefore, the quality of the overall tourism experience is unlikely to be compromised as a result of the Project and is highly unlikely to affect future tourism revenues.

Accidents and malfunctions could occur during Operations and Maintenance, as discussed in Chapter 5. The effect of the low-risk incidents (e.g., small brush fire, multiple tower failure, small leaks and spills) on Quality of Tourism Experience and Tourism Visitation and Expenditures may result in temporary, localized delays to travel or distractions to the visual experience. The accident most likely to occur is a small spill or leak of fuel or lubricants. Minor spills will be cleaned-up efficiently and effectively and unacceptable environmental effects are not anticipated. Considering that these events would occur primarily away from tourist attractions and would be limited, the proposed mitigation will limit the effect.

The only areas where Project operations and maintenance may affect the tourism quality of experience are along the Labrador Straits near Forteau, on certain sections of Route 430 on the Northern Peninsula and on certain sections of the TCH in Central and Eastern Newfoundland and on the Avalon Peninsula. These are more fully described below Tourism interest in Labrador is increasing, but despite improved ferry service and a continuous road connection from the Labrador Straits to Québec and beyond, challenges still face tourists travelling to and from Labrador. Travel from Central to Southeastern Labrador requires driving on rough roads with limited services. Availability of rental vehicles or suitable accommodations during the peak travel months is also limited. Tourists may become disappointed if these challenges are further exacerbated by traffic delays, either in Labrador or on the Northern Peninsula, that cause difficulty meeting ferry and plane schedules. The quality of the experience might also be affected by the visibility of transmission towers around Forteau and L'Anse Amour in what is perceived to be an unspoiled landscape. However, this effect will not likely be measurable.

Tourism in the Northern Peninsula has been increasing, especially to Gros Morne National Park. Traffic delays on Route 430 (the major vehicle route to the region) which has limited capacity for passing, and the need to change plans as a result of delays, could affect the quality of the tourism experience. Competition for limited airplane seats, rental vehicles and suitable accommodations could also affect the quality of experience. Tourist's enjoyment of the area might also be minimally affected by the visibility of transmission towers near Shoal Cove East.

Tourism has also been increasing in Central and Eastern Newfoundland, particularly in the eastern portion of the region around Terra Nova, Trinity and Bonavista. Project-related traffic delays on the TCH could affect tourists' ability to access some sites in a timely manner, and this could minimally affect the quality of the tourism experience.

If major system repairs or presence of workers cause traffic delays on the TCH, access to six of the province's top 19 tourism destinations, as well as time sensitive transportation modes, might be adversely affected.

Summary of Likely Residual Environmental Effects

The likely residual effects of Project Operations and Maintenance on the Quality of Tourism Experience and Tourism Visitation and Expenditures KIs are as follows:

- Adverse, because the transmission line is a permanent presence on the landscape. Also, Project Operations and Maintenance will result in occasional, temporary traffic disturbance.
- Of low magnitude, because the transmission line is primarily located away from tourism areas. In more heavily populated and traffic areas (Avalon Peninsula), the transmission line runs parallel to existing transmission lines.
- Regional, because the effect will extend into the RSA.
- Of short-term to far future duration, as Operations and Maintenance will occur throughout the life of the Project, but Maintenance activities will be short-term events.
- Of low to moderate frequency, as maintenance activities and associated effects are expected to occur occasionally and sporadically; and, while the Project presence on the landscape will last throughout the life

of the Project, the effects of viewing the Project will depend on a variety of environmental conditions such as weather, terrain, and vantage point, and may therefore also be occasional and sporadic.

There is a high degree of confidence that the actual effect of Project Operations and Maintenance on Tourism will not be greater than predicted because transmission lines are common occurrences in many parts of the world, do not present high risk and are predictable in their effects, and the predictions are based on past experiences with major construction projects in the province.

16.7.7 Environmental Effects Summary and Evaluation of Significance

16.7.7.1 Summary of Environmental Effects

A summary of the potential Project-related environmental effects on the KIs for the Tourism VEC are presented in Table 16.7.7-1. The information is brought together to develop an overall conclusion about the effects of the Project on the Tourism VEC.

Table 16.7.7-1 Environmental Effects Analysis Summary: Tourism

Project Phase / Key Indicator	Likely Residual Environmental Effects Summary Descriptors				
	Direction	**Magnitude**	**Geographic Extent**	**Duration**	**Frequency**
Construction					
Quality of Tourism Experience	**Adverse** – Project-related construction will result in occasional short-term interference (visual, noise, dust, traffic disruptions, accommodation shortages) with enjoyment of tourism activities, but these disruptions are within the normal variability of the effects of construction activities within the province	**Low** – Effects management measures will result in minimal traffic delays and minimal shortages of accommodation and means of transportation	**Local to Regional** – Local and sometimes regional (e.g., traffic delays in one zone of the province can affect tourism in another zone)	**Medium-term** – Project construction will occur from one to four years, but not necessarily that length of time in any one location, nor will Project activities occur near major tourism destinations	**Moderate** – Disturbances may occur intermittently throughout the Construction phase
Tourism Visitation and Expenditures	**Adverse** – In some locations construction activities may cause traffic delays or some irritants in travel bookings	**Low** – Construction interruptions will be minor, short-term and within the range of normal effects related to construction activities within a tourism season	**Local to Regional** – Local and sometimes regional (e.g., traffic delays in one zone of the province can affect tourism in another zone)	**Medium-term** – Project construction will occur over a four year period, but not necessarily that length of time in any one location, nor will Project activities occur near major tourism destinations	**Moderate** – Disturbances may occur intermittently throughout the Construction phase, primarily in the transport of large scale Project components

Table 16.7.7-1 Environmental Effects Analysis Summary: Tourism (continued)

Project Phase / Key Indicator	Likely Residual Environmental Effects Summary Descriptors				
	Direction	**Magnitude**	**Geographic Extent**	**Duration**	**Frequency**
Summary of Likely Residual Construction Effects on Tourism: The Quality of Tourism Experience KI could be intermittently affected (e.g., noise, dust, small leaks or spills, visual disturbance, traffic delays) but these are within the range of normal effects related to construction activities. Occasionally, large scale construction components could cause traffic delays during the summer (July and August) when equipment and materials are moved along travel routes frequented by tourists, but these are also within the range of normal effects related to construction activities. Conflicts between Project-related personnel and tourists for travel and accommodation resources will be limited, if they occur at all, because construction personnel will mainly be housed in temporary construction camps. Project-related personnel may use a variety of transportation modes to reach Project sites. Throughout the year, this should not pose a capacity problem for tourists, but during high tourism season when there is greater demand for airplane seats and rental cars, resident and non-residents may occasionally experience difficulty booking certain travel modes. These disturbances are within the normal travel experience of tourists, especially during the peak tourism seasons, and can be managed by avoiding Project Construction near tourism sites, by effective scheduling, and through ongoing communications with appropriate agencies. These effects management measures should prevent loss of revenue to tourism operators.					
Operations and Maintenance					
Quality of Tourism Experience and Tourism Visitation and Expenditures	**Adverse** – Visual effect of structures may create a negative quality experience at particular locations, but most structures are located in remote areas away from major roads, which should not affect tourism visitation or expenditures	**Low** – Effects management measures will result in minimal traffic delays or accommodation and transportation mode shortages, except for major system repairs which are infrequent events and for which emergency planning is in place	**Regional** – The effects of the Project will extend into the RSA	**Short-term to Far Future** – Maintenance activities will be short-term and temporary events – The transmission system will be placed permanently on the landscape	**Low to Moderate** – Activities are expected to occur occasionally – The effect of viewing the Projec will be sporadic depending on environmental conditions

Table 16.7.7-1 Environmental Effects Analysis Summary: Tourism (continued)

Project Phase / Key Indicator	Likely Residual Environmental Effects Summary Descriptors				
	Direction	**Magnitude**	**Geographic Extent**	**Duration**	**Frequency**
Summary of Likely Residual Operations and Maintenance Effects on Tourism: Traffic delays caused by major system repairs are unlikely, but should they occur, Nalcor's existing effects management measures, emergency planning and communications with appropriate tourism and transportation departments and agencies are expected to address these repairs including extreme events (e.g., hurricanes, ice storms) to minimize associated effects. Large permanent structures on the landscape could negatively affect some tourists' quality of experience, but the transmission system will avoid special tourism places (e.g., Gros Morne and Terra Nova National Parks), is visible in relatively few remote wilderness areas, and will not be visible in most regions except the Avalon Peninsula where it parallels already existing structures. Considering this, the Operations and Maintenance of the Project is expected to have a minor to negligible effect on the Quality of the Tourism Experience and on Tourism Visitation and Expenditures.					

16.7.7.2 Definition and Determination of Significance

Significant adverse effects are considered to be those that cause a change in the VEC that will alter its status, integrity and future viability / sustainability beyond an acceptable level.

For the Tourism VEC, a significant adverse environmental effect is defined as one where the Project causes a decrease in the overall quality and enjoyment of Newfoundland and Labrador's tourism product, in such a way that it results in a detectable decrease in tourism visitation and expenditure levels in one or more regions of the province and / or where it threatens the successful operation and overall economic viability of one or more tourism enterprises. An environmental effect that does not meet these criteria is considered not significant.

Construction, and operations and maintenance of major transmission lines have occurred within the province without any significant negative effect on tourism. Construction activities associated with the proposed Project are short-term, avoid key tourism attractions, are located away from most communities and major roads, and are within the normal pattern of summer construction activity within the province. Project Construction activity will use existing roadways and access routes where possible, thus, not adding unnecessary land disturbance. Construction workers will be housed in temporary accommodations along the ROW, which will remove workers from unnecessary interaction with local communities and will avoid competition with tourism establishments in the region. Planning, coordinating and scheduling Project activities to avoid seasonal tourism traffic and ongoing communication and consultation with relevant agencies and tourism industry organizations will minimize disruption to tourist travellers.

Through Nalcor's effects management measures, the NLDTW's long-term knowledge and expertise in traffic management, the province's focus on creating and maintaining a high quality tourism product, and the strength of Hospitality Newfoundland and Labrador's partner relationships among government and tourism operators, sufficient policies and practices are in place to manage likely adverse effects of the Project on tourism. Therefore, current tourism opportunities are expected to remain available and viable, and future tourism opportunities are not expected to be compromised as a result of the Project.

Based on the above, the Project, including its Construction and Operations and Maintenance phases, is likely to result in no significant adverse environmental effects on the Tourism VEC.

16.7.8 Evaluation of Project Alternatives

This section compares alternative transmission corridor segments with the corresponding portions of the proposed Project corridor discussed throughout this assessment on Tourism. The alternative segments cross approximately the same geographic areas as the preferred corridor. For the proposed Project and alternative corridor segments, construction activity and visual aesthetics of the towers on the landscape will be the primary effects on the quality of the tourism experience; however, the towers are anticipated to have little to no effect on tourism visitation and expenditures, with the possible exception of the tourism experience at the Point Amour Lighthouse Provincial Historic Site for the Point Amour Alternative Segment (A3). In all cases, primary tourism sites are avoided, construction will be scheduled to avoid areas of high tourism concentration during the summer months, and towers are planned to avoid interruption of major view planes (Visual Aesthetics VEC, Section 16.8).

The comparison of the Project and alternative corridors is included in Table 16.7.8-1.

Table 16.7.8-1 Summary Evaluation of Project Alternative Means: Tourism

Project Alternative Means	Environmental Implications (Compared to the Proposed Transmission Corridor)	
	Quality of Tourism Experience	**Tourism Visitation and Expenditures**
A2: North-west of Strait of Belle Isle Alternative Segment	No difference, as few tourists visit the area.	No difference, as no tourism facilities are located in the immediate area.
A3: Point Amour Alternative Segment	Tower will likely be visible on the road to Point Amour Lighthouse Provincial Historic Site as opposed to along Route 530 at Forteau Point. Point Amour is a designated tourism site whereas Route 530 at Forteau Point is a route that tourists travel. The transmission tower and its construction could affect the overall quality of tourism experience at Point Amour because tourists would be more likely to expect construction or a tower along a public roadway.	If tourists feel the tower and its construction on the road to the lighthouse impedes their view of the region, a slight decrease in visitation and expenditures might occur at the site. However, tourists can no longer climb the lighthouse staircase to view the Straits.
A4: Strait of Belle Isle Newfoundland Side Alternative Segment	It is unlikely that construction would impede traffic or that towers would be visible on the alternative route.	No difference.
A5: GNP North-east Alternative Segment	The proposed area through which both routes would go is rarely used by tourists (no outfitters, limited trails).	There are no tourism establishments or means to spend money on either route.
A6: GNP West-central Alternative Segment	Small collections of RV parks are located on both routes. The alternative routing has a few more RVs / mobile trailers. The construction and permanent placement of towers could diminish the quality of tourism experience.	It is unlikely that the construction and viewing of a tower will result in decreased visitation and expenditures because few tourists travel in this area and limited opportunities exist for expenditures.
A7: GNP Eastern LRM Crossing Alternative Segment	Little difference. The proposed routing crosses an accessible waterbody on which an outfitter is located. The alternative route is less accessible, but an outfitter is also located on it.	It is unlikely that the construction and viewing of several towers will result in decreased visitation and expenditures as alternative areas are available for hiking and limited opportunities exist for expenditures in the immediate area.
A8: GNP IATNL Alternative Segment	Back country trails are located in this area. Towers are less visible from an outfitting lodge in the alterative routing.	It is unlikely that the construction and viewing of a tower will result in decreased visitation and expenditures in the region.
A9: Birchy Lake Alternative	The alternative passes through a popular RV and summer tourist area as well as one outfitter cabin. The proposed routing avoids these areas.	Some diminished expenditures could occur with the alternative routing if RVs or day users in the area are concerned about construction activities and their associated disturbances (e.g., noise, dust, traffic, small leaks or spills, general human presence or viewing a tower).
A10: NLOA Alternative Segment	The alternative partly follows an existing transmission line. The alternative may overlap with four outfitters.	The alternative will increase access which may increase visitation and expenditures for some outfitters. It is unlikely to affect other outdoor tourists as it is a remote region of the province.
A11: Avalon Alternative Segment	Both routes cross popular boating and summer tourism areas. The alternative routing crosses more waterbodies than the proposed routing. The construction and permanent placement of towers might affect tourists' quality of experience.	It is unlikely that the construction and viewing of a tower will result in decreased visitation and expenditures as construction is common on the Avalon Peninsula near the TCH, and other transmission lines are located in the region.

In summary, the alternative segments could cause some minor irritations to the overall quality of experience, but many of these effects would be momentary as they would occur primarily when traveling by car and less frequently when hiking or boating. Neither the alternatives nor the preferred corridor will likely cause measurable effects to tourism visitation or expenditures.

No technically and economically feasible alternatives for the submarine cable crossing or the shoreline electrode sites were identified (see Chapter 2, Section 2.12.3), and therefore marine Project alternatives are not evaluated for Tourism.

16.7.9 Cumulative Environmental Effects

Cumulative effects are the overall effect on the Tourism VEC as a result of the Project's residual effects in combination with effects of past, present and reasonably foreseeable future projects and activities.

Projects that could overlap temporarily with the Project include:

- Lower Churchill Hydroelectric Generation Project (assuming construction begins in 2011, peak employment would occur in 2016);
- TLH3 (Happy Valley-Goose Bay to Cartwright Junction – operational since late 2009);
- General Economic and Infrastructure Development (Labrador); and
- General Economic and Infrastructure Development (Island).

From the perspective of the Project, cumulative effects on Tourism (Quality of Tourism Experience and Tourism Visitation and Expenditures) will be greatest during Project Construction because noise, dust, visuals, traffic delays, transportation shortages and demand for accommodation will be greatest, particularly along major traffic routes.

Cumulative effects associated with the Project are summarized in Table 16.7.9-1. This table outlines trends, existing developments and proposed initiatives that could affect the Tourism VEC in the RSA (i.e., projects that could simultaneously occur with this Project in the Construction, and Operations and Maintenance phases that could cause increased traffic delays, shortages of suitable accommodation and means of transportation along major traffic routes (e.g., TLH, TCH), or could cause a diminished quality of tourism experience).

A significant effect would cause a decrease in the overall quality and enjoyment of Newfoundland and Labrador's tourism products in such a way that it (1) results in a detectable decrease in tourism visitation and expenditure levels in one or more regions of the province, and / or (2) threatens the successful operation and overall economic viability of one or more tourism enterprises. The effects of the Project in combination with other projects and activities that have been or will be carried out are not expected to result in an effect on the Tourism KIs that would be considered significant, based on the definition. Therefore, significant cumulative effects on the Tourism VEC are not likely to occur.

Table 16.7.9-1 Cumulative Environmental Effects Summary: Tourism

Cumulative Effects Analysis	Central and Southeastern Labrador	Strait of Belle Isle[(a)]	Northern Peninsula	Central and Eastern Newfoundland	Avalon Peninsula
Current (Baseline) Tourism Condition	– Tourism is increasing as a result of business travellers and the completion of the TLH.	n/a	– Tourism is increasing as a result of continual increased visitation at Gros Morne National Park and interest in outdoor and cultural tourism product.	– Tourism is increasing, particularly on the Bonavista Peninsula and Twillingate Islands.	– Tourism is increasing, particularly business travellers on the north-east Avalon as a result of a buoyant growing economy.
Likely Residual Environmental Effects of Labrador-Island Transmission Link	– Some possible short-term traffic inconvenience due to movement of large scale Project components in the Labrador Straits area near Forteau. – Visual presence of tower near Forteau.	n/a	– Some possible short-term inconvenience due to movement of large scale Project components on Route 430. – Visual presence of towers near Shoal Cove East, Portland Creek Pond and Rack Lake.	– Some possible short-term inconvenience due to movement of large scale Project components entering / exiting Deer Lake marshalling yards and travelling north and east. – Visual presence of towers at Birchy Lake and Riverfront Chalet.	– No anticipated measurable residual effects.

Table 16.7.9-1 Cumulative Environmental Effects Summary: Tourism (continued)

Cumulative Effects Analysis	Central and Southeastern Labrador	Strait of Belle Isle[(a)]	Northern Peninsula	Central and Eastern Newfoundland	Avalon Peninsula
Likely Cumulative Environmental Effects (within RSA) of Other Future Projects and Activities	– Increased demand and insufficient supply of short-term accommodations in Happy Valley-Goose Bay area due to construction at Muskrat Falls of both the Project and the Lower Churchill Hydroelectric Generation Project, and increased traffic as result of TLH3. – Increased traffic on Route 510 plus increased workers as a result of general economic development could affect the ability of tourists to find suitable accommodations in the Labrador Straits, or diminish the overall quality of tourism experience during the peak tourism season.	n/a	– Increased numbers of travellers related to other projects and activities could result in more frequent traffic delays on Route 430 during the peak tourism season (July and August), causing tourists to miss travel connections to Labrador and time sensitive United Nations Educational, Scientific and Cultural Organization (UNESCO) sites. – Increased traffic related to other projects and activities could cause a decrease in quality of tourism experience. – Increased demand by workers on other projects and activities for limited accommodations, restaurants and retail services could discourage visitors to the region.	– No anticipated projects that will overlap with the Project.	– No anticipated projects that will overlap with the Project.
Cumulative Environmental Effects Summary	– **Not significant** considering that construction will occur over four years, a traffic management plan and accommodations camps will be in place, and Nalcor will adjust its schedule to accommodate high tourism season. Thus, the contribution of the Project to cumulative effects is considered low.	n/a	– **Not significant** considering construction will occur over four years and a traffic management plan will be in place. Thus, the contribution of the Project to cumulative effects is considered low.	– No anticipated cumulative effects.	– No anticipated cumulative effects.

n/a Not applicable.
(a) Strait of Belle Isle does not apply to tourism. Information related to either side of the Strait of Belle Isle is contained within the appropriate geographic land region (i.e., the Central and Southern Labrador or the Northern Peninsula).

16.7.10 Monitoring and Follow-up

The tourism industry in Newfoundland and Labrador is subject to ongoing management, regulatory enforcement and monitoring (through, for example, the collection of statistical data on visitation and accommodation occupancy rates, expenditures, quality and satisfaction rates) by the appropriate government departments and agencies, industry organizations and others. Nalcor has neither the mandate nor the expertise to monitor the tourism industry in the Project areas, but has provided, and will continue to provide, Project information to such agencies as required and requested. As described above, a number of the effects management measures proposed by Nalcor include initiatives related to ongoing communication and cooperation with authorities and other participants in the tourism industry, which will serve as a means to identify and help to address any Project-related issues and effects as they arise throughout Project Construction and into the Operations and Maintenance phase of the Project.

16.8 Visual Aesthetics

16.8.1 Introduction

The aesthetic value of the landscape can vary according to its scenic elements and the perception of the landscape by viewers. All landscapes have scenic value, which may be altered by changes brought on by the Project and other future developments. The goal of the visual aesthetics section of this assessment is to determine the amount and significance of the changes to the visual landscape potentially resulting from the Project.

This section provides an assessment of the level of Project-related alterations to the visual landscape, the degree to which the alterations contrast with the existing landscape, and the expected significance of these changes. The existing environment and the visual classes used in this assessment were characterized in Section 15.8. The scenic quality of the landscape and the sensitivity of the views at 12 Key Observation Points (KOPs) were described and ranked, and are used in assessing the Project's visual effects. This process included consideration of landscapes, landscape integrity, aesthetics and wilderness values (see Section 15.8.3) as outlined in Section 4.4.4.4 of the EIS Guidelines and Scoping Document (Government of Newfoundland and Labrador and the Government of Canada 2011). The visual Aesthetics Component Study (Stantec 2011b) was also used to inform the assessment, as it indicated the potential number of towers visible from a given location and the visual exposure (i.e., likely visibility of the proposed transmission line).

The landscape of Newfoundland and Labrador outside of urban centres is typically forested, as much of the province is undeveloped. Construction of the Project will therefore visually contrast with much of the present visual landscape. The ROW may be especially visible where the required clearing of trees for the Project components (e.g., access, ROW) creates a linear contrast against the natural surroundings. Transmission towers are likely to contrast with the existing environment where they are visible from a short distance or when they are visible against the sky.

16.8.2 Environmental Assessment Study Areas

16.8.2.1 Spatial Boundaries

The LSA focuses on the 2 km wide transmission corridor within which Project-related components and activities will occur, while also considering the general nature and location of other Project components. Primarily, this consists of the cleared ROW and transmission towers, but also includes the converter stations, access trails and roads, temporary camps and storage areas. From within the LSA, any of these visible components will likely be in the foreground of potential viewers, depending on the view angle, topography and vegetation cover.

The RSA includes locations up to 4.8 km from the ROW. This distance encompasses views that could potentially have a foreground or middle-ground view of the Project. Beyond this distance, the Project will be in the

background and details of the landscape generally become blurred and blend in with their surroundings, and are unlikely to have a visual effect.

16.8.2.2 Temporal Boundaries

The temporal boundaries for the EA of the Visual Aesthetics VEC encompass the Construction phase and the Operations and Maintenance phase of the Project. Although this assessment considers the Construction phase, there is a focus on the Operations and Maintenance phase, as this is when all Project components (e.g., transmission towers, conductors, converter stations) will be completed and expected to be the most visible.

16.8.3 Potential Environmental Issues, Indicators and Interactions

16.8.3.1 Potential Environmental Issues

This section outlines potential issues associated with the Project altering the visual aesthetics of the landscape. Issues and questions related to visual aesthetics, as identified in the EIS Guidelines and Scoping Document (Government of Newfoundland and Labrador and the Government of Canada 2011), through regulatory, Aboriginal and stakeholder consultation, and by the EIS study team are outlined in Table 16.8.3-1.

Table 16.8.3-1 Identified Issues and Questions: Visual Aesthetics

Issue / Question	Nature and Rationale	Specific Considerations
How visually distracting will a cleared ROW and towers be in the landscape?	The cleared ROW and towers will be visible in the landscape	The cleared ROW and towers may be visually discernible and may have an adverse effect on the scenery
How dominant will multiple 43 m high transmission towers be in the landscape?	The towers will be visible depending on the viewers' proximity to the structures, the topography and the vegetative buffer present	Above the horizon, towers visible against a sky background may become predominant silhouettes
The Project may have adverse visual effects at waterbody crossings	The Project may be visible from waterbodies	User groups may find the views of the Project adverse and detract from their experience
The Project may have adverse visual effects in remote areas	The Project may be visible from remote cottages, outfitting lodges and recreation areas	User groups may find views of the Project adverse and detract from their experience
The Project may have adverse visual effects where it crosses in close proximity to communities	The Project may be visible from communities	User groups may find views of the Project adverse and detract from their experience
The Project may have adverse visual effects depending on the proximity to the Main River Waterway Provincial Park and Gros Morne National Park[(a)]	The Project may be visible if the corridor is in close proximity to park boundaries	User groups may find views of the Project adverse and detract from their experience
How will the Project affect sightseeing for tourists?	The Project will likely be visible to tourists at certain locations	User groups may find views of the Project adverse and detract from their experience

[(a)] Due, in part, to public concern related to visual aesthetic effects, Nalcor decided to avoid Gros Morne National Park (recognized as a UNESCO World Heritage Site), so as not to disturb the natural beauty of the area.

16.8.3.2 Key Indicators and Measurable Parameters

The KIs focus and frame the visual aesthetics effects analysis on the specific interaction of the Project with the landscape. The three KIs for visual aesthetics are the view of the cleared ROW, the view of the transmission towers and conductors, and the view of other Project components (i.e., the converter station at Soldiers Pond).

The chosen KIs will focus on visibility of the Project components in the landscape. The MPs are based on the analysis of visibility of the Project and the degree of contrast the Project component has with the surrounding landscape. The MPs reflect the potential for disturbance to visual aesthetics. The KIs and their associated MPs and the rationale for their selection are shown in Table 16.8.3-2.

Table 16.8.3-2 Key Indicators and Associated Measurable Parameters: Visual Aesthetics

Key Indicator	Rationale for Key Indicator	Measurable Parameter	Rationale for Measurable Parameter
View of the ROW	Concern about how the cleared ROW will appear in the landscape	Amount of the cleared ROW visible, and contrast with the landscape	To highlight positive or negative visual effects of the cleared ROW
View of the transmission towers and conductors	Concern about the size and number of transmission towers that will be visible	Amount and size of transmission towers and conductor visible, and contrast with the landscape	To highlight positive or negative visual effects of the transmission towers
View of the other Project components	Concern about other Project components that will be visible	Amount of other Project components (e.g., converter station) that will be visible and contrast with the landscape	To highlight positive or negative visual effects of other Project components

16.8.3.3 Potential Project-Visual Aesthetics Interactions

From Construction to Operations and Maintenance, potential Project-Visual Aesthetics interactions will vary depending on the Project component or activity and individual perceptions. Project components and activities (e.g., access roads, temporary bridges, quarrying and borrowing, construction access trails, and camps) will vary during Construction, and Operations and Maintenance. For example, some construction access infrastructure will be reclaimed prior to commencement of Operations and Maintenance. Potential Project-Visual Aesthetics interactions in relation to the selected KIs are outlined in Table 16.8.3-3.

Table 16.8.3-3 Potential Project Interactions: Visual Aesthetics

Project Phase / Activity	Key Indicator		
	View of the Cleared ROW	**View of the Transmission Towers and Conductor**	**View of the Other Project Components**
Construction			
Construction access trails and roads	– New or expanded linear clearings[(a)] to the ROW	– New or expanded linear clearings[(a)] to the towers	– New or expanded linear clearings[(a)] to the other Project components
Movement and presence of personnel, equipment and materials	– Personnel and equipment may be visible on portions of the ROW	—	– Personnel and equipment may be visible on other Project components
Construction camps	—		– May be visible from existing access
Marshalling yards and staging areas (depends on location)			– New or expanded clearings
Right of way clearing and preparation	– Visible in forested areas – Not visible in open barrens		—
Quarrying and borrowing	—		– New or expansion of existing excavation
Transmission tower assembly and installation	– Personnel and equipment may be visible on portions of the ROW	– Portions of towers under construction or complete towers may be visible	—
Conductor installation		– Portions of conductors under construction or complete conductors may be visible	
Converter station site preparation and construction	—	—	– New clearings and facilities
Preparation and construction of submarine cable landing sites (on-land works)			
Construction and installation of submarine cables (Marine works)			—
Electrode site preparation and installation			

Table 16.8.3-3 Potential Project Interactions: Visual Aesthetics (continued)

Project Phase / Activity	Key Indicator		
	View of the Cleared ROW	**View of the Transmission Towers and Conductor**	**View of the Other Project Components**
Island system upgrades	—	– New towers may be more visible than those that are replaced	– Additional or modified structures and facilities
Presence of workers	– Personnel and equipment may be visible	– Personnel and equipment may be visible	– Personnel and equipment may be visible
Contracting / expenditures	—	—	—
System commissioning	– Personnel and equipment may be visible		– Personnel and equipment may be visible
– **Operations and Maintenance**			
Access trails and roads	– Linear clearings[(a)] or natural revegetation of reclaimed linear clearing	– Linear clearings[(a)] or natural revegetation of reclaimed linear clearing	– Linear clearings[(a)] or natural revegetation of reclaimed areas will be visible
Presence and operation of the transmission system	– ROW visible in cleared areas; in barrens the ROW may or may not be visible	– Towers visible; conductors less visible	– Facilities will be visible, as will revegetation of reclaimed areas
Routine line inspections and repairs	– Personnel and equipment in the ROW or above (i.e., in a helicopter)	– Personnel and equipment in the ROW or above (i.e., in a helicopter)	—
Vegetation management	– Personnel and equipment may be visible; change in vegetation cover due to cutting and herbicide application may be visible	– Personnel and equipment may be visible	
Potential major system repairs	– Personnel and equipment may be visible; if required, cleared areas of regenerating vegetation may be visible	– Personnel and equipment may be visible; if required, cleared areas of regenerating vegetation may be visible	– Modified structures or facilities
Operation of the electrodes	—	—	– Personnel and equipment may be visible
Employment / presence of workers	– Personnel and equipment may be visible	– Personnel and equipment may be visible	
Contracting / expenditures	—	—	—

— No Interaction.

(a) Linear clearing: contrasting linear form with two roughly parallel edges dividing the area in two.

16.8.4 Approach to the Environmental Effects Analysis

Visual aesthetics analysis examines the contrast between the Project and the existing landscape. This analysis focuses on the Project components that will be constructed and operated on land and not on the marine components, as the infrastructure across the Strait of Belle Isle is underwater and not visible to the public. The following section describes the methods used for the visual aesthetic effects assessment for the Project.

16.8.4.1 Analytical Methods

The effects assessment of visual aesthetics uses the information from the existing environment chapter. In Section 15.8, the existing landscape was classified at 12 KOPs that considered the viewscapes along the transmission corridor. As described in Section 15.8, Nalcor used the United States Department of Interior, Bureau of Land Management (BLM) method to determine visual landscape ratings (USDI 1984). This process described and ranked the existing visual character at each KOP. The existing environment at each KOP was classified using a scenic quality evaluation and a sensitivity level analysis intended to reflect the visual aesthetics.

The effects assessment focuses on using landscape modelling to superimpose the Project components (e.g., cleared ROW, towers, converter station) onto the images from the 12 KOPs selected as indicators for the Project to provide a qualitative assessment. The modelled images allow the amount of alteration to the image as a result of the Project to be calculated and the level of contrast with the surrounding landscape to be determined. The effects assessment considers the amount of alteration and the level of contrast to determine the overall visual effect of the Project. The effect is determined by comparing the overall visual effect with the landscape class derived in Section 15.8. The effects are assessed for the Construction, and Operations and Management phases of the Project and for each KI.

The assessment also considers the findings of the viewscape modelling completed by Nalcor in the Viewscapes Component Study (Stantec 2011b) to provide context for the potential visibility of Project components (i.e., potential effects on Visual Aesthetics) along the entire length of the transmission corridor in a qualitative manner, recognizing that the final ROW has not been selected. Computer modelling (details provided in Stantec 2011b) was used to generate maps showing the potential number of transmission towers visible from a given location, and the visual exposure (i.e., figures that present the likely visibility of the proposed transmission towers). This considers that the effect of a change in a view, and the resulting effect on Visual Aesthetics, depends on an individual's perception.

Key Observation Point Determination

The study team selected KOPs that offer: the least obstructed view of the Project; are most representative of the views in that area; are likely to be viewed by the most people; and / or represent the worst case scenario view of the Project. The KOPs are publicly accessible locations, albeit some of which are more remote to access and were identified as having visual sensitivities through Nalcor's public consultation process as outlined in the Viewscapes Component Study (Stantec 2011b).

The overall perception of visual alteration depends largely on the number of viewers and the sensitivity of the viewers to visual changes to the landscape. Where the transmission corridor intersects travel routes, or lies near frequented areas, the Project will have the greatest number of viewers, which increases its potential for effects on visual aesthetics. The eight locations where the transmission corridor will be near roadways are at the Kenamu River, TLH3, Forteau Point, Birchy Lake, Buchans Highway, Chapel Arm, Witless Bay Line and Soldiers Pond. The Project will cross 1,100 km of the province, approximately 88% of which is uninhabited Crown land and is therefore rarely seen by the public; thereby, reducing overall visual sensitivity. A small number of people who travel to these remote parts of the province to participate in outdoor recreation may encounter the ROW and infrastructure. The remote locations selected include Portland Creek Pond, Rack Lake, Four Ponds Lake, and the Exploits River. The KOPs are described in Table 16.8.4-1, along with the rationale for their selection.

Table 16.8.4-1 Key Observation Point Determination

KOP[(a)]	Location / Region	Rationale
01	Kenamu River / Central and Southeastern Labrador	– Kenamu River crossed by the TLH3 – Recreational use – Area of interest based on consultation with stakeholders
02	TLH3 / Central and Southeastern Labrador	– TLH3 – Area of interest based on consultation with stakeholders
03	Forteau Point / Central and Southeastern Labrador	– Crossing area near existing highways and communities
04	Portland Creek Pond / Northern Peninsula Newfoundland	– Outfitters, boating, International Appalachian Trail
05	Rack Lake / Northern Peninsula Newfoundland	– Outfitters, high land, minimal tree cover
06	Four Ponds / Northern Peninsula Newfoundland	– Outfitters, International Appalachian Trail
07	Birchy Lake / Central and Eastern Newfoundland	– Main highway route, recreation area
08	Buchans Highway / Central and Eastern Newfoundland	– Tall tree cover, community road, Exploits River
09	Exploits River / Central and Eastern Newfoundland	– Recreational rafting, River Front Chalet, Exploits River
10	Chapel Arm / Avalon Peninsula Newfoundland	– Community entry road off TCH
11	Witless Bay Line / Avalon Peninsula Newfoundland	– Existing transmission line, silhouettes on flat expanse of land
12	Soldiers Pond / Avalon Peninsula Newfoundland	– Converter station near TCH

Source: Stantec (2011b).
[(a)] KOP = Key Observation Point.

Landscape Modelling

Stantec Consulting Ltd. (Stantec 2011b) created computer-generated images of the Project components superimposed on the existing environment for each of the 12 KOPs. These images included the ROW and tower infrastructure in the accurate, photo-realistic images.

Landscape View Effects Analysis

For each KOP, the percentage alteration in the view resulting from the Project components was calculated by delineating the outline of visible Project components and comparing the area altered to the total size of the field-of-view (total size of the photograph). The effects assessment then compares the percentage of alteration with the existing environment classification determined in Section 15.8.3 and shown in Table 16.8.4-2.

Table 16.8.4-2 Acceptable Percent Alteration of Classified Landscapes

Classification[(a)]	Acceptable Level of Disruption	Percent Alteration
Class I	Natural evolutions	0.0%
Class II	Minor changes	Up to 1.5%
Class III	Moderate changes	Up to 7.0%
Class IV	Major changes	Up to 30.0% (not above)

(a) Classification based on USDI (1984).
Percent Alteration: Percent of alteration that is acceptable (as adapted from BCMF 2001).

The contrast of the Project with its surroundings is also considered to determine how much the alterations attract the viewer's attention in the context of their surroundings. The contrast of the alterations can either increase or decrease depending on the following factors: clutter; skylining; scale; viewshed; backgrounding; and, screening (PSC Wisconsin 2010, internet site). These factors are described below:

- Clutter refers to numerous poles and wires, particularly when various types at different heights are mixed with other highly visible unnatural elements or human interventions. Existing clutter can decrease contrast; however, introducing clutter to a previously undisturbed landscape can increase contrast.
- Skylining occurs when transmission towers and wires create highly visible silhouettes that exceed the height of the horizon of existing landscape elements, which increases contrast.
- Scale differentiation occurs in the foreground when large structures make human-scaled elements (e.g., cars) appear smaller, which increases contrast.
- Viewshed effect occurs when the towers and ROW interfere with distant panoramic views, which increases contrast.
- Backgrounding occurs when the towers do not exceed the height of vegetation and are visually absorbed by the landscape and the cleared ROW is below the viewing angle and unseen, which decreases contrast.
- Screening or buffering occurs when vegetation or other foreground objects block or partially block the view of towers and / or the ROW, which decreases contrast.

The factors listed above are considered when rating the contrast of the Project with the landscape. Contrast is defined under the following categories (USDI 1986):

- None: The Project is not visible or perceptible;
- Low: The Project can be seen but does not attract attention;
- Moderate: The Project begins to attract attention and begins to dominate the characteristic landscape; and
- High: The Project demands attention, will not be overlooked, and is dominant in the landscape.

Environmental Effects Descriptors

Descriptors used to assess the Project effects on each KI (cleared ROW, transmission towers, and other Project components) are explained in Table 16.8.4-3. The effects descriptors include direction, magnitude, geographic extent, duration and frequency. These effects descriptors were applied to the effects of the Project on the KIs during the Construction, and the Operations and Maintenance phases of the Project. The effects descriptors qualify or quantify potential interactions between the Project and the views of the KOPs and the effects on the visual aesthetics. This assessment focuses on the ROW and towers in the images at the KOPs modelled except for KOP 12, where the converter station is also modelled.

Table 16.8.4-3 Effects Descriptors: Visual Aesthetics

Effects Descriptor	Definition
Direction	
Adverse	Effect is undesirable and negatively affects the overall visual character of the landscape
Neutral	Effect is not apparent and does not affect the overall visual character of the landscape
Beneficial	Effect is desirable and improves the overall visual character of the landscape
Magnitude	
No effect	Effect is not perceptible (no alteration to the view)
Low	Effect is visible, but does not attract attention
Moderate	Effect attracts attention and begins to dominate the landscape
High	Effect is dominant in the landscape
Geographic Extent	
Local	Effect is clearly visible to a distance of 1.9 km
Regional	Effect is visible to a distance of 4.8 km
Beyond Regional	Effect is visible beyond a distance of 4.8 km
Duration	
Short-term	Effect will be evident for less than one year
Medium-term	Effect will be evident for one to four years
Long-term	Effect will be evident for longer than four years, but does not extend more than 30 years
Far Future	Effect will be evident throughout Project operations

In addition to the effects descriptors applied to each likely effect on the KI (i.e., direction, magnitude, geographic extent and duration), the assessment also addresses how often an effect occurs, or frequency, and certainty, which is the level of confidence attributed to the effects prediction.

16.8.5 Construction

16.8.5.1 Overview of Project Construction and Associated Effects Management

Construction will take place over a four year period. Following construction of the access roads, crews will move along the transmission line ROW completing each component / activity sequentially, except for the converter stations, electrode sites and horizontal directional drilling at the landing sites. Construction activities include: preparing access; clearing the ROW (i.e., removal of vegetation that exceeds 2 m in height at maturity); transporting construction materials; installing tower foundations; assembling and installing towers; stringing conductors; directionally drilling boreholes and installing the initial portions of the submarine cables; installing electrodes; and, constructing converter stations. Construction components also include temporary camps, marshalling yards and staging areas for delivery and storage of materials and infrastructure assembly. These activities are expected to result in disturbance to the existing visual landscape either by their presence or the resulting Project infrastructure that is constructed.

Nalcor has selected a transmission corridor, within which the ROW will be constructed, in consideration of visually sensitive areas (e.g., avoidance of Gros Morne National Park). Mitigation measures to limit the effects of the Project on the visual landscape include:

- avoidance of visually sensitive areas;
- following existing disturbance corridors where practical;
- constructing in remote, uninhabited areas; and
- retaining a vegetative buffer zone at watercourses and major highway crossings to the extent practical.

The transmission line and associated components and activities will be routed / designed to avoid direct, physical interaction with existing protected areas in the province. Nalcor will work directly with the GNL Natural Heritage Branch, Parks and Natural Areas Division (and other organizations as applicable) in detailed design and planning for sections of the proposed transmission line that will occur within 1 km of the boundaries of an existing protected area, including in ROW alignment, tower design and placement, and scheduling with the goal to avoid or reduce any potential visual or other interactions.

Nalcor will work directly with any commercial outfitter with an existing, active hunting and / or fishing camp located within the proposed transmission corridor, or within 5 km of the corridor or the planned locations of any other permanent Project component. This will include consultation during detailed design and planning (e.g., ROW selection, tower design and placement, scheduling) for sections of the proposed transmission line within these areas, with the goal to avoid or reduce any potential issues or interactions during Construction, or Operations and Maintenance, including possible routing approaches to minimize the eventual use of the ROW by ATVs. Nalcor will also meet and consult generally with the NLOA and other industry representatives to discuss issues and potential effects management measures.

16.8.5.2 Existing Knowledge

Transmission towers and related infrastructure have been shown to affect the visual aesthetics of landscapes, as indicated in Table 16.8.5-1. No specific references for visual effects of construction of similar or related projects could be found.

Visual aesthetic effects on landscapes are perceived differently depending on the observer. The PSC Wisconsin (PSC Wisconsin 2010, internet site) reports that public response to installed transmission corridors and towers varies, as aesthetics are based on human perceptions. PSC Wisconsin describes the effects of a transmission corridor as being adverse, neutral or beneficial and that the aesthetics of transmission corridors are likely to be adverse for most people, particularly where lines cross a natural landscape. Some people tend not to notice transmission corridors (neutral response) and see them as part of the infrastructure necessary to sustain everyday lives and activities. Others see transmission corridors as beneficial, as they represent economic development and symbolize economic strength (PSC Wisconsin 2010, internet site).

Soini et al. (2009) state that there is a difference in perception of the public depending on certain demographics. Urban people, outdoor enthusiasts, and people with higher education and income levels had negative opinions related to their desire to use transmission corridor areas for recreation. Land owners in rural and agricultural areas viewed transmission lines as financially beneficial because they could gain income through land leases to utility companies or by using the corridor to grow Christmas tree crops (Soini et al. 2009).

Table 16.8.5-1 Existing Knowledge (Construction): Effects of Similar Projects on Visual Aesthetics

Reference	Study / Project Context	Summary of Findings
PSC Wisconsin (2010, internet site)	Human perception of visual aesthetic effects of transmission corridors in Wisconsin	Peoples' perception of the visual effects of transmission corridors and towers are mainly negative but may also be neutral or positive
Soini et al. (2009)	Case study on perceptions of transmission lines among residents of Finland	Visual perceptions of transmission lines are not homogenous and depend on land ownership, knowledge concerning power lines in general, and environmental attitudes

16.8.5.3 Construction Effects: Visual Aesthetics

Project components will become more visible as Construction progresses from clearing for the access and ROW, to tower and building erection, and to conductor installation. The effects of the Project on Visual Aesthetics recognizes that there will be increasing levels of alteration to viewscapes during Project Construction, but focuses on the final alteration (i.e., during Operations and Maintenance) when all Project components are constructed and operational (see Section 16.8.7).

In general, the presence of short-term and intermittent construction activities during this phase of the Project is unlikely to affect Visual Aesthetics, except where the ROW or workspace is visible. The towers will be visible, once they are erected, from locations outside the ROW.

16.8.6 Operations and Maintenance

16.8.6.1 Overview of Project Operations and Maintenance and Associated Effects Management

Operations and maintenance activities include maintaining access roads, routine inspections and repairs, vegetation management, operation of electrodes, and potential major repairs. These activities will not be readily evident at any particular time as they are intermittent and not intensive. In terms of visual aesthetic effects, the presence of the transmission system will be continuously evident and is the focus of this assessment.

Mitigation of Project effects on Visual Aesthetics includes allowing the majority of the ROW (except for the access trail) to revegetate and the natural reclamation of the Project components (e.g., camps, marshalling yards, temporary access) not required during Operations and Maintenance. Some components (e.g., ROW, towers, access roads and facilities) will remain visible through the life of the Project and mitigation is not practical.

The ROW will revegetate, with the type and amount of regrowth depending on the habitat type crossed. Recovery of disturbed areas is expected to go through many phases over several seasons. Operations and Maintenance activities include vegetation management through manual and chemical control methods. This is expected to begin during year eight of operations and be repeated every seven years thereafter, or as required for safety.

16.8.6.2 Existing Knowledge

Existing knowledge related to effects of the existing, operating transmission systems on visual aesthetics is summarized in Table 16.8.5-1.

16.8.7 Project Effects (Construction, and Operations and Maintenance): Visual Aesthetics

This section contains the assessment of the effects of the Project on the KOPs which are indicators of the Visual Aesthetics along the entire length of the Project. The assessment indicates the percent alteration and contrast rating at each KOP with all Project components constructed. This section also applies the effects descriptors at each KOP during Construction, and Operations and Maintenance phases of the Project. As discussed earlier, the findings of the Viewscapes Component Study (Stantec 2011b) were considered during the assessment of Project effects on Visual Aesthetics, as appropriate.

KOP 01, Kenamu River, Central and Southeastern Labrador

There is one tower visible in this image at a distance of 252 m from the camera. The conductors are also visible as they span the river. The ROW is not visible in the image because of the vegetated buffer to be maintained along the river. The percentage of alteration as a result of the Project is 0.52%. The contrast of the Project is moderate, as it begins to attract attention, but it does not yet dominate the view. KOP 01 is a Class III landscape. This landscape should partially retain the existing landscape character and the level of change may be moderate, as the Project components may attract attention, but should not dominate the view. The percentage of alteration and level of contrast for KOP 01 are within the expectations for this landscape class.



Photograph 16.8.7-1 KOP 01 Kenamu River with Project Modelling

Note: Photograph taken June 2011, Central and Southeastern Labrador, 52.84615° N, 60.15177° W.

Table 16.8.7-1 Effects Descriptors for the Key Indicators at KOP 01 Kenamu River

KI	Effects Descriptors			
	Direction	Magnitude	Geographical Extent	Duration
View of ROW	No effect	n/a	n/a	n/a
View of Transmission Towers and Conductors	Adverse	Moderate	Local	Far Future
View of Other Project Components	n/a	n/a	n/a	n/a

n/a Not applicable.

Overall, there is no effect on the view of the ROW because it is screened by the buffer of vegetation along the Kenamu River. The effect of the transmission tower is adverse in direction and moderate in magnitude as it is

skylining above the existing vegetation, becoming dominant against the sky. The scale of the tower is disproportionate to the existing landscape as the tower dwarfs the trees. The effect is local in geographical extent and far future in duration, as the Project components are within 1.9 km, and will be visible throughout the life of the Project.

During Construction the visual effect will be of low frequency, as construction activities will be visible over the four years, but sporadic as the different components are built along the ROW. During Operations and Maintenance activities, the frequency of the visual effects will be high, as the visual effect of the tower and conductors will be continuous.

There is a high degree of confidence that the actual effect of the Project on KOP 01 will not be greater than predicted in the effects analysis because visibility of the transmission system was assessed by comparing photographs of current, existing views at the KOPs with computer generated representations with accurate and realistic computer modelled simulations superimposed on the same photos to facilitate comparison. The visual quality classifications of the KOPs in the current state (2010 to 2011) were formed based on accepted BLM methods (USDI 1984) for visual contrast and sensitivity.

KOP 02 Trans - Labrador Highway, Phase 3, Central and Southeastern Labrador

There are three towers visible in this image at a distance from 1,090 m to 1,704 m from the camera. The ROW is not visible in the image. The percentage of alteration as a result of the Project is 0.15%. The contrast of the Project is moderate, as the skylining of the towers attracts the viewer's attention, but the Project does not dominate the view. KOP 02 is a Class IV landscape. This landscape can accommodate major modifications (no more than 30%) to the landscape character and the level of change may dominate the view. The percentage of alteration and level of contrast for KOP 02 are within the expectations for this landscape class.



Photograph 16.8.7-2 KOP 02 TLH3 with Project Modelling

Note: Photograph taken June 2011, Central and Southeastern Labrador, 52.77637° N, 59.94086° W.

Table 16.8.7-2 Effects Descriptors for the Key Indicators at KOP 02 TLH3

KI	Effects Descriptors			
	Direction	**Magnitude**	**Geographical Extent**	**Duration**
View of ROW	No effect	n/a	n/a	n/a
View of Transmission Towers and Conductors	Adverse	Moderate	Local	Far Future
View of Other Project Components	n/a	n/a	n/a	n/a

n/a Not applicable.

Overall, there is no effect on the view of the ROW because it is screened by the existing vegetation and below the viewing angle. The effect of the transmission towers is adverse in direction and moderate in magnitude as they are skylining and exceed the height of the existing vegetation, emphasizing their presence in the landscape. The effect is local in geographical extent and far future in duration as the Project components are within 1.9 km, and will be visible throughout the life of the Project.

During Construction the visual effect will be of low frequency, as construction activities will be visible over the four years, but sporadic as the different components are built along the ROW. During Operations and Maintenance activities, the frequency of visual effect will be high, as the visual effects of the towers and conductors will be continuous.

There is a high degree of confidence that the actual effects of the Project on KOP 02 will not be greater than predicted in the effects analysis because visibility of the transmission system was assessed by comparing photographs of current, existing views at the KOPs with computer generated representations with accurate and realistic computer modelled simulations superimposed on the same photos to facilitate comparison. The visual quality classifications of the KOPs in the current state (2010 to 2011) were formed based on accepted BLM methods (USDI 1984) for visual contrast and sensitivity.

KOP 03 Forteau Point, Central and Southeastern Labrador

There is one tower visible in this image at a distance of 335 m from the camera. The conductors are also visible. The ROW is not visible in the image. The percentage of alteration as a result of the Project is 0.75%. The level of contrast is high, as the tower is large in scale compared to its surroundings, and is made more prominent because of the skylining. KOP 03 is a Class IV landscape. This landscape can accommodate major modifications to the landscape character and the level of change may dominate the view. The percentage of alteration and level of contrast for KOP 03 are within the expectations for this landscape class.



Photograph 16.8.7-3 KOP 03 Forteau Point with Project Modelling

Note: Photograph taken September 2010, Central and Southeastern Labrador, 51.46387° N, 56.97446° W.

Table 16.8.7-3 Effects Descriptors for the Key Indicators at KOP 03 Forteau Point

KI	Effects Descriptors			
	Direction	**Magnitude**	**Geographical Extent**	**Duration**
View of ROW	No effect	n/a	n/a	n/a
View of Transmission Towers and Conductors	Adverse	Moderate	Local	Far Future
View of Other Project Components	n/a	n/a	n/a	n/a

n/a Not applicable.

There is no effect on the view of the ROW as the ROW is not visible due to the screening and buffering provided by the existing vegetation, and it is below the horizon line. The effect of the transmission tower is adverse in direction and moderate in magnitude due to the contrast with the landscape. The tower and conductors are skylined, as they are highly visible against the sky and exceed the height of their surroundings. The tower also adds to visual clutter with the seven existing poles that are of a different type and at a different

height. The effect is moderate, however, because the contrast fits within the landscape classification. The effect is local in geographical extent and far future in duration, as the Project components are within 1.9 km, and will be visible throughout the life of the Project.

During Construction the visual effect will be of low frequency, as construction activities will be visible over the four years, but sporadic as the different components are built along the ROW. During Operations and Maintenance activities, the frequency of visual effects will be high, as the visual effect of the towers and conductors will be continuous.

There is a high degree of confidence that the actual effects of the Project on KOP 03 will not be greater than predicted in the effects analysis because visibility of the transmission system was assessed by comparing photographs of current, existing views at the KOPs with computer generated representations with accurate and realistic computer modelled simulations superimposed on the same photos to facilitate comparison. The visual quality classifications of the KOPs in the current state (2010 to 2011) were formed based on accepted BLM methods (USDI 1984) for visual contrast and sensitivity.

KOP 04 Portland Creek Pond and Inner Pond, Northern Peninsula

There are 14 towers visible in this image at a distance ranging from 857 m to 4,698 m from the camera. The ROW is visible in the image. The percentage of alteration as a result of the Project is 0.99%. The contrast of the Project is moderate, as the ROW attracts attention, but it does not dominate the view. KOP 04 is a Class II landscape. This landscape should retain the existing landscape character and the level of change should not attract attention. The percentage of alteration and level of contrast for KOP 04 are within the expectations for this landscape class.



Photograph 16.8.7-4 KOP 04 Portland Creek Pond and Inner Pond with Project Modelling

Note: Photograph taken June 2010, Northern Peninsula, 50.16545° N, 57.48345° W.

Table 16.8.7-4 Effects Descriptors for the Key Indicators at KOP 04 Portland Creek Pond and Inner Pond

KI	Effects Descriptors			
	Direction	**Magnitude**	**Geographical Extent**	**Duration**
View of ROW	Adverse	Moderate	Local / Regional	Far Future
View of Transmission Towers and Conductors	Adverse	Low	Local / Regional	Far Future
View of Other Project Components	n/a	n/a	n/a	n/a

n/a Not applicable.

The view of the ROW is adverse in direction and moderate in magnitude due to the contrast with the panoramic views. The amount of alteration visible is small, however, the linear nature of the ROW results in a somewhat higher contrast than would otherwise be expected with the small alteration. With a resulting moderate contrast, the magnitude is also rated moderate. The viewing angle is from above, making the ROW visible as a band wrapping around the waterbody in the image. Although the ROW is visible, the dominant view is still of the waterbody and mountains. The effect of the transmission towers is adverse in direction and low in magnitude, as they blend into the existing vegetation and background and do not exceed the height of existing vegetation from this perspective. The effect is local and regional in geographical extent and far future in duration as the Project components are visible within 4.8 km, and will be visible throughout the life of the Project.

During Construction the visual effect will be of low frequency, as construction activities will be visible over the four years, but sporadic as the different components are built along the ROW. During Operations and Maintenance activities, the frequency of visual effects will be high, as the visual effect of the towers and conductors will be continuous.

There is a high degree of confidence that the actual effects of the Project on KOP 04 will not be greater than predicted in the effects analysis because visibility of the transmission system was assessed by comparing photographs of current, existing views at the KOPs with computer generated representations with accurate and realistic computer modelled simulations superimposed on the same photos to facilitate comparison. The visual quality classifications of the KOPs in the current state (2010 to 2011) were formed based on accepted BLM methods (USDI 1984) for visual contrast and sensitivity.

KOP 05 Rack Lake, Northern Peninsula of Newfoundland

There are nine towers visible in the image at a distance ranging from 526 m to 3,001 m from the camera. The ROW is visible in the image, although from this angle it appears as a small sliver of cleared vegetation that disappears into the horizon. The percentage of alteration as a result of the Project is 1.13%. The contrast of the Project is moderate, as it begins to attract attention, but does not yet dominate the view. KOP 05 is a Class III landscape. This landscape should partially retain the existing landscape character and the level of change may be moderate, and may attract attention, but should not dominate the view. The percentage of alteration and level of contrast for KOP 05 are within the expectations for this landscape class.



Photograph 16.8.7-5 KOP 05 Rack Lake with Project Modelling

Note: Photograph taken June 2010, Northern Peninsula, 50.178060° N, 57.28128° W.

Table 16.8.7-5 Effects Descriptors for the Key Indicators at KOP 05 Rack Lake

KI	Effects Descriptors			
	Direction	**Magnitude**	**Geographical Extent**	**Duration**
View of ROW	Adverse	Low	Local / Regional	Far Future
View of Transmission Towers and Conductors	Adverse	Moderate	Local / Regional	Far Future
View of Other Project Components	n/a	n/a	n/a	n/a

n/a Not applicable

The view of the ROW is adverse in direction and low in magnitude as it is only slightly visible and blends into the background and disappears into the rolling hills. The effect of the towers is adverse in direction and moderate in magnitude. Although they do not exceed the height of the vegetation and are somewhat visually absorbed by the landscape, the towers do contrast as silhouettes against the consistent evergreen backdrop and disrupt the panoramic view of the landscape, creating a viewshed effect. The effect is local and regional in

geographical extent and far future in duration as the Project components are visible within 4.8 km, and will be visible throughout the life of the Project.

During Construction the visual effects will be of low frequency, as construction activities will be visible over the four years, but sporadic as the different components are built along the ROW. During Operations and Maintenance activities, the frequency of visual effects will be high, as the visual effect of the towers and conductors will be continuous.

There is a high degree of confidence that the actual effects of the Project on KOP 05 will not be greater than predicted in the effects analysis because visibility of the transmission system was assessed by comparing photographs of current, existing views at the KOPs with computer generated representations with accurate and realistic computer modelled simulations superimposed on the same photos to facilitate comparison. The visual quality classifications of the KOPs in the current state (2010 to 2011) were formed based on accepted BLM methods (USDI 1984) for visual contrast and sensitivity.

KOP 06 Four Ponds, Northern Peninsula

There are 11 towers visible in this image at a distance ranging from 917 m to 2,010 m from the camera. The ROW is visible in the image where it passes over a hill. The percentage of alteration as a result of the Project is 0.38%. The contrast of the Project is moderate, as it begins to attract attention where the ROW is visible on the hill and the towers skyline on the right side of the image. KOP 06 is a Class III landscape. This landscape should partially retain the existing landscape character and the level of change may be moderate, and may attract attention, but should not dominate the view. The percentage of alteration and level of contrast for KOP 06 are within the expectations for this landscape class.



Photograph 16.8.7-6 KOP 06 Four Ponds with Project Modelling

Note: Photograph taken June 2010, Northern Peninsula, 49.90654° N, 57.41250° W.

Table 16.8.7-6 Effects Descriptors for the Key Indicators at KOP 06 Four Ponds

KI	Effects Descriptors			
	Direction	**Magnitude**	**Geographical Extent**	**Duration**
View of ROW	Adverse	Low	Local / Regional	Far Future
View of Transmission Towers and Conductors	Adverse	Moderate	Local / Regional	Far Future
View of Other Project Components	n/a	n/a	n/a	n/a

n/a Not applicable.

The view of the ROW is adverse in direction and low in magnitude, as some of the ROW is below the viewing angle and not visible. The portion of the ROW that is visible rolls over the top of a ridge and does not dominate the view. The effect of the transmission towers is adverse in direction and moderate in magnitude, as some blend into the background vegetation and some are skylining off into the distance. In the middle of the image, the transmission towers are within the panoramic views to the channel through the Long Range Mountains, creating a viewshed effect. The effect is local and regional in geographical extent and far future in duration as the Project components are visible within 4.8 km, and will be visible throughout the life of the Project.

During Construction the visual effects will be of low frequency, as construction activities will be visible over the four years, but sporadic as the different components are built along the ROW. During Operations and Maintenance activities, the frequency of visual effects will be high, as the visual effect of the towers and conductors will be continuous.

There is a high degree of confidence that the actual effects of the Project on KOP 06 will not be greater than predicted in the effects analysis because visibility of the transmission system was assessed by comparing photographs of current, existing views at the KOPs with computer generated representations with accurate and realistic computer modelled simulations superimposed on the same photos to facilitate comparison. The visual quality classifications of the KOPs in the current state (2010 to 2011) were formed based on accepted BLM methods (USDI 1984) for visual contrast and sensitivity.

KOP 07 Birchy Lake, Central and Eastern Newfoundland

There are six towers visible in this image at a distance ranging from 877 m to 1,794 m from the camera. The ROW is not visible in the image. The percentage of alteration as a result of the Project is 0.12%. The contrast of the Project is low, as it can be seen, but it does not attract attention. KOP 07 is a Class II landscape. This landscape should retain the existing landscape character and the level of change should not attract attention. The percentage of alteration and level of contrast for KOP 07 are within the expectations for this landscape class.



Photograph 16.8.7-7 KOP 07 Birchy Lake with Project Modelling

Note: Photograph taken June 2010, Central and Eastern Newfoundland, 49.29126° N, 56.78918° W.

Table 16.8.7-7 Effects Descriptors for the Key Indicators at KOP 07 Birchy Lake

KI	Effects Descriptors			
	Direction	**Magnitude**	**Geographical Extent**	**Duration**
View of ROW	No effect	n/a	n/a	n/a
View of Transmission Towers and Conductors	Adverse	Low	Local	Far Future
View of Other Project Components	n/a	n/a	n/a	n/a

n/a Not applicable.

There is no effect on the view of the ROW as the ROW is below the viewing angle. The effect of the transmission towers is adverse in direction and low in magnitude, as they are skylining at the horizon, but are so far off into the distance that they are hazy and difficult to distinguish. The effect is local in geographical extent and of far future duration as the Project components are visible within 1.9 km, and will be visible throughout the life of the Project.

During Construction the visual effects will be of low frequency, as construction activities will be visible over the four years, but sporadic as the different components are built along the ROW. During Operations and Maintenance activities, the frequency of visual effects will be high, as the visual effect of the towers and conductors will be continuous.

There is a high degree of confidence that the actual effects of the Project on KOP 07 will not be greater than predicted in the effects analysis because visibility of the transmission system was assessed by comparing photographs of current, existing views at the KOPs with computer generated representations with accurate and realistic computer modelled simulations superimposed on the same photos to facilitate comparison. The visual quality classifications of the KOPs in the current state (2010 to 2011) were formed based on accepted BLM methods (USDI 1984) for visual contrast and sensitivity.

KOP 08 Buchans Highway, Central and Eastern Newfoundland

There is one tower visible in this image at a distance of 76 m from the camera. The conductors are visible as they pass over the highway. The ROW is not visible in the image. The percentage of alteration as a result of the Project is 0.62%. The contrast of the Project is moderate, as the tower and conductors attract attention, but do not dominate the view. KOP 08 is a Class IV landscape. This landscape can accommodate major modifications to the landscape character and the level of change may dominate the view. The percentage of alteration and level of contrast for KOP 08 are within the expectations for this landscape class.



Photograph 16.8.7-8 KOP 08 Buchans Highway with Project Modelling

Note: Photograph taken June 2010, Central and Eastern Newfoundland, 48.95657° N, 56.07592° W.

Table 16.8.7-8 Effects Descriptors for the Key Indicators at KOP 08 Buchans Highway

KI	Effects Descriptors			
	Direction	**Magnitude**	**Geographical Extent**	**Duration**
View of ROW	No effect	n/a	n/a	n/a
View of Transmission Towers and Conductors	Adverse	Moderate	Local	Far Future
View of Other Project Components	n/a	n/a	n/a	n/a

n/a Not applicable.

There is no effect on the view of the ROW as the ROW is screened and buffered by the existing vegetation along the roadway. The effect of the tower and conductors is adverse in direction and moderate in magnitude because they are skylining and are visible against the sky, emphasizing their presence in the landscape. The large scale of the tower dwarfs vegetation and the other elements in the image. The effect is local in geographical extent and of far future duration as the Project components are within 1.9 km, and will be visible throughout the life of the Project.

During Construction the visual effects will be of low frequency, as construction activities will be visible over the four years, but sporadic as the different components are built along the ROW. During Operations and Maintenance activities, the frequency of visual effects will be high, as the visual effect of the tower and conductors will be continuous.

There is a high degree of confidence that the actual effects of the Project on KOP 08 will not be greater than predicted in the effects analysis because visibility of the transmission system was assessed by comparing photographs of current, existing views at the KOPs with computer generated representations with accurate and realistic computer modelled simulations superimposed on the same photos to facilitate comparison. The visual quality classifications of the KOPs in the current state (2010 to 2011) were formed based on accepted BLM methods (USDI 1984) for visual contrast and sensitivity.

KOP 09 Exploits River, Central and Eastern Newfoundland

There are nine towers visible in this image at a distance ranging from 4,820 m to 5,020 m from the camera. The ROW is not visible in the image. The percentage of alteration as a result of the Project is 0.01%. The contrast of the Project is low, as it can be seen, but it does not attract attention. KOP 09 is a Class III landscape. This landscape should partially retain the existing landscape character and the level of change may be moderate, and may attract attention, but should not dominate the view. The percentage of alteration and level of contrast for KOP 09 are within the expectations for this landscape class.



Photograph 16.8.7-9 KOP 09 Exploits River with Project Modelling

Note: Photograph taken June 2010, Central and Eastern Newfoundland, 48.95° N, 55.91° W (approximate).
This photograph was taken from a helicopter and therefore presents an enhanced view of the horizon.

Table 16.8.7-9 Effects Descriptors for the Key Indicators at KOP 09 Exploits River

KI	Effects Descriptors			
	Direction	**Magnitude**	**Geographical Extent**	**Duration**
View of ROW	No effect	n/a	n/a	n/a
View of Transmission Towers and Conductors	Adverse	Low	Beyond Regional	Far Future
View of Other Project Components	n/a	n/a	n/a	n/a

n/a Not applicable.

There is no effect on the view of the ROW as the ROW is blocked by existing vegetation and is below the viewing angle. The effect of the towers is adverse in direction and low in magnitude. Although the towers exceed the height of the existing vegetation and are skylining at the horizon, they are so far in the distance that they begin to blend into the sky and are almost unnoticeable. The effect is beyond regional in geographical extent and far future duration as the Project components are beyond 4.8 km, and will be visible throughout the life of the Project.

During Construction the visual effects will be of low frequency, as construction activities will be visible over the four years, but sporadic as the different components are built along the ROW. During Operations and Maintenance activities, the frequency of visual effects will be high, as the visual effect of the towers and conductors will be continuous.

There is a high degree of confidence that the actual effects of the Project on KOP 09 will not be greater than predicted in the effects analysis because visibility of the transmission system was assessed by comparing photographs of current, existing views at the KOPs with computer generated representations with accurate and realistic computer modelled simulations superimposed on the same photos to facilitate comparison. The visual quality classifications of the KOPs in the current state (2010 to 2011) were formed based on accepted BLM methods (USDI 1984) for visual contrast and sensitivity.

KOP 10 Chapel Arm, Avalon Peninsula Newfoundland

There is one tower visible in this image at a distance of 209 m from the camera. The conductors are visible as they pass over the roadway. The ROW is not visible in the image. The percentage of alteration as a result of the Project is 0.26%. The contrast of the Project is low, as it can be seen, but does not attract attention. KOP 10 is a Class IV landscape. This landscape can accommodate major modifications to the landscape character and the level of change may dominate the view. The percentage of alteration and level of contrast for KOP 10 are within the expectations for this landscape class.



Photograph 16.8.7-10 KOP 10 Chapel Arm with Project Modelling

Note: Photograph taken July 2010, Avalon Peninsula, 47.51298° N, 53.68761° W.

Table 16.8.7-10 Effects Descriptors for the Key Indicators at KOP 10 Chapel Arm

KI	Effects Descriptors			
	Direction	**Magnitude**	**Geographical Extent**	**Duration**
View of ROW	No effect	n/a	n/a	n/a
View of Transmission Towers and Conductors	Adverse	Low	Local	Far Future
View of Other Project Components	n/a	n/a	n/a	n/a

n/a Not applicable.

There is no effect on the view of the ROW as it is screened and buffered by the existing vegetation. The effect of the transmission tower is adverse in direction and low in magnitude. Despite the fact that the towers are skylined, they are de-emphasized by the mimicking tips of the trees at a similar height. The visual clutter of the existing towers and conductors serves to reduce the contrast of the Project. The effect is local in geographical

extent and of far future duration as the Project components are within 1.9 km, and will be visible throughout the life of the Project.

During Construction the visual effects will be of low frequency, as construction activities will be visible over the four years, but sporadic as the different components are built along the ROW. During Operations and Maintenance activities, the frequency of visual effects will be high, as the visual effect of the tower and conductors will be continuous.

There is a high degree of confidence that the actual effects of the Project on KOP 10 will not be greater than predicted in the effects analysis because visibility of the transmission system was assessed by comparing photographs of current, existing views at the KOPs with computer generated representations with accurate and realistic computer modelled simulations superimposed on the same photos to facilitate comparison. The visual quality classifications of the KOPs in the current state (2010 to 2011) were formed based on accepted BLM methods (USDI 1984) for visual contrast and sensitivity.

KOP 11 Witless Bay Line, Avalon Peninsula

There are four towers from the Project visible in this image at a distance ranging from 393 m to 825 m from the camera. The ROW is not visible in the image. The percentage of alteration as a result of the Project is 0.14%. The contrast of the Project is low, as it can be seen, but does not attract attention. KOP 11 is a Class IV landscape. This landscape can accommodate major modifications to the landscape character and the level of change may dominate the view. The percentage of alteration and level of contrast for KOP 11 are within the expectations for this landscape class.



Photograph 16.8.7-11 KOP 11 Witless Bay Line with Project Modelling

Note: Photograph taken July 2010, Avalon Peninsula, 47.33768° N, 53.06134° W.

Table 16.8.7-11 Effects Descriptors for the Key Indicators at KOP 11 Witless Bay Line

KI	Effects Descriptors			
	Direction	**Magnitude**	**Geographical Extent**	**Duration**
View of ROW	No effect	n/a	n/a	n/a
View of Transmission Towers and Conductors	Adverse	Low	Local	Far Future
View of Other Project Components	n/a	n/a	n/a	n/a

n/a Not applicable.

There is no effect on the view of the ROW as the ROW is below the viewing angle and is not visible. The effect of the transmission towers is adverse in direction and low in magnitude. Although the towers are skylining and the short vegetation does not obstruct the view of the towers, they blend in with the existing transmission towers. The effect is local in geographical extent and of far future duration as the effects are within 1.9 km, and Project components will be visible throughout the life of the Project.

During Construction the visual effects will be of low frequency, as construction activities will be visible over the four years, but sporadic as the different components are built along the ROW. During Operations and Maintenance activities, the frequency of visual effects will be high, as the visual effect of the towers and conductors will be continuous.

There is a high degree of confidence that the actual effects of the Project on KOP11 will not be greater than predicted in the effects analysis because visibility of the transmission system was assessed by comparing photographs of current, existing views at the KOPs with computer generated representations with accurate and realistic computer modelled simulations superimposed on the same photos to facilitate comparison. The visual quality classifications of the KOPs in the current state (2010 to 2011) were formed based on accepted BLM methods (USDI 1984) for visual contrast and sensitivity.

KOP 12 Soldiers Pond, Avalon Peninsula

There are 26 Project towers visible in this image at distances ranging from 573 m to 2,385 m from the camera. The ROW, towers and the converter station are visible in the image. The percentage of alteration as a result of the Project is 1.05%. The contrast of the Project is low, as it can be seen, but it does not attract attention. KOP 12 is a Class IV landscape. This landscape can accommodate major modifications to the landscape character and the level of change may dominate the view. The percentage of alteration and level of contrast for KOP 12 are within the expectations for this landscape class.



Photograph 16.8.7-12 KOP 12 Soldiers Pond with Project Modelling

Note: Photograph taken July 2010, Avalon Peninsula, 47.41588° N, 53.00123° W.

Table 16.8.7-12 Effects Descriptors for the Key Indicators at KOP 12 Soldiers Pond

KI	Effects Descriptors			
	Direction	**Magnitude**	**Geographical Extent**	**Duration**
View of ROW	Adverse	Low	Local / Regional	Far Future
View of Transmission Towers and Conductors	Adverse	Low	Local / Regional	Far Future
View of Other Project Components	Adverse	Low	Local / Regional	Far Future

The view of the ROW is adverse in direction and low in magnitude, as the ROW blends into an existing ROW and does not dominate. The effect of the transmission towers is adverse in direction and low in magnitude, as the Project towers blend into the existing towers making it difficult to distinguish one transmission line from the other. The effect of the other Project component, i.e., the converter station, is adverse in direction and low in magnitude, as the converter station is visible in the landscape where no such structure was visible before; but it is backed by rolling hills, it does not exceed the height of the existing vegetation, and it is not a noticeable feature in the landscape. The effect is local and regional in geographical extent and of far future duration, as the effects extend past 1.9 km but less than 4.8 km, and the Project components will be visible throughout the life of the Project.

During Construction the visual effects will be of low frequency, as construction activities will be visible over the four years, but sporadic as the different components are built along the ROW. During Operations and Maintenance activities, the frequency of visual effects will be high, as the visual effect of the converter station, towers and conductors will be persistent.

There is a high degree of confidence that the actual effects of the Project on KOP 12 will not be greater than predicted in the effects analysis because visibility of the transmission system was assessed by comparing photographs of current, existing views at the KOPs with computer generated representations with accurate

and realistic computer modelled simulations superimposed on the same photos to facilitate comparison. The visual quality classifications of the KOPs in the current state (2010 to 2011) were formed based on accepted BLM methods (USDI 1984) for visual contrast and sensitivity.

Transmission Line Viewscape

In relation to the entire transmission corridor length, the viewshed modelling (Stantec 2011b) found that for the hypothetical centre line, 43% of the towers are potentially visible from within a 15 km wide study area centred on the centre line of the transmission corridor, 27% of the towers are potentially not visible, and 30% are likely not visible from within that Study Area. The KOPs were selected as indicators of the potential effects of the Project on Visual Aesthetics, but the visual exposure analysis presented in the Viewscapes Component Study (Stantec 2011b) provides a comprehensive presentation that considers multiple criteria. This allows the reader to choose a location on the map to determine the likelihood of seeing transmission towers from that vantage point. However, the visual exposure analysis is for a hypothetical centre line ROW and tower locations, and the Project views will depend on the final ROW alignment and tower placement. The assessment of the effects of the Project on the Visual Aesthetics VEC considers this visual exposure analysis, but also recognizes that the effect of a change in a view, and the resulting effect on Visual Aesthetics, depends on an individual's perception.

Considering the mitigation employed during initial routing to avoid visually sensitive areas (e.g., avoidance of Gros Morne National Park) and Nalcor's commitment to work with stakeholders during final ROW alignment selection, the effects on the Visual Aesthetics are predicted to be acceptable and predicted to have minimal effects on the viewscapes for activities such as sightseeing by tourists.

Accidents and malfunctions could occur during Construction, and Operations and Maintenance, as discussed in Chapter 5, Accidents and Malfunctions. The effects of low-risk incidents (e.g., small brush fire) on Visual Aesthetics may result in an alteration to, or obscurity of, existing views due to the presence of smoke. Considering that these events would occur within disturbed areas (e.g., the ROW) and would be of short duration due to the emergency response measures proposed, these effects are is expected to be limited.

16.8.8 Environmental Effects Summary and Evaluation of Significance

16.8.8.1 Summary of Environmental Effects

Likely effects of the Project on the Visual Aesthetics VEC, based on the nature and findings of the above analysis of effects on the KIs for the selected KOPs, and the consideration of the visual exposure modelling completed by Stantec (2011b) for the entire length of the transmission corridor are summarized in Table 16.8.8-1.

Table 16.8.8-1 Environmental Effects Analysis Summary: Visual Aesthetics

Project Phase / Key Indicator	Likely Residual Environmental Effects Summary Descriptors				
	Direction	**Magnitude**	**Geographic Extent**	**Duration**	**Frequency**
Construction					
View of Cleared ROW	No effect at 8 KOPs; Adverse at 4 KOP	Low at 3 KOPs; Moderate at 1 KOP	Local / Regional	Far Future at 4 KOPs	Low at 4 KOPs
View of Transmission Towers and Conductors	Adverse at 12 KOPs	Low at 6 KOPs; Moderate at 6 KOPs	Local / Regional / Beyond Regional	Far Future at all KOPs	Low at all KOPs
View of Other Project Components[(a)]	Adverse at 1 KOP	Low at 1 KOP	Local / Regional at 1 KOP	Far Future at 1 KOP	Low at 1 KOPs
Summary of Likely Residual Construction Effects on Visual Aesthetics: Clearing of the ROW and installation of the transmission towers and other Project components will result in changes to the existing views to varying degrees, depending on location and the stage of Construction, with the towers expected to be visible from greater distances due to their height. The effect of the Project on Visual Aesthetics will likely be acceptable, given the low percentage of alteration of the landscape and low level of contrast with the existing environment.					
Operations and Maintenance					
View of Cleared ROW	No effect at 8 KOPs; Adverse at 4 KOP	Low at 3 KOPs; Moderate at 1 KOP	Local / Regional	Far Future at 4KOPs	High at all KOPs
View of Transmission Towers	Adverse at 12 KOPs	Low at 6 KOPs / Moderate at 6 KOPs	Local / Regional / Beyond Regional	Far Future at all KOPs	High at all KOPs
View of Other Project Components[(a)]	Adverse at 1 KOP	Low at 1 KOP	Local / Regional at 1 KOP	Far Future at 1 KOP	High at all KOPs
Summary of Likely Residual Operations and Maintenance Effects on Visual Aesthetics: The Project components (e.g., the ROW, transmission towers, converter stations and shoreline electrode sites) will be visible throughout the life of the Project. The effect of the Project on Visual Aesthetics from a regional perspective will likely be acceptable, given the low percentage of alteration of the landscape and low level of contrast with the existing environment.					

(a) Only assessed at KOP 12 Soldiers Pond as this was the only KOP with "Other Project Components" (i.e., Soldiers Pond Converter Station) modelled.

16.8.8.2 Definition and Determination of Significance

A significant effect of the Project on the Visual Aesthetics VEC is one where the presence of Project infrastructure and / or activities dominates the visual landscape of an area in such a way that causes an unacceptable change in the overall aesthetic character, quality, value and use of that location for the overall population. An environmental effect that does not meet these criteria is not significant.

As shown in Table 16.8.8-1, the Project's effects on the KIs have directions that are either neutral or adverse, magnitudes that range from no effect to moderate, and geographic extents that range from local to beyond regional. The cleared ROW, the transmission towers, and the other Project components (e.g., electrode lines, electrode sites, converter stations, access) will result in added visual disturbances within the natural landscape of the province. However, these Project components will not be visible from all locations along the corridor, or from all locations within the regions crossed. As discussed earlier, the Project will cross approximately 1,100 km of the province, approximately 88% of which is uninhabited Crown land and is therefore rarely seen by the public, thereby reducing overall visual effects. The percentage of alteration and level of contrast for the views at the KOPs with the Project components included are acceptable for their respective landscape class. In addition, the visual exposure modelling (Stantec 2011b) showed that 57% of the towers in the hypothetical centre line ROW are either potentially not visible or likely not visible from within 7.5 km on either side of the transmission corridor centre line; while the remaining 43% are potentially visible.

Perceptions related to any given effect of the Project on a particular landscape view is largely subjective and dependant on the opinions of individuals. Nalcor has considered visually sensitive areas during the initial planning phases of the Project (e.g., avoidance of Gros Morne National Park) and the use of existing disturbance corridors (e.g., the TLH3) to limit the effects on the visual aesthetics of the regions crossed.

It is predicted, based on the findings of the visual effects assessment (Table 16.8.8-1) and the visual exposure modelling (Stantec 2011b), that the presence of Project infrastructure and / or activities will not dominate the visual landscape of any area in such a way that causes an unacceptable change in the overall aesthetic character, quality, value and use of that location for the overall population. Therefore, the Project is not likely to result in significant adverse effects on the Visual Aesthetics VEC.

16.8.9 Evaluation of Project Alternatives

Nalcor has identified alternative segments for portions of the transmission corridor. The Construction, and Operations and Maintenance of these alternative transmission corridor segments would result in the same types of effects to the visual landscape in the same general areas of the province. These alternative segments are compared to the proposed Project corridor, with respect to predicted effects on the Visual Aesthetics KIs, in Table 16.8.9-1.

Table 16.8.9-1 Summary Evaluation of Project Alternative Means: Visual Aesthetics

Project Alternative Means[a]	Environmental Implications (Compared to the Proposed Transmission Corridor)[b]		
	View of Cleared ROW	View of Transmission Towers and Conductors	View of Other Project Components
A2: North-west of Strait of Belle Isle	No difference	No difference	No difference
A3: Point Amour	Passes through the coastal community; adverse effect	Passes through the coastal community, adverse effect	No difference
A4: of Strait of Belle Isle NF Side	No difference	Towers would only be on one side of the roadway; reduced adverse effect	No difference
A5: GNP North-east	No difference	No difference	No difference
A6: GNP West - Central	Through scenic area; adverse effect	Through scenic area; adverse effect	No difference
A7: GNP Eastern LRM Crossing	Avoids scenic area; reduced adverse effect	Avoids scenic area; reduced adverse effect	No difference
A8: GNP IATNL	Avoids scenic area; reduced adverse effect	Avoids scenic area; reduced adverse effect	No difference
A9: Birchy Lake	No difference	No difference	No difference
A10: NLOA	Uses existing ROW; beneficial effect	Passes through communities; adverse effect	No difference
A11: Avalon	No difference	Avoids two road crossings; reduced adverse effect	No difference

(a) As identified and described in Chapter 2, Project Rationale and Planning.

(b) Namely, the proposed Project described in Chapter 3, Project Description, and assessed in the preceding Environmental Effects Analysis.

Incremental adverse effects on the Visual Aesthetics KIs are predicted for three segment alternatives, A3: Point Amour, A6: GNP West Central and A10: NLOA, as discussed below:

- The A3: Point Amour alternative segment would locate the Project in close proximity to L'Anse Amour and its historic tourism icon, the Point Amour Lighthouse. This could result in an adverse visual aesthetic effect with skylining transmission towers that would likely have a disproportionate scale and dwarf the human-scaled scenic lighthouse.
- The A6: GNP West Central alternative segment would locate the Project closer to Hawkes Bay and around the shoreline of West Lake, potentially resulting in an adverse effect on visual aesthetics. The cleared ROW and transmission towers have the potential to dominate the views in this recreational area as the ROW wraps around West Lake and potentially creates a viewshed effect.
- The A10: NLOA alternative segment would locate the transmission corridor closer to three towns (i.e., Millertown, Buchans Junction, and Buchans), potentially resulting in an adverse effect on visual aesthetics at those locations. Although the A10 alternative segment would likely use and expand the existing transmission line ROW, creating a beneficial effect, the transmission towers would be visible and could result in additional visual clutter when combined with existing towers.

Neutral effects on the Visual Aesthetics KIs are predicted for three segment alternatives, A2: North-west of Strait of Belle Isle, A5: GNP NE and A9: Birchy Lake, as discussed below:

- The A2: North-west of Strait of Belle Isle alternative segment is a short segment near the southern end of the Labrador portion of the transmission corridor, east of the Québec border and north of the Strait of Belle Isle, and is predicted to result in no difference in effects on visual aesthetics of the landscape, as both the proposed corridor and the alternative corridor cross similar landscapes.
- The A5: GNP NE alternative segment east of the Project on the north-east side of the Northern Peninsula is predicted to result in no difference in effects on visual aesthetics. The A5 alternative and the proposed corridor are both far (> 5 km) from the Viking Trail Route 430, and are not expected to be visible.
- The A9: Birchy Lake alternative segment, a short alternative in the Birchy / Sandy Lakes area of west-central Newfoundland, is predicted to result in no difference in effects on visual aesthetics. Both the proposed corridor and the A9 alternative segment cross similar landscapes.

Reduced adverse effects on the Visual Aesthetics KIs are predicted for four segment alternatives, A4: Strait of Belle Isle NF side, A7: GNP Eastern LRM Crossing, A8: GNP IATNL and A11: Avalon.

- The A4: Strait of Belle Isle alternative segment is located near the north-west portion of the Project on the Northern Peninsula and is predicted to result in a reduced adverse effect on visual aesthetics as compared with the proposed Project corridor. The Project includes a submarine cable crossing of the Strait of Belle Isle. After making landfall, the cables connect to the transmission towers which span Route 430, the Viking Trail. In the A4 alternate segment, Route 430 is closer to the shoreline and the conductor would be trenched under the highway before connecting to the towers. The A4 alternative is predicted to result in a reduced adverse effect on the visual aesthetics by not having transmission towers flanking the Viking Trail. This would likely reduce the amount of visual clutter to the landscape.
- The A7: GNP Eastern LRM Crossing alternative segment, which lies to the east of the proposed Project where the corridor crosses the Long Range Mountains, is predicted to result in a reduced adverse effect on visual aesthetics as compared with the proposed Project corridor. The A7 alternative segment would avoid the scenic area of Portland Creek Pond and Inner Pond. KOP 05 represents the A7 alternative segment and when compared to KOP 04 which represents the proposed corridor, A7 was predicted to result in a reduced adverse effect on the visual aesthetics.
- The A8: GNP IATNL alternative segment is a short segment in the area of the Long Range Mountains that extends off A7 and deviates further east, which is predicted to result in a reduced adverse effect on visual aesthetics, as compared to the proposed Project corridor. Nalcor added this segment for consideration as suggested by the International Appalachian Trail Newfoundland and Labrador Association. The A8 alternative segment avoids the visually sensitive scenic trail area.
- The A11: Avalon alternative segment is a short segment near the eastern terminus of the Project on the Avalon Peninsula. It is predicted that this alternative segment would result in a reduced negative effect on visual aesthetics by avoiding two road crossings, thereby reducing visual clutter and visual distraction of the transmission towers. The towers that cross the roadways create a skylining effect and the scale dwarfs the human-scaled objects in the area.

No technically and economically feasible alternatives for the submarine cable crossing or the shoreline electrode sites were identified (see Chapter 2, Section 2.12.3), and would not be visible; therefore, marine Project alternatives are not evaluated for Visual Aesthetics.

16.8.10 Cumulative Environmental Effects

The cumulative environmental effects assessment examines the visual aesthetics of a particular region with the Project in place and in operation, in combination with the effects on the visual aesthetics resulting from existing activities and reasonably foreseeable future developments. The likely effects on visual aesthetics as a

result of the Project in combination with past, present, and future projects and activities may result in cumulative visual aesthetic effects.

The majority of the landscape of Newfoundland and Labrador is currently of a naturalistic character. The visual landscape may change with the amount and type of projects and / or activities that occur and overlap with each other in the RSA. The projects and activities considered for the cumulative effects assessment for Visual Aesthetics VEC are described below:

- The Lower Churchill Hydroelectric Generation Project is expected to result in changes to the visual aesthetics of the Churchill River Valley changing the flows and water levels in the Churchill River and portions of the associated valley into a reservoir. This effect on visual aesthetics is expected to overlap with the Project at the northern terminus of the transmission corridor.
- The TLH3 Construction: The TLH3 and the Project will overlap for approximately 150 km. The clearing of forested land for the Project is expected to result in an adverse cumulative visual effect where the two projects are visible from the same location.
- General Economic Infrastructure: This includes general and likely works and development activities throughout the regions (e.g., transportation improvements, municipal works, proposed quarries, cottage development areas, and small agricultural developments) (GNL 2011, internet site).
- Commercial Forestry Activity: The activities outlined in the forestry industry's 5 year plans for new access roads and harvesting in Forest Management District 19A and District 21 in Labrador, and primarily in Forest Management Districts 6, 9, 16 and 17 in Newfoundland may adversely affect visual aesthetics (GNL 2011, internet site) and may overlap with the visual effects of the Project in some locations.

The effects of the Project in combination with other projects and activities that have been or will be carried out are not expected to result in an effect on the Visual Aesthetics KIs that would cause an unacceptable change in the overall aesthetic character, quality, value and use of that location for overall population. Therefore, significant adverse cumulative environmental effects on Visual Aesthetics are not likely to occur. The planning (e.g., route selection), consultative and other effects management measures identified will serve to avoid or reduce potential interactions and adverse effects of this Project.

The analysis of cumulative effects on Visual Aethetics by region crossed by the Project is summarized in Table 16.8.10-1.

16.8.11 Monitoring and Follow-up

Monitoring or follow-up programs related to visual aesthetics are not considered to be warranted due to the findings of the assessment and the individual, subjective nature of the perception related to the effects of the Project on the Visual Aesthetics.

Table 16.8.10-1 Summary Cumulative Environmental Effects: Visual Aesthetics

Cumulative Effects Analysis	Central and Southeastern Labrador	Strait of Belle Isle[(a)]	Northern Peninsula	Central and Eastern Newfoundland	Avalon Peninsula
Current (Baseline) VEC Condition	Landscape is primarily naturalistic in character in a remote setting, except for the portion that follows the TLH3 and the southern portion near the coastal communities	n/a	Landscape is primarily naturalistic in character in a remote setting, with communities and roads at the coast and some forestry activity (i.e., access and clearcuts) in the southern portions	Landscape is primarily naturalistic in character but with existing disturbance corridors related to highways, transmission lines and communities	Characteristic landscape; existing disturbance corridors followed, including highways and transmission lines; higher population densities reflect more human influence on the viewscape
Likely Residual Environmental Effects of Labrador-Island Transmission Link	Views of the ROW, transmission towers, converter station and shoreline electrode site	n/a	Views of the ROW and transmission towers	Views of the ROW and transmission towers	Views of the ROW, transmission towers, converter station and shoreline electrode site
Likely Cumulative Environmental Effects of Other Future Projects and Activities	Alterations to the existing viewscapes due to clearing of vegetation to accommodate activities, or infrastructure construction related to these projects (e.g., Lower Churchill Hydroelectric Generation Project, highway maintenance, forestry access roads and harvesting areas)	n/a	Alterations to the existing viewscapes due to clearing of vegetation to accommodate activities, or infrastructure construction related to these projects (e.g., forestry access roads and ROWs, and harvesting, cottages)	Alterations to the existing viewscapes due to clearing of vegetation to accommodate activities, or infrastructure construction related to these projects (e.g., infrastructure developments, forestry access roads and ROWs, and harvesting, agriculture, cottages, quarries)	Alterations to the existing viewscapes due to clearing of vegetation to accommodate activities, or infrastructure construction related to these projects (e.g., infrastructure development)
Cumulative Environmental Effects Summary	**Not Significant** The level of contribution of the Project to cumulative effects or visual aesthetics is limited, considering the remoteness of much of the corridor and the use of existing disturbance corridors where practical	n/a	**Not Significant** The level of contribution of the Project to cumulative effects or visual aesthetics is limited, considering the remoteness of much of the corridor and the use of existing disturbance corridors where practical	**Not Significant** The level of contribution of the Project to cumulative effects or visual aesthetics is limited, considering the remoteness of much of the corridor and the use of existing disturbance corridors where practical	**Not Significant** The level of contribution of the Project to cumulative effects or visual aesthetics is limited, considering the remoteness of much of the corridor and the use of existing disturbance corridors where practical

Note: Naturalistic Character: A landscape setting where the basic elements are displayed in a composition that appears unaltered by man (USDI 1984).

Characteristic Landscape: The established landscape within an area being viewed. This does not necessarily mean a naturalistic character. It could refer to a silvaculture setting, an inhabited landscape, a primarily natural environment, or a combination of these types (USDI 1984).

5 n/a Not applicable.

16.9 Environmental Assessment Summary

This section presents a summary of the EA for the Socioeconomic Environment. Subsections address the following:

- effects management measures planned for the Project to address identified issues;
- potential effects of moderate to high risk accidents and malfunctions and planned mitigation and response measures;
- likely residual Project effects and their significance;
- cumulative environmental effects associated with the Project; and
- environmental monitoring and follow-up programs planned in relation to the Project.

16.9.1 Effects Management Measures

Table 16.9.1-1 and Table 16.9.1-2 provide a summary of the effects management measures that Nalcor has incorporated into the Project for Construction, and Operations and Maintenance, respectively. Nalcor has designed the Project components specifically to address identified issues, and is proposing to use best management practices and effects management options designed to avoid or limit the effects of the Project on the Socioeconomic Environment. Further, through the adaptive management process, Nalcor will assess issues that arise during the Construction, and Operations and Maintenance phases to allow appropriate changes to be made to effects management strategies or methods, and will adopt these changes in a timely manner.

Table 16.9.1-1 Construction Mitigation Strategies and Methods – Socioeconomic Environment

VEC	Proposed Mitigation
Historic and Heritage Resources	– Information on known Historic and Heritage Resources will be mapped and used during the planning and design phase of the Project, including the transmission line ROW selection. Nalcor will consult with the PAO during detailed Project design, as needed. – Nalcor will conduct an historic resources field survey of those sections of the selected ROW that cross through identified high potential areas. The specific nature and locations of such surveys will be planned in consultation with the PAO. – Nalcor and its contractors will apply for all required provincial and federal permits required for Project construction in relation to Historic and Heritage Resources, including for both the transmission system itself as well as all associated and ancillary infrastructure and activities (access trails, camps, quarries, marshalling yards), and will adhere to permit conditions. – Nalcor or its contractors will identify any known Historic and Heritage Resources within 100 m of planned Project activities, and these sites will be made known to supervisory personnel. A 50 m "no work" buffer will be maintained around all known Historic and Heritage Resources sites to avoid interactions between Project activities and these known resources. – The orientation and training programs provided to construction personnel will include briefings related to Historic and Heritage Resources, including the avoidance of known sites, site and artefact recognition, the importance and value of such resources and their preservation, and the protection and contingency measures to be implemented in the event of an accidental resource discovery. – In the event that unregistered Historic and Heritage Resources are discovered, work will be halted immediately at that location, the PAO will be notified and, if requested, a Stage 1 Historic Resources Overview Assessment will be initiated by Nalcor in accordance with provincial guidelines. – If Historic and Heritage Resources are encountered and cannot be avoided through Project design, mitigation in the form of Systematic Data Recovery will be undertaken in full consultation with the PAO and in accordance with provincial guidelines (GNL 1992) (i.e., appropriate excavation,

Table 16.9.1-1 Construction Mitigation Strategies and Methods – Socioeconomic Environment (continued)

VEC	Proposed Mitigation
	documentation, salvage and retrieval and conservation of materials, followed by analysis and report preparation). – Where Project components are constructed in an area known to have high potential to contain palaeontological resources, periodic inspections of disturbed areas by qualified palaeontologists will be undertaken to limit the potential for disturbance of fossils and the loss of any information they may provide. – Nalcor will continue to consult with relevant Aboriginal communities and organizations, to further understand any sites of cultural-historical importance or other Historic and Heritage Resources that may be located within or near planned Project activities. Information made available to Nalcor through such consultation will be considered during ongoing Project design and eventual implementation, and Aboriginal groups will be kept informed as Project work progresses. – Mitigation measures identified above will be included in the EPP for all Project activities. – Historic and Heritage Resources contingency and response measures for the Project will be included in the EPP.
Communities - Transportation Infrastructure and Services	– Nalcor will comply with all laws and regulations regarding transportation, waste disposal, noise, and safety. – Access to and within the Project area for the transportation and distribution of personnel, equipment and materials to the work areas will be through existing ports and other provincial transportation infrastructure. – Small local ports will be evaluated on an as needed basis and will only be used following consultation with owners and stakeholders and if it is determined that the adjacent infrastructure (e.g., area roads) have the capacity to meet Project requirements. – Nalcor will continue to liaise with the relevant planning authorities regarding the Port of Goose Bay dock, and will be involved to the extent appropriate and necessary to upgrade the Port of Goose Bay dock. – Existing access to select points along the transmission corridor ROW and other Project will be used wherever possible. – The Project will not make substantial use of the Gulf or Strait of Belle Isle ferry services as both have identified capacity issues. – Existing operational quarries will be used where appropriate and practical. – Existing clearings and pits will be used for laydown areas, camps or other construction infrastructure such as marshalling yards and staging areas wherever possible. – All construction workers will be housed in small, temporary, self-contained construction camps established at strategic points along or near the ROW. – Extended work-days and the rotational work schedule will allow workers to return to their homes between work cycles; therefore, there will be no demands placed on local housing or other accommodations. – The use of construction camps will minimize pressure on local municipal infrastructure and the secured nature of the camps will help to minimize worker-community interactions. Nalcor will liaise with the provincial Department of Transportation and Works and local stakeholders and communities regarding the condition of the road surface of Route 510 in Labrador and the potential for Project-related traffic to result in further road surface deterioration. – Nalcor will liaise with Department of Transportation and Works and local authorities to address expected Project traffic volume and potential traffic delays.

Table 16.9.1-1 Construction Mitigation Strategies and Methods – Socioeconomic Environment (continued)

VEC	Proposed Mitigation
	– Nalcor will advertise to notify motorists of the details of anticipated traffic delays and, where possible, these activities will avoid periods of peak traffic. – All traffic operations will be conducted in accordance with provincial legislation, including the *Uniform Highway Transport Vehicle Regulations*, which regulate both the weight and dimensions of highway vehicles operating in Atlantic Canada.
Communities - Waste Disposal Infrastructure and Services	– Waste disposal procedures will be identified in the Project EPP. – Waste disposal for the Project will be permit-based, and will only be undertaken with the approval of waste management authorities or municipalities across the province. – Nalcor will consult with local communities and stakeholders regarding Project waste disposal requirements. – Whenever possible, waste materials will be reused and/or recycled. – Domestic waste and other potential waste attractants will be temporarily stored in bear-proof containers before being transported to an approved disposal site. – Where local waste management facilities do not have the capacity or authority to accept Project waste, Nalcor and its contractors will remove the waste from the area and make arrangements to appropriately dispose of it elsewhere.
Communities - Safety and Security Services	– Nalcor will develop SHERP, which will include plans to address potential unplanned incidents and emergency situations, handling and storage of materials, driving safety, animal encounters, emergency response communications, spill response, personnel injury response and vehicle accidents. – All Project personnel will be made aware of the SHERP and designated staff will receive SHERP training. – In the event of an unplanned incident (e.g., forest and other fire, spill or leak of hazardous materials), the appropriate provincial and local authorities will be advised and called upon to help resolve the situation, as indicated in the SHERP. – Nalcor will coordinate communications with local emergency management officials as necessary.
Communities - Health Conditions / Community Well-being	– Construction activities will be conducted in accordance with municipal by-laws regarding noise. – In the event that an issue (e.g., sleep disruption due to noise) is raised by local residents, it will be discussed and mitigation measures will be implemented as appropriate. – Nalcor will offer an easement payment to address a situation where there is a direct land issue with the ROW placement. – Nalcor will consult with property owners on any issues related to use of their property, and, as appropriate, potential effects will be managed through Project design or, if necessary, a negotiated damage claim settlement.

Table 16.9.1-1 Construction Mitigation Strategies and Methods – Socioeconomic Environment (continued)

VEC	Proposed Mitigation
Economy, Employment and Business	– Nalcor and its contractors and sub-contractors will apply the principles and procedures regarding employment, business activities and benefits as set out in the Benefits Strategy (prepared for both the Labrador-Island Transmission Link and the Lower Churchill Hydroelectric Generation Project). – Nalcor will develop a Contracting and Purchasing policy for the Project to support business opportunities for Newfoundland and Labrador enterprises. – Nalcor will continue to participate in an informal working group with relevant government departments to identify issues and planning to meet the Project's labour force requirements. – Nalcor will consult with relevant stakeholder organizations and provincial departments and agencies to develop and implement a Gender Equity Program and a Diversity Program for the Project. – A hiring protocol will be established for Project Construction, consistent with the Canadian Charter of Human Rights and Freedoms, as well as any associated terms and conditions of governmental approvals for the Project. – Nalcor will work with contractors to encourage pre-construction training initiatives including health and safety, cultural awareness, gender sensitivity, environmental awareness, respectful workplace protocols, and specialized skills training, to enable people in the province to participate fully in the Project. – Nalcor will work with training institutions and government agencies throughout the province to offer technical advice and expertise where appropriate and to assist in coordinating training for Project-related work with relevant stakeholders. – Nalcor will adhere to the Lower Churchill Innu IBA which defines how the Labrador Innu will participate in and benefit from this development, including processes for continued consultation and cooperation throughout Project planning. – Nalcor and Innu Nation have agreed to co-operate in the development of a specific Innu Training Plan to help encourage and assist Innu to participate in and become qualified for employment on the Project. – Nalcor will engage employees and potential employees through a variety of programs and practices focusing on a positive work environment; opportunities for training and professional development; participation in career fairs, career counselling and mentorship; and, student achievement awards and temporary employment opportunities. – Nalcor will support employees through an Employee Assistance Program (EAP), which will provide counselling for employees and their families who are experiencing problems in their work or personal lives, and will establish a workplace committee to serve as a discussion forum to address workplace issues and make recommendations to Nalcor and its contractors on any requirements and measures for improvement.
Land and Resource Use	– Nalcor and its contractors will identify, obtain and comply with all authorizations, approvals and permits from relevant provincial and federal agencies that are required in relation to Project construction. – Nalcor will provide information and updates to organizations and the general public as appropriate regarding ongoing and planned construction activities to proactively avoid potential adverse interactions and any safety issues. – Known land and resource use components and activities have been avoided where possible during Project design and planning, including during selection of the proposed transmission corridor and identification of locations for other key Project components (e.g., electrodes, submarine cable

Table 16.9.1-1 Construction Mitigation Strategies and Methods – Socioeconomic Environment (continued)

VEC	Proposed Mitigation
	landing sites, converter stations). – Known land and resource use components and activities will be avoided where possible during the detailed route selection process for the transmission line ROW within the corridor. – During the detailed route and site planning, Nalcor will consult with government departments, Aboriginal and stakeholder groups, and the public as necessary. – Existing access roads and trails will be used wherever possible, and existing transmission lines will be followed where possible, while respecting technical design requirements. – Existing industrial sites and other developed areas will be used for key Project components, and borrow material will be extracted from existing operational quarries and from within the ROW wherever practical. – Project-related elements and activities will be scheduled in specific areas to avoid interactions with land and resources users to the extent practical, and Nalcor will be in regular communication and consultation with relevant agencies, organizations and representatives during Project planning and implementation. – Nalcor will adhere to the Lower Churchill Innu IBA which defines how the Labrador Innu will participate in and benefit from this development, including processes for continued consultation and cooperation throughout Project planning. – Nalcor will continue to consult with other relevant Aboriginal communities and organizations in Labrador and Quebec, particularly those with demonstrated contemporary land use in the vicinity of the Project, to provide Project information and discuss any issues that arise. – During detailed design and planning (e.g., ROW selection, tower design and placement, scheduling) Nalcor will engage in the following to seek to avoid or reduce any potential issues or interactions during construction and / or operations: o work with any commercial outfitter with an existing, active hunting and / or fishing camp located within the proposed transmission corridor, or within 5 km of it or of the planned location of any other permanent Project component; o explore possible routing to minimize the eventual use of the ROW by ATVs and snowmobiles in areas that are currently remote and inaccessible; and o meet and consult with the Newfoundland and Labrador Outfitters Association (NLOA) and / or other industry representatives to discuss general issues and potential effects management measures. – The transmission line and associated components and activities will be routed and designed to avoid direct, physical interaction with existing protected areas. Nalcor will work with the GNL Natural Heritage Branch, Parks and Natural Areas Division (and other organizations as applicable) during detailed engineering design and planning (e.g., ROW selection, tower design and placement, scheduling) for those sections of the proposed transmission line that will occur within 1 km of the boundaries of an existing protected area, to seek to avoid or reduce any potential visual or other interactions. – Nalcor will consult with the DND during detailed design and planning (e.g., ROW selection, tower design and placement, scheduling, communications protocols, infrastructure mapping) for sections of the proposed transmission line that will occur within the designated low level flight training area in Labrador. – Nalcor will use other standard effects management measures used effectively during past and ongoing transmission line construction and maintenance activities, such as: o discussion with private property owners regarding issues related to any intrusion on property,

Table 16.9.1-1 Construction Mitigation Strategies and Methods – Socioeconomic Environment (continued)

VEC	Proposed Mitigation
	both prior to and after such events; o use only essential vehicles along the transmission line to limit noise; and o limit access to only approved routes and specific vehicles. – When it is necessary to acquire property rights, Nalcor will implement its *Property Acquisition Policy*, with the goal to treat all property owners with respect and in a fair, transparent, and consistent manner. – Wood (timber) cleared from the ROW, will be limbed and stacked within the ROW, and will be available for removal by local residents.
Marine Fisheries	– Prior to the start of construction activities in the Strait of Belle Isle, Nalcor representatives will consult with local fishers and other interested parties, to provide information on proposed construction activities, answer questions and discuss concerns or suggestions regarding construction activities. – Prior to the start of electrode construction activities in Conception Bay, Nalcor representatives will meet with local fishers and other interested parties, particularly those who use any fishing grounds along the shoreline near the Dowden's Point shoreline electrode site, to provide information on proposed construction activities, answer questions, and discuss concerns or suggestions regarding construction activities. – Nalcor will establish a Fisheries Liaison Committee (FLC), including a representative of the Labrador Fishermen's Shrimp Company Ltd. and of the Fish, Food and Allied Workers (FFAW), for the construction period to facilitate its ongoing fisheries consultation and advisory process during construction. – A 500 m radius (1,000 m wide) Safety Zone, within which only Project support and service vessels will be allowed, will be established around all active construction areas within the marine environment; in accordance with Rule 43 of the *Collision Regulations* under the *Canadian Shipping Act*, Nalcor will consult with relevant Transport Canada personnel to determine the most appropriate means for boundary demarcation and communication. – The Safety Zone will serve to prevent or reduce direct interactions, particularly contact, between construction activities and equipment and fishing activities. This will protect personal safety, reduce the potential for gear and vessel damage in these areas, and allow a more efficient operating environment for both fisheries and Project activities. – Prior to the start of construction activities in the Strait of Belle Isle, Nalcor will develop a Vessel Traffic Management Plan (VTMP) to promote the safe and efficient operation of Project construction-related marine traffic and fishing vessel operations in the vicinity of all construction activities and in other areas of the Strait of Belle Isle where Project vessels might operate. – The VTMP will be developed in consultation with applicable agencies and organizations, including advice and guidance from experts with the Ship Safety Branch of Transport Canada and the Canadian Coast Guard (CCG). – The VTMP will include measures that Project-related vessels (including small service boats) will follow when operating in the area, and that all fishing vessels should follow when they are involved in harvesting operations close to, or transiting, the general vicinity of Project activities. – Working with the CCG's Notices to Shipping and the Canadian Broadcasting Corporation's Fisheries Broadcast, Nalcor will ensure that all fishing vessels operating in the Strait of Belle Isle are given advance notice of planned construction work. – Nalcor will make available Fishing Gear Loss or Damage Compensation (similar to programs currently in use within the province's offshore area for petroleum exploration and development) to

Table 16.9.1-1 Construction Mitigation Strategies and Methods – Socioeconomic Environment (continued)

VEC	Proposed Mitigation
	cover any damage to commercial fishing gear or other equipment if an incident occurs that involves contact with a Project vessel outside the Safety Zone during construction. – Nalcor will provide economic compensation for any Strait of Belle Isle commercial fishing enterprise (i.e., licence holders who have been actively involved in harvesting scallop in the relevant area in recent years) that experiences a loss of fishing income as a result of Project marine construction activities, based on the principles developed jointly by Nalcor and the FLC.
Tourism	– Nalcor has sought to avoid known and key tourism attractions and sites during Project planning, including in the selection of the proposed transmission corridor for the transmission line, and in the identification of locations for other key project components (e.g., electrodes, submarine cable landing sites, converter stations). – Project construction workers will be housed in temporary construction camps rather than in local hotels, B&Bs and other accommodations, to avoid placing demands on tourist accommodation, especially during peak tourism seasons. – Nalcor will follow standard safety and notification procedures when using provincial transportation infrastructure. – Nalcor and its contractors will coordinate and schedule Project-related transportation of large equipment and materials to avoid heavy seasonal tourism traffic to the extent practical. – Nalcor will regularly communicate and consult with relevant agencies and tourism industry organizations and representatives as part of its coordination and scheduling efforts.
Visual Aesthetics	– Nalcor has selected a corridor, within which the ROW will be constructed, to avoid visually sensitive areas such as Gros Morne National Park. – During Project planning and design, Nalcor has routed and designed the transmission line and associated components and activities to avoid direct, physical interaction with existing protected areas in the province, and to follow existing ROWs to the extent practical. – Nalcor will continue to work with the GNL Natural Heritage Branch, Parks and Natural Areas Division (and other organizations as applicable) during detailed design and planning (including during ROW alignment, tower design and placement, scheduling) for sections of the proposed transmission line that will be within 1 km of the boundaries of an existing protected area to try to avoid or reduce any potential visual interactions. – Nalcor will work directly with any commercial outfitter with an existing, active hunting and / or fishing camp located within the proposed transmission corridor, or within 5 km of the corridor or the planned location of any other permanent Project component, including during detailed design and planning (e.g., ROW selection, tower design and placement, scheduling) for sections of the proposed transmission line within these areas. – Nalcor will meet and consult with NLOA and industry representatives to consider possible routing approaches to minimize the eventual use of the ROW by ATVs. – During detailed planning and design, Nalcor will use the following measures to limit the effects of the Project on the visual landscape: o avoidance of visually sensitive areas; o following existing disturbance corridors where practical; o constructing in remote, uninhabited areas; and o retaining a vegetative buffer zone at watercourses and major highway crossings to the extent practical.

Table 16.9.1-2 Operations and Maintenance Mitigation Strategies and Methods – Socioeconomic Environment

VEC	Proposed Mitigation
Historic and Heritage Resources	– In the event that unregistered Historic and Heritage Resources are encountered, the Historic and Heritage Resources contingency and response measures included in the EPP will be implemented. – Specific precautionary and reporting measures identified as contingency and response measures in the EPP will be followed, including: o implementation of a Stage 1 Historic Resources Assessment in accordance with provincial guidelines; and o cessation of any Project activities at this location until an appropriate approach is developed and approved by the PAO.
Communities	– Project Operations and Maintenance activities will be carried out in accordance with standard procedures and in accordance with required and relevant environmental protection measures. – Nalcor will incorporate Operations and Maintenance activities for the Project into its established transmission system inspection and maintenance, and integrated vegetation management programs. – Nalcor will develop SHERP; SHERP, will include plans to address potential unplanned incidents and emergency situations, including handling and storage of materials, driving safety, animal encounters, emergency response communications, spill response, personnel injury response and vehicle accidents. – All Project personnel will be made aware of the SHERP and designated staff will receive SHERP training. – In the event of an incident (e.g., forest and other fire, spill or leak of hazardous materials), the appropriate provincial and local authorities will be advised and called upon as indicated in the SHERP to help resolve the situation. – Nalcor will coordinate communications with local emergency management officials as necessary. – All herbicide application will be conducted in accordance with the *Pesticides Control Regulations* 1996 (plus amendments) under the *Environmental Protection Act* SNL 2002, and will be performed by applicators certified with an Industrial Vegetation license issued by the Department of Environment. – Herbicide applications will not be undertaken in Protected Public Water Supply Areas, private or provincial parks, ecological reserves, or on private lands without permission of the owner. – Vegetation buffer zones, established at environmentally sensitive areas during transmission line construction, will be maintained during vegetation management activities, with only danger trees being removed from these areas.
Economy, Employment and Business	– Nalcor will incorporate Operations and Maintenance activities for the Project into its established transmission system inspection and maintenance, and integrated vegetation management programs. – Nalcor and its contractors and sub-contractors will apply the principles and procedures outlined in the Benefits Strategy (prepared for both the Labrador-Island Transmission Link and the Lower Churchill Hydroelectric Generation Project) regarding employment, business activities and benefits. – Nalcor will continue to participate in an informal working group with relevant government departments to identify issues and planning to meet the Project's labour force requirements. – Nalcor will consult with relevant stakeholder organizations and provincial departments and agencies to develop and implement a Gender Equity Program and a Diversity Program for the Project. – Nalcor's hiring (i.e., consistent with the Canadian Charter of Human Rights and Freedoms, as well as any associated terms and conditions of governmental approvals for the Project) and training policies (i.e., including health and safety requirements, work place protocols and skill development programs) developed for the Project Construction phase will apply to Project Operations and Maintenance. – Nalcor will follow the contracting and purchasing practices developed for the Project Construction phase.

Table 16.9.1-2 Operations and Maintenance Mitigation Strategies and Methods – Socioeconomic Environment (continued)

VEC	Proposed Mitigation
	– Nalcor will adhere to the Lower Churchill Innu IBA which defines how the Labrador Innu will participate in and benefit from this development, including processes for continued consultation and cooperation throughout Project Operations and Maintenance.
Land and Resource Use	– Nalcor and its contractors will identify, obtain and comply with all authorizations, approvals and permits from relevant provincial and federal agencies that are required in relation to its Project Operations and Maintenance activities. – Nalcor will continue to communicate with the public regarding upcoming maintenance activities and the overall operation of the transmission system, and general planning and scheduling will be done to avoid interfering with adjacent land and resource uses and users within or adjacent to the ROW as much as possible. – Nalcor will adhere to the Lower Churchill Innu IBA which defines how the Labrador Innu will participate in and benefit from this development, including processes for continued consultation and cooperation throughout Project Operations and Maintenance. – Nalcor will continue to consult with other relevant Aboriginal communities and organizations in Labrador and Quebec, particularly those with demonstrated contemporary land use in the vicinity of the Project, to provide Project information and discuss any issues that arise. – Nalcor will consult with the DND during operations and maintenance to schedule activities for sections of the proposed transmission line that will occur within the designated low level flight training area in Labrador.
Marine Fisheries	– The FLC established for the Construction phase will continue to function during at least the initial years of Project operations and maintenance, if all parties consider it to be useful and necessary; the FLC's role is to facilitate information exchange and communications between Nalcor and the fishing industry, and to identify and seek to resolve any concerns or issues that arise during Operations and Maintenance. – Nalcor will consult and address any issues related to commercial fisheries in the Strait of Belle Isle that result from Project activities. – A Safety Zone (500 m radius), within which only Project support and service vessels will be allowed, will be in place around any vessel(s) engaged in routine maintenance or major system repair work for the submarine cables. – Working with the CCG's Notices to Shipping and the Canadian Broadcasting Corporation's Fisheries Broadcast, Nalcor will ensure that all fishing vessels operating in the Strait of Belle Isle are given advance notice of planned maintenance or repair programs. – The VTMP developed for marine construction activities in the Strait of Belle Isle will be adapted and applied to any cable maintenance and / or repair activities.
Tourism	– Nalcor will follow standard safety and notification procedures when using provincial transportation infrastructure. – Nalcor and its contractors will coordinate and schedule Project-related transportation of large equipment and materials required for Project maintenance activities to avoid heavy seasonal tourism traffic to the extent practical. – Nalcor will communicate and consult with relevant agencies and tourism industry organizations and representatives as part of its coordination and scheduling efforts.
Visual Aesthetics	– Nalcor will allow the majority of the ROW (except for the access trail) to revegetate and will encourage natural reclamation of the Project components (e.g., camps, marshalling yards, temporary access) not required during Operations and Maintenance.

16.9.2 Accidents and Malfunctions

Chapter 5 identified and described potential incidents (i.e., accidents and malfunctions) related to Project Construction, and Operations and Maintenance. It also described the potential environmental consequence (i.e., magnitude, extent, and duration) of these incidents and their probability of occurrence. The risk of each incident, a function of both probability of occurrence and environmental consequence, was then assessed as low, moderate or high.

Incidents that are considered to have low risk (i.e., have a low to high probability of occurrence, and a low consequence) have been assessed as part of the environmental effects assessment for potentially affected socioeconomic VECs elsewhere in this chapter. Incidents that are considered to have a moderate to high risk and have potential effects on the socioeconomic environment are addressed in this section. Table 16.9.2-1 lists the moderate to high risk potential incidents that may affect the socioeconomic environment. Table 16.9.2-1 also summarizes the potential effects of the incident and describes the prevention and response measures that will be implemented by Nalcor to address the incident.

Moderate to high risk incidents in the Socioeconomic Environment are assessed below. Because they are not likely to occur and effects management measures will be in place, the effects of such moderate to high risk incidents are not likely to be significant.

Table 16.9.2-1 Summary of Potential Moderate to High Risk Incidents that Could Affect the Socioeconomic Environment

Description of Incident	Likely Effects on the Socioeconomic Environment	Prevention and Response Measures
Electrocution due to human contact with transmission lines, submarine cable, or electrodes.	– Human injury or death.	– The Environmental Protection Plan (EPP), the Safety, Health and Environmental Emergency Response Plan (SHERP) and the Occupational Health and Safety Plan (OHSP) will contain measures for the prevention of and response to electrocution incidents. – "High voltage" signage will be posted at converter stations, transition compounds, electrode sites and buried power lines. – Fencing will restrict public access to converter stations and the electrode sites. – Horizontal directional drill (HDD) and a rock berm will be used to prevent interaction between fishing activity and the submarine cable. – The transmission system will be designed to trip out in the event of a ground fault.

Table 16.9.2-1 Summary of Potential Moderate to High Risk Incidents that Could Affect the Socioeconomic Environment (continued)

Description of Incident	Likely Effects on the Socioeconomic Environment	Prevention and Response Measures
Large spill (e.g., 1,000 L) of diesel fuel during construction that spills over the ground and into a watercourse.	– Groundwater contamination may interact with human health if the diesel fuel reaches an aquifer used for human consumption. – Changes in soil quality may affect agricultural activities and /or property values. – Degradation of vegetation may result in changes to the visual aesthetics of the area. – Increased demand on local safety, security and emergency services. – Historic and Heritage Resources may be affected.	– The SHERP will contain a spill prevention and response plan. – The EPP will contain conditions for fuel handling and storage, including procedures for spill response. – Spill kits will be available at all worksites. – A spill response team will be formed and trained prior to construction. – Spills will be reported to the appropriate federal or provincial authority to coordinate the provincial response. – Mobile storage tanks will comply with the *Transportation of Dangerous Goods Regulation* SOR/2008-34, as well as the *Storage and Handling of Gasoline and Associated Products Regulations,* 2003, under the *Environmental Protection Act.* – Fuelling or servicing will not be permitted within 50 m of a waterbody. – Biodegradable lubricants and hydraulic fluids will be used, where practical, when working near a waterbody. – Fuels and oils will be stored at least 100 m from any surface water. – Converter station sites will be surrounded by a constructed berm or dyke to prevent release of transformer oils or other substances into the environment.
Large fuel spill into the marine environment, during construction, due to vessel collision.	– Wildlife mortality, degradation of marine water quality, and resulting effects on the fishing industry. – Historic and Heritage Resources may be affected.	– The SHERP will contain safety measures for vessel operation and collision prevention. – Project vessels will comply with the *Canada Shipping Act.*

Table 16.9.2-1 Summary of Potential Moderate to High Risk Incidents that Could Affect the Socioeconomic Environment (continued)

Description of Incident	Likely Effects on the Socioeconomic Environment	Prevention and Response Measures
Large forest fire in Labrador, originating along the access roads or right-of-way (ROW), during the summer.	– Health effects resulting from the release of particulate matter into the atmosphere. – Reduction in visibility and long-term effects to the visual landscape. – Effects on land use (e.g., outfitting, recreation, hunting). – May pose a risk to public safety. – Historic and Heritage Resources may be affected.	– Adherence to terms and conditions of Operating Permits issued by the Forest Services Branch. – The SHERP will contain a fire prevention plan. – The EPP will contain forest fire prevention measures and a fire response plan. – Firefighting equipment will be available at each worksite. – In the event of a forest fire, steps will be taken to extinguish the fire (if safe to do so), and the fire will be reported to the provincial Forest Services Branch.
Forest fire near a populated community in Newfoundland, originating along the access roads or ROW, during the summer.	– Health effects resulting from release of particulate matter into the atmosphere. – Reduction in visibility and long-term effects to the visual landscape. – Effects on land use (e.g., outfitting, recreation, hunting). – May pose a risk to public safety. – Increased demand on local safety, security and emergency services. – May affect tourism travel and visitation. – Historic and Heritage Resources may be affected.	– Adherence to terms and conditions of Operating Permits issued by the Forest Services Branch. – The SHERP will contain a fire prevention plan. – The EPP will contain forest fire prevention measures and a fire response plan. – Firefighting equipment will be available at each worksite. – In the event of a forest fire, steps will be taken to extinguish the fire (if safe to do so), and the fire will be reported to the provincial Forest Services Branch.
Vehicle-vehicle or vehicle-pedestrian collision resulting in multiple deaths.	– Human injury or mortality.	– The SHERP will include safety measures for vehicle operation, including collision prevention. – The SHERP and vehicle operator awareness programs will address high potential collision areas, time of day and seasons. – Where possible, Project highway activities will avoid periods of peak traffic.

Table 16.9.2-1 Summary of Potential Moderate to High Risk Incidents that Could Affect the Socioeconomic Environment (continued)

Description of Incident	Likely Effects on the Socioeconomic Environment	Prevention and Response Measures
Vessel-vessel collision resulting in multiple deaths.	– Human injury or mortality. – Spilled fuel could affect marine fisheries.	– The SHERP will include safety measures for vessel operation, including collision prevention. – The SHERP and vessel operator awareness programs will address high potential collision areas, time of day and seasons, and marine vessel observation procedures.
Aircraft collision or released sling load within a populated area.	– Human injury or mortality.	– Helicopter operation for Project construction and operation (including slinging) will comply with Canadian Aviation Regulations. – Nalcor has provided Project description information to DND and has discussed with DND the nature of ongoing military flight activities in the area. Nalcor will continue to consult with DND during detailed Project design. – Nalcor and / or its contractor(s) will provide briefings to DND authorities regarding its planned and ongoing construction activities, particularly those involving aircraft activity in Labrador.

The following sections provide a description of the conditions or activities that could lead to each incident listed in Table 16.9.2-1, the potential effects of the incident on the socioeconomic environment, and a description of prevention and mitigation measures that will be implemented. Additional information on each incident is provided in Chapter 5.

Electrocution due to human contact with transmission lines, submarine cable, or electrodes.

Description of Incident

During Project operation, an electrical current will travel through the Project converter stations, through on-land transmission lines, through the submarine cables and through the electrodes and wood pole electrode lines. Human contact with a live wire or electrical equipment could lead to electrocution.

Likely Effects of Incident on the Socioeconomic Environment

The potential effects of electrocution on a human depends on the magnitude of the current, the voltage and amperage, the duration of contact, and the electrical resistance of the body. In the case of electrocution of a human, serious injury (e.g., burns, loss of limbs, damage to internal organs, and neurological damage) or death may result.

Summary of Prevention and Response Measures

Nalcor will proactively identify potential electrical hazards related to Project Construction, and Operations and Maintenance. Prevention measures and response procedures will be described in the EPP, the SHERP, and the OHSP. The following measures will be implemented to reduce likelihood of electrocution during Project Construction, and Operations and Maintenance:

- the transmission towers will be designed in accordance with Canadian Standards Association (2009) standards, using the fail safe design principle, as described in Section 5.4.1;
- "High voltage" signage will be posted at the converter stations, transition compounds and electrode sites;
- "High voltage" signage will be posted where power lines are buried (e.g., between the transition compounds and their respective landing points) so that there is no excavation or development in the cable areas;
- public access to the converter stations will be restricted by galvanized steel security fences and locked gates;
- the electrode sites will be enclosed by locked, chain link fences to prevent public access from the land and sea sides. Sea side fencing will be installed on the permeable berm crest; and
- the submarine cable will be protected from interaction with fishing activity by HDD and by a rock berm.

The transmission system will be designed to trip out in the event of a ground fault. The system will attempt to clear the fault by reclosing and re-energizing the line. It will make a fixed number of attempts before remaining off-line. If a conductor failure occurs (i.e., if the conductor breaks), the line will trip out before coming into contact with anything. If a tower failure occurs and the conductor touches the tower, the system will trip out and the risk of electrocution is removed, unless a person or animal is in direct contact with the tower. If the conductor does not touch the tower at any point during the fall, the live conductor could (on its way to the ground) come into contact with a person or animal. Electrocution resulting from conductor or tower failure requires a specific combination of circumstances (e.g., tower failure during which the conductor does not touch the tower and a person or animal is located in the direct path of the falling conductor).

Large spill of diesel fuel during construction that spills over the ground and into a watercourse.

Description of Incident

During Project Construction, and Operations and Maintenance, environmentally hazardous materials such as hydrocarbons (e.g., gasoline and diesel), lubricating oils and hydraulic fluid will be used. Diesel fuel for the re-fuelling of heavy equipment will be transported in a 1,000 L portable fuel storage tank. There is a potential that this fuel tank could be breached due to a mishap (e.g., roll over), and that up to 1,000 L of diesel fuel could spill over the ground and into a watercourse.

Likely Effects of Incident on the Socioeconomic Environment

If the diesel fuel reaches an aquifer that is used for human consumption, the spill could affect the health of the people or communities using the aquifer as a drinking water supply. Depending on the location of a fuel spill, this type of incident could also have a localized effect on agricultural activities and / or property values through the degradation of soil quality, and it could have a localized effect on the visual aesthetics of the area through the degradation of vegetation. A large fuel spill could also temporarily put an increased demand on safety, security and emergency services (e.g., spill response).

Summary of Prevention and Response Measures

The SHERP will include specific instructions for the prevention of and response to spills or leaks of hazardous material. Spill response kits will be maintained at all worksites, and spill kit contents will be based on the

volume of fluids in use, the type of fluid, proximity to water and other relevant factors at a particular worksite. All personnel involved in hydrocarbon transport and transfer will be trained in spill response. A Response Team will be formed, trained and will receive regular practice in "mock" responses for incidents that require co-ordinated action. Any spills in excess of the amount, concentration, level, or rate of release authorized by the *Newfoundland and Labrador Environmental Protection Act* (*NLEPA*) or any Project approvals granted under the *NLEPA* will be reported to the Government of Newfoundland and Labrador Department of Environmental and Conservation (NLDEC).

All mobile storage tanks will be registered under, and comply with, the *Transportation of Dangerous Goods Regulation* SOR/2008-34, as well as the *Storage and Handling of Gasoline and Associated Products Regulations*, 2003, under the *Environmental Protection Act*. Records will be maintained of all storage tank contents to reconcile inventories as a check against undetected leakage. All transport vehicles will be licensed and maintained according to safety requirements. Fuelling or servicing of mobile equipment will not be permitted within 30 m of a waterbody.

Large fuel spill into the marine environment, during Construction, due to vessel collision.

Description of Incident

The operation of marine vessels in the Strait of Belle Isle could lead to a marine incident. Vessel-vessel or vessel-ground collisions are influenced by marine traffic, weather conditions, vessel watch procedures and human factors such as fatigue. A collision between the fallpipe vessel or a material transport ship and another boat or the seabed could result in a large spill of fuel into the marine environment. The worst case scenario would involve a fully-fuelled vessel releasing all of its fuel into the sea.

Likely Effects of Incident on the Socioeconomic Environment

A large fuel spill into the marine environment would affect the quality of the water in the Strait of Belle Isle, and could result in the direct mortality of marine wildlife and fish and / or the loss or alteration of marine vegetation and habitat. Changes to fish, wildlife and their habitat in the Strait of Belle Isle could affect marine fisheries, and have subsequent economic effects on communities that rely on marine fisheries.

Summary of Prevention and Response Measures

The SHERP will include safety measures for vessel operation, including the prevention of collisions. All Project personnel will be made aware of the SHERP and designated staff will receive SHERP training, and vessel operator awareness programs will limit the potential for collisions. Project vessels will also comply with the *Canada Shipping Act.* The SHERP and vessel operator awareness programs will address high potential collision areas, time of day and seasons, and marine vessel observation procedures.

Forest fire affecting 470 ha in Labrador, originating along the access roads or ROW, during the summer, or forest fire in the vicinity of a populated community in Newfoundland, originating along the access roads or ROW, during the summer.

Description of Incident

The operation of combustion engines (e.g., vehicles, heavy equipment, chain saws), blasting activity and workers smoking have the potential to ignite forest fires. Both combustion engines and workers are expected to be present during most Project Construction, and Operations and Maintenance activities, and blasting may occur during foundation construction. Several Project activities will occur in forested areas where the ignition source could lead to a forest fire.

Given the Forest Services Branch's policy not to fight fires that do not threaten communities or harvestable resources, a forest fire in Labrador could affect a large tract of land. The average extent of forest fires in Labrador is approximately 470 ha (Sullivan 2010, pers. comm.). A similar fire in Newfoundland would be more

actively fought because it would have a greater likelihood of approaching a populated community. Consequently, a large forest fire in Newfoundland could temporarily put an increased demand on safety, security and emergency services (e.g., fire fighting response).

Likely Effects of Incident on the Socioeconomic Environment

Forest fires can affect air quality through the release of particulate matter into the atmosphere. Particulate matter can cause eye, nose and throat irritation, breathing difficulties and reduced lung function in humans (Health Canada 2011, internet site). Emissions from forest fires can travel long distances, thus potentially affecting air quality far from the fire location.

Particulate matter also affects visibility, thus temporarily affecting the visual aesthetics of the area. Longer-term effects to the visual landscape result from large tracts of burned vegetation and forest cover. This may be a deterrent to tourists.

The alteration of a forest by fire also has the potential to affect other land uses, such as outfitting, hunting, trapping, general recreation and tourism. A forest fire may also result in a loss of infrastructure (e.g., power lines, buildings) and may pose a risk to public safety.

Summary of Prevention and Response Measures

The SHERP will include a plan for fire prevention. All Project personnel will be made aware of the SHERP and designated staff will receive SHERP training, and the forest fire prevention plan will be followed by Nalcor and its contractors. Forest fire prevention measures addressed in the SHERP will include the storage and disposal of flammable material, the use of designated smoking areas, and the prohibition of burning brush or debris.

Detailed information on firefighting equipment and procedures will be provided in the SHERP, the EPP and other environmental documents, such as terms and conditions of permits and authorizations. Fire fighting equipment, as described in Chapter 5, that is suitable to the labour force and working conditions will be available at each worksite and will be in proper working condition, as required by the Operating Permit. In the event of a forest fire, immediate steps will be taken to contain or extinguish the fire to the extent practical and safe, and fires will be reported immediately to the nearest regional office of the Forest Services Branch.

Vehicle-vehicle or vehicle-pedestrian collision resulting in multiple deaths.

Description of Incident

The operation of vehicles and heavy equipment on provincial highways, Project access roads and the ROW could result in vehicle-vehicle or vehicle-pedestrian collisions which could, in turn, result in one or more human deaths. The potential for these types of collisions is influenced by vehicle traffic volumes, pedestrian traffic volumes, speed of travel, weather conditions (i.e., visibility) and personal factors such as seat belt use, fatigue, and alcohol use.

Likely Effects of Incident on the Socioeconomic Environment

The consequence of a vehicle-vehicle or vehicle-pedestrian collision could range from vehicle damage to serious injury or death. Given the frequency of motor vehicle collisions in Canada, the probability of a Project vehicle being involved in a collision that results in minor injury or vehicle damage is considered moderate, as described in Chapter 5. A vehicle collision could also result in serious injury or death of one or more people. Although the likelihood of a fatal collision occurring is less than that of a minor injury collision, such a collision could directly affect those involved in the collision and indirectly affect the well-being of a community of friends, family and acquaintances.

Summary of Prevention and Response Measures

The SHERP will include safety measures for vehicle operation, including collision prevention. All Project personnel will be made aware of the SHERP and designated staff will receive SHERP training, and driver / operator awareness programs will limit the potential for vehicle collisions. The SHERP and driver awareness programs will address high potential collision areas, time of day and seasons, and speed restrictions on Project roads. Where possible, Project highway activities will avoid periods of peak traffic.

Vessel-vessel collision resulting in multiple deaths.

Description of Incident

The operation of marine vessels in the Strait of Belle Isle could lead to a marine incident. Vessel-vessel or vessel-ground collisions are influenced by marine traffic, weather conditions, vessel watch procedures and human factors such as fatigue.

Likely Effects of Incident on the Socioeconomic Environment

Marine vessels will be used for the transportation of materials, for laying the submarine cable, and for building the rock berm. Cable laying and rock berm construction activities will be conducted primarily from slow-moving vessels. Material distribution may use large ships travelling at higher speeds and with limited manoeuvrability. Vessel watch procedures will limit the potential for accidents in high traffic areas.

The effects of a vessel collision could range from vessel damage to serious human injury or death. The effects of a vessel collision depend on the speed of travel, the size of the vessels involved, and the point / angle of collision. Although the likelihood of a collision resulting in serious injury or death is less than that of vessel damage or minor injury, the effects would include the physical harm to those directly involved in the collision, and indirect effects to the well-being of a community of friends, family and acquaintances.

A vessel collision could also result in a large fuel spill into the marine environment. This may affect the quality of the water in the Strait of Belle Isle, and could result in the direct mortality of marine wildlife and fish and / or the loss or alteration of marine vegetation and habitat. Changes to fish, wildlife and their habitat in the Strait of Belle Isle could affect marine fisheries, and have subsequent economic effects on communities that rely on marine fisheries.

Summary of Prevention and Response Measures

The SHERP will include safety measures for vessel operation, including the prevention of collisions. All Project personnel will be made aware of the SHERP and designated staff will receive SHERP training, and vessel operator awareness programs will limit the potential for collisions. The SHERP and vessel operator awareness programs will address high potential collision areas, time of day and seasons, and marine vessel observation procedures.

Aircraft collision or released sling load within a populated area.

Description of Incident

During Project Construction, helicopter transport will be used, in some areas, for material distribution. Where helicopters are used, the transmission towers may be assembled in marshalling yards or lay down areas and slung by helicopter to the ROW. In all slinging operations, there is a risk of dropped loads. Helicopters may also be used for transmission line inspections in winter during Project Operations and Maintenance.

The Project is located in a region used for low-level flight training by DND. Flight training occurs at altitudes as low as 30 m above ground level and the transmission towers will reach a height of between 38 m and 49 m. As a result, there is a risk of collision between DND aircraft and Project helicopter traffic, and between DND aircraft and the transmission towers and transmission line during both Project Construction, and Operations and Maintenance.

Likely Effects of Incident on the Socioeconomic Environment

It is not known yet to what extent helicopters or slinging operations will be used for material distribution during Project Construction, or to what extent transmission line inspections will be conducted from the air during the Project Operations and Maintenance phase. An aviation accident (e.g., a collision or inadvertent release of a sling load) may result in serious injury or death of the passengers, or members of the public, if the incident occurs in or over a populated area. Such an incident would also affect the well-being of a community of friends, family and acquaintances.

Summary of Prevention and Response Measures

Helicopter operation for Project Construction, and Operations and Maintenance (including slinging) will comply with Canadian Aviation Regulations (CAR). CAR regulates flight operations, and provides instruction on safety measures / limitations such as:

- minimum visibility requirements for flight;
- minimum fuel requirements;
- weight and balance requirements;
- pre-flight inspections and safety briefings;
- horizontal and vertical distance that an aircraft must maintain if flight is conducted over a built up area; and
- standards for slinging (e.g., requirement for a quick release mechanism and back-up in case of emergency).

Nalcor has provided Project description information to DND and has discussed with DND the nature of ongoing military flight activities in the area. The discussions between Nalcor and DND also included potential concerns, future planning, and design and communication measures to prevent potential interactions between the Project and DND flight activity. Nalcor will continue to consult with DND during detailed Project design to identify issues related to tower design and transmission line routing and will address these issues, where possible, during the design process. Early communication with DND will allow Project activities (i.e., helicopter traffic) and Project components (e.g., transmission towers) to be incorporated into DND's planning and navigation aids (e.g., charts).

Nalcor and / or its contractor(s) will also provide full and regular briefings to DND authorities regarding its planned and ongoing construction activities, particularly those involving aircraft activity in Labrador, to coordinate planning and communication around Project construction activities. More information on that communication plan can be found in Section 16.5.

16.9.3 Residual Project Effects and Significance

The environmental effects assessment framework focuses the assessment on important and likely issues and interactions and considers the overall social and economic context. The framework integrally reflects socioeconomic and ecological interrelationships between VECs, other aspects of the natural and human environments, and associated Project related issues as indicated in the interactions tables. The socioeconomic VECs and KIs within various VECs are interrelated (e.g., Economy, Employment and Business affect Community Infrastructure and Services, Community Well-being, and Tourism; Visual Aesthetics and Protected Areas affect Tourism; Land and Resource Use, and Tourism affect the Economy, Employment and Business). As well, the Socioeconomic VECs and Biophysical VECs are interrelated (e.g., Vegetation, Caribou and Furbearers affect both recreational and Aboriginal Contemporary Land and Resource Use; Marine Fish and Fish Habitat affects Marine Fisheries). Nalcor's attention to sustainability as fundamental to the assessment also reflects the respect for the right of future generations to the sustainable use of renewable and non-renewable resources. This EIS integrally considers the capacity of renewable resources that are likely to be affected by the Project to meet the needs of present and future generations. This section summarizes the residual Project effects on the Socioeconomic Environment, and their significance.

Effects management measures are in place to minimize residual Project effects on the Socioeconomic Environment during both Construction, and Operations and Maintenance phases as indicated in Table 16.9.1-1 and Table 16.9.1-2. These measures include avoidance of historic and heritage sites and important resources or resource use locations where feasible; use of existing roads and facilities where possible; paralleling existing transmission lines where possible; specific pre-construction field surveys as necessary and appropriate; and, adherence to permit conditions. As well, the remoteness of the Project in much of Newfoundland and Labrador has helped to minimize likely interactions with the human environment. Implementation of the provincial Benefits Strategy and the current Innu IBA, Nalcor's planned ongoing communication with relevant regulatory agencies and potentially affected user and stakeholder groups, and Aboriginal communities to finalize Project planning and design, and contingency and response measures included in the EPP to address issues that do arise will also minimize residual effects. The residual effects identified in the assessment reflect the interrelationships between the various VECs and associated issues.

Likely residual effects on the Socioeconomic Environment are primarily temporary in nature, occurring mainly during Project Construction, and include increased demand on local transportation infrastructure, community services and waste facilities, temporary traffic delays, possible labour force competition and wage inflation, and noise or visual disturbance. Longer term effects during Operations and Maintenance include EMF, noise and other periodic disturbances. Beneficial effects of the Project include increased employment and business opportunities, increased income and increased tax revenue, and an increase in business activity throughout the province.

Historic and Heritage Resources

Considering the mitigation measures undertaken during Project planning to address effects on historic and heritage resources (e.g., avoidance, specific field surveys), and the contingency measures in place for the Construction, and Operations and Maintenance phases (i.e., Historic and Heritage Resources contingency and response measures included in the EPP), residual Project effects are unlikely. That is, no disturbance to or loss of historic and heritage resources, including Sites of Cultural-Historic Importance, is predicted; and, if such resources are disturbed, provincial protocols will be followed to evaluate and document the resource and record its historical and cultural context. Therefore, the likely residual Project effects on the Historic and Heritage Resources VEC are not significant.

Communities

Due to the scale and distribution of Project activities, the likely residual Project effects on communities throughout the life of the Project will be primarily local and of short duration (e.g., increased demand for transportation infrastructure and community services, noise disturbance) during Construction, or longer duration (e.g., EMF, noise or other disturbance) during Operations and Maintenance. Some localized beneficial effects (e.g., highway improvements, waste disposal revenue) will be long lasting. Therefore, the likely residual Project effects on the Communities VEC are not significant.

Economy, Employment and Business

Nalcor will apply the principles and procedures regarding employment (hiring protocols, skills development programs, Gender Equity and Diversity programs), business activities (such as procurement and contracting policies) and benefits (provincial and Labrador Innu) as set out in the current Benefits Strategy. Nalcor will also continue to consult with Aboriginal groups regarding issues that arise throughout the Project and with relevant provincial agencies regarding planning to meet labour force needs. Considering these effects management measures, the likely residual effects of the Project on economy, employment and business will be primarily and substantially beneficial (i.e., increased employment, incomes, tax revenues and business activity within the province and beyond) mainly during the four-year Construction phase, but also extending over the life of the Project, and experienced thoughout the province and beyond. Therefore, the likely residual Project effects on the Economy, Employment and Business VEC are not significant.

Land and Resource Use

Nalcor has undertaken considerable consultation regarding land and resource use with relevant commercial and public groups and organizations during Project planning and design to identify appropriate effects management measures (e.g., avoiding locations of specific commercial, municipal and recreational land and resource uses, traditional Aboriginal uses, and protected areas). Considering this, and the planned ongoing consultation and discussion with relevant groups and organizations to seek to avoid undesirable interactions with traditional and contemporary land and resource users, the likely residual effects of the Project on land and resource use include occasional and temporary disruption of existing land or resource users near Project work areas, and the creation of additional access to previously inaccessible areas, which may be beneficial to land users in some areas. However, the presence of the Project is not likely to change the ecological integrity, cultural value or societal use and enjoyment of protected areas. Design, consultation, permitting, communications and / or other effects management will identify and address most issues. Therefore, the likely residual Project effects on the Land and Resource Use VEC are not significant.

Marine Fisheries

Nalcor will implement a variety of measures (consultation with fishers, notification of Project activities, ongoing liaison through the FLC, a VTMP and Safety Zones) aimed at limiting Project-related interference with fishing activities in the Strait of Belle Isle. Nalcor will also develop programs to compensate for damage to gear or loss of income during Construction in conjunction with the FLC. Considering this and the planned ongoing consultation and discussion with the FLC to provide information and address concerns related to commercial fishing enterprises, the likely residual effects of the Project on Marine Fisheries will include some short-term interference with fishing activities over a small area in the Strait of Belle Isle. However, overall landings or fishing income and recreational fishing opportunities are not likely to decrease. Therefore, the likely residual Project effects on the Marine Fisheries VEC are not significant.

Tourism

Nalcor has undertaken effects management measures (i.e., avoiding construction in visually sensitive locations and near tourism sites) and will continue to implement other measures (e.g., Project workforce primarily housed in camps, effective scheduling to avoid heavy tourist periods, ongoing communications with appropriate agencies and stakeholders) to prevent interference with the tourist experience and loss of revenue to tourism enterprises. The likely residual Project effects on tourism include intermittent, temporary disruption to the quality of the tourism experience due to noise, dust, visual disturbance, traffic delays, or accommodation shortages during Project Contruction. This is normal in relation to construction activities within the province, and current tourism opportunities are expected to remain available and viable, and future tourism opportunities are not expected to be compromised. The transmission system is largely in remote areas, and will not be visible in most regions of the province except the Avalon Peninsula where it parallels existing structures, thereby having a minor to negligible effect on the quality of the tourism experience. Therefore, the likely residual Project effects on the Tourism VEC are not significant.

Visual Aesthetics

Clearing of the ROW, and installation of transmission towers and other Project components will result in changes to existing viewscapes in the province to varying degrees during Construction, depending on view location and the stage of Construction, and the Project components (e.g., the ROW, transmission towers, converter stations and shoreline electrode sites) will likely be visible throughout the life of the Project, depending on the viewing location. However, from a regional perspective, the presence of the Project will not alter the overall aesthetic character, quality, value and use of the location for the overall population. Therefore, the likely residual Project effects on the Visual Aesthetics VEC are not significant.

A summary of the VECs selected for the Socioeconomic Environment, and the significance of the likely residual effects of the Project VEC, are provided in Table 16.9.3-1.

Table 16.9.3-1 Summary: Significance of Residual Effects on Socioeconomic Valued Environmental Components

VEC	Likely Significant Residual Effect	Comment
Historic and Heritage Resources	No	The effects of the Project on Historic and Heritage Resources are unlikely to result in the loss of identified Archaeological Resources and /or Palaeontological Resources without the appropriate documentation or retrieval of the material-culture and the scientific information it contains, or the loss of unidentified Archaeological and /or Palaeontological Resources such that the overall understanding of the history of a region would be negatively affected. The effects of the Project on Sites of Cultural-Historical Importance are unlikely to result in the direct disturbance of a known site such that its integrity and cultural value is diminished.
Communities	No	The effects of the Project on Communities are unlikely to result in a change in the overall availability and quality of infrastructure and services for current users and / or in the health and well-being of affected individuals or communities that lead to a detectable and sustained decrease in the overall quality of life and / or health of a population.
Economy, Employment and Business	No	The effects of the Project on Economy, Employment and Business are unlikely to cause an overall, detectable and sustained decrease in the economy, employment or business activity over the life of the Project.
Land and Resource Use	No	Considering the effects management measures in place and planned, the effects of the Project on Land and Resource Use are unlikely to negatively affect the successful operation or overall economic viability of commercial enterprises; or prevent or substantially restrict overall levels of ongoing development in and planned growth of communities; or result in a decrease in the nature and / or cultural value of Aboriginal contemporary traditional land use activities or other recreational land and resource users; or compromise the ecological integrity, cultural value and / or societal use and enjoyment of Protected Areas.
Marine Fisheries	No	Nalcor's planned consultation, ongoing liaison, compensation programs during Construction and other effects management means for commercial Marine Fisheries will ensure that any Project interference with fishing activities will not result in a decrease in overall landings or fishing income as compared to pre-Project levels and adverse effects on the successful operation and overall economic viability of fishing enterprises in the area are not likely. The Project will have no likely measurable adverse effect on recreational fisheries (i.e., no loss of overall recreational fishing opportunity or decrease in quality of the experience) in the Strait of Belle Isle or Conception Bay.
Tourism	No	The effects of the Project on Tourism are unlikely to cause a decrease in the overall quality and enjoyment of Newfoundland and Labrador's tourism product, in such a way that it results in a detectable decrease in tourism visitation and expenditure levels in one or more regions of the province and / or where it threatens the successful operation and overall economic viability of one or more tourism enterprises.
Visual Aesthetics	No	The effects of Project Construction and the presence of Project infrastructure and / or activities over the life of the Project are unlikely to affect Visual Aesthetics such that it dominates the visual landscape of an area such as to cause an unacceptable change in the overall aesthetic character, quality, value and use of that location for the overall population. The Project residual effects on Visual Aesthetics will be acceptable.

While the Project is likely to have residual effects on the Socioeconomic Environment as represented by the VECs assessed, effects will be primarily positive and within the capacity of the environment. The Project will not adversely affect the integrity and cultural value of archaeological and /or palaeontological resources such that the resources will be diminished or the historical context within the region will be lost, or that the integrity and cultural value of a site of cultural-historical importance will be diminished. Neither will the Project adversely affect the economic viability of existing enterprises, reduce the tourism experience, restrict the overall levels of community development, reduce the level of recreational land and resource use, including Aboriginal contemporary land use activities, or, compromise the ecological integrity, or visual, cultural or societal value and enjoyment of protected areas. Therefore, the residual effects of the Project on the Socioeconomic Environment are likely to be not significant.

16.9.4 Cumulative Environmental Effects

The cumulative effects assessment considered the overall effect of the Project on the Socioeconomic Environment (Historic and Heritage Resources; Communities; Economy, Employment and Business; Land and Resource Use; Tourism; Marine Fisheries; and Visual Aesthetics VECs) as a result of the Project's residual environmental effects in combination with those of other projects and activities that have been or will be carried out. The existing environment considers all projects and activities that have been undertaken in the past, or are ongoing. The future projects and activities considered for the cumulative effects assessment included those with potential overlapping environmental effects within the RSA. Reasonably foreseeable future projects and activities considered in the cumulative effects assessment for the Socioeconomic Environment include the Lower Churchill Hydroelectric Generation Project, the TransCanada Highway Phase 3 development, Hebron offshore oilfield development, Long Harbour Processing Plant, Iron Ore Company of Canada expansion, commercial forest harvesting, general economic infrastructure development, increased off highway vehicle use due to improved access, tourist industry / recreational activities, and general marine shipping activities in the Strait of Belle Isle and Conception Bay.

Historic and Heritage Resources

Adverse Project-related effects on historic and heritage resources are not anticipated to occur, and if unregistered historic or heritage sites are encountered or disturbed, they will be addressed according to provincial protocols, and are not likely to result in significant effects. The potential for overlapping or cumulative effects is limited to situations where the physical zone of disturbance of the Project would overlap directly with that of another project and activity that affects a historic and heritage resource. For example, ground disturbance from general infrastructure work and increased OHV access associated with forestry roads could contribute to cumulative effects in the vicinity of communities, or seabed disturbance from fishing activities could contribute to cumulative effects on marine archaeological resources in the Strait of Belle Isle. However, there is very low potential for cumulative effects because the Project and all other development activities are subject to the Newfoundland and Labrador *Historic Resources Act* (1985) and will be governed by application of the assessment and mitigation policies. The cumulative effects on the Historic and Heritage Resources VEC are not significant.

Communities

In Labrador, Nalcor's Lower Churchill Hydroelectric Generation project will overlap with the proposed Project in relation to demand on existing infrastructure (e.g., Port of Goose Bay, highway in the Happy Valley-Goose Bay area) and community services (e.g., waste disposal). On the Island, the Project will overlap with other known projects requiring transportation infrastructure (i.e., TCH) in the Isthmus of Avalon area. Nalcor is involved in consultation regarding development of the Port of Goose Bay, and may be involved in addressing highway traffic effects in Happy Valley-Goose Bay through consultation with the Newfoundland and Labrador Department of Transport and Works.

Cumulative effects on community well-being and health conditions as a result of employment and income opportunities from the Project in combination with others are generally beneficial and any adverse effects will likely be negligible and / or not significant. The cumulative effects on the Communities VEC are not significant.

Employment, Economy and Business

The main consideration for the Employment, Economy and Business VEC from a cumulative effects perspective relates to competing sources of demand for labour and business resources, which may adversely affect individual operations or, more generally, may reduce the full realization of total and sustained provincial economic benefits. Nalcor is involved in addressing potential labour shortages through a variety of effects management strategies, and any such adverse cumulative effects are considered not significant.

Given the nature and health of the provincial economy at present, substantial economic benefits to Newfoundland and Labrador are expected as a result of this Project in combination with other existing and future projects; the projects will all generate benefits to the province in terms of increased total incomes, increased employment and training opportunities, opportunities for business activity and growth, and government tax revenue. These cumulative outcomes will generate immediate direct benefits to the economy, and also lead to longer-term indirect changes such as development of a skilled and experienced labour force with higher skills that commands higher wages and employment opportunities, and more competitive businesses. The cumulative effects on the Employment, Economy and Business VEC are not significant.

Land and Resource Use

There is limited new or proposed development activity in the regions through which the proposed Project passes, and the nature and intensity of existing land and resource use activities is not expected to change; therefore, little potential exists for overlapping effects of other projects and activities with the proposed Project with respect to land and resource use. Given this and the planned ongoing Project-related effects management measures and the appropriate management, regulation and enforcement of other future developments and activities, the cumulative environmental effects on Land and Resource Use are not significant.

Marine Fisheries

Other marine activities in the Strait of Belle Isle and Conception Bay that are relevant to the Marine Fisheries VEC are limited to long established general shipping activities. The nature and intensity of general vessel traffic is not expected to change, and there are no other proposed development projects in the area. Considering this and the planned Project-related effects management measures and the appropriate management, regulation and enforcement of other future developments and activities, the cumulative environmental effects on Marine Fisheries are not significant.

Tourism

Other projects (e.g., TLH3, Lower Churchill Hydroelectric Generation Project) and activities (general economic development in Labrador and on the Island) could combine with the proposed Project to result in cumulative effects on Tourism (i.e., quality of tourism experience, tourism visitation and expenditures). Increased traffic (on Route 510 in Labrador) plus an increased need for worker accommodation, or more frequent traffic delays (on Route 430 in the Northern Peninsula) as a result of general economic development during the peak tourism season could affect the ability of tourists to find available or suitable accommodations or diminish the overall quality of tourism experience. From the perspective of the Project, the potential for cumulative effects on Tourism will be greatest during Project Construction because noise, dust, visual aesthetics, traffic delays, transportation shortages and accommodation competition will be greatest during this phase, particularly along major traffic routes.

Considering that Project Construction will occur over four years, the Project workforce will primarily be housed in camps, a traffic management plan will be in place, and Nalcor will adjust its schedule to accommodate the

high tourism season, the contribution of the Project to cumulative effects is considered low. The cumulative effects on the Tourism VEC are not significant.

Visual Aesthetics

The likely effects of the Project on Visual Aesthetics in combination with other projects and activities may result in cumulative visual aesthetic effects, which are at least partially influenced by the perception of the viewer. Alterations to existing viewscapes are due to clearing of vegetation to accommodate activities, or infrastructure construction related to the projects (e.g., Lower Churchill Hydroelectric Generation Project, highway maintenance, forestry access roads and harvesting areas, infrastructure developments)

The level of contribution of the Project to cumulative effects on visual aesthetics is limited, considering the remoteness of much of the corridor and the use of existing disturbance corridors where practical. The cumulative effects on the Visual Aesthetics VEC are not significant.

16.9.5 Environmental Monitoring and Follow-up

Monitoring programs are those implemented to meet regulatory requirements and / or demonstrate compliance to commitments made by Nalcor for this Project. Follow-up programs are those implemented to verify EIS predictions and / or deal with issues of uncertainty, such as the effectiveness of effects management measures. Monitoring and follow-up programs proposed for socioeconomic issues are outlined below. Several of these programs involve ongoing consultation with stakeholder groups and regular provision of information to regulatory agencies. Nalcor will address any issues that become apparent through its monitoring and follow-up programs appropriately through its adaptive management process.

Historic and Heritage Resources

The Project is subject to the Newfoundland and Labrador *Historic Resources Act* (1985) and will be governed by application of accepted protocols. Consequently, no specific monitoring and follow-up activities are recommended or proposed for the Historic and Heritage Resources VEC.

Communities

The monitoring of components, services (e.g., highway use statistics, waste volumes and landfill capacity) and social characteristics related to community infrastructure and services, and community health and well-being are typically the responsibility of municipal, Aboriginal, provincial and / or federal authorities. Nalcor does not have responsibility to monitor these aspects. However, Nalcor will continue to provide Project information to authorities with monitoring responsibilities, and to consult with relevant groups regarding community issues throughout the Project.

Employment, Economy and Business

As described in Section 16.4.10, under the terms of the provincial Benefits Strategy (GNL 2010, internet site), Nalcor will provide information to the GNL on a monthly basis on a number of employment parameters (e.g., person-hours, resident hires) and economic parameters (goods and services, purchases by industry category, contracts). Also, as described in Section 16.4.10, Nalcor will report on a quarterly basis on hiring and employment objectives and targets, and other commitment-related parameters such as level of compliance with the Benefits Strategy, activities carried out in relation to employment programs, and procurement forecasts.

Also, as part of its ongoing governmental, Aboriginal, stakeholder and public consultation activities throughout the Project, Nalcor will provide information and updates on Project activities and effects related to Economy, Employment and Business on a regular basis. This information will be used to facilitate planning and continuous improvement of Nalcor strategies to optimize Project benefits to Newfoundland and Labrador.

Land and Resource Use

Nalcor is not responsible for monitoring parameters related to the Land and Resource Use VEC (e.g., municipal land use, hunting and angling activity, cabin development, outfitting, resource exploration and development) required for management purposes. However, Nalcor will use its ongoing processes of communication with government departments, communities, stakeholder groups and individual land and resource users as a means to identify and address any Project-related issues and effects as they arise throughout the Project.

Also, as described in Section 16.5.10, Nalcor will continue to use information collected during past and ongoing discussions with potentially affected Aboriginal groups and communities to avoid conflicts with and adverse effects on contemporary land use for traditional purposes to the extent practical.

Marine Fisheries

Monitoring commercial and recreational marine fisheries and the fishing industry through the collection of statistical data (e.g., catch quantities, locations, values) is the responsibility of federal authorities. While it does not have responsibility to monitor marine fisheries, Nalcor will provide Project information to authorities with monitoring responsibilities as required and requested. Nalcor will also continue to communicate and consult with area fishers as a means to identify and address any Project-related issues and effects that may arise throughout the Project.

Tourism

Nalcor is not responsible for monitoring the tourism industry in Newfoundland and Labrador; this monitoring is undertaken by the appropriate government departments and agencies, industry organizations and others (e.g., through the collection of statistical data on visitation and accommodation occupancy rates, expenditures, quality and satisfaction rates). However, Nalcor will continue to provide Project information to the responsible agencies as required and requested. Planned effects management measures, including those related to Nalcor's ongoing communication and cooperation with authorities and tourism industry representatives, will serve as a means to identify and address Project-related issues and effects as they arise throughout the Project.

Visual Aesthetics

As indicated in Section 16.8.11, monitoring or follow-up programs related to visual aesthetics are not considered to be warranted for the Project due to the findings of the assessment and the individual, subjective nature of the perception related to the effects of the Project on the Visual Aesthetics.

16.10 Aboriginal Summary

Nalcor's understanding of interests, values, concerns, contemporary and historic land and resource use activities (including cultural aspects), and Aboriginal traditional knowledge (Aboriginal Ecological Knowledge in this EIS) including important issues facing Aboriginal groups is demonstrated throughout this EIS. To gain this understanding of Aboriginal interests, values, issues and concerns, Nalcor has planned, offered and undertaken various consultation processes and activities with all potentially affected Aboriginal communities and organizations.

Nalcor recognizes and acknowledges that Aboriginal groups and communities often require additional resources and support to engage in consultation processes, particularly with regard to large development projects and their EAs. While there is no legal requirement for formal capacity arrangements, Nalcor has developed an approach to consultation which includes the provision of funding and / or other support to Aboriginal communities and organizations to facilitate Project-related consultation, where appropriate. Further details on Nalcor's correspondence, discussions and other consultation initiatives and offers with individual groups are provided in Chapter 7, Aboriginal Consultation and Issues Scoping.

The key objectives and elements of Nalcor's Aboriginal consultation program have included the following:

- providing Aboriginal communities with information on the proposed Project, including its purpose and associated components and activities;
- identifying and documenting any questions or concerns about the Project and its potential environmental and socioeconomic effects (both beneficial and adverse);
- collecting and considering information on contemporary land use activities (including sites of cultural and historical importance) by Aboriginal persons in or near the Project area, as well as relevant Aboriginal Ecological Knowledge; and
- discussing possible approaches and measures to avoid or reduce any likely adverse effects and enhance benefits of the Project on Aboriginal communities and their interests and activities, and on the environment in general.

As presented in Chapter 7, the results of the issues scoping include the identification of areas of concern about the Project as determined through the consultation process. Each of these issues and concerns have been addressed in the EIS, as shown in Table 7.2.2-1, Table 7.3.3-1, Table 7.4-1, and Table 7.5.2-1.

Nalcor appreciates that populations living in proximity to the Project may have substantial and distinct knowledge, which can be considered in the assessment of the effects of the Project, and the mitigation. As such, Nalcor considered Aboriginal traditional knowledge of the existing environment as an integral part of this EIS, to the extent that it was available. As outlined in Section 2.3 of the EIS Guidelines and Scoping Document (Government of Newfoundland and Labrador and the Government of Canada 2011), in the EA process, Aboriginal traditional knowledge may be regarded as the knowledge, understanding and values that residents of Aboriginal communities have in relation to the environment and the potential environmental effects of the Project and proposed mitigation measures. Aboriginal traditional knowledge (referred to as Aboriginal Ecological Knowledge in this EIS) related to the biophysical existing environment is presented in Chapter 10. Aboriginal knowledge on the socioeconomic existing environment is incorporated into the baseline information and not presented separately, but rather integrally considered throughout Chapter 15, as appropriate.

Nalcor considered the Aboriginal traditional knowledge to assist in its understanding, including the inter-relationships among such matters as: ecosystem function; resource abundance, distribution and quality; social and economic well-being; and, use of the land and resources. Nalcor also considered the traditional knowledge that was available, to inform the development of adequate baseline information, identification of key issues, prediction of effects, and assessment of their significance.

In this EIS, Nalcor has demonstrated its understanding of the interests, values, concerns, contemporary and historic activities, Aboriginal Ecological Knowledge and important issues facing Aboriginal groups. With this understanding, Nalcor has determined, based on the results of this EIS, that the Project is likely to cause no significant environmental effects on the various aspects of the environment valued by Aboriginal persons, including air quality, water quality (freshwater and marine), fish (freshwater and marine), vegetation (including medicinal plants), wildlife (terrestrial and marine), and the respective habitats (i.e., freshwater, marine, and terrestrial). This indicates the continued functionality / sustainability of all the ecological and biological processes by which the landscape, ecosystems and species levels are linked. Nalcor also has determined, based on the results of this EIS, that the Project is not likely to cause significant environmental effects on Historic and Heritage Resources or Land and Resource Use. With all of these aspects of the environment considered, the Project is not likely to affect Aboriginal contemporary land and resource use, or compromise the ability of future generations to meet their needs.

16.11 References

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NALCOR ENERGY

LABRADOR-ISLAND TRANSMISSION LINK

ENVIRONMENTAL IMPACT STATEMENT

Chapter 17

Commitments, Sustainability and Conclusions

April 2012

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LIST OF ACRONYMS

Acronym	Description
ac	alternating current
ATV	All Terrain Vehicles
CCG	Canadian Coast Guard
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CSA	Canadian Standards Association
dBA	Decibels (A-weighted scale)
dc	direct current
DND	Department of National Defense
e.g.	for example
EA	Environmental Assessment
EIS	Environmental Impact Statement
ELC	Ecological Land Classification
EPP	Environmental Protection Plan
EPRI	Electric Power Research Institute
FLC	Fisheries Liaison Committee
GHG	greenhouse gases
GNL	Government of Newfoundland and Labrador
HDD	horizontal directional drilling
HSEQ	Health and Safety, Environment and Quality
HVdc	High Voltage direct current
i.e.	that is
IATNL	International Appalachian Trail - Newfoundland and Labrador
IBA	Impacts and Benefits Agreement
ISO	International Standards Organization
KI	Key Indicator
km	kilometre
LSA	Local Study Area
LWCRT	Labrador Woodland Caribou Recovery Team
m	metres
NL	Newfoundland and Labrador
NLDEC	Newfoundland and Labrador Department of Environment and Conservation
OHSP	Occupational Health and Safety Plan
OHV	off highway vehicle

Acronym	Description
PAO	Provincial Archaeology Office
RCMP	Royal Canadian Mounted Police
ROW	right-of-way
RSA	Regional Study Area
SARA	*Species at Risk Act*
SHERP	Safety, Health and Environmental Response Plans
SIMOPS	Simultaneous Operations
TSS	total suspended solids
VEC	Valued Environmental Component
VTMP	Vessel Traffic Management Plan
WEP	Women's Employment Plan

17 COMMITMENTS, SUSTAINABILITY AND CONCLUSIONS

17.1 The Project

Nalcor Energy's (Nalcor) vision is to help build a strong economic future for successive generations of Newfoundlanders and Labradorians. Nalcor's core values of open communication, accountability, safety, honesty and trust, teamwork, respect and dignity, and leadership set common direction on how to make decisions. Nalcor recognizes that it is not only what they achieve, but how they achieve it, that truly makes them proud of their accomplishments. The Labrador-Island Transmission Link (the Project) has been planned with this vision and these core values in place.

Nalcor considers the Project to be the best option, from an engineering and environmental perspective, to transport the hydroelectricity generated at the Muskrat Falls Generating Station to the converter station at Soldiers Pond in Newfoundland.

The Project will include the following key components:

- an alternating current (ac) to direct current (dc) converter station at Muskrat Falls;
- approximately 400 kilometres (km) overhead High Voltage direct current (HVdc) transmission line from Muskrat Falls to Forteau Point;
- three, approximately 35 km long, submarine cables across the Strait of Belle Isle (i.e., between Forteau Point and Shoal Cove), with associated onshore infrastructure (transition compounds and land cables at both cable landings);
- approximately 700 km of overhead HVdc transmission line from Shoal Cove to the Avalon Peninsula;
- a dc to ac converter station at Soldiers Pond; and
- shoreline electrodes at L'Anse au Diable and Dowden's Point, and overhead, wood pole electrode lines between the shoreline electrode sites and their respective converter stations.

As directed by the Government of Newfoundland and Labrador and the Government of Canada in the Guidelines, Nalcor's approach to this environmental assessment (EA) included adherence to the basic principles of environmental assessment:

- conducting the EA to allow consideration of the potential effects of the Project in a careful and precautionary manner;
- Aboriginal and public participation;
- consideration of Aboriginal Traditional and Community Knowledge;
- integration of sustainable development factors; and
- application of the Precautionary Principle / Precautionary Approach.

Nalcor will use the Environmental Impact Statement (EIS) as they enter the detailed design phase, to refine and optimize technical, economic and environmental features, in consultation with regulators, Aboriginal groups, and stakeholders, as outlined throughout this EIS.

17.2 Purpose of the Project

The purpose of the Project is to provide the least-cost domestic electricity supply alternative, and address the current and future energy requirements of residents and industry on the Island of Newfoundland. The Project will address the growing demand for electricity by transmitting a clean, sustainable source of energy, thereby reducing reliance on oil-fired thermal generation and bringing about lower and more stable electricity rates in the province over the long term.

17.3 Key Environmental, Social and Economic Benefits of the Project

The Project can significantly reduce atmospheric emissions (including greenhouse gases (GHGs)) resulting from electricity generation activities on the Island. Once the Project is operational, and with the displacement of existing thermal generation from the Holyrood plant, over 98% of the province's electrical energy will be emission-free. The transmission of clean, renewable hydroelectricity from the lower Churchill River to the Island through the Project will play an important role in helping the province meet its climate change policies and objectives.

The Project will also result in socioeconomic benefits throughout its Construction and Operations phases. This includes direct, indirect and induced employment, and business opportunities related to the requirement for goods and services. Over the longer term, the Project will provide energy and infrastructure to facilitate development and growth in Newfoundland and Labrador's energy sector and overall economy. The Project will provide adequate and reliable electrical power that is characterized by lower and more stable electricity costs into the long-term, both for use by current residents and businesses, as well as to help attract new industry to the province.

17.4 Commitments

As indicated in Section 2.1 of the Environmental Impact Statement Guidelines and Scoping Document (the Guidelines) (Government of Newfoundland and Labrador and the Government of Canada 2011), EA is a planning tool that enables consideration of the potential effects of a project in a careful and precautionary manner before actions are taken to allow that project to proceed. As such, Nalcor has presented their corporate information, the alternatives to the Project, alternative methods for carrying out the Project, the environment that will be affected, the important environmental effects associated with the Project, measures that are designed to mitigate adverse effects and enhance benefits, and the significance of residual environmental effects.

In this EIS, Nalcor has demonstrated adherence to the basic principles of EA by addressing: Environmental Assessment: A Planning Tool; Aboriginal and Public Participation; Aboriginal Traditional and Community Knowledge; Sustainable Development; and the Precautionary Principle, as stated in Section 2 of the EIS Guidelines and Scoping Document (Government of Newfoundland and Labrador and the Government of Canada 2011).

The Project is being planned by Nalcor in a manner that considers environmentally (i.e., biophysical and socioeconomic) sensitive areas of the province and has avoided many such areas to the extent practical. Nalcor has incorporated best industry practices and mitigation options for routing, Construction, and Operations and Maintenance to limit residual adverse effects; used Traditional and Community Knowledge of the existing environment; and, will continue to engage in consultation with government, Aboriginal, and public stakeholders.

Nalcor's commitments (i.e., high level approaches / principles) for this Project are presented in Table 17.4-1. For ease of reference, these are provided by chapter, with a reference to the section of the EIS where the commitments are made. Keeping in alignment with the precautionary principle during the planning of the Project, Nalcor has developed, and will apply appropriate mitigation, despite any uncertainty of the level of an effect of the Project on a Valued Environmental Component (VEC) or a Key Indicator (KI). Mitigation measures (i.e., environmental protection for a specific issue) proposed by Nalcor for the Project are discussed throughout the assessment and summarized at the end of each assessment chapter (i.e., Chapter 11, Atmospheric Environmental Effects Assessment; Chapter 12, Terrestrial Environment: Environmental Effects Assessment; Chapter 13, Freshwater Environment: Environmental Effects Assessment; Chapter 14, Marine Environment: Environmental Effects Assessment; and Chapter 16, Socioeconomic Environment: Environmental Effects Assessment).

Table 17.4-1 Commitments for the Labrador-Island Transmission Link

Section	VEC	Aspect	Commitment
Chapter 1: Introduction			
1.1	—	Overview of Project	As illustrated throughout this EIS, the EA process, including its associated governmental, Aboriginal and stakeholder consultation, has been and will continue to be a key aspect of Project planning and design.
1.2	—	Proponent	As a proud, diverse energy company, its people are committed to a bright future for the province, united by the following goals and core values: **Goals** *Safety:* To be a world class safety leader *Environment:* To be an environmental leader *Business Excellence:* Through operational excellence to provide exceptional value to all consumers of our energy *People:* To ensure a highly-skilled and motivated team of employees who are strongly committed to our success and future direction *Community:* To be a valued corporate citizen in Newfoundland and Labrador **Core Values** *Open Communication:* Fostering an environment where information moves freely in a timely manner *Accountability:* Holding ourselves responsible for our actions and performance *Safety:* Relentless commitment to protecting ourselves, our colleagues and our community *Honesty and Trust:* Being sincere in everything we say and do *Teamwork:* Sharing our ideas in an open and supportive manner to achieve excellence *Respect and Dignity:* Appreciating the individuality of others by our words and actions *Leadership:* Empowering individuals to help guide and inspire others
1.2	—	Proponent	Committed to marketing these opportunities around the world, Nalcor – Oil and Gas will maximize benefits from these resources to help attract continued investment that will strengthen the economy in Newfoundland and Labrador.
1.2	—	Proponent	As reflected in its above-listed corporate goals and values, Nalcor is striving to be a leader in environmental protection and sustainability, and is committed to maintaining a high standard of environmental responsibility and performance
1.2	—	Proponent	The corporation has state-of-the-art and proven policies and procedures related to environmental protection and management which will be implemented throughout this Project.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
1.2	—	Proponent	The corporation has an outstanding record of environmental protection and stewardship, and this objective and experience will be applied to the planning and development of this Project to avoid or reduce potential environmental effects during its Construction, and Operations and Maintenance phases.
Chapter 2: Project Rationale and Planning			
2.4.1	—	Economic Evaluation	To facilitate analysis, *Strategist*® was used to develop least-cost Isolated Island (without the Project) and Interconnected Island (with the Project) generation expansion plans. A comparison of the two expansion plans will be provided, and the plan with the lowest Cumulative Present Worth is the preferred expansion plan.
2.5	—	Environmental Considerations	The company must meet any current environmental regulations laid out in both provincial and federal legislation and also must consider potential new environmental legislation due to the longer term nature of its generation expansion decisions. The company must also adhere to any provincial policy provided in this regard.
2.5.8	—	Wind	Wind power has a place in the electricity generation mix on the island and, due to its low environmental footprint, it will be incorporated whenever economically viable.
2.5.13.3	—	—	Nalcor will continue to avail of all appropriate channels to obtain the firm transmission services required to develop an export sales portfolio for the Gull Island project.
2.11.1.4	—	Interest Rates	Prior to Decision Gate 3, the Project will have established and secured equity financing, and remaining financing will be provided via debt markets.
2.13.7	—	—	The following additional alternatives are also listed specifically in the EIS Guidelines and Scoping Document: a. Alternative means of accessing the corridor including, but not limited to, helicopter, permanent access roads, temporary access roads and ice roads: ▪ LCP Engineering providing information on potential use of helicopters and ice roads (and why / why not). b. Alternative clearing methods, including mechanical and manual clearing: ▪ Right-of-way (ROW) clearing will be carried out in accordance with standard utility practices and procedures, and will involve the removal of all vegetation that exceeds 2 m at maturity. ▪ Vegetation will be removed primarily by mechanical harvesters, with chain saws or other hand-held equipment potentially used in small areas (e.g., along watercourses). ▪ Given the size of the area required to be cleared and the volume of wood along the ROW (an approximately 1,100 km long by 60 m wide area), the use of mechanical harvesters is the only technically and economically viable means of clearing the ROW.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
			c. Construction sequence: ▪ The process for the construction of transmission lines is standard and defined by the sequence of required steps and elements, as follows: ROW clearing and access, material distribution, tower foundation installation, tower assembly and erection, and conductor stringing. ▪ Due to the linear nature of transmission lines, construction activities can typically be conducted in succession and concurrently. The start of each activity is often staggered to allow crews to move down the transmission line route completing each construction phase ahead of the next. In addition, work programs can begin and proceed separately in different segments of the line, through a series of strategically placed and timed work fronts. ▪ Chapter 3 presents an overview of the Project construction process and schedule. The specific timing and sequencing of all specific aspects of Project construction will again be defined as part of the detailed engineering design of the Project, and will primarily be determined by the eventual construction contractor(s) involved. d. Construction labour force accommodation: ▪ As described in Chapter 3, the construction workforce will be housed in a series of work camps located throughout the province at strategic locations along and near the transmission line ROW. ▪ All camps will be established and operated in accordance will all applicable regulations and permits, including those related to environmental and human (health and hygiene) considerations. ▪ This Project design decision has been made by Nalcor based on Project requirements, as well as the stated preferences of stakeholders through EA consultations, in order to reduce interactions between the Project workforce and local communities, as well as to prevent potential effects on the tourism industry by filling up hotel and other accommodations throughout the province during the peak tourist season. e. Alternative means of controlling vegetation within the right of way, including both mechanical and chemical means: ▪ Nalcor will incorporate the HVdc transmission line into its integrated vegetation management program for its transmission and distribution systems. ▪ Vegetation will be controlled manually / mechanically, as well as through the selective application of vegetation-control agents in certain areas. ▪ As described in Chapter 3, the use of herbicides for vegetation control along transmission lines is a common and highly regulated activity in Newfoundland and Labrador and elsewhere, and is required for this Project given the overall length and scale of the ROW, as well as to ensure effective control of certain species.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
			▪ Any and all such herbicide use will be subject to approval from the Department of Environment and Conservation, and will be undertaken in full compliance with the *Pesticides Control Regulations*. As is standard practice, there will be a public notification and an evaluation of any environmental sensitivities wherever herbicides are to be used. Vegetation control personnel will be appropriately trained and qualified.
2.14	—	Routing and Design	Once identified, and prior to final Project design and construction, Nalcor will conduct public consultations to present these transmission line routing(s) to the interested public and stakeholders.
2.14	—	Routing and Design	Nalcor and / or its contractors will identify, apply for and adhere to all require permits and other authorizations that are required for Project Construction and / or Operations and Maintenance
2.15.2.1	—	Environmental Protection Plan (EPP)	Nalcor will implement its state-of-the-art and proven policies and procedures related to environmental protection and management during the Construction and Operations and Maintenance of this proposed Project.
2.15.2.1	—	EPP	Each activity-specific Environmental Protection Plan (EPP) will be a field-useable document, addressing provisions that will avoid or reduce environmental effects which may be associated with construction.
2.15.2.1	—	EPP	As appropriate, each EPP will include items relating to vegetation clearing, grubbing and grading, storage and handling of fuel, blasting, quarrying, dust control, waste and sewage disposal, work in water, contingency plans for unplanned events such as spills, rehabilitation and compliance monitoring.
2.15.3	—	Safety, Health and Environmental Emergency Response Plan (SHERP)	Nalcor will conform to both provincial and federal legislation relating to safety, health and environmental emergency response planning with the intent of meeting both its legal and corporate responsibilities.
2.15.3	—	SHERP	Project-specific SHERPs will address: roles and responsibilities, personal protective equipment, materials storage, driving safety, working at heights, working near or over water, working near or on ice, vessel operation and safety, animal encounters, emergency response communications, spill response, personnel injury response, search and rescue, fire and explosion response, and vehicle / vessel accidents.
2.15.4	—	Benefits Strategy	Nalcor and its contractors and sub-contractors will follow the Benefits Strategy, which outlines activities and protocols regarding employment and business benefits to ensure that work is performed in the province for the benefit of industry and employees; and, is similar to benefits arrangements that the province has had in place with oil and mining companies.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
2.15.4	—	Benefits Strategy	Some of the highlights of the Benefits Strategy relevant to this Project include: *Engineering and Project Management* – Project management activities associated with the projects will be executed in the province. – The Engineering, Procurement and Construction Management (EPCM) contractor will establish its own engineering, procurement, construction management and overall project management office in the province with appropriate personnel and decision-making authority. – The Lower Churchill Construction Project team and its EPCM contractors and sub-contractors will perform all engineering and project management, with the possible exception of specialized engineering, for the project in the province. – All reasonable efforts will be made to have specialized engineering performed in the province. In the event there is specialized engineering undertaken outside the province, Nalcor-Lower Churchill Project will ensure that such work is done in full collaboration with and is integrated into the local engineering effort. – No less than the following number of engineering and project management hours for the Transmission Link will take place within the province: 1.0 million person hours. *Procurement and Contracting* – Procurement will be managed from the Lower Churchill Project and its EPCM contractor offices in the province. – Nalcor-Lower Churchill Project and its EPCM contractor will be responsible for the following: ▪ issue all Requests for Proposals and procurement related documents; ▪ primary point of contact for all inquiries regarding contracts and procurement; ▪ co-ordinate supplier development activities; ▪ make all decisions related to procurement; ▪ issue procurement awards; and ▪ conduct all meetings with suppliers related to procurement. – Contractors and sub-contractors will be aware of, and must comply with, the applicable terms of the benefits strategy. – Nalcor-Lower Churchill Project will conduct appropriately-timed supplier development workshops to ensure local suppliers and contractors can prepare for bidding and establish business relationships. Workshops will be held on both the Island and Labrador.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
			Construction and Assembly – No less than the following number of construction and assembly person hours for the Transmission Link will take place in the province: 2.5 million person hours. – A construction hiring protocol will be established and implemented, and will include a gender equity program, including a women's employment plan, and a diversity program to address employment equity. *Gender Equity* – Nalcor-Lower Churchill Project will implement a gender equity program, including a women's employment plan. – The program will establish quantitative goals and emphasize continuous improvement which will increase access and employment for women. *Diversity* – The objectives of the diversity program will be to address employment equity for the projects, including access to employment for disadvantaged groups. *Reporting* – Nalcor will provide to the Provincial Government monthly and quarterly reports on the total number of person hours of work and number of person hours of project management and design work, as required over the life of the project.
Chapter 3: Project Description			
3.3.2.1	—	Transmission Line	Nalcor will meet the Canadian Standards Association (CSA) conductor clearance standard applicable to the type and size of the watercourse and will comply with the *Navigable Waters Protection Act*.
3.5	—	Operations and Maintenance	Nalcor will integrate activities associated with the Operations and Maintenance of the Project into Nalcor's existing transmission system inspection and maintenance program.
3.5.2.3	—	Vegetation Maintenance	Nalcor will incorporate the Project into its integrated vegetation management program for its transmission and distribution systems.
3.5.2.3	—	Vegetation Maintenance	A survey will be undertaken before each vegetation management program is initiated to determine priority vegetation management areas.
3.6.1	—	EPP	Nalcor's Environmental Policy and Guiding Principles will be implemented during the Construction, Operations and Maintenance of the Project.
3.6.2	—	SHERP	Nalcor will proactively identify potential safety, health and environmental emergencies related to Project Construction, Operations and Maintenance.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
3.6.2		SHERP	The SHERP will be a field-useable document that describes the prevention measures and emergency response procedures for unplanned safety, health and environmental events.
3.7.2	—	Workforce	The Operations and Maintenance workforce will form part of Nalcor's overall transmission line maintenance program and will consist of Nalcor employees based in Labrador and on the Island.
Chapter 4: Effects of the Environment on the Project			
4.1.1	—	Biophysical, Vegetation	Nalcor will attempt to use existing disturbances (e.g., clear cuts) to the extent practical, and will also attempt to use parallel (or otherwise) existing disturbance corridors (e.g. roads, transmission line ROWs) to reduce the amount of new access that is required, and thus the amount of clearing. In addition, the amount and type of equipment required for the clearing process will be determined by the vegetation types within the areas that require clearing.
4.1.7.1	—	Biophysical, Currents and Tides	Nalcor is conducting a two year current monitoring program, commencing in 2011, to add to Nalcor's existing substantial knowledge of the currents in the Strait of Belle Isle cable crossing corridor.
4.1.11.2	—	Biophysical, Climate Change	Nalcor will inspect 100% of the transmission line each year via ground patrol or helicopter.
4.1.11.2	—	Biophysical, Climate Change	Nalcor will monitor extreme weather events and have emergency response plans in place to address the effects of these events on the Project.
Chapter 5: Accidents and Malfunctions			
5.2	—	Management Systems	Nalcor will proactively identify potential incidents related to Project Construction, and Operations and Maintenance.
5.2	—	Management Systems	Prevention measures and response procedures will be described in the EPP, the SHERP, and the Occupational Health and Safety Plan (OHSP).
5.2	—	Management Systems	The EPP, the SHERP and the OHSP will be field-useable documents that address prevention measures and incident response procedures for unplanned safety, health and environmental events.
5.2	—	Management Systems	Nalcor will implement Health and Safety, Environment, and Quality (HSEQ) Management Systems to meet the requirements of ISO14001:2004 (Environment), CAN Z1000-06 (Health and Safety), and ISO 9001:2000 (Quality). Existing systems within the Nalcor HSEQ Management System will be used for the Project, as appropriate, for these common elements: – document and records control; – communication; – incident preparedness and response;

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
			– compliance and management system auditing; – management review; and – existing systems within the Nalcor HSEQ Management System will be used for the Project.
5.2	—	Management Systems	All Project Construction, and Operations and Maintenance personnel will be required to maintain a high level of vigilance, undergo regular safety training, and be familiar with the SHERP, the EPP and the OHSP.
5.2	—	Management Systems	Third-party contractors will be screened for compatibility with Nalcor policies and procedures and only those that meet the criteria will be hired.
5.4.1	—	Transmission Tower Failure, Prevention and Response	The transmission towers will be designed in accordance with CSA (2009) standards.
5.4.1	—	Transmission Tower Failure, Prevention and Response	The transmission towers will be constructed in accordance with CSA standards and guidelines, and with the principle of Good Utility Practice.
5.4.1	—	Transmission Tower Failure, Prevention and Response	In accordance with the principle of Good Utility Practice, the construction of the transmission towers will be conducted by qualified, specialized contractors, with workers experienced in the erection of steel lattice tower transmission lines.
5.4.2	—	Transmission Tower Failure, Risk Evaluation	The transmission towers for the Project will meet Nalcor's current ice load standard and are designed for a 50-year return period meteorological event.
5.4.2	—	Transmission Tower Failure, Risk Evaluation	Nalcor will proactively identify potential electrical hazards related to Project Construction, and Operations and Maintenance.
5.5.1	—	Electrocution, Prevention and Response	Prevention measures and response procedures to address potential electrical hazards will be described in the EPP, the SHERP, and the OHSP.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
5.5.1	—	Electrocution, Prevention and Response	The following measures will be implemented to reduce likelihood of electrocution during Project Construction, and Operations and Maintenance: – The transmission towers will be designed in accordance with CSA standards, as described in Section 5.8.1. – "High voltage" signage will be posted on High Voltage direct current (HVdc) towers, the converter stations, transition compounds and electrode sites. – "High voltage" signage will be posted where power lines are buried (e.g., between the transition compounds and their respective landing points) to ensure that there is no excavation or development in the cable areas. – Public access to the converter stations will be restricted by galvanized steel security fences and locked gates. – The electrode sites will be enclosed by locked, chain-link fences to prevent public access from the land and sea sides. Sea side fencing will be installed on the electrode berm crest. – Avian-safe separation of the energized and / or grounded parts of the power line will be incorporated into the transmission line design. – The submarine cable will be protected from interaction with fishing activity by horizontal directional drilling (HDD) and the rock berm.
5.9.1	—	Fires, Prevention and Response	All Project personnel will be made aware of the SHERP and designated staff will receive SHERP training, and the fire prevention plan will be followed by Nalcor and its contractors.
5.9.2	—	Fires, Risk Evaluation	Nalcor will ensure that all Project field personnel are trained in the use of fire-fighting equipment and that trained personnel are available to respond immediately to an incident.
5.10.1	—	Forest Fires, Prevention and Response	All Project personnel will be made aware of the SHERP and designated staff will receive SHERP training, and the forest fire prevention plan will be followed by Nalcor and its contractors.
5.10.1		Forest Fires, Prevention and Response	Nalcor will ensure that all Project field personnel are trained in the use of fire-fighting equipment and that trained personnel are available to respond immediately to an incident.
5.10.1	—	Forest Fires, Incident Prevention and Response	Nalcor will require that its contractors have fire-fighting expense coverage as part of the Commercial General Liability requirement.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
5.12.1		Motor Vehicle Collisions, Incident Prevention and Response	All Project personnel will be made aware of the SHERP and designated staff will receive SHERP training, and driver / operator awareness programs will limit the potential for vehicle collisions, and other vehicle-wildlife incidents.
5.13.1	—	Marine Vessel Collisions, Incident Prevention and Response	All Project personnel will be made aware of the SHERP and designated staff will receive SHERP training, and vessel operator awareness programs will limit the potential for wildlife collisions, and other vessel-wildlife incidents.
5.13.1	—	Marine Vessel Collisions, Incident Prevention and Response	Simultaneous Operations (SIMOPS) procedures will be developed by Nalcor to ensure safe and efficient operations of multiple vessels while working in the Strait of Belle Isle.
5.14.1	—	Aviation Accidents, Incident Prevention and Response	Nalcor will continue to consult with Department of National Defense (DND) during detailed Project design to identify issues related to tower design and transmission line routing and will address these issues, where possible, during the design process.
5.14.1	—	Aviation Accidents, Incident Prevention and Response	Nalcor and / or its contractor(s) will provide full and regular briefings to DND authorities regarding its planned and ongoing construction activities, particularly those involving aircraft activity in Labrador to ensure coordinated planning and communication around Project Construction activities.
Chapter 6: Environmental Setting			
			No commitments were made in this chapter.
Chapter 7: Aboriginal Consultation			
7	—	Consultation and Issue Scoping	Nalcor is committed to consulting Aboriginal communities and organizations appropriately on the proposed Project.
7.1	—	Labrador Inuit	Although the proposed Project does not cross through or near land areas covered by the *Labrador Inuit Land Claims Agreement*, Nalcor is committed to open discussions with the Nunatsiavut Government and has and will continue to provide information on the Project and its EA to the Labrador Inuit.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
7.3.1	—	Proposed Agreements, Quebéc Innu and Naskapi	Although there was no formalized consultation agreement put in place with some Québec Innu groups or with Naskapi Nation of Kawawachikamach, Nalcor has and will continue to provide these groups with Project-related information and opportunities to identify any interests, issues and concerns.
Chapter 8: Regulatory and Public Consultation			
			No commitments were made in this chapter.
Chapter 9: Environmental Assessment Approach and Methodology			
9.3.5	—	Construction	Nalcor is responsible for the implementation of planned mitigation measures and all contractors and subcontractors will be required to adhere to the mitigation measures outlined in this EIS and associated documents (e.g., the EPP).
9.3.5	—	Construction	As per section 4.10 of the EIS Guidelines and Scoping Document (Government of Newfoundland and Labrador and Government of Canada 2011) Nalcor will prepare an EPP for each main construction site, and have the EPPs approved by the regulatory authorities before starting construction.
9.4.6	—	EA Summary, Monitoring and Follow-up	Nalcor will comply with the monitoring requirements (including details such as scheduling, sampling design, frequency, and reporting) stipulated by the regulators in the eventual Project permits.
9.4.6	—	EA Summary, Monitoring and Follow-up	Nalcor has committed to working with the regulators and other stakeholders to finalize the details of many of the follow-up programs outlined in this EIS.
9.4.6	—	EA Summary, Monitoring and Follow-up	Monitoring programs will include, as appropriate: – the objectives of the monitoring program and a schedule for collection of the monitoring data required to meet these objectives; – the sampling design, methodology, selection of the subjects and indicators to be monitored, and their selection criteria; – the frequency, duration and geographic extent of monitoring, and justification for the extent; – the application of the principles of Adaptive Environmental Management; – reporting and response mechanisms, including criteria for initiating a response and procedures; – the approaches and methods for monitoring the cumulative effects of the Project with existing and future developments in the Project area; – integration of monitoring results with other aspects of the Project including adjustments to operating procedures and refinement of mitigation measures;

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
			– experience gained from previous and existing monitoring programs; – the advisory roles of independent experts, government agencies, communities, holders of Aboriginal traditional and community knowledge and renewable resource users; – procedures to assess the effectiveness of monitoring and follow-up programs, mitigation measures and recovery programs for areas disturbed by the Project; and – a communications plan to describe the results of monitoring to interested parties.
9.4.6	—	EA Summary, Monitoring and Follow-up	Nalcor will explain how the public and Aboriginal groups will continue to be involved in monitoring programs, including participation in the design and implementation of environmental management and monitoring and follow-up programs, as appropriate. This process will include describing plans to maintain communications and working relationships with the affected communities, Aboriginal organizations, municipalities and government agencies throughout the life of the Project, as appropriate.
9.4.6	—	EA Summary, Monitoring and Follow-up	During the development of any monitoring and follow-up programs, Nalcor will discuss with the appropriate Aboriginal groups and communities, ways in which holders of Aboriginal traditional and community knowledge, including elders, women and youth, could be involved.
9.4.6	—	EA Summary, Monitoring and Follow-up	If unforeseen adverse environmental effects are identified during any of the monitoring or follow-up programs, Nalcor will, as part of their ongoing adaptive management process, adjust the existing mitigation measures or, if necessary, develop new mitigation or compensation measures to address those effects.
9.5.2	—	EA Principles, Aboriginal and Public Participation	Nalcor understands that meaningful public involvement can only take place if Aboriginal groups and the public have a clear understanding of the nature of the Project as early as possible in the environmental assessment process. As such, Nalcor: – will continue to provide up-to-date information, as it becomes available, to Aboriginal groups and the public, and especially to the communities likely to be affected by the Project; – will continue to involve the main interested parties in determining how best to deliver that information, that is, the type of information required, format and presentation methods, as well as the need for community meetings; – will explain the results of the EIS in a clear and direct manner (i.e., plain language summary) to make the issues comprehensible to the widest possible audience; and – will continue to consider and acknowledge all requests for consultation with Aboriginal groups during Project approvals and throughout the life of the Project.
9.5.5	—	EA Principles, Precautionary	Nalcor will use information obtained from any of the monitoring and / or follow-up programs undertaken to feed into their adaptive management process for continued improvement. The adaptive management process will ensure timely, proactive responses to identified issues to limit the resulting effect.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
Chapter 10: Existing Biophysical Environment			
			No commitments were made in this chapter.
Chapter 11: Atmospheric Environment: Environmental Effects Assessment			
11.2.5.1	Atmospheric Environment	Construction, Overview	Following their Environmental Policy and Guiding Principles of 'Preventing Pollution', 'Improve Continually', and 'Comply with Legislation', Nalcor is committed to reducing adverse environmental effects to the extent practical.
11.2.5.4	Atmospheric Environment	Construction Effects, Air Quality	Nalcor will not burn slash or other debris during Construction.
11.2.5.5	Atmospheric Environment	Construction Effects, Sound	Nalcor will conduct construction activities in accordance with municipal by-laws regarding noise.
11.2.5.5	Atmospheric Environment	Construction Effects, Sound	During the drilling activity at Forteau Point and Shoal Cove, Nalcor will evaluate and apply the appropriate mitigation with respect to noise control.
11.2.6.3	Atmospheric Environment	Operations and Maintenance Effects, Climate	Nalcor's proposed mitigation measures to reduce environmental effects of Project Operations and Maintenance on the Climate KI (GHG emissions) will be implemented wherever technically and economically feasible.
11.2.6.5	Atmospheric Environment	Operations and Maintenance Effects, Sound	Nalcor will conduct line inspections via helicopter and / or ground patrol annually.
11.2.6.5	Atmospheric Environment	Operations and Maintenance Effects, Sound	In addition to the helicopter inspections, Nalcor will thoroughly inspect approximately 10% of the line each year, which will include a tower and conductor inspection, via land based equipment such as all terrain vehicles (ATV).
11.2.10	Atmospheric Environment	Monitoring and Follow-up	Nalcor will employ a complaint driven process to address the generation of excessive airborne dust during any phase of the Project. The validity of the complaint will be ascertained by Nalcor and corrective actions implemented as warranted and appropriate.
11.2.10	Atmospheric Environment	Monitoring and Follow-up	Nalcor will employ a complaint driven process to address noise issues identified during any phase of the Project. The validity of the complaint will be investigated by Nalcor, and corrective actions implemented as warranted and appropriate.
11.3.1	Atmospheric Environment	EA Summary, Effects Management Measures	Nalcor is proposing to use best management practices and accepted, proven mitigation options to avoid or limit the effects of the Project on the Atmospheric Environment. Further, through their adaptive management process, Nalcor will assess issues that arise so that appropriate changes can be made to mitigation strategies or methods, and adopted in a timely manner.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
11.3.2	Atmospheric Environment	EA Summary, Accidents and Malfunctions	All Project personnel will be made aware of the SHERP and designated staff will receive SHERP training, and the forest fire prevention plan will be followed by Nalcor and its contractors.
11.3.2	Atmospheric Environment	EA Summary, Accidents and Malfunctions	Nalcor will implement fire prevention measures and adhere to conditions of Operating Permits.
11.3.5	Atmospheric Environment	EA Summary, Monitoring and Follow-up	Nalcor will employ a complaint driven process to address the generation of excessive airborne dust and / or noise during any phase of the Project. Nalcor will confirm the validity of the complaint and implement corrective actions as warranted and appropriate.
Chapter 12: Terrestrial Environment: Environmental Effects Assessment			
12.2.4.1	Vegetation	Approach to Analysis, Methods	Nalcor will avoid environmental sensitivities (e.g., known occurrences of listed plants, regionally uncommon plants and their associated habitat) to the extent practical during final ROW routing, or employ appropriate mitigation measures.
12.2.4.1	Vegetation	Approach to Analysis, Methods	The hypothetical centre line ROW and 20% contingency were not used in the assessment of this KI, as Nalcor will avoid known occurrences of listed plants in the final routing of the ROW or employ appropriate mitigation.
12.2.4.1	Vegetation	Approach to Analysis, Methods	Nalcor plans to avoid regionally uncommon plants and their associated habitat.
12.2.5.1	Vegetation	Construction, Overview	Nalcor will comply with existing provincial legislation and regulation (Newfoundland and Labrador *Forestry Act* 1990), and with the vegetation clearing requirements of all applicable permits and follow standard industry mitigation measures, including avoidance (e.g., wetlands, known listed plant species locations), setbacks and buffers (e.g., riparian areas) to limit the effects on Vegetation to the extent practical.
12.2.5.1	Vegetation	Construction, Overview	Nalcor is proposing a number of Project-specific mitigation measures designed specifically to reduce potential environmental effects on vegetation, as outlined below, by KI.
12.2.5.1	Vegetation	Construction, Overview	All Nalcor mitigation requirements referencing setbacks and buffers for waterbodies will also be applied to wetlands, as appropriate.
12.2.5.1	Vegetation	Construction, Overview	If construction is required in wetland areas, Nalcor will conduct the work in winter, fall, late summer, summer, spring (in order of preference), to the extent practical.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
12.2.5.1	Vegetation	Construction, Overview	Nalcor will adhere to federal and provincial guidelines or management plans relating to listed or regionally uncommon plants (e.g., NL Species at Risk Policy, Committee on the Status of Endangered Wildlife in Canada (COSEWIC) Status Reports, *Species at Risk Act* (*SARA*) Recovery Strategies), unless otherwise approved by appropriate regulatory agencies.
12.2.5.1	Vegetation	Construction, Overview	Nalcor will consult with Newfoundland and Labrador Department of Environment and Conservation (NLDEC) Wildlife Division regarding siting, routing or mitigation strategies for Project infrastructure in the vicinity of known listed plants or species of concern, particularly within the Northern Peninsula where a diversity of such species exists.
12.2.5.1	Vegetation	Construction, Overview	Where avoidance is not possible, Nalcor, in consultation with federal and provincial regulators, will develop protection measures and environmental management techniques for listed or regionally uncommon plant species based on site-specific conditions and species sensitivity criteria.
12.2.5.1	Vegetation	Construction, Overview	Nalcor will inspect equipment required for Construction before use to reduce the potential for the introduction of non-native and invasive plant species.
12.2.5.1	Vegetation	Construction, Overview	Nalcor will comply with existing provincial legislation and regulation (Newfoundland and Labrador *Forestry Act* 1990).
12.2.5.4	Vegetation	Construction Effects, Wetlands	Nalcor will limit the alteration / loss of wetland habitat to the extent practical by routing of the ROW to avoid wetlands where feasible.
12.2.5.4	Vegetation	Construction Effects, Wetlands	This wetland habitat will be avoided by Nalcor to the extent practical, and where effects occur, appropriate mitigation will be employed in a proactive manner.
12.2.5.5	Vegetation	Construction Effects, Shoreline	Nalcor will limit the amount of riparian shoreline alteration to the extent practical by routing of the ROW to avoid large waterbodies and rivers (and their associated shoreline)
12.2.5.6	Vegetation	Construction Effects, Listed Plants	Nalcor will avoid known occurrences of listed plants and / or important habitat during the final routing and siting of the Project ROW and associated Project components, where possible.
12.2.5.6	Vegetation	Construction Effects, Listed Plants	When routing or siting of Project components cannot avoid known occurrences of listed plants and / or important habitat, Nalcor will conduct pre-construction floristic listed plant surveys of important habitat for listed plants affected by the final Project component location or alignment
12.2.5.6	Vegetation	Construction Effects, Listed Plants	Should any individual listed plant species be located, Nalcor will retain a qualified botanist to assist in the development and implementation of an appropriate mitigation strategy, in consultation with the appropriate regulatory agencies, as discussed above.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
12.2.5.7	Vegetation	Construction Effects, Regionally Uncommon Plants	Nalcor's commitment to consult with NLDEC Wildlife Division once the ROW has been selected allows for a more precise identification of areas with high potential habitat for regionally uncommon plants.
12.2.5.7	Vegetation	Construction Effects, Regionally Uncommon Plants	Nalcor has committed to re-run the Regionally Uncommon Plant model once a ROW has been selected, based on input and advice from the NLDEC Wildlife Division.
12.2.6.1	Vegetation	Operations and Maintenance, Overview	Nalcor is proposing additional mitigation measures that will be in place to avoid or minimize potential adverse effects of the Project on vegetation during Operations and Maintenance, and include:
12.2.6.1	Vegetation	Operations and Maintenance, Overview	Nalcor will not use sterilants as a means of vegetation control, but will rely on non-residual herbicides (i.e., Tordon 101 with Sylgard 309 as a surfactant) and mechanical methods, where practical.
12.2.6.1	Vegetation	Operations and Maintenance, Overview	Nalcor will inspect equipment required for Operations and Maintenance before use to reduce the potential for the introduction of non-native and invasive plant species.
12.2.10	Vegetation	Monitoring and Follow-up	Based on the nature of the Project, compliance with federal and provincial regulatory requirements and concerns raised by the public during the consultation process, Nalcor is proposing to monitor the effects on listed plants or induced effects resulting from improved access.
12.3.5.1	Caribou	Construction, Overview	Nalcor is proposing mitigation measures to reduce the potential effect of habitat alteration or loss / fragmentation, including using existing disturbed areas as much as possible, limiting the number of access roads and decommissioning these roads following Construction wherever practical.
12.3.5.1	Caribou	Construction, Overview	Nalcor will use the data on caribou core areas provided by the NLDEC Wildlife Division during final ROW alignment selection to avoid Primary Core area, to the extent feasible.
12.3.5.1	Caribou	Construction, Overview	Nalcor will comply with laws and regulations pertaining to fish and wildlife, forest fires, forest travel, smoking and littering.
12.3.5.1	Caribou	Construction, Overview	Nalcor will continue its participation on the Labrador Woodland Caribou Recovery Team (LWCRT) and support of related research, such as the telemetry monitoring program.
12.3.5.3	Caribou	Construction Effects	Although the assessment area overlaps with 3% of the Primary Core area and these areas of overlap contain primary ranked habitat (55%), Nalcor will undertake special management initiatives to limit access and disturbance of calving / post-calving habitat to mitigate avoidance effects.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
12.3.6.1	Caribou	Operations and Maintenance, Overview	Nalcor will develop access control measures to monitor and manage public off highway vehicle (OHV) use of corridor roads and trails; they will be applied during the Construction and the Operations and Maintenance phases of the Project.
12.3.6.1	Caribou	Operations and Maintenance, Overview	Nalcor will use existing disturbed areas as much as possible, limiting the number of access roads, and will decommission those access roads and trails used during Construction that are not required for the Operations and Maintenance activities.
12.3.6.1	Caribou	Operations and Maintenance, Overview	Nalcor will use non-residual herbicides (i.e., Tordon 101 with Sylgard 309 as a surfactant) and mechanical methods, where practical.
12.3.6.1	Caribou	Operations and Maintenance, Overview	Nalcor will implement a policy of no wildlife harvesting during working hours, no feeding, and no possession of firearms or pets by transmission line maintenance and repair personnel.
12.3.6.1	Caribou	Operations and Maintenance, Overview	Nalcor will avoid conducting non-essential activity in caribou Primary Core area in Newfoundland during the sensitive calving and post-calving season, to the extent feasible.
12.3.6.1	Caribou	Operations and Maintenance, Overview	Nalcor will consider employing such mitigation measures as avoiding activity in Primary Core area in Newfoundland during the sensitive calving / post-calving season, to the extent feasible.
12.3.6.3	Caribou	Operations and Maintenance Effects	Nalcor will use non-residual herbicides (i.e., Tordon 101 with Sylgard 309 as a surfactant) and mechanical methods, where practical.
12.3.10	Caribou	Monitoring and Follow-up	Nalcor will continue its participation on the LWCRT and will continue to support research (such as telemetry work) that will lead to further understanding of the threatened herds.
12.3.10	Caribou	Monitoring and Follow-up	Nalcor will work closely with all stakeholders and will be able to assist in such aspects as monitoring and controlling access.
12.4.4.1	Furbearers	Analysis Approach, Methods	In specific areas where identified Newfoundland marten habitat overlaps the transmission corridor, Nalcor will consult with the NLDEC Wildlife Division to identify the most suitable route for the ROW.
12.4.5.1	Furbearers	Construction, Overview	Nalcor will have mitigation measures in place to limit the potential effect of habitat loss or alteration and fragmentation.
12.4.5.1	Furbearers	Construction, Overview	Nalcor will use existing disturbed areas and corridors as much as possible, limit the number of access roads, and decommission roads used during Construction that are not required for Operations and Maintenance.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
12.4.5.1	Furbearers	Construction, Overview	Nalcor will comply with laws and regulations pertaining to fish and wildlife, forest fires, forest travel, smoking and littering.
12.4.5.1	Furbearers	Construction, Overview	Nalcor will consult with the NLDEC Wildlife Division regarding final routing of the ROW in the vicinity of known marten habitat, particularly within the Northern Peninsula.
12.4.5.3	Furbearers	Construction Effects, Marten	Nalcor will consult with the NLDEC Wildlife Division to identify the most suitable alignment for the final ROW and the amount of primary habitat that would be affected.
12.4.5.3	Furbearers	Construction Effects, Marten	Project personnel will not be permitted to possess firearms on-site, and Nalcor will enforce a 'no-harvesting' policy during working hours.
12.4.5.4	Furbearers	Construction Effects, Red Fox	Nalcor will not permit Project personnel to possess firearms on-site, and will enforce a 'no-harvesting' policy during working hours.
12.4.5.5	Furbearers	Construction Effects, Porcupine	Project personnel will not be permitted to possess firearms on-site, and Nalcor will enforce a 'no-harvesting' policy during working hours.
12.4.5.6	Furbearers	Construction Effects, Beaver	Project personnel will not be permitted to possess firearms on-site, and Nalcor will enforce a 'no-harvesting' policy during working hours.
12.4.6.1	Furbearers	Operations and Maintenance, Overview	Nalcor may consider modifying the vegetation management program to maintain the habitat connectivity created during construction in core marten areas in Newfoundland
12.4.6.1	Furbearers	Operations and Maintenance, Overview	Nalcor will use non-residual herbicides (i.e., Tordon 101 with Sylgard 309 as a surfactant) and mechanical methods, where practical.
12.4.6.1	Furbearers	Operations and Maintenance, Overview	Nalcor personnel and contractors will not interfere with traplines or associated equipment.
12.4.6.3	Furbearers	Operations and Maintenance Effects	Nalcor will meet or exceed the requirements of the regulations for application of herbicides.
12.4.8	Furbearers	Monitoring and Follow-up	Nalcor will work with the NLDEC Wildlife Division to design a study to investigate the effects of ROW Construction and Operations on marten habitat use in the Main River core area, utilizing a before-after-control-impact experimental design.
12.5.5.1	Avifauna	Construction, Overview	Nalcor will have in place a number of mitigation measures designed specifically to reduce potential environmental effects on avifauna.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
12.5.5.4	Avifauna	Construction Effects, Passerines	Nalcor will limit the amount of riparian shoreline alteration to the extent practical by routing of the ROW to avoid large waterbodies and rivers (and their associated shoreline).
12.5.6.1	Avifauna	Operations and Maintenance, Overview	Nalcor will use non-residual herbicides (i.e., Tordon 101 with Sylgard 309 as a surfactant) and mechanical methods, where practical.
12.5.6.3	Avifauna	Operations and Maintenance, Waterfowl	During final routing of the ROW, Nalcor will attempt to minimize the crossing and disturbance of wetland habitat, with particular attention given to large wetland complexes or those that are known to be important for waterfowl.
12.5.9	Avifauna	Cumulative Effects	Nalcor has committed to mitigation measures that will limit Project effects on avifauna habitat and populations.
12.5.10	Avifauna	Monitoring and Follow-up	Nalcor will undertake a follow-up study to evaluate the presence of breeding pairs of Harlequin Duck on rivers known to support this species that are affected by the Project.
12.5.10	Avifauna	Monitoring and Follow-up	Nalcor will survey relevant portions of rivers known to support breeding Harlequin Duck pairs (i.e., 5 km upstream and downstream) during the appropriate season before construction activities commence to determine the extent of breeding activities. In Labrador, this will involve the Traverspine and St. Paul rivers and on the Island, particularly rivers on the Northern Peninsula (e.g., Torrent River). The information collected will be used by Nalcor for consideration in the identification of final alignment across these rivers in consultation with the Canadian Wildlife Service.
12.5.10	Avifauna	Monitoring and Follow-up	Nalcor will conduct Harlequin Duck surveys along rivers crossed by the Project that are known to support breeding populations, immediately following Project Construction and for a period of two years following commencement of Operations and Maintenance, to document the abundance and distribution of Harlequin Duck and determine the Project effects on breeding pairs.
12.5.10	Avifauna	Monitoring and Follow-up	Nalcor will note any observations of Red Knot or other avian species of conservation status during Project Construction activities.
12.5.10	Avifauna	Monitoring and Follow-up	Nalcor will conduct aerial surveys to identify Osprey and Bald Eagle nests and nesting activity within the Local Study Area (LSA) prior to Project Construction.
12.5.10	Avifauna	Monitoring and Follow-up	During Nalcor's routine inspection of the ROW and other Project components (e.g., access) throughout the life of the Project, the inspectors will maintain a log of observations or evidence of avifauna involved with vehicle collisions or interactions with the transmission line (i.e., collisions or electrocutions), note the presence of nests on transmission towers or poles, and note any areas of environmental concern related to avifauna within or adjacent to the Project components.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
12.5.10	Avifauna	Monitoring and Follow-up	Nalcor will note public OHV use of transmission corridor roads and trails observed during maintenance and inspections, as part of the access control measures.
12.6.1	Terrestrial Environment	EA Summary, Effects Management Measures	Nalcor will use best management practices and mitigation options designed to avoid or reduce the effects of the Project on the Terrestrial Environment.
12.6.1	Terrestrial Environment	EA Summary, Effects Management Measures	Through Nalcor's adaptive management process, Nalcor will assess issues that arise during the Construction, and Operations and Maintenance phases to allow appropriate changes to be made to mitigation strategies or methods, and adopted in a timely manner.
12.6.1	Terrestrial Environment	EA Summary, Effects Management Measures	Nalcor will adhere to federal and provincial guidelines or management plans relating to listed or regionally uncommon plants (e.g., NL Species at Risk Policy, COSEWIC Status Reports, *SARA* Recovery Strategies), unless otherwise approved by appropriate regulatory agencies.
12.6.1	Terrestrial Environment	EA Summary, Effects Management Measures	Nalcor will consult with NLDEC Wildlife Division regarding siting, routing or mitigation strategies for Project infrastructure in the vicinity of known listed plants or species of con*cern*, particularly within the Northern Peninsula where a diversity of such species exists.
12.6.1	Terrestrial Environment	EA Summary, Effects Management Measures	Where avoidance of listed or regionally uncommon plant species is not possible, Nalcor, in consultation with federal and provincial regulators, will develop protection measures and environmental management techniques for the plants based on site-specific conditions and species sensitivity criteria.
12.6.1	Terrestrial Environment	EA Summary, Effects Management Measures	Nalcor will comply with existing provincial legislation and regulation (Newfoundland and Labrador *Forestry Act* 1990).
12.6.1	Terrestrial Environment	EA Summary, Effects Management Measures	Nalcor will use detailed imagery to route the ROW to minimize the amount of primary and secondary marten habitat traversed, and identify areas where other mitigation options (e.g., restricting the width of the ROW or leaving slash piles within the ROW to provide security areas for marten) would be implemented.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
12.6.1	Terrestrial Environment	EA Summary, Effects Management Measures	Nalcor will enforce a 'no-harvesting' policy during working hours, and Project personnel will not be permitted to possess firearms or have pets on-site.
12.6.6	Terrestrial Environment	EA Summary, Monitoring and Follow-up	During Project Construction and routine ground and air inspections during Operations and Maintenance, Nalcor will note any areas of environmental concern related to vegetation (e.g., erosion, poor vegetation establishment, weeds) and incidents related to effects on wildlife and avifauna species (e.g., vehicle collisions, electrocutions, unauthorized access and resulting disturbance presence of nests on transmission towers or poles).
12.6.6	Terrestrial Environment	EA Summary, Monitoring and Follow-up	Nalcor will address any issues that become apparent through their follow-up studies, monitoring and inspection programs appropriately through their adaptive management process.
12.6.6	Terrestrial Environment	EA Summary, Monitoring and Follow-up	In consultation with Environment Canada and the NLDEC Wildlife Division, Nalcor proposes to design a follow-up program to target known locations of listed plant species and their important habitats, coupled with a review of OHV use facilitated by the Project.
12.6.6	Terrestrial Environment	EA Summary, Monitoring and Follow-up	Nalcor will work with the NLDEC Wildlife Division to develop an effective monitoring program to support the Red Wine Mountain Herd (RWMH) population, and work with all stakeholders to monitor and control access and deter illegal hunting.
12.6.6	Terrestrial Environment	EA Summary, Monitoring and Follow-up	If modified vegetation management techniques are adopted to help facilitate marten movement across the ROW, Nalcor would work with the Wildlife Division to design an appropriate study to investigate their effectiveness.
12.6.6	Terrestrial Environment	EA Summary, Monitoring and Follow-up	Prior to Project Construction commencement, Nalcor will conduct a study to evaluate the presence of breeding pairs of Harlequin Duck on rivers that are affected by the Project and known to support this species, to determine the extent of breeding activities.
Chapter 13: Freshwater Environment: Environmental Effects Assessment			
13.2.5.1	Freshwater Resources	Construction	Following Nalcor's Environmental Policy and Guiding Principles of 'Preventing Pollution', 'Improve Continually' and 'Comply with Legislation', Nalcor is committed to reducing adverse environmental effects to the extent practical.
13.2.5.1	Freshwater Resources	Construction	Nalcor will obtain all permits required for all construction that is located within 15 m of the high water mark of a waterbody (e.g., fording), and comply with all permit conditions.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
13.2.5.1	Freshwater Resources	Construction	Storage and handling of fuels and hazardous or controlled products will be in compliance with the Transportation of Dangerous Goods regulation SOR/2008-34, as well as the Storage and Handling of Gasoline and Associated Products Regulations under the *NLEPA.*
13.2.5.1	Freshwater Resources	Construction	All discharges of run-off from Construction activities will conform to the *Environmental Control Water and Sewage Regulations*, 2003 under the *Water Resources Act* (O.C. 2003-231).
13.2.5.1	Freshwater Resources	Construction	Nalcor will conduct the appropriate site evaluations during the final routing of the Project so that, to the extent practical, the selected crossing locations will have the least possible adverse effects on the watercourse.
13.2.7.2	Freshwater Resources	Significance Determination	As required by provincial authorities, Nalcor will undertake a pre-examination of the watercourse crossing (including collecting information on the stream's morphology, substrate, water velocity, depth, and bank slope at the proposed crossing location) to select the preferred location at each crossing.
13.2.10	Freshwater Resources	Monitoring and Follow-up	Nalcor will comply with regulatory requirements to monitor water quality during the life of the Project.
13.2.10	Freshwater Resources	Monitoring and Follow-up	Nalcor will conduct monitoring as required to comply with permit conditions or regulatory requirements, and data collected will be entered into Nalcor's International Standards Organization (ISO) documentation.
13.3.5.1	Fish and Fish Habitat	Construction	Standard mitigation (as documented in standard operating procedures, guidelines, and recommendations) will be applied by Nalcor to reduce the likelihood and magnitude of adverse effects.
13.3.5.1	Fish and Fish Habitat	Construction	Nalcor will conduct the appropriate site evaluations during the final routing of the Project so that, to the extent practical, the selected crossing locations will have the least possible adverse effects on the watercourse, and thus fish and fish habitat.
13.3.5.3	Fish and Fish Habitat	Construction	Nalcor will include mitigation such as a minimum 20 m buffer on all watercourses, and a reduced ROW of 3 m width at stream crossings; therefore, this effect is not considered further in this assessment.
13.3.7.2	Fish and Fish Habitat	Significance Determination	As required by provincial authorities, Nalcor will undertake a pre-examination of the watercourse crossing (including collecting information on the stream's morphology, substrate, water velocity, depth, and bank slope at the proposed crossing location) to select the preferred location at each crossing.
13.3.7.2	Fish and Fish Habitat	Significance Determination	Nalcor is committed to adhere to the associated legislation, Newfoundland and Labrador Operational Statements (NLOS) and standard mitigation from both industry and government (where feasible), and any permit conditions.
13.3.10	Fish and Fish Habitat	Monitoring and Follow-up	Nalcor will conduct monitoring as required to comply with permit conditions or regulatory requirements, and data collected will be entered into Nalcor's International Standards Organization (ISO) documentation.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
13.4.1	Freshwater Environment	Summary, Effects Management Measures	Nalcor will use best management practices and accepted, proven mitigation options to avoid or reduce the effects of the Project on the Freshwater Environment.
13.4.1	Freshwater Environment	Summary, Effects Management Measures	Through Nalcor's adaptive management process, Nalcor will assess issues that arise so that appropriate changes can be made to mitigation strategies or methods, and adopted in a timely manner.
13.4.1	Freshwater Environment	Summary, Effects Management Measures	Nalcor will enforce a 'no-harvesting' policy for all Project personnel during working hours.
13.4.1	Freshwater Environment	Summary, Effects Management Measures	Nalcor will use non-residual herbicides (i.e., Tordon 101 with Sylgard 309 as a surfactant) and mechanical methods, where practical.
13.4.3	Freshwater Environment	Summary, Accidents and Malfunctions	All Project personnel will be made aware of the SHERP and designated staff will receive SHERP training, and the forest fire prevention plan will be followed by Nalcor and its contractors.
13.4.3	Freshwater Environment	Summary, Accidents and Malfunctions	Nalcor will implement leak and spill prevention measures and fire prevention measures in accordance with relevant regulations, and adhere to conditions of relevant permits, and other mitigation measures.
13.4.6	Freshwater Environment	Summary, Accidents and Malfunctions	Nalcor will conduct monitoring during the life of the Project to comply with provincial and federal permits and regulatory requirements.
Chapter 14: Marine Environment: Environmental Effects Assessment			
14.2.5.1	Marine Fish and Fish Habitat	Construction, Overview	Other mitigation measures of the Project construction phase that Nalcor will employ to minimize effects on the Marine Fish and Fish Habitat VEC include: – cable corridor will not be swept prior to cable installation; – chemically-benign rock will be used for berm construction to minimize the effect on seawater and surficial sediment chemistry; – construction time will be minimized to decrease the amount of exposure to vessel noise by invertebrates and fishes; – drill mud will be recovered from the bore holes and conduit to the extent possible; – drill mud will be recycled and the cuttings will be disposed of on land;

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
			– silt curtains will be deployed during electrode site dredging to minimize the extent of increased turbidity; – biodegradable lubricants and hydraulic fluids will be used where practical, when working near waterbodies; – proper protocols will be implemented to avoid accidental introduction of potentially deleterious substances to the marine environment including all applicable regulations to minimize effect on seawater and surficial sediment chemistry; – spill kits and trained personnel will be present on-site at all times, allowing for prompt containment; – a spill response team will be formed and trained; – spills will be reported to the appropriate authority; – fuelling or serving or mobile equipment on-land will not be permitted within 50 m of a waterbody; – Nalcor will prepare and implement a SHERP (Safety, Health and Environment Emergency Response Plan), which will include spill prevention and response plan; and – Nalcor will prepare and implement an EPP (Environmental Protection Plan), which will include conditions for fuel handling and storage, including procedures for spill response.
14.2.6.1	Marine Fish and Fish Habitat	Operations and Maintenance, Overview	Mitigation that Nalcor will apply to Project activities during the Operations and Maintenance phase are as follows: – screen / armouring of the cable is on the same electric potential as the outside ambient so that the electric field is confined to the inside of the cable; – submarine cable armour and protective rock berm will minimize electric fields; – the rock berm will serve as a partial barrier to the EMF generated by the cable; – the cable will be laid on the seabed rather than buried which reduces the potential for a temperature increase to occur to the seabed and the associated biota; – the rock breakwater berm at each electrode site will act as a barrier for invertebrates and fishes; – routine visual inspections will be conducted with a remotely operated vehicle (ROV); – electrodes will be designed to minimize electric and magnetic fields (e.g., through electrode design, electrode materials, electrode surface area, low resistivity surroundings); – operation of electrodes under normal conditions as a bipole system will involve only low levels of electric current flowing through the electrodes (<1%); – operation of electrodes under upset conditions as a monopole system will be minimized to the extent possible; – minimization of contact area between the shoreline saltwater pond and the breakwater to ensure a safe voltage gradient on the sea side of the breakwater;

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
			– system is expected to operate during monopolar operations (100%) for less than 40 hours per year; and – Nalcor will use biodegradable lubricants and hydraulic fluids where practical, when working near waterbodies.
14.2.9	Marine Fish and Fish Habitat	Monitoring and Follow-up	A follow-up program will be conducted by Nalcor to evaluate the electromagnetic fields (EMFs) that will be generated by the operating submarine cable and electrodes.
14.3.6.1	Marine Mammals and Sea Turtles	Operations and Maintenance, Overview	Mitigation that Nalcor will apply to Project activities during the Operations and Maintenance phase are as follows: – Project vessels will maintain constant course and speed to the extent practical; – Project vessels will detour around marine mammals and sea turtles if feasible; – routine visual inspections of the submarine cable will be completed with an ROV; – screen / armouring of the cable is on the same electric potential as the outside ambient so that the electric field is confined to the inside of the cable; – submarine cable armour and protective rock berm will minimize electric fields; – the rock berm will serve as a partial barrier to the EMF generated by the cable; – electrodes will be designed to minimize electric and magnetic fields (e.g., through electrode design, electrode materials, electrode surface area, low resistivity surroundings); – operation of electrodes under normal conditions as a bi-pole system will involve only very low levels of electric current flowing through the electrodes (<1%); – the HVdc system is designed to require less than 40 hours per year of monopolar operations (100%) using the electrode; – minimization of contact area between the shoreline saltwater pond and the breakwater to ensure a safe voltage gradient on the sea side of the breakwater; and – Nalcor will use biodegradable lubricants and hydraulic fluids where practical, when working near waterbodies.
14.3.9	Marine Mammals and Sea Turtles	Monitoring and Follow-up	A follow-up program will be conducted by Nalcor to evaluate the EMFs that will be generated by the operating submarine cable and electrodes.
14.4.6.1	Seabirds	Operations and Maintenance, Overview	Electrodes will be designed by Nalcor to minimize the electric and electromagnetic fields (e.g., through selection of electrode materials and maximization of electrode surface area).

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
14.4.9	Seabirds	Monitoring and Follow-up	During Project construction and routine inspections during Operations and Maintenance, Nalcor will note any incidents related to effects to seabirds (e.g., stranding) and address these issues appropriately through their adaptive management process.
14.5.1	Marine Environment	EA Summary, Effects Management Measures	Nalcor has designed the marine Project components specifically to address identified issues, and will use best management practices and mitigation options designed to avoid or limit the effects of the Project.
14.5.1	Marine Environment	EA Summary, Effects Management Measures	Through Nalcor's adaptive management process, Nalcor will assess issues that arise during construction and Operations and Maintenance phases to allow appropriate changes to be made to mitigation strategies or methods, and adopted in a timely manner.
14.5.3	Marine Environment	EA Summary, Accidents and Malfunctions	Nalcor will develop and follow the Simultaneous Operations (SIMOPS) protocol to promote safe and efficient operation of vessels working in the Strait of Belle Isle.
14.5.3	Marine Environment	EA Summary, Accidents and Malfunctions	Nalcor will provide notification of Project activities and schedule to mariners and prepare fisheries broadcast announcements of Project activities and schedule directed at marine vessel operators in the Project area.
14.5.6	Marine Environment	EA Summary, Monitoring	During the Project Construction and routine inspections during Operations and Maintenance, Nalcor will note any incidents related to effects on seabirds (e.g., stranding) or other marine wildlife species, and will address these issues appropriately through their adaptive management process.
14.5.6	Marine Environment	EA Summary, Monitoring	Nalcor will conduct a follow-up program to verify effect predictions concerning the EMFs that will be generated by the operating submarine cable and electrodes. Findings from the program will be used to refine and optimize mitigation measures or any concerns that arise in relation to baleen whales and sea turtles of conservation concern, as appropriate and as part of Nalcor's adaptive management process.
Chapter 15: Existing Socioeconomic Environment			
			No commitments were made in this chapter.
Chapter 16: Socioeconomic Environment: Environmental Effects Assessment			
16.2.5.1	Historic and Heritage Resources	Construction, Overview	– Nalcor will consult with the Provincial Archaeology Office (PAO) on known Historic and Heritage Resources during the detailed Project design and final transmission line ROW selection. – Once the transmission line ROW is defined, Nalcor will conduct an historic resources field survey of those sections of the ROW that cross through areas identified high potential for undiscovered Historic and

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
			Heritage Resources. The specific nature and locations of such surveys will be planned in consultation with the PAO.
16.2.5.1	Historic and Heritage Resources	Construction, Overview	– Nalcor and its contractors will apply for and adhere to all required provincial and federal permits required for Project Construction and Operations and Maintenance. – Nalcor or its contractors will identify any known Historic and Heritage Resources within 100 m of planned Project activities, and these will be made known to supervisory personnel. A 50 m radius "no work" buffer will be maintained around all known sites to avoid interactions of Project activities with the known resources. – The orientation and training programs provided to construction personnel will include briefings related to Historic and Heritage Resources. – Standard precautionary and reporting procedures will apply throughout Project Construction, and Operations and Maintenance. In the event that unregistered Historic and Heritage Resources are discovered, work will be halted immediately at that location, the PAO will be notified, and a Stage 1 Historic Resources Overview Assessment would be initiated by Nalcor in accordance with provincial guidelines.
16.2.5.1	Historic and Heritage Resources	Construction, Overview	– Where Project components are constructed in any area which is known to have high potential to contain palaeontological resources, periodic inspections of disturbed areas by qualified palaeontologists will be undertaken to limit the potential for disturbance of fossils and the loss of any information they may provide. – Nalcor will continue to consult appropriately with relevant Aboriginal communities and organizations, to further understand any sites of cultural-historical importance or other historic and heritage resources that may be located within or near planned Project activities. Any such information that is made available to the proponent will be considered throughout ongoing Project design and eventual implementation, and Aboriginal groups will be kept informed as Project work progresses.
16.2.10	Historic and Heritage Resources	Monitoring and Follow-up	Nalcor will have full-time On-Site Environmental Monitors at various construction sites. These individuals will continually inspect worksites and activities for conformance with the EPP and mitigation measures required by design, and compliance with government regulations and permits.
16.3.5.1	Communities	Construction, Overview	Nalcor will use standard practices and procedures and will comply with applicable regulatory requirements during Project Construction.
16.3.5.1	Communities	Construction, Overview	Nalcor will work with government departments and agencies before and during Project Construction to facilitate planning and preparation for Project activities.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
16.3.5.3	Communities	Construction Effects, Transportation	Nalcor has liaised with and will continue to liaise with the relevant planning authorities and be involved to the extent appropriate and necessary to upgrade the Goose Bay dock.
16.3.5.3	Communities	Construction Effects, Transportation	Nalcor will continue to consult regularly with various authorities such as the Department of Transportation and Works and the Town of Happy Valley-Goose Bay, to reduce any adverse socioeconomic effects of additional road traffic within the community.
16.3.5.3	Communities	Construction Effects, Transportation	Nalcor will liaise with the responsible authority (provincial Department of Transportation and Works) and local stakeholders and communities to explore ways to minimize and address issues relating to Route 510 road conditions.
16.3.5.3	Communities	Construction Effects, Transportation	Nalcor will liaise with provincial and local authorities to provide them with the necessary information to plan and manage the expected traffic volumes.
16.3.5.3	Communities	Construction Effects, Transportation	All traffic operations will be conducted in accordance with provincial legislation, including the *Uniform Highway Transport Vehicle Regulations*, which regulate both the weight and dimensions of highway vehicles operating in Atlantic Canada.
16.3.5.4	Communities	Construction Effects, Waste Disposal	Nalcor will dispose of Project waste in accordance with regulatory requirements and with the approval of local and regional waste management authorities.
16.3.5.5	Communities	Construction Effects, Safety	Nalcor's Occupational Health and Safety Guidelines and Emergency Response Plans do and will conform to provincial and federal legislation with the intent of meeting Nalcor's legal and corporate responsibilities.
16.3.5.5	Communities	Construction Effects, Safety	Nalcor will develop Safety, Health and Environmental Emergency Response Plans (SHERP) to address potential unplanned incidents and emergency situations; all Project personnel will be made aware of the SHERP and designated staff will receive SHERP training.
16.3.5.7	Communities	Construction Effects, Community Well Being	Nalcor will discuss with private property owners any issues related to intrusion on their property.
16.3.5.8	Communities	Construction Effects, Summary	Where infrastructure requirements are insufficient or where the Project is considered to have the potential to negatively affect the quality of existing infrastructure, Nalcor will continue to liaise with the appropriate authorities and key stakeholders to help address these matters.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
16.3.6.1	Communities	Operations and Maintenance, Overview	Nalcor will integrate activities associated with the operation of the HVdc system into Nalcor's existing system-wide inspection and maintenance program.
16.3.6.1	Communities	Operations and Maintenance, Overview	Nalcor will incorporate the Project into its established vegetation management program for its transmission and distribution system.
16.3.6.3	Communities	Operations and Maintenance Effects, Transportation and Waste	Nalcor will integrate activities related to transmission line inspection and vegetation management into Nalcor's existing transmission system inspection and maintenance program.
16.3.6.4	Communities	Operations and Maintenance Effects, Safety	Nalcor will develop Safety, Health and Environmental Emergency Response Plans (SHERP) to address potential unplanned incidents and emergency situations.
16.3.6.5	Communities	Operations and Maintenance Effects, Health	Nalcor will not use sterilants as a means of vegetation control, but will rely on non-residual herbicides and mechanical methods, where practical.
16.3.6.6	Communities	Operations and Maintenance Effects, Well Being	Nalcor has adopted criteria of 50 dBA at the edge of the ROW, as recommended by the Electric Power Research Institute (EPRI) in the United States for HVdc transmission lines (EPRI 2008).
16.3.10	Communities	Monitoring and Follow-up	Nalcor has provided and will continue to provide Project information regarding social parameters to relevant authorities (including community and government organizations and agencies) as input to their monitoring and decision-making processes, and to consult with relevant groups throughout the life of the Project.
16.4.1	Economy, Employment and Business	Operations and Maintenance Effects	Nalcor will work with its staff to minimize any potential job loss resulting from the closure of the Holyrood Thermal Generating Station and find solutions that work for the employees and Nalcor.
16.4.5.1	Economy, Employment and Business	Construction, Overview	Nalcor and its contractors and sub-contractors will follow the principles and procedures outlined in the Benefits Strategy regarding employment and business activities and benefits for Newfoundland and Labrador.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
16.4.5.1	Economy, Employment and Business	Construction, Overview	Nalcor will make efforts to optimize economic, employment and business opportunities to Newfoundland and Labrador workers and companies; however, there inevitably will be economic leakages to other areas of Canada and elsewhere, as some of the required materials, equipment and specialized labour will have to come from manufacturers and suppliers from outside the province and country.
16.4.5.1	Economy, Employment and Business	Construction, Overview	Nalcor will implement commitments made in any executed Impacts and Benefits Agreement (IBA), followed by first consideration for employment of qualified Newfoundland and Labrador residents, considering gender equity and diversity provisions.
16.4.5.1	Economy, Employment and Business	Construction, Overview	Any collective agreements entered into by Nalcor or its primary contractors will contain provisions consistent with the employment protocol in the Benefits Strategy.
16.4.5.1	Economy, Employment and Business	Construction, Overview	Prior to sanction, Nalcor will engage in consultation with relevant stakeholder organizations and provincial departments and agencies to develop and implement a Gender Equity Program and a Diversity Program for the Project.
16.4.5.1	Economy, Employment and Business	Construction, Overview	The Gender Equity Program will include a Women's Employment Plan (WEP) and Business Access Strategy, in which Nalcor will establish goals for the employment of women in Project construction, Operations and Maintenance based on Statistics Canada's Employment Equity Data Report.
16.4.5.1	Economy, Employment and Business	Construction, Overview	Nalcor has worked, and will continue to work, with governments, Aboriginal groups, women's organizations, training institutions and labour organizations to discuss Project labour requirements, to identify existing or anticipated gaps in the labour supply pool, and will explore and discuss potential approaches to address gaps.
16.4.5.1	Economy, Employment and Business	Construction, Overview	Nalcor will: – Encourage pre-construction training initiatives to enable people in the province to participate fully in the Project. – Work with successful contractors to provide adequate workplace training (including health and safety, cultural awareness, gender sensitivity, environmental awareness, respectful workplace programs, specialized skills training for employees. – Work with contractors who have the responsibility to develop and implement apprenticeship programs for the Project. – Work with training institutions and government agencies throughout the province to offer technical advice and expertise where appropriate and to assist in coordinating training for Project-related work with relevant stakeholders.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
16.4.5.1	Economy, Employment and Business	Construction, Overview	Nalcor will engage employees and potential employees through a variety of programs and practices to: – Maintain a work environment that facilitates the achievement of their career goals and provides the training and support they need to meet Nalcor's business objectives; – Encourage employed journeypersons to participate in post-journeyperson training; – Support initiatives to increase the number of women who have skills required to support the Project, including supporting post-secondary education institution efforts that encourage the participation of women in trades and other occupations required by the Project; – Provide or encourage contractors and sub-contractors to provide on-the-job-training opportunities for qualified participants during the construction phase; – Communicate with school staff and students about career options, participating in career fairs and supporting training efforts; – Contribute to and participate in activities and initiatives designed to help students become aware of and interested in the skilled trades in general, upcoming Project employment opportunities, and associated training opportunities and requirements; – Contribute to student achievement awards and provide summer student employment opportunities and work-term placement opportunities on the Project; – Nalcor and Innu Nation have agreed to co-operate to develop a specific Innu Training Plan to help encourage and assist Innu to participate in and become qualified for employment on the Project.
16.4.5.1	Economy, Employment and Business	Construction, Overview	Nalcor will support employees through: – Access to an Employee Assistance Program (EAP), which will provide counselling for employees and their families who are experiencing problems in their work or personal lives. – Establishment of a workplace committee that serves as a discussion forum for identifying and discussing perceived or potential workplace issues and makes recommendations to Nalcor and its contractors on any requirements and measures for improvement.
16.4.5.1	Economy, Employment and Business	Construction, Overview	Goods and services will be acquired on a Best Value basis, which is defined as a blend of total cost, quality, technical suitability, credit worthiness, delivery and continuity of supply and services, and where total cost comprises initial purchase price plus Operations and Maintenance costs as deemed applicable by Nalcor.
16.4.5.1	Economy, Employment and Business	Construction, Overview	Nalcor will investigate the capabilities of businesses in communities in the vicinity of the Project, and disseminate information on the scope of the Project as details are available.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
16.4.5.1	Economy, Employment and Business	Construction, Overview	Nalcor will follow its Contracting and Purchasing policy for the Lower Churchill Project.
16.4.5.1	Economy, Employment and Business	Construction, Overview	During Project construction Nalcor will establish a Business Opportunities Committee with representation from Nalcor, key Project contractors and representatives of the provincial business community, to encourage dialogue on its Industrial Benefits Planning activities and help provincial businesses effectively pursue Project opportunities.
16.4.5.2	Economy, Employment and Business	Construction, Existing Knowledge	Nalcor will make efforts to hire qualified people from within the province and to encourage training for residents of Newfoundland and Labrador in those occupational categories in which it is warranted and feasible.
16.4.6.1	Economy, Employment and Business	Operations and Maintenance, Overview	Nalcor will integrate activities associated with the operation of the HVdc system into its existing inspection and maintenance program.
16.4.6.1	Economy, Employment and Business	Operations and Maintenance, Overview	Nalcor's Project Construction hiring and business contract protocols will apply to the Operations and Maintenance phase.
16.4.6.4	Economy, Employment and Business	Operations and Maintenance Effects, Employment	Nalcor's Project Construction hiring and training policies will apply to the Operations and Maintenance of the Project.
16.4.6.5	Economy, Employment and Business	Operations and Maintenance Effects, Business	Nalcor will undertake much of the Operations and Maintenance activities for the new HVdc transmission system as part of its normal operations and maintenance programs.
16.4.6.5	Economy, Employment and Business	Operations and Maintenance Effects, Business	Nalcor's contracting and purchasing practices will apply to the Project Operations and Maintenance, with full and fair opportunity given to all suppliers, and with goods and services being acquired on a Best Value basis and with Newfoundland and Labrador benefits included in the selection factors for contract awards.
16.4.9	Economy, Employment and Business	Cumulative Effects	Potential labour shortages are being and will continue to be addressed through a variety of effects management strategies to mitigate potential effects both by Nalcor in terms of the Project and the construction industry generally.
16.4.10	Economy, Employment and	Monitoring and Follow-up	Under the terms of the Benefits Strategy (Government of Newfoundland and Labrador (GNL) 2010, internet site), Nalcor will, on a monthly basis from the date of sanction of the Project and throughout construction, provide information to the Government of Newfoundland and Labrador on the following (broken out by

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
	Business		National Occupational Classification Code, location, contractor, Aboriginal affiliation and gender relating to the Project for the period): – total number of person-hours of all work on the Project in that month and to date; – number of person-hours of Project management in the province in that month and to date; – number of person-hours of engineering design work in the province in that month and to date; – number of person-hours of construction and assembly in the province in that month and to date; – number of residents hired for the Project Team and the percentage of Project Team members who are residents; – number of residents hired for engineering design work and the percentage of engineering design workers who are residents; – number of residents hired for construction and the percentage of construction workers who are residents; and – number of person-hours of specialized engineering performed outside the province (if any) by component.
16.4.10	Economy, Employment and Business	Monitoring and Follow-up	Nalcor will report to the Government of Newfoundland and Labrador monthly, providing information on the: – total value of goods and services purchased; – total value of services purchased from businesses in the province by geographic location; – total value of purchases by industry category (e.g., transportation, fuel, equipment); – cumulative total value of goods and services referred to above for the year to date; and – details of contracts awarded in that month.
16.4.10	Economy, Employment and Business	Monitoring and Follow-up	Nalcor will report to the Government of Newfoundland and Labrador on a quarterly basis on hiring and employment objectives and targets. In addition, quarterly reports will be provided on: – the level of compliance with the Benefits Strategy over the reporting period; – information regarding supplier development workshops performed during the reporting period; – report of activities carried out pursuant to the Gender Equity Program; – report of activities carried out pursuant to the Diversity Program; and – procurement forecasts.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
16.4.10	Economy, Employment and Business	Monitoring and Follow-up	Nalcor will continue to provide information and updates on Project activities and effects related to Economy, Employment and Business on a regular basis as part of its ongoing governmental, Aboriginal, stakeholder and public consultation activities throughout the Project. Such information and consultation will also be used, as necessary, to facilitate planning and continuous improvement through modification of Nalcor strategies to optimize Project benefits to Newfoundland and Labrador.
16.5.5.1	Land and Resource Use	Construction, Overview	Some key environmental effects management measures that relate to this VEC include those which are summarized below: – The avoidance of known land and resource use components and activities where possible during Project planning to date, including in the selection of the proposed transmission corridor, and in the identification of locations for other key project components (e.g., electrodes, submarine cable landing sites, converter stations). – This planning approach will be carried forward into the detailed route selection process for the transmission line ROW within this corridor, which will also involve additional and future consultation with government departments, Aboriginal and stakeholder groups and the public. – The selection of the transmission corridor and planning of other Project components has also be based on an approach of maximizing the use of existing access roads and trails wherever possible, utilizing existing industrial sites and other developed areas, using existing quarries and extracting borrow material from within the ROW wherever practical, and following existing transmission lines where possible (including for several hundred kilometres from Port Blandford in Eastern Newfoundland to Soldiers Pond on the Avalon Peninsula). – Designing, planning and scheduling Project-related elements and activities in specific areas to avoid interactions with land and resources users to the extent practical, as well as regular communication and consultation with relevant agencies, organizations and representatives as part of such planning and eventual implementation. – Nalcor will follow the IBA with the Labrador Innu, which covers both the Labrador-Island Transmission Link and the Lower Churchill Hydroelectric Generation Project, and defines how the Labrador Innu will participate in and benefit from these developments. The specific nature and provisions of the IBA are and will remain confidential. – Nalcor will continue to consult appropriately with relevant Aboriginal communities and organizations in Labrador and Québec, particularly those with demonstrated contemporary land use near the Project. This will include the provision of Project information and updates on ongoing and planned activities, and discussion of any issues and potential means to address them. – Nalcor will work directly with any commercial outfitter with an existing, active hunting and / or fishing

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
			camp located within the proposed transmission corridor, or within 5 km of the corridor or of the location of any other planned permanent Project component. This will include consultation during detailed design and planning for sections of the proposed transmission line within these areas (e.g., ROW selection, tower design and placement, scheduling), to seek to avoid or reduce any potential issues or interactions during construction and / or operations. It will also include exploring possible routing approaches to help minimize the eventual use of the ROW by ATVs and snowmobiles in areas that are currently remote and inaccessible. – Nalcor will meet and consult generally with the Newfoundland and Labrador Outfitters Association (NLOA) and / or other industry representatives to discuss general issues and potential effect management measures. – Nalcor will consult directly with the Department of National Defense (DND) during detailed design and planning for sections of the proposed transmission line that will occur within the designated low level flight training area in Labrador, including for example in ROW selection, tower design and placement and scheduling. Nalcor will also cooperate with DND to develop appropriate communications procedures for flight activity in the designated low level flight training area, and to include eventual Project infrastructure on relevant DND maps and navigational charts. – Nalcor will implement other standard effects management measures used by Nalcor and its subsidiaries during past and ongoing transmission line construction and maintenance activities, including discussion with private property owners regarding issues related to any intrusion on property both prior to and after doing so). – Nalcor and its contractors will identify, obtain and comply with all authorizations, approvals and permits from relevant provincial and federal agencies that are required in relation to Project Construction and / or Operations and Maintenance activities.
16.5.5.1	Land and Resource Use	Construction, Overview	When seeking to acquire required property rights, Nalcor will follow its *Property Acquisition Policy* to conduct negotiations and provide a fair balance between the needs of property owners, Nalcor and the ratepayers and citizens of the province. The objective is to secure voluntary property settlements in a timely manner at a reasonable cost.
16.5.5.1	Land and Resource Use	Construction, Overview	Nalcor will exercise its rights to secure land interests for public projects through the process of expropriation only when all other avenues are exhausted. An expropriation and the required property owner compensation follow specific procedures as set out in provincial legislation. Even after an expropriation is filed, Nalcor will continue to attempt to secure a negotiated settlement with affected property owners.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
16.5.5.1	Land and Resource Use	Construction, Overview	Nalcor will work directly with the GNL Natural Heritage Branch, Parks and Natural Areas Division (and other organizations as applicable) during detailed engineering design and planning (e.g., for ROW selection, tower design and placement, and scheduling) for those sections of the proposed transmission line that will occur within 1 km of the boundaries of an existing protected area, to seek to avoid or reduce any potential visual or other such interactions.
16.5.5.3	Land and Resource Use	Construction Effects, Commercial/ Municipal Land Use	Nalcor will consult with all relevant communities in or near the Project area as part of such planning, as well as during Project construction, to provide information and updates on ongoing and planned construction activities, identify questions or concerns, and to seek to address any issues through design and scheduling.
16.5.5.3	Land and Resource Use	Construction Effects, Commercial/ Municipal Land Use	While conducting any construction or maintenance activities within Protected Public Water Supply Areas, Nalcor will follow relevant environmental protection and regulatory requirements.
16.5.5.3	Land and Resource Use	Construction Effects, Commercial/ Municipal Land Use	Nalcor will work directly with Transport Canada, DND and other relevant authorities to ensure that the presence and characteristics of any transmission towers in the general vicinity of these facilities are in keeping with required guidelines and regulatory standards, so as to not interfere with the operations and safety of aircraft. Nalcor will cooperate to include Project infrastructure on maps and navigational charts, and coordinate and communicate regarding any Project-related aircraft activities in these areas during construction.
16.5.5.3	Land and Resource Use	Construction Effects, Commercial/ Municipal Land Use	During detailed engineering design, Nalcor will attempt to maximize the distance of the transmission line ROW from existing and commercially active outfitting camps in this area. Nalcor will work directly with any active commercial outfitter with an existing camp located within 5 km of the transmission corridor or of any other planned permanent Project component.
16.5.5.3	Land and Resource Use	Construction Effects, Commercial/ Municipal Land Use	Nalcor will provide Project information and updates to provincial forest planners and managers so that future operational plans (5 year or annual) can fully incorporate the Project ROW and any associated forest clearing.
16.5.5.3	Land and Resource Use	Construction Effects, Commercial/ Municipal Land Use	During detailed routing for the transmission line ROW and during construction, Nalcor will consult with adjacent operators and land owners (e.g., those with existing quarries, staked claims, oil and gas exploration parcels, impost land, mining leases, agricultural areas and Crown titles) as required, to provide up to date information on planned construction activities and to optimize planning and scheduling.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
16.5.5.3	Land and Resource Use	Construction Effects, Commercial/ Municipal Land Use	Nalcor will provide advanced notice of planned construction work in the Strait of Belle Isle through mechanisms such as the Canadian Coast Guard's (CCG) Notices to Shipping and the Canadian Broadcasting Corporation's Fisheries Broadcast.
16.5.5.4	Land and Resource Use	Construction Effects, Recreational Land Use	Nalcor will provide information and updates to organizations and the general public as appropriate regarding ongoing and planned construction activities, with the goal to facilitate good communication and planning to proactively avoid interactions with recreational uses and any safety issues.
16.5.5.4	Land and Resource Use	Construction Effects, Recreational Land Use	In the event that Nalcor has to acquire a recreational property (i.e., a cabin), Nalcor will follow its *Property Acquisition Policy* to conduct negotiations and provide a fair balance between the needs of property owners, Nalcor and the ratepayers and citizens of the province.
16.5.5.5	Land and Resource Use	Construction Effects, Aboriginal Land Use	Nalcor will provide information and updates to Aboriginal groups and organizations, as appropriate, for ongoing and planned construction activities, so as to facilitate good communication and planning to proactively avoid such interactions and any safety issues.
16.5.5.5	Land and Resource Use	Construction Effects, Aboriginal Land Use	Nalcor is engaged with NunatuKavut Community Council under a community engagement agreement and ongoing data collection of contemporary traditional land and resource use information as a result of the agreement will be considered where relevant during detailed Project design.
16.5.5.5	Land and Resource Use	Construction Effects, Aboriginal Land Use	Nalcor will consult with Aboriginal communities and organizations to explore possible approaches to transmission line routing.
16.5.5.5	Land and Resource Use	Construction Effects, Aboriginal Land Use	Nalcor will continue to use information collected during past and ongoing discussions with potentially affected Aboriginal groups and communities to avoid conflicts with contemporary land use for traditional purposes to the extent practical.
16.5.5.5	Land and Resource Use	Construction Effects, Aboriginal Land Use	Nalcor has a continued commitment to undertake and finalize land and resource use studies under the current community engagement agreements with NunatuKavut Community Council, Pakua Shipu and Unamen Shipu. Nalcor will consider and incorporate information where relevant, including the potential for mitigation and adaptive management during detailed design and routing.
16.5.5.5	Land and Resource Use	Construction Effects, Aboriginal Land Use	In the event that Nalcor has to acquire an existing Aboriginal property (i.e., campsite or cabin), Nalcor will follow its *Property Acquisition Policy* to conduct negotiations and provide a fair balance between the needs of property owners, Nalcor and the ratepayers and citizens of the province.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
16.5.5.6	Land and Resource Use	Construction Effects, Protected Areas	With respect to Newfoundland T'Railway Provincial Park, Nalcor will continue to explore options with the GNL Natural Heritage Branch, Parks and Natural Areas Division to address the Project-T'Railway Provincial Park interaction and arrive at a mutually acceptable approach which is in compliance with the necessary approvals.
16.5.5.6	Land and Resource Use	Construction Effects, Protected Areas	Nalcor will continue to work and consult with the NL Parks and Natural Areas Division and other relevant organizations as it proceeds with Project planning, in order to seek to incorporate any available information regarding proposed protected areas into its planning, design and implementation of the Project.
16.5.5.6	Land and Resource Use	Construction Effects, Protected Areas	Nalcor will integrate activities associated with the operation of the HVdc system into its existing system-wide inspection and maintenance program.
16.5.6.1	Land and Resource Use	Operations and Maintenance, Overview	Nalcor will integrate activities associated with the operation of the HVdc system into its existing system-wide inspection and maintenance program.
16.5.6.3	Land and Resource Use	Operations and Maintenance Effects, Commercial/ Municipal Land Use	Nalcor will continue to meet with the International Appalachian Trail - Newfoundland and Labrador (IATNL) to discuss the specific routing and tower placement for the Project as engineering progresses, to reduce visual issues in key areas where technical and cost considerations facilitate this.
16.5.6.3	Land and Resource Use	Operations and Maintenance Effects, Commercial/ Municipal Land Use	Nalcor will consult with government departments, Aboriginal groups, outfitters and other groups and individuals to explore possible transmission line routing approaches in currently remote and identified sensitive areas to help minimize the eventual use of the ROW by ATVs and other public.
16.5.6.4	Land and Resource Use	Operations and Maintenance Effects, Aboriginal Traditional Land Use	Nalcor will consult Aboriginal communities and organizations to explore possible transmission line routing approaches.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
16.5.6.4	Land and Resource Use	Operations and Maintenance Effects, Aboriginal Traditional Land Use	Nalcor has a continued commitment to undertake and finalize land and resource use studies under the current community engagement agreements with NunatuKavut Community Council, Pakua Shipu and Unamen Shipu.
16.5.10	Land and Resource Use	Monitoring and Follow-up	Nalcor will continue to provide Project information to relevant agencies and organizations responsible for planning, management, regulatory enforcement and monitoring related to land and resource use, as required and requested.
16.5.10	Land and Resource Use	Monitoring and Follow-up	Nalcor will continue to use information collected during past and ongoing discussions with potentially affected Aboriginal groups and communities to avoid conflicts with contemporary land use for traditional purposes to the extent practical.
16.5.10	Land and Resource Use	Monitoring and Follow-up	Nalcor has a continued commitment to undertake and finalize land and resource use studies under the current community engagement agreements with NunatuKavut Community Council, Pakua Shipu and Unamen Shipu.
16.5.10	Land and Resource Use	Monitoring and Follow-up	Nalcor will consider and incorporate information provided in land and resource use studies by Aboriginal groups where relevant, including the potential for mitigation and adaptive management during detailed design and routing.
16.5.10	Land and Resource Use	Monitoring and Follow-up	Nalcor will assess any new relevant information regarding contemporary traditional land use activities of the Quebec Innu of Uashat mak Mani-Utenam, Matimekush-Lac John, Nutashkuan, Ekuanitshit and the Naskapi Nation of Kawawachikamach become available, in relation to the Project-related components.
16.6.5.1	Marine Fisheries	Construction, Overview	Nalcor representatives will consult further with local fishers and other interested and applicable parties before Project construction activities commence in the Strait of Belle Isle.
16.6.5.1	Marine Fisheries	Construction, Overview	Nalcor will establish a Fisheries Liaison Committee (FLC) for the Project construction period to facilitate its ongoing fisheries consultation and advisory process during construction.
16.6.5.1	Marine Fisheries	Construction, Overview	Nalcor will establish a Safety Zone, in accordance with Rule 43 of the Collision Regulations under the *Canadian Shipping Act*, around all active construction areas within the marine environment.
16.6.5.1	Marine Fisheries	Construction, Overview	Nalcor will consult with relevant Transport Canada personnel to determine the most appropriate means for boundary demarcation and communication.
16.6.5.1	Marine Fisheries	Construction, Overview	Nalcor will develop a Vessel Traffic Management Plan (VTMP) before Project construction activities commence in the Strait of Belle Isle, in consultation with applicable agencies and organizations, including advice and guidance from experts with the Ship Safety Branch of Transport Canada and the CCG.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
16.6.5.1	Marine Fisheries	Construction, Overview	Nalcor will provide advance notice of planned construction work in the Strait of Belle Isle through mechanisms such as the CCG's Notices to Shipping and the Canadian Broadcasting Corporation's Fisheries Broadcast.
16.6.5.1	Marine Fisheries	Construction, Overview	Nalcor will make available Fishing Gear Loss or Damage Compensation to cover any damage to commercial fishing gear or other equipment if an incident occurs during the Project Construction phase that involves contact with a Project vessel outside the Safety Zone. This will be similar to programs currently in use within the province's offshore area for petroleum exploration and development.
16.6.5.1	Marine Fisheries	Construction, Overview	Nalcor will provide economic compensation for any Strait of Belle Isle commercial fishing enterprise that experiences a loss of fishing income as a result of marine construction activities. This compensation will be available to licence holders who have been actively involved in harvesting scallop in the relevant area in recent years, and will compensate for any demonstrated actual loss of net commercial fishing income.
16.6.5.1	Marine Fisheries	Construction, Overview	Further principles and operational components of economic compensation will be developed jointly by Nalcor through discussions with the FLC.
16.6.5.1	Marine Fisheries	Construction, Overview	Prior to the start of electrode construction activities in Conception Bay, Nalcor representatives will meet with local fishers and other interested and applicable parties, particularly those who use any fishing grounds along the shoreline near the Dowden's Point shoreline electrode site.
16.6.6.1	Marine Fisheries	Operations and Maintenance Overview	Nalcor will consult and address any issues related to commercial fisheries in the Strait of Belle Isle that result from Project activities.
16.6.6.1	Marine Fisheries	Operations and Maintenance Overview	Working with the FLC, CCG's Notices to Shipping and the Canadian Broadcasting Corporation's Fisheries Broadcast, Nalcor will provide advance notice of planned maintenance or repair programs in the Strait of Belle Isle.
16.7.5.1	Tourism	Construction, Overview	Project construction workers will be housed in temporary construction camps rather than in local hotels, B&Bs and other accommodations, so as to avoid placing demands on these services, especially during peak tourism seasons.
16.7.5.1	Tourism	Construction, Overview	Nalcor will coordinate and schedule Project-related transportation of large equipment and materials to avoid heavy seasonal tourism traffic to the extent practical, and communicate and consult regularly with relevant agencies and tourism industry organizations and representatives as part of Project planning.
16.7.5.2	Tourism	Construction, Existing Knowledge	Nalcor will schedule certain Project-related movements and presence of personnel, equipment and materials to accommodate heavy seasonal tourism traffic, and will communicate with their sub-contractors about alternate travel and living arrangements during high tourism season.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
16.7.5.4	Tourism	Construction Effects, Visitation	Nalcor will schedule certain Project-related movements and presence of personnel, equipment and materials to accommodate high volume seasonal tourism traffic.
16.7.5.4	Tourism	Construction Effects, Visitation	Nalcor will communicate to the public, the Royal Canadian Mounted Police (RCMP) and appropriate government departments and agencies when non-routine Project-related movement and presence of personnel, equipment and materials will occur in sufficient time for these departments and agencies to take appropriate action and / or for the public to make alternative arrangements.
16.7.6.3	Tourism	Operations and Maintenance, Effects	Nalcor will schedule certain non-routine traffic delays to accommodate heavy seasonal tourism traffic and Nalcor will communicate to the public, the RCMP and appropriate government departments and agencies of such action.
16.7.6.3	Tourism	Operations and Maintenance, Effects	Nalcor will also ensure that if large numbers of Operations and Maintenance personnel are required, that appropriate travel and accommodations arrangements are made during the high tourist season that would not unduly interfere with travel and accommodation needs of tourists.
16.7.6.3	Tourism	Operations and Maintenance, Effects	Nalcor will also make alternative accommodations' arrangements if large numbers of non-routine personnel are required in the field.
16.7.6.3	Tourism	Operations and Maintenance, Effects	Nalcor will schedule certain non-routine traffic delays to accommodate heavy seasonal tourism traffic and Nalcor will communicate to the public, the RCMP and appropriate government departments and agencies of such action.
16.7.6.3	Tourism	Operations and Maintenance, Effects	This notification will occur in sufficient time for officials to take appropriate action and / or for the public to adjust travel plans.
16.7.6.3	Tourism	Operations and Maintenance, Effects	Nalcor will also ensure that if large numbers of Operations and Maintenance personnel are required, that appropriate travel and accommodations arrangements are made during the high tourist season that would not unduly interfere with travel and accommodation needs of tourists.
16.7.6.3	Tourism	Operations and Maintenance, Effects	Nalcor will also make alternative accommodations' arrangements if large numbers of non-routine personnel are required in the field.
16.7.6.3	Tourism	Operations and Maintenance, Effects	Nalcor will schedule certain Project-related activities to accommodate heavy seasonal tourism traffic and will communicate to the public, the RCMP and appropriate government departments and agencies using traditional and social media when non-routine Project-related traffic is present.

Table 17.4-1 Commitments for the Labrador-Island Transmission Link (continued)

Section	VEC	Aspect	Commitment
16.7.6.3	Tourism	Operations and Maintenance, Effects	Notification regarding the scheduling of certain Project-related activities will be provided with sufficient time for officials to take appropriate action and / or for the public to make alternative arrangements.
16.7.6.3	Tourism	Operations and Maintenance, Effects	If appropriate, Nalcor will make alternative accommodation arrangements when large numbers of personnel are in the field.
16.7.9	Tourism	Cumulative Effects	Nalcor has neither the mandate nor the expertise to monitor the tourism industry in the Project areas, but has, and will continue to, provide Project information to such agencies as required and requested.
16.8.5	Visual Aesthetics	Construction	Nalcor has selected a corridor, within which the ROW will be constructed, in consideration of visually sensitive areas (e.g., Gros Morne National Park).
17.1	—	Planning	Nalcor will use the Environmental Impact Statement (EIS) as they enter the detailed design phase, to refine and optimize technical, economic and environmental features, in consultation with regulators, Aboriginal groups, and stakeholders, as outlined throughout this EIS.
17.4	—	EA Principles, Precautionary	Nalcor has developed, and will apply appropriate mitigation, despite any uncertainty of the level of an effect of the Project on a Valued Environmental Component (VEC) or a Key Indicator (KI).
17.7	—	Planning	Nalcor will continue to refine and optimize the Project (e.g., corridor selection) through planning and design, as more detailed information is collected, including the findings of the effects assessment and ongoing engineering.
17.7	—	Routing and Design	Nalcor will conduct public consultations to present the proposed final transmission line route to the interested public and stakeholders once identified, and prior to final Project design and construction.
17.7	—	Planning	Nalcor and / or its contractors will identify, apply for and adhere to all permit terms and other authorizations that are required for Project Construction, and / or Operations and Maintenance.
17.8	—	EA Principles, Precautionary	Nalcor will use information provided by Aboriginal and / or stakeholder groups, or obtained during any of the monitoring and / or follow-up programs undertaken to feed into their adaptive management process for continued improvement. The adaptive management process will ensure timely, proactive responses to identified issues to limit the resulting effect.

17.5 Valued Environmental Components Summary

Nalcor selected VECs to focus the environmental assessment on the components of the biophysical and socioeconomic environment that are most valued and / or sensitive, and which have a meaningful potential to be affected by the Project. Table 17.5-1 provides a summary of the VECs that Nalcor selected and the significance of the predicted residual effects on the VECs (see Chapter 11 (Atmospheric Environmental Effects Assessment), Chapter 12 (Terrestrial Environment Effects Assessment), Chapter 13 (Freshwater Environment Effects Assessment), Chapter 14 (Marine Environment Effects Assessment) and Chapter 16 (Socioeconomic Environment Effects Assessment) for details). The cumulative effects (i.e., predicted to occur on the VECs with consideration of effects from other projects in the Regional Study Area) and their likely significance are also presented in Table 17.5-1.

Table 17.5-1 Summary: Significance of Effects on Atmospheric, Terrestrial, Freshwater, Marine and Socioeconomic Valued Environmental Components

VEC	Likely Significant Residual Effect	Comment	Likely Significant Cumulative Effect
Atmospheric Environment			
Atmospheric Environment	No	The changes to climate (GHG emissions), air quality and sound resulting from the Project are unlikely to substantively influence ambient conditions within the Regional Study Area (RSA). Therefore, the Project is not likely to result in significant adverse effects on the Atmospheric Environment.	No
Terrestrial Environment			
Vegetation	No	The effects of the Project on the vegetation abundance and diversity, wetlands, riparian shoreline, listed and regionally uncommon plants, and timber resources are not expected to affect any Vegetation KIs such that its continued contribution to ecosystem function within the LSA and the RSA are not sustainable. The likely residual effects of the Project on Vegetation are not significant.	No
Caribou	No	The effects of the Project on woodland caribou are not expected to cause a decline in population, such that the viability or recovery of woodland caribou populations in Central and Southeastern Labrador and Newfoundland are threatened. The likely residual effects of the Project on Caribou are not significant. In recognition of the present status of RWMH, and that other activities and pressures such as poaching and predation may continue, the overall fate is likely one of continued decline with or without the Project. If these existing (pre-Project) factors remain unchecked, the cumulative environmental effects are predicted to be significant, and not a result of the Project effects. The cumulative effects on the remainder of the Caribou herds in the province are rated as not significant.	No – MMH Yes - RWMH No – Newfoundland
Furbearers	No	The effects of the Project on marten, red fox, porcupine and beaver are not expected to result in a decline in the numbers of animals such that a population cannot be maintained within the RSA or in any of the Project regions. The likely residual effects of the Project on Furbearers are not significant.	No

Table 17.5-1 Summary: Significance of Effects on Atmospheric, Terrestrial, Freshwater and Marine Valued Environmental Components (continued)

VEC	Likely Significant Residual Effect	Comment	Likely Significant Cumulative Effect
Avifauna	No	The effects of the Project on waterfowl, passerines, raptors, upland game birds or other avian species of special conservation status are not expected to cause a population decline for any of the KIs or representative species / guilds therein, such that the viability of that population is not sustainable. The likely residual effects of the Project on Avifauna are not significant.	No
Freshwater Environment			
Freshwater Resources	No	The predicted effects on freshwater resources (Water Quality) (i.e., increase in total suspended solids (TSS), nutrients, herbicides, toluene or ethylbenzene in exceedance of guidelines or relative to baseline conditions) during the Construction, and Operations and Maintenance of the Project consider standard, proven, effective mitigation. The effects are well understood, are unlikely to result in a decrease in water quality of a given watercourse, such that applicable guidelines are exceeded or the watercourse cannot sustain its baseline functions over the lifetime of the Project, and are not significant.	No
Fish and Fish Habitat	No	The predicted effects on Fish Habitat, and Fish Abundance and Species Assemblage during the Construction, and Operations and Maintenance of the Project consider standard, proven, effective mitigation. The effects are well understood, will be localized, are unlikely to affect Fish and Fish Habitat over the life of the Project, and are not significant.	No
Marine Environment			
Marine Fish and Fish Habitat	No	The effects of the Project on the benthic habitat, marine water quality, and marine fish are not expected to affect conditions, populations, distributions or activities (e.g., feeding, spawning, and migration) at a regional scale for a period exceeding one year, and are not significant.	No
Marine Mammals and Sea Turtles	No	The effects of the Project on baleen whales, toothed whales, pinnipeds and sea turtles are not expected to result in changes to conditions, populations, distributions or activities at a regional scale for a period exceeding one year, and are not significant.	No
Seabirds	No	The effects of the Project on migrating shorebirds, nesting seabirds, and at-sea seabirds are not expected to result in changes to conditions, populations, distributions or activities at a regional scale over the long-term, and are not significant.	No

Table 17.5-1 Summary: Significance of Effects on Atmospheric, Terrestrial, Freshwater and Marine Valued Environmental Components (continued)

VEC	Likely Significant Residual Effect	Comment	Likely Significant Cumulative Effect
Socioeconomic Environment			
Historic and Heritage Resources	No	No loss or permanent disturbance of Historic and Heritage Resources, including Archaeological and /or Palaeontological Resources, is predicted as a result of the Project; however, if such resources are disturbed, provincial protocols will be followed to evaluate and document the resource, and it is not expected that the integrity and cultural value of the resource will be diminished or the historical context within the region will be lost. The likely residual effects of the Project on Historic and Heritage Resources are not significant. The effects of the Project on Sites of Cultural-Historical Importance are unlikely to result in the direct disturbance of a known site such that its integrity and cultural value is diminished, and are not significant.	No
Communities	No	Due to the scale and distribution of Project activities, any adverse effects on Communities throughout the Project will mostly be local and of short duration (e.g., increased demand for transportation infrastructure and community services, noise disturbance) during Construction, or longer duration (e.g., EMF, noise or other disturbance) during Operations. Some localized beneficial effects (e.g., highway improvements, waste disposal revenue) will be long lasting. No effects will result in a detectable and sustained decrease in the overall quality of life and / or health of a population. The likely residual effects of the Project on Communities are not significant.	No
Economy, Employment and Business	No	The overall (net) Project effects on Economy, Employment and Business are overwhelmingly beneficial (i.e., increased employment, incomes, tax revenues and business activity within the province and beyond) throughout the Project; potential exists for adverse effects to local businesses due to labour force competition and wage inflation due to Project-related employment during Construction. The likely residual effects of the Project on Economy, Employment and Business are not significant.	No
Land and Resource Use	No	Considering the effects management measures in place and planned, the Project effects on Land and Resource Use are not expected to negatively affect the successful operation or overall economic viability of commercial enterprises, or the ongoing planned growth of communities, contemporary traditional land use by Aboriginal users or other recreational land and resource users, or the ecological integrity, cultural value and / or societal use and enjoyment of protected areas. The likely residual effects of the Project on Land and Resource Use are not significant.	No

Table 17.5-1 Summary: Significance of Effects on Atmospheric, Terrestrial, Freshwater and Marine Valued Environmental Components (continued)

VEC	Likely Significant Residual Effect	Comment	Likely Significant Cumulative Effect
Marine Fisheries	No	Nalcor's planned consultation, ongoing liaison and other effects management response plans and economic compensation programs during Construction for commercial marine fisheries will help ensure that any Project interference with fishing activities will not result in a decrease in overall landings or fishing income as compared to pre-Project levels; and, adverse effects on the successful operation and overall economic viability of fishing enterprises in the area are not likely. The Project is unlikely to have an effect on recreational fisheries that would result in a measurable decrease in overall participation levels in the Strait of Belle Isle or Conception Bay. The likely residual effects of the Project on Marine Fisheries are not significant.	No
Tourism	No	The quality of the tourism experience could be intermittently affected (e.g., noise, dust, visual disturbance, traffic delays, accommodation shortages) during Project Construction, but this is normal with respect to construction activities within the province, and is unlikely to cause a decrease in visitation and expenditures by tourists or negatively affect the successful operation and overall economic viability of tourism enterprises. The transmission system is largely in remote areas, and will not be visible in most regions of the province except the Avalon Peninsula where it parallels already existing structures, thereby having a minor to negligible effect on the quality of the tourism experience. The likely residual effects of the Project on Tourism are not significant.	No
Visual Aesthetics	No	Clearing of the ROW, and installation of the transmission towers and other Project components will result in changes to the existing views to varying degrees during Construction, depending on view location and the stage of Construction, and the Project components (e.g., the ROW, transmission towers, converter stations and shoreline electrode sites) will be visible throughout the life of the Project. However, the Project effect on Visual Aesthetics is predicted to be acceptable and not significant.	No

17.6 Description of the Environment with the Project

The natural environment of the province with the Project is summarized through a discussion on biodiversity and renewable resources, related to their availability to future generations (i.e., sustainability) in the following
5 subsections.

The socioeconomic environment of the province with the Project is summarized through a discussion of the opportunities available during and after the Project, as it relates to all Newfoundlanders and Labradorians.

17.6.1 Biodiversity

Biodiversity encompasses the variety of life at all levels of organization, from the genetic to the landscape level and all the ecological and biological processes by which these levels are connected (Biodiversity Convention Office 1996).

Components of biodiversity have been assessed separately and quantitatively / qualitatively for the Project in:

- Chapter 11, Atmospheric Environment: Environmental Effects Assessment;
- Chapter 12, Terrestrial Environment: Environmental Effects Assessment (see Section 12.2 Vegetation; Section 12.3 Avifauna; Section 12.4 Caribou; Section 12.5 Furbearers);
- Chapter 13, Freshwater Environment: Environmental Effects Assessment (see Section 13.3 Fish and Fish Habitat); and
- Chapter 14, Marine Environment: Environmental Effects Assessment (see Section 14.3 Fish and Fish Habitat (Marine); Section 14.4 Marine Mammals and Sea Turtles; Section 14.5 Marine Associated Avifauna).

- The intent of this discussion is to summarize overall potential effects of the Project on biodiversity, through a qualitative discussion. Biodiversity is not simply a function of the number of species present but rather includes an evaluation of the function of ecosystems and the effects that the Project may have on it (Chapin et al. 2000). For the purpose of this EA, Nalcor considered biodiversity at the landscape level, the ecosystem (e.g., habitat type) level, and the species level, and it is presented as a synthesis of ecological effects in consideration of the VEC effects assessments listed above.

17.6.1.1 Landscape Level

Landscape pattern refers to the mosaic of habitat types (e.g., wetlands, riparian, black spruce forest, deciduous forest, and freshwater and marine). In Newfoundland and Labrador, this mosaic is diverse, as the Project will cross four ecoregions in Labrador: High Boreal Forest – Lake Melville Ecoregion; Low Subarctic Forest – Mecatina River Ecoregion; String Bog – Eagle River Plateau Ecoregion; and, the Forteau Barrens Ecoregion, and in Newfoundland, the Project will cross six ecoregions: Strait of Belle Isle Ecoregion; Northern Peninsula Forest Ecoregion; Long Range Barrens Ecoregion; Central Newfoundland Ecoregion; Maritime Barrens Ecoregion; and, Avalon Forest Ecoregion, including hundreds of watercourse crossings within each of these ecoregions. Each of these ecoregions supports a diverse assemblage of habitat types, with their respective topographical variations, vegetation species assemblages and hydrological features (e.g., wetlands, watercourses, ponds). In addition, the Project also includes a submarine crossing of the Strait of Belle Isle, and shoreline electrodes at Dowden's Point (Conception Bay) and L'Anse au Diable (Strait of Belle Isle). Due to the primarily linear nature of the Project, the Project footprint within any one ecoregion is limited and predicted to be not significant.

17.6.1.2 Ecosystem Level

Nalcor developed an ecological land classification (ELC) (Stantec 2010a,b) for the Project that includes a 15 km wide area, centred on the transmission corridor. This ELC was used as the basis for assessment of the various habitat types crossed by the Project components. As the Project will involve clearing for various Project components, and vegetation management will also be required within the right-of-way (ROW) for safety, effects on vegetation are expected. These effects are predicted to be local and will not disproportionately affect any particular habitat type.

Based on the assessment, the amount of each of the ELC habitat types, listed plants and regionally uncommon plants affected by the Project will not be significant. This considers that the ROW and other Project components will affect a small proportion of the habitat available within the RSA. Health effects on vegetation are not anticipated due to the limited emissions, and dust deposition will occur primarily along the road access, and will be localized and seasonal.

With respect to wildlife, the ELC habitat types were used to delineate and assess the effects of the Project on wildlife habitat and wildlife. This includes loss of habitat related to indirect effects of avoidance of suitable habitat due to sensory disturbance from Project Construction, and Operations and Maintenance. No significant effects on wildlife or wildlife habitat are predicted.

Freshwater fish habitat (e.g., riparian areas and watercourses) will be crossed by Project components, in compliance with the DFO Newfoundland and Labrador Operational Statements (DFO 2010) to the extent feasible, and as permitted (e.g., fording). Effects are predicted to primarily be at the LSA level, the distribution and quality of the habitat is expected to remain sustainable, and effects on fish habitat are predicted to be not significant.

With respect to the Strait of Belle Isle submarine crossing component of the Project, it is expected that the habitat and distribution of fish and marine fauna will not be affected at the RSA level.

17.6.1.3 Species Level

Clearing of vegetation for the Project will result in the alteration / loss of vegetation. The various habitat types crossed by the Project will continue to be represented within the LSA and RSA, and therefore, effects on population viability of individual species are predicted to be not.

The effects of the Project on terrestrial wildlife species, including listed species, and their use of, and distribution within these habitat types on a seasonal or year-round basis are predicted to be not significant. On a regional basis, the distribution and populations are expected to remain sustainable. The mitigation proposed by Nalcor is expected to promote natural regeneration of vegetation within the ROW and other areas required for other Project components that are not required during the Operations and Maintenance phase thereby limiting effects of habitat loss and fragmentation. Wildlife populations are not expected to be affected at the RSA level.

Conflicts between wildlife and the Project components (e.g., vehicle and vessel traffic) may result in the death of individual animals. Mitigation is in place to address this, and with limited occurrences expected, no effect on populations at the regional level are expected. The effects on wildlife are predicted to be not significant.

The localized effects on freshwater fish and fish habitat are not expected to affect populations at the regional level, and are predicted to be not significant.

For the marine component, there are no fish, bird, mammal or reptile species, including listed species, that are predicted to be significantly affected by the Project. Installation of the cables and the rock berms across the Strait of Belle Isle will result in alteration / loss of flora and fauna on the seafloor, however, these species will continue to be represented in the LSA and RSA, and effects on population sustainability are expected to be not significant.

17.6.1.4 Summary of Project Effects on Biodiversity

Issues related to biodiversity that were considered by the study team were based on the EIS Guidelines and Scoping Document (Government of Newfoundland and Labrador and Government of Canada 2011), Nalcor's consultation, traditional ecological knowledge, community ecological knowledge and professional judgement. The following issues were addressed qualitatively and / or quantitatively in the relevant VEC sections, and considered for the discussion on effects of the Project on biodiversity:

- Air quality and noise;
- Freshwater and marine water quality;
- Habitat alteration / loss / fragmentation;
- Barriers to movement;

- Ability of habitat or species to adapt and / or recover;
- Response to changes in habitat (e.g., edge effects, increased access);
- Distribution of species;
- Invasive / non-native species;
- Response of species to Project disturbances (e.g., noise, lighting); and
- Species of special conservation concern.

The assessment of the effects on biodiversity resulting from the Project, considers the mitigation, both applied and proposed by Nalcor, as it relates to the terrestrial, freshwater and marine environments affected by the Project components. The definition and determination of significance for the effects of the Project on each of the VECs were developed to consider the aim of sustainable development (i.e., satisfying the needs of present generations without compromising the ability of future generations to meet their own needs). As such, this EA considered the sustainable development objective to preserve environmental integrity, which is linked with biodiversity. The assessment predicts that the effects of the Project will not affect the sustainability of populations, distributions or composition of fish, vegetation, and wildlife at the regional level, in any of the regions with which the Project overlaps.

The EA predicts that no significant residual effects on fish (freshwater and marine), vegetation and wildlife (terrestrial and marine), and their respective habitats (i.e., freshwater, marine, terrestrial) will occur as a result of Construction and / or Operations and Maintenance for the Project. This indicates the continued functionality of all the ecological and biological processes by which the landscape, ecosystems and species levels are linked, as they were evaluated in relation to the Project. As such, any likely effects on biodiversity within the LSA and RSA, and the province as a result of the Project, are not likely to be significant.

17.6.2 Renewable Resources

As per Section 4.5.4 of the EIS Guidelines and Scoping Document (Government of Newfoundland and Labrador and the Government of Canada 2011), Nalcor determined, based on the results of the assessment, that the Project is not likely to cause significant environmental effects on renewable resources and will not compromise their capacity to meet present and future needs. As discussed for biodiversity, renewable resources (i.e., resources that can be renewed on a regular basis, either naturally or by human action) are addressed by Nalcor as an integral part of the applicable VECs (e.g., fish (Freshwater Fish and Fish Habitat VEC; Marine Fish and Fish Habitat); wildlife (Furbearers VEC; Avifauna VEC; Caribou VEC; Marine Mammals and Sea Turtles VEC; Seabirds VEC); the forest (Vegetation VEC). As per the EIS Guidelines and Scoping Document, the analysis of the effects on renewable resources considers non-living resources (e.g., atmosphere (Atmospheric Environment VEC), freshwater (Freshwater Fish and Fish Habitat VEC) and marine (Marine Fish and Fish Habitat VEC)).

Considering the findings for each of the VECs in this EIS (i.e., no significant residual effects) and those noted for the assessment on biodiversity in the previous subsection (i.e., any likely effects on biodiversity of the LSA, RSA and the province as a result of the Project, are predicted to be not significant), the Project is not likely to result in significant effects on renewable resources. As it is predicted that the functionality of all the ecological and biological processes by which the landscape, ecosystems and species levels are linked will continue, the capacity of renewable resources to meet present and future needs is expected to continue, following Construction of the Project, extending through Operations and Maintenance.

17.6.3 Socioeconomic Environment

Components of the socioeconomic environment have been assessed separately and quantitatively / qualitatively for the Project in:

- Chapter 16, Socioeconomic Environment: Environmental Effects Assessment (see Section 16.2 Historic and Heritage Resources; Section 16.3 Communities; Section 16.4 Economy, Employment and Business; Section 16.5 Land and Resource Use; Section 16.6 Marine Fisheries; Section 16.7 Tourism; and, Section 16.8 Visual Aesthetics).

As summarized in Section 17.5, the Project is not likely to result in significant effects on the socioeconomic VECs.

The socioeconomic benefits generated through the Construction and Operations and Maintenance phases of the Project will include direct, indirect and induced employment, and business opportunities related to the requirement for goods and services. The energy transported by the Project is expected to facilitate continued development and growth in Newfoundland and Labrador's energy sector and overall economy. The electrical power that is provided will benefit current residents and businesses, as well as help attract new industry to the province. This will assist in the continued diversification of opportunities for all Newfoundlanders and Labradorians, including future generations, while at the same time, not precluding their use and enjoyment of the province's renewable resources and natural beauty (i.e., sustainable development).

17.7 Alternative Evaluation and Final Right-of-Way Routing

As discussed in Section 2.14, an important principle of EA is that it should occur at an early stage of, and therefore refine and optimize, Project planning and design. Therefore, in conjunction and concurrent with the EA process, Nalcor is continuing with its technical and environmental analysis of the identified transmission corridors, including the alternative segments, to identify and eventually select a specific ROW alignment for the transmission line.

Section 4.3.2.2 of the EIS Guidelines and Scoping Document (Government of Newfoundland and Labrador and the Government of Canada 2011) indicates that alternative means of carrying out the Project, which are technically and economically feasible, and the environmental effects of any such alternative means need to be discussed. The following discussion describes how Nalcor has, and is continuing to refine and optimize the Project (e.g., corridor selection) through planning and design, as more detailed information is collected, including the findings of the effects assessment and ongoing engineering.

The selection of a final ROW for the Project involves a "filter" approach that determines the final alignment through the consideration of engineering requirements or constraints and the avoidance of environmental, social or cultural issues, where possible and practical, at finer levels of scale, and as more detailed information is collected and considered. The process employed by Nalcor for routing the Project is discussed in detail in Section 2.12. Specifically, Section 2.12.1, describes the method of identifying a 10 km-wide transmission line study area for the Project based initially on a transmission proposal first made in the 1970s. The study area identified represents the most coarse level of filter. This exercise involved using 1:50,000 scale mapping and digital topographic data, and was undertaken with a view to reducing the line length, while at the same identifying and avoiding key known technical, environmental and socioeconomic issues and constraints such as difficult topography and meteorological conditions, protected areas and other known environmentally sensitive areas, where possible and practical.

As described in Section 2.12.2, a preferred 2 km wide transmission corridor was identified, along with various alternative corridor segments in particular areas. Corridor selection, including the alternative segments, was completed with consideration of the following factors when possible and practical, but at a finer spatial scale than the study area:

- minimize the length of the transmission line;

- avoid unfavourable meteorological conditions such as heavy icing and/or strong winds;
- avoid difficult terrain;
- minimize the requirement for new access roads and trails;
- minimize watercourse and wetland crossings;
- cross watercourses at right angles;
- avoid interactions with communities, protected areas and other known environmentally and socially important areas; and
- avoid known sites of archaeological and historic importance.

The selection of a final on-land corridor by Nalcor will require a determination of which, if any, of the alternative corridor segments will be part of that final corridor. Section 2.13.6 describes and discusses the alternative corridor segments that:

1. are specified in the EIS Guidelines and Scoping Document (Government of Newfoundland and Labrador and the Government of Canada 2011);
2. have been identified and evaluated by Nalcor and its engineering consultants as part of the Project planning and design process; and/or
3. have been identified and suggested by Aboriginal and stakeholder groups and the public as part of Nalcor's consultation activities to date.

The evaluation of the alternative corridor segments (see Table 2.13.6-1, Figure 2.13.6-1, Figure 2.13.6-2, Figure 2.13.6-3) will be based on consideration of technical and engineering requirements, cost and environmental and social issues. This evaluation of the alternative corridor segments will consider the information from the Evaluation of Project Alternatives section in Chapter 11, Chapter 12, Chapter 13, Chapter 14 and Chapter 16. In those chapters, Nalcor compared the likely residual effects predicted on the KIs of the VECs predicted for the proposed transmission corridor, with those likely residual effects on the KIs predicted for the comparable alternative corridor segment. The final corridor selected will represent a balance between engineering and technical requirements, environmental protection, and socioeconomic considerations.

During the preparation of this EIS, Nalcor continued to collect more information related to engineering and costs for the Project. Considering the engineering requirements, cost and environmental factors presented throughout the EIS, the corridor that is currently favoured includes the alternative corridor segments A2, A4, A6, and A7 with A8. Nalcor has determined that at this stage of engineering and Project planning it is this corridor alignment that is technically and economically feasible, and respects the environmental and social objectives identified.

Alternative corridor segment A2 is currently favoured at this stage of Project planning because it avoids an extreme icing zone with high altitude and high exposure. As such, A2 avoids the associated construction and operations issues and has a lower cost. From an environmental perspective there is little difference, although A2 has less adverse effects on Vegetation (i.e., wetlands and timber resources) and Avifauna (e.g., Wetland affiliated species), and greater adverse effects on Furbearers (i.e., marten, red fox, porcupine, beaver) and Avifauna (i.e., Conifer Scrub and Lichen Heathland affiliated species) as compared to the corresponding proposed corridor segment.

Alternative corridor segment A4 is currently favoured because it limits the exposure to salt contamination, increases the electrical reliability and has a lower cost. From an environmental perspective there is little difference, with greater adverse effects on Furbearers (i.e., red fox, beaver) and Avifauna (i.e., Open Conifer Forest and Scrub / Heathland / Wetland complex affiliated species) for A4 as compared to the proposed

corridor segment. The A4 alternative corridor segment would have less adverse effects on Visual Aesthetics because the towers would be approximately 3 km from the highway.

Alternative corridor segment A6 is currently favoured because from an environmental perspective A6 has less adverse effects on Caribou (i.e., less Primary Core area) and Avifauna (i.e., coniferous habitat affiliated species). This alternative corridor segment has greater adverse effects on Furbearers (i.e., red fox, beaver), Tourism (i.e., more recreational vehicles and mobile trailers) and Visual Aesthetics (i.e., scenic area crossed) as compared to the proposed corridor segment. There is no difference between the proposed corridor segment and the A6 alternative corridor segment from an engineering or cost perspective.

Alternative corridor segment A7 plus A8 is currently favoured because it avoids an extreme icing zone due to its lower altitude and exposure. As such, A7 plus A8 avoids the associated construction issues and has a lower cost, and from a maintenance and operations perspective it greatly improves system reliability. From an environmental perspective A7 plus A8 has less adverse effects on Vegetation (i.e., less wetlands, riparian vegetation and timber resources), Caribou (i.e., less Primary Core area), Land and Resource Use (i.e., better for recreation as it is further away from the proposed International Appalachian Trail network), Tourism (i.e., towers less visible from backcountry trails) and Visual Aesthetics (i.e., avoids a scenic area). The alternative corridor segment A7 plus A8 has greater adverse effects on Furbearers (i.e., red fox, beaver) and Avifauna (i.e., Conifer Habitat affiliated species and Wetland affiliated species).

Based on the above considerations, further engineering analysis, and aerial and ground surveys in the final design stage, a preferred transmission line on-land ROW averaging approximately 60 m wide will be selected (i.e., finest filter stage). The specific surveys would be developed in consultation with the appropriate regulators or as determined through the permitting process. To facilitate routing selection for the ROW, Nalcor's analysis will include a constraints mapping exercise. Inputs to this analysis and planning process will include available information on the biophysical and socioeconomic environments, any additional information collected and issues identified as part of the EA process, as well as the results of the associated Aboriginal, public and stakeholder consultations, discussions with regulators, and any associated terms and conditions of EA approval (e.g., requirements to avoid certain environmental sensitivities in the selection of a ROW).

Regardless of final ROW alignment and location of associated Project components (e.g., access), this EIS provides a comprehensive assessment of the biophysical environment and socioeconomic environment effects likely to result from the Construction, and Operations and Maintenance of the Project. This is due to Nalcor's experience and familiarity with projects of a similar nature and their likely effects, identification of well-known and effective mitigation, and employing a conservative and precautionary approach in the EIS, including consideration of the Precautionary Principle. The final alignment of the three submarine cables within the 500 m wide corridor across the Strait of Belle Isle will be selected during final engineering and driven by technical requirements, with consideration of biophysical environment and socioeconomic environment inputs and assessment (see Chapter 10, Chapter 14, Chapter 15 and Chapter 16). The sites for the L'Anse au Diable and Dowden's Point shoreline electrodes are as described in this EIS.

Once identified, and prior to final Project design and construction, Nalcor will conduct public consultations to present the proposed final transmission line route to the interested public and stakeholders. This will serve as a final check on the overall environmental acceptability of the ROW, and allow final amendments to address any important remaining environmental (biophysical and socioeconomic) issues, as required and possible. It is also important to note that many Project components and activities will require additional specific regulatory permits and / or other provincial, federal and municipal authorizations (see Chapter 3). This post-EA permitting process will provide additional opportunities for relevant regulatory departments and agencies to receive and review these detailed designs, and to establish specific terms and conditions to avoid or reduce environmental effects. Nalcor and / or its contractors will identify, apply for and adhere to all permit terms and other authorizations that are required for Project Construction, and / or Operations and Maintenance.

17.8 Monitoring and Follow-up Program Summary

The monitoring and follow-up programs are provided for each of the VECs within the EIS. As discussed, the monitoring and follow-up program details will be finalized through discussions with the appropriate regulators, Aboriginal groups and stakeholders, as outlined in Section 9.4.6 of this EIS.

As indicated in Section 9.5.5 of this EIS, Nalcor will use information provided by Aboriginal and / or stakeholder groups, or obtained during any of the monitoring and / or follow-up programs undertaken to feed into their adaptive management process for continued improvement. The adaptive management process will ensure timely, proactive responses to identified issues to limit the resulting effect.

17.9 Overall Conclusion

The Project consists of the construction and operation of a ± 350 kilovolt (kV) HVdc electricity transmission system from Central Labrador to the Avalon Peninsula on the Island. A two kilometre (km) wide corridor has been identified within which a transmission line right-of-way (ROW) with an average width of 60 metres (m) will be selected.

The Project will extend over a distance of approximately 1,100 km, and at this stage of engineering and planning includes the following key components:

- an ac to dc converter station at Muskrat Falls near the lower Churchill River in Central Labrador;
- an overhead transmission line from Muskrat Falls to the Strait of Belle Isle (approximately 400 km), using the A2 alternative corridor segment;
- marine cable crossings of the Strait of Belle Isle with associated infrastructure (transition compounds and land cables at both cable landings);
- an overhead transmission line from the Strait of Belle Isle to Soldiers Pond on the Island's Avalon Peninsula (approximately 700 km), using the A4, A6 and A7 plus A8 alternative corridor segments;
- a dc to ac converter station at Soldiers Pond, with some associated Island system upgrades; and
- electrodes, or high capacity grounding systems, in the Strait of Belle Isle (Labrador) and Conception Bay (Newfoundland), connected to their respective converter stations by small overhead transmission lines.

In this EIS, Nalcor has demonstrated adherence to the basic principles of environmental assessment as outlined in Section 2 of the EIS Guidelines and Scoping Document (Government of Newfoundland and Labrador and the Government of Canada 2011). These principles are: using environmental assessment as a planning tool; Aboriginal and public participation is a central objective; collection and consideration of Aboriginal traditional and community knowledge; promotion of sustainable development; and applying a precautionary approach (as per the Precautionary Principle) in the planning and assessment of the Project.

The conclusion of this EIS is that the likely residual environmental effects (positive or negative) that result from the Construction, and Operations and Maintenance of the Project, are not likely to be significant. Considering this, and the commitments made in this EIS, Nalcor respectfully submits that the Project will be constructed, and operated and maintained in an environmentally responsible manner, respecting the principles of sustainable development. The Project will preserve ecosystem integrity, respect the right of future generations to the sustainable use of renewable and non-renewable resources, and enhance the lives of all Newfoundlanders and Labradorians.

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NALCOR ENERGY

LABRADOR-ISLAND TRANSMISSION LINK

ENVIRONMENTAL IMPACT STATEMENT

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