

Nalcor Energy – Lower Churchill Project



L-ITL FURBEARERS AND SMALL MAMMALS PROTECTION AND ENVIRONMENTAL EFFECTS MONITORING PLAN

Nalcor Doc. No. ILK-PT-MD-0000-EV-PL-0005-01

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1 PURPOSE

The purpose of this Labrador-Island Transmission Link (L-ITL) Furbearers and Small Mammals Protection and Environmental Effects Monitoring Plan (FSM-PEEMP) is to demonstrate how any adverse environmental effects will be mitigated, and to set out a program for monitoring the effectiveness of mitigation measures. To comply with regulatory requirements and commitments made in the L-ITL Environmental Impact Statement (EIS), the L-ITL's FSM-PEEMP approach includes consideration of:

- Mitigation objectives – performance objectives in respect of each adverse environmental effect;
- Mitigation – measures planned to achieve the mitigation objectives;
- Metrics and targets – specific, quantifiable, relevant and time constrained;
- Follow-up or Monitoring Programs – how the Project will include follow-up or monitoring surveys to confirm that mitigation strategies are meeting the mitigation objectives; and
- Contingency – plan to be implemented should monitoring reveal that mitigation measures have not been successful.

The L-ITL's FSM-PEEMP relates to furbearing mammals, represented in this plan by beaver (*Castor canadensis*), marten (*Martes Americana* – the Labrador population), red fox (*Vulpes vulpes*) and porcupine (*Erethizon dorsatum*) and small mammals. The FSM-PEEMP builds on existing information and commitments made in the EIS (Nalcor 2012), and conditions of permits and licenses.

2 SCOPE

This plan addresses the required aspects of furbearers and small mammals protection and effects monitoring for the design, construction, and operation phases of the Project for the L-ITL (described in Section 6.0).

3 DEFINITIONS

Environmental Assessment: An evaluation of a project's potential environmental risks and effects before it is carried out and identification of ways to improve project design and implementation to prevent, minimize, mitigate, or compensate for adverse environmental effects and to enhance positive effects.

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Environmental Management: The management of human interactions with the environment (air, water and land and all species that occupy these habitats including humans).

Environmental Protection Plan: Document outlining the specific mitigation measures, contingency plans and emergency response procedures to be implemented during the construction or operations of a facility.

Environmental Effects Monitoring: Monitoring of overall Project effects to confirm the predictions of EA and to fulfill EA commitments.

Environmental Compliance Monitoring: Monitoring of Project activities to confirm compliance with regulatory requirements and commitments made through the EA process.

Furbearer: For this plan, this refers to Beaver, Marten, Red Fox and Porcupine.

Small Mammals: For this plan, this refers to the twenty species of mammals listed in Table 7-1.

4 ABBREVIATIONS & ACRONYMS

CEAA	Canadian Environmental Assessment Act
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CWS	Canadian Wildlife Service
EA	Environmental Assessment
EEMP	Environmental Effects Monitoring Plan
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EPP	Environmental Protection Plan
ERC	Environment and Regulatory Compliance
HSE	Health Safety and Environment
IPD	Integrated Project Delivery
LCP	Lower Churchill Project
L-ITL	Labrador-Island Transmission Link
NE	Nalcor Energy
NL	Newfoundland and Labrador
NLDEC	Newfoundland and Labrador Department of Environment and Conservation
PEEMP	Protection and Environmental Effects Monitoring Plan
RCP	Regulatory Compliance Plan
SARA	Species at Risk Act

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5 REFERENCE DOCUMENTS

LCP-PT-MD-0000-PM-PL-0001-01	LCP Project Execution Plan
LCP-PT-MD-0000-PM-CH-0001-01	LCP Project Charter
LCP-PT-MD-0000-EA-PL-0001-01	LCP Generation Environmental Assessment Commitment Management Plan
LCP-PT-ED-0000-EA-SY-0002-01	Environmental Impact Statement and Supporting Documentation for the Labrador-Island Transmission Link
LCP-PT-MD-0000-EV-PL-0009-01	LCP HVdc Overland Transmission and HVdc Specialties Environmental Protection Plan
LCP-PT-MD-0000-RT-PL-0001-01	Regulatory Compliance Plan
LCP-PT-MD-0000-HS-PL-0001-01	Health and Safety Plan
LCP-PT-MD-0000-HS-PL-0004-01.	LCP Emergency Response Plan
LCP-PT-MD-0000-EV-PY-0001-01	LCP No Harvesting Policy
ILK-PT-MD-0000-EV-PL-0001-01	Labrador-Island Transmission Link Endangered Species Act – Listed Species Impacts Mitigation and Monitoring Plan

6 LABRADOR-ISLAND TRANSMISSION LINK PROJECT DESCRIPTION

As described in the L-ITL EIS, the Project consists of the Construction and Operations of a \pm 350 kilovolt (kV) High Voltage direct current (HVdc) electricity transmission system from Central Labrador to the Avalon Peninsula on the Island of Newfoundland (the Island) (Figure 6-1).

The transmission system will include the following key components:

- An alternating current (ac) to direct current (dc) converter station at Muskrat Falls;
- Approximately 400 km overhead hvdc transmission line from Muskrat Falls to Forteau Point;
- A 60 m wide right of way (ROW);
- Three, approximately 35 km long, submarine cables across the Strait of Belle Isle (SOBI) (i.e., between Forteau Point and Shoal Cove), with associated onshore infrastructure (transition compounds and land cables at both cable landings);

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- Approximately 700 km of overhead hvdc transmission line from Shoal Cove to the Avalon Peninsula;
- A dc to ac converter station at Soldiers Pond;
- Shoreline electrodes at L'Anse au Diable and Dowden's Point,
- An overhead, wood pole electrode line
 - Near Forteau Point and L'Anse au Diable; and
 - Between Soldiers Pond and Dowden's Point.

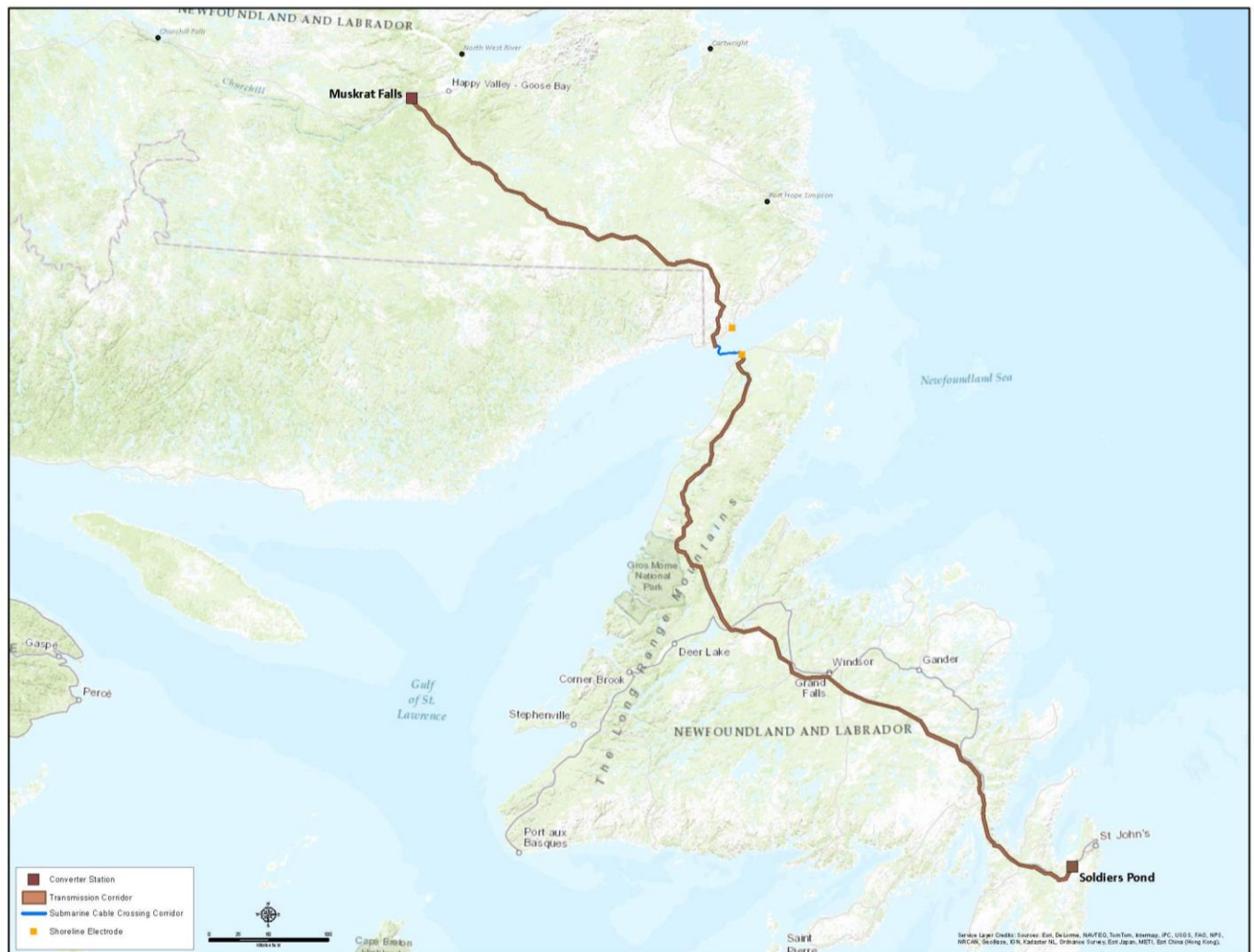


Figure 6-1: Labrador-Island Transmission Link (Nalcor, 2012).

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7 EXISTING INFORMATION

7.1 BEAVER

Beaver occupies rivers, streams, marshes, lakes and ponds and is most often found in association with riparian and wetland habitat; it is a keystone species as its watershed modification is important in creating and maintaining local ecological conditions. Beaver is common in wooded regions, with its range extending into the semi-barrens where trees are in adequate supply (Bangs 1898). Beaver has a widespread distribution, with a strong association with the presence of deciduous trees (Allen 1983), although beaver can subsist on conifers (Van Gelder 1982). Beaver shows a distinct preference for the bark of trees, preferentially aspen, but it is uncommon in Newfoundland and Labrador. Due to the paucity of aspen, alder is one of the most important beaver foods in the province (Nalcor, 2012).

Beaver sightings were restricted to wetlands in both Newfoundland and Labrador during 2008 baseline surveys (Nalcor 2012). As beaver are abundant in wetland habitats throughout the province, predicted potential effects to beaver are expected to be similar in all geographic regions. Habitats that provide foraging, damming, resting and feeding opportunities for beaver are preferred. In areas of lower productivity that may be found in southern Labrador (i.e., lower quality food sources), beaver are less selective regarding species of forage (Nalcor, 2011). The most recent survey of beaver in Labrador in 2006, along the lower Churchill River, also indicated a relatively low density (0.04/km²) compared to elsewhere in North America (Minaskuat Inc. 2008a). Additionally, only 17 percent of the colonies observed were identified as active and the majority of them deemed to be in medium to poor habitat quality. There were no active colonies and seven inactive colonies detected along the originally proposed transmission corridor (Minaskuat Inc. 2008b). Habitat ratings of these sites along the transmission corridor were rated as 'medium' quality (Stantec 2010).

7.2 MARTEN

Habitat selection by marten depends on the availability of dense canopy forest patches within a matrix of bogs and scrub (Smith and Schaefer 2002). Marten favour and are most successful in continuous late-successional coniferous forests (Buskirk 1992; Buskirk and Ruggiero 1994; Poole et al. 2004). Mature coniferous habitat is important because it provides the vertical and horizontal structure thought to be necessary for marten (Bowman and Robitaille 1997). This structure provides access to subnivean (under-snow) areas in winter for hunting.

Marten diet varies considerably in different geographic areas; voles are typically the most common food in all seasons, although marten is a generalist omnivore, preying on a variety of small mammals, birds, insects, fish, vegetation and carrion, and sometimes relying heavily on fruit in autumn (Martin 1994).

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Mech and Rogers (1977) suggest that the availability of food may be the most crucial factor affecting marten distribution. Marten is considered to have a higher degree of resilience than a species with a more restricted distribution (Conover et al. 1985).

Marten are trapped and considered to be of cultural and economic importance in Labrador. However, in Newfoundland, their sensitivity to habitat alteration and small population estimates (total of 286 to 556 individuals) has contributed to their listed status (Schmelzer 2008). As described in Nalcor (2012), the American Marten [(*Martes americana*), Newfoundland subspecies *atrata*, described from here as Newfoundland Marten] is restricted to three core habitats in Newfoundland, where it is listed as Threatened under the NLESA. Five subpopulations are distributed among three core areas (Near Main River, Terra Nova and west-central Newfoundland). The L-ITL intersects two core areas, near Main River and Terra Nova (Nalcor 2012).

As this subspecies is listed, the environmental effects management measures associated with it are presented in the Labrador-Island Transmission Link Listed Species Impacts Mitigation and Monitoring Plan.

7.3 RED FOX

The Red Fox is native to both Newfoundland and Labrador. A generalist predator, it is found throughout a wide range of habitat types. Breeding occurs during the winter months and young (1 to 10) are born during spring (CWS/CWF 1993). Home ranges for red fox typically range 4 to 8 km² and are centered around the den (CWS/CWF 1993). Although their diet is made up predominantly of small mammals and snowshoe hare, red fox diet varies seasonally and may also include fish, birds and their eggs (including waterfowl and seabirds), insect, and berries (CWS/CWF 1993)(Stantec 2010).

Red fox are considered common throughout Newfoundland and Labrador. Home ranges for red fox typically range 4 to 8 km² and are centered around the den. As a generalist species, they are found in any habitat that supports prey [e.g., snowshoe hare and microtines (rodents that belong to the subfamily Microtinae, which is comprised of voles, lemming and muskrat)]. Due to the variety of habitats of interest, habitat type and quality was likewise not rated for this species in the Study Area (15 km wide corridor around the ROW). While red fox populations are described as healthy, estimates vary widely, from 10,000 to 100,000 individuals in each of Newfoundland and Labrador (Nalcor 2012).

7.4 PORCUPINE

Porcupine is adaptable and considered a generalist at the landscape level, using a wide range of seasonal habitat types, including conifer and mixed wood forests, throughout Canada (Roze 1989; Griesemer et al. 1998).

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Porcupine prefers coniferous cover, uses open water habitat only rarely, as a travel corridor, and selects habitat to provide for foraging, predator avoidance, and resting (Stricklan et al. 1995; Sweitzer and Berger 1992). Porcupine are not found in Newfoundland, and therefore the effects and mitigations apply to porcupine in the Central and Southeastern Labrador region only.

Considered scarce only decades ago, porcupine is now common and occurs throughout Labrador. Schmelzer (2001) suggests that porcupine home ranges in Labrador are largest in winter at 7.01 km² (plus or minus 2.46 km²) and smaller in summer at 5.69 km² (plus or minus 2.28 km²). Porcupine is often pursued as a small game species during traditional and recreational hunting activities, and provides a food source for Innu and for others (Nalcor 2009). Numbers provided by the DEC Wildlife Division in April of 2009 places the Labrador porcupine in the range of 2,500 to 10,000 individuals (ACCDC 2008). Primary habitat for porcupine is abundant, and occupied 67% (3,839 km²) of the Southeastern Labrador portion of the Study Area (Stantec 2010).

7.5 WOLVERINE

The wolverine is the largest terrestrial mustelid species found in Canada (CWS and CWF 2001a, internet site). This carnivore has strength uncharacteristic of its size, no natural predators and a fierce reputation (CWS and CWF 2001a, internet site). Although known as a scavenger of carrion (primarily ungulates), wolverine diet varies both seasonally and regionally.

There is no conclusive data to suggest that they are present in Labrador, and this species does not occur in Newfoundland. Wolverine inhabit remote wilderness areas within the boreal forest across Canada (Banfield 1987) have occupy habitats with much diversity. Key to this species is an abundance of both small and large mammals and the presence of efficient predators. Wolverines are primarily scavengers and depend on wolves and other predators to provide carrion. Caribou carrion is the primary food source for wolverine (Magoun and Valkenburg 1983) and also know to take porcupine, beaver, small mammals and snowshoe hare (Lofroth et al. 2007).

Suitable caching, resting and denning habitat is also important, although little research exists on these matters. Denning sites are often associated with rock outcrops, talus slopes and snow formations in tundra that allow for tunnelling (Magoun and Valkenburg 1983). Wolverine mate in summer, generally at two years of age and two to three young are born the following March (delayed implantation) (Nalcor 2012).

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7.6 SMALL MAMMALS

Sixteen small mammal species have been recorded in Labrador, fifteen of which are native species (see Table 7-1). House mouse (*Mus musculus*) and Norway rat (*Rattus norvegicus*) are introduced species that are typically restricted to areas of human habitation. Eleven small mammal species have been recorded in insular Newfoundland. Only four of the small mammal species found in Newfoundland are native, including meadow vole, little brown bat (*Myotis lucifugus* subsp. *atrata*), northern long-eared bat (*Myotis septentrionalis*), and hoary bat (*Lasiurus cinereus*). The remaining seven species are accidental or deliberate introductions.

The lower small mammal species richness in Newfoundland is attributable to the isolation of Newfoundland from continental North America and the relatively poor dispersal capabilities of terrestrial small mammal species. Eastern red bat (*Lasiurus borealis*) is listed as occurring in Newfoundland accidentally. The breeding range of eastern red bats in Atlantic Canada extends to Nova Scotia and these migratory bats can be blown off course by storms and extralimital occurrences occur regularly (Broder et al. 2003) (Nalcor 2012).

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Species	Common Name	Labrador	Newfoundland
<i>Rattus norvegicus</i>	Norway rat	Non-native	Non-native
<i>Microtus pennsylvanicus</i>	Meadow vole	Native	Native
<i>Mus musculus</i>	House mouse	Non-native	Non-native
<i>Myotis lucifugus</i> subsp. <i>atrata</i>	Little brown bat	Native	Native
<i>Peromyscus maniculatus</i>	Deer mouse	Native	Non-native (Introduced prior to 1968)
<i>Clethrionomys gapperi</i>	Southern red-backed vole	Native	Non-native (First recorded in 1999)
<i>Clethrionomys glareolus</i>	Northern bank vole	Not present	Non-native (Exotic / alien)
<i>Sorex cinereus</i>	Masked shrew	Native	Non-native (Introduced in 1958)
<i>Microtus chrotorrhinus</i>	Rock vole	Native	Not present
<i>Phenacomys ungava</i>	Eastern heather vole	Native	Not present
<i>Condylura cristata</i>	Star-nosed mole	Native	Not present
<i>Zapus hudsonius</i>	Meadow jumping mouse	Native	Not present
<i>Napaeozapus insignis</i>	Woodland jumping mouse	Native	Not present
<i>Dicrostonyx hudsonius</i>	Labrador collared lemming	Native	Not present
<i>Synaptomys borealis</i>	Northern bog lemming	Native	Not present
<i>Sorex hoyi</i>	Pygmy shrew	Native	Not present
<i>Sorex palustris</i>	Water shrew	Native	Not present
<i>Lasiurus cinereus</i>	Hoary bat	Not present	Native
<i>Myotis septentrionalis</i>	Northern long-eared bat	Native	Native
<i>Lasiurus borealis</i>	Eastern red bat	Not present	Accidental

Table 7-1: Small Mammal Species in Newfoundland and Labrador

8 REGULATORY COMPLIANCE

Beaver, red fox, marten (excluding the Newfoundland population) and porcupine are not currently listed by provincial (NLDEC 2013, Internet site) or federal agencies (SARA Public Registry 2013b, Internet site). None of these species has been assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2013, Internet site), and all are considered “secure” in NL by the General Status of Species in Canada initiative (General Status of Species in Canada 2012, Internet site).

Species at risk (i.e., Newfoundland marten or any additions to the ESA in the future) are covered under the NLESA Listed Species Impacts Mitigations and Monitoring Plan, and will be updated as required.

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Beaver, marten, and red fox in NL are managed by the Wildlife Division of the NLDEC under Newfoundland and Labrador Regulation 68/12 Furbearing Animals Trapping and Shooting Order, 2012-2013 under the Wild Life Regulations (2012) and the *Wild Life Act* (2012). Porcupine in Labrador is managed by the Wildlife Division under Newfoundland and Labrador Regulation 74/12 Open Season Small Game Hunting and Snaring Order, 2012-2013 under the Wild Life Regulations (2012) and the *Wild Life Act* (2012).

To comply with federal and provincial legislation and regulations the LCP has, or will:

- Avoided critical habitat for Newfoundland marten to the extent possible;
- Identified furbearer habitat within the Project area, as presented in the EIS (Nalcor 2012);
- Designed and employed appropriate best management mitigation to avoid disturbance and mortality of furbearers and porcupine;
- Conduct monitoring or follow-up, as appropriate, to determine success of the mitigation; and
- If required, address contingency plans if the mitigation is found to be unsuccessful.

The intent of the L-ITL FSM-PEEMP is to evaluate and to respond appropriately to the findings of the Project effects during construction and operations on:

- Disturbance to furbearers and porcupine and their residences;
- Disturbance to small mammals; and
- Mortality of furbearers, small mammals and porcupine.

In addition, the NLR 87/13, also referred to as the Labrador-Island Transmission Link Undertaking Release Order under the Environmental Protection Act releases the Project from environmental assessment and sets conditions for this release that the LCP must meet. The release of the Labrador-Island Transmission Link from environmental assessment under section 3 is subject to the following terms and conditions:

- a) Nalcor Energy shall adhere to all mitigation, monitoring and commitments stated in the Environmental Impact Statement submitted April 12, 2012 and the additional Environmental Impact Statement information submitted December 10, 2012;

Submission of this EEMP satisfies the condition/requirement in NL Reg 87/13 that Nalcor Energy shall prepare an environmental protection plan for the following project valued ecosystem components, VECs, in order to minimize disturbance and mitigate potential effects on VECs during project construction and operation and submit the environmental protection plan to the Minister of Environment and Conservation for approval before the start of any site-specific construction. The environmental protection plan shall address the following:

- (iii) furbearers and small mammals, including American marten in Labrador.

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9 SUMMARY OF LIKELY RESIDUAL PROJECT EFFECTS

The likely residual effects on furbearers and small mammals include habitat loss, alteration or fragmentation due to vegetation clearing, possible mortality directly due to collisions with vehicles or indirectly as a result of sensory disturbance and avoidance of human activity from Project activities during Construction or Operations and Maintenance, and increased mortality due to hunting or trapping pressure associated with increased access along the ROW. As well as the adverse effects, the Project has the potential to increase the amount of suitable habitat for red fox (i.e., maintenance of semi-open habitat during Operations and Maintenance), and maintenance activities along the ROW and at other Project related facilities are not likely to have an adverse effect on red fox or beavers, species that are relatively tolerant of human activities (Nalcor 2012).

The Project is predicted to affect only a small portion of available furbearers and small mammals habitat within the study area, and to have no measurable effect on the regional distributions or populations of furbearer species. Therefore, the Project is not likely to result in significant adverse environmental effects on furbearers and small mammals. The primary environmental effect of Project Construction on marten will be through the alteration or loss of habitat required for the various Project components (e.g., access, transmission ROW). However, a number of other Project components or activities also have potential to affect Marten, including vegetation management, sensory disturbance, and subsequent increased OHV use and hunting or trapping pressure. Nalcor has committed to mitigation measures that will limit Project effects on Marten and their habitat. Overall, likely residual environmental effects to Furbearer KIs are predicted to be low in magnitude, are limited to the RSA and predicted to be not significant. It is predicted that the Project will not have a measurable effect on the regional distributions or populations of furbearers (Nalcor 2012).

10 ENVIRONMENTAL EFFECTS MANAGEMENT

The effects management plans (i.e., mitigation measures outlined in the EIS [Nalcor 2012] and the Lower Churchill Project (LCP) HVdc Overland Transmission and HVdc Specialties Environmental Protection Plan (EPP) (Nalcor, 2013) and the commitments made are captured in the following (Nalcor 2012):

- Nalcor will consult with the NLDEC Wildlife Division regarding final routing of the ROW in the vicinity of known Newfoundland marten habitat, particularly within the Northern Peninsula;

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- Nalcor will use detailed imagery to route the ROW to minimize the amount of primary and secondary 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;
- Nalcor will use existing disturbed areas and corridors as much as possible, limit the number of access roads, and decommission roads not required for Operations and Maintenance;
- Existing access roads will be used and development of new access will be minimized, to the extent practical;
- Clearing activities will only occur within the ROW and other site specific areas (e.g., converter station, marshalling yards, camps);
- Vegetation clearing for the transmission ROW and other Project components will be conducted using the following measures:
 - All vegetation shall be cut within 150 mm of the surface of the ground;
 - All vegetation that exceeds 2 m height at maturity will be cut;
 - Trees will be felled onto the ROW away from standing forest and away from any waterbody; any leaning or danger trees partially knocked down during clearing will be removed; and
 - Merchantable timber will be cleared through various means (e.g., feller-buncher (mechanical), hand-falling), de-limbed, and neatly piled at a right angle to, but within the ROW, to a height not exceeding 3 m.
- Tree tops, limbs, brush and debris will be piled along the edge of the ROW or used for brush mats;
- A 6.5 m break will remain between slash piles at least every 200 m to facilitate drainage and wildlife passage;
- Biodegradable lubricants and hydraulic fluids will be used where practical, when working near waterbodies;
- 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*;
- Spill kits will be available at all work sites, and a spill response team will be formed and trained prior to Construction, and all spills will be reported to the designated Environmental Monitor, construction supervisor, or designated Project personnel;

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- Any spill of reportable quantities of hazardous or regulated materials will be contained immediately and the application of absorbent pads (e.g., granular, pillow, sock) will be used to absorb and contain the spill; these spills will be reported to the appropriate federal or provincial authority to coordinate the provincial response;
- All spills will be reported to the designated Environmental Monitor, construction supervisor, or designated Project personnel;
- Engine idling will be minimized and environmental awareness training with key contract personnel will be conducted on this topic;
- Well maintained equipment with quality mufflers will be used, and equipment maintenance schedules will be followed;
- During windy conditions, specific Project activities that generate air-borne dust will be assessed on a case by case basis and corrective actions implemented as warranted and appropriate to reduce dust;
- Haul distances for construction material will be limited to the extent practical;
- Construction activities will be conducted in accordance with municipal by-laws regarding noise;
- High noise-producing construction equipment will be strategically placed as far away as practical from receptors;
- All equipment will have appropriate mufflers and will be well maintained;
- Blasting activities will be designed and undertaken in compliance with provincial and federal regulations;
- Blasting mats will be used in environmentally sensitive areas as defined in the EPP;
- The size of explosive charges will be limited during blasting activities;
- Construction staging areas will be located and operated in a manner that limits disturbance to native vegetation to the extent practical;
- Unless otherwise agreed upon with the NLDEC, all construction materials and debris will be removed from marshalling yards and construction staging areas when Construction is complete, and the areas returned to original land use capability, regraded and allowed to revegetate naturally;
- Nalcor will comply with laws and regulations pertaining to fish and wildlife, forest fires, forest travel, smoking and littering;
- Hardwood vegetation within 30 m of waterbodies occupied by beaver will not be cleared, unless clearing is required for electrical line clearance;

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- Culverts will be removed from water crossings of access roads not required for Operations and Maintenance so as not to attract beaver;
- Three hours prior to any blasting, a visual reconnaissance of the area will be undertaken to determine the presence of any wildlife; blasting will be delayed where practical until wildlife have been allowed to leave the area;
- Work areas will be kept clean and organized at all times; crews will collect and dispose of all waste away from the job site, as appropriate;
- Project personnel will take all necessary precautions to prevent and minimize any spillage, misplacement or loss of fuels and other hazardous materials;
- Work activities will occur in a manner that does not deliberately harass wildlife;
- Only essential vehicle use, including helicopter flights, will be permitted within the transmission corridor to limit disturbance to wildlife;
- Project personnel will adhere to appropriate speed limits applicable to the size and class of the access roads to reduce the potential for vehicle-wildlife collisions;
- Project personnel will not be permitted to possess firearms or have pets on-site and Nalcor will enforce a 'no-harvesting' policy during working hours. The exception to firearm possession will be bear monitors as described in the EPP;
- Site-specific mitigation measures relating to furbearers will be developed prior to and during Project Construction if necessary;
- Nalcor will use non-residual herbicides (i.e., Tordon 101 with Sylgard 309 as a surfactant) and mechanical methods, where practical. The requirements of the applicable regulations will be met or exceeded. All herbicide applications will be conducted by qualified, trained personnel in a careful manner, following the manufacturers' instructions and as per the Pesticides Control Regulations 1996 (plus amendments) under the *Environmental Protection Act* SNL 2002;
- Ground travel within the ROW for inspection or maintenance of the transmission line will be restricted to existing and / or approved trails. These trails will be used and maintained in accordance with the applicable regulations.;
- Upon completion of the Construction phase, temporary access will be assessed to determine if it will be needed for Operations and Maintenance; where access is to be decommissioned, the disturbed area will be returned to a comparable land use capability, depending on the road or trail condition;
- Upon completion of Construction, all disturbed areas (e.g., exposed mineral soils) and construction staging areas not required for Operations and Maintenance or access will be regraded to re-establish drainage patterns, blend with the natural terrain and allowed to revegetate naturally.;

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- Where access roads and trails require the installation of permanent watercourse crossing structures (e.g., bridges, culverts), the protection of riparian shoreline(s) will include regular inspection and maintenance of those structures;
- Vegetation buffer zones, established at environmentally sensitive areas during construction, will be maintained. Only danger trees will be removed from these areas;
- Access control measures (e.g., signage, gates) to address OHV use of access roads and trails required for Project Operations and Maintenance will be examined and discussed with NLDEC Wildlife Division, and applied as applicable and will be described in the EPP;
- Transmission line maintenance and repair personnel will adhere to appropriate speed limits applicable to the size and class of the access roads to reduce the potential for vehicle-wildlife collisions;
- Transmission line maintenance and repair personnel will not feed or harass wildlife;
- Nalcor personnel and contractors will not interfere with traplines or associated equipment;
- Only essential vehicular activity, including helicopter flights, will be permitted along the transmission line ROW to minimize disturbance to wildlife;
- Effective scheduling and logistics for maintenance work will be completed to minimize the number of vehicle trips per maintenance task;
- Completing any inspections, maintenance and / or repairs as quickly and efficiently as safety allows;
- Spill kit and trained personnel will be present on-site at all times, allowing for prompt containment of hazardous products;
- Well maintained equipment with quality mufflers will be used and equipment maintenance schedules will be followed;
- Engine idling will be minimized and environmental awareness training with key personnel will be conducted on this topic;
- All site personnel shall receive training to recognize the Newfoundland Marten and its prior to the start of clearing and any other site activities;
- In areas of identified critical marten habitat, clearing activities will take place outside the denning season, to avoid potential disturbance or destruction of marten dens and individuals (breeding season is early April – June 30);
- Notice of potential impacts to marten and their habitat at the job site shall be given to the OSEM for evaluation;

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- To the extent practical, scheduling of activities will be limited and adaptable during sensitive periods in the winter; construction activities will be scheduled considering sensitivities related to areas of wildlife habitat and periods in wildlife cycles, and considering additional mitigation measures that may be required;
- The HVdc Overland Transmission and HVdc Specialties EPP and best management practices will be followed, and On-Site Environmental Monitors (OSEMs) will oversee the implementation of the EPP;
- Buffer zones will be implemented to protect wildlife at the site (see Section 9.18 of the HVdc Overland Transmission and HVdc Specialties EPP ;
- Antifreeze will not be used as a method of pest control on site;
- Personnel to operate under established regulations and guidelines with respect to wildlife and its habitat (e.g., nesting birds, caribou, waterfowl, wetlands, inland fish, rare plants, riparian species, prohibition of feeding wild animals, prohibition of harassing wildlife) to minimize additional impacts (Wild Life Regulations under the Wild Life Act (O.C. 96-809);
- All wildlife sightings and nuisance wildlife will be reported to the On-Site Environmental Monitor;
- The Forestry Branch will be contacted and updated with regards to nuisance wildlife and wildlife encounters;
- Equipment and vehicles will yield the right-of-way to wildlife and adhere to construction site speed limits;
- Environmental awareness training, with regular briefings, will be implemented for all Project personnel;
- Work plans shall be submitted in advance and shall be reviewed for potential conflicts, including endangered species, critical habitat and other areas of concern (i.e., beaver dams and nesting sites);
- Where required (i.e., as per associated EEM Plans), prior to commencement of work, an on-site wildlife biologist shall be on-site to survey for areas of concern (critical breeding habitat, etc.) and to provide input on work methods, lay out approved travel routes and work areas and associated buffer zones;
- In areas where concerns have been identified, OSEM shall ensure work crews are aware of concerns identified and work methods to be used;
- There shall be no intrusion into “no-go” zones without prior permission of the OSEM;
- Waste management will be implemented to avoid attracting wildlife;
- Crews shall not travel outside of marked work areas and trails. If markers are not clear or are missing, the OSEM shall be consulted prior to commencing or continuing with the work;

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- The OSEM shall monitor work activity in sensitive sites at all times and provide advice on access and travel requirements; and
- The Environmental Coordinator shall be informed of activities near sensitive areas so that they may notify any regulators.

11 ENVIRONMENTAL EFFECTS MONITORING

This FSM-PEEMP contains both:

- Follow-up Programs – studies or surveys designed and implemented to evaluate the predictions of the EA and to determine the effectiveness of any measure taken to mitigate the adverse environmental effects of the Project; and
- Monitoring Programs – studies or surveys designed and implemented to determine whether the L-ITL is implemented as proposed, and that mitigation measures proposed to minimize the Project's environmental effects are implemented.

A summary of the FSM-PEEMP is presented in Table 12-1 at the end of this document.

12 SURVEY PROTOCOLS

The LCP has committed to conduct follow-up and monitoring programs to evaluate the effectiveness of the effects management plans, and to determine if expansion or reduction or deletion of the indicated programs is appropriate (with justification). This would apply to the following, as appropriate:

- Data collection during construction;
- Data collection during operations; and
- Follow-up and monitoring report.

Protocols for the data collection are discussed in the following subsections. Data collection includes metrics that are species specific, quantifiable, repeatable, relevant and time constrained. The goal is to collect meaningful data in a focused, defensible, repeatable approach, within a reasonable timeline to ensure that the mitigation is appropriate. Where it is determined that the mitigation is not appropriate or can be improved, a contingency plan would be presented as per their adaptive management approach.

The scope of the effects monitoring included surveys for Marten, and recording of sightings of and interactions with the four identified furbearer and small mammal species. Environmental monitoring associated with marten is presented in the Species at Risk Impacts Mitigation and Monitoring Plan.

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12.1 BASELINE DATA COLLECTION

Baseline data collection refers to the determination of the presence of Furbearers where Project activities are taking place. Baseline surveys have been conducted to document Furbearer presence in the Churchill River valley in the Project area. The survey results are presented in Nalcor Energy (2012) and are integral to data collection during construction and considered the initial part of that process.

12.2 DATA COLLECTION DURING CONSTRUCTION

12.2.1 Furbearer Sightings and Interactions

The results of the On-Site Environmental Monitors' reports that reference sightings, interactions and consequences that relate to furbearer and small mammal encounters during construction, and will include regulatory compliance tracking. These data will be presented in Excel, or similar format, with the following information:

- Date;
- Time;
- Location (utm or lats/longs);
- Interaction type – brief description of the type of interaction: sighting, human/animal conflict, vehicle/animal conflict;
- Furbearer species details – sex, age, behavior at the time of the interaction;
- Interaction details - explanation of the nature of the interaction;
- Issue resolution - explanation of the action(s) undertaken to resolve the interaction;
- Interaction consequence – description of the outcome (animal was scared away; animal was killed); and
- Additional actions undertaken – details of actions undertaken (e.g., no additional actions required; report sent to wildlife division) and notes on regulatory compliance.

A compilation of daily reports will be submitted to the NLDEC-WD on a weekly basis which will document wildlife encounters. These data will be compiled by the LCP's EA/EEM Commitments Coordinators once a year during construction (December) and the data evaluated to determine if the observed effects of the Project on furbearers and small mammals would require changes to the mitigation through the LCP's adaptive management approach.

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12.3 DATA COLLECTION DURING OPERATIONS

12.3.1 Furbearer Sightings and Interactions

The data collected during operations of the Project will be the same as collected during the construction period, but will be collected by the LCP's Inspection Crews, Maintenance Crews and other operations staff during the first five years of operation.

These data will be compiled once each year (December) and the data evaluated to determine if the observed effects of the Project on furbearers and small mammals would require changes to the mitigation through the LCP's adaptive management approach. As during construction, Furbearer sightings, interactions and consequences will be reported in a timely manner to the On-Site Environmental Monitor or other staff member and the information distributed to crews to increase their level of awareness and caution when furbearer species are in the vicinity of the activity during operations and maintenance.

12.3.2 Follow-up and Monitoring Program

A final Follow-up and Monitoring Report will be generated that contains a section that compiles the information collected on Project interactions with furbearers and small mammals as outlined above to address Follow-up (i.e., verification of EIS predictions) and a section to address Monitoring (i.e., regulatory compliance), as discussed in the following subsections.

12.3.3 Follow-up

The Follow-up portion of the Follow-up and Monitoring Report, within the FSM-PEEMP, will include the collation of all data related to Project interactions with Furbearers collected during the construction period and the first five years of operations. The Follow-up portion of the report will present the pre-construction Furbearers baseline information, consider the data as a description of the effects collected on interactions with furbearers and small mammals during the Project construction and operations time periods, and discuss the effects observed in relation to the effects predictions made in the EIS (i.e., no significant adverse residual effects on furbearers and small mammals).

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12.3.4 Monitoring

The FSM-PEEMP proposes monitoring of On-Site Environmental Monitors' (OSEM) observations and efforts related to the interactions of the Project components and activities with furbearers and small mammals to show that the Project was implemented as proposed, and that mitigation measures to minimize the Project's adverse environmental effects on furbearers and small mammals were implemented appropriately. OSEMs conduct daily monitoring of construction activities to ensure the best management practices and mitigation measures are implemented as described in the Environmental Protection Plan. If improvements are required, the Environmental Management System procedures ensure improvement and follow-up. All project-environment interactions are monitored by the LCP's OSEMs, as well as contractor environmental monitors and Government of NL monitors to identify construction-related effects (e.g., bears at camps, water quality, vehicle-wildlife collisions). These observations determine project effects and indicate whether additional mitigation is required.

If the Project components and activities and the mitigation measures are implemented as proposed, the effect on furbearers will be minimal (as per the predictions of the EA). Compliance Monitoring, which is undertaken by the OSEMs ensures Project compliance with regulatory requirements and other environmental commitments made in the EIS, and the terms and conditions of the EA release.

It is also worth noting that LCP has proposed species specific monitoring for a furbearer, for the Newfoundland population of marten. The monitoring program is described in the Listed Species Impacts and Mitigations and Monitoring Plan.

12.3.5 Contingency Plan

At this time, contingency plans are not anticipated for furbearers and small mammals and any changes to the L-ITL's procedures or mitigation plans would be addressed through the adaptive management approach, if and as appropriate. Any changes proposed would be based on the findings of the Follow-up and Monitoring Programs.

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Table 12-1: Summary of the Furbearers and Small Mammals Protection and Environmental Effects Monitoring Plan.

Survey Type	Objective	Location	Timing	Frequency	Contingency (e.g., if furbearers are present)
Data Collection During Construction					
Furbearer (Beaver, Red Fox, Marten and Porcupine) Interaction Observation	To determine Furbearer (Beaver, Red Fox, Marten and Porcupine) responses with Project components and activities during construction	All Project construction locations	Throughout the construction period	On-going	Communication with the Wildlife Division
Data Collection During Operations					
Furbearer (Beaver, Red Fox, Marten and Porcupine) Interaction Observation	To determine Furbearer (Beaver, Red Fox, Marten and Porcupine) responses with Project components and activities during operations	All Project components and activities during operations	Throughout the first five years of operations	On-going	Communication with the Wildlife Division
Follow-up					
	Verify EIS predictions on the Project effects on Furbearers (Beaver, Red Fox, Marten and Porcupine)	Project area	Interim Report following construction; Final Report after first five years of operations	One report post-construction; one report following five years of operations	Communication with the Wildlife Division
Monitoring					
	Verify regulatory compliance during Project construction and operations	Project area	On-Site Environmental Monitors through construction and by Inspection/Maintenance crews through operations; Interim Report following construction; Final Report after first five years of operations; other reports as per incident, as required	On-going	Communication with the Wildlife Division

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