Field Surveys for Spring Peeper, Blue-spotted Salamander and Northern Two-lined Salamander



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File No: 121511260

**Interim Report** 

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## **Executive Summary**

The 2014 Herptile Environmental Effects Monitoring Program (EEMP) was completed as part of a larger EEMP developed based on the requirements and commitments in the Lower Churchill Generation Project Environmental Impact Statement (EIS) (Nalcor 2009a and 2009b). The primary objectives of the herptile EEMP were to verify the presence and distribution or habitat associations of three species identified through the environmental assessment process as requiring further investigation: spring peeper (*Pseudacris crucifer*), blue-spotted salamander (*Ambystoma laterale*) and northern two-lined salamander (*Eurycea bislineata*). A secondary objective of the program was to collect samples of tadpoles to support the Ecorisk EEMP (reported under the Ecorisk EEMP report).

Evening road call surveys for spring peeper were conducted along the Trans Labrador Highway and associated side roads between Muskrat Falls and Gull Island. On each night, a series of listening stations were visited, spaced a minimum of 0.8 km apart, and any spring peepers heard over a five-minute period were recorded. To reduce disturbance effects associated with the vehicle, a one-minute wait period was implemented prior to the start of the survey. All calls were recorded and the intensity summarized according to predetermined category codes.

Daytime visual encounter surveys were conducted opportunistically in habitats with potential to support one or more of the species of interest. Detailed field protocols and datasheets were developed and distributed to field leads involved with the herptile and other ongoing EEMPs to support field efforts.

Spring peeper was detected at 13 of the 23 listening stations visited over a three day period between June 16 and June 18, 2014. One station visited with no detections was located in an area where a chorus of spring peeper had previously been heard in late May.

General area searches for spring peeper, blue-spotted salamander, and Northern two-lined salamander were carried out on four occasions in June, however team members also searched opportunistically for these species while collecting tadpoles for the Ecorisk and other EEMPs. Additional records of spring peeper were not recorded, and no species of salamander was observed. Both salamander species have specific features that challenge detection: Blue-spotted salamanders are generally subterranean or are hiding under leaf litter, fallen logs or rocks, and adult Northern two-lined salamanders, while typically associated with small perennial streams and seepage tracts, often forage terrestrially up to 100 m or more away from these areas.

The 2014 Herptile EEMP was developed as a single year program; however the protocols and datasheets developed through this initiative can be used throughout additional field efforts related in support of ongoing EEMPs related to the Project.



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## 1.0 2014 HERPTILE PROGRAM

The 2014 Herptile Environmental Effects Monitoring Program (EEMP) was completed by Stassinu Stantec Limited Partnership (Stassinu Stantec) and is part of the broader EEMP that Nalcor Energy is completing in conjunction with the Lower Churchill Generation Project (the Project). The work is based on the requirements and commitments in the Lower Churchill Generation Project Environmental Impact Statement (EIS) (Nalcor 2009a and 2009b).

The primary objectives of the herptile field program were to:

- 1. Verify the presence, distribution and/or habitat associations of spring peeper (*Pseudacris crucifer*), blue-spotted salamander (*Ambystoma laterale*) and northern two-lined salamander (*Eurycea bislineata*) in the lower Churchill River valley for which there is relatively limited information available, and/or uncertainty surrounding their distribution in the region.
- 2. Collect samples of tadpoles to support the Ecorisk EEMP.

This interim report provides a summary of the methods and results from the 2014 herptile field program related to the first objective. The results of the tadpole collection are detailed in the Ecorisk EEMP report.

### 1.1 Background

The term herptile refers to both amphibians and reptiles. Seven species of amphibians have been documented in Labrador. These include four species of frog; the wood frog (*Rana sylvatica*), mink frog (*Rana septentrionalis*), northern leopard frog (*Rana pipiens*) and the northern spring peeper; the American toad (*Bufo americanus*) and two species of salamander; the blue-spotted salamander and the northern two-lined salamander. There are no known established reptile species in Labrador<sup>1</sup>. We are using the term herptile to remain consistent with the EIS.

In support of the EIS (Nalcor 2009a, 2009b), baseline studies targeting herptiles were conducted in July 2006, supported by incidental observations collected by the Study Team from 2006 through 2008 (spanning June through September) (Minaskuat Inc. 2008). The dedicated field program focused on habitats with relatively high moisture content along the lower Churchill River, its tributaries and adjacent habitats, as well as transects extending from wetland habitats above the river through to shoreline alder zones (11 sites total, comprising eight habitat types). Through these efforts, the Study Team confirmed the presence of adults and juveniles of all seven herptile species in the lower Churchill River valley. Observations of spring peeper (nine adults, Appendix A), blue-spotted salamander (>23 larvae, Appendix A), and northern two-lined salamander (three adults, Appendix A) were relatively low compared to other species (e.g.,

<sup>&</sup>lt;sup>1</sup> Snapping turtle (*Chelydra serpentina*) has been reported in Labrador, but observations are likely of released captive turtles (e.g., CBC 2009).



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thousands of American toad were recorded), but this was believed to be related to survey timing (i.e., occurring outside the ideal time to detect the species) and/or the species' behaviour (e.g., the general subterranean nature of juvenile and adult blue-spotted salamanders can make them difficult to locate).

Following submission of the EIS, a separate herptile Environmental Effects Analysis was completed in 2009 (Nalcor 2009c), in response to an information request (IR) from the Joint Review Panel (IR #JRP.10: "in order for the Panel to understand the effects of the Project on herptiles, the Proponent is asked to provide an analysis of the predicted environmental effects of the Lower Churchill Project on herptiles, including the rationale for such predictions"). This analysis focused on the seven species known to occur in Labrador, incorporating observations from baseline studies (2006-2008) and existing literature, and considered environmental effects on amphibians were considered adverse and high in magnitude during construction, but overall were considered not significant (i.e., the Project will not result in a change in species richness and therefore no change in biodiversity) following implementation of mitigation measures and best management practices.

In August 2011, the "Report of the Joint Review Panel – Lower Churchill Hydroelectric Generation Project" was released, highlighting the Panel's recommendations (JRP 2011). The Panel noted that "the Department of Environment and Conservation recommended ...additional monitoring and management measures for those species that may be found in the Project area, such as ... spring peeper, where limited information is available". The Panel recommended that if the Project was approved, a monitoring program should be conducted to confirm the presence of and monitor the impact of the Project on spring peepers and salamanders.

### 1.2 Study Team

Stassinu Stantec personnel led the field and written components of the Herptile EEMP (Table 1.1).

### Table 1.1Herptile Study Team

Name	Role
Diane Ingraham	Project Manager
Perry Trimper	Senior Technical Advisor
Mike Crowell	Technical Advisor
Dustin Oaten	Field Lead
Karen Rashleigh	Field Lead
Angela Dunphy	Field Assistant – Road Call Counts
Trish Layden	Field Assistant – Road Call Counts
Additional Field Assistants	Opportunistic Area Searches



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Prior to the start of the field component of the Herptile EEMP, all personnel reviewed the Health, Safety, and Environment (HSEQ) Plan, and the Risk Management Strategy (RMS) 1 (Stassinu Stantec Limited Partnership 2014). A daily hazard assessment (RMS 2) was completed each day, prior to the start of surveys. The required scientific research permit (permit #: IW2013-66, Appendix B) was acquired from the Wildlife Division, Department of Environment and Conservation, Government of Newfoundland and Labrador, prior to the initiation of the surveys.

## 2.0 METHODS

### 2.1 Study Area

The Study Area for the Herptile EEMP included suitable habitats within the Project Footprint between Muskrat Falls and Gull Island, including areas above and below the area of inundation, and along the Transmission Line (Figure 2-1).



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Figure 2-1 2014 Herptile Survey Locations



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### 2.2 Evening Acoustic Surveys – Spring Peeper

Evening acoustic surveys, or road call counts, were carried out over three evenings from June 16-18, 2014, coinciding with the breeding period for spring peeper (based on calling activity) in the Study Area.

Roadside surveys were based on Stantec's national protocols for Nocturnal Amphibian Surveys (Stantec 2014). Surveys were conducted by a two-person team (field lead and assistant) in areas of suitable habitat (e.g., wetlands) along the Trans Labrador Highway (TLH) and associated access roads between Gull Island and Muskrat Falls. On each survey night, the team drove westward along the TLH to the furthest start point (from Goose Bay), with surveys starting approximately ½ hour after sunset. From this location, the team would drive back towards Goose Bay, stopping at "listening stations" spaced at a minimum of 0.8 km intervals, and listen for spring peepers over a five-minute period. To reduce disturbance effects associated with the vehicle, a one-minute wait period was implemented prior to the start of the survey. All calls were recorded and the intensity summarized according the following category codes (RIC 1998):

- 0 = no spring peeper heard calling.
- 1 = estimate of 1-5 individuals calling at site; individual spring peepers can be counted (no overlapping calls).
- 2 = estimate of 6-10 individuals calling at site; calls of individual spring peepers are distinguishable, but some calls overlap.
- 3 = estimate of > 10 individuals calling at site; full chorus, or continuous calls, where individual spring peepers cannot be distinguished.

Weather information, survey location (coordinates) and general habitat descriptions were recorded at each survey location. Surveys were only conducted under appropriate weather conditions (i.e., moist nights with light rain or fog, winds less than level three on the Beaufort Wind Scale, and temperatures at or above 8°C).

### 2.3 Daytime Visual Encounter Surveys

Daytime visual encounter surveys were conducted opportunistically in habitats with potential to support one or more of the species of interest (i.e., spring peeper, blue-spotted salamander, northern two-lined salamander). Detailed field protocols and datasheets (Appendix C) were developed based on the specific habitat requirements and seasonal behavior of each target species, and distributed to field leads involved with the herptile and other ongoing EEMPs (e.g., avifauna). Table 2.1 summarizes the search methods employed for each species.



### Nalcor Energy Lower Churchill Project, Environmental Effects Monitoring Program – 2014 Herptile

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### Table 2.1Search Methods by Habitat Type and Target Herptile Species

Habitat Search Method	Ponds and small water bodies, side- pools of wetlands and lakes, roadside ditches and other ephemeral waterbodies	Wetlands	Small perennial fishless streams and rivers (especially ones with rocks beneath surface / protruding rocks)	Mesic / moist forest or thicket habitats near breeding ponds & ditches
Acoustic Listening for spring peepers	$\checkmark$	$\checkmark$		
Area Searches Search under leaf litter, fallen logs, rocks		$\checkmark$		<ul> <li>√ - blue-spotted</li> <li>salamander adults</li> <li>√ - Northern two- lined salamander</li> <li>adults may forage</li> <li>up to 100m from</li> <li>water</li> </ul>
<b>Dipnetting</b> (dip net sweeps can be used to flush individuals)	<ul> <li>√ - spring peeper tadpoles or egg masses; adults (adults may be flushed when walking perimeter of waterbody)</li> <li>√ - blue-spotted salamander larvae</li> </ul>	<ul> <li>√ - spring peeper tadpoles and adults (adults may be flushed when walking perimeter of wetlands)</li> <li>√ - Northern two- lined salamander may occur in small streams over peaty bottoms in a variety of wetlands</li> </ul>	√ - Northern two- lined salamander eggs, larvae, and adults (shuffle /turn over rocks and stream material and dip net downstream to catch potential larvae)	

Start and end times, and linear distance (m) surveyed (where possible) were recorded for each search effort, and photographs taken. Any amphibians that were encountered or flushed during surveys were noted.

### 3.0 RESULTS

### 3.1 Spring Peeper

Spring peeper surveys were carried out concurrently with Common Nighthawk (CONI) surveys (reported elsewhere), to enhance EEMP efficiency. Both survey methods required a one-minute wait period before the start of the listening period (three minutes for spring peeper and six plus an additional two for CONI). Spring peeper was detected at 13 of the 23 listening stations visited over a three day period between June 16 and June 18, 2014. Table 3.1 summarizes the survey



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effort, weather conditions, and results (by call category) for spring peeper (details provided in Appendix D).

Date	Survey Duration	Weather Conditions	Survey Cat	Findings egory Co	Total Number of		
(Start Time - End Time)			0	1	2	Listening Stations	
June 16	2130 - 2355	Clear skies, little to no wind; relatively warm throughout surveys (>15°C)	4	5	1	10	
June 17	2123 - 2246	Overcast with occasional light rain, little to no wind; >15°C	2	2	3	7	
June 18	2110 - 2245	Overcast, little to no wind; >15°C	4	2	0	6	
<sup>1</sup> Category code 3 calls were not observed during surveys							

### Table 3.12014 Spring Peeper Road Call Survey Results

One listening station visited on June 16 was targeted because a chorus of spring peeper was incidentally documented there in late May. The wetland at this site – located across the TLH from the entrance to the Edward's Brook camp – was also searched by team members on June 12 (Table 3.2). The team did not detect any spring peeper on either date in June.

### Table 3.22014 Amphibian Search Record

Date	Survey Duration (Start Time / End Time)	Weather Conditions	Habitat / General Location	Search Method	Observations
June 12	1 hour	Hot and sunny; >20°C	Open black spruce with some deadfall	Ground search	none
June 12	1 hour	Hot and sunny; >20°C	Wetland	Area search – wetland	4 Northern Leopard Frog, Mink Frog
June 26	0.5 hour (1030 – 1100)	Hot and sunny; 21°C	Small creek (~1 m wide)	Area search / stream search; surveyed ~200m along creek	none
June 26	1 hour (1500 - 1600)	Hot and sunny; >20°C	Small waterbody along TLH	Area search	10 Northern Leopard Frog adults and ~50 tadpoles; ~200 American toad tadpoles
June 27	2 hours (0900 - 1100)	Hot and sunny; 31°C	Along Churchill River	Area / ground search	3 American Toad



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Three additional dedicated amphibian searches were carried out in June however no spring peeper were recorded (Table 3.2, Appendix D). Study teams also searched opportunistically for this and other species while collecting tadpoles for the Ecorisk EEMP with the same result. Spring peeper adults are very small (< 3 cm) and highly cryptic making them difficult to locate, aside from their characteristic breeding calls.

### 3.2 Salamanders

The search effort for salamanders was opportunistic, based on when suitable habitats were encountered in the field (during other EEMPs). Both species have specific habitat features that are difficult to predict prior to heading to the field. Blue-spotted salamanders are generally subterranean, making them difficult to locate in general. Adults are sometimes found under likely hiding places (e.g., leaf litter, fallen logs and rocks), particularly near breeding ponds during the breeding season (likely mid-May to early June in Labrador). Northern two-lined salamanders are typically associated with small perennial streams and seepage tracts, although adults will often forage terrestrially up to 100 m or more away, depending on habitat.

Dedicated amphibian searches were carried out on four occasions in June (Table 3.2, Appendix D), and team members also searched opportunistically for salamanders while collecting tadpoles for the Ecorisk EEMP (reported elsewhere). No salamanders were observed throughout surveys in 2014.

### 4.0 SUMMARY

The 2014 Herptile EEMP included a series of road call count surveys for spring peeper, and area and general searches for spring peeper, blue-spotted salamander, and Northern two-lined salamander, within suitable habitats in the Study Area between Muskrat Falls and Gull Island. Spring peeper was heard calling from 13 of 23 listening stations visited in 2014. No other observations of spring peeper, or of blue-spotted salamander or Northern two-lined salamander were made during area searches.

Table 4.1 summarizes the information relative to the distribution and associated habitats for spring peeper, blue-spotted salamander, and Northern two-lined salamander in Labrador and in the Study Area as defined by the study objectives. Spring peeper has been confirmed by the Study Team in various locations in the lower Churchill River valley, through direct observation (six locations) and by their distinct calls (13 locations). The Study Team has also confirmed the presence of both salamander species in the Study Area: larval and adult blue-spotted salamander were found in three locations on the north side of the river valley, and adult northern two-lined salamander from two locations, also north of the river.



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### Table 4.1Species Summaries

Species	Distribution in Labrador	Summary of Project- related Observations	Habitat	
Spring Peeper	Previous records from Goose River and Peters River near Goose Bay. Recorded in 2014 from various locations between Gull Island and Muskrat Falls.	9 adults observed in 2006 from both the north and south side of the Churchill River (observed outside breeding season); Adults heard calling at 13 of 23 listening stations visited in 2014 (refer to Figure 2-1).	Usually in fishless, ephemeral ponds and small water bodies in a variety of wetlands including roadside ditches: also breed in side pools of lakes and streams, and permanent ponds; during non-breeding season primarily terrestrial and prefer forested thickets (uplands and wetlands) with extensive canopy cover; prefer mesic habitats with moist refuge versus dry open forest types; hibernate within frost affected ground zone.	
Blue-spotted Salamander	Known distribution extends from points along the TLH from Goose Bay to Churchill Falls. Several records from residential (backyard) locations in Goose Bay.	23+ sightings of larvae between 2007 and 2008, from two locations on the north side of the TLH; 1 observation of an adult at Muskrat Falls (north spur) in 2013. None seen in 2014.	Breed in fishless aquatic habitats (e.g., ponds, pools off lake shores, quarry and sand pits, roadside ditches, woodland pools, wetland pools and pools off small slow streams) in early spring; do not occur in streams or rivers; transformed larvae and adults are generally subterranean but found near surface during summer; hibernate in soil below frost line.	
Northern Two- lined Salamander	Records from Goose Bay area to Churchill Falls, along the Churchill River and TLH.	3 sightings of adults between 2007 and 2008 (from two locations). None seen in 2014.	Small headwater perennial streams and seepage tracts; generally in areas without fish (primary woodlands but also wetlands); also occur in larger streams and rivers and perennially running slow streams over peaty bottoms in wetlands; may also breed in ponds, and to a lesser extent, fishless lakes; hibernate in water or below frost line near banks of seeps and streams. Larvae require more than one season to transform.	

The 2014 Herptile EEMP was developed as a single year program. The protocols and datasheets developed in this initiative can be used to support related ongoing Project EEMPs.



### Nalcor Energy Lower Churchill Project, Environmental Effects Monitoring Program – 2014 Herptile

REFERENCES September 19, 2014

## 5.0 **REFERENCES**

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## **APPENDIX A**

Herptiles Observations, 2006-2008



Table A.1Spring Peeper, Blue-spotted Salamander and Northern Two-lined Salamander Observations during Baseline<br/>Studies

		Niccosteres	General Coordinate (or Start Location)			ocation)	Ushitat	
Date	Survey	Observed	UTM Easting	UTM Northing	Latitude	Longitude	Туре	General Location
Spring Peeper								
23 July 2006	Rare Plant	1 Adult	615496	5872317	52.9880	-61.2794	FW	South side of MF Reservoir, close to GI
23 July 2006	Rare Plant	1 Adult	598500	5872886	52.9965	-61.5323	WL	North side of GI Reservoir
23 July 2006	ELC	1 Adult	622058	5877853	53.0363	-61.1796	WL	South side of MF Reservoir, east of Gull Lake
24 July 2006	Rare Plant	4 Adults	642593	5899397	53.2247	-60.8640	GB	South side of MF Reservoir
25 July 2006	Rare Plant	1 Adult	607525	5869856	52.9675	-61.3989	GB	GI, north side River
29 July 2006	ELC	1 Adult	619202	5877102	53.0302	-61.2225	MD	North side of MF Reservoir, east of Gull Lake
Blue-spotted	Salamander							
24 July 2007	Rare Plant	>3 Larvae	635387	5896973	53.2048	-60.9729	RSP/ AP	Along TLH, north side of MF Reservoir
14 July 2008	Road side	>20 Larvae	669276	5906526	53.2809	-60.4609	RSP/ AP	Along TLH, downstream of MF Reservoir
9 Oct 2013	Arch- aeology	1 Adult	648313	5902778	53.2535	-60.7768	Tree stump	North Spur, MF
Northern Two	-lined Salama	ander						
12 July 2007	Rare Plant	2 Adults	593170	5872132	52.9907	-61.6120	RI	North side of GI Reservoir
14 July 2008	Road side	1 Adult	654845	5905200	53.2734	-60.6778	RSP/ AP	Along TLH, downstream of MF Reservoir
General coordinates represent the general survey area within which there was a sighting. UTM grid is 20U. RI = Riparian (in the river, side pools and flows), RSP/AP = Road Side Pond / Anthropogenic Pond, FW = Fir/White Spruce dominated forest, WL = Wetland, MD = Mixed forest (deciduous dominant), TLH = Trans Labrador Highway, GI = Gull Island, MF = Muskrat Falls								





Figure A-1 Spring Peeper, Blue-spotted Salamander and Northern Two-lined Salamander Observations, 2006-2013



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## **APPENDIX B**

**Research Permit** 



CIMFP Exhibit P-00271 - Appendix O - 16



GOVERNMENT OF NEWFOUNDLAND AND LABRADOR Dept of Environment & Conservation

## **Scientific Research Permit**

(as under Section 86 of the Wildlife Regulations, Consolidated Newfoundland and Labrador Regulation 1156/96)

### Permit #: IW2013-66

**Project Title:** *Wildlife Environmental Effects Monitoring During Construction of the Lower Churchill Hydroelectric Development* 

#### Issued to:

Perry Trimper, Stassinu Stantec Limited Partnership P.O. Box 482, Station C, Happy Valley-Goose Bay, NL A0P 1C0 Tel: (709) 896-5860

#### Permit to:

1) *Winter Research*: Undertake winter aerial and ground track surveys for moose, otter, marten, porcupine and other wildlife;

2) *Spring Summer Research*: Undertake spring/summer breeding bird point count surveys, otter and black bear hair snag trapping, and directed surveys for spring peeper and salamanders;
3) *Fall Research*: Undertake fall aerial surveys for beaver colonies and deploy specialized traps to determine presence of water and pygmy shrews.

The objectives of these studies are to collect additional baseline information and to monitor potential environmental effects during construction of the Lower Churchill Hydroelectric Development.

Date of research: March 1 to October 1, 2014.

### Date of Permit Expiration: November 1, 2014.

**Location:** All field investigations will occur primarily within the lower Churchill River watershed of Labrador. Of interest is a 20 km radius around the Project footprint in the lower Churchill River valley and the AC transmission line from Muskrat Falls to Churchill Falls (Figure 1). The intent is to establish a monitoring grid throughout the Study Area where cells become permanent monitoring stations. Where possible and appropriate, pre-existing transects and grids will be resurveyed and supplemented.

#### **Conditions:**

 The permit holder may designate other individuals to perform these actions on his behalf, with suitable supervision. The permit holder is responsible for the training of any designated individuals and must ensure that designated individuals follow all conditions of this permit.

- 2) Names and contact information for all individuals participating in research activities shall be provided to the Wildlife Division, Department of Environment and Conservation prior to commencement of field work. Additional names or deletion of names can be provided to Wildlife Division on an ongoing basis.
- Prior to initiation of the field program for effects monitoring and baseline investigations, a digital copy of the shape files of all survey routes must be provided to the Wildlife Division.
- 4) This permit is only valid for work within the indicated study area (Figure 1).
- 5) With the exception of activities covered under this permit, no wildlife species, including the study species, will be unduly harassed, injured or killed as a result of activities performed under this permit. The Wildlife Division advises applicants to operate under established regulations and guidelines with respect to wildlife and wildlife habitat to minimize adverse impacts (Section 106 of the Wild Life Regulations under the *Wild Life Act* (O.C. 96-809)).
- 6) Disturbance of all wildlife should be minimized during helicopter and ground transportation. Whenever possible, aircraft should not descend lower than 100 meters (above ground level) during surveys.
- 7) The field program will be conducted using accepted wildlife research techniques and targeted species will be disturbed as little as possible. The methods and survey dates described in the application will be followed as closely as possible. Any changes to the survey design or methodology outlined in the initial permit request will require prior approval before implementation.
- 8) A detailed protocol should be provided to the Wildlife Division for approval prior to any sampling of small mammals or amphibians. Any samples that are collected must be turned into the Wildlife Division following identification. A permit is required and must be obtained prior to transporting any samples or specimens out of the province.
- 9) To avoid the introduction of non-native species all research equipment should be new and unused, or equipment that has not been previously used outside of Labrador.
- 10) Final reports should be submitted for each of the components of the work proposed and permitted. Reports should provide a synopsis of the location of surveys, methods employed, number of samples/specimens taken, location of samples/specimens, additional relevant ecological information and a summary of next steps. The raw data and coordinates should be submitted in digital format along with the final reports for each component and for the following: small mammals, amphibian, otter, marten, moose, black bear, porcupine, beaver, breeding birds, mercury level analysis and all sightings of wildlife and sign. The permit holder is responsible to obtain any and all permissions which may be required to release this information to the Wildlife Division. Final reports are to be remitted by the following dates to the Wildlife Division:

*Winter Research*: May 1, 2014 *Spring/Summer Research*: October 1, 2014 *Fall Research*: December 1, 2014

- 11) Any unusual wildlife observations or any adverse effects observed during the Project are to be reported immediately to the Wildlife Division.
- 12) This permit does not absolve or relieve the permit holder from any other laws, permits, regulations or orders.
- 13) This permit does not relieve the permit holder from the requirement to acquire permission to access private property.
- 14) All conditions of this permit must be adhered to and data and results from this project submitted to the Wildlife Division prior to another permit being issued.
- 15) Under the discretion of the Director of Wildlife, this permit can be revoked without notice.

March 12, 2014

Date:

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Director of Wildlife

PO Box 2007 Corner Brook, NL A2H 2L7 Phone: (709) 637-2008 Fax: (709) 637-2004 Page 20





Application for Permit – Wildlife EEM - Lower Churchill River Watershed

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# APPENDIX C

Herptile Field Protocols



## Amphibian Search Record

Date:	Weather Conditions:			
Field Lead & team:	General Location (reservoir/TL):			
	UTM Location: @ start of survey or central to survey area			
Habitat Description:				
Start Time:	End Time:			

Search Method used	Species Observed	Comments (e.g., life stage, #'s)
Dip Netting	Spring Peeper	
Ground Search	🗌 American Toad	
(under fallen trees, leaves and other	Northern Leopard Frog	
debris)	Mink Frog	
	Wood Frog	
	□ Blue-spotted Salamander	
	Northern Two-lined Salamander	
	Unknown Salamander	
	🗌 Unknown Frog	

For all species of interest (i.e., peepers or salamanders), record the following information:

Species	# and life history stage	GPS Location (UTM)	Habitat Characteristics	Photograph? (individual and/or habitat)	Time of Day



## CIMFP Exhibit P-00271 - Appendix O - 16

### NALCOR ENERGY LOWER CHURCHILL PROJECT, ENVIRONMENTAL EFFECTS MONITORING PROGRAM – 2014 HERPTILE

	Ponds and small water bodies, side-pools of wetlands and lakes, roadside ditches and other ephemeral waterbodies	Wetlands	Small perennial fishless streams and rivers (especially ones with rocks beneath surface / protruding rocks)	Mesic / moist forest or thicket habitats near breeding ponds & ditches
Acoustic Listening for Peepers	$\checkmark$	$\checkmark$		
Area Searches Search under leaf litter, fallen logs, rocks		$\checkmark$		- blue-spotted salamander adults $$ - Northern two-lined salamander adults may forage up to 100m from water
<b>Dipnetting</b> (dip net sweeps can be used to flush individuals)	<ul> <li>√ - peeper tadpoles or egg masses; adults (adults may be flushed when walking perimeter of waterbody)</li> <li>√ - blue-spotted salamander larvae</li> </ul>	<ul> <li>√ - peeper tadpoles and adults (adults may be flushed when walking perimeter of wetlands)</li> <li>√ - Northern two-lined salamander may occur in small streams over peaty bottoms in a variety of wetlands</li> </ul>	√ - Northern two-lined salamander eggs, larvae, and adults (shuffle /turn over rocks and stream material and dip net downstream to catch potential larvae)	

### Search Methods / Species Encountered within Habitat Types



### NALCOR ENERGY LOWER CHURCHILL PROJECT, ENVIRONMENTAL EFFECTS MONITORING PROGRAM – 2014 HERPTILE

### Egg and Larval Forms of Herptile Species of Interest to the 2014 EEMP

Eggs – Northern Two-lined salamander



Eggs – Blue-spotted Salamander



Larvae - Blue-spotted Salamander



Larvae - Northern two-lined Salamander



Spring peeper tadpole -eyes lateral





NALCOR ENERGY LOWER CHURCHILL PROJECT, ENVIRONMENTAL EFFECTS MONITORING PROGRAM – 2014 HERPTILE





## CIMFP Exhibit P-00271 - Appendix O - 16

### NALCOR ENERGY LOWER CHURCHILL PROJECT, ENVIRONMENTAL EFFECTS MONITORING PROGRAM – 2014 HERPTILE



Species 💡 SPPE 💡 NTLS 💡 BLSS

#### NLTS = Northern Two-lined Salamander, SPPE = Spring Peeper, BLSS = Blue-spotted Salamander, MF = Muskrat Falls, GI = Gull Island

	Dato #		# General Coordinate (or Start Location) – 20U		Habitat Tupo	Constal Location			
	Date	#	Easting	Northing	Latitude	Longitude	париаттуре	General Location	
SPPE	23 July 2006	1 Adult	615496	5872317	52.9880	-61.2794	Fir/white spruce woodland	South side of MF Reservoir, close to GI	
SPPE	23 July 2006	1 Adult	598500	5872886	52.9965	-61.5323	Wetland	North side of GI Reservoir	
SPPE	23 July 2006	1 Adult	622058	5877853	53.0363	-61.1796	Wetland	South side of MF Reservoir, east of Gull Lake	
SPPE	24 July 2006	4 Adults	642593	5899397	53.2247	-60.8640	Gravel bar	South side of MF Reservoir	
SPPE	25 July 2006	1 Adult	607525	5869856	52.9675	-61.3989	Gravel bar	GI, north side River	
SPPE	29 July 2006	1 Adult	619202	5877102	53.0302	-61.2225	Mixed – deciduous dominant	North side of MF Reservoir, east of Gull Lake	
NLTS	12 July 2007	2 Adults	593170	5872132	52.9907	-61.6120	Riparian	North side of GI Reservoir	
BLSS	24 July 2007	>3 Larvae	635387	5896973	53.2048	-60.9729	Roadside pond / anthropogenic	Along TLH, north side of MF Reservoir	
NTLS	14 July 2008	1 Adult	654845	5905200	53.2734	-60.6778	Roadside pond / anthropogenic	Along TLH, downstream of MF Reservoir	
BI SS	14 July 2008	>20	669276	5906526	53 2809	-60.4609	Roadside pond / anthropogenic	Along TLH, downstream of ME Reservoir	
DESS	14 July 2000	Larvae	007270	3700320	55.2009	00.4009	Readine pond / anthopogenie		
BLSS	9 Oct 2013	1 Adult	648313	5902778	53.2535	-60.7768	Tree stump / recently cleared	North Spur, MF	



## APPENDIX D

2014 Herptile Data



### NALCOR ENERGY LOWER CHURCHILL PROJECT, ENVIRONMENTAL EFFECTS MONITORING PROGRAM – 2014 HERPTILE

Date	Northing	Easting	Start Time	Code	General Habitat / Comments	
June 16	611005	5871409	2145	0	At end of Gull Island road; sand / mixed forest	
June 16	610481	5571809	2201	2	Gull Island Road; sand / black spruce forest; SPPE >100m away	
June 16	609481	5872499	2220	0	Gull Island road; sand / black spruce forest	
June 16	609841	5873387	2236	1	Gull Island Road; three wetlands nearby and open black spruce forest along roadside; 2-3 SPPE	
June 16	611890	5875093	2251	1	TLH; clearing / open black spruce forest with wetlands ~ 500 m to east and west of TLH; ~1 SPPE	
June 16	613862	5877047	2306	0	TLH; adjacent to open / mulched area of TL and black spruce forest	
June 16	615068	5878732	2319	0	TLH; adjacent burn habitat and black spruce forest	
June 16	620625	5881602	2336	1	TLH; wetland ~300m to southwest; near access road AR 21; one SPPE	
June 16	621682	5882283	2342	1	TLH; wetlands north and south of road, near access trail AT 20; 3-5 SPPE calling	
June 16	626073	5887954	2355	1	TLH; black spruce forest; one SPPE	
June 17	622495	5882913	2124	0	TLH; near pond / black spruce forest; possible SPPE during 1-minute wait period	
June 17	623276	5883339	2137	2	TLH; wetland	
June 17	624169	5884353	2145	0	TLH @ entrance to Edward's Brook / Johnson's camp; extensive wetland on north side of TLH; previously heard chorus of SPPE here in late May	
June 17	628057	5889109	2200	1	TLH; wetland complex near access trail AT13; heard SPPE calling between stations	
June 17	630186	5891052	2214	2	TLH; between string bog and wetland / mixed forest	
June 17	631614	5893425	2229	1	TLH; adjacent to large sandpit / black spruce habitat; one SPPE in distance	
June 17	634528	5895873	2246	2	TLH; sandy area with wetlands nearby (<250m)	
June 18	636131	5897564	2118	0	TLH; gravel pit on north side	
June 18	636267	5898457	2132	0	TLH side road; open area with sand / mixed forest	
June 18	640467	5901194	2154	0	TLH; recently cut TL intersecting bordered by open black spruce forest	
June 18	640959	5901479	2209	1	TLH; adjacent to cleared area / wetlands / mixed forest; one SPPE	
June 18	641529	5902655	2223	1	TLH; sandy area with adjacent forest	
June 18	644612	5904535	2245	0	TLH side road; sand with wetlands in distance / black spruce forest	
SPPE = Spri	SPPE = Spring Peeper, TLH = Trans Labrador Highway, TL = Transmission Line					

#### 2014 Spring Peeper Road Call Survey Results Table D.1



### NALCOR ENERGY - LOWER CHURCHILL GENERATION PROJECT - EEM PROGRAM - 2014 HERPTILE PROGRAM

## **Amphibian Search Record**

Date: 12 The	Weather Conditions:
	Warm / Sonny >20-2502
Field Lead & team: Karen R + crews.	General Location (reservoir/TL):
	UTM Location: @ start of survey or central to survey area
	625291, 5885660
Habitat Description: Open black Spree	( low quality for herps)
Start Time: App not	End Time:

Search Method used	Species Observed	Comments (e.g., life stage, #'s)
Dip Netting	Spring Peeper	
Ground Search	🗆 American Toad	looked inder
(under fallen trees, leaves and other	Northern Leopard Frog	the Fallen log etc.
debris)	Mink Frog	by our location
	Wood Frog	relatively far
	Bive-spotted Salamander	from water t
	Northern Two-lined Salamander	generally day other
	Unknown Salamander	mmembers scarched
	Unknown Frog	obs.

For all species of interest (i.e., peepers or salamanders), record the following information:

Species	# and life history stage	GPS Location (UTM)	Habitat Characteristics	Photograph? (individual and/or habitat)	Time of Day
140					



### NALCOR ENERGY - LOWER CHURCHILL GENERATION PROJECT - EEM PROGRAM - 2014 HERPTILE PROGRAM

## **Amphibian Search Record**

Date:	Weather Conditions:			
12 June	Warm, smny (>20°-25°2)			
Field Lead & team:	General Location (reservoir/TL):			
Karren R + warnis	Wetland C Road to Johnson's Camp.			
	UTM Location: @ start of survey or central to survey area			
	624474, 5884751			
Habitat Description: PREVIOUS LY	Heard a Chorus of SPPE have in late May!			
, wetland complex	larers of open water summed			
by cabins, forested are	Ca da			
Start Time:	ILr. End Time:			
<u></u>	๚๚๚๚๚๚๚๚๚๚๚๚๚๚๚๚๚๚๚๚๚๚๚๚๚๚๚๚๚๚๚๚๚๚๚๚๚๚			

Search Method used	Species Observed	Comments (e.g., life stage, #'s)
Dip Netting	Spring Peeper	
Ground Search	🗆 American Toad	4 N. Leopard hory
(under fallen trees, leaves and other	🕑 Northern Leopard Frog	adults
debris)	Mink Frog	1 6/ - 4.15
	Wood Frog	I multi hand
	Blue-spotted Salamander	
	🗆 Northern Two-lined Salamander	
	🛛 Unknown Salamander	
	🗆 Unknown Frog	

For all species of interest (i.e., peepers or salamanders), record the following information:

Species	# and life history stage	GPS Location (UTM)	Habitat Characteristics	Photograph? (individual and/or habitat)	Time of Day
n/a					
170					9
		· ·			



## **Amphibian Search Record**

Date:	Weather Conditions:
June 26/14	HOT
Field Lead & team:	General Location (reservoir/TL):
DUSTIN OFTEN	T/L
Jama Lucaus	UTM Location: @ start of survey or central to survey area
JARED ILLERIN	0627484: 5888704
Habitat Description:	n en en fregen en e
- smell water bu	he HUY dep
Start Time: 150.0	End Time: 1600

Search Method used	Species Observed	Comments (e.g., life stage, #'s)
Dip Netting	Spring Peeper	10 - NLFR aluHs
Ground Search	🛛 American Toad	NSO-NLER tadjoles
(under fallen frees, leaves and other dobrin)	🗹 Northern Leopard Frog	N200 - ANTO tedpoles
debns)	🗆 Mink Frog	
2 A		4 · · · ·
· · · · ·	Blue-spotted Salamander	
	🗆 Northern Two-lined Salamander	0.
	🗌 Unknown Salamander	
	🗌 Unknown Frog	

For all species of interest (i.e., peepers or salamanders), record the following information:

8 *9* 

Species	# and life history stage	GPS Location (UTM)	Habitat Characteristics	Photograph? (individual and/or habitat)	Time of Day
		e 1 gurenn fijdetritking stiggt settittinger und ander händer 1	terilitari da companya and and a companya and a com		<u>e - 1017722 - Lunco recorde</u>
			andra in the state of the state		in en en sen sen sen sen sen sen sen sen
Heiden annan an	a Antimis surge continues of the local straight of the	anta gan ya kata da anga da na kata da na manakata na kata da na k Na kata da na	a da ta		, Manufata anna an Anna Anna an Anna an
iju mainen andre geographisken verse opgest sentifiset finder operation andre statistical sentencies			en e		kappy junti atta ingi je kini atta kini di pisa di kapa dani i ingi na pisa di kapa di

## **Amphibian Search Record**

Date:	a initia and an	Weather Conditions:		
June 26	14	Hot/SURLY 21°C		
Field Lead & team:		General Location (reservoir/TL):		
DUSTIN OA	TEN	Reservoir		
- 1 0'	Pilser	UTM Location: @ start of survey or central to survey area		
Jared (+1		0644787: 5904522		
Habitat Description:	•			
Small the	e lon	*		
Start Time: 1030		End Time: 1100		

Search Method used	Species Observed	Comments (e.g., life stage, #'s)		
Dip Netting	Spring Peeper	-No observations		
Ground Search	🗆 American Toad	- SURIAL NDOOM		
leaves and other	Northern Leopard Frog			
debris)	Mink Frog	too prohitition		
*	🗌 Wood Frog			
ŕ.	🗆 Blue-spotted Salamander	for surveying.		
	🗆 Northern Two-lined Salamander	PLutur		
	🗆 Unknown Salamander	105-20.01		
· · ·	🗆 Unknown Frog			

For all species of interest (i.e., peepers or salamanders), record the following information:

Species	# and life history stage	GPS Location (UTM)	Habitat Characteristics	Photograph? (individual and/or habitat)	Time of Day
		i 			an an the second se
			n fi sharilm iliyoti nizin ti daki nin kayi ana masa a yang masa mana ti		niyi inan mananga ina birin ina in
iteratura interneti anterneti anterneti de la constante de la constante de la constante de la constante de la c		1.0	ngi pagi ngi ngi ngi ngi ngi ngi ngi ngi ngi n		
		ny manager and the strand strands any description of the strands of the	un de la companya de		
n förstanda sinna sociale social sind sind social social social social social social social social social socia			aliya ana ana ana ana ana ana ana ana ana a		
			n in production of the second s		

## **Amphibian Search Record**

Date:	Weather Conditions:		
JUNE 27/14	HOT-31°C		
Field Lead & team	General Location (reservoir/TL):		
DUSTIN OATEN	RESERVOIR		
Jared Pilgrim	UTM Location: @ start of survey or central to survey area 635734 ; 5892698		
Habitat Description:			
Along Churchill	River		
Start Time: 0900	End Time: 1100		

\* \*

Search Method used	Species Observed	Com	ments (e.g., lif	e stage, #'s)
Dip Netting	□ Spring Peeper	9		
C <sup>C</sup> Ground Search	🔀 American Toad	3	AMTO	Jults
(under fallen frees, leaves and other	Northern Leopard Frog			
debris)	Mink Frog			ų.
	🗆 Wood Frog			4
ت	Blue-spotted Salamander			. *
*	🛛 Northern Two-lined Salamander			ج
	🗆 Unknown Salamander			
ح ·	🗆 Unknown Frog	1 		\$:

For all species of interest (I.e., peepers or salamanders), record the following information:

p. 10

Species	# and life history stage	GPS Location (UTM)	Habitat Characteristics	Photograph? (Individual and/or habitat)	Time of Day
		n na na mana ang ing ang ang ang ang ang ang ang ang ang a	ter en		
alatan kilonan kipang menjanan kipang kipan Mang menjaran 2010 pini kiman kang menjaran kina pana kina pana kina		alan mula da alista da angan da ang da ang da a Mangan mula sa angan da angan da angan da angan da angan da ang	en e		
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		stimenen in die die sind hein institution in die state aus die state aus die state aus die state aus die state annen men ander aus die state die state die state die state aus aus aus aus aus die state aus die state aus aus	an a		