

Spring Peeper (*Pseudacris crucifer*) in Labrador, Canada: an update

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Abstract

Spring Peeper (*Pseudacris crucifer*) was first confirmed in Labrador in 1998, when vocalizations were recorded near Happy Valley-Goose Bay. Prior to this, only unsubstantiated reports of Spring Peepers in Labrador existed. In 2006, we visually documented nine Spring Peepers at six locations west of Happy Valley-Goose Bay, in the lower Churchill River valley. In 2014, using auditory surveys, we further documented 1–10 Spring Peepers calling at 13 additional locations in the same general area. These new records support earlier findings and provide additional information on the species at the extreme northeastern edge of its range.

Key words: Amphibian; Spring Peeper; *Pseudacris crucifer*; range; Labrador

Introduction

Bleakney (1954) reported that a student described watching “tiny tree frogs with suction disc finger tips and huge vocal sacs” in a ditch near Menihék Lake Camp in western Labrador, suggesting that the frogs in question were Spring Peepers (*Pseudacris crucifer*). Maunder (1983) subsequently reported that two environmental personnel working in Labrador heard what they believed to be at least one Spring Peeper calling on the evening of 11 July 1980 near Thomas Brook (53.17°N, 60.93°W) in the lower Churchill River Valley.

However, the first tangible evidence for Spring Peepers in Labrador was provided by Bergman (1999). In her account, Bergman described hearing infrequent calls of single Spring Peepers throughout the day on 14 June 1998 while canoeing on the Peters and Goose Rivers (between 53.33°N, 60.78°W and 53.40°N, 60.43°W), as well as a large chorus of Spring Peepers that same evening adjacent to the Goose River (53.38°N, 60.48°W). The following evening, she made an audio recording of two Spring Peepers calling in a small marsh on the south bank of the Goose River (53.37°N, 60.50°W). This recording is vouchered in the natural history collection of The Rooms Provincial Museum in St. John’s, Newfoundland (NFM HE-122). In an addendum to her publication, Bergman indicated that she had been informed that school children had observed “weensy tree frogs” with “sticky feet” that were consistent in colour with Spring Peepers, in the trees and bushes near Gosling and Alexander Lakes, near Happy Valley-Goose Bay.

Since Bergman’s (1999) publication, there have been no additional peer-reviewed, published records of the species in Labrador. However, in 2006, a series of field-based studies was initiated in support of an environ-

mental assessment of the Lower Churchill Hydroelectric Generation Project. As part of these studies, we documented Spring Peepers and other amphibians along the north and south sides of the lower Churchill River Valley in central Labrador.

Methods

Our study area focussed on the segment of the lower Churchill River Valley between Horse Island Rapids (52.9965°N, 61.5323°W) and Muskrat Falls (53.2247°N, 60.8640°W; Figure 1), in the vicinity of the abovementioned hydroelectric project. Specifically, we surveyed natural habitats within 2 km of the river and its tributaries, primarily in road accessible areas. Note: on completion of the hydroelectric project, the projected reservoir-related flooding will not inundate much of the area we surveyed (see Figure 2-1 and Figure A-1 in Stassinu Stantec 2014).

Ground surveys to locate and identify amphibians occurred 13–15 July 2006 in 27 locations in our study area, as well as in areas along the Goose River and Lake Winokapau (Minaskuat Inc. 2008a). To supplement these efforts, observations of amphibians were collected during five other field programs targetting other components (e.g., wetland and rare plant surveys), but inclusive of suitable habitat for amphibians. Combined, these surveys spanned a period from 24 June to 14 September 2006 and involved visits to >400 locations over 75 field days (Minaskuat Inc. 2008b,c,d,e,f). All surveys were conducted by groups of 2–4 people (with at least one wildlife biologist per group) operating per field day. Groups walked through wetlands and forested habitats as they were encountered and documented all amphibians heard or observed.

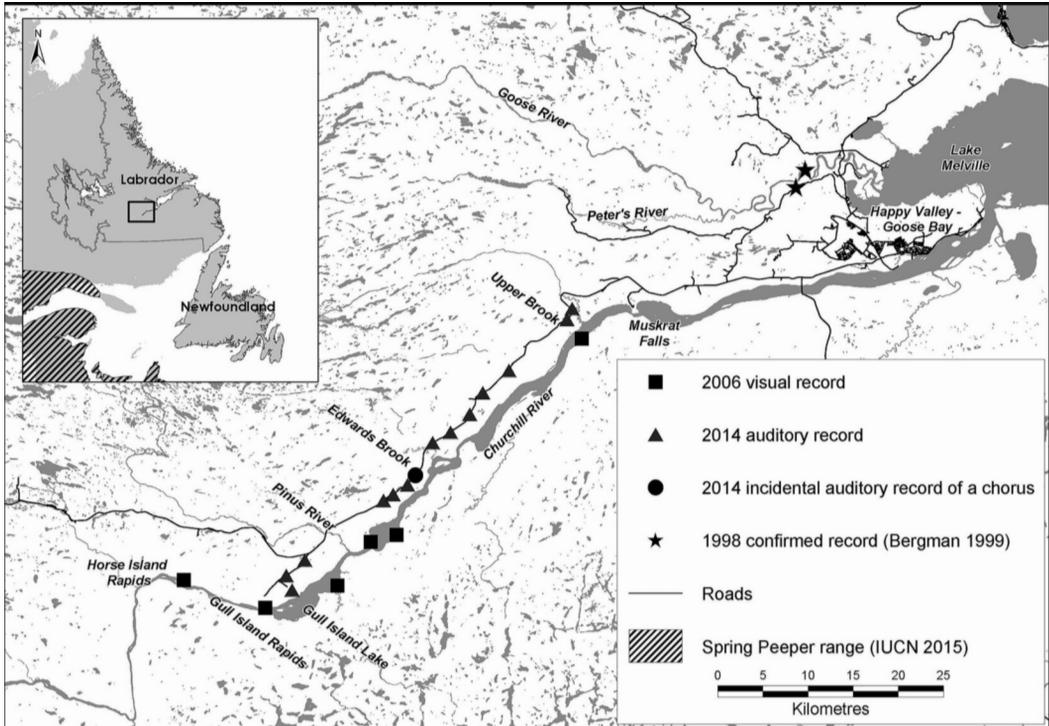


FIGURE 1. Spring Peeper (*Pseudacris crucifer*) records in Labrador, Canada.

To gain a more complete understanding of the extent of Spring Peeper distribution within our study area, we conducted systematic auditory surveys in 2014. Twenty-three locations along the lower Churchill River Valley were surveyed over three evenings, 16–18 June, coinciding with the expected breeding period for Spring Peeper (based on calling activity) in the region. Auditory survey locations were spaced a minimum of 0.8 km apart (based on standard operating procedures: nocturnal amphibian survey [unpubl.]; Stantec, Corner Brook, Newfoundland and Labrador; March 2014) along road-accessible areas between Gull Island Lake (52.9845°N, 61.3543°W) and Muskrat Falls.

Surveys started ~0.5 h after sunset (between 2110 and 2130) and were conducted only when winds were <20 km/h, there was little or no precipitation, and air temperatures were >10°C. At each stop, a two-person team listened for calling Spring Peepers for 5 minutes. If the number of Spring Peepers calling could not be distinguished (because of call overlap), we estimated a range for the total number of Spring Peepers in the area (e.g., 6–10 individuals).

Results

During the 2006 ground surveys, we found nine Spring Peepers at six locations (Table 1). On 24 July, three recently transformed froglets (Figure 2a) and

one adult (Figure 2b) were found in a wetland complex made up of bog, swamp, and shallow water, located at 53.2247°N, 60.8640°W (Figure 2c). Between 23 and 27 July, five adults were found at five other locations between Horse Island Rapids and Pinus River (53.0363°N, 61.1796°W; Table 1). We did not capture and preserve any of the frogs encountered but took representative images (Figures 2a and 2b) that have been deposited in the natural history collections of The Rooms Provincial Museum (NFM HE-121).

During the 2014 auditory surveys, we documented Spring Peepers calling at an additional 13 locations (Table 1). We documented 6–10 individuals at three locations, 2–5 individuals at another three locations, two individuals at two separate locations, and a single individual at the remaining five locations. We did not make any audio recordings of the calls. All Spring Peeper observations in 2014 were from locations different from those identified in 2006. We did not hear any choruses during the surveys; however, K.R.R. previously heard a Spring Peeper chorus within the study area (53.0942°N, 61.1457°W) while conducting avifauna surveys in late May of the same year. This location, a shallow water wetland along the Trans Labrador Highway, was visited again during auditory sampling on 14 June, but no Spring Peepers were calling at that time.

TABLE 1. Visual and auditory records of Spring Peepers (*Pseudacris crucifer*) in the lower Churchill River Valley, Labrador, Canada, in 2006 and 2014. For the auditory records, the general location and coordinates indicate the position of the biologist during the survey.

| General location and habitat | No. peepers | Year | Date | Survey type | Location |
|---|-------------|------|---------|-------------|---------------------|
| Alder (<i>Alnus</i> sp.) shrub habitat on the banks of a tributary inflow to the Churchill River (southside) near Gull Island Lake | 1 adult | 2006 | July 23 | Visual | 52.9880°N 61.2794°W |
| Open fen/bog along the northside of the Churchill River near Horse Island Rapids | 1 adult | 2006 | July 23 | Visual | 52.9965°N 61.5323°W |
| Wetland along the southside of the Churchill River near Pinus River | 1 adult | 2006 | July 23 | Visual | 53.0363°N 61.1796°W |
| Bog/swamp/shallow water wetland complex along the southside of the Churchill River near Lower Brook. | 1 adult | 2006 | July 24 | Visual | 53.2247°N 60.8640°W |
| | 3 juveniles | | | | |
| Open bog along the northside of the Churchill River near Gull Island rapids | 1 adult | 2006 | July 25 | Visual | 52.9675°N 61.3989°W |
| Mixed deciduous forest along the northside of the Churchill River near Pinus River | 1 adult | 2006 | July 29 | Visual | 53.0302°N 61.2225°W |
| Gull Island road | 6-10 | 2014 | June 16 | Auditory | 52.9988°N 61.3633°W |
| Gull Island road | 2-5 | 2014 | June 16 | Auditory | 52.9988°N 61.3633°W |
| TLH* between Pinus River and Edwards Brook | 1 | 2014 | June 16 | Auditory | 53.0137°N 61.3322°W |
| TLH* between Pinus River and Edwards Brook | 1 | 2014 | June 16 | Auditory | 53.0703°N 61.1996°W |
| TLH near Edwards Brook | 2-5 | 2014 | June 16 | Auditory | 53.0762°N 61.1836°W |
| TLH between Pinus River and Edwards Brook | 1 | 2014 | June 16 | Auditory | 53.1261°N 61.1158°W |
| TLH between Edwards Brook and Lower Brook | 2 | 2014 | June 17 | Auditory | 53.0852°N 61.1594°W |
| Along the TLH | 6-10 | 2014 | June 17 | Auditory | 53.1360°N 61.0857°W |
| Along the TLH | 2 | 2014 | June 17 | Auditory | 53.1529°N 61.0531°W |
| TLH between Edwards Brook and Lower Brook | 1 | 2014 | June 17 | Auditory | 53.1739°N 61.0308°W |
| TLH between Edwards Brook and Lower Brook | 6-10 | 2014 | June 17 | Auditory | 53.1952°N 60.9862°W |
| TLH between Edwards Brook and Lower Brook | 1 | 2014 | June 18 | Auditory | 53.2439°N 60.8875°W |
| TLH between Edwards Brook and Lower Brook | 2-5 | 2014 | June 18 | Auditory | 53.2543°N 60.8785°W |

*TLH = Trans Labrador Highway.



FIGURE 2. Spring Peepers (*Pseudacris crucifer*) captured in a small wetland complex adjacent to the main stem of the lower Churchill River, Labrador, on 24 July 2006 (53.2247°N, 60.8640°W). a. Recently transformed Spring Peeper captured in a dip net. b. Adult Spring Peeper found in a peat moss (*Sphagnum* sp.) dominant carpet punctuated by patches of low shrubs, graminoids, and forbs. c. Aerial view of the location of Spring Peeper captures. Photos: M.D. MacDonald.

Discussion

To date, all tangible records of Spring Peepers in Labrador have been from within the High Boreal Forest (Lake Melville) Ecoregion (Meades 1990). This ecoregion is considered unique in Labrador in that summers are warmer and shorter and winters less severe than in the adjacent ecoregions (Meades 1990; Way *et al.* 2016). The ecoregion itself has been described as a “thermal oasis” because it supports several species, including Leopard Frog (*Lithobates pipiens*), that are typically only found further south (Maunder 2016). The occurrence of more “southern” species in the ecoregion

has been attributed to a historical northward shift in warm temperatures and, consequently, warmer-area species, followed by a southward shift and subsequent cooling that left some of those species trapped in the area (Maunder 2016; see also Vilks and Mudie 1983; Way *et al.* 2016).

Relative to our study area in the lower Churchill River, the nearest records of Spring Peepers are from >400 km away, near Sept-Îles, Quebec (Bleakney 1954; Bider and Matte 1996) and, possibly, western Labrador near Menihék Lake Camp (Bleakney 1954). As such, Spring Peeper populations near Happy Valley-Goose

Bay and along the lower Churchill River Valley appear to be functionally isolated from neighbouring populations to the south and west and are considered “disjunct”. However, as we did not survey any areas outside of the lower Churchill River Valley and given the limited amphibian-related research in Labrador in general, it remains possible that Spring Peepers, like Wood Frogs (*Rana sylvatica*; Chubbs and Phillips 1998), occur in isolated populations elsewhere in Labrador. Whether the populations of Spring Peepers documented here and by Bergman (1999) are disjunct from populations in neighbouring Quebec requires further study.

Before our study, the only confirmed record of Spring Peepers in Labrador was Bergman’s (1999) account of this species near Happy Valley-Goose Bay. Here, we documented the presence of Spring Peeper over a larger geographic area in central Labrador, including 19 areas south and west of Bergman’s observations. Bergman indicated that the closest confirmed record of Spring Peeper was 500 km to the southwest of her observation, near Sept-Îles, Quebec. Our study has narrowed this gap by approximately 80 km and has provided additional information on this species at the extreme north-eastern edge of its range.

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