

# SNOWY TREE CRICKETS IN MANITOBA

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The 11 species of true crickets (Insecta: Orthoptera: Gryllidae) from Manitoba are easily recognized when males communicate (sing) to attract mates, to promote copulation, and to aggressively interact with other male crickets.<sup>1</sup> The songs of different species are distinguished by both sound frequency and the rhythm in which individual chirps are produced.<sup>1</sup>

On the evening of 1 September 2023, the authors were listening to the sounds of crickets in a rural area near Petersfield, Manitoba when a debate ensued regarding the species singing that night. After listening to numerous recordings of cricket species found in Manitoba, which soon extended to other species found elsewhere in North America, a consensus was reached that numerous crickets singing that night were Snowy Tree Crickets (*Oecanthus fultoni*). Although the primary author noted that these cricket songs had been present since he moved to the property in 2014, little evidence was found of this species in Manitoba.

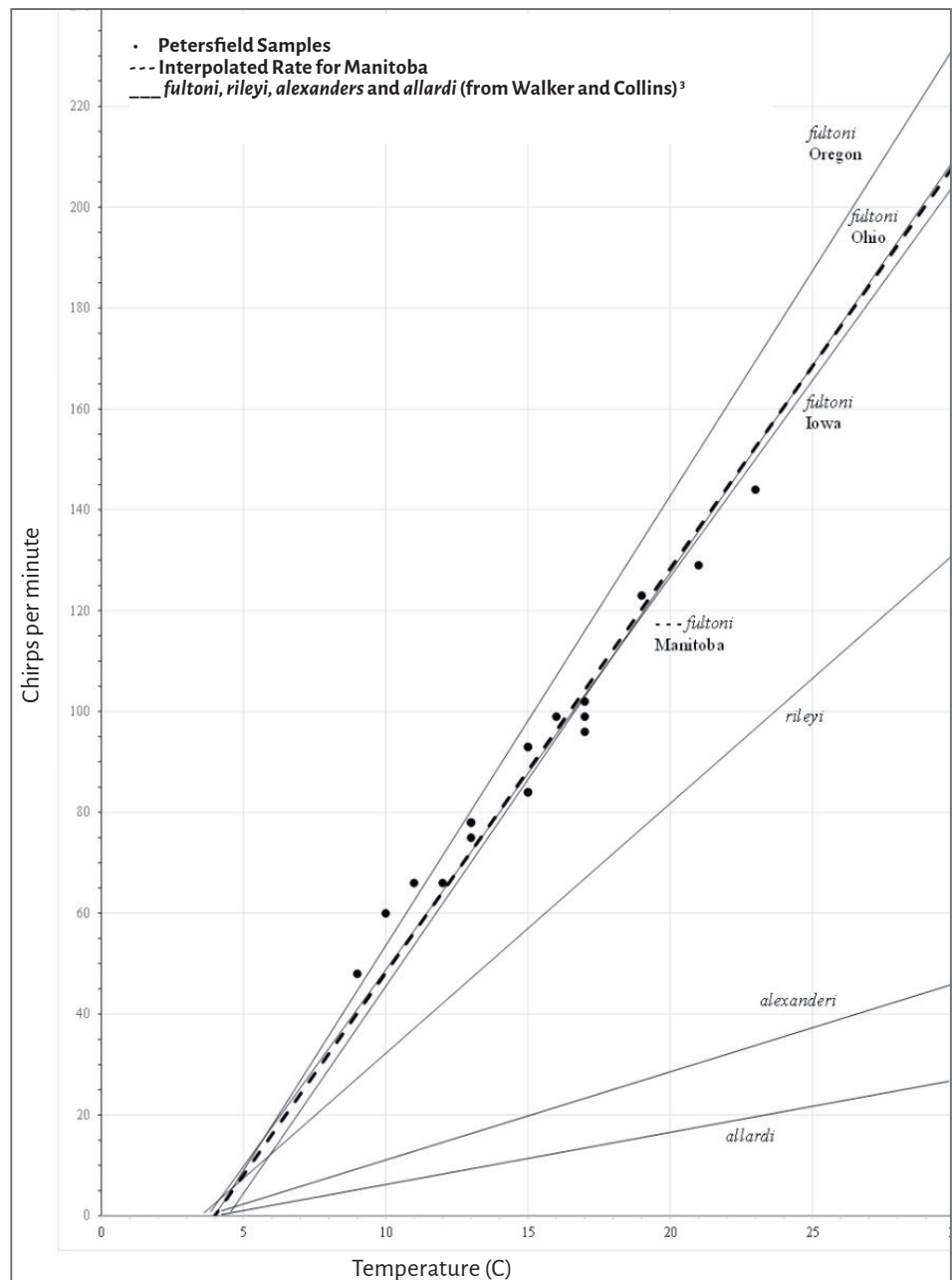
To further explore the distribution of these Snowy Tree Crickets, audio recordings of crickets were collected on the property and elsewhere using ASR (Another Sound Recorder) recording application for Android phones. A minimum of 10 seconds was used for all recordings. Temperature measurements were taken from an AcuRite Iris® weather station located 3 m above ground level (agl). Although the accuracy of recording temperature would have been improved with a portable thermometer, the fixed weather station located near most sample points, was selected for convenience.

Initial audio recordings of Snowy Tree Crickets were collected and submitted to iNaturalist for corroboration.<sup>2</sup> Cricket

expert N. Collins responded and verified that the species we recorded on a property near Petersfield, Manitoba was *O. fultoni*. After exploring iNaturalist further, we recognized that we were not the first community scientists to record Snowy Tree Crickets in Manitoba. There is one recording of Snowy Tree Cricket by M. Krieger, who recorded the first Snowy Tree Cricket in Bird's Hill Park, Manitoba on 28 September 2022. To further validate species identification, we collected additional audio recordings of a few individual crickets from 1 to 29

September 2023.

Other tree crickets (in the *rileyi* group) are also known as thermometer crickets because their chirp rates generally follow a linear relationship with temperature (i.e., chirp rates increase as the air temperature increases).<sup>3</sup> Chirp rates were plotted against temperature (Figure 1). The linear trendline was interpolated with the intercept set to zero<sup>3</sup> at 4°C with an  $R^2 = 0.9756$ . As the chirp rate points and trend line suggest, the crickets recorded in Petersfield followed the same pattern as the Snowy Tree Crickets



**FIGURE 1.** Comparison of new world thermometer cricket chirp rates to the Snowy Tree Cricket chirp rate recorded near Petersfield, Manitoba.

published elsewhere.<sup>3</sup> The spectrogram and of a representative song and chirp rate of a Petersfield individual was plotted (Figure 2) using Raven Lite.

*O. fultoni* is part of a group of closely related species (*rileyi* group) which includes a western species *O. rileyi* found in Canada.<sup>4</sup> Although the range of *O. rileyi* includes southern British Columbia (BC), it seems not to have been recorded east of BC. Its song is very similar to that of the Snowy Tree Cricket. We distinguished our crickets from *O. rileyi* based on song characteristics in Figure 1 and on the 2-3-3 cadence of the eight pulses within a chirp visible in Figure 2.<sup>4</sup> Interested readers can listen to tree cricket recordings on The Orthopterists' Society website.<sup>5</sup>

On 14 September 2023, a survey was done of Snowy Tree Crickets where calling males were approached with a flashlight with the goal of capturing a specimen. Searching intensively for one individual proved frustrating; moving between individuals after about one minute of searching quickly resulted in finding an individual, which was captured and photographed (Figure 3). Because we were uncertain of how abundant this species was at the time of collection, we released the individual. After contacting the curator at University of Manitoba's J. B. Wallis / R. E. Roughley Museum of Entomology collection<sup>6</sup>, we were advised to collect and submit an individual for morphological verification. At the time of submission, we were not successful in capturing another Snowy Tree Cricket.

Audio reconnaissance surveys were used to identify about a dozen crickets that were living inside forested areas of the property. These crickets appeared to sing from plants at a height ranging from 0.5 to 1.5 metres agl. The habitat on the area searched is dominated by trembling aspen (*Populus tremuloides*) forest cover, with occasional secondary tree species of bur oak (*Quercus macrocarpa*) and balsam poplar (*Populus balsamifera*). The shrub layer has many species of fruiting shrubs such as American plum (*Prunus americana*), saskatoon (*Amelanchier alnifolia*), hazel (*Corylus* sp.), hawthorn (*Crataegus* sp.) and chokecherry (*Prunus virginiana*). This corresponds well to Walker's habitat description for the Snowy Tree Cricket.<sup>4</sup>

Audio reconnaissance surveys were used to map the local distribution of Snowy Tree Crickets in the wider Petersfield area. Roadside point samples were performed by driving, stopping, and listening for crickets at selected forest patches within 8 km of the area where they were initially detected. Positive Snowy Tree Cricket detections were mapped (Figure 4). One set of samples was taken on a line south of Lake Winnipeg, about half-way between Bird's Hill Park and Petersfield, Manitoba, to try and determine if the known population between these areas was somewhat widespread; no Snowy Tree Crickets were detected. None were detected in a survey carried out in south Winnipeg. One other species, the four-spotted tree cricket (*Oecanthus quadripunctatus*) appeared to

be common in audio surveys.

One genus and four species of tree crickets (Oecanthinae) were found to be in the University of Manitoba's J. B. Wallis / R. E. Roughley Museum of Entomology collection.<sup>6</sup> Specimens from Manitoba included Prairie Tree Cricket (*Oecanthus argentinus*), Black-horned Tree Cricket (*O. nigricornis*), Narrow-winged Tree Cricket (*O. niveus*) and Four-spotted Tree Cricket (*O. quadripunctatus*) but excludes Snowy Tree Cricket (*O. fultoni*). Orthoptera of Manitoba lists Forbes's Tree Cricket (*O. forbesi*) but excludes *O. niveus* and *O. fultoni*.<sup>7</sup>

In North America, Snowy Tree Cricket range includes Mexico and the contiguous United States, except Montana, Florida and Mississippi. The Canadian portion of its range includes southern Quebec, southern Ontario, and southwestern British Columbia. The first Snowy Tree Cricket observation in Bird's Hill Park, Manitoba (M. Krieger in 2022) extends its range about 375 km northward into Manitoba from Minnesota. The population found near Petersfield Manitoba would further extend the range of Snowy Tree Crickets northward into the prairie provinces by 30 km.

Based on the evidence provided, the Snowy Tree Cricket should be added to the list of tree cricket species found in Manitoba. We did not find it in small, isolated forest stands we sampled; it did, however, occur in the relatively large contiguous area of forest near Petersfield in our study, and in Bird's Hill Park, where M. Krieger recorded a song in 2022. More work is needed to determine the

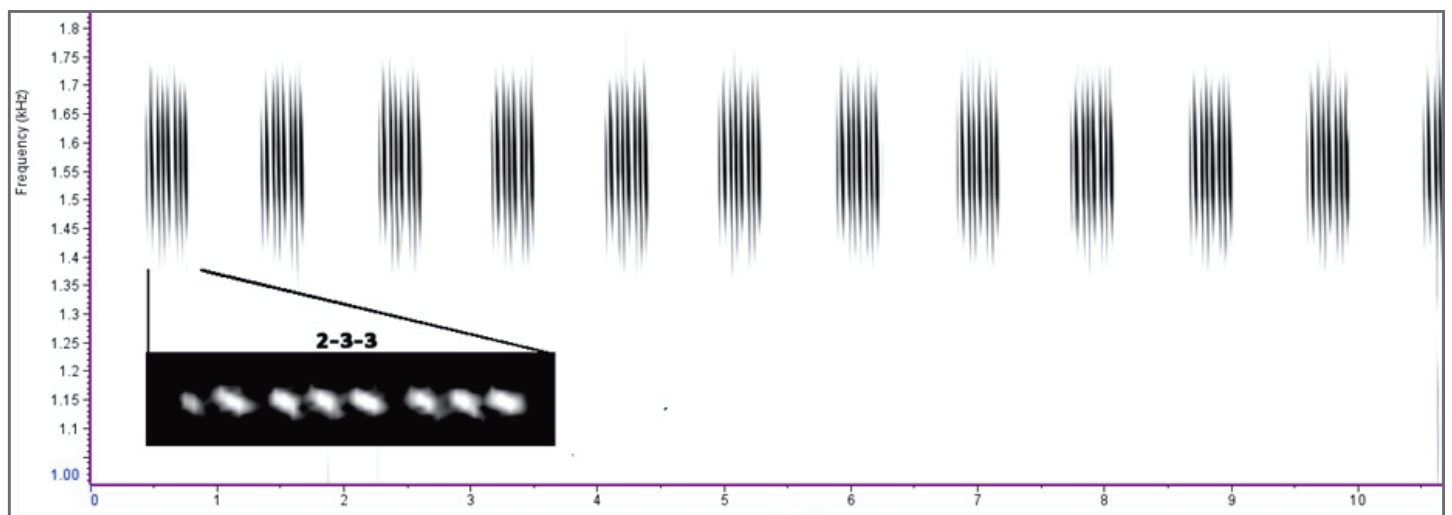
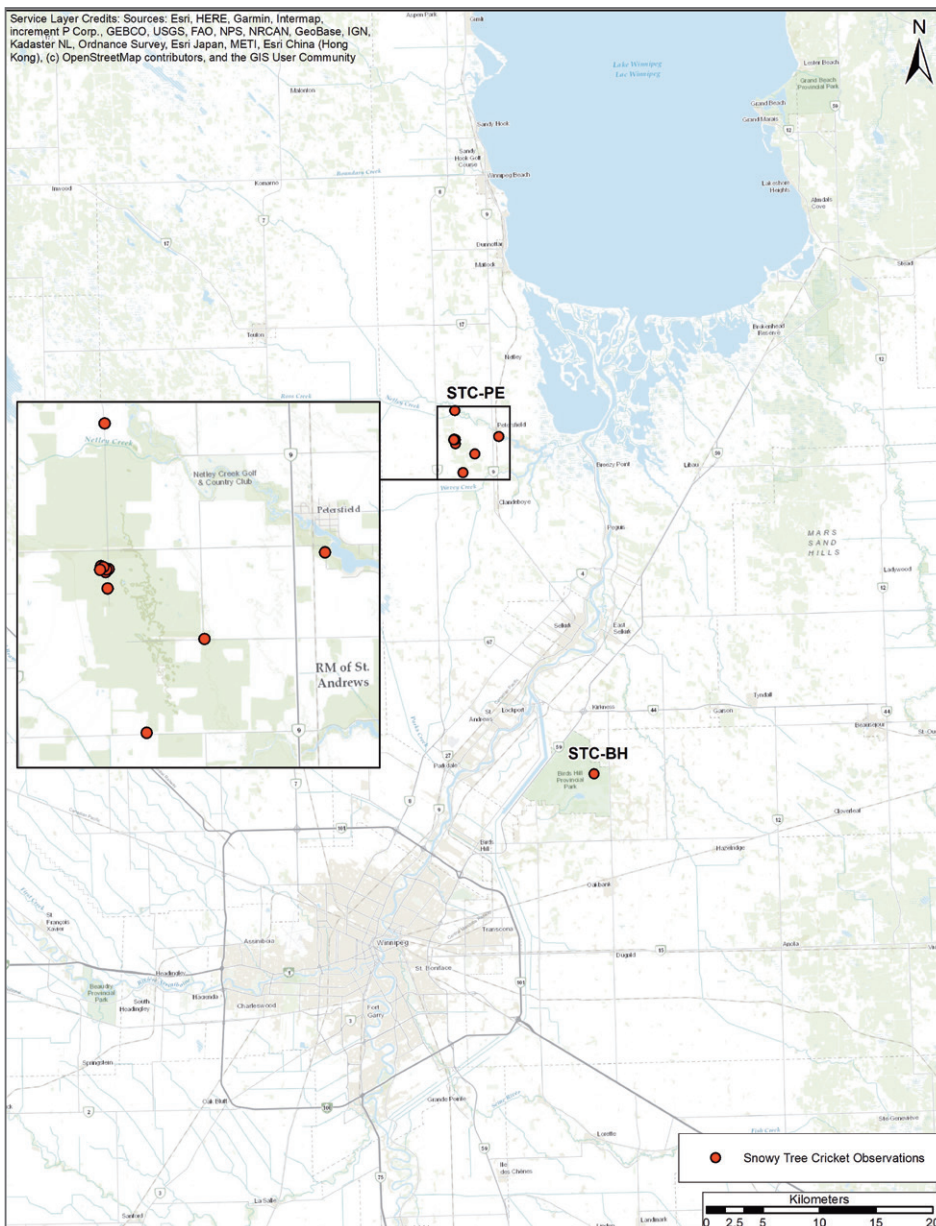


FIGURE 2. Spectrogram of the calling song of Snowy Tree Cricket at 12°C. Note that there are 11 chirps in 10 seconds with each chirp containing 8 pulses, generally in a 2-3-3 pattern.



**FIGURE 3.** Male Snowy Tree Cricket shown (left) in the position in which it was singing, and (right) in detail. Photos by A. McIlraith.



**FIGURE 4.** Locations of Snowy Tree Cricket north of Winnipeg, Manitoba, Canada. STC-PE is location near Petersfield, STC-BH is location in Bird's Hill Park. Inset shows detail of locations at STC-PE.

distribution, dispersion, and range of Snowy Tree Crickets in Manitoba and elsewhere in western Canada. We would like to encourage community scientists to post their observations on iNaturalist.

### Acknowledgements

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