

Pilot Study of Boreal Chorus Frog and Wood Frog Distribution and Aquatic Habitat Conditions in Cape Churchill, Manitoba

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Introduction

In June 2002, we initiated a pilot study to examine the distribution and habitat associations of boreal chorus frogs (*Pseudacris maculata*) and wood frogs (*Rana sylvatica*) in the vicinity of the Nestor One Field Station, Cape Churchill, Manitoba. Our interest was in developing methods that would allow future, more complex studies of these two species in the tundra ecosystem. Objectives of our study were to:

1. Determine presence and relative abundance of boreal chorus frogs and wood frogs in the study area.
2. Examine relationships between frog occurrence and distance to the Hudson Bay shoreline.
3. Assess H₂O quality (pH, conductivity, total dissolved solids) of water bodies where frog species were located.

Methods and Results

Frog surveys were conducted along four transects that were selected using a stratified random sample method. Each transect originated at a randomly selected location along the coastline of Hudson Bay and terminated 3-km inland. Surveys were conducted by volunteers from the Canada Goose research teams at Nestor One. Thus, logistical and personnel constraints necessitated that some surveys were done in poor conditions (e.g., wind) that may have influenced detectability.

Transects lengths seemed to be adequate in that the range of landscape features of the area were represented. Aural detection and identification of frogs was found to work well, but visual identification was rare. Locations where frogs were detected within the 10m belt transect were sampled for pH and temperature with a handheld combination water tester (Hanna Instruments). Calibration buffer solutions were not available so total dissolved solids (TDS) and conductivity were not accurately measured during the pilot study. The nearest water body to the detection point was sampled for paired comparisons of pH and temperature.

Frogs could be heard at substantial distances but often became quiet when observers approached within 20 m. This became problematic in that the transect width was *a priori*

set at 10 m. Thus, we had few sampling points during the pilot study. Following the trial protocol, only six detection/sampling points were located along three transects. Wood frogs were detected at three locations, chorus frogs at one location, and both species at two locations. Aural detection indexing indicated multiple frogs were present and calling at half of the locations.

Mean distance of sampling points was 1289 ± 303 m from the Hudson Bay shoreline. Detection points were in sedge areas or willow thickets that were either flooded by melt water or were along the shorelines of freshwater lakes. Frogs appeared to occupy pools with lower pH ($\bar{x} = 7.66 \pm 0.26$) compared to that found in random paired pools ($\bar{x} = 8.37 \pm 0.15$) but the difference was not significant ($t_5 = -2.279$, $P = 0.07$). Water temperature at occupied sites was $18.13^\circ \pm 1.42^\circ$ C compared to $15.52^\circ \pm 1.13^\circ$ C at paired sites. However, these results should be considered only as a preliminary assessment due to the very limited sample size and nature of the pilot study.

Future Research

Our data collection was very limited during the 2002 study and we were unable to meet the initial objectives. However, the 2002 pilot study allowed us to identify problems in the protocol and study design that we can easily correct. Pending acquisition of funding, we anticipate having a researcher continuing this study for a two-week period during the summer of 2003. We will use the experience from the 2002 pilot study to revise the protocol. Belt transects of 50m will be used instead of 10m. All locations where frogs are detected within the belt transect and all freshwater pools intersected by the transect path (route walked, not the entire belt) will be sampled for pH levels, TSD, conductivity, depth and temperature, and a qualitative description will be noted for each. These data will be used to evaluate habitat use and distribution of the two frog species in the study area.