



Acoustic and morphological identification of the sympatric cricket frogs *Acris crepitans* and *A. gryllus* and the disappearance of *A. gryllus* near the edge of its range

JONATHAN P. MICANCIN^{1,2} & JEFF T. METTE¹

¹Department of Biology, University of North Carolina, Chapel Hill, North Carolina 27599, USA

¹Corresponding Author. E-mail: micancin@email.unc.edu

Abstract

Although the Northern Cricket Frog, *Acris crepitans*, and Blanchard's Cricket Frog, *A. c. blanchardi* or *A. blanchardi*, have declined in areas near the northern margins of their ranges in the eastern and central United States, no such declines have been reported for the Southern Cricket Frog, *A. gryllus*, at the northern margin of its range in the Southeast. However, the status of *A. gryllus* is obscured by its sympatry with *A. crepitans* and the difficulty of identifying the two species. To address these difficulties, we studied *A. crepitans* and *A. gryllus* from North Carolina in the field and in a large museum collection. We quantified distinct differences in the click components of the vocalizations of *A. crepitans* and *A. gryllus* and used these differences to identify calling males from field recordings. Based on field recording and collection, we developed a discriminant function to identify preserved specimens by the extent of hind-foot webbing and the diameter of anal tubercles. During surveys from 2004 to 2007, we found that *Acris crepitans* was more widespread than expected from published reports, as it was frequently found in the Coastal Plain. *Acris gryllus* was less widespread than expected, as we could not find it in the northern part of the upper Coastal Plain, where published reports indicated it should occur. By applying our discriminant function to *Acris* collected in 1962 and 1963, we confirmed that *A. gryllus* once occurred in this area. In 2008, we resurveyed sites where *A. gryllus* had once occurred alone or in syntopy with *A. crepitans* and confirmed that *A. gryllus* is now missing from three major river basins in the upper Coastal Plain of North Carolina. We conclude that while the range of *A. crepitans* is stable in North Carolina, *A. gryllus* has disappeared from a large area near the northern edge of its range.

Key words: amphibian decline, Anura, Coastal Plain, Fall Zone, syntopy

Introduction

The decline of amphibians is a global phenomenon. Precipitous declines of charismatic species with small ranges have drawn much of the attention of the scientific and public communities, but declines have also occurred among common and widespread species. An explicit goal of Partners in Amphibian and Reptile Conservation (PARC), an organization concerned with amphibian decline, is “to keep common native species common”. The first step in achieving this goal is to identify common but declining species.

The cricket frogs (*Acris*, Hylidae) are widespread in the eastern United States but numerous populations have declined near the northern margins of the range of the genus. The midwestern representative of *Acris*, Blanchard's Cricket Frog (*A. crepitans blanchardi* Harper or *A. blanchardi*, see Gamble *et al.*, 2008), has declined dramatically, even in suitable habitat where other amphibians have not declined (Lannoo, 1998). The decline of Blanchard's Cricket Frog was first noted in its small Canadian foothold in southern Ontario and the decline has since been observed throughout the northern half of its range (reviewed in Gray and Brown, 2005), from Michigan, Ohio, and West Virginia in the east, through Indiana, Illinois, and Wisconsin, to the northwestern reaches of *Acris* in Minnesota, Iowa, Nebraska, South Dakota, and Colorado. The northeastern terminus of the range of *Acris* is in New York, where the decline of the Northern Cricket Frog, *A. crepitans*