

# Fecundity in the Illinois Chorus Frog (*Pseudacris streckeri illinoensis*) from Madison County, Illinois

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## ABSTRACT

Fecundity as determined by counts of oviductal eggs is reported for the Illinois chorus frog (*Pseudacris streckeri illinoensis*), a threatened species in Illinois. Mean clutch size was 608 oviductal eggs (n = five clutches). Clutch size ranged from 411 to 783 eggs (SD = 140 eggs). Individual egg masses deposited in nature averaged 22 eggs per mass (range = 8-42 eggs, SD = 13 eggs, n = 9 egg masses). The egg masses ranged from 13 mm long by 7 mm wide for one containing 13 eggs to 18.5 mm long by 5 mm wide for one containing 35 eggs. The mean number of oviductal eggs was somewhat higher than the mean previously reported for this frog from Arkansas. The number of eggs per mass oviposited in Illinois was about half the number reported for Arkansas females.

## INTRODUCTION

The Illinois chorus frog, *Pseudacris streckeri illinoensis*, is restricted to sandy substrates in the floodplains of the Mississippi and Illinois rivers in Arkansas, Illinois, and Missouri (Conant and Collins, 1991). *Pseudacris s. illinoensis* is uncommon and listed as a threatened species in Illinois (Herkert, 1992). This highly fossorial frog is distributed in Illinois mainly along the central part of the Illinois River (Brown and Rose, 1988; Smith, 1961 and 1966). Other Illinois populations are scattered along the Mississippi River floodplain in Madison, Monroe, and Alexander Counties (Axtell and Haskell, 1977; Brown and Brown, 1973; Brown and Rose, 1988; Gilbert, 1986; Holman et al., 1964).

The life history of *Pseudacris streckeri illinoensis* is poorly known. Details about its fossorial habits are best known (reviewed by Tucker, 1995 and Tucker et al., 1995). The only account on fecundity is based on specimens from Arkansas (Butterfield et al., 1989). Because fecundity is an important life history trait and little known for this subspecies, I report on fecundity from a small sample of road-killed gravid females from Madison County. I also include a description of oviposition behavior.

## METHODS

Fecundity was studied by counting oviductal eggs from five road-killed females that appeared to retain most or all of the eggs within the body cavity. All five frogs were found killed on Sand Road (Sec. 19, T4N, R8W) in Madison County, Illinois between 9-

14 April 1994. Eggs were removed from the oviducts, teased apart, and counted at 7X magnification. Females were deposited in the collections of the Illinois Natural History Survey (INHS 12342-12343, 12345, 12347, 12351).

I also counted eggs contained in the individual egg masses that the female oviposits. Nine egg masses were collected on 13 April 1994 under Illinois Department of Natural Resources permit number 94-8s and were also deposited in the collections of the Illinois Natural History Survey (INHS 12352). Egg masses were collected from a water-filled ditch where ten female *P. s. illinoensis* were observed ovipositing on 10 April 1994. No other species of *Pseudacris* were heard calling at this site. Eggs in these masses were also counted under 7X magnification. Individual eggs in each egg mass were also staged (Gosner, 1960). Means and standard deviations (= SD) were rounded to the nearest whole number of eggs.

## RESULTS

Mean clutch size was 608 oviductal eggs ( $n =$  five clutches). Clutch size ranged from 411 to 783 eggs ( $SD = 140$  eggs). The mean for nine individual egg masses was 22 eggs per mass (range = 8-42 eggs,  $SD = 13$  eggs). The egg masses ranged from 13 mm long by 7 mm wide for one containing 13 eggs to 18.5 mm long by 5 mm wide for one containing 35 eggs. Mean stage for the nine egg masses was stage 5.3 (range = stage 2-stage 7.5,  $SD = 1.6$  stages).

I observed ten pairs of amplexing frogs in the process of depositing eggs. All were in a similar posture when first observed. In each case, the female had grasped grass blades that were parallel to the water's surface with her front legs. Thus, all of the females were suspended upside down. Consequently, egg masses were deposited on the bottom side of the object. Egg masses quickly become obscured by floating silt and debris due to the sticky gelatinous coating holding the egg mass together. Once coated by silt and debris, the egg masses were difficult to see.

## DISCUSSION

Smith (1961) and Johnson (1987) reported 400 and 200-400 eggs per female for Illinois and Missouri *Pseudacris streckeri illinoensis*, respectively. Butterfield et al. (1989) found that clutches of Arkansas *P. s. illinoensis* averaged 468.6 eggs ( $n = 12$  clutches) compared to a mean of 608 eggs per clutch that I observed for *P. s. illinoensis* from Madison County, Illinois. The mean number of oviductal eggs that I found is somewhat higher than the mean reported by Butterfield et al. (1989). However, my sample and the one from Arkansas are both small and variable with Butterfield et al. (1989) reporting a range of 148-1,012 eggs among 12 Arkansas females. In part, this variation could be due to counts from females that had deposited a portion of their total clutch before they were collected in the Butterfield et al. study or killed crossing roads for the current study. Ideally, eggs should be counted before the breeding season begins. However, this fossorial frog is difficult to collect except during the breeding season. Moreover, sacrificing females from small populations such as the one in Madison County to count oviductal eggs would be difficult to justify given the availability of road-killed frogs.

Trauth et al. (1990) found that *Pseudacris streckeri illinoensis* from Arkansas contained slightly more eggs than a small sample of *P. s. streckeri* from Arkansas. In contrast, Bragg (1942) reported egg complements of 708, 695, and 401 eggs (mean = 601 eggs) for three female *P. s. streckeri* from Oklahoma. In this instance, means for Oklahoma *P. s. streckeri* and Illinois *P. s. illinoensis* were almost identical (i.e., 601 eggs vs. 608 eggs, respectively). Thus, no evidence of geographic variation in fecundity is apparent from the limited number of observations that have been made for *P. streckeri*.

Female *Pseudacris streckeri illinoensis* do not lay their eggs in a single mass but instead divide them into a number of smaller egg masses. Butterfield et al. (1989) found that 78 egg masses averaged 41 eggs each. The number of eggs per mass oviposited in Illinois is about half the number reported for Arkansas females (Butterfield et al., 1989) but the Illinois sample is very small. Previously, Bragg (1942) reported that the usual number of eggs per egg mass for *P. s. streckeri* was 20 to 50, which is consistent with results for *P. s. illinoensis* from Illinois and Arkansas.

Illinois females of *Pseudacris streckeri illinoensis* deposited eggs on grass stems and leaves similar to Oklahoma females of *P. s. streckeri* (Bragg, 1942). However, sticks and twigs are also used for oviposition by Arkansas *P. s. illinoensis* (Butterfield et al., 1989). Individual egg masses of *P. s. illinoensis* and those of *P. s. streckeri* (Bragg, 1942) become coated with silt and debris. The coating may provide some protection from predators (Bragg, 1942).

#### ACKNOWLEDGMENTS

I thank James Hatcher, J. B. Camerer, and M. M. Tucker for assistance in the field. I thank G. B. Rose and L. E. Brown for critical comments on an earlier version of this manuscript. This work was partially supported by the Illinois Natural History Survey and the Upper Mississippi River System Long Term Resource Monitoring Program. This research was also supported by the Illinois Department of Transportation contract 1-5-90179 for FAP 310, J. K. Tucker and D. P. Philipp, co-principal investigators.

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