EVALUATION OF THE NORTH AMERICAN AMPHIBIAN MONITORING PROGRAM'S (NAAMP) CALLING ANURAN SURVEY

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ABSTRACT

The use of calling surveys to monitor anuran populations is widespread in North America. Several studies have focused on the precision of calling surveys, but no investigations have determined their accuracy. I quantified the accuracy and precision of calling surveys for seven Rhode Island anurans: wood frog (*Rana sylvatica*), green frog (*R. clamitans*), bullfrog (*R. catesbeiana*), pickerel frog (*R. palustris*), American toad (*Bufo americanus*), spring peeper (*Pseudacris crucifer*), and gray tree frog (*Hyla versicolor*). I specifically addressed call chronology, frequency, variation in calling intensity, the relationship between the number detected calling in the pond and the number actually in the pond, the power of calling surveys to detect population declines, and sex ratios. Drift fence and pitfall arrays completely encircling breeding sites were used to determine the number of individuals of each species present on a daily basis at five ponds in 1997 and seven ponds in 1998. Calling surveys were conducted at arrayed sites for 30 min per night and satellite sites for 16 min throughout the breeding season from March through July. The timing of calling differed among the seven species, resulting in a minimum of four distinct survey periods to detect all seven species. Frequency of calling ranged from 33.0% to 95.3% among the seven species. There was a significant correlation between the number of males in the pond and the number of males detected with calling surveys for *R. clamitans*, *P. crucifer*, and *B. americanus*. Calling surveys were not accurate for *R. sylvatica*, *R. palustris*, or *R. catesbeiana*. Calling surveys were precise for *H. versicolor, R. clamitans, R. catesbeiana*, and *P. crucifer*. Power analysis predicted that the current North American Amphibian Monitoring

Program's (NAAMP) survey protocol (i.e. three survey periods per year) would be sufficient to predict a 3% annual population decline in *R. clamitans* and *P. crucifer* over a 10-year period. Using current NAAMP surveys, 72, 75, and 88 sites per year need to be monitored to detect a 5% annual population decline in *R. palustris, R. sylvatica*, and *B. americanus.* At present, *R. clamitans* and *P. crucifer*, appear to be the only species whose populations can be monitored with calling surveys.