

## Struktur und Entwicklung der größten Subpopulation der Gelbbauchunke (*Bombina variegata*) in Niedersachsen

Damaris Riedner<sup>1,2</sup>, Adelina Weißmann<sup>1</sup>, Christian Höppner<sup>3</sup>,  
Holger Buschmann<sup>3</sup> & Heike Pröhl<sup>1</sup>

<sup>1</sup>Institut für Zoologie, Tierärztliche Hochschule Hannover, Bünteweg 17, D-30559 Hannover; <sup>2</sup>Derzeitige Adresse: Institut für Biologie, Syddansk Universitet, Campusvej 55, DK-5230 Odense; <sup>3</sup>NABU Niedersachsen, Alleestr. 36, D-30167 Hannover, damaris.riedner@web.de, adelina.weissmann@gmail.com, christian.hoepfner@nabu-niedersachsen.de, heike.proehl@tiho-hannover.de

### Structure and development of the largest subpopulation of the yellow-bellied toad (*Bombina variegata*) in Lower Saxony, Germany

Amphibians worldwide suffer from strong population declines. In Germany, populations of the yellow-bellied toad (*Bombina variegata*) on its northern distribution range in the Weserbergland are particularly endangered by habitat fragmentation. We investigated the largest population of yellow-bellied toads in this area regarding their subpopulation structure (snout-vent length (SVL), number of subadults, males and females), recapture and survival probabilities and population size. The latter refers to data from capture-mark-recapture occasions in 2010, 2013 and 2016 and to the effective population size, assessed from the genetic variability within the population. The results show that the SVL significantly varied between the first and second monitoring dates per year and between the sexes. However, the SVL difference between sexes was very low and suggests sexual monomorphism in body size. The number of subadults, males and females significantly differed between the dates as well. In 2016 the number of subadults among the captured animals was the highest, which suggests a good reproduction in the previous year. The ratio between the sexes was mostly balanced, as well as the recapture probability, which was higher than 50 % on all dates. The survival probability ranged between 45 % and 86 % with lower survival rates between than within the years. Since the last estimate in 2006, the population developed positively, but with strong fluctuations in population size ( $N = 781$  to  $1,469$ ). Depending on the method, the effective population size differed ( $N_e = 43$  to  $464$ ). Overall, the data show that the population is stable but  $N_e$  too small for long-term maintenance. We suggest continuing the monitoring, to expand the estimations of the effective population size on the metapopulation and to improve the connections with other subpopulations. This way, inbreeding depression can be prevented, and this important population can be secured on a long-term basis.

**Keywords:** *Bombina variegata*, population structure, capture-mark-recapture, Cormack-Jolly-Seber model, recapture probability, survival probability, effective population size.

### Zusammenfassung

Amphibien-Populationen sind weltweit von Rückgängen betroffen. In Deutschland sind die Populationen der Gelbbauchunke (*Bombina variegata*) an ihrem nördlichen