

Ist die Aktivitätsabundanz ein geeignetes Maß zur Schätzung der Populationsgröße bei Kreuzkröten (*Epidalea calamita*)?

Hannah Justen¹, Martin Altemüller² & Ulrich Sinsch¹

¹Institut für Integrierte Naturwissenschaften, Abteilung Biologie, Universität Koblenz-Landau, Universitätsstraße 1, D-56070 Koblenz, sinsch@uni-koblenz.de,

²NABU-Wasservogelreservat Wallnau, Wallnau 4, D-23769 Fehmarn

Are call and visual count surveys suitable surrogate measures for capture-mark-recapture population size assessment in the natterjack toad (*Epidalea calamita*)?

This case study on the natterjack toad (*Epidalea calamita*) aims to compare different quantitative methods used to estimate local population size. The study area is a part of the nature reserve Wallnau located on the island of Fehmarn (Baltic Sea). All surveys were done during the main activity period of the spring cohort from April 13 to May 11, 2015. Population size was estimated using the Chapman modification of the Lincoln-Petersen index and was based on replicated capture-mark-recapture (CMR) data. We used passive integrated transponder (PIT) for individual tagging. Simultaneously we recorded the pigmentation pattern of the belly to identify individuals using the freeware program Wild_ID with posterior manual quality control. During the night preceding each of the 10 capture campaigns we surveyed the study area for calling males and visible adults walking along predetermined transect routes. The numbers of calling, visible and captured males were used as independent estimators for the size of the local breeding assemblage. The CMR-data indicated 205 individuals (95% confidence interval: 156–254) representing the local male population. The considerably smaller numbers of calling, visible and captured males per night at the study area did not correlate significantly with the Chapman-estimates of population size. This is not surprising because activity of male natterjacks is influenced by weather condition, satellite behaviour and the concentrations of sexual hormones, whereas the presence of males during the reproductive period within the study area is not. Consequently, activity-influenced abundance estimates are unreliable to estimate local population size and to infer trends in population dynamics. We propose an alternative survey scheme for monitoring obligations under the Habitats Directive which provides reliable and comparable data on population size for long-term studies.

Key words: Amphibia, *Epidalea calamita*, populations size, capture-mark-recapture, PIT-tagging, pigmentation pattern, call survey, visual counting, monitoring, Habitats Directive.

Zusammenfassung

Diese Fallstudie an der Kreuzkröte (*Epidalea calamita*) vergleicht unterschiedliche quantitative Methoden zur Bestimmung der lokalen Populationsgröße. Die Untersuchungsfläche befand sich im Naturschutzgebiet Wallnau auf der Ostseeinsel Fehmarn, der Untersuchungszeitraum war die Hauptaktivitätsperiode der Frühlingskohorte zwischen dem 13.4. und 11.5.2015. Als Maß für die lokale Populationsgröße