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# Can we use bioacoustic methods in habitat suitability modeling?

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## Abstract

Traditionally birds habitat preferences analysis are very rarely considered to be connected with bioacoustic methods. Meanwhile the technology of recording and analyzing acoustic data have developed in a way which allows us to use it in completely new areas of biological sciences. Here we present results of a comparison of two habitat suitability models built on distribution data gathered in two ways: traditional and bioacoustic.

As a model species we used Cinnamon-breasted Rock Bunting *Emberiza tahapisi* subsp. *goslingi*, one of many African birds, which biology and ecology is almost not known. The study site (approximately 9 km<sup>2</sup>) was situated in the Bamenda-Banso Highlands near Big Babanki village ( NW Province, Cameroon) is covered with the mosaic of montane forests, woodlands, scrublands and pastures.

During three seasons (November-December in years 2011-2013) repeated transect countings were conducted and locations of all the birds seen and heard were marked. Simultaneously automatic recordings took place and all habitat types were sampled giving all together over 1200 hours of recordings. For detecting species' vocalizations on the recordings we used automatic and semi-automatic methods. (SongScope, Xbat).

Based on detailed habitat map and two types of distribution data, habitat suitability models for *E.tahapisi* were built using MaxEnt. Best models were selected from each group and detailed comparison were conducted. Despite the differences in number of locations used (106 for transect countings and 42 for bioacoustic recordings), models based on two methods appeared to be remarkably similar in predicting species' distribution and also in predictive power of each model's variables.

Those results show that even though bioacoustic and transect counting methods are so different, they can give the same results. Moreover, we believe that further analyzes of already gathered acoustic data will allow us to build habitat suitability models for many more species from study area.

**Keywords:** automatic recording, habitat suitability modeling, probability of distribution, Africa

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