Estimating density of birds on the base of multichannel recordings

Karl-Heinz Frommolt[*1]

[1]Museum Für Naturkunde Berlin (MfN) – Invalidenstraße 43 D-10115 Berlin, Germany

Abstract

Recent audio recording technics allow an unsupervised recording of environmental sounds over long periods of time. However, it is still a challenge to extract useful information for assessing the environment from these long-term recordings. Mostly unsupervised recordings are used to search for rear species, to estimate the species composition or to assess the soundscape. Here we will show how on the basis of multichannel recordings not only the species composition but also the abundance of birds could be determined. We present two approaches. The first is based on hyperbolic localization of calling birds. Using an array of synchronized multichannel audio-recorders we studied the distribution of European bittern (Botaurus stellaris) in an extended wetland area. On the basis of the audio recordings we could estimate the number of territorial behaving birds over a period of six years. Our second approach is based on four channel recordings with directional microphones. On the example of different rail species (Porzana spec.) we show how the number of calling birds could be assessed based on differences in amplitude and time delay of arrival on the different sound tracks of a single recording device. We will discuss advantages and limitations of the two approaches. We recommend the use of four-channel recordings for soundscape studies which give the opportunity to extract besides general soundscape parameters more detailed species specific information.

Keywords: soundscape, multichannel recordings, abundance estimation

[*]Speaker