Acoustic monitoring of individuals in birds: lessons from owls and songbirds

Pavel Linhart*†[1], Ladislav Ptáček*[2], Lukáš Machlica[3], Luděk Müller[4], Pavel Jaška[5], Alexandra Průchová[5], Monika Chrenková[5], Marina Kipson[6], and Martin šálek[7]

[1]Institute of Animal Science, Ethology Department – Pratelstvi 815, 104 00, Praha 10 Uhrineves, Czech Republic

[2]University of South Bohemia, Faculty of Science, Institute of Physic and Biophysics – Branisovska 31, 37005, Ceske Budejovice, Czech Republic

[3]University of West Bohemia, Faculty of Applied Sciences, Department of Cybernetics – Univerzitni 8, 30614, Plzen, Czech Republic, Czech Republic

[4]University of West Bohemia, Faculty of Applied Sciences, European Centre of Excellence NTIS - New Technologies for Information Society – Univerzitni 22, 306 14, Plzen, Czech Republic

[5]University of South Bohemia, Faculty of Science, Department of Zoology – Branisovska 31, 37005, Ceske Budejovice, Czech Republic

[6]Department of Zoology, Faculty of Science, Charles University – Viničná 7, 128 44, Praha 2, Czech Republic

[7]Institute of Vertebrate Biology, Academy of Sciences of the Czech Republic, – Kvetna 8, 603 65, Brno, Czech Republic

Abstract

Individual acoustic monitoring based on individual differences in vocalizations is considered as promising tool that could substitute or complement traditional capture-mark individual tracking techniques at least for certain species of birds. In this lecture, we will give an example that capture-mark techniques may have long-term impact on a bird's behaviour (willow warblers avoid the second capturing even year after the first capture) and hence the development of non-invasive acoustic individual tracking techniques would be highly desirable. We will then continue by exploring the potential application of acoustic individual monitoring techniques in the two model bird species with fundamentally different vocalizations: little owl and chiffchaff. We will present the data on individual variation in calls and songs within and between years in both species and will discuss different practical issues associated with application of acoustic monitoring techniques: how many calls do we need to record, quality of recordings, which parameters should we focus on; size of the population that can be monitored, etc. We will argue that acoustic monitoring of songbirds is particularly challenging. Probably, analogues of content-independent speaker recognition methods will need to be used in many songbird species due to their complex and variable songs.

Keywords: individual recognition, population monitoring, songbird, owl, behavior, long, term monitoring

*Speaker

†Corresponding author: pavel.linhart83@gmail.com