Appendix H : Minimum and maximum detection distance for birdsongs in an Alpine coniferous forest (Jura)

We estimated the minimum and maximum detection distance of a SM4 ARU for most of the passerine songs in an Alpine coniferous forest (Jura). The sound level of the song ranges between 75 dB SPL for the quietest species goldcrest (*Regulus regulus*) to 100 dB SPL for the loudest song thrush (*Turdus philomena*) with most of the song frequencies between 2 kHz to 8 kHz (Brackenbury, 1979). We found that the detection distance of a SM4 ARU was between 70 m and 124 m with an average distance of 90 m for the quietest species (Fig. H-1a) while the detection space varied between 142 m till 385 m with an average distance of 217 m for the loudest one (Fig. H-1b). Thus, the maximum detection distance could vary up to 3 times depending on the intensity and the frequencies of the bird song or call.



Figure H-1: Detection distance of the ARU obtained with the model in: (a) an Alpine coniferous forest (Jura, France) for the quietest bird species (75 dB SPL re20µPa at 1 m) and the loudest one (100 dB SPL re20µPa at 1 m) with frequency range between 2 kHz to 8 kHz. The profile of the source and the ambient sound takes into account the frequency response of the ARU. The contribution of geometric (i.e. spreading loss) attenuation (A_{geo} , green), atmospheric absorption (A_{atm} , red) and habitat attenuation (A_{hab} , purple) are depicted with different colours. T°C, RH, Ps and a_0 values are set to the experimental values found during the Jura transect

Reference

Brackenbury. (1979). Power Capabilities of the Avian Sound-Producing System. *Journal of Experimental Biology*, 78(1), 163–166. <u>https://doi.org/10.1242/jeb.78.1.163</u>