

Wildlife presence in a rural soundscape near a wind turbine

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Studies of wind turbine noise yield generous amounts of low quality sound data in various environments. In the present context, audio recordings near a turbine in the rural setting of Chevetogne, Belgium, are exploited to highlight wildlife presence. Two weeks of 12000 Hz continuous sound data were measured at three positions around the turbine, at distances of 100 and 200 meters. Upon inspection, the audio records were found to contain elements of anthropophony (the turbine, various vehicles, voices, church bells), geophony (wind) but most interestingly a rich biophony (birds, insects and mammals). The detected bird species are common in the area. Colorcomposite spectrograms, assembled from acoustic indicators that target wildlife detection, allow a direct visualization of 24 hours of sound data at once. The acoustic complexity index (ACI) excels at highlighting the contributions of passerines, while a modified spectral entropy (Hs) captures the voices of birds with more monotonous songs. A third dimension, derived from the sound pressure level, gives a sense of the weight of human activities on the soundscape, namely through road traffic and agricultural work. The final spectrograms display the musical score of the day, showing birds singing on and off in succession or simultaneously but in different frequency ranges. Observations related to the coexistence of birds and the wind turbine are in line with existing knowledge; common passerines are heard at short distances from the turbine and limited raptor presence on site is captured (*Buteo buteo*).