

Sound recognition for biodiversity monitoring

DESCRIPTION

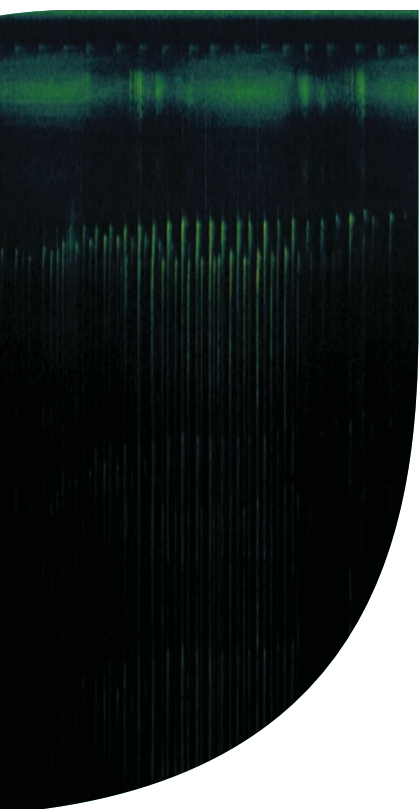
Sound recognition models have been developed to identify species from audio recordings across four European animal groups: breeding birds, amphibians, bats, and grasshoppers. Built using machine learning, the models are trained on data from open-access bioacoustics repositories, most notably Xeno-Canto.org. They aim to cover all species found on the European continent, though taxonomic coverage is currently shaped by the availability of validated training data – birds are fully covered, while some species in southern and eastern Europe remain absent for other groups due to data gaps. Models are updated annually, and coverage is expected to expand steadily as new training data becomes available, partly thanks to contributions generated through MAMBO activities.

The models analyse recordings in three-second time windows, returning presence or absence predictions with confidence scores. They accept both WAV and MP3 formats of any length and are compatible with a wide range of recording equipment – from smartphones and low-cost devices like Audiomoths to professional high-end recorders. Audiomoths, capable of broadband recording up to 384 kHz, have been used extensively for field testing.



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BENEFITS OF USING THE TECHNOLOGY

Many animal species are most reliably detected through sound, yet manually identifying species from recordings is time-consuming and demands significant expertise. These models address that bottleneck by processing large volumes of recordings rapidly and consistently.

A key strength is the ability to collect well-standardised data across multiple species groups using a single method. Combining passive acoustic monitoring (PAM) with automated recognition increases both the volume and accuracy of ecological data while reducing costs - making the approach highly scalable for international biodiversity monitoring. The models support both long-duration field deployments and real-time identification assistance for citizen scientists through biodiversity portals and mobile apps.



TARGET USERS

-  Ecology and conservation professionals, including Natura 2000 officers, reserve managers, consultants, and NGOs involved in biodiversity monitoring
-  Academic researchers and students exploring broader ecological questions
-  Biodiversity portals and mobile apps seeking scalable, standardised identification tools
-  Citizen scientists and volunteers engaged in species recording
-  Nature educators using sound-based identification to raise public awareness of local biodiversity

