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Augmented reality forest soundscapes

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🌲 We can use digital technologies to educate, stimulate and highlight the crucial issues of wildlife, species loss, and nature connectedness.

Since the beginning of the lockdown response to the coronavirus pandemic the [soundscape](#) of the world around us has [changed dramatically](#).

Outdoors or in, there was a notable drop in ambient background noise that is almost exclusively down to the reduction in sound caused by humans or to use its formal term, *anthropophony*.

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In our visually dominated society this provided a rare treat for the ears, specifically the opportunity to clearly hear the sounds created by other living creatures that inhabit the world (*biophony*) and the non-biological sounds of the outdoors (*geophony*).

Pandemic

This soundscape can be considered the sonic equivalent of a landscape, perceived through the ears rather than the eyes. An added beauty of sound in conveying information is that it provides a perception of our natural world in 360 degrees unlike the more limited visual field of view.

The ability to [focus upon the living world](#) has been striking and likely contributes to the anecdotal evidence currently being discussed that suggests there has been an increase in the number and diversity of species being heard and recognised in recent months.

Alongside this, hearing the soundscapes around us with added clarity has for many provided a meditative, therapeutic, educational, and/or stimulating distraction from the pandemic.

The value of listening to the soundscapes around us now, perhaps more than ever, is highly evident as exemplified in the inspired [Sounds of the Forest](#) activity organised by the Timber Festival team, inviting people to record and share their forest sounds from across the world.

As the lockdown is lifted and the anthropophony inevitably returns, we may again find it difficult to hear the non-human sounds of nature.

Sound

Having observed the difficulties experienced when listening to nature prior to the lockdown, the research work that we are doing in the *nature soundscapes* project draws upon the potential power and agency of sound as a medium to stimulate the senses, engage, excite, and educate audiences about the natural world.

Using a range of equipment, we devised a framework that allows us to add to the natural soundscape of many outdoor locations. Drawing upon the principles of augmented reality, our activities and sound system mixes with, rather than replaces, the natural soundscape.

Augmented reality (AR) has come on dramatically in recent years and is concerned with using technology to [add additional virtual layers of information](#) on top of the real world that we experience around us.

If you've ever used a smartphone app to add bunny ears or sunglasses to your face in a photo, then you've experienced AR.

In the activities that we're carrying out in nature soundscapes, we employ a similar set of principles, but make use of additional layers of *sound* that are mixed to those in the real-world, resulting in what is termed an *Audio Augmented Reality* (AAR).

Trees

The AAR approach allows us to present an unlimited, unconstrained number of sounds and place them, or have them moving, in the space around our audience.

By accompanying the sounds with a suitable educational narrative, the system can be used to highlight any number of important ecological issues. In broad terms, we designed the nature soundscapes experience to facilitate stories oriented around the past, present and future.

In doing so, we are able, for example, to explore the sounds of extinct species, to highlight current and at-risk species, and consider how the soundscapes to come might be perceived in possible futures.

The approach also gives us the potential to amplify sounds that exist in the living planet, but may not be audible to the human ear, thereby making them hyper-realistic. For instance, we can amplify the sound of insects moving inside a log or the water moving inside a tree.

Using a library of sounds, computer software, and speakers hidden in the trees, we have so far created a forest soundscape experience that takes the audience on an experiential educational journey.

Foxes

The equipment was initially installed and evaluated in an area of mixed deciduous woodland in the [Kielder Forest](#), Northumberland, UK on a drizzly couple of days in November 2018.

We were able to invite along colleagues from [Albion Outdoors](#) to obtain an expert opinion on the feasibility of the approach. Alongside some technical revelations, the power of the experience to make listeners believe that there were other species in the forest was convincing.

Crucially, much like a theatrical performance, we found that if the equipment failed, even intermittently, then it broke the illusion – an important finding for our ongoing work.

The nature soundscapes experience was first officially presented during [Timber Festival](#) in a forest clearing at the festival site at Feanedock, UK in July 2019.

Our audiences experienced around 40 minutes of diverse sounds, accompanied by a talk and discussion from one of our team, with a soundscape that included a sonic tour of a diurnal cycle (with birds, badgers, foxes and deer).

Behavioural

This was followed with a series of more exotic sounds (lynx, wolves, howler monkeys and whales), and culminating in a cacophony of anthropophonics (road traffic, construction site noise and trains).

Feedback from the audiences at Timber 2019 was positive. Those who participated reported very high levels of enjoyment and engagement with the nature soundscapes but highlighted difficulties in being able to identify many of the sounds presented, leading to a desire to want to learn more.

One participant reported: “[I] Learnt loads about sounds I’ve heard for years” and “It was an unusual experience and was thought provoking”.

In addition to the direct responses about their experience with us, our audience also reinforced that the presence of the sounds of nature have a calming effect upon them. We also became aware of the behavioural ecological implications on local species in the forest and the project intends to provide further research potential in this regard too.

Soundscapes

Moving forwards with the work, we plan to offer more opportunities for the public to engage with our nature soundscapes. In the short-term we are considering how we might facilitate this as social distancing measures continue and are looking at the feasibility of digital versions that people can experience in their own time.

However, we are largely concerned with the longer-term and working with education providers and community groups to produce tailored education experiences, accessible to all, but with a particular emphasis upon capturing the attention and focus of the children and young people who are rapidly inheriting both *the* natural world and *our* policy world (e.g. DEFRA’s *A Green Future: Our 25 Year Plan to Improve the Environment*).

Finally, we’re looking forward to meeting you all at [Timber](#) 2021 in the National Forest and continuing our soundscape conversations! If you’re interested in getting involved, then please contact us.

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These Authors

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Andrew Weatherall works at the [National School of Forestry](#), University of Cumbria. Jo Maker is the Timber Festival coordinator, [The National Forest Company](#). They are together the guest editors of this [Special Collection in The Ecologist](#). To make a donation to support the next Timber festival, [visit JustGiving](#).