

## Ears of Others – Activities in Listening Like Animals

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**ABSTRACT:** Ears of Others: Activities in Listening Like Animals is a workshop that was delivered at Invisible Places 2017. The workshop explores the hearing of animals through practical activities including soundwalking and field recording. Through these activities, the workshop seeks to increase esteem for animals, the everyday environments in which these animals are encountered and the sound of these environments.

**KEYWORDS:** acoustic ecology, soundwalking, field recording, soundscape composition, public art, sound art, site-specific, community engagement, animal biology, acoustics and psychoacoustics, science outreach.

## 1. Introduction

Ears of Others: Activities in Listening Like Animals is a workshop themed around the aural-perceptual abilities of animals. The workshop comprises critical listening, field recording, sound processing, sound modelling and paper mask-making activities. The intension of the workshop is to build regard and empathy towards animals with whom we share our environments, and in turn insight consideration of how we impact these animals. Furthermore, the workshop employs animals and their ways of hearing to encourage a reflection upon our own ways of hearing, and to frame and motivate activities in listening and creatively engaging with sound.

The workshop combines my skills and interest in field recording and soundscape composition, my experience as a lecturer in sound and music technology, and my passion for wildlife and the natural environment. The workshop is also informed by research in to the work of the World Soundscape Project particularly R. Murray Schafer's 'Ear Cleaning' exercises (Schafer 1969) and the practice of soundwalking towards which Hildegard Westerkamp has contributed greatly (Westerkamp 2001). Pauline Oliveros' 'Deep Listening' practices (Oliveros 2005) and Christina Kubisch's 'Electrical Walks'<sup>1</sup> have further informed the workshop. All of these practices similarly seek to insight attentive listening in everyday contexts and in turn greater appreciation of these contexts and their sound. Like Kubisch's walks, each delivery of the Ear of Others workshop is site-specific: the workshop's field recording activity is carried out in local green spaces and animals known to inhabit these spaces and the broader region are investigated in the workshop's opening activity – a presentation upon the hearing of different animals. This presentation and the creative activities that follow it draw extensively upon animal biology research as well as acoustics and psychoacoustics and because of this one may interpret the workshop as science outreach.

The workshop has been delivered twice: On the opening day of Invisible Places 2017 and in May 2015 at the Centre for Contemporary Art (CCA), Derry/Londonderry, UK as part of an arts initiative entitled 'Our Neighbourhood'<sup>2</sup>. Following the delivery of the workshop at the CCA, the workshop was transcribed in to a set of steps for undertaking the activities of the workshop oneself. These are presented in the book "Between a Dog and a Wolf" (Browne 2015), which was an outcome of the aforementioned Our Neighbourhood project. This article provides an overview of the Invisible Places 2017 delivery of the Ears of Others workshop.

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1. [http://www.christinakubisch.de/en/works/electrical\\_walks](http://www.christinakubisch.de/en/works/electrical_walks)

2. <http://cca-derry-londonderry.org/public-programme/sarah-browne-and-aislinn-odonnell-our-neighbourhood/>

## 2. Ears of Others at Invisible Places 2017

The Ear of Others workshop was delivered across a full day on Wednesday 5<sup>th</sup> April 2017, the opening day of the Invisible Places 2017 conference. The University of the Azores, Ponta Delgada, São Miguel Island hosted the workshop. On this occasion, the workshop group comprised eight people who were a mix of local residents and conference attendants. Whilst the workshop was open to ages fourteen and above, all of the group were adults over the age of eighteen. What follows is an account of each workshop activity as it occurred at Invisible Places 2017.

### 2.1. The Hearing of the Animals of São Miguel Island

I opened the Invisible Places 2017 delivery of the workshop with a presentation upon the anatomy and processes of hearing of five different animals: dogs, frogs, owls, bats and dolphins. I led my discussion of each animal with species and breeds of this animal that are resident on São Miguel Island. Below is an extract of the information I presented on each animal.

My presentation opened with a discussion of dogs and an image of the *Cão Fila de São Miguel*, a breed of cattle dog originating on, and common to, São Miguel. Much of my discussion of the hearing of dogs focused upon their pinna, which through their form and flexibility, aid dogs in collecting and localising sound (Evans and de Lahunta 2013, 739). Participants of the workshop living on São Miguel informed me that whilst illegal in Portugal, the ears of the *Cão Fila de São Miguel* are, sadly, very often cropped.

Following dogs, I focused upon owls. There was once a species of owl endemic to the Azores, the *São Miguel scops owl* (Rando et al. 2013). This animal is now extinct. Whilst uncommon, the long-eared owl<sup>3</sup> and barn owl are known to inhabit São Miguel. Both the long-eared owl and barn owl have asymmetric ears, one ear is higher than the other (Lynch 2007, 44). This is so that as well as perceiving where to the left and right a sound comes from, these species of owl can also perceive where up or down a sound's source is located.

The Iberian water frog is common to the Azores.<sup>4</sup> Frogs have no pinna; instead they have large exposed circular eardrums on either side of their face. A frog's lungs are also sensitive to sound. This prevents frogs from damaging their own eardrums when they croak, which can be incredibly loud, by equalising the pressure across the eardrum. It is also thought that hearing through their lungs allows frogs to localise sound better (Ehret et al. 1994).

The final two animals discussed, bats and dolphins, are both known for their use of echolocation to navigate and to locate and track prey. Bats create the ultrasonic calls needed for

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3. Xeno-Canto, a social media website for sharing bird song recordings, includes (at the time of writing) a recording of a long-eared owl on São Miguel island. <http://www.xeno-canto.org/>.

4. <http://www.azores.gov.pt/Gra/srrn-cets-en/conteudos/livres/Iberian+Frog.htm>

echolocation in their larynx. Regarding catching prey, the arrival time of a reflected call and how the amplitude and frequency of the reflected call differs to the bat's original call, tell the bat how far away their prey is, how fast and in what direction its moving, and the size of this prey (Carew 2000, 42). The Azores have an endemic species of bat called the Azores noctule bat, which is one of very few species of bat in the world that is active in the daytime.<sup>5</sup>

The Azores are renowned as one of the best locations in the world to encounter wild whales and dolphins. Certain species of dolphin such as the common bottlenose dolphin reside in the Azores archipelago all year round.<sup>6</sup> Like bats, dolphins<sup>7</sup> use echolocation. Unlike bats, dolphins create the ultrasonic calls necessary for echolocation by passing air through channels behind a part of their foreheads known as the melon, which focuses and projects these calls forwards (Whitlow 2000). The echo of these calls and all other sounds, including the whistles and clicks that dolphins use to communicate, are brought to the dolphin's inner ear through their jaws (Dudzinski and Frohoff 2014, 43).

## 2.2. Field Recording

Following my presentation on the hearing of animals, I introduced the workshop group to the field recording equipment I had brought with me, which included binaural and contact microphones, hydrophones and a bat detector. The group then split in to pairs and I distributed the field recording equipment amongst these pairs. The group then headed to a nearby park, Jardim Antonio Borges – a botanical gardens comprising plants from across the globe, a number of ponds and a system of artificial passageways and caves over which there are a series of walkways and lookouts (fig 1.). Pairs were invited to walk the park and use the equipment they had been given to record whatever appealed to them. However, I recommend each pair choose an animal, consider the sounds important to this animal and seek out and record these sounds. Halfway through the activity pairs were asked to swap equipment and repeat the exercise with a new animal focus.

Earlier in the day, one of the workshop participants who lived locally shared with the group a photo they had recently taken in Jardim Antonio Borges of bats roosting in the park's passageways and caves, and commented that they were very often there and unflinching to human presence. Unfortunately, on the day of our visit these bats were not present. Very little was heard through the bat detector on this occasion. Related to bats however, I issued each pair with a clicker (usually used to train dogs) and requested they attempt echolocation

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5. <http://www.azores.gov.pt/Gra/srrn-cets-en/conteudos/livres/Azorean+Noctule+Bat.htm>

6. <http://www.visitazores.com/en/experience-the-azores/whale>

7. The information and materials presented in the workshop regarding dolphins were supplemented by Prof José Azevedo of the University of the Azores who, prior to the workshop, very kindly spent a great deal of time discussing these animals with me as well as more broadly animal life on São Miguel Island and as his own research, which pertains to marine life (<http://www.moniket.net/en>).

through use of the clicker. This also encouraged the group to explore the phenomenon of reverberation in the park.

Throughout the group's time in the park, frogs could be heard croaking in the park's ponds. In my opening presentation, I shared with the group how frogs will listen to the rhythm of other frogs croaking around them and will adjust the rhythm of their own croaking so that their croaks fit between the croaks of other frogs (Narins 1995). One pair of participants spent much of their time listening to and recording the frogs with the binaural microphones given to them. This pair commented to me that they had found observing the patterns of frog croaking I had spoken of earlier deeply pleasurable.

Whilst most pairs had been relatively unsuccessful in capturing anything with the supplied hydrophone, one individual managed to capture frog croaks with this device. This microphone and the individual's patience and perseverance, enabled them to capture very impressive, clear, isolated croaks containing detail not usually audible to the ear.

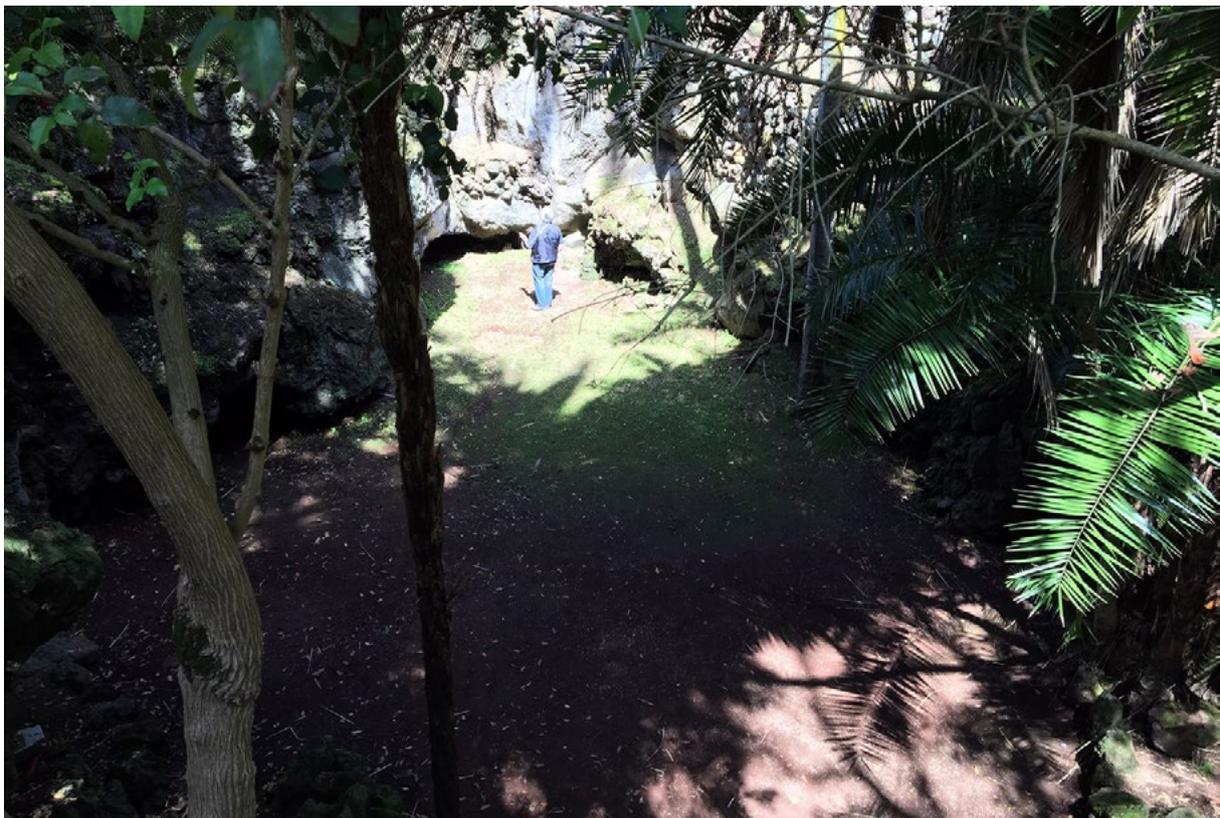


Figure 1. Workshop participant field recording in Jardim Antonio Borges.

## 2.3. Sound Editing, Processing and Modelling

After the field recording activity, participants returned to the workshop base where they had access to laptops and the software Audacity.<sup>8</sup> Participants were given a quick introduction into how to load sounds into Audacity and do some basic editing. Following this, participants were given time to listen back to and edit the recordings they had made in the park. Later in to the activity, I demonstrated how recordings may be processed to simulate the perspective of a particular animal. In simulating the hearing of a barn owl, I used EQ to narrow the frequency range of the recordings from 20–20kHz, which is the frequency range of human hearing, to 200–10kHz, which is the frequency range of barn owl hearing (Konishi 1973). I also used EQ to increase the volume level for frequencies between 500–10kHz. Barn owls are more sensitive to sound in this range than humans (ibid.). My simulation of barn owl hearing also included a Max for Live<sup>9</sup> patch I had built that replicates the barn owl's ability to localise sound vertically.

## 2.4. Mask-making

The workshop ended with a mask-making activity. Participants were asked to create a barn owl mask that both mimicked the vertical asymmetry of the barn owl's ears but also the barn owl's 'facial ruff', which acts like a satellite dish focusing sound on to either ear (Knudsen et al. 1979). Participants worked in pairs and were provided with a pair of binaural microphones, card and stationary. No indication as to how to construct the mask aside from a scientific image of a barn owl's face were given. This was deliberate as I felt not giving a template would provide more of a challenge for an adult audience, and result in different and inventive solutions. The activity did indeed end with very different and inventive solutions, one of which can be seen in figure 2. After creating their masks, pairs listened to the binaural microphones set within these masks to see how the form of their masks filtered and reflected sound. Pairs then swapped masks, discussed the differences and all together we considered the reasons for these differences.

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8. <http://www.audacityteam.org/>

9. <https://www.ableton.com/en/live/max-for-live/>



Figure 2. Workshop participants trialling their Barn Owl Masks.

### 3. Conclusion

In both deliveries of the Ears of Others workshop, it has been clear to me that whilst most people know very little about animal hearing coming in to a workshop, they find this subject very appealing and thus a good stimulus for considering their own hearing and for engaging in listening. It is hoped that this appeal persists beyond the time of the workshop and encourages further engagement with everyday environments, and the sound and animal inhabitants of these environments. The workshop also stands to encourage studying and working with sound, and encourage an interest in physics and biology.

I intend on continuing to research animal hearing and continuing to apply this research in further deliveries of the workshop. I also intend on developing a similar workshop aimed at children as well as refashioning the workshop in to other forms of media such as a mask-making book and a mobile application. The mobile application I intend would be an aural equivalent to Marshmallow Laser Feast's 'In the Eyes of the Animal' (2105)<sup>10</sup>, a VR experience in which the viewer can explore a forest environment through the lens of different animals. Building this application would continue my practice-based research in to mobile sound and aural augmented reality (Green 2011).

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10. <http://iteota.com/>

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