HAL
open science

Global Sound Archive. Soundmap Projects and the Perspective of Future

Noémie Fargier

To cite this version:

Noémie Fargier. Global Sound Archive. Soundmap Projects and the Perspective of Future. IASH. Humanities of the Future: Perspectives from the Past and Present, 21, pp.83-97, 2020, 978-0-9532713-1-3. hal-03194051

HAL Id: hal-03194051

https://hal.science/hal-03194051v1

Submitted on 12 Apr 2021

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Extrait de l'ouvrage collectif Humanities of the Future: Perspectives from the Past and Present, dir. Ben Fletcher-Watson et Jana Phillips, Edimbourg, IASH Occasional Papers, vol. 21, 2020, p.83-97.

NOÉMIE FARGIER

Global Sound Archive: Soundmaps Projects and the Perspective of Future

Since Google Earth was launched in 2005 and following its development over the past 15 years, every square kilometre of the earth has been documented and we can get a view of almost any location. Thanks to the Google Earth global collection of photographs, which are regularly updated, we can see changes in the landscape and virtually visit the most remote areas of the world.

Online soundmaps use this webmap technology to display field recordings in their geographic location. Most of the collections are local and collaborative, but also temporary. However, some of the soundmaps, constantly fed with contributions, gather recordings from all over the world and from the past four decades. They display 'sonic time capsules' with both patrimonial and historical goals: 'preserving sounds before they disappear' and building a global sound archive which can be studied by future generations (Montreal Soundmap, n.d.).

The soundmaps can thus provide precious material for the humanities of the future. They already enable reflection on the way we document the world, especially if we compare those sound collections with the Google Earth photographs with which they are linked. Sounds are not presented as objective reflections of reality but as contextual recordings. This is to say that soundmaps add a human and subjective dimension to webmap technology. They invite us not only to listen to what the world sounded like, but also to think about the making of archives.

In this respect, I will question their potential use throughout time. I will mainly focus on Aporee, the oldest and largest global soundmap using the Google Earth service, which appears as a case study. I will discuss the selection, the conservation, and representativeness of the sound archive that it is constructing. I will also examine the soundmapping itself, looking into its audio-visual framework and questioning its representation of space.

A model: Aporee

The growing Aporee sound collection, fed by a 'community' of almost 2,000 contributors, gathers more than 51,000 sounds from more than 45,000 places. We can find some recordings from the 1980s to today and from almost all the countries in the world. The soundmap not only allows us to listen to today's sonic environments, but preserves the sounds of yesterday for tomorrow and stores them in the digital library 'Internet Archive'. Aporee, also called 'Radio Aporee', started as an online platform in 2000 and turned into an online soundmap when Google Earth was launched; it was the first soundmap project to use the webmap technology and, in a way, grew simultaneously.

It uses the webmap as a tool to reinforce the connection between the field recording and 'its places of origin' (Noll, 2019). The sound collection, although huge and open to almost every collaborator, is homogeneous because of the curator's guidelines. The sounds they expect – location sounds, from the outside or public space (either urban, rural or natural) – avoiding 'extensive chunks of music', should be an authentic *picture* of reality (Noll, 2019). The sound, recorded with some good quality gear, should be unedited and unprocessed. The recordist appears as a witness who shares with a community of listeners a testimony and an experience. The written information they give about the context of the recording and the gear used should attest to the documentary purpose.

This sound collection's methodology, and its limitations, are to be understood in the cultural heritage of the World Soundscape Project, created by the musician Raymond Murray Schafer and a group of composers at Simon Fraser University (Vancouver) in the late 1960s. Acoustic ecology, which was both an artistic movement and a school of thought, introduced

a care for sonic environments by listening to, recording, archiving and studying them and by fighting against noise pollution. The 'soundscape', the sonic equivalent of landscape, can refer, according to Schafer (1977), either to a real sonic environment or to its sonographic rebuilding based on field recordings. It could also be a musical composition evoking a specific location. It is, in any case, an 'acoustic field of study' (Schafer, 1977, p.7). The soundscapes collected on the Aporee soundmap are raw field recordings of the *real* soundscape we could have heard if we were there; the view of their geographic location contributes to testify to their veracity and to their scientific usefulness.

The Aporee global soundmap aims to offer a ready-to-use collection of sonic environments for researchers and for artists. The search filters (by place, by contributor, by type of sound, by year) present it as an organised sound archive, of which location is the most visible criterion. The web design, in addition to the Google Earth graphic standards, appears as neutral. Created by a German artist, Udo Noll, Aporee combines the collaborative culture of the open source web and the seeming neutrality of an institutional archive collection. It is considered an unequalled and inspiring model of its kind. However, this is a model that could be questioned, regarding its audio-visual framework and its prospect of building a global sound archive.

Objectives and perspectives

Today

Collaborative global soudmaps following the Aporee model combine two contradictory archive sources: a digital company which is one of the 'Tech Giants' (Google), and a plurality of individuals (the contributors). Whilst the soundmap's creators are using a free service offered by the digital company, the contributors are also sharing free data which can be used and sold by it (as Aporee's privacy settings make clear). Their contributions are made under the rules of the digital company which they help to expand. That being said, let's look into the audio-visual synergy that this association of two contradictory representations of space generates.

Instead of offering an alternative cartography, where the sonic dimension

would prevail, soundmaps following the Aporee model are pinning sounds on a map which pretends to reflect an objective and immediate reality. Even if they are not contesting the view-from-above's dominant representation of space, they still offer a counterpoint. The sounds, recorded from the ground by a plurality of individuals, complete and contradict the visual webmap at the same time.

When visiting those soundmaps, in contrast to the photographic reproduction where we can zoom in to get closer and closer, or jump, by clicking, from one country to another, we need to take the time to listen to the recordings which are embedded in different locations. This listening time is one we can't speed up; a time we need to experience as the recordist experienced the location. They were not only *there*, they also made the recording from a specific position and at a certain distance, producing, as in photography, a sense of scale. The recordist can choose to focus on a specific detail of the space, a specific event, or aim at an overall 'picture'. Even if the microphone doesn't have the same selectivity as the human ear, and though there is no sonic equivalent for the term 'point of view',[1] sound recording is still an act of framing.

The parallels between photography and sonography are contradicted by the use of photography in the webmap, because what we see appears as a continuous and real-time reproduction of the Earth, instead of an archive collection. Google Earth's aerial photographs assembly (taken from a satellite, a plane or a drone, depending on the scale) doesn't seem to involve any human being but, rather, seems to be the mere product of an all-powerful technology. The world, seen from above, is presented as an unquestionable perception of reality, making us forget that it is still a representation, led by a specific system of values. However, the introduction of a sonic dimension implies a change of perspective which can be the first step for a change of paradigm.

Location recordings cannot pretend, as the image does in webmaps, to reflect a permanent space. However, their temporality can overcome the recording context. Soundscapes vary according to the moment and to

1 Rick Altman calls 'point-of-audition' a sound that, in a film, might be heard by a character (1992).

the listener, but they are also evolving over the years. Location recordings, although embedded in a 'gridded map', allow the representation of a *lived space* and therefore participate in what Jean-Marc Besse calls a 'lived geography' (Besse, 2010; Anderson, 2016). Location recordings not only create a change in perception, they open the way to experience: the experience of an individual, captured at that specific place at a certain time, which can be shared with some remote listener at any place and time. The web soundmap is a device of data and experience sharing. The virtual experience of space it enables is not only shaped for *remote in space* users, but also *remote in time*.

Beside the added value of experience, introducing subjectivity and sensitivity into an apparently objective and functional representation of space encourages us to question the mapping and making of archives. In fact, the Aporee soundmap not only combines two perceptions of space (from above/from the ground, objective/subjective, continuous/fragmented), it also points out the soundmaps' historicity, by displaying sounds as recordings (unlike the seemingly immediate visual reality) and giving information about how they were made. As a collection project, the soundmap plays a role in conserving sound recordings and selecting them. Among the issues related to creating an archive, the representativeness of those recordings and their relevancy for future generations are some of the main points of discussion.

Tomorrow

If those sound collections are to be kept from a historical perspective, we have to be very aware of what they tell and what they omit. Any collection of archives implies an act of selection and classification. In this respect, we could wonder if the typology of sounds and the collecting mode do not fit with some ideological or aesthetical standards, setting apart some undesirable or less remarkable sounds according to the prevailing sonic culture.

As discussed earlier, the Aporee project conforms with acoustic ecology's pedagogic ambitions but also its aesthetic standards. That causes a lack of diversity in the typology of sounds which is reinforced, Jacqueline

Waldock argues (2011), by the social homogeneity of the contributors, who are mostly men, familiar with recording devices and collaborative media. Not only women, but also social groups untrained to the field recording practices are, in a way, silenced by this model of collaborative soundmapping. Waldock draws attention to the subjectivity of listening, not only as a psychological and individual act, but as affiliated to a specific culture or a social position. In this respect, women might hear and record spaces in a different way, as might 'minorities'. According to Waldock, the relevancy of the sound collected lies in its 'personal relationship' to the contributor, which should be explained 'either by written narrative or by aural description' (2011).

Following those critiques, widening the contributors' social profiles would improve the representativeness of the sound collection. As field recording and collaborative soundmapping are still niche practices nowadays, collecting sounds during field recording workshops with underrepresented social groups could introduce new objects of aural attention. The second option is to open the collection to types of sounds other than strictly environmental sounds. Should the soundmap also contain speeches, music, sounds from machines and political events to enrich the collection?

The British Library's huge sound collection, a small part of which is displayed on the UK soundmap, has clear historical and anthropological goals, covering 'the entire range of recorded sound: music, drama and literature, oral history, wildlife and environmental sounds' (British Library, 2019), which are all classified in subcategories. The British Library has undertaken a vast digitisation of ancient recordings (phonograph cylinders, disk records, magnetic tapes) in order to preserve their content before the original equipment becomes obsolete.[2] Today's researchers can already listen to some lost sounds, such as urban or rural soundscapes, ancient machines, or vocal accents. The British Library's growing sound collection will be a mine of information for the historians and anthropologists of future times. If mapping is not the first goal but instead one of the classification parameters, the UK Soundmap, which includes soundscapes, wildlife

2 See the British Library's 'Save our Sounds' project: https://www.bl.uk/projects/save-our-sounds.

sounds, accents and dialects, and traditional music from England, draws attention at a local scale to British sonic diversity and its ongoing erosion.

To what extent could a global and collaborative soundmap offer an exhaustive sound-from-the-world collection and represent the world's cultural and social diversity? If the means of production, as we can attest from the history of art and techniques, have never been spread equally within the population, studying collaborative archive collections requires extra attention to its production. Therefore, in a historical and anthropological prospect, the *who* and the *where from* of the recordist is almost as significant as the *where* and the *what* of the recording; or, in other words, the relationship between the place of living and the place of recording is a significant clue in understanding the audio document itself and in exploring the role of familiarity and strangeness in the way we listen to the world.

The day after tomorrow

On a long-term scale, there are preservation concerns arising from the fact that soundmaps rely on web archiving. Most webmaps projects vanish from the visible web after a few years. When they are led by individuals instead of institutions or libraries, the recordings they have collected may be stored in places researchers are unable to reach. Udo Noll, who created the Aporee soundmap, thought from the beginning about saving the contents of his website. Firstly, because in the future the website's data capacity will be reached, and there may not be enough space to load new sounds or sounds of an uncompressed format (wav); and secondly, in order to ensure a copy of the collection exists. With that intention, Udo Noll collaborated with the Internet Archive, a non-profit transnational organisation, which aims at 'building a digital library of Internet sites and other cultural artifacts in digital form' and providing 'Universal Access to All Knowledge' (Internet Archive, 2014). The Internet Archive is also a pioneer of its kind, as it started in 1996, a few years after the World Wide Web was created, by archiving this new medium itself, and was the first transnational web library to be created. Its headquarters are located in San Francisco, and the data are stored in three data centres in California (San Francisco, Richmond and Redwood

City). To avoid a loss of the collections, and in case of a catastrophe, a mirror backup has been created in the Bibliotheca Alexandrina, Egypt, established in 2002 to commemorate the lost antique library, with both national and international prospects. From the Aporee platform created by the German Udo Noll, to the global sound collections stored in California and Egypt, the local recordings, coming from all over the globe, can be listened to online from anywhere, at any time, and are concretely stored on two continents. The association of a virtual space and 'real places' are part of the web paradox, which is reinforced in global soundmaps by the virtual ability to travel and to be immersed in some remote places.

This experience of ubiquity cannot really be reproduced by the web archive. As Niels Brügger alerts us, we can't expect the web archive 'to be an identical copy on a 1:1 scale of what was actually on the live web at a given time' (2011, p.32).

> When archiving newspapers, film, radio, and television, the main choices are related to the selection of the material, while the archiving process itself *grosso modo* consists of taking a copy out of circulation and storing it; no matter who stacks the newspapers or presses the record button on the video recorder, the archived copies are identical to what was once in circulation, just as all copies are identical. In contrast, with web material, choices have to be made in relation to both selecting and archiving, and we always do more than just remove the web material from circulation; the material is never totally unchanged.
>
> (Brügger, 2011, pp.32-33)

In fact, when we go to the Aporee collection page on the Internet Archive website, there is no longer a map. All we can see is a collection of sonograms, sorted by view, title, date archived and creator. We can look for specific sounds in the collection by key words, thanks to the search engine which will search in the metadata. When we write, for instance, 'rain brazil', four different sonograms appear. If we click on one of them, for instance, 'Tauary (Amazonian Rainforest) – Screaming Piha in the Amazonian Rain Forest'

by Félix Blume, we can listen to it and read more information, including the location data. When clinking on the link, nothing new appears, but when copying it on to Google Maps, the exact place is pinpointed on the map, as in the original soundmap. However, the search engine has swiftly demonstrated its limits: first, I haven't found a sound of rain, but of the rainforest; second, I made my search in English, assuming that most of the metadata would be in English, but if I do the same search in French, I find one more result. In fact, the limits are not posed by the search engine but by the precision of the metadata and the language used there. The entire sound collection can't be explored by catching a glimpse of sound; as a first step, words are not only helpful but necessary to find a sound and recognise what it is.

Beyond that, the recording format itself can pose a problem for future use by humanities researchers. How can we ensure they will be able to play the recordings? And how can we ensure the digital data is sustainable on a long-term scale? Won't the collection be too large at that point? Shouldn't the criteria for inclusion be more selective to ensure the collection's lasting relevance?

Echoes from the planet

Among environmental soundmaps, some collections prove more specific than others in terms of the typology of sounds presented and in the modality of contributions. The Nature Soundmap, created by the Australian field recordist and photographer Marc Anderson, gathers sounds from wild environments made by professionals from all over the world. Recorded with high-quality material and using binaural technology (a pair of stereo microphones which reproduce the spatial perception of two ears), they aim at producing a sensation of immersion. The remote webmap visitor, while listening through headphones, is plunged into an environment that seems to surround them. They can close their eyes, concentrate, and virtually travel through listening. The power of those sonic environments adds another dimension to the visual webmap. The place where the sound is pinpointed is only an indication of where we are landing or diving. The temptation to click on a new place every 15 seconds is absent, compared

to Aporee, because the sounds we are listening to are not only recordings that document a place, they are also dealing with sensations and have the capacity to make the listener feel that they *are there*.

This immersive nature soundmap collection echoes back to the work of Bernie Krause, an American musician and bio-acoustician who has been recording natural soundscapes since the 1960s. Krause has created the Wild Sanctuary in California, where 'a vast and important collection of whole-habitat field recordings and precise metadata' is stored (Wild Sanctuary, n.d.). Through conferences, books and exhibitions, he has brought awareness to the endangered *biophonies* of the planet,[3] documenting their ongoing loss and showing their richness from an environmental and aesthetical perspective. In his opinion, field recordists have a role to play in the preservation of sonic biodiversity – first, by presenting each specific biophony as a whole sonic ecosystem. He terms this the 'niche hypothesis': the idea that 'in order to be heard, whether in urban, rural, or wild habitats, vocal organisms must find appropriate temporal or acoustic niches where their utterances are not buried by other signals' (Krause, 2015, p.40). The combination of different frequencies, mixing with each other in order to be heard, makes him compare sonic ecosystems to symphonies. Beside this musical approach, he asserts the need, for scientific use of the recorded data and metadata, to give precise information about biodiversity in the recorded environments.

The second role that field recordists could play, according to Bernie Krause, is to give evidence of biodiversity loss throughout the years by comparing two recordings of the same environment several years apart. Ultimately, the sonic medium, and its ability to trigger emotions, can be used to alert audiences and governments to the need to preserve ecosystems. If listening to an environment introduces a care for it, listening to it from the perspective of its extinction may not only change the colour of our emotions but also introduce a real and urgent concern about its preservation.

3 Bernie Krause calls biophony 'the collective sound produced by all living organisms that reside in a particular biome' (2015, p.11). A natural soundscape is also characterised by its geophony, 'the non-biological natural sounds produced in any given habitat, like wind in the trees or grasses, water in a stream, waves at the ocean shore, or movement of the earth', and often conflicts with anthropophony, 'all the sounds that we human generate', most of which, in his opinion, is 'chaotic or incoherent – sometimes referred to as noise' (Krause, 2015, p.12).

Though designed as a collection of wild soundscapes, Anderson's Nature Soundmap has secondary historical goals. In fact, because of climate change, deforestation, natural extractions, and sound, air, earth, and water pollution, wild soundscapes have been changing over the past 50 years. In this respect, this sound archive lacking human presence still documents humanity's impact. The clear goals implied by the type of sonic environments targeted, and the limiting of contribution to professional nature field recordists, means that the Nature Soundscape avoids, in part, the problem of seeking to be representative. However, we can argue, as more than 95% of the contributors are white men, the lack of women in sound practices is still reinforced by the image of the solitary explorer braving the dangers of the wild world to record it.

Global/Local

If the typology of sounds and the identity of the recordist are two of the main issues implied in the making of a global sound archive, the soundmapping itself also has to be discussed. The maps studied, which I called the Aporee model, are based on a webmap service (here, Google Earth); and most of the existing global soundmaps follow this model, as if there is no alternative. However, soundmapping existed before Google Earth, and different way of intersecting the visible and the audible have been explored.

If we understand a map as a visual or graphic representation of space, representing a sonic environment can be done in many ways. Peter McMurray, in his 2018 article 'Ephemeral cartography: on mapping sound', gives alternative models of soundmapping throughout history. In the late 1960s, at the same time as Raymond Murray Schafer was developing his notion of soundscape and was mapping the increase of noise pollution in Vancouver, 'a group of urban planners and designers in Boston, led by Michael Southworth and Kevin Linch, developed a much more city-friendly notion of soundscape, articulated in a number of soundmaps as well' (McMurray, 2018, p.125). They used an original graphic vocabulary to map the different type of sounds in the city, 'including music, chimes, police officers and vehicles', and to display their locations and superpositions (McMurray, 2018, p.125). These data visualisations, McMurray argues,

'are key materialisations of soundscape for Schafer' (2018, p.125). But if Southworth is mapping 'about sound', Schafer provided in *The Vancouver Soundscape* and its associated LP (1973) 'the first systematic attempt to make a map of sound – that is, a map comprising not merely visual representations of sound but recordings of the sounds themselves' (McMurray, 2018, p.127). Since the 1980s, sound and visual artists have looked for alternative ways of mapping sound. Annea Lockwood's field recording projects about rivers, which she called 'Sound Maps', were not only released on records (*A Sound Map of the Hudson River*, 1989) but also in visual and sonic installations (*A Sound Map of the Danube*, 2005).

According to sound artist Isobel Anderson, 'if we are to harness sound as a creative and expressive cartography, we must map listening rather than solely fixed sound' (2016). As an example, she describes the installation she made at Belfast's Metropolitan Arts Centre, with the songwriter Fionnuala Fagan, about Belfast's disappeared Sailortown. Instead of using a 'gridded map', they wrote songs inspired by their interviews with members of the Sailortown Regeneration Group (SRG), and 'began to map the streets and buildings that have now disappeared' (Anderson, 2016). The exhibition combined 'songs alongside composed soundscapes, objects, images, and text' (Anderson, 2016). The visitor could listen to each song 'through headphones mounted on the walls at different locations in the space' and explore, at the same time, some 'photographs and objects from Sailortown' (Anderson, 2016). This intermedial project is far removed from a sonic data collection following the Aporee model. However, it still documents a territory and reveals 'voices that had been silenced in traditional maps of the city' (Anderson, 2016).

Nevertheless, all these attempts for an alternative sonic cartography have local scales and specific targets. This is to say, mapping local sounds at a global scale is an almost impossible challenge. What would an alternative global soundmap look like? Would it be interactive? Kinetic? Would it render a subjective perception of space? And how can the ephemeral qualities of sound be rendered? Nowadays, some of the most advanced cartographers in alternative representation of space, such as the French *Terra Forma* group (Aït-Touati, Arènes, and Grégoire, 2019), aim at mapping an 'inhabited

planet', and the way we interact with space, territories and ecosystems, mostly focuses on local scales.

Should we understand those global web soundmaps for what they are – a collection of local sounds pin-pointed in their geographic location – without seeking for an alternative representation of space and using the webmap device as a frame or a tool? In every respect, global soundmaps have two main advantages: making their remote visitors travel through space and time and making them think of the way one's listening to the world could be shared and represented.

BIBLIOGRAPHY

Aït-Touati, F., Arènes, A. and Grégoire, A, 2019. *Terra Forma. Manuel de Cartographies Potentielles*. Paris: Éditions B42.

Altman, R. ed., 1992. *Sound Theory, Sound Practice*. London: Routledge.

Anderson, I., 2016. Soundmapping beyond the grid: Alternative cartographies of sound. *Journal of Sonic Studies*, 11 [online]. Available at: <https://www.researchcatalogue.net/view/234645/234646 > [Accessed 12 May 2020].

Besse, J.-M., 2010. Le paysage, espace sensible, espace public. *META: Research in Hermeneutics, Phenomenology, and Practical Philosophy*, 2(2), pp.259-286.

Besse, J.-M., 2018. *La Nécessité du Paysage*. Marseille: Parenthèses.

British Library, 2019. *Save our sounds*. [online] Available at: <https://www.bl.uk/projects/save-our-sounds> [Accessed May 24 2020].

Brotton, J., 2013. *A History of the World in Twelve Maps*. London: Penguin Books.

Brügger, N. and Schroeder, R. eds., 2017. *The Web as History: Using Web Archives to Understand the Past and the Present*. London: UCL Press.

Brügger, N., 2011. Web archiving – between past, present, and future. In: M. Consalvo and C. Ess, eds. 2011. *The Handbook of Internet Studies*. Chichester: Wiley-Blackwell. pp.24-42.

Droumeva, M., 2017. Soundmapping as critical cartography: engaging publics in listening to the environment. *Communication and the Public*, 2(4), pp.335-351.

Droumeva, M., Jordan, R. eds., 2019. *Sound, Media, Ecology*. London: Palgrave Macmillan.

Internet Archive, 2014. *Internet archive*. [online] Available at: <https://archive.org/about/≥ [Accessed May 24 2020].

Krause, B., 2015. *Voices of the Wild: Animal Songs, Human Din, and the Call to Save Natural Soundscapes*. London: Yale University Press.

Leloup, R., 2017. Les enjeux de la cartographie sonore par rapport à la frontière de la neutralité. *Intersections*, 37(2), pp.59-72.

McMurray, P., 2018. Ephemeral cartography: on mapping sound. *Sound Studies*, 4(2), pp.110-142.

Montreal Soundmap, n.d. *Montreal soundmap*. [online] Available at: <https://www.montrealsoundmap.com/≥ [Accessed May 24 2020].

Noll, U., 2019. *Info & help*. [online] Available at: <https://aporee.org/maps/info/#about> [Accessed May 24 2020].

Noll, U., 2020. *Radio aporee*. [online] Available at: <https://aporee.org/maps/≥ [Accessed May 24 2020].

Schafer, R.M., 1970. *The Book of Noise*. Wellington: Price Milburn & Co.

Schafer, R.M., 1977. *The Tuning of the World*. New York, NY: Knopf.

Sterne, J., 2003. *The Audible Past: Cultural Origins of Sound Reproduction*. Durham, NC: Duke University Press.

Thulin, S., 2018. Sound maps matter: expanding cartophony. *Social & Cultural Geography*, 19(2), pp.192-210.

Varghese, S., 2020. The Noise of Time. *New Stateman*, 21-27 Feb., pp.41-43.

Waldock, J., 2011. Soundmapping: critiques and reflections on this new engaging medium. *Journal of Sonic Studies*, 1 [online]. Available at: <https://www.researchcatalogue.net/view/214583/214584> [Accessed 12 May 2020].

Wild Ambiance Pure Nature Soundscapes, 2020. *Nature soundmap*. [online] Available at: <https://www.naturesoundmap.com/> [Accessed May 24 2020].

Wild Sanctuary, n.d. *Wild sanctuary*. [online] Available at: <http://www.wildsanctuary.com/index.html> [Accessed May 24 2020].