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SOUND MAPPING IN STELVIO NATIONAL PARK

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**Abstract:** The paper illustrates the field recording and photographic project developed in the Val di Rabbi area of the Stelvio National Park-Trentino. In particular, it details the experience of archiving and collecting sounds derived from the environment, which is significant in terms of the conservation of multispecies interactions and preservation of the valley’s peculiarities. The ideas presented align with the narratives of Anthropocene sound sampling activities, which challenge traditional modes of classification in an era of unprecedented climate change, extinction of species, and endangered ecosystems. Furthermore, this project’s goal is to develop a collaborative, open access, co-created, and long-lasting sound map which leads to a rethinking of taxonomies as open systems of knowledge.

**KEYWORDS:** soundscape, climate change, Anthropocene, sixth mass extinction, listening, soundmaps.

1. Introduction

The first decade of the twenty-first century saw an explosion of sound studies, an interdisciplinary field dedicated to the study of the socio-cultural and natural meanings and manifestations of sound (Helmreich 2016). Increased attention has been directed towards sound and noise in urban cities, the creation of sound maps, and the sharing of experiences between experts and laypeople. For Italian national parks, sound-related issues are related to monitoring the state of welfare and impact factors on non-human animal species, and scientists thus use them as a tool for investigation. For instance, Roberta Righini and Gianni Pavan (2019) have reconstructed, from an ‘ecoacoustic’ perspective, the soundscape of the integral nature reserve of Sasso Fratino in Casentino Forest National Park with the goal of mapping biodiversity and possible anthropogenic noise to monitor and protect the park’s ecosystem. Here, we propose an in-

terdisciplinary approach to sound recording and listening practices that seeks to reconcile both scientific research and the humanities.<sup>1</sup> On the one hand, sound can be a method of soundscape quality analysis in the scientific field, and on the other hand, it is a means to perceive and approach the environment differently than through sight. Our aim is to report the research experience conducted in the summer of 2022 in the Val di Rabbi area of the Stelvio National Park-Trentino, which will continue in the coming

<sup>1</sup> In this sense, since the project is in an interdisciplinary field which seeks to reconcile scientific and the humanities in an integrated approach to the environmental problems of our time, it could be included in the discipline of environmental humanities. The environmental humanities encourage creative methods and artistic approaches which lead to reconsidering the relationships between humans, non-human beings, and the environment by highlighting their interconnection. Indeed, one peculiarity is that it allows us to read the world’s entanglements from many angles, “whether informed by the arts or the sciences, and whether these angles are human or not” (Iovino et al. 2018: 4).

months. The first phase of the project had been conducted in order to collect and archive black and white photographs and the ‘naturalcultural’ recordings of the valley. A future goal is to expand the project to create a sound map in which park operators, local people, and visitors can contribute with the chance to add and modify their recordings. In this last phase, people can use field recorders or mobile phones as recording instruments and would be invited to listen carefully and to record the surrounding acoustics of the territory. Indeed, sound is an effective tool for exploring and documenting a particular geographical location and the people who inhabit and visit it. It also serves to document interactions between humans and non-humans, as well as non-biological sounds, such as flowing water and rustling wind, since “expanding listening allows other things to enter as well” (Kanngieser & Gallagher 2016: 651). Moreover, in the ongoing sixth mass extinction (i.e., the Anthropocene era), it is important to consider new ways of bringing people closer to the environment through the senses, especially in national park areas. By using a field recorder with headphones or a mobile phone, the intention is to bring the potential listener closer to the sound source and lead them to reflect on their surroundings and “on becoming with” (Haraway 2008: 244) into a place and, more broadly, into a world composed of many agencies, “of other forms of life, with their distinctive ambient sensitivities” (Raffles 2010: 323). In particular, using a field recorder with headphones can lead to a hyper-awareness of one’s surroundings, enabling people to perceive in a relational and multispecies manner.

As a matter of fact, by practising a passionate immersion in our multispecies world through listening carefully to sounds’ sources (Dooren et al. 2016), one becomes increasingly aware of the fields of relationships and interconnectedness which comprise our world: the rhythms of the intra-actions among humans, non-humans, and non-living things (Barad, 2007: 141). We observe how we interact with the environment, constantly changing our sensations and emotions, thoughts, and memories. According to Solomos (2018), sound is “a network of relationships” because “sound is what connects us to our environment [...] and to the world” (99). While sight seems to be the only sense which requires the object in question to be distanced, hearing is an immediate relationship between a subject and its surroundings: “Sound is relational” (Helmreich 2016: 8).<sup>2</sup> Furthermore, from a strictly scientific perspective, environmental recordings are a valid source for researching the displacement of non-human animals’ populations or their extinction due to climate change and the anthropic impact on territories (Comstock & Hocks 2016: 165). Given the regular presence of birds and insects in the recordings, this study methodology could be added as integrative to ornithological and entomological research. Thus, listening and recording are effective modes of knowledge and understanding, enriching our awareness of being part of a relational system, in which each part is interdependent on the other.



Figure 1. Val di Rabbi. Drinking trough near Malga Monte Sole. Photo by Matteo Ferrari.

<sup>2</sup> We could also expand this concept by considering the concept of rhizome. In *A Thousand Plateaus* (1987), Gilles Deleuze argues that a rhizome represents a sort of underground net which connects a multiplicity of significative elements, each with their own properties.



## 2. Sounds in troubled times

*Perhaps voices from the death space will speak to us. If we could hear these harmonics, we would hear the call of those who are slipping out of life forever. There we might encounter a narrative emerging from extinctions, a level of blood that connects us rather than driving us apart. Such a narrative would enjoin us to rethink everything we thought we knew about who we are and how to live within the imperilled family of life on Earth* (Bird Rose 2011: 146).

Rachel Carson's *Silent Spring* (1962) inextricably linked natural sounds to the quality and well-being of the environment. In particular, the author explains how pesticides harm not only insects, but also the birds which feed on those insects – and how these substances endanger the health of the Earth and the human beings who inhabit it. Carson's suggestion to switch from passive behaviour to an engaged connection with nature through the senses led us to reflect on the ongoing biodiversity crisis. According to the scientific community, we are in the Anthropocene era, where anthropic impact is causing the sixth mass extinction, which is comparable in size to the Cretaceous-Tertiary extinction, when 75% of life on the planet was phased out. The difference is that this extinction is caused by humans (Kolbert 2014). Nevertheless, different research perspectives use other expressions to define our age which not only emphasise the massive human impact, but also the coexistence of other species and their fundamental role in the biosphere. For example, in addition to the concepts of 'Anthropocene', 'Capitalocene', and 'Plantationocene', – which lead to sustain human exceptionalism on Earth – Haraway notes another of

particular interest called 'Chtulucene', in which connection with the surrounding world and other living beings is of fundamental importance. With the term Chtulucene. Haraway (2015) expresses her desire of trying to catch the heterogeneity of the reality and the "entangles myriad temporalities and spatialities and myriad intra-active entities-in-assemblages including the more-than-human, other-than-human, inhuman, and human-as-humus" (160). In an interview with Federica Timeto (2020), Haraway underlines the urgency of thinking in harmony with the many beings of the earth – including humans – which are involved in the dynamic practices of making worlds to redefine new patterns of relationship and lay the foundation for a new horizon of meaning.

In *The Great Derangement*, Ghosh (2016) argues that artistic and media expressions can be useful and effective in addressing climate issues. Indeed, current challenges include the search for interdisciplinary, hybrid, and collaborative creative practices and theories, as well as new narratives which aim to communicate our *naturalcultural* world (Bertoni 2016). Sound itself is a possible alternative language, a way to respond to the challenges of our time in view of a participation-based approach to the environment. The intention is not to impose a visual privilege on hearing. Rather, sound is an opportunity to incorporate and fix in memory systems of signification other than human, (e.g., birdsong or the sound of cicadas [Dobson & Schauerman 2021: 18]) with "an awareness of their increasing unavailability in an era of unprecedented planetary spread of the human population" (Bruyn 2016: 153).

Figure 2. Sheep near Dorigoni Refuge. Photo by Matteo Ferrari.

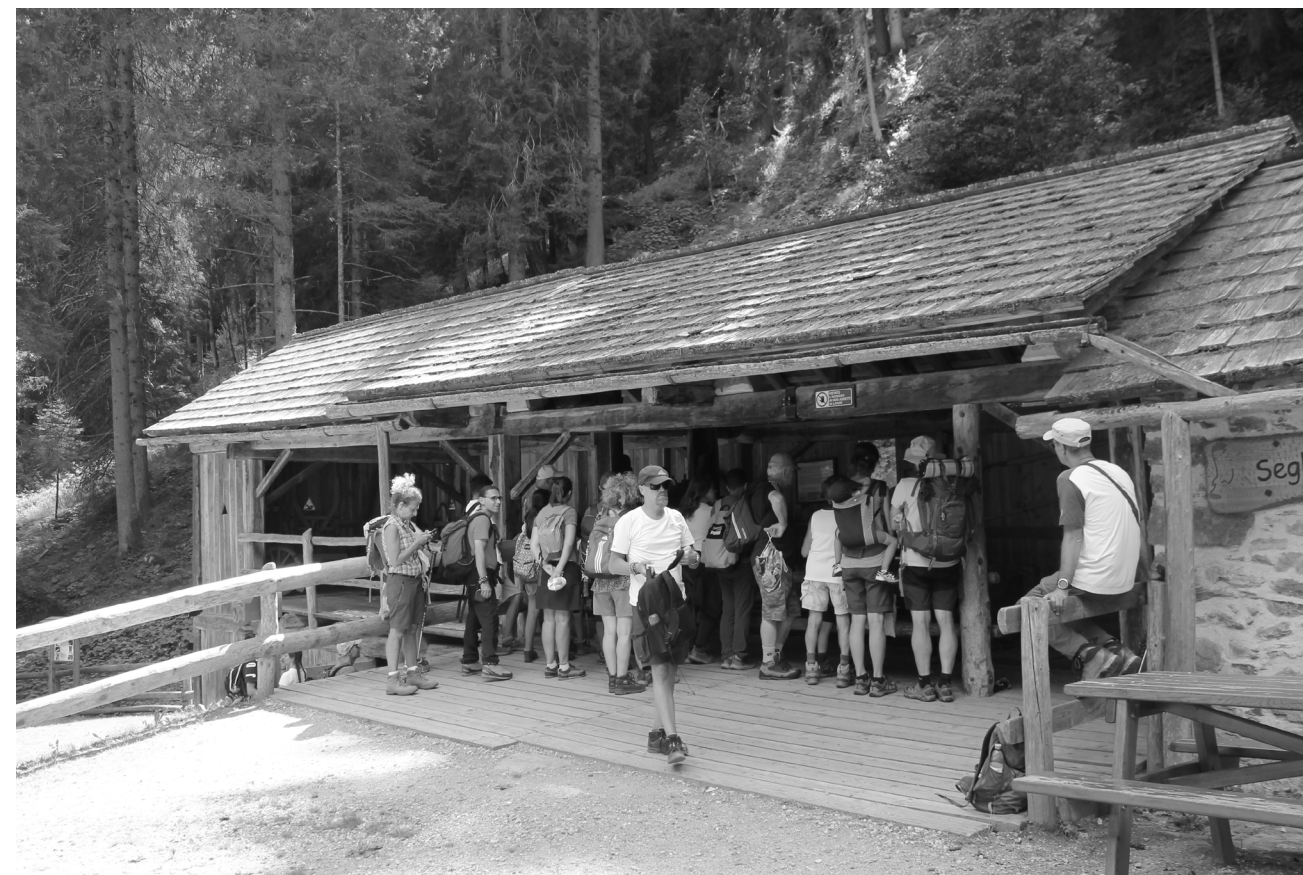


Figure 3. Val di Rabbi. During a guided tour of the Venetian sawmill. Photo by Francesca Corradini.

## 3. Theory behind the project

*It's an intensely interactive world, a landscape across which animals of the same and different species connect and communicate.*

*Listen. Can you hear it? With the soundscape we take tentative steps into a wider, richer world* (Raffles 2010: 329).

A pioneering sound archive project which has influenced scientific research in this field is the World Soundscape project at Simon Fraser University in Canada. The research group was founded in 1969 by environmentalist, composer, and sound researcher Murray Schafer and other researchers like Hildegard Westerkamp and Barry Truax, among others. The group was interested in how noise pollution began to compress natural sounds. Since then, this view has become the core of the development of 'acoustic ecology', which has been conceptualised as a way to detect biodiversity and anthropogenic impact on environmental sounds (Pasoulas 2020). Schafer's ideas on soundscape have influenced generations of scholars from musicologists and ethnomusicologists to visual artists and other disciplines: acoustics, physics, sound engineering, history, geography, anthropology, ethnology, psychology, design, and urban planning, just to name a few. For instance, during the second half of the twentieth century, the role of sound has been investigated by the disciplines of soundscape ecology and bioacoustics conceived as studies of the production, transmission, communication, and reception of non-human animals' sounds, including their vocalization, hearing abilities and acoustic behaviour. These fields of research influenced the sound recording activities of protected areas such as in National Parks where for a long time have concentrated their sound-

scape research on detecting natural systems and individual non-human animal behaviour sounds (Ednie & Gale 2021: 179). As a matter of fact, field recordings in this area, has been focused on individual living organisms rather than report a complexity of interactions (Pijanowsky et al. 2011). It is in the discipline of ecoacoustics that bioacoustics and soundscape ecology has been consequently incorporated to focus on the complex ecological dynamics reflected in biological sounds (biophony) such as vocalizations and sounds from non-human animal voices, natural sounds (geophony) which include geophysical agents, and climate phenomena, human animals' sounds and noises (anthropophony and technophony) (Suer et.al. 2015; Farina 2018: 28).<sup>3</sup>

The first decade of the twenty-first century saw an explosion in sound studies, a field devoted to investigating the cultural and social meanings of sound in music, speech, and other forms of communication. These studies quickly grew into "a novel zone for thinking about soundscapes, sound states, vibration, echo, reverb, signal, [and] noise" (Helmreich 2016: 18). For example, scholars (de Mori & Seeger 2013; Sakakeeny 2010) have explored the role of sound in relation to agency, human and non-human animals' relationships, and their space of coexistence. In the same light, ecoacoustics emerges as a robust and interdisciplinary science (Farina 2017: 1) with a wide range of applications

<sup>3</sup> Ecoacoustics, as other emerging fields, faces challenges in pinpointing its exact beginnings and historical origins. Although the term "ecoacoustics" was proposed during a meeting in Paris in June 2014 alongside the term "soundscape ecology", the exact date of its foundation cannot be determined. This meeting concluded that ecoacoustics encompasses the study of ecologically-based sounds and therefore includes the field of soundscape ecology.



and interests, such as the study of the relationship between non-humans, humans, and the environmental sounds providing a powerful tool for monitoring, managing, and conserving acoustic biodiversity in the face of global climate change. A pioneer of this discipline was Bernie Krause, an American musician and sound ecologist who founded the Wild Sanctuary to archive the world's natural soundscapes and thus preserve them from extinction. Similarly, biodiversity loss and species extinction are central themes in Monacchi's work. In *Fragments of Extinction* (2013), he emphasises the fact that humans are part of a complex ecosystem composed of other entities. Introducing the term 'acoustemology', Steven Feld (2017), argues that sound, rather than being a measure of something or someone, is a relational process between human and non-human entities (12). Moreover, acoustemology, which considers the coexistence between humans, non-human animals, living and non-living creatures, "is based on the basic assumption that life is shared with others in relationship, with numerous sources of action" (13) or, using Bruno Latour's (2007) definition, "actant" (34). Extending the concept of acoustemology, Anja Kanngieser (2016), defines it as the possibility to reconsider our relationship with spaces, territories, and geographies.

#### 4. Sound mapping

*Sound is a vibration that travels through the air and implants itself in the flesh. But its force ripples far beyond merely human environs. Sound saturates the atmosphere and renders air heavy with story. [...] Sonic vibrations ripple and intensify, saturating the atmosphere with [...] a dense archive of story (Cohen 2017: 38).*

At historical moments, when a crisis of knowledge is most acutely felt, the need to classify and sort objects into a series of hierarchically ordered typologies finds full expression. Both Western taxonomy and scientific objectivism have repeatedly attempted to capture species and encase them into 'useful' categories. Nevertheless, in today's age of hyper information, the renewed interest in cataloguing and archiving may be due to the need to disentangle such an excess of knowledge which makes it difficult to navigate (Baldacci 2016: 17). By the end of the nineteenth century, archives began to stimulate new modes of research and exchange within academic institutions. The notion of archives, including taxonomy, was revisited, and rethought from various perspectives. Today, several scholars are reconsidering archives from the perspective of their specific materiality, whether real or virtual, as technology and media increase their degree of complication, making them complex sites for knowledge processing (Birdsall & Tkaczyk 2019: 5-6).<sup>4</sup> While archival collecting has long been associated with neutrality and exclusivity, today scholars are questioning the politics of archives and the archival practices of

acquisition, classification, preservation, and access: sound maps are considered by sound archive professionals to be a means of allowing the public to take part in the curatorial process. Indeed, digital archives, such as sound maps, have fundamentally changed the way data is accessed (Reséndiz 2014).<sup>5</sup>

The sound map is a digital, interactive medium which has emerged in sound studies over the last two decades. It is an open area of experimentation that takes the forms of the diffuse archive, the atlas of narratives, and the practices of acoustic exploration. Differently from traditional cartography, that seems to be connected exclusively to the sense of sight or even touch, sound map changes the way a map is created, used, and experienced. Sound mapping activities have mainly focused on cities to raise awareness about traffic, noise, and the disappearance of natural sounds to create an open archive format (Waldock 2012). Furthermore, a series of regional, national, and global sound maps has been created, including the Basque Country and UK sound maps, and Aporee - a project directed at combining sound recording and cartographic practices to present a global sound mapping. The majority of sound collections are place-specific, collaborative, and often non-holistic, as they only account for a specific type of sound. However, over the last four decades, sound maps have been constantly enriched by contributions not only from experts but also from laypeople, thus forming true collective archives of "shared data and experiences" (Fargier 2020: 60). For example, Earth.fm aims to bring people around the world closer to conscious listening to soundscapes biodiversity, which are becoming increasingly scarce and endangered due to human impacts on ecosystems. In addition, in Italy there is Soundiversity, a map created to involve both local people of the Verona and Vicenza provinces and the public in general, to raise awareness about biodiversity loss and thus the importance of its conservation. As a matter of fact, the involvement of local people and the public can be seen as crucial in sound mapping activities: this is because it fosters a stimulus to reflection and knowledge of the sound dimension of ecosystems in which humans, non-humans, and plants mutually shape each other, enables the exploration of negative or positive perceptions of sounds in places, and timely actions to collect, conserve and enjoy biocultural diversity (Carlyle 2021). This can lead to reflection and knowledge that humans and the ecosystem influence each other through continuous intra-action.

In our case, sound recording practices are intended to complement existing citizen science projects in Val di Rabbi area of Stelvio National Park-Trentino such as the monitoring of pollen, and species.<sup>6</sup> In relation to this, the British biologist Carole Morrison (2021) and her research team used data from sound recordings made by individual citizens as part

5 In the seminal book *Archive Fever* (2017), Jacques Derrida individuates a near-obsessive urge towards archiving and document collection in modern times, which he defines as a 'fever'. However, this project's intention is not to collect documents which result from an action of power, but rather to collect traces – understood as a bridge – that enable the connection between past and present. This element allows for a redefinition of the way archives are structured.

6 These are the sites of the projects: <https://www.parcostelviotrentino.it/it/conoscere-il-parco/citizen-science-chirotteri/26-770.html>; <https://www.parcostelviotrentino.it/it/conoscere-il-parco/progetto-monitoraggio-impollinatori-e-progetto-ape-mellifera-come-bioindicatore/26-108098.html>

of citizen science projects to show that over the past 25 years there has been a major and pervasive loss of diversity in soundscapes caused by changes in species abundance in both Europe and America. This highlights that this approach can be considered crucial in non-human animals' research such as birds and insect monitoring, in detecting the reduction of biodiversity, and in studying migratory phenomena. In this perspective, sound mapping could be conceived as an effective tool from a scientific and historical point of view because it enables the archival preservation of sounds that risk disappearing.



Figure 4. Val di Rabbi. Children walking along Rabbi's stream  
Photo by Matteo Ferrari.

#### 5. Project methods and structure

During the initial phase conducted last year, the Val di Rabbi map was divided into sections based on the boundaries of Stelvio National Park-Trentino. Then, exploratory excursions were successively made to record the sounds of these areas and take black and white photographs. The instruments used for recordings were the Zoom H5, Zoom H2n recorders, and the AudioMoth, a recorder which can be fixed to trees to record acoustic and ultrasonic sounds.<sup>7</sup> The collection of photographs and sound recordings was organized according to specific locations, providing an interactive methodological way of knowing with and through the ma-

7 The Zoom H2n is a portable recorder with five internal microphones and four recording modes, whereas the Zoom H5 allows for four simultaneous recording tracks and interchangeable microphone capsules.

teriality of the senses (Talianni 2020). Each folder contains recordings of locations and black-and-white photographs reflecting "the meshwork" of entanglements (Ingold 2013: 99). Several recordings captured non-human animals and non-living elements: the sound of cicadas, bees, and birds; the flow of water in fountains, troughs and streams; sheep, cows and their bells.<sup>8</sup> While 'human' sounds include visitors to old Venetian sawmills, voices of people near shelters and in the woods, and shepherds' whistles. Moreover, the various recordings made at different points of the Rabbi's stream – which flows through the valley – 'reconstruct' its trajectory through sound.<sup>9</sup>

The aim is to collect the Val di Rabbi soundscape by concentrating on listening and recording the sound atmosphere of the various places with the conviction that listening is "not simply a process in which one hears a sound but is an entire bodily experience of being in a place where sound is a focal point" (Whitehouse 2015: 66). Recordings have the power of transport and help to find new alternative ways of interpreting and understanding the environment. According to Talianni (2020), a narrative composed by field recordings involves the ways places are inhabited by humans and non-humans becoming a collaborative and interactive method of understanding life (60).

A next phase already underway involves research among the living, tangible and intangible sources, cartographies, historical documents, and biocultural diversities of Val di Rabbi: this historical investigation aims to understand the Rabbi Valley and its inhabitants through primary sources. In the second recording phase, participant engagement includes local residents, park operators, and other stakeholders such as visitors. In particular, recording campaigns will be launched within the park along itineraries where people will be able to contribute to the sound mapping of the area, with the chance to add and modify their contribution, themselves becoming promoters of a form of participatory sustainable tourism.<sup>10</sup>

The sounds collected in the initial and subsequent phases will be mapped with QGIS. However, the configuration of the map has not yet been defined because it is being identified and implemented.

#### 6. Conclusion

This article explored the sound mapping project launched in the summer of 2022 in Val di Rabbi area of Stelvio National Park-Trentino. Firstly, we attempted to establish the historical path of research into the soundscape and the archiving of sound. We proposed sound as a means of exploring the current ecological crisis" and for bringing people closer to the environment, non-human animals, and non-living beings (Louro et al. 2021: 5). Finally, we described the

8 The recordings are available here: <https://archive.org/details/val-di-rabbi.-people-cows-with-cowbells-grasshoppers.-malga-villar-alta>

9 An intriguing example is Anna Lockwood's *Sound Map of the Hudson River* (1982) commissioned by the Hudson River Museum. It is a 70-minute piece that collects recordings made at fifteen locations along the 563 kilometres of the waterway. Also of interest is her fieldwork for *A Sound Map of the Danube* (2008).

10 In this phase it is possible to organize collective soundwalks, a practice introduced by Hildegard Westerkamp, which fits here as a knowledge tool intimately connected to the dynamics of a territory. As a matter of fact, the soundwalk is a highly evocative tool for raising acoustic awareness.



gained and ongoing experience in Val di Rabbi which began in summer, 2022 and will continue in the future months. In fact, the next step in the research is to continue the collection of sounds and then realize a sound map, an open and shared archive which everyone can access and add their subjective contribution.<sup>11</sup> Being both participatory and subjective, sound mapping activity could be an effective “approach to understanding space, place, and territory” (Thulin 2018: 25) which constitutes a multispecies archive of collective memories. Moreover, we considered the idea that sound recordings and sound maps offer the possibility to redefine taxonomic and archive procedures, methodologies, and content. A sound map contributes to redefining

be investigated and if they can be considered a valid tool to be implemented in Val di Rabbi. In a recording, the plurality of interdependent sounds, as a constellation, forms a footprint to allow one to reconstruct the environment from which it comes. For instance, a team of scientists recently discovered an environmental DNA sample from 2 million years ago in Greenland, which allowed for the reconstruction of certain non-human and plant species that characterised the area. Reconstructing the fragment made it possible to trace back to ecosystems which are now extinct (Kjær et.al. 2022). Sound recordings are similar, as they reflect the landscape’s uniqueness, biocultural complexity, and fragility.<sup>12</sup>



Figure 5. Val di Rabbi. Recording marmots at Sternai Lake (2797m). Photo by Matteo Ferrari.

taxonomy by organizing sounds based on location and relevant attributes and revealing new relationships and entanglements: we call this *Rhizomatic taxonomy*. In addition, it redefines the archive by expanding the scope and materiality of what is generally preserved and creating a more immersive and comprehensive documentation of a place. In addition to the implementation of the sound map, design and methods will then be channelled into an ethnographic approach. As a matter of fact, it is considered that sound recording it is a useful tool in the field of multispecies study, such as in multispecies ethnographic approaches. In addition to the sound recordings that will be used as ethnographic material and in which the agency of non-human animals and the environment emerges, unstructured interviews and participant observation with the local population, park operators, and visitors are planned. In particular, the role of sounds in experiencing and studying the environment will

12 Given the progressive extinction of many non-human animal species, sound recordings may soon be used to reconstruct the biodiversity which was present in certain places as a ‘trace’. Jacques Derrida states in *Archives Fever* (2017) that without a trace (like a concrete or virtual imprint), it is impossible to recover what remains from the past. The trace represents a medium which guarantees the possibility of a common substratum between past and present. Moreover, Bruce Chatwin proposed a similar vision in his studies on the function of song in Australian Aboriginal peoples (2012): every landscape and every place contains a soundtrack.

11 We find in Trentino an interesting example of a citizen science project, *Suoni di vita in città*, managed by Muse. This project aims to allow people to collaborate to map the diffusion of urban bird species.

Bibliography

Baldacci, C. (2016) *Archivi impossibili. Un’ossessione dell’arte contemporanea*, Milan, Johan & Levi.

Barad, K. (2007) *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*, Durham: Duke University Press.

Bertoni, F. (2017) Politics of Excess: Alternative World Making for Troubled Earths. *Science as Culture* 26(2): 266-270. <https://doi.org/10.1080/09505431.2016.1272565>.

Birdsall, C. & Tkaczyk, V. (2019) Listening to the Archive: Sound data in the Humanities and Sciences. *Technology and Culture* 60(2): 1-13. <https://doi.org/10.1353/tech.2019.0061>.

Brabec de Mori, B. & Seeger, A. (2013) Introduction: Considering Music, Humans, and Non-humans. *Ethnomusicology Forum* 22(3): 269-286. <https://doi.org/10.1080/17411912.2013.844527>.

British Library. (2019) Save our sounds. Available at: <https://music.britishcouncil.org/news-and-features/2023-01-30/british-library-saving-our-sounds> (accessed 30.12.2024).

Bruyn, B. D. (2016) Anthropocene Audio: The Animal Soundtrack of the Contemporary Novel. *Critique: Studies in Contemporary Fiction* 57(2): 151-165. <https://doi.org/10.1080/00111619.2015.1019411>.

Carson, R. (1962) *Silent Spring*, London, Penguin.

Carlyle, A. (2021) Dropping Down Low: Online Soundmaps, Critique, Genealogies, Alternatives. In: Bull, M. & Cobussen M. (Eds) *The Bloomsbury Handbook of Sonic Methodologies*, London, Routledge. <https://doi.org/10.5040/9781501338786.ch-037>.

Cohen, J. J. (2016) Posthuman Environs. In: Oppermann, S. & Iovino, S. (Eds), *Environmental Humanities: Voices from the Anthropocene*, London, Rowman & Littlefield International: 25-44.

Comstock, M. & Hocks, M. E. (2016) The Sounds of Climate Change: Sonic Rhetoric in the Anthropocene, the Age of Human Impact. *Rhetoric Review* 35(2): 165-175. <https://doi.org/10.1080/07350198.2016.1142854>.

Chatwin, B. (2012) *The Songlines*, New York, Penguin.

Deleuze, G. & Guattari, F. (1987) *A Thousand Plateaus*, translated by Brian Massumi. Minneapolis, University of Minnesota Press.

Derrida, J. & Prenowitz, E. (2017) *Archive Fever: a Freudian Impression*, Chicago, University of Chicago Press.

Dobson, J. & Schauerman, J. (2021) Transcending Boundaries: The Acousmatic Story in the Anthropocene. *Cadernos de Arte e Antropologia* 10(2). <https://doi.org/10.4000/cadernosaa.3695>.

Ednie, A. & Gale, T. (2021) Soundscapes and protected area conservation: Are noises in nature making people complacent? *Nature Conservation* 44: 177-195. <https://doi.org/10.3897/natureconservation.44.69578>.

Earth.fm. (2022) earth.fm: Listen to nature sounds, fall in love with the Earth. Available at: <https://earth.fm/> (Accessed on 30 December, 2024).

Fargier, N. (2020) Global Sound Archive. Soundmap Projects and the Perspective of Future. *IASH. Humanities of the Future: Perspectives from the Past and Present* 21: 83-97.

Farina, A. (2018) An Ecology of Voices: The soundscapes of Tuscany’s Lunigiana. In: Iovino, S., Cesaretti, E., Past, E. (Eds) *Italy and the Environmental Humanities: Landscape, Natures, Ecologies*, Charlottesville, University of Virginia Press: 28-36.

Feld, S. (2017) On post-ethnomusicology alternatives: acoustemology. In: Giannattasio, F. & e Giuriati, G. *Perspectives on a 21st Century Comparative Musicology: Ethnomusicology or Transcultural Musicology*, Udine, Nota: 82-98.

Foucault, M. (1972) *The Archaeology of Knowledge*, New York, Pantheon Books.

Gallagher, M., Kanngieser, A., Prior, J. (2016) Listening geographies: Landscape, affect and geotechnologies. *Progress in Human Geography* 41(5): 618-637. <https://doi.org/10.1177/0309132516652952>.

Ghosh, A. (2016) *The Great Derangement: Climate Change and the Unthinkable*, Chicago, University of Chicago Press.

Helmreich, S. (2016) *Sounding the Limits of Life: Essays in the Anthropology of Biology and Beyond*, Princeton, Princeton University Press.

Haraway, D. J. (2015) Anthropocene, Capitalocene, Plantationocene, Chtulucene: Making Kin. *Environmental Humanities* 6(1): 159-165.

Haraway, D. J. (2016) *Staying with the Trouble: Making Kin in the Chthulucene*, Durham, Duke University Press.

Iovino, S., Cesaretti, E., Past, E. (2018) *Italy and the Environmental Humanities: Landscapes, Natures, Ecologies*, Charlottesville, University of Virginia Press.

Ingold, T. (2007) Against Soundscape. In: Carlyle, A. (Ed) *Autumn Leaves: Sound and the Environment in Artistic Practice*, Paris, Double Entendre: 10-13.

Ingold, T. (2013) *Making: Anthropology, Archaeology, Art and Architecture*, London, Routledge.

Kanngieser, A. M. (2016) A Brief Proposition Toward a Sonic Geo-politics: Rajarhat New Town. *Journal of Sonic Studies* 12.

Kolbert, E. (2014) *The Sixth Extinction: An Unnatural History*, London, Hachette.



ry, New York, Henry Holt and Company.

Kjær, K. H., Winther Pedersen, M., De Sanctis, B., De Cahsan, B., Korneliussen, T. S., Michelsen, C. S., Sand, K. K., Jelavić, S., Ruter, A. H., Schmidt, A. M. A., Kjeldsen, K. K., Tesakov, A. S., Snowball, I., Gosse, J. C., Alsos, I. G., Wang, Y., Dockter, C., Rasmussen, M., Jørgensen, M. E., Willerslev, E. (2022) A 2-million-year-old Ecosystem in Greenland Uncovered by Environmental DNA. *Nature* 612(7939): 283-291. <https://doi.org/10.1038/s41586-022-05453-y>.

Latour, B. (2007) Reassembling the Social: An Introduction to Actor-network-theory, Oxford, Oxford University Press. Louro, I., Mendes, M., Paiva, D. & Sánchez-Fuarros, I. (2020) A Sonic Anthropocene. Sound Practices in a Changing Environment. *Cadernos De Arte e Antropologia* 10(1): 3-17. <https://doi.org/10.4000/cadernosaa.3377>.

Monacchi, D. (2013) Fragments of Extinction: Acoustic Biodiversity of Primary Rainforest Ecosystems. *Leonardo Music Journal* 23: 23-25. [https://doi.org/10.1162/lmj\\_a\\_00148](https://doi.org/10.1162/lmj_a_00148).

Morrison, C. A., Auniņš, A., Benkő, Z., Brotons, L., Chodkiewicz, T., Chylarecki, P., Escandell, V., Eskildsen, D. P., Gamero, A., Herrando, S., Jiguet, F., Kålås, J. A., Kamp, J., Klvaňová, A., Kmecl, P., Lehtikainen, A., Lindström, Å., Moshøj, C. M., Noble, D., Butler, S. J. (2021) Bird Population Declines and Species Turnover are Changing the Acoustic Properties of Spring Soundscapes. *Nature Communications*, 12(1). <https://doi.org/10.1038/s41467-021-26488-1zz>.

Rodríguez Reséndiz, O. P. (2016) Digital Preservation of Sound Recordings. *Investigación Bibliotecológica: Archivonomía, Bibliotecología e Información* 30(68): 173-195. <https://doi.org/10.1016/j.ibbai.2016.06.009>.

Pijanowski, B. C., Farina, A., Gage, S. H., Dumyahn, S. L. & Krause, B. L. (2011) What is Soundscape Ecology? An Introduction and Overview of an Emerging New Science. *Landscape Ecology* 26(9): 1213-1232. <https://doi.org/10.1007/s10980-011-9600-8>.

Pasoulas, A. (2020) The Art and Science of Acoustic Ecology. *ENT & Audiology News* 28(6).

Raffles, H. (2010) *Insectopedia*, New York, Vintage Books.

Rose, D. B. (2011) *Wild Dog Dreaming: Love and Extinction*, Charlottesville, University of Virginia Press.

Righini, R. & Pavan, G. (2019) A Soundscape Assessment of the Sasso Fratino Integral Nature Reserve in the Central Apennines, Italy. *Biodiversity* 21(1): 4-14. <https://doi.org/10.1080/14888386.2019.1696229>.

Sakakeeny, M. (2010) Under the Bridge: An Orientation to Soundscapes in New Orleans. *Ethnomusicology* 54(1): 1-27. <https://doi.org/10.5406/ethnomusicology.54.1.0001>.

Solomos, M. (2018) From Sound to Sound Space, Sound environment, Soundscape, Sound Milieu or Ambiance. *Paragraph* 41(1): 95-109. <https://doi.org/10.3366/para.2018.0253>.

Sueur, J. & Farina, A. (2015) Ecoacoustics: the Ecological Investigation and Interpretation of Environmental Sound. *Biosemiotics* 8(3): 493-502. <https://doi.org/10.1007/s12304-015-9248-x>.

Talianni, K. (2020) The Soundscape of Anthropocene. *Airea: Arts and Interdisciplinary Research*, (2): 63-76. <https://doi.org/10.2218/airea.5037>.

Thulin, S. (2018) Sound Maps Matter: Expanding Cartophony. *Social & Cultural Geography* 19(2): 192-210. <https://doi.org/10.1080/14649365.2016.1266028>.

Timeto, F. (2020) *Bestiario Haraway. Per un femminismo multispecie*, Milan, Mimesis.

Van Dooren, T., Kirksey, E. & Münster, U. (2016) Multispecies Studies. Cultivating Arts of Attentiveness. *Environmental Humanities* 8(1): 1-23. <https://doi.org/10.1215/22011919-3527695>.

Whitehouse, A. (2015) Listening to Birds in the Anthropocene: the Anxious Semiotics of Sound in a Human-dominated World. *Environmental Humanities* 6(1): 53-71. <https://doi.org/10.1215/22011919-3615898>.

Waldock, J. (2012) Soundmapping: Critiques and reflections on this New Publicity Engaging Medium. *Journal of Sonic Studies* 1.

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