**(Re)Creating Avian Worlds**

Experiences of and Reflections on Making, Listening to and Composing with Field Recordings of Birds

– Patricia Jäggi –

This article is based on auditory and (auto)ethnographic field work carried out on 1 April 2021 in the small nature protection area Wauwilermoos in Central Switzerland. As part of the project *Seeking Birdscapes: Contemporary Listening and Recording Practices in Ornithology and Environmental Sound Art*,[[1]](#footnote-1) this day incorporated two main tools to explore the auditory relation between humans and birds: field recordings of birdscapes such as the lapwing habitat at Wauwilermoos and interviewing of *ornithophilic* persons such as composer Marie-Cécile Reber.

The first part of the paper compares recording experiences of directional recording technologies such as parabola and shotgun with wide-angled settings of MS and ambisonic. These autoethnographic listening and recording experiences of birds are interspersed with ethnographic snapshots from previous interviews and workshops, followed by a wider discussion of the history of avian field recordings, including their impact on the science of avian bioacoustics and on the perception of birds in society more broadly through recording albums of birds such as bird guides.

Finally, the article expands its focus on the practices and dissemination of avian field recordings with a contemporary composer’s perspective on bird vocalizations. Based on the interview with Reber, I describe her long-standing artistic exploration of the sounds of insects and, lately, birds. In this way, the article explores field recordings of birds from different angles and aims to discuss them critically in the context of current ecological and posthumanist perspectives on human-nature relations.

**1. A Note on Methodology**

Recent thinking and writing on sound has started to conceptualize ‘listening as an activity through which listening subjects continually produce and position themselves in relation to the everyday sound world’.[[2]](#footnote-2) An understanding of listening as a kind of embodied thinking-feeling foregrounds the processual becoming of an auditory self.[[3]](#footnote-3) Against this background, a reflexive autoethnographic/ethnographic approach can be used to explore the sonic relationships between humans and animals such as birds. Through an exploration of my own listening experience and the auditory subjectivities of others, I attempt to grasp the ephemeral power of sound and listening. The article includes accounts of both: The next section of the article includes autoethnographic writings based on experiments with field recording technologies and connects them to a media and cultural history of bird recordings and to current ethnographic encounters with *ornithophilic* others such as ornithologists (see section 3). With auditory ethnography I refer less to an observation of myself acting in the environment in question, and rather to a strong outward directionality as an observer in the field and, in this specific case, as an interviewer trying to capture and understand the world through the ears (and eyes, etc) of my interlocutors such as Marie-Cécile Reber. This encounter is described in section 4. Ultimately, autoethnography and ethnography are not strictly separable, but, to a personal and practical understanding, differ in their attitude either towards the inner self (*auto*ethnography) or the perceived outside world (ethnography), which are not strictly separable either. To understand auditory-sonic relations more deeply it is useful to constantly oscillate between the two perspectives.

**2. Morning: Field Recording of Birds**

2.1 Spatial, global listening with ambisonic and MS microphones

My aim is to record the lapwings. Their sound has something synthesizer-like about it, or like a children's toy. In one of my bird books it is written that in their mating flight and song lap wings yodel and produce wummering sounds with their wings.[[4]](#footnote-4) I had first encountered the breeding lapwings of Wauwilermoos a year earlier and found myself increasingly drawn to their sounds. On 1 April they are in the midst of the mating season and I am hoping to catch their acrobatic flight and mating songs with an ambisonic microphone. I try to find the best spot to be as close as possible to them while not scaring them. Their official breeding meadow is surrounded by an electric fence. A nearby group of birdwatchers joke that the fence is not only against predators such as foxes or martens, but is also – perhaps especially! – to keep humans away. There are several lapwings flying and singing in the nearby empty agricultural fields. I decide to try my luck there first, to avoid the chatting birders on my recording. I put the mic on the tripod, adjust the gain and press rec in the hope that the lapwings will approach it during their crazy flights and songs.

Currently, ambisonic recording technology is enjoying a revival fueled by internet technology giants such as Google/YouTube and Facebook. This renaissance is thanks to the ambisonic’s capacity to capture the entire surrounding sound in only four audio channels and the possibility of easily rotating the captured sound afterwards, allowing it to be rendered e.g., on head-tracked headphones, head-mounted AR/VR sets, etc.[[5]](#footnote-5) A Sennheiser Ambeo microphone, which has four tetrahedrally arranged cardioid microphones, accompanies me on this field trip. Previously, I had mostly used a MS setting with one Schoeps CCM4 cardioid and a CCM8 figure-of-eight microphone to record birdscapes at a wide angle. The MS, which in its original configuration uses an omnidirectional and a lateral figure-of-eight microphone, is a predecessor of ambisonic technology, which was developed in the 1970s.[[6]](#footnote-6)

To get to know the auditory-aesthetic differences between this MS setting and a Sennheiser Ambeo ambisonic microphone, I undertook a recording test with field recordist, musician and artist Christoph Brünggel.[[7]](#footnote-7) On a Sunday morning in February 2021, we placed the tripod with the ambisonic mic in one of the first allotment garden patches at Zürichberg above the city of Zürich. Due to its two sonic sides, the place seemed an ideal location to explore the spatiality of MS and ambisonic recordings.[[8]](#footnote-8) On the ascending side behind the gardens, there is a forest with birds and a path for strollers and joggers. Facing downwards, one sees the allotment gardens, the residential buildings beyond them and in the distance and around 200 metres lower down the rumbling city center. There weren't many people in the gardens that morning, therefore we could experiment with the moving sounds of somebody walking around the garden patch. The recording took about two hours.

The Ambeo ambisonic recording enabled us to perceive distant sounds in more colours and contours such as the bells of the churches from the old town or the wood pigeon singing above us. The Ambeo seemed to enhance distant sounds, making the sounds feel closer and, thus, making the space feel more compact and smaller than it really is. It works a bit like a 3D zoom, but makes it difficult to estimate the staggered nature of close-by sounds, making them all seem to happen directly in front of your ears. The ambisonic microphone seems to generate a higher resolution than the human ear. On the one hand, this allows the listener to hear sounds much better than in a natural listening situation, but on the other hand, it strongly influences the spatial perception and distance location of the sounds.

In comparison to the Ambeo, the church bells as heard through the MS Schoeps set-up seemed less present and less contoured, but spatially, they felt more accurate to the reality experienced on-site. The feeling for the surrounding space of the MS recording comes closer to a natural listening experience. A listener who is unfamiliar with the place would probably not be aware of that and prefer the ambisonic recording because of its immediacy.

During my recording session with the Sennheiser Ambeo in the Wauwilermoos I was hoping to catch a lapwing flying over the microphone singing. I tried to get closer to the birds, but every time I approached them, they would flee. I placed the tripod with the mic more and more into the field, but I was afraid that the farmer, who was fertilizing the field right next to the birds’ fenced breeding area with a huge noisy tractor, would shoo me away. In short, the recording situation felt far from ideal. But I repeatedly spotted lapwings with my binoculars running around in the field, flying up and sounding out loudly. I moved the microphone to different locations and waited at a distance for them to fly and sing close to the mic.

2.2 Directed, focused listening with parabolic and shotgun microphones

People may have asked themselves why I was making an ambisonic recording of birds, where parabolic recording has become one of the most iconic and common ways of recording birds (as described in section 3.1). Indeed, almost a year earlier, I had visited the Wauwilermoos for a recording experiment with other researchers and an artist equipped with a parabola in addition to other recording gear.[[9]](#footnote-9) The idea of the parabolic technology is to help to obtain a close-up of the single bird one wants to hear. The physics of the parabolic technology with a mic facing inside excludes the unwanted sounds of other sound sources. But, with a mono mic inside the parabola, it is difficult to capture it because one must be extremely precise in following the sound source.[[10]](#footnote-10) For that purpose, one should preferably use open headphones to still be able to locate the sound source or sometimes also record without headphones. If you do not have the budget for the best parabolic microphones that equalize the frequency spectrum, the higher frequencies are excessively present in the recording. But this still means that with a parabola it is difficult to capture the low voice of an eagle owl, for example.

For avian bioacousticians, parabolic recordings offer the advantage of recording less unwanted *noise* that would make the analysis of the song structure and other details in a sonogram quite blurred. Despite their easier accessibility and affordability today, parabolas are still bulky, costly and not easy to handle. Therefore, ornithologists also use the simpler shotgun microphones that enable a similar, but much less directed listening experience. My co-researcher Matthias Lewy and I joined ornithologist Shannon Luepold and ornithology master’s student Sandro Carlotti on their field research about Bonelli's warblers and wood warblers in the Swiss Jura mountains in June 2019. For recording the Bonelli's warblers, Carlotti used a Sennheiser ME66 unidirectional shotgun microphone. Each time we heard a Bonelli's warbler, Sandro used his binoculars to identify the bird by the colours of the three rings on its right leg. Then he recorded the bird by pointing the microphone in its direction. He commented that he was especially interested in the relation between a higher trill rate and an increased pairing and breeding success of the Bonelli's warbler. He assumed that the higher the trill rate, the higher the quality of a male is. For this purpose, he collected 129 recordings of 21 study males between 18 April and 25 June 2019.[[11]](#footnote-11)

To determine the singing activity of the Bonelli's warblers, Carlotti later went through each recording separately using Audacity 2.2.2's sonogram function.[[12]](#footnote-12) He accelerated the recordings 1.5 to 2.5 times and counted the number of trills per 15 minutes. He also determined for each trill whether it contained a syllable switch or not. He accomplished it by distinguishing pitch differences of two successive syllables acoustically and visually on the sonogram. With a chaffinch drowning out the warbler, this determination becomes extremely difficult as the sound is hard to distinguish and the sonogram looks visually blurry. The parabola or the shotgun only works if the targeted sound source can be isolated. If there is another songster sitting in line with the warbler (either behind or in front), it may drown the warbler out. By contrast, if a chaffinch sits somewhere behind the parabola or the shotgun, it gets quieted down. This field experience showed us vividly how field recording of birds is an important epistemological tool for bioacoustics. Its historical development is described in section 3.1.

2.3 Reflections on field recording experiences

Field recording technologies shape birdscapes. Listening through an ambisonic microphone and through a parabolic recording system are two extremes of a mediated and technologised auditory experience of birds. For me, the perceived sonic 3D zoom effect of the ambisonic technology and the focus or microscopic zoom effect of a parabola are astonishing in the way they significantly change the perception of a birdscape. Choosing a specific technology to record birds is a decision for a specific sound aesthetics. The directionality enabled by a parabola or shotgun makes sense for isolating the songs and calls of a specific bird species. Using an ambisonic or other wide-angled recording technology serves the opposite aesthetics: it captures (nearly) all surrounding sounds and, thus, presents birds in a whole environment and mesh of sounds.

This contrast can be understood as a technologised version of one of the basic ideas of Pauline Oliveros’ practice of Deep Listening. Ambisonic recording can be seen as a simulation of an expanded or global listening whose aim is to bring attention to the whole space/time continuum and to multiple sources that are sounding simultaneously.[[13]](#footnote-13) In addition to a practice of global listening, Oliveros speaks of a focused listening attention. Here, a sound or sequence of sounds is targeted as a focus within the space/time continuum.[[14]](#footnote-14) The parabolic or directional listening is a technological simulation of a focused listening.

To conclude this section, exploring field recording autoethnographically made me aware of how recordings create birdscapes rather than representing them. Many nature recordings try to express a realism. But microphones are ‘non-neutral interfaces’, as sound artist Francisco López has put it, and what you actually get to hear is a cleaned up, edited and transformed version, rather than a ‘pure’ sound environment.[[15]](#footnote-15) The recording equipment used is already a first transformational step of what sound artists like López or Salomé Voegelin call the creation of ‘hyperrealities’ and ‘sonic possible worlds’.[[16]](#footnote-16) Also with regards to Deep Listening, what ultimately makes these sonic worlds is that they offer an enhanced listening experience rather than representing reality.

**3. Interlude: The Beginning of Bird Field Recordings**

Looking into the history of avian field recording and the dissemination of bird recordings through records offers further insights into the creation of sonic birdscapes. In his book about field recording, historian Alexandre Galand writes about capturing the sounds of nature: ‘The invention of portable recording systems turns auditory naturalism on its head, that is to say, the perception and study of the sounds of nature. Henceforth, it is possible to capture these and re-listen to them (or have others listen to them) out of context, whether for pleasure or for scientific or pedagogical reasons. These captures, notably in the form of discs, can aid in identifying and naming the species of a given natural habitat. They will also serve to bear witness to the beauty and diversity of that habitat and preserve its sound.’[[17]](#footnote-17) He mentions three core points in which field recordings of nature and - in the context of this article - of birds became highly relevant: the study and analysis of animal communication in natural science such as in zoology, animal bioacoustics and the study of animal behaviour. The growth of new fields of peripheral research such as zoomusicology can be added. The dissemination of bird recordings was on the one hand part of an entertainment industry, but with the creation of bird sound guides it also became an important tool for instructing a broader public in identifying birds by ear. As a third point, Galand mentions the possibility of raising ecological awareness through field recordings. This last point will be discussed critically in the final section of this paper.

3.1 The parabola and the birth of avian bioacoustics

Terminology still used today, *song*, *singing*, *phrase* or *motif*, refers to a history of birdsong research that dates back to an era before audio recording. Historian Joeri Bruyninck explored this turn from the ‘musical’ ear of the ornithologist to the mechanical *ears* of microphones in his 2019 book *Listening in the Field: Recording and the Science of Birdsong* in more detail*.* He shows how audio recordings and sonograms replaced the transcription of birdsong in musical notation in the course of the first half of the 20th century.[[18]](#footnote-18) This began in the late 1920s, when the condenser microphone and the tube amplifier replaced the recording horn, so first field recordings of wild birds could be made. Field recordings helped to overcome the subjective and unreliable ear of the human listener and enabled a new objective way of hearing. But, as Bruyninck shows, from the beginning, many obstacles had to be overcome to produce usable field recordings. The 1930s saw the emergence of the recording engineer who, at the side of the ornithologist, was in control of the recording process.[[19]](#footnote-19) Early outdoor recordists such as the German Ludwig Koch came from the studio and adapted the indoor experience to the field. They arranged up to six different microphones around the bird performer as if he was in a studio. Each of these mics was linked to a control panel in a van hundreds of meters away. The main difference to the studio for Koch was that the recording should not only capture the bird in question, but also evoke its habitat in the background.[[20]](#footnote-20) Due to the preference for a tranquil and clear natural sound environment, there was a constant battle against anthropogenic noise in the low frequency spectrum. Filtering these noises outproduced a high-pitched, thin and squeaky artificial sound. It was Cornell ornithologists who chanced to hear a Radio News story about a parabolic reflector that was used for sports broadcasting, movie production, and even in the studio. The research group produced their own parabola for picking up and concentrating birdsong and was pleased with the superior results and the close-up effect due to the cut out of parts of the reverberation. But still, the best recordings were made on quiet days and at a relatively short distance.[[21]](#footnote-21) Since then and until today Cornell ornithologists have promoted parabola to record birds– nowadays with handy, affordable and easily transportable discs available on the market for a wider community of nature recordists.[[22]](#footnote-22) These new technological possibilities for recording and re-listening to birds found a perfect complement in the invention of the sound spectrograph in the 1950s. Ornithologists started to decipher meaningful patterns of animal vocalizations on the sonograms instead of transcribing them by their own ears. This led to the science of bioacoustics as it is known today.[[23]](#footnote-23)

3.2 Slowdown and the question of what music is

In contrast to most bioacousticians who base their analysis of bird sounds on sonograms, Hungarian amateur ethnomusicologist Peter Szőke (1910-1994, who, with his ornithomusicology, was a pioneer of zoomusicology, as it is called today) used the change of speed function as an ‘acoustic microscope’ to make accurate musical transcriptions.[[24]](#footnote-24) He excessively used the slowdown function of his tape machine to hear, analyze and transcribe the details of birdsong that could not be perceived by the naked human ear.[[25]](#footnote-25)Generally, human hearing has a much lower time resolution than a bird's ear, which means that to analyze birds, Szőke inadvertently approached the bird's way of hearing. With the aid of his ‘sound microscopy’ he noticed that the skylark produces 100-130 sounds per second and identified around 1000 completely different motifs in the song of just one specimen, showing that one cannot make reliable judgments out in the field.[[26]](#footnote-26) He ultimately tried to prove that some bird species vocalize in fixed tone systems and that this has to be considered music: ‘[Besides the skylark, w]e have made satisfactory recordings of the songs of other - slower, but still very fast singing - bird species, the analysis of which has also convinced us that bird song is indeed music.’[[27]](#footnote-27) He found astonishing parallels between the woodlark and folk music, such as a manifestation of the principle of the change of fifths.[[28]](#footnote-28) To him, the laws of music appeared to have created similar structures in humans and birds and, thus, are universal.[[29]](#footnote-29) But he also adds to this insight the observation that ‘folk music is art, but bird music is music, but not art.’[[30]](#footnote-30) Szőke, in the end, did not equate ‘biological music’ with human music, even though his analyses could have let him draw such a conclusion. Probably it was only his musical taste that got in the way. In the reactions to his vinyl record *The Unknown Music of Birds* (1986), which for the first time made the slowdowns of birds public,[[31]](#footnote-31) he commented that ‘the enthusiasts of the so called “new music” (... I’d rather say: “a musical music”) of our age – composers, aesthetes, artists – are primarily interested in the unmusical bird sounds of my collection.’[[32]](#footnote-32) The new music creators and listeners obviously found musical meaning in slowed-down birds that Szőke had categorized as unmusical. They revealed that Szőke measured the birds against a musical understanding that was limited and, thus, in need of expansion.

3.3 Birds on records: the beginning

The first bird recording is credited to the above-mentioned wildlife recording pioneer and bioacoustician Ludwig Koch (1881-1974) who, as an 8-year-old child, made a recording of an Indian or Common Shama of his family's private menagerie with an Edison phonograph and a box of wax cylinders, which his father had purchased at the Leipzig Fair.[[33]](#footnote-33) This 10-inch disc, issued in 1910, with a 3,5 minute long *Song of a Nightingale,* can be considered the first commercially sold bird record. The recording was made of a captive bird in the aviary of the Bremen merchant, ornithologist and breeder of song canaries, Karl Reich.[[34]](#footnote-34) In the 1910s Reich issued bird records focusing on different elaborate songbirds such as the thrushes, canaries or the thrush-nightingale he had held in his aviary. In the 1920s he started to combine bird song with human music such as German folk songs or a Hawaiian tune played by an instrumental entertainment orchestra.[[35]](#footnote-35) In these records the birds act like the singers in the foreground, and the instrumental music of humans is like accompanying the voices in the background. The 1920s were also the time of the first live usage of a recorded bird: Ottorino Respighi included the playback recording of a nightingale in the third movement of his realistic symphonic work *Pini di Roma* from 1924. He is the first known composer to let a bird sing directly from a shellac record. The record, entitled *Il canto dell'usignolo*, is even included as a performer in the score. It is assumed that the mentioned record nr. 6105 was pressed by the Deutsche Grammophon in Germany but had an Italian numbering which makes it difficult to find and reconstruct the record today. It consists of two nightingale recordings from Reich's aviary. On part 1 there is a recording from 24 May 1913 and part 2 is the already mentioned nightingale recorded in 1910.[[36]](#footnote-36)

The first published recordings of non-captive wild birds date back to Koch and his *Gefiederte Meistersänger - Das erste tönende Lehr- und Hilfsbuch zur Beobachtung und Bestimmung der heimischen Vogelwelt* (Feathered Mastersingers: The first sounding text and help book for the observation and identification of the native bird world, 1935).[[37]](#footnote-37) After a successful career as a trained concert singer that was interrupted by the military service obligation during the First World War, Koch became director of the cultural branch at Electrical and Musical Industries (EMI) in Germany in 1928.[[38]](#footnote-38) At this time his childhood interest in animals, particularly birds, was revived. He started to develop gramophone recordings for cultural but also educational purposes.[[39]](#footnote-39) *Gefiederte Meistersänger* was the first of his educational *sound-books* which comprised text, photographs and gramophone recordings in one product. The recordings Koch had made between 1927 and 1935, using acoustic and the new Neumann electrical recording gear, filled three 10-inch discs.[[40]](#footnote-40) They were accompanied by an informative booklet written by ornithologist Oskar Heinroth.[[41]](#footnote-41) With the publishing of his recordings Koch aimed at overcoming ‘musical notations and curves which meant nothing either to a scientist or to a bird-lover’.[[42]](#footnote-42) He was further convinced that a translation of a bird's vocalizations into syllables ‘such as tu, tu, tu or tse tse tse will never bring to the ears of the average listener the sweetness of the song of the wood-lark or the characteristic note of the marsh-tit’.[[43]](#footnote-43) His records aimed to educate listeners while simultaneously enabling enjoyment. After his forced exile to Great Britain as a Jew, Koch pursued his educational interests with his well-known soundbook *Songs of Wild Birds* (1936).[[44]](#footnote-44) In the course of his career as a wildlife recordist he cooperated with, among others, Julian Huxley, a London-based ethologist and zoo director (1935-42) who was as active and engaged as Koch in public nature education for conservation purposes. Together they published *Animal Language* in 1964, a soundbook that humorously offers insights about the communication behaviour of a wide range of animals.[[45]](#footnote-45)

3.4 The aesthetics of bird sound guides

Bird guides that help practice bird identification by ear are an important genre in popular educational writing. *Bird Songs Recorded from Nature* was a first such guide published in the USA in 1931 by Albert R. Brand and Peter Keane from Cornell University*.* In 1942, the Laboratory of Ornithology at Cornell presented the first of a series of bird guides entitled *American Bird Songs*, the precursor of which can be downloaded today as a digital application*.*[[46]](#footnote-46) In Europe the self-taught Danish ornithologist Carl Weismann was one of the first sound guide creators, publishing eleven records between 1939 and 1955 with 66 Danish species.[[47]](#footnote-47) In the 1950s the French bioacoustician and recording specialist Jean C. Roché started his career and published over 300 records with sound guides of birds and other animals, of whole sound environments and ambiances from around the world.[[48]](#footnote-48) Roché said in an interview with Alexandre Galand that for bird identification guides ‘one needs proper passages in which the bird is a soloist, and a good sample of songs and calls of the species.’[[49]](#footnote-49) For the guides a focused recording, made by a parabola or shotgun microphone, is preferable. From the recordings, samples are chosen that best teach the sound of the species.[[50]](#footnote-50) The edited samples in earlier bird guide records and in today's apps usually range in length from a few seconds for calls to up to half a minute for the song. In general, a sample represents a single style of a call or a song which is the most common and representative for the species. As it is discussed in the respective literature, the production of a clean and pure aesthetic with as little ambient noise as possible, the exclusion of other species and of any sounds produced by the recording equipment can somehow give a sterile impression of a bird.[[51]](#footnote-51)

The well-known composer Olivier Messiaen was a sceptic of birdsong recordings and the mechanical reproduction of birdsong as such. He didn't use available records because of their limited inclusion of only several repetitions of a short phrase of a single style to be representative for the species. Messiaen wanted to transcribe the whole range of a bird's songs and calls. His only reliance on recordings was when his wife occasionally used a tape-recorder so that he could finish his transcribing at home instead of in the field.[[52]](#footnote-52)

Musicologist Rachel Mundy maintains that field guides promote a particular model of sonic identity of birds which parallels the way collections and classifications in natural history museums are developed. From a media-historical perspective, she argues that the short 20-30 second excerpts also date back to the limited capacity of early recordings and storage but have been maintained as the standard for later bird field guides.[[53]](#footnote-53)

That the songs of birds are still represented by short and sterile snippets of their most significant calls and song phrases in today's field guides may not only have its reason in a history of science and media, as Mundy suggests, but may also lie in the limited capacity of human cognition and the way memorisation functions.

As a bird watching beginner and participant of a 2-year field ornithology training course by Birdlife Lucerne, I experienced these core sounds as quite helpful in learning to discriminate between the different bird species at home. Cleaner recordings help me focus on listening and memorising the song or call and avoid unwittingly being tricked by any other significant detail of the recording. The advantage of a cleaned recording, as artificial as it may feel, is to carry no distracting information. In the field, such other acoustic and also visual clues are of course crucial for bird identification. Being short, to the point and sterile, bird guides developed their own educative sound aesthetics.[[54]](#footnote-54)

Playing bird recording back to birds

I sometimes use my bird guide app in the field to identify a bird. Once in doing so, I played the nuthatch from my phone quite loud to be able to show it to my husband who was with me. I wanted his help comparing what we heard with the nuthatch recording in the app. It was a perfect match because the recording completely upset the real nuthatch. He flew in our direction, sat down at the closest tree trunk, and scolded us so loudly that we got scared. After around thirty seconds he calmed down and I felt ashamed to have upset this little bird. Now I knew from firsthand experience why playback experiments with field recordings of the birds are largely taboo in the bird watching community and are only used for research purposes.

On the day in the field with the two ornithologists in June 2019, Shannon Luepold, who did field research on wood warblers in the same area as Sandro Carlotti, demonstrated her playback experiment: she placed a small loudspeaker on a wooden pole and played the wood warbler's song from her mobile phone via Bluetooth from about 20 metres away. That day the warblers only came a bit closer but did not respond through singing or any other reaction. During the heyday of the mating season the wood warblers had not only sung competitively, but some of the males even tried to attack the adversarial loudspeaker-warbler to get him out of their territory, Luepold reported.[[55]](#footnote-55) It is a biological fact that singing and flying to drive a rival out of the territory costs birds a lot of energy. Playing birds their own sounds is therefore a cautiously undertaken endeavour because it is seen as an ethically problematic intervention into their life worlds.

The question of playing nature back its sounds, leads over to the artistic approach of Marie-Cécile Reber. Her work is concerned with ‘respectfully intervening’ in a natural environment with musical compositions. Reber is a composer, piano teacher and deep listening practitioner. Her long-standing exploration of the sounds of insects and, lately, birds will be described based on the conversation we had on 1 April. The following text is based on a transcription of the audio record.

**4. Afternoon: Interview with Marie-Cécile Reber**

We placed ourselves on top of the bird watching tower overlooking the small wetland and the fields. During our 1.5-hour conversation the lapwings were actively performing their mating songs in flight or loudly defending their territory.[[56]](#footnote-56) It was an unexpectedly hot day, which felt more like summer than late winter/early spring.

4.1 Insects and the threshold of hearing

Reber's work has a close relationship to the sound worlds of animals. For many years she worked with her own field recordings of ants and crickets. Already as a child spending time at the family’s *Maiensäss* (alpine hut) above Feldis in the Swiss Alps, she became interested in the sounds of insects. During our conversation she mentioned the many flies in the alpine hut. She caught them with a beaker and heard their noises amplified through it. That fascinated her. She also recalls the many times she observed insects in the alpine pastures or in the nearby forests. There, for the first time, she became aware of what she calls the micro lives of ants. She later recalled this intensive visual experience and became curious to hear them. At the end of the 1980s, she started to experiment with recording the sounds inside anthills. She used the most sensitive microphones that were available at the time such as a Sanken speaker microphone as well as pickups from a violin which she put on the floor. She wanted to find out how the ants sound, how they communicate with each other, something which is beyond the hearing range of humans. Her works ‘Schwelle’ (1994, 1995, 1996/2003) and ‘Insect’ (2003) explored the threshold between hearing and not hearing. ‘In their world,’ Reber says, ‘the ants hear each other loudly.’ This insight fascinated her very much and led her to explore the threshold of hearing and not hearing, also by using microphones as extensions of her own ears: ‘My work was for a long time about that which is very quiet, that which we no longer can perceive.’ Reber says and adds, ‘there is the world which is real for us, conscious and clear. And the other, which is less clear to us, exists just as much and has just as much of a world.’ Ants occupied her work for more than ten years and are responsible for the direction in which she is still actively working as a composer and artist today.

4.2 The outdoor sound installation *Pirol*

The beginning of her 8-minute compositional work *Pirol* (2017) is a birdscape with various songsters. This forms the background, so to speak, against which the song of the oriole slowly stands out. In this way the composition gradually turns the focus to the voice of an oriole. First, we hear a call, then two melodies that develop. This is followed by a lively dialogue between the orioles, which gently flattens out towards the end and dissolves again into the bird song ambience.[[57]](#footnote-57)

The songs of the oriole are composed. Reber cut a recording of the oriole's natural singing into fine units and put them together to form new melodic sequences. Cutting, reassembling and recombining forms the core of her compositional approach.[[58]](#footnote-58) Sometimes she extracts extremely small parts of the sounds and works with it like handcrafted granular synthesis. But still, Reber's compositional intervention into the original oriole sound is very cautious and subtle. As effects, she only used filters: ‘If I take something away [by filtering], there is a completely different sound, but I haven't broken or destroyed the sound.’ It is essential to her way of working with field recordings that she changes a sound only in such a way that its origin remains recognizable. She says that she sometimes works on a single sound sample for many days until she gets it to the point where she thinks it is just right. In ‘Pirol’ she retained the characteristic sounds of the oriole in a slightly exaggerated form and adapted typical structures of birdsong such as repetitions.

4.3 Composing with and for microworlds

Another important guideline for Reber is to adapt her compositions to the environment in which the respective animals live. Her compositional working process is based on preliminary and accompanying, intensive listening experiences outdoors. This way, she said, she becomes very much absorbed by the microworlds of the animals: ‘whether it's the ants or the birds, I feel like I get closer to them and they are actually becoming something familiar (German: *heimisch*) in me.’ The word *heimisch*, here translated as *familiar*, could also be translated as *native*, *homelike* or *domestic*. She adds that because she opens up to how they live, they would not only come very close to her, but that there is also a higher attention and a growing intensity that arises. Listening this way, she says, she can ‘find out things about the birds, like the fact that they are adapting their pitch according to an environment.’ A growing awareness of the existence of the sounds and melodies of a bird's microworld produces a strong fascination in her, she said.

Through her deep engagement with the sonic lifeworld of ants, crickets or birds, outdoors is the place where she prefers to present her compositions. She wants her insect or bird compositions to mix with the *real* sound environment of the animals. *Pirol* was first presented in front of the Löwendenkmal monument in Lucerne. The loudspeakers were placed on the little lake of this tiny park. After 8 minutes of gradually increasing, culminating and decreasing oriole songs, she paused the installation for 15 minutes to avoid interfering too extensively with the sound environment. This had another surprising effect: ‘It was exciting that the birds reacted so much to the orioles. It was unbelievable. The birds around were all like responding to it,’ she reported. The pause in between playing the oriole compositions enabled the audience to feel the contrast and highlighted the reaction of the birds to the invented oriole songs. Her composition, thus, influenced the sound environment. For her, this also shows how the reacting birds listen very carefully to their environment. ‘If I think about it from a bird's stance, I think they are incredibly deep listeners. Animals in general are. It's so interesting to observe that when one talks, the other one listens. [...] I think [birds] are very attentive and listen very carefully to what is happening.’

4.4 Reflections on compositional approach

Two things in Reber's artistic approach are especially inspiring for thinking about our sonic relation to nature.

One is her sensitive approach to composing not only *with* the sounds of a natural environment, but also *for* a natural environment. It is an attempt to fit the humanly produced sounds into a given sonic environment instead of dominating it, which is informed by a personal search for a balanced way we humans might use (through field recording) and impact ‘nature’ (in playing the recordings back). To reach that artistic aspiration, she deepens her aural perception and personal understanding of the respective microworld that her music addresses.

Part of this rapprochement process is also a change of perspective: she tries to hear the world as ants or birds do. A decentering of the human position bears a great possibility for an extension of the perceptual field. According to Oliveros, field recordings offer a great opportunity not only to become more sensitive to sounds but also to explore sounds that are not ordinarily in one's own awareness.[[59]](#footnote-59) As already discussed in the first reflection section, field recordings can function as means for enhancing our personal perceptual range and awareness. Reber's *Pirol* is an example of how this perceptual enhancement may work not only for humans, but probably also for other listeners such as the birds that reacted to the extraordinary *Pirol* sounds. An enhanced listening experience and sound art works such as *Pirol* may be, thus, not limited to human listeners and can even include other species with respect to their listening habits.

**5. Concluding thoughts**

The idea of rising awareness and understanding more deeply can connect all these practices of field recording, which embrace making and listening as well as editing and creative transformation. By choosing different types of microphones, a single bird or its whole birdscape can be creatively simulated, by re-listening to a bird at the same, lower or higher speed, it can be analyzed in specific detail and thanks to excerpts of short characteristic samples of a bird's recorded voice, it may be easier to memorize the sounds of different species. Dealing with field recordings of birds not only raised my awareness of the different bird species that I had not known before, their life habits and their lived environment, but also of the technologically mediated ‘personality’ they have received in the course of the 20th and 21st centuries. Sadly, the decline of birds worldwide seems at odds with their rising mediatized presence in today’s communication media, sound art and musical compositions. This casts doubt on the prevailing belief that a mediatisation of birds or other *natural* sonic agents will reach more people and raise collective awareness to help their conservation.

On my recording from 1 April, the sound of the tractor fertilizing the field reminds me of the huge impact of human agriculture on the land and the danger such a machine poses for the ground breeding lapwings. And I envision this place to have been a huge wetland that was drained to grow food. Knowing this triggers dark emotions about the loss of habitat, the misuse of fertilizers and pesticides, and the vulnerability of life in general. On the same recording, I suddenly hear the flying lapwing's song, triggering a moment of wonder and joy. And this gives me a little hope that they will return for breeding also in the coming years.

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1. The author would like to thank the Swiss National Science Foundation (SNSF) for supporting the research presented in this article (SNF 100016\_182813/ Seeking Birdscapes: Contemporary Listening and Recording Practices in Ornithology and Environmental Sound Art) [↑](#footnote-ref-1)
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7. I would like to thank Christoph Brünggel for the interesting recording and listening sessions. [↑](#footnote-ref-7)
8. Due to the limited 4 channels of the Zoom H6 in charge, we had to record MS and ambisonic separately. [↑](#footnote-ref-8)
9. I would like to thank my co-researchers Helena Simonett and Matthias Lewy as well as Martina Lussi, who as an artist and musician accompanies and mediates the project's research, for the lively exchange on the field recording trip to Wauwilermoos on 5 May 2020. [↑](#footnote-ref-9)
10. The field recordist and bioacoustician Eloïsa Matheu, who has more than 30 years of experience with parabolic recordings, explained in a workshop that it is easier to find the ideal focal point with a stereo mic. I would like to thank Eloïsa Matheu for sharing her precious knowledge about bird recording. Workshop with Eloïsa Matheu, 26 April 2021, Zoom Online [↑](#footnote-ref-10)
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12. Programmes especially made for bird and animal bioacoustics are Raven Lite and Kaleidoscope Lite. [↑](#footnote-ref-12)
13. Pauline Oliveros, *Deep Listening: A Composer’s Sound Practice*, New York et al, iUniverse, 2005, p. XVII and 12 [↑](#footnote-ref-13)
14. *ibid.*, p. XXIII and XXIV [↑](#footnote-ref-14)
15. Francisco Lopez, “Environmental Sound Matter”, April 1998, in www.franciscolopez.net/env.html, 31 Dec 2021 [↑](#footnote-ref-15)
16. *ibid.*; Salomé Voegelin, *Sonic Possible Worlds: Hearing the Continuum of Sound* [↑](#footnote-ref-16)
17. ‘L'invention des systèmes d'enregistrement portables bouleverse l'audio-naturalisme, c'est-à-dire l'appréhension et l'étude des sons de la nature. Désormais, il est possible de capter ceux-ci et de les réécouter (ou de les faire écouter à des autres) hors contexte, que ce soit pour le plaisir ou pour des raisons scientifiques et pédagogiques. Les captations, notamment sous la forme de disques, peuvent aider à identifier et dénombrer les espèces d'un milieu naturel. Elles servent aussi à témoigner de la beauté et de la diversité de celui-ci, à conserver la trace.’ Alexandre Galand, *Field Recording: L’usage sonore du monde en 100 albums*, Marseille, Le mot et le reste, 2012, p. 16 [↑](#footnote-ref-17)
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27. Péter Szőke, *Zur Entstehung und Entwicklungsgeschichte der Musik*, p. 39 [↑](#footnote-ref-27)
28. *ibid.*, p. 64 [↑](#footnote-ref-28)
29. Gergely Loch, *Between Szőke’s Sound Microscope and Messiaen’s Organ: The Cultural Realities of Blackcap Song*, p. 149 [↑](#footnote-ref-29)
30. Péter Szőke, *Zur Entstehung und Entwicklungsgeschichte der Musik*, p. 65 [↑](#footnote-ref-30)
31. Péter Szőke, *The Unknown Music of Birds (Az ismeretlen madárzene)*, Hungaroton (LPX 19347), Budapest, 1987 [↑](#footnote-ref-31)
32. Péter Szőke, *A zene eredete és három világa*, Budapest, Magvető, 1982, p. 96-97; English translation Gergely Loch, *Between Szőke’s Sound Microscope and Messiaen’s Organ: The Cultural Realities of Blackcap Song*, p. 150 [↑](#footnote-ref-32)
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