

INvironments: Critical Listening Positionalities in Soundscape Ecology

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ABSTRACT

INvironments: Critical Listening Positionalities in Soundscape Ecology

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INvironments is a podcast centered around how soundscape recordings can be used as a method to study changes in natural ecosystems. More specifically, the podcast investigates soundscape ecology by exploring its various methodologies and how they form ecological knowledges. The basic idea for soundscape ecology and its “auditory link to nature” (Pijanowski et al., 2011, p.203) is to provide supplementary indicators of ecosystem health and biodiversity by analyzing and comparing the frequency spectrum of a sound recording from a given environment. While the discourse and methods of recording in soundscape ecology stem from specific trends in the field of acoustic ecology and the works of the World Soundscape Project (WSP), the notion of “soundscape” in this context is not fixed, but still open to interpretations. As a result, the epistemologies formed about ecosystems via soundscape ecology hinge on considerations of what the soundscape is, how it influences who is listening, and how the listening inevitably affects the recording.

In this research-creation podcast series, I investigate which normative discourses of “soundscape” become reiterated through soundscape ecology, and consequently, which get left behind. Comprising of 4 episodes, the series traces a genealogical story of soundscape ecology while gradually becoming a more self-reflexive examination of my own normative listening positionality. Discussing the motivations and practices behind the recording of soundscape ecology reveals how a variety of interrelated interpretations of soundscape recordings could supplement this scientific data-gathering. However, more rewardingly, embracing wider listening

positionalities can open the field up to wider forms of community engagement through ecological awareness. In examining how variations in listening positionalities and their associated methods for recording ecosystems, we may yet find a stronger and more nuanced framework for how ecological epistemologies are formed through soundscape ecology.

Keywords: soundscape ecology, listening positionality, field recording, podcast, research-creation, ecosophy

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Introduction

Close links between humanity and soundscape have always been an essential lens through which we understand the world. [...] Those of us living close to the natural world have learned the permutations of these dynamics well. It is likely that deep within the human limbic brain is ancient writing that springs to life every time we reconnect with these delicate webs of acoustic finery. (Krause, 2013, p.104-5)

Soundscape ecology is a field that uses soundscape recordings as a method to understand changes in biodiversity and ecosystem dynamics. Sound becomes a means for studying the complexities in life and landscape across different climates. However, as Bernie Krause alludes to in the passage above, soundscapes are more than a methodological tool. Rather, they allow us to connect to landscapes and reattune our attention to our place within them.

Meanwhile, for most of my life, I spent my time doing the opposite. As an avid podcast listener and radio host, I focus much of my listening attention to sound sources I control. While walking around my neighbourhood, I would hang on Malcolm Gladwell's every word in his podcast *Revisionist History* rather than the symphonies of traffic, birds and wind that make up my area's soundscape. I realize now after my thesis project's completion, that perhaps the only way I could properly reattune myself to my place within the wider soundscape its landscape was to make a podcast about it. Over the course of its creation, I was able to determine where I stand within the soundscape only by coming to terms with where my listening came from.

In understanding where my listening priorities, and in turn, how they map onto my listening to soundscapes, I discovered that soundscape ecology has never received a careful study of its dominant forms of listening. In this case, the goal of *INvironments* was to distinguish the links between culturally constructed listening positionalities and soundscape ecology. In this field, dominant forms of listening to natural soundscapes have a substantial impact on how ecologists form epistemologies about endangered ecosystems. In this historically precarious

moment, climate action requires more explorative and transdisciplinary methods for studying the human effects on, and the inevitable changes facing, ecosystems. My intention for *INvironments* was to promote a way of ecological thinking that puts into question the cultural assumptions that fold into the methods for studying ecosystem interactions.

In this text, I reflect on how I created *INvironments* and how I proceeded to question what soundscape ecology could gain from alternative listening positionalities and recording methods. Without a background in the ecology sciences, my interest in this link between listening and learning from soundscapes became my point of entry into soundscape ecology. To refine this goal, my breakdown of this field required a study of the dominant forms of listening that it employs. In doing this, the podcast became a way for me to unsettle my own preconceptions on listening and the deep-rooted cultural contexts that orient it. With my own listening positionality in mind, the question then became to ask what soundscape ecology might look like should it incorporate new creative and explorative methods for listening to and recording ecosystems.

The first section of this thesis outlines the inspirational concepts that ground the logic of *INvironments*. This theoretical framing portion leads directly into the literature review, where I situate my research within the evolving corpuses of soundscape studies and the criticism that flavors it.

The literature review is followed by a discussion of the methods used to create *INvironments*. This includes an elaboration on podcasting as a method, including my use of field recordings, interviews, sound design, and music scoring.

The final chapter is a discussion which readdresses my research questions as framed through each of the four episodes of *INvironments*. Working chronologically through each

episode highlights my development as a researcher as the self-reflective nature of podcasting exposed a need for me to consider my own listening positionality.

This podcast aims to raise awareness of the often overlooked (or over-listened!) acuties that come from listening to changing ecosystems. Soundscape ecology is an interdisciplinary field where all listening positionalities and recoding methods serve as a valid form of tracking biodiversity and the overall health of ecosystems. What must be addressed are the processes that come between our formation of ecosystem knowledges and the ecosystem itself. In soundscape ecology, the fluidity of listening intentions and positionalities can change a dominant perspective of the soundscape, and therefore reorient how we understand the dynamics of the ecosystem's acoustic activity.

1. Theoretical Framework

1.1. Introduction

INvironments is largely a transdisciplinary undertaking. It functions not necessarily by extrapolating relevant information across fields, but by working through and with them. In this section, and following into the literature review, I will outline the most relevant texts that ground the theoretical framing of my work. This is intended not only to situate the work in a particular academic context, but to express the changes the project underwent in the self-reflexive analysis of my listening positionality. I will begin by outlining the inspirational works that set my project in motion including Felix Guattari's ecosophy and Donna Haraway's situated knowledges.

1.2. Ecosophical Thinking

In developing *INvironments*, it became apparent that the links between the creative aspects of the project and the research goals were in constant dialog with one another. To begin

this portion of the theoretical framework, I will discuss two closely linked inspirational concepts: Guattari's ecosophy and Haraway's situated knowledges, which each present a progression of scientific and ecological thinking that are open-ended, experimental and based on building upon and reformulating localized subjectivities.

A major goal of *INvironments* was to bridge questions concerning methodologies for understanding the changing environment to an accessible format for a general public to embrace and be a part of. This progression can be heard across the four episodes of *INvironments*, culminating in the final episode "Why Does This Matter?" wherein the scope of soundscape ecology is extended to a wide array of listening positionalities and community activities. During the podcast, this concentration on intertwining listening positionalities, and eventually community practices, is a product of thinking ecosophically. Ecosophy is a term independently described by Guattari and Arne Naess. I use Guattari's work here as a guide because it associates "the ecological crisis" with a "more general crisis of the social, political and existential, which involve[s] changes in production, ways of living and axes of value" (Guattari, 2000, p.119). Guattari's ecosophy is a way of thinking ecologically wherein a wider consideration of nature, non-human entities, and social structures cause a shift in the individual as their subjective thoughts become assemblages of entities, structures, and ideologies. Ecosophy reframes thinking ecologically, whether that be with regards to climate change, ecosystem dynamics or interrelated environmental phenomena, as something more than a scientific pursuit relating only to nature as a discrete subject. To think ecosophically is to entertain the value of intersubjective perspectives, and as commentator Bernd Herzogenrath notes, it highlights the "alliances and feedback loops between various regimes" be them natural and cultural, human and non-human, material and representational (Herzogenrath, 2009, p.5). In *The Three Ecologies*, Guattari argues that the

production of a collective mass-media subjectivity (Guattari, 2000, p.6) is directly correlated with the dramatic ecological decline the planet has faced during the 20th century. While I do not aim to make claims on the nature of mass media in my work, Guattari's connection between the diversity of subjectivities as a strategy for working against ecological destruction resonates with *INvironments*. In my attempt to broaden methodologies for recording natural ecosystems, questioning the social and political aspects of listening became quintessential. Ecosophy serves as a means of bridging the humanities to the natural sciences by describing the assemblages and ideological production that is implied in scientific data-gathering contexts. My whole question of identifying what the "soundscape" means in regards to its discussion in soundscape ecology (in Episode 1) follows precisely this kind of ecosophical approach.

John Tinnell (2012) elaborates on the distinctions of Guattari's ecosophy by stressing its difference from Naess' ecosophical environmentalism. In this sense, the domains of 'the human' and the 'natural environment' are viewed as discrete and stable categories. However, Guattari's ecosophy "rethinks this relationship in terms of dynamic assemblages [...] without assigning humans, nature, or culture a fixed role or place in the production of subjectivity" (Tinnell, 2012, p.38). Across *INvironments*, the boundaries between data, representation and discourse contained within the term "soundscape" are constantly negotiated. I view this as ecosophical since part of the problem of grappling with the climate crisis is not just a question of data or how ecosystems are represented using soundscape recording, but how we talk about these representations and think about our listening. These ties between representational production (discourse) and methodology (practice) are a key aspect of my work. In identifying some of the potential blind spots within soundscape ecology, such as its rearticulation of a dominant listening positionality and the white settler listening frameworks propelled by recording in general, *INvironments* ends

with a call for wider participation in soundscape ecology. Wider participation in the field opens a potential for it to become a community enriching activity informed by situated and experimental recordings. This call is meant to draw from the ecosophical step away from organized collective action, in favor of assemblages (p.42) of partial perspectives, methods and listening positionalities. Soundscape ecology, as described in my work, becomes more than a fixed field of study, but a potential site for open interdisciplinary knowledge creation where the boundaries between people, soundscape and environment are continually shaped and reshaped.

1.3. Situated Knowledges

Using the term “situated” earlier in the text is intentional as well. Guattari’s ecosophy is coalesced in my work with another guiding concept – this time from Donna Haraway. Her essay “Situated Knowledges” is a feminist critique of scientific objectivism, which is understood as an extension of patriarchal power. In this sense, Haraway offers a way of configuring knowledge not propelled by “the knowledges ruled by phallogocentrism [...] and disembodied vision, but those ruled by partial sight and limited voice” (Haraway, 1988, p.196). In my work, I associate this “partial sight” with listening positionalities that transcend the normalized description of soundscapes outlined by the work of R. Murray Schafer. Normalized listening and normalized methodologies enact what Haraway calls a “god trick” (Haraway, 1988, p.188) wherein the established protocol is so centralized, it becomes invisible. Yet, embracing situate knowledges provides any scientific, technological, engineering and mathematical (STEM) field (which are largely overrepresented by a dominant patriarchal perspective) with a wider discourse of the subject of its study. As the discourse widens, so do the methods.

With ecosophically and situated knowledge-based approaches to my research, I prod soundscape ecology to find new ways in which it could incorporate creative and experimental

recording with diverse ideas of landscape, soundscape and ecosystem. In framing soundscape ecology this way, links between the scientific terminology used in the field and unique, explorative soundscape recording practices became possible. Throughout the rest of the literature review, I will describe the main discourses informing “soundscape” in my work: going from authoritative definitions to fluid sites for experimentation. This is a key starting point for understanding my project as it answers why I responded to soundscape ecology with a call for wider listening positionalities and experimental recording methods. At the same time, much of my recording, listening and critical inclinations to soundscape ecology are built on the foundation of literature I will presently outline.

2. Literature Review

Taking theoretical inspiration from Guattari and Haraway, I was pushed to think ecologically by assembling the nebulous discursive stands that make up a culturally produced and ecologically relevant discourse on soundscapes. The review that follows mimics the progression of how I understood my own listening positionality as well as that which dominates soundscape ecology by starting from a more traditional approach to the subject. The discussion then expands by introducing critical writings responding to the traditional canon. Lastly, I will provide an overview for the studies conducted in soundscape ecology and the practical aspects of their taxonomies of sound and soundscape.

2.1. Finding the Soundscape

Soundscape ecology is the focus of my podcast. However, something became glaringly apparent the more I worked through the corpus of soundscape ecology literature. Many authors who use the word “soundscape”, as A.Y. Kelman has already uncovered, “[rework] Schafer’s term from the inside out to suit their own needs” (Kelman, 2010, p.215). For example,

soundscape ecologist Bernie Krause uses it to describe both the audible environment, but also the recording itself. Upon peeling through historical layers of soundscape discourses, the term leads directly to R. Murray Schafer and his work with the World Soundscape Project (WSP). It is enormously useful to have a clear definition on what constitutes a soundscape. Indeed, a working definition is what guides and organizes listening, as soundscape ecologist Almo Farina mentions during my interview with him: “no name, no concept”.

Most of soundscape studies, in its academic sense, branches from Schafer’s work. Starting back in the late 1960s at Simon Fraser University, Schafer’s description of the soundscape was formed “from the language of the environmental movement” (Kelman, 2010, p.216) in order to better describe the effects of noise pollution on the city and its inhabitants. Looking at Schafer’s writing and archived interviews, his overarching definition of soundscape boils down to “any collection of sounds”. While the definition here feels innocent and broad enough, the real fissures begin to deepen the closer we look at it. Across his published works, such as 1969’s *The Book of Noise* and 1977’s *The Tuning of the World*, Schafer’s preference over which sounds can *benefit* human ears imbue his listening with a certain attention. Kelman is the author of this critique, asserting that that the discussion of soundscapes, as framed by Schafer, is “lined with ideological and ecological messages about which sounds “matter” and which do not; it is suffused with instructions about how people ought to listen; and, it traces a long dystopian history that descends from harmonious sounds of nature to the cacophonies of modern life” (Kelman, 2010, 214). Moreover, Schafer’s normative inclinations on how we *should* listen are occasionally racist, as Dylan Robinson has shown (such as when the former discredits Inuit music entirely as nearly impossible to integrate into Western contexts (Robinson, 2020, p. 21). The problem lies in the fact that because of his watershed contribution

to sound-related fields, Schafer's listening positionality became somewhat of a dominant listening positionality. The discursive spaces opened by Schafer's repertoire are coloured by his own preferences and prejudices. I elaborate on this at some length in the podcast, as this influence has profoundly attuned the ears that are listening (and writing and educating) in soundscape ecology.

Schafer's distinctions between noisy lo-fi sounds and purer hi-fi sounds (Schafer, 1993, p.43) further entrench the discourses linked to soundscapes within other dominant forms of cultural reception that are governed by hegemonic patriarchal values. Jonathan Sterne's "Soundscape, Landscape, Escape" offers a helpful way of considering why Schafer defines his soundscape preferences in this way. Rather than viewing Schafer's terms as an authoritative definition of sounds in the landscape, perhaps it is best to think of the latter's prescribed listening methods as ways "of listening that had come into vogue as Schafer's ideas first came together" (Sterne, 2013, p.188). Put another way, this listening was a part of new field-based practices linked to the use of high-fidelity portable recording equipment and electro-acoustic studio manipulation techniques. At the same time, the production of hi-fi stereo equipment for leisurely listening entrench Schafer's words in a post-war middleclass fantasy of escapist entertainment. Sterne validates these contexts in connecting them to Schafer's use of hi-fi to explain how the "definition of the hi-fi soundscape borrows its morphology from the aesthetics of the hi-fi record and hi-fi system in the bourgeois living room" (p.188). A product of his time and class as he may be, Schafer's cultural context and its effect on his listening still lives through soundscape ecology. For this reason, unpacking his terms related to soundscapes is essential.

The intention of the discourse analysis that runs through *INvironments* was not to support mainstream claims and/or argue for what a soundscape is or isn't. Nevertheless, I acknowledge

that my project builds upon other works that have criticized the foundations of Schafer's definitions. I find more comfort in situating *INvironments* not within a directly Schaferian discourse, but rather in the responses that have flavored soundscape-related topics since. In the 50 years since the popular apparition of the term soundscape in academic discourses, many writers have addressed the narrowness of Schafer's positionality.

Immediate variations in the definition of soundscape, as mentioned in episode 1 of *INvironments*, come from WSP collaborators like Barry Truax and Hildegard Westerkamp. Indeed, the idea of a soundscape as an identifiable "thing" is challenged here as Truax emphasizes a soundscape "isn't merely a physical reality but a mental one as well" (Truax, 2013, p.37). Likewise, Westerkamp and her soundwalking methodology emphasize the subjective experience of sound as a personal and embodied event – not an objective physical reality (Westerkamp, 2006). These interjections into the earliest forms of soundscape discourse draw attention to the links between listening and recording. Part of my interest in Westerkamp's work, as described in the podcast, is how the individual reception and recording of soundscapes can serve as a site for situated knowledges of ecosystems. Useful articles from Kamila Stasko-Mazur (2015) and Adams et al. (2008) come to mind here. They are discussed more thoroughly below in the recording methodology portion of this text.

Equally important is the effect that the notion of soundwalking has on the very concept of soundscape. I am most interested in how a heuristic of soundscape-as-subjective-experience can affect the practice of soundscape ecology. By the last episode of *INvironments*, I introduce Andra McCartney's work specifically because of her separation of soundscape from prioritized listening, and closer toward the "emotional tones of experience" (McCartney, 2010, p.168). In other words, McCartney does not appraise soundscapes within a hierarchy of "wanted" or

“unwanted” sounds, but rather, she appreciates soundscape recordings as a valuable representation of a recordist’s explorative experience (p.160). Accordingly, McCartney held very personal and embodied views on soundwalking and soundscape recording which contrasts significantly against the dominant discourse perpetuated by Schafer’s work that influenced soundscape ecology. Indeed, McCartney’s writing in “Ethical Questions About Working with Soundscapes” (2016), was essential to my research questions because it dismantles the inherent white male listening positionality in Schafer’s work in order to question what a feminist ontology of soundscapes might look and sound like.

In focusing heavily on Schafer’s contribution to the broad idea of soundscape, *INvironments* is granted an ability to answer to this discourse and not necessarily elevate it. To express my own critique of these ideas, I turned to more critical works that unpack Schafer’s foundational and authoritative writings.

2.2. The Critical Soundscape

With these responses to Schafer, and likewise the definition of “soundscape”, I felt equipped with sufficient information to ask the question “what is a soundscape” in the first episode of the podcast. However, what began as a discourse and textual analysis to find answers quickly became a space for me to formulate *my* answer. In formulating a potential answer to “what is a soundscape” by working through the texts that have tried to answer the same question, I was able to situate my work within the growing body of what I deem critical soundscape studies. It has become more fashionable lately not simply to formulate a precise idea of what constitutes the soundscape, but rather to work in criticism of the Schaferian discourse to make way for wider ontologies of sound and its reception. Beginning here with Mitch Akiyama was useful as he claims is that the “definition and scope of soundscape is almost Cagean in its

expansiveness” (Akiyama, 2010, p.56). This allows for multiple interpretations and claims to be folded into the discourse.

Like Sterne, Akiyama draws attention to the implicit biases and limits posed by recording. Importantly, these limits relate to the “measure of framing and exclusion” (p.54) that comes with sound recording. This point becomes increasingly important when considering what kind of ecological information can be transmitted and analyzed through soundscape ecology. The tension rises when Akiyama speaks of the soundscape’s tendency to paradoxically “isolate an acoustic environment and make it a repeatable event for study purposes” (p.57). The issue here led me down a trajectory of questioning what a description of soundscape as something that is beyond recordable and analyzable might look like. Indeed, this question is already accounted for in the more recent entries to the soundscape studies corpus, as recording itself is an extension of isolationist, rational and colonialist mentality. But often, these critical soundscape studies provide a possibility to de-colonize the hegemonic listening positionality present in Schafer’s writing to make way for other marginalized ontologies of sound.

2.3. Soundscape Positions

INvironments did not spend much time outlining what might constitute “other” listening positionalities. However, the podcast, notably the third episode “What’s In A Position?” establishes that there exist many intricate, embodied and personal cultural listening positionalities. Taking account of how others may listen outside of the Schaferian context matters because the value of soundscape ecology hinges on what one listens to and how. In this context, my coincidental reading of Dylan Robinson’s *Hungry Listening* with a cohort of graduate students led by Owen Chapman fundamentally shifted my approach to researching what constitutes a soundscape. The third and fourth episodes of *INvironments* question the structure of

my research in presenting Schafer as *the* point from which the rest of soundscape studies flows. Indeed, this turned the research of *INvironments* into a slightly auto-ethnographic endeavour as I began to question why I framed things in this way while simultaneously analyzing how my listening is “guided by positionality as an intersection of perceptual habit, ability and bias” (Robinson, 2020, p.37). At the same time, the podcast is attempting to disturb the very structures and discourses I participate in directly.

My thinking was certainly provoked by Robinson’s *Hungry Listening* because it exposed some of the pitfalls in how I approached a research question which asks, can multiple perspectives, listening positionalities and ontologies of sound benefit soundscape ecology? The question began to feel less appropriate as some ontologies of sound are not meant to be attached to colonial questions of analysis and collection. In Robinson’s work, recording is framed as a technology of colonial oppression which reduces Indigenous songs and environments into scrutable commodities. While my own listening positionality is steeped within the dominant settler culture I grew up in, the shift toward a critical listening positionality helped me not only situate my own blind spots as a listener, but how these unaccounted effects map on to soundscape ecology as well. With *Hungry Listening*, my goal then became to shift my awareness to the “normative listening orientations across a range of gendered and racial formations, and [develop] self-reflexivity around how these are guided by their own specific forms of hunger, starvation, and drive toward knowledge fixity” (Robinson, 2020, p.69).

Likewise, the question of normative listening positionalities in soundscape studies is prodded in media productions that operate outside of purely academic discourses. For example, as expressed in episode 4 of *INvironments*, Nik Forrest’s very low frequency (VLF) recordings featured in their installations such as “Où Nous Sommes” – which is featured in the podcast –

presents what Nik calls the potential for “non-binary listening” to environmental sound. The recordings articulate a sonic environment that transcends any binary classification that Schafer would use to distinguish “good” from “bad” sounds. And indeed, in relation to soundscape ecology, Nik’s recordings present a unique aural glimpse into sonic activity in natural landscapes that cannot be rendered by traditional modes of nature sound analysis like spectral analysis. Between “Où Nous Sommes” and Nik’s “Pembina” recording which they also provided for me, I was made aware of what other sonic subjectivities might sound like – separated from listening for sources, interferences and signal-to-noise ratios.

Moreover, I was made aware of works by Anishinaabe artists Rebecca Belmore and Julie Nagam through Kate Galloway’s 2020 essay “Listening to Indigenous Knowledge of the Land in Two Contemporary Sound Art Installations”. Though I did not personally experience these artists’ work in the spaces they were presented in, Galloway’s article helped in pointing out how these sound art installations expose the conventional idea of “soundscape” which enables a “de-indigenization” (Galloway, 2020, p.186) of natural spaces by deploying strict Schaferian conceptions of the relationship between human and natural ecosystem. What is sidelined, however, are much older and metaphysical considerations of the relationship between sound, ecosystem and human – whether it be through aural storytelling or natural sound – that can reorient listening to, and indeed, learning from sound. My idea was not to incorporate and appropriate these means of listening into soundscape ecology, but rather to encourage the idea that there are many ways to listen to a natural soundscape.

2.4. Soundscape Ecology and Conclusion

With my exploration of more critical soundscape studies accounted for, over the course of my research for *INvironments*, I also became familiar with some of the prominent studies

conducted in the ecology sciences that used soundscape recordings as methodology. These involved projects done through Purdue University under Bryan Pijanowski (2011), the seminal texts for soundscape ecology terminology established by Almo Farina (2011), more local projects happening at Université de Québec à Trois Rivières led by Raphael Proulx (2019), and the autobiographical-methodological overview of the work of pre-eminent soundscape ecologist Bernie Krause (2013). I was able to speak with nearly all these ecologists, as will be discussed in the interview method section. Upon reading about the studies and methods of soundscape ecology, it became clear that the motivation for establishing terms like biophony, geophony, sonotope, and all the taxonomies of sound are more pragmatic than anything. While the terms used in soundscape ecology orient ecologists to listen to the ecosystem in a certain way, they facilitate the analysis of the properties of sound in the landscape. One aspect that unifies the way soundscape ecologists use the term soundscape is the usefulness of having a taxonomy of soundscape terms. Later in the text, I use Almo Farina's sonotope as a way of connecting this utilitarian terminology to a form of explorative soundscape recording. During my interviews with the ecologists, a pattern emerged in how they all described the term soundscape according to these scientific conventions (biophony, geophony, anthropophony). The attention here is less on the politics of listening to the soundscape in a specific goal-oriented way as seen with Schafer, but rather, to facilitate the comparative analysis at the center of soundscape ecology.

This literature review, at first glance may seem to suffer from the graduate student researcher's plight of grasping too many texts under the assumption that *everything matters*. But to situate, and indeed make *INvironment's* goals achievable, these discursive strands felt like they started to naturally spell out an intricate rhizomatic structure. Drawing back on Guattari's ecosophy, I was inspired to use my podcast as a means of assembling these disparate but

intimately related discourses of soundscape. With no fixed or central corpus to study from, the podcast's strength came from its ability to work ecosophically, as Guattari critic Manola Antonioli posits, by “promoting any new practices (slowing down, short cycles, pooling knowledge and creativity, downsizing, new production and consumption paradigms) that allow us to enhance the links to each other and to our environment” (Antonioli, 2018, p.3). I used the podcast to reconnect my ears to natural soundscapes and for its ability to relay audio information effectively. Yet *INvironments* proved to be most rewarding to me in how it laid out the patterns of my normalized listening positionality. Reading my own patterns in listening *for* information, extrapolating environmental data and tracing sources became almost a disturbing discovery. My normalized settler position here felt like something that was getting in the way and blocking me from considering different marginalized listening positionalities. But it turned out to provide useful insight into why a deep criticism of soundscape ecology is necessary. The podcast ends with a realization that if we want to learn about how ecosystems change, how their sounds are affected by the climate crisis, we need to first study where we are listening from and how. Am I listening for extractive purposes? In what ways do my recordings act as technologies of colonialism? Through the process of this literature review and its shift from tracing the listening positionality of soundscape ecology toward a self-reflexive study, the process of creating *INvironments* became catalyst for personal growth.

3. Methods

3.1. In Pod We Trust

According to Guattari, thinking ecosophically is entirely about changing the role and production of media. *The Three Ecologies* is mostly a critique of mass-media as an extension of invasive capitalist regimes which are directly interpolated in the Earth's ecological destruction.

Meanwhile, Hannah McGregor articulates in an interview on the *Below the Radar* podcast, that a podcast is an “iterative”, “non-centralized” and “amateurish” “low-barrier access medium”. (Johal, interview with Hannah McGregor, Sept. 2020). Meeting this DIY, endearingly open-ended medium with an ecosophical focus on intersubjective thinking against highly organized and centralized forms of media production feels like a comfortable fit. Likewise, a lack of visual representations, to paraphrase *Radiolab*’s Jad Abumrad, emphasizes the sonic textures and flexes an audience’s listening imagination. With comparative soundscapes and interviews in my work, special attention to the nuances of the audio was especially relevant. In this section, I will first outline my choice as to why I made a podcast before exploring the motivations and allowances of my creative choices within it.

First, there is no one way to podcast. As Richard Berry wrote in 2016, “there is an infinite array of highly specialized but small-scale podcasts” (Berry, 2016, p.663). Today, creating a podcast is a bit of punchline – something that has become almost ubiquitous with young, white, male audio producers like myself. And while I have spent time thinking about the social and class privilege that makes DIY podcasting a viable option for me, I hoped that my branching ideas on what constitutes a soundscape would become more obvious as listeners make their way through *INvironments*. I did not choose this format primarily for its accessibility of production nor its simple process for distribution. I chose podcasting as a medium to talk about soundscape ecology because it allowed for an experimental openness at the core of my thesis. At the same time, this format is accessible to general audiences, making it less of a strictly guarded or academic project. I intended to reflect the need for wider discourses of soundscapes, different recording methodology and community engagement in soundscape ecology. To this end, I included various methods that would not only emphasize the role of audio in relaying important

information (as it does in soundscape ecology) but to bolster the connections between sound, ecosystem and human.

I situate *INvironments* within journalistic, narrative-, and research-driven podcasts such as Malcolm Gladwell's *Revisionist History*, Gimlet's *How to Save A Planet*, TED's *Twenty Thousand Hertz* and perhaps most inspirationally, Avery Trufelman's series like *Articles of Interest* and *Nice Try! Utopian*. In all these examples, the podcast is driven by building an evolving narrative that is told through a specific field, object or person. By this I mean I took inspiration in telling a story about soundscape ecology that then grew to discuss the need for situated knowledges in the face of the climate crisis. Likewise, all these inspirational podcasts use intricate sound design, music, and particular mixing techniques to articulate the story. Making my podcast's production part of the storytelling was essential to me. My inspiration grew out of these podcasts, but as mentioned in the literature review, the DIY nature of my podcast made me feel as though a self-reflection on the way I structured my work, and what kind of listening positionality I imbued it with was absolutely necessary. In adding this nuance to *my* practice, I hoped listeners would see why this kind of self-reflection would matter for soundscape ecology – where listening positionality governs how ecosystem changes are understood via their soundscape.

INvironments is a coalescing of two narratives – one about the history and practice of soundscape ecology, the other about the cultural construction of listening positionality. The two narratives are linked by the question of what constitutes a soundscape. In this way, the podcast is ecosophical for its emphasis on the analysis of individual to collective ecologies, moving from “humanity to biosphere” (Antonioli, 2017, p.3). A number of my methods in creating the podcast and experimenting with the creative research involved my own personal and embodied practice

as a recordist. In the following sections, I will outline how my own experience in the creative methods for *INvironments* strengthened the ecosophical themes of the work. These methods include field recording, interviews, sound design and music. They are discussed in this way as this how the chronology of the workflow unfolded in the making of *INvironments*.

3.2. In the Field

With a Tascam DR-40 stereo recording device, I was equipped to wander around forests, mountains and lakes in southern Quebec during the summer of 2020. As free as I was to record the sonic events around me, my field recording was grounded in specific practices I had studied. Namely, my intention was to hear the effects of creative soundscape recording practices like soundwalking and sounding parts of the environment on the ecological knowledge gathered. While soundwalking is a method used initially by the World Soundscape Project for ethnographic studies of changing landscapes as seen in the *Five Villages Soundscapes* (1977), the method is fundamentally about “listening to the environment” (Adams et al., 2008, p.3). The purpose of my field recording, as one of the first and crucial steps to my research-creation project was to see (or rather hear) if variations in recording yielded different sounding soundscape. To complete these experiments, I chose locations around southern Quebec that had rich summer biophonies (organism vocalisations) with plenty of sonic activity to explore. These included regions outside of Montreal like the Grey Valley trail near Huberdeau, Quebec, the Terra Perma protected forest and permaculture village, Mount Gosford, Parc National d’Oka and Parc du Mont Saint Bruno. Other locations were also selected closer to Montreal and its urban soundscape like the Summit Woods in Westmount, Quebec, and Mount Royal Park. While my methods in recording were inspired by Andra McCartney and Hildegard Westerkamp, I wanted to maintain a certain coherence with the wide array of methods used in soundscape ecology. For

my recording, I was particularly inspired by Bernie Krause for the simplicity of his setup. Krause has a stable recording setup, he told me during an interview, consisting of initially a UR tape recorder – now a digital recorder – paired with two Sennheiser MKH30 / 40 microphones in mid/side configuration (Krause, personal interview with the author, Nov. 25, 2020). The combination and placement of these two directional microphones records a wide stereo audio file.

My setup was not nearly as sophisticated due not only to the small budget of this podcast, but also to highlight some of the affordances of DIY, non-specialized recording (Farina, 2019). I used my Tascam DR-40 with an attached hand grip to minimize any handling noise and recorded using the Tascam's internal microphones in mid/side configuration. I chose this setup so that I would not limit the nearly omnidirectional pickup-pattern of the internal microphones with any more precise and directional shotgun or field mics. I monitored my recordings in the field with Audio-Technica ATH-M50x headphones. For each of my recording excursions, the gain was typically set anywhere between -15 dB to -5 dB depending on the intensity of ambient biophonies and geophonies.

Aside from the technical specificities, the field recording methodology consisted of more than simply turning on the device and listening to the incoming soundscape. As described in episode 2 of *INvironments*, the methods for recording in soundscape ecology are manifold. Some ecologists, like Krause, monitor their recordings in real time – leaving their recorders rolling and listening as it happens. The segments of Krause's recordings I featured in the second episode including before and after selective logging soundscapes from the Lincoln Meadow in the Sierra Nevada and the Governor's Camp, Kenya recording offer rich soundscapes captured with simple attendant monitoring. Other ecologists, as explained by Raphael Proulx (2019), leave their

recorders on for hours if not days at a time. The increments of time also vary as some ecologists only capture short 10 second snapshots for several weeks versus a continuous recording for only a few hours. It depends on how much data can be processed.

Some of my recordings emulated the attendant monitoring inspired by Bernie Krause. This was especially effective when I was in the presence of notable biophonic events such as early dawn choruses of birds at Oka National Park in July 2020, or watching deer graze very quietly at Mont Saint-Bruno Park also in July 2020. However, I like to consider my field recording as a more experimental endeavour because of how I incorporated more embodied and explorative forms of recording that are not typically used in soundscape ecology. What I found, however, was that these new methods drastically changed the soundscapes in question.

The problems in soundscape recording and framing mentioned before by Mitch Akiyama are echoed by other writers. Bernie Krause expressed in our interview that “no microphone in the world can pick up an entire habitat” (Krause, personal interview with the author, Nov. 25, 2020). Sound artist and biologist Francisco Lopez has held strong opinions on the fact that “recordings can never replace ‘real’ experience” (Lopez, 1998, p.3). In trying to sidestep away from any claims over the objective value of a representational soundscape, I instead favored my own experimental soundwalks as a partial perspective of the sonic environment that still held some value in how it recorded *my* experience of the sonic environment.

Thinking about the recorded sound of experience was directly inspired by Hildegard Westerkamp and Andra McCartney. As part of the World Soundscape Project, Westerkamp marks an important change in the consideration of soundscapes not just as markers of wanted or unwanted sounds but to provide emphasis the subjective exploration of space and its relationship to the listener. This theme is at the heart of soundwalking. With my Tascam, my goal then

became to explore how I personally interacted with the soundscape and what kind of pockets within it I could unveil. Indeed, soundwalking with a recording device is an adaptable method which can be applied for various research outcomes (Adams et al., 2008). In keeping with my project's ecosophical focus, my explorative recordings interject a reformulation of the dominant way of listening and recording in soundscape ecology as my body is effectively fused into the environmental sounds, establishing as, Kamila Stasko-Mazur writes, a "personal relationship to [the] living place" (Stasko-Mazur, 2015, p.441). Andra McCartney and David Paquette write about the agential empowerment that comes with soundwalking as intricate information about the sonic environment is unique to their experience (Paquette & McCartney, 2012). These unique explorations open further potentials for alternative mappings of the space and insert other ontologies of sound and their listening positionalities into a consideration of the landscape.

What my own soundwalking exposed to me on a more scientific level, however, was how it can be intimately connected to soundscape ecology. This became apparent when I spoke to ecologist Almo Farina who clarified his concept called sonotope. A sonotope, according to Farina, is a heterogeneous layer or patch of sonic activity within a soundscape. These patches can be heard according to different spatial and temporal axes as different acoustic events happen at different times, volumes and cycles within one ecosystem. As an example, a chorus of chirping crickets at dusk are not indicative of an entire forest's soundscape, but they constitute a particular sonotope within the forest. I frame my soundwalking within soundscape ecology as a method for recording small localized sonotopes. In the last episode of *INvironments*, I attempt to connect the idea of sonotope to the potential of soundscape ecology to include alternative mappings of sound and space. In this sense, everyone's listening positionality and their unique interaction with the sonic environment can nuance the whole of soundscape ecology.

Perhaps most importantly, my soundwalking, when replicated in the same environments but separated by either time or space, indicated the tangible importance of thinking along the lines of the sonotope. This is how episode 3 of *INvironments* begins: a side by side comparison of recordings I did at the Summit Woods in Westmount, Quebec where the only variation was a 180-degree turn. Using the analytical method of spectral analysis, as typically employed by soundscape ecologists, I wanted to establish if there indeed was a concrete change in these sonotopes beyond just my audible perception. Figure 1 is a representation of the frequencies recorded at the Summit Woods on 14 July 2020 toward 7:30 PM. The spikes in the center indicate the point in time when I turned on my heels to begin recording behind me. Notably, there is a decrease in street noise (everything under roughly 1500 Hz) after the midway spike.

Figure 1: Spectrogram of 180 degree Summit Woods recording, 14 July 2020

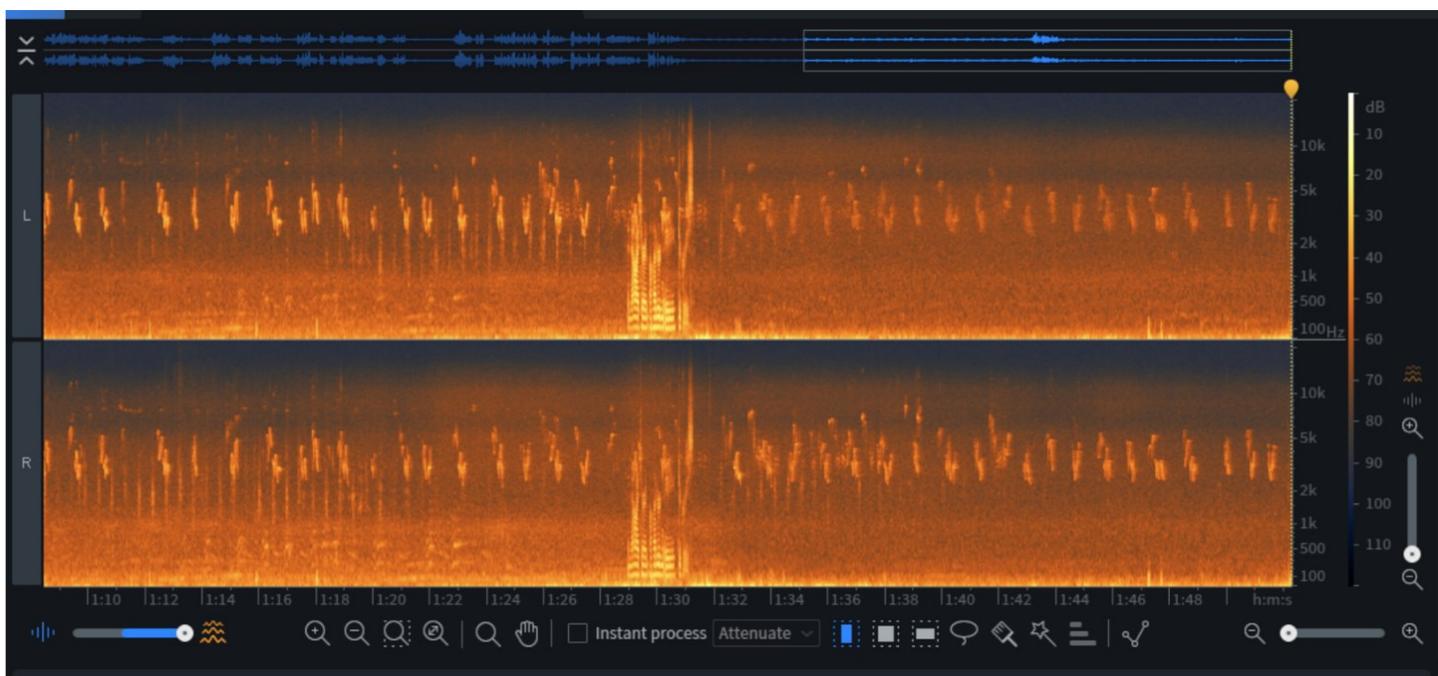


Figure 2: Spectrogram of 180 degree Summit Woods recording – same location as Fig. 1, 12 September 2020

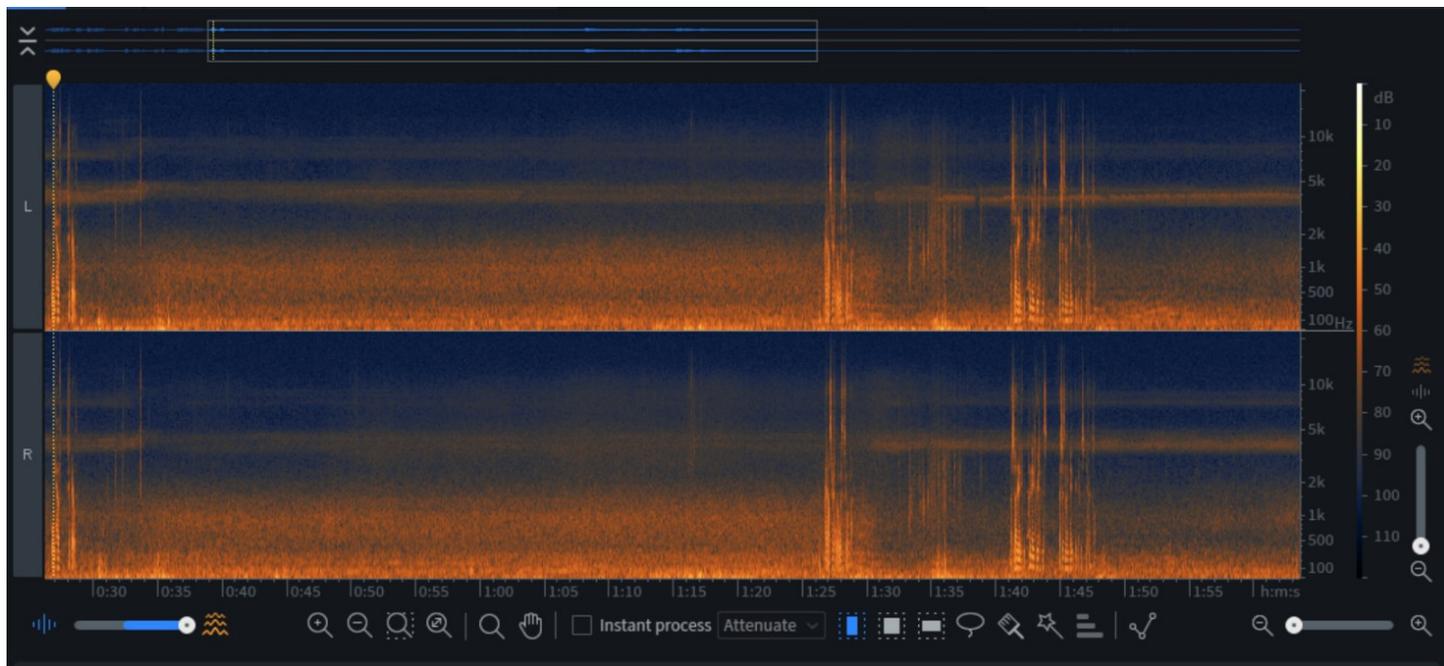


Figure 2 represents the same position, only recorded two months later, on 12 Sept 2020 around 4:30 PM. The most apparent difference is the lack of chirping birds as seen periodically between 2kHz and 5kHz on Figure 1. Moreover, the din of traffic noise from distant streets is more prominent, likely due to the thinning autumn trees allowing more sound to travel from the distant roads to my microphone. Using spectral analysis in this way, I did not gauge how comparative soundscape recordings display changes in ecosystem dynamics, as detailed by Krause, Farina, and Proulx. Rather, the comparison was to establish the pockets of sonotopes existing within one soundscape.

Comparing the spectrogram in figures 1 and 2 demonstrates why accounting for sonotopes within soundscapes matter. The Summit Woods soundscape, as I learned through my comparative field recording methodology, undergoes drastic changes depending on position in

time and space. This is at the heart of the logic of episode 3 of *INvironments*. But again, the importance of the sonotope is not just to nuance the way a soundscape is recorded.

In the podcast, sonotopes became a key to linking soundscape ecology to the wider perspectives and methods I've discussed before from McCartney and Westerkamp. Indeed, McCartney's doctoral dissertation connects sounding and soundwalking in Westerkamp's compositions to a form of feminist epistemology, or an intervention into how sound and place can be explored according to non-conventional listener exploration. I included a short segment in episode 4 in which McCartney explains how to *sound* objects and spaces by manipulating the positions of directional microphones. While this technique became a favorite of mine, it also allowed me to frame my embodied and explorative recordings as sonotopes. It distances the recording from an ideal or prescriptive method and accepts the partiality of the recording as a valid perspective into a sonic environment. In hiking and soundwalking around the natural spaces of southern Quebec, at Mount Gosford, the Grey Valley Trail along the Rouge River near Huberdeau, Qc., the Terra Perma permaculture village and preserved forest, Oka National Park and Mont Saint Bruno National Park, my explorative field recordings provided a vantage point not only into particularities in sounds across the landscape, but implicated my experience directly into the findings.

3.3. Interviews

The motivation for including interviews in my podcast changed as I was constructing the project. Initially, my intention for their inclusion was merely citational or a way of putting a voice to the soundscape ecology literature I reviewed. This choice was more aesthetic than anything as it broke the drone of my narration with the inclusion of other voices. As mentioned in an earlier section, the interviews instead provided a way of matching the

ecologists' unique perspectives and subjectivities to larger ecological discourses. After having spoken with the people included in my work – Bernie Krause, Almo Farina, Raphael Proulx and Nik Forrest – their contributions mattered more than previously conceived. Beyond the content which they provided for my podcast, these interviews reframed in research. My original objectives which more extractive and less collaborative. But throughout the process of making the podcast, each contribution from the participants became something to work *with* my research, not something to work *for* my research. This distinction matters because it further embraces the situated knowledges theme at the heart of my work while also using the podcast format as a space for collaborative, iterative knowledge production. In concert with my reflective podcasting, these interviews helped frame soundscape ecology as “re-markings, reorientatings” (Haraway, 1988, p.111) of otherwise extractive approaches to interviewing and researching. Working across my discussions with the ecologists and one sound artist functioned as my way of incorporating “situated and embodied knowledges” (p.191) to form a fluid but cohesive idea of soundscape ecology. In this section, I will outline how and why these interviews shifted the focus of my project as they enabled me find my particular voice amid the soundscape/soundscape ecology discourses.

But before outlining each interview participant's role in my work, I want to acknowledge the lack of diversity in my candidates. This aspect sparked a long line of self-reflection. Indeed, many of the ecologists working within sound methodologies are from the same white group. Perhaps this is because the field reproduces a dominant white listening positionality as discussed earlier with Schafer. Perhaps soundscape ecology still participates in producing in-group mentalities around audio technology and recording, as Tara Rodgers (2010) has explored in her work, that generate gendered barriers. Marlee Harrell addresses this aspect of most STEM fields,

describing this process of exclusionary in-group mentalities as cognitive practices which “have a larger impact, however, often because they are essentially social norms that have been internalized, and so change the individual’s thinking patterns” (Harrell, 2016, p.16)..There are many articulations of settler culture within soundscape ecology: from what Bernie Krause calls the “white colonialist doing the work” in unceded lands, to the distinctions between signal sources, noise and interference. But in wanting to find more ecologists with nuanced listening positionalities, I asked myself what that would bring. Would it only help me *define* what a listening positionality is? Is that a question I should even answer? Ultimately, as I say in episode 3, it is not my place to answer what entails a listening positionality as everyone’s cultural experience grants them a unique and valid perspective. My role, then, was simply to say that there exist many positions when it comes to listening. Likewise, it is also the role of white settler recordists like Bernie Krause and myself to think about where our intentions come from and remain aware that the field is lacking in its diversity.

Bernie Krause

Bernie Krause was a top priority. He is often credited as a foundational figure in soundscape ecology by having conducted some of the first comparative soundscapes of ecosystems since the late 1960s and used the recordings as a method for tracking ecological changes. He has traveled the world recording remote areas from South America to Kenya. Krause is essential to a study of soundscape ecology because he helped define the vocabulary of particularities in the soundscape such as biophonies (animal made sounds), geophonies (naturally occurring environmental sounds) and anthropophonies (human and technology made sounds). My interest in soundscape ecology began when I heard his TEDtalk many years ago and subsequently read his book *the Great Animal Orchestra*. In reading the book, which is partially

dedicated to R. Murray Schafer, I noticed some of the assumptions on the nature of soundscapes that seemed to move forward the Schaferian preferences and analyses of soundscapes. With that in mind, my approach to interviewing Krause was primarily to gain more clarity on how he felt his listening, and indeed his early work in establishing soundscape ecology, was effected by Schafer and a guiding idea of soundscape. As I asked him to define the term, his answer was similar to Schafer's and he proceeded to laud his contribution to sound studies as one the field's most important figures. I was prepare to prod Krause with some of my criticism of Schafer, but before I could, he suffixed his praise of Schafer with an elaboration on the many problems with his work, the whole of acoustic ecology and even soundscape ecology. I was quite surprised. I had preliminary thoughts on including a discussion of listening positionality in my podcast, but in hearing Krause articulate all the limits in white settler listening habits and the corpus of authoritative literature on it, I knew my thinking was not just tangentially related to soundscape ecology, but directly part of its operation. In fact, one soundbite from our interview, transcribed below, showed how ecosophical Krause's approach to environmental awareness is. Access to, and even the entire language of environmental sciences, are indicative of mainly one active positionality. Krause seemingly argued my thesis for me.

Lou Raskin: *Because you describe how influenced you are by Schafer and the WSP, do you feel Schafer sum up effectively how people listen by default?*

Bernie Krause: *I think so. One of the things that bothers me about Schafer's work is it doesn't take into account how people from other cultures actually listen. Soundscape ecology and acoustic ecology is a very white brand. [...] The academic group from which Schafer came at Simon Fraser University in the 1960s and 70s, with Barry Truax and Hildegard Westerkamp - it was all very white. Very few people were involved in the environmental issues that were mainly white academics. And it's pretty much the same today. [...] But that's a real problem with the whole idea and the concepts and the philosophies of soundscape ecology. Look at the online discussions happening right now. It's all white shit. (Krause, personal interview with the author, Nov. 25, 2020)*

Beyond this indictment, there were particular links to the technological aspects of his recording that were quite illuminating. It was especially rewarding to discover the link between his influence from Schafer and his recording technique. Contrasted with my field recording, for example, Krause's soundscape recordings are extremely high fidelity (as heard in the soundscapes he provided for me in episode 2) as it is fixed, mixed and adjusted for playback. The results are stunning yet they invoke, like Jonathan Sterne has argues, the emphasis of stereo culture and audiophilia (2012, p.186-188) that come with the groundwork set by acoustic ecology.

Talking to Bernie Krause presented an opportunity to trace some links between the traditional notion of "soundscape" and the dominant listening positionality it implies in soundscape ecology. Even though Bernie was intensely self-reflexive about his privilege and listening positionality, what wider methods and discourses could do to soundscape ecology still remained to be seen.

Almo Farina

As another formative figure in soundscape ecology, Almo Farina's contribution to *INvironments* was surprising in many ways. My intention in inviting him as participant in my podcast was to essentially speak about all the terms he authored. I was prepared to ask questions about the taxonomies of sounds, the interconnection of landscape and soundscape, as well as learn about his involvement with other ecologists like Bernie Krause and Bryan Pijanowski. But from the onset of our discussion, Farina steered into topics I had not previously considered. Namely, I was so fixed on the idea of soundscape ecology, I did not anticipate considering *ecoacoustics* which Farina described as a wider field in which soundscape ecology is located. Soundscape ecology, Farina distinguished, more accurately describes the connection between

sound and landscape whereas ecoacoustics is a more general way of describing the ecological application of sound-related methodologies.

Farina also clarified many ideas I had presumed. For instance, I typically described soundscape ecology as a means of better analyzing the interactions between organisms and their habitat and providing insight on ecosystem interactions. Farina told me quite blatantly “this is not completely true” because methodologies for analyzing sounds in ecosystems do not correlate directly to understanding the interactions of all species in the landscape. Sounds do not tell ecologists directly how many species are present, as some organisms do not vocalize, and many occupy too similar a part of the frequency spectrum to sufficiently determine whether or not there are changes in population size and health from one soundscape recording to another. This conversation led to one of the most essential ideas in *INvironments*: the sonotope. Before this conversation, I was only slightly familiar with the term by having read it in Farina’s *Soundscape Ecology Handbook*. Farina’s emphasis on the sonotope as a pocket of sounds within a given soundscape then became context to which I could bridge experimental recording and wider discourses of soundscapes to soundscape ecology.

Raphael Proulx

Situating soundscape ecology within a more local context was important to me. Until I spoke with Raphael Proulx from Université de Québec à Trois-Rivières, the field felt like an esoteric topic that still has not been integrated in most ecology sciences departments. Proulx not only helped localize soundscape ecology, but he also served as the only ecologist I spoke to who did not occupy a foundational relationship with soundscape ecology as Almo Farina and Bernie Krause do. Talking to Proulx gave insight in how this field can influence and attract ecologists who would not otherwise use sound recording as a methodology. At the same time, his interview

also provided me with audio samples of the soundscape ecology basics. For instance, coming up naturally in our conversation when discussing methods, he described spectral analysis, differences in microphone set ups, and issues with crunching big pools of sound data. With this information, I was ensured my podcast would serve its initial purpose not just as graduate student project, but primarily, as Hannah McGregor says about scholarly podcasting, as an *accessible* way of communicating the amazing applications and methods of soundscape ecology. Proulx effectively brought these aspects out in discussing the work he had done with Montreal sound designer and artist Thibault Quinchon. He exposed soundscape ecology for its creative potential as it bridges sound art and production to wider ecological awareness.

Nik Forrest

As the only participant in my interviews who is not an ecologist, I wanted to speak with Nik Forrest because their work with very low frequency (VLF) recordings exemplified a more drastic example of how listening positionality is tied to recording ecosystems. Forrest elaborated on how VLF recording in their work is indicative of a queer listening – one which does not distinguish between preferred sound sources and a rejection of noise. Instead, the VLF recordings offer an idea of space or ecosystem that is otherwise *hidden* from the ear. It also valorizes noise, something that is usually dismissed or filtered out of most audio recordings.

Lou Raskin: *What interests you in exploring the “imperceptible” or at least the limits in how we know and perceive the environment?*

Nik Forrest: *So many things! [...] One of the things that really interests me is what pressure does queer theory put to bare on ecology. And what pressure does trans theory put on queer ecology? So what happens if you start thinking trans ecology? [...] Common sense will tell us visibly, there are men and there are women. That’s common sense, right? However, the biological reality, as I begin to understand it, it’s much more complicated than that. It’s not apparent to a sensory regime, however, there’s all this other stuff going on under the surface. (Forrest, personal interview with the author, Nov. 6, 2020)*

Recording the inaudible frequencies that constitute Forrest's VLF work responds to the edges of the soundscape discourses from Schafer and the WSP that were washed out. It exposes a fissure in this dominant listening positionality and exposes a wider, more experimental method for soundscape ecology. Listening to the environment, outside of a "goal oriented" listening of sound, as suggested perhaps in the work of the World Soundscape Project, is about attunement, as Forrest says, "thinking about listening differently might be related to listening differently to each other" (Forrest, personal interview with the author, Nov. 6, 2020). With their words in mind, I began to see the connection from soundscape ecology, according to Farina's sonotope, to forms of not only alternative recording methods like VLF recording, but to a wider social practice such as those mentioned in the podcast like the Record the Earth Project from Purdue and Leah Barclay's Sonic Explorers project. Bernie Krause also expressed in an email to me how these crowd-sourced, community-oriented soundscape projects derived from initiatives that begin as far back as the 1980s:

The Record the Earth project was a derivative of the Global Soundscape Project we proposed to [Pijanowski] in 2007[...]. To be fair, the idea is not especially original to us, either. Murray Schafer talked about variations on this theme 30 years ago. The technology wasn't quite there. The World Forum for Acoustic Ecology (WFAE) has proposed different models along these lines. Eric Leonardson, from Chicago's World Listening Project has likewise put together proposals based on this model. Chris Watson, Jez Riley French, and Peter Cusack in the UK have each worked with variations of this concept. (Krause, personal communication to the author, 27 Nov. 2020)

As mentioned in episode 4 of *INvironments*, soundscape ecology has already been connected to community practices. However, this is usually done in the name of acquiring extensive soundscape data. Bryan Pijanowski's Record the Earth mobile app is a shining example. But with Nik Forrest's interview, I began to think of crowd sourcing soundscapes differently. The sonotope may provide a justification for lay recordings of pockets of

soundscapes, but instead of framing this as an activity of collection and extraction, Forrest offers the idea of attunement. I wanted episode 4 to demonstrate that soundscape ecology can imply anyone – as all the ecologists I spoke to lauded crowd sourcing and community participation. But the connection between sound, environment and community became the most revealing aspect of Forrest’s participation in my project.

3.4. Sound Design and Music

It was important for me that *INvironments* had a consistent *feel*. The podcast is structured in a relatively linear way that is inspired by podcasts like *The Most Perfect*, *Articles of Interest*, *Revisionist History* and *How To Save a Planet*. Even though its content may unfold in this traditional way, I saw the sound design and music composition for the podcast as a means of reinforcing the themes of the show in a less chronological and more interconnected way. In this section I will speak about the connection between themes and musical motifs used in *INvironments* as well as some of the sound design and mixing choices that enhanced the telling of this soundscape ecology story.

To begin, the music I made for the podcast was intended not only to serve as accompaniment to my narration, but to tell the story by emphasizing themes at certain points. All the motifs in the show stem from the main theme that plays during the show’s opening and at its end. The main theme is built on the foundations of two arpeggiated chords which I play on acoustic guitar, an instrument reminiscent of folk traditions in which music and ecological awareness are commonly associated. The chords are Db major and A major (the minor 6th of Db). This interval sounds mysterious and open-ended. However, the choice of these chords and the subtle dissonance that they create represents something more. The key of Db major repeats across *INvironments*’ music because it came to signify the concept of “soundscape”. The key of

A major repeats across the series to signify topics related to “ecology.” As such, the main theme is a juxtaposition of these musical ideas which thematically suggest “soundscape ecology.” The main theme also uses my soundscape recordings as part of the composition. The theme opens with thunder, then blends in a dawn chorus of birds steeped in a deep tremolo effect which create a strong rhythm set against my programmed kick and snare. In the second half of the theme, a distorted buzz from a mosquito was edited to resonate in a Db note, to gel more cohesively with the rest of the music. All the choices were meant to playfully exemplify some ideas in Bernie Krause’s work, namely the connection between human-made music and the world’s biophonies and geophonies. It emphasizes the role of listening positionality in my work as I turn traditionally non-musical voices like thunder, waves and mosquitos into a musical composition. These natural sound sources become musical if one listens to them as such.

Each derivative “soundscape” and “ecology” theme had specific intentions behind them as well. First, the “soundscape” motif, played most extensively during the first episode, is in the key of Db major. However, the motif is made up of multiple chords within this key signature. With each chord change, we anticipate the return to the tonic Db, but are guided along a relatively unpredictable progression of five chords. The intention here was to demonstrate the fluidity of the term “soundscape” which has many interpretations. I likened these interpretations to the chords in the soundscape motif. Each one suggests its tonic center, but none of them are the tonic center. There are many listening positionalities related to what a soundscape is, but there is no one definition.

In episode 1, the motif is first heard as a solo acoustic guitar when I introduce Schafer to the story. However, when I speak about the World Soundscape Project and the eventual nuancing

of the idea of “soundscape”, the arrangement of the motif is fuller, to indicate that the soundscape discourse is growing.

In episode 2, I introduce the ecology motif. In keeping with the A major idea that suggests “ecology” in the opening motif, this melody is not actually articulated with chords. Because “ecology” is framed in my podcast and even in soundscape ecology as a network of interrelations, I composed the ecology motif as sequences of short staccato notes. When each of these 3 staccato sequences harmonize with one another, they create the effect of a chord, that is, playing multiple notes synchronously. The notes in the ecology motif work to this ecological goal as each note is in relation with its harmonic counterparts, the guiding bass, and the finger-picked guitar which announces a resounding A major chord at the end of each measure. The isolatable but interacting nature of the notes in this motif is meant to convey the interrelations of species and ecosystem as told through their sound in soundscape ecology.

As a final important theme, I included a motif for the sonotope. To express why this term is so important in this podcast, I fit it into the context of the musical motifs discussed so far. The sonotope motif, which opens episode 3 and reoccurs later in the episode, is built from the same Db major structure that the soundscape motif comes from. However, the sonotope motif is simpler because it only uses the root note (Db) and its fifth (Ab). With these notes, the melody does not give enough musical information to confirm the key or indeed the nature of the chords (whether they be major or minor). These notes *can* be indicative of what the key of the motif is, but they do not have to be. Usually it is 3rd and 7th notes of a scale that distinguish whether it is major or minor. But here, the sonotope motif represents a partial hint at what the key signature is, without directly expressing it much in the way that a sonotope is a partial representation of an ecosystem’s soundscape, without being indicative of its *whole* soundscape. In fact, playing the

sonotope motif over the opening “soundscape ecology” motif, for example, shows how the sonotope notes can be played over either a Db major tonic or an A major tonic and still keep a consonant harmony. I used a heavily processed synth bass to play the sonotope motif because it pushed the idea of partiality or ambiguity further. The bass sounds like it could have originated from an acoustic sound source like a bass guitar and amp but could just as easily be heard as a synthesized instrument. This use of synth bass, and synthesized step sequences in other parts of the podcast are meant to evoke a sense of malleability and flexibility to the music. Just like soundscape ecology, there is no one way to record, analyze and understand an ecosystem. Using soft synths from Ableton Live 10’s library as well as TapeX from ADSR, my attempt was to embrace the ambiguity and open-endedness of synthesizers which have no one preeminent tone compared to an acoustic instrument. Likewise, these synth sequences are a nod to the work of Krause and Beaver featured in the podcast. There is a long history of ecologically themed electronic music albums from Jean-Marie Mercimek’s soundscape-oriented *La Flourenn en Mars* (2020), to Mort Garson’s *Plantasia* (1976). Hopefully listeners will hear the *INvironments* score as a part of this tradition.

During the sonotope motif at the start of the 3rd episode, I also included a tremolo-steeped soundscape recording. As the rate of the tremolo accelerates, the soundscape goes from sounding choppy to consistent. This piece of sound design attempts to sonically hint at how accumulations of sonotopes, or more patches of ecosystem sound, can provide a better sound map of ecosystem interactions. Matched with the sonotope motif playing over it, I wanted to express the episode’s argument that listening positionalities function as patches or subjective layers that can provide a framework for recording sonotopes.

More notable sound design elements occur at the start of episode 2. I edited together a changing tapestry of soundscapes that are constantly cutting out, glitching and stammering. The intention here was twofold. First, this piece articulates sonically how natural sound can represent ecological degradation. The degradation here was represented through cuts and choppy editing. The second intention was to draw attention to the medium of sound recording that comes between the sound source and our listening which inform the epistemologies about natural ecosystem. These glitches in the soundscape emphasize that the recording is indeed not the same as the natural sound event and that forming ideas about these events is not as clear as it seems. The soundscape piece here, much like the sonotope piece that starts episode 3, hints at the main idea of the episode. All these creative choices in using motifs and evocative sound design are part of the reason I chose to use the podcast as a format for *INvironments*. As a method for the research, this open exploration of sound design further entrench my podcast within a creation-as-research framework. As I reinforce the themes of the podcast through musical tags, I allow audiences to understand the interconnectedness of my ideas beyond a presentation of literal content. This nudge toward alternative ways of knowing through creative and explorative research is especially open-ended in podcasting as there are no strict conventions for producing a podcast. Such an openness encourages an “exploration through creative processes that include experimentation, but also analysis, critique, and a profound engagement with theory and questions of method” (Chapman & Sawchuk, 2012, p.19).

Outside of my own creative contributions, other production choices in the podcast included the occasional use of popular songs. For instance, in concocting a sonic impression of 1969 in episode 1 before I introduce Schafer, I featured “St Stephen” from the Grateful Dead’s 1969 album *Aoxomoxoa*. Along with the late 60s counter-culture atmosphere it provides, “St

Stephen” is a song whose lyrics (by Robert Hunter) continually question the state of reality and typical sense perception. However, no sufficient answers are proposed in the song. In the context of my asking “what is a soundscape” and never getting a perfect discrete answer, the song’s content and themes felt appropriate.

Episode 1 also contains an excerpt of Schafer’s *Gamelan* (1979). This piece is an original composition but appropriates musical elements of percussion ensembles from Java and Indonesia, only transposed for a vocal arrangement. Using *Gamelan* to introduce Schafer is a subtle hint at his complex and often problematic compositional inspirations. It also contextualizes Schafer first and foremost as a composer, then an acoustic ecologist. This distinction is subtle but offers insight on the kind of listening Schafer lends to his acoustic environment by thinking sound in musical terms.

In episode 2, I introduce my discussion with Bernie Krause. In summarizing some of his career leading up to his introduction, I included a sample of his own composition “Spaced” from his seminal 1970 album with Paul Beaver, *In A Wild Sanctuary*. The intense rising and falling frequencies at the song’s climax are reminiscent of the famous THX sound mark (which Krause claims in an interview, was stolen from him), which added some regalia and fanfare to the introduction of Bernie Krause into the podcast. The same sample is featured later in the episode when it is abruptly cut off (for comedic and dramatic effect) by Almo Farina who shatters some of my conceptions about soundscape ecology. This abrupt end underscores the sudden sobriety in Farina’s remark on how soundscape ecology is not simply about studying the interactions of ecosystems.

The final popular song featured in the podcast is in the last episode where I inserted Joni Mitchell’s “Both Sides Now”. First, at the beginning of episode 4, I describe how listening is

subject to context. Listening to different things in different contexts at different times, like Andra McCartney asserts, changes the way we listen. The first time “Both Sides Now” is used, it is an example of how my listening changes, for example, when I hear a Joni Mitchell song with rich lyrical imagery. The song is likewise used towards the episode’s end. Mitchell’s themes of changing perspective with experience and seeing things “from both sides now” became an analog for me to express not only how my perspective changed since the beginning of the first episode, but how different listening positionalities, sonotopes and methods can create a soundscape ecology that works beyond any one definition of soundscape and any one specific listening positionality.

By the 35 minute mark of episode 4, “Both Sides Now” becomes gradually more soaked in reverb before fading into silence. The reverb swell functions as a sonic camera pull, as if we are zooming out of the song, letting it fill the space that surrounds my voice, and all the listeners as well. The sense of space created by this pull is then contrasted with the 45 seconds of silence that conclude the episode after I say “it begins with listening”. The idea here was to link the widening space from the reverb of “Both Sides Now” to the listener’s own personal sonic environment. It almost works as a listening exercise, giving the listener a chance to zero in on their immediate environment in a way that is informed by the episode’s remarks on embodiment and attunement.

Through these creative practices in *INvironments* including music and sound design, I hope to reinforce the themes of each episode. Ending *INvironments* in this way, I am hoping that the podcast’s lasting impression will be one that makes general audiences’ study where they listen from and why. At the same time, these aesthetic/production choices are also meant to

subconsciously bolster the interconnect topics like “soundscape”, “ecology”, and “sonotope” that inform each episode of *INvironments*.

4. Discussion

4.1. Overview

In this last section, I elaborate on the negotiation of ideas and questions that cycled through the making of my podcast. Before I conducted the creative methodologies to make this project, I had based my research on some preliminary questions. These were posed in response to the literature I had read on various soundscapes discourses within and around soundscape ecology as discussed in the literature review. While these questions helped to connect my work to a body of academic work, the creative work involved in making the podcast, including the field recording, interviews musical composition, and mixing of the podcast, folded in new expansions on these older questions - sometimes even flagging some as irrelevant and replacing them with new questions altogether. For the sake of clarity and organization, I will break down the discussion of the changes in my questions according to each episode of *INvironments*.

4.2. Preliminary Research Questions

To express how my questions developed over the creation of *INvironments*, it is important to review my initial research questions. My major questions asked:

- How does soundscape ecology reiterate a normalized listening positionality?
- How can more explorative and experimental ways of recording soundscapes change the way we understand an ecosystem’s sound?
- What kind of ecological epistemologies would a soundscape ecology based on creative and explorative methods generate?

These foundational questions remained a consistent guide for my research. In the following episode breakdown, I will display how the creation of the podcast challenged these lines of questioning.

4.3. Episode 1: What Is A Soundscape?

Like all the episodes of *INvironments*, episode 1 is framed by a central question. But looking closer at the term “soundscape”, as shown in the literature review, is not unique to my work. I see this episode more as a synthesis of discursive trends from acoustic ecology – namely the ideas of the World Soundscape Project – but builds from the analysis done by Mitch Akiyama (2010), Jonathan Sterne (2013) and A.Y. Kelman (2010). However, in recording for this episode, I was required to acknowledge that my own listening is steeped in a certain normalized position.

Before making the podcast, I still automatically referred to Schafer’s vague but pointed idea of soundscape whenever I thought of the term. The extent to which Schafer became a default for me became quite apparent when I started recording some soundscapes for episode 1. In my recordings, there were times when I would think out loud and take verbal notes on what I was hearing. More often than I care to admit, I would make judgements on how much noise was present in my environment, how clean or sparse it was, and what kind of ethnographic information I could extrapolate from it. These thoughts are all indicative of how pervasive the acoustic ecology discourse was in my listening. The field recordings for episode 1 demonstrated to me the clear link between listening and recording. How many times did I impose a goal or a specific listening objective when recording in the field? What was I listening for? Why?

In reference to my questions regarding how normative listening habits can infiltrate the recording soundscapes, the first episode’s attempts to synthesize a definition of “soundscape”

exposed not only that there is no definitive way to do this, but that recording can be a reproduction of a listening positionality. I exemplify this difference in the episode by contrasting my recordings with soundscape compositions by Hildegard Westerkamp and Barry Truax. The value of these comparisons is in hearing the connection between discourse and practice, or culturally produced listening and field recording. This tension would be touched on again in episode 4 in my discussion with Nik Forrest.

4.4. Episode 2: What Is Soundscape Ecology?

Since episode 1 set the theoretical stage for how the soundscape term took shape in academic contexts, it was always my goal to explore how the definition described by Schafer and his hierarchical approach to classifying wanted or unwanted sound sources mapped onto soundscape ecology. In reference to the question of how normative listening is reproduced in soundscape ecology, episode 2 was structured in a way that it could answer the question discretely by explaining how Bernie Krause's work and most of the terminology of soundscape ecology is informed by acoustic ecology. Episode 3 was intended to nuance the information disclosed in episode 2.

When I spoke with Krause, I asked him about what Schafer's work meant to him. He answered me initially as I expected, explaining how the *Tuning of the World* changed his life and how Schafer's work is ground-breaking because he was able to effectively describe sound phenomena with a new evocative vocabulary. Krause confirmed that since his exposure to Schafer's work and the rest of acoustic ecology, and after the creation of his soundscape/synthesizer seminal album with Paul Beaver, 1970's *In A Wild Sanctuary*, he considered the sounds of ecosystems in previously unconceived ways. This contributed to Krause's influential classification of ecosystem sound sources including biohonies, geophonies

and anthropophonies (Krause, 2013). While these are helpful principles to guide the soundscape analysis such as calculating acoustic complexity indexes, the listening positionality that informs Schafer's work is still felt in soundscape ecology.

However, through the interviews conducted for episode 2 and the rest of *INvironments*, the listening positionality that I expected to dominate soundscape ecology was not as impermeable as I originally thought. Almo Farina, another author of foundational concepts in soundscape ecology, described his terms to me merely "as a matter of words" (Farina, personal interview with the author, Sept. 15, 2020). He stressed that the terminology is essential to proceeding with a workable methodology and analysis for soundscapes. I understood this to mean that a description of sound is not just indicative of one's positionality in listening to it but introduces a practical dimension that can facilitate a shared understanding on complex sound activity in ecosystems.

Like Farina, Raphael Proulx emphasized the vocabulary of the physics of sound (amplitude, frequency) and its rendering as a spectrogram as a facilitation of studying complexities of biodiversity. Proulx described a listening guided not entirely by a cultural description such as Schafer's, but by a physics of the sound itself. In asking how certain normative listening positionalities become reiterated in soundscape ecology, I never contemplated that listening positionality in soundscape ecology could be steered by a predominantly physical description of sound. Of course, the physics of sound are also a cultural production. Nevertheless, these insights from Proulx broadened my understanding of soundscape ecology by drawing attention to the scientific objectives of its practice.

In accordance with this previous insight, Proulx also drew my attention to the fluidity of soundscape ecology as methodology. I viewed the field as somewhat of a monolith, thinking it

was a general way of studying interactions in an ecosystem. While this is still true, Proulx widens the study to consider not only how sounds intermingle across a landscape, but to keep in mind the variation in organism vocalizations, size of organism, species diversity and the medium through which the sound travels (Proulx, 2019, p.45-47). The objectives with which the ecologist enters the ecosystem, whether it be to study frogs in streams like Proulx, or other biophonic or geophonic activity for example, equally inform their listening.

In making the podcast, my research was grounded on how cultural definitions and preferences in listening positionalities affect the study of soundscape ecology. As much as I did to study the literature informing soundscape ecology, the interviews with the ecologists in episode 2 emphasized some of the scientific objectives that guide listening which I had not completely anticipated. During my own field recording, should I have entertained these considerations when recording? What would they change about my listening and consequently, my recording? While I may acknowledge this as a blind spot, it certainly supports the value of including these interviews in the podcast as an extension of research-from-creation. Here, I acknowledge the “looping” (Chapman & Sawchuk, 2012, p.50) relationship that emerges between my interaction with the ecologists and their inclusion in my podcast, and the research questions that I had been working through.

4.5. Episode 3: What’s In A Position?

In mentioning research-from-creation, I am reminded of how the field recording for episode 3 turned my creative process into a personal reflection of my own listening positionality. As addressed in the podcast, the field recording’s physical framing informed me of the limits of what I recorded. Beyond the spatial filtering, I questioned what my listening intentions would change about my approach to recording. Effectively, this turned my explorative recordings into a

site for critiquing normative listening positionalities in acoustic ecology and soundscape ecology. Framing my recording process in this way, and indeed, in reflecting on my field recording through recording the narration of the podcast, a possibility for my work to challenge soundscape ecology with “ontological questions of what constitutes research” (Chapman & Sawchuk, 2015, p.49) started to emerge.

Episode 3 highlighted this constructive effect of creation-as-research not only because of the meanings I extrapolated from my field recording, but because of narrating what I learned from these recordings. The reflection that occurred through scripting and speaking about the changes in recording and its framing, turned this creative form of explorative research into criticism of my own recording intentions and listening positionality. I did not initially think *INvironments* would take this turn toward a more personal / subjective approach. But I realize now, if I was truly thinking about the entire project according to ecosophical and situated knowledge-based concepts, why not begin with myself? If I am aiming to understand how other listening positionalities and other subjectivities can affect soundscape ecology, why not use my own experience as a starting point to describe how culturally normative listening deploys a certain way of recording?

In talking with Bernie Krause about this subject, I found a commonality in our experiences. Both our cultural listening positionalities were initially informed by Schafer, the distinction between noise and signal purity, and a lack of consideration for the unceded lands we record. Much like my own experience in recording, Krause’s long career of field recording left him with similar considerations on the effect his listening had on his practice:

Lou Raskin: *I was thinking about that. About your work in collaboration with certain indigenous communities, like the Wy’am at Cellilo Falls.*

Bernie Krause: *Yes, the Wy’am tribe and the Nez Perce in North-western US. And the Ba Aka in the Central African Republic.*

LR: *Right.*

BK: *But I got to admit, I was another white colonialist coming in to those environments and doing the work. I got to admit where I was coming from. I was attending those meetings and encounters as a white person who was going to draw material from them and publish it. And that's bullshit [...] but that was the culture I came from and I had to go through that in order to figure out what was happening around me. We just have to change that attitude. We can't be the sociologist who goes into these different groups, like we have done, an extract a whole image of stuff from our perspective and hope we're going to learn anything about the world around us. (Krause, personal interview with the author, Nov. 25, 2020)*

What struck me about the conversation here was how Krause acknowledged that recording is not sufficient to draw ecological knowledge if it is always going to be analyzed and discussed according to the white-dominated academic and scientific discourses. It shifts focus from listening to recordings with “innocent” ecologically-sensitive ears, but with ears that are informed by dominant forms of Western listening.

It supports the ecosophical sentiment of my work to make soundscape ecology a “dispositive of the production of subjectivity” (Guattari, 2000, p.34), ecologically speaking. In reflecting on my recording, I acknowledged how a Schaferian listening is bound to political, social and economic regimes. Jonathan Sterne, as previously mentioned, has already outlined how the idea of “soundscape” is connected to popular discourses of masculine stereo hi-fi culture from post-war North America (2013, p.188). With the question of how listening guides the recording in soundscape ecology, my reflections on my field recording helped me ground my own assembled listening subjectivity. Understanding what else may be out there was the task of episode 4.

4.6. Episode 4: Why Does This Matter?

In tracing how other ways of listening can reorient the survey of ecosystems in soundscape ecology, my intention in the last episode was not only to show how soundscape ecology is connected to wider creative and community practices, but to argue for its relevance as

a whole. Again, the motivation here is drawing from *The Three Ecologies* wherein ecosophy “implies promoting any new practices (slowing down, short cycles, pooling knowledge and creativity, downsizing, new production and consumption paradigms) that allow us to enhance the links to each other and to our environment” (Antonioli, 2018, p.3). My arguing for soundscape ecology as a community activity is not a new idea. Hildegard Westerkamp’s soundwalking excursions served as somewhat of a template in how I considered soundscape recording as a “living connection between listener and place” (Westerkamp, 2006) though the idea has already become more closely associated with soundscape ecology itself. The *Record the Earth* project from Purdue University as well as Leah Barclay’s Sonic Explorers initiative were inspiring examples that I wanted to discuss in my podcast. Especially in the case of the latter, Barclay has developed how sound recording contains a “potential [...] in generating a shift in consciousness in a way that might provoke critical awareness for world issues” (Barclay, 2019, p.29). However, a consideration of what crowd sourcing and widespread community recording activities entail present ethical challenges in terms of data collection, accessibility, and land rights.

Perhaps a deficit of *INvironments* is its optimistic ending. I framed crowd-sourced recording for soundscape ecology as a possible answer to encourage different listening positionalities and field recording methods. All the ecologists I spoke with validated the idea of wide-spread citizen science wherein anyone can go out to natural spaces and parks near them to record soundscapes using whatever devices are accessible to them. Almo Farina published a recent paper arguing for more accessible forms of Zoom-oriented recording for citizen science soundscape ecology (Farina et al., 2014). The idea was that, with Harawayan inclinations, wider ontological perspectives on sound and more recordings can create a rounder average to study the

changes in natural ecosystem sounds. In our interview, Raphael Proulx reminded me of the potential dangers in crunching big crowd-sourced data:

Raphael Proulx: *When you go into what I call “big data”, you shift your focus from estimating the effect of something on something else. Rather you go for having a proper central estimation of what you are after. There’s tons of noise in there, noise in terms of data noise, but then you have so much of it, the average is going to be very good. [...] But when you go into these crowd-sourcing methods, [...] you are more in descriptive than a hypothesis-driven testing.*

Lou Raskin: *That’s an important distinction.*

RP: *Yeah but I think it’s useful.*

(Proulx, personal interview with the author, Sept. 22, 2020)

I argued that crowd-sourced soundscape ecology was a simple way for wider listening positionalities to influence the breadth of the soundscape recording by pushing the definition of “what is a soundscape” further. However, like Proulx makes apparent, this form of data collection changes the study of soundscape ecology from a hypothesis-driven model to a descriptive model. The problem with wide descriptive models like this is that such an array of sound recordings makes up an immense data set for ecologists to unpack and study. While ecologists like Bryan Pijanowski have proposed certain machine learning applications (2019) to analyze and render big data sets of soundscape recordings for efficient analysis, the question then becomes how to store and organize these findings, and additionally, to ask who is listening in this case.

Likewise, I generally posit that all listening positionalities can contribute to widening soundscape ecology’s findings, but what if recording soundscapes is directly antithetical to certain listening positionalities? In his recent book *Hungry Listening*, Dylan Robinson describes how recording functions as an extension of a settler logic to control, preservation and knowledge fixity (2020, p.32). In suggesting that anyone can record and submit to a growing body of

soundscape recordings, am I pushing this settler logic by further normalizing recording and its association to these settler fixations? Bernie Krause made the distinction of expressing how, as a white man, going to record lands that do not belong to him encouraged a colonialist form of research. My concern now is even in providing a space for people of different cultures and listening positionalities to record, am I neglecting to acknowledge the colonialist aspects of recording itself?

In asking these questions, and in finishing the podcast, new questions about the intersections between responding to the climate crisis with creative methods and the ethics of these methods becomes an increasingly important consideration. Through this discussion of the questions that arose out of producing *INvironments*, I realize not only my branching considerations of soundscape ecology, but the limits in own listening positionality and assumptions on recording itself.

5. Closing Thoughts

INvironments is a podcast that considers the connection between listening, recording and forming ecological knowledges through sound. The intention of this podcast was to encourage soundscape ecology to incorporate new creative and explorative methods for recording ecosystems. While new methods and ways of listening would enhance how ecologists may record soundscapes and, as argued by Donna Haraway in “Situated Knowledges”, provide a stronger basis for ecological knowledge, these wider practices may “ignite an awareness and connection to the environment” (Barclay, 2019, p.28) through sound. The podcast became an accessible form of synthesizing discourses from critical soundscape studies and soundscape ecology which centered on my own creative and reflective methods as meeting point for the two. In this process, I used Almo Farina’s notion of sonotope, or a patch of a soundscape within a

larger soundscape, as a way of introducing and providing justification for explorative sound recording practices oriented by a situated listening positionality.

To articulate these ideas in the podcast, I used a variation of interconnected methods. These included a discourse analysis of the term “soundscape” from soundscape ecology and its roots in Schafer’s and the World Soundscape Project’s work, explorative field recording, interviews, the composition of musical motifs, and sound design. While the analytical, narrative, and self-reflexive structure of *INvironments* is inspired by other investigative podcasts such as *Articles of Interest*, *Nice Try! Utopian*, and *Twenty Thousand Hertz*, the space provided by this format allowed me to introduce experimental recording methods into soundscape ecology that may not have otherwise been executable. In this way, the podcast connected questions of the cultural construction of listening to the formation of ecosystem epistemologies through soundscape ecology.

Theoretically, the podcast is also an extension of two major influences on my work: ecosophy and situated knowledges. However, during this podcast’s creation, I see now how relevant a discussion of research-creation is in the context of the latter two terms. In *The Three Ecologies*, Guattari describes ecosophy as a means of thinking about ecological issues that deconstructs the cultural, social, technological and political links that frame how we consider nature. Guattari aims for a “multifaceted movement [...] that will simultaneously analyse and produce [...] collective and individual subjectivity that completely exceeds the limits of individualization, stagnation, identificatory closure” (Guattari, 2000, p.68). My intervention into the ecology sciences is grounded in this philosophical tradition which emphasizes the role of cultural subjectivity as a foundation for guiding how we listen to, approach, and understand nature. Likewise, Donna Haraway’s “Situated Knowledges” outlines a similar need to value

partial and situated experiences in scientific discourses. This means stepping away from the damaging authority of objectivism to form a science, like Guattari describes, built on combinations of subjectivities, positions, and knowledges. To bridge these ideas to soundscape ecology, Chapman and Sawchuk's modes of research-creation, namely research-from-creation in which my field recordings functioned as an "exploration of theoretical, and methodological [...] insights from creative processes" (Chapmans & Sawchuk, 2015, p.49). Working within creation-as-research, I used my position as a podcaster / narrator to reflect on what guided my listening and why. This challenges the methodology altogether by putting into question how my collection of ecological information through field recording, is an extension of a strict settler discourse of listening to the environment.

From this theoretical vantage, I notice a particular weakness in my work. As expressed by the ecologists and argued by my work, I call for wider participation and different listening positionalities to nuance soundscape ecology. However, as Dylan Robinson addresses, the act of recording itself is indicative of the invisible dominance of a white-settler logic. I questioned whether I naively called for more listening positionalities in soundscape ecology, when, as Bernie Krause states in our interview, the field, its discourse, and its methods are already so white-dominated. But as my podcast shows, perhaps more than recording can be invoked when discussing the introduction of additional listening positionalities and methods in soundscape ecology. My explorative, soundwalk-inspired recordings represent one possible approach, but as my discussion with Nik Forrest illustrates, very low frequency recording presents another approach. Similarly, Kathleen Galloway describes how art installations by Anishinaabe artist Rebecca Belmore and Anishinaabe/Métis/German/Syrian artist Julie Nagam respectively depict the connection between identity, landscape and sound in their works. Both these artists use

audio-visual components in their work that “engages nonhuman nature to tell a story about it and *with it*” (Galloway, 2020, p.196) and not for it, as the recording in soundscape ecology currently suggests. Nagram’s installation *Our future is in the land: if we listen to it* represents the ecosystem as “dynamic, alive, and operates on a different time scale and level of intimacy than human history” (p.196) furthering the notion that field recording alone is an inappropriate and settler-propelled methodology that cannot sufficiently represent how Nagram’s Anishinaabe/Métis/German/Syrian listening positionalality attunes to the ecosystem. Therefore, through the fluidity of sonotope concept and the already existing connections between sound art, field recording and ecosystem knowledge, perhaps this is the way for more situated ecosophical knowledges to intervene into soundscape ecology.

While *INvironments* does not aim to define what a soundscape or a listening positionality exactly *is*, its emphasis on manifold meanings is critical. It was important to create in a format that is, as Hannah McGregor holds, “low barrier access” to invite different perspectives and listening positionalities into soundscape ecology. *INvironments* will be released one episode at a time weekly in the summer of 2021. Acknowledging that podcasting emphasizes an able-eared reception, and that listening positionality is perhaps more than just *hearing*, I will make transcriptions of each episode in text available through links in the podcast’s show notes. Though I intended for this work to be listened to, excluding those with limited hearing is not something I want to encourage. My work was to think of ecology not just as network of the natural world, but as a web of perspectives and methods. In linking soundscape ecology to this broader ecosophical approach, my hope is to encourage deeper self-examination as a way of connecting and working with vulnerable ecosystems. Whatever the methodology, venturing toward these crucial goals during the climate crisis begins, at least, with listening.

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