

Beyond the Buzzword: Eco-Improvisatory Music in Theory and Application

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In the words of David Rothenberg:

There is so much more music out there in the natural world than that made by humans alone. If we are to make sense of that music as improvisers, we'll need to find some way to join in.¹

Introduction

This paper highlights the centrality of nature to musical performance by theorising aspects of eco-improvisatory practice that are only superficially understood. The melodies and rhythms of more-than-human species have long manoeuvred their way into human composition as concrete musical ideas, yet questions surround the use of nature within improvisational space. What are the aims, processes, supposed benefits, and onsite disadvantages of eco-improvisatory practice? Is it just an extra musical proposition, or could it derive from music's supposed roots in nature? How can indeterminate music be measured? And if nature is the cutting-edge referent, why do some so-called eco-improvisations take place in abiotic environments?

Ingram's view that "music, amongst all the arts, has a special affinity with ecological ideas"² adds currency to Boyle and Waterman's recent call for the construction of appropriate frameworks and methodologies for an ecology of musical performance.³ Ecomusicology⁴ informs a holistic musicology with ecocriticism. The buzzword "eco"⁵ commands agency across many scholarly disciplines, but for the purposes of this paper it encapsulates the personal ecological language created as an improviser purposefully tunes in to the soundscape of a physical site.

¹ David Rothenberg, May 27, 2011.

² David Ingram, *The Jukebox in the Garden: Ecocriticism and American Popular Music Since 1960* (Amsterdam: Rodopi, 2010), 11.

³ W. Alice Boyle and Ellen Waterman, "The Ecology of Musical Performance: Towards a Robust Methodology," in *Current Directions in Ecomusicology: Music, Culture, Nature*, eds. Aaron S. Allen and Kevin Dawe (New York: Routledge, 2016), 25, 31. Boyle and Waterman note that scientific ecology (the study of the interrelationships among organisms and their physical environment) is distinct from the political movement of environmentalism.

⁴ Ecomusicologists consider musical and sonic issues related to ecology and the natural environment. See Aaron S. Allen, "Ecomusicology," in *The Grove Dictionary of American Music*, ed. Charles Hiroshi Garrett (New York: Oxford University Press, 2014).

⁵ The prefix "eco" derives from the Greek *oikos*, signifying that the world at large is our "house."

This paper contributes to a pedagogy for the eco-improvisatory dynamic in its most idiosyncratic form: that in which human musicians improvise *in* or *out* of "sync" with the acoustic presence of more-than-human life. It is a practice steeped in possibilities such that electronic intervention is enabling these parallel sound worlds to cohere. While acknowledging this paradox, I draw on personal exposure to the practice in Australia and abroad to focus on the music for its own integrity. I posit that ecological resilience and momentum between species must come into play for this random art form to thrive. In this sense, resilience becomes a question of musical response or uptake,⁶ bounced back and forth between the human and the more-than-human. To demonstrate this trope, the paper focuses on live and technologised performances by the American clarinetist and philosopher David Rothenberg.

Summary Framework

Early efforts to connect human and more-than-human soundworlds came from soundscape studies and acoustic ecology. R. Murray Schafer founded the World Soundscape Project in 1971 (since 1993 the World Forum for Acoustic Ecology) as an initiative for managing sonic environments. Other individuals made unique contributions. David Lumsdaine, for instance, captured over 3,000 recordings of outback-Australian soundscapes before the noise of the twenty first century overtook them.⁷ Since birds are a primary metaphor for eco-improvisation (however strange their language is to humans),⁸ there remains speculation that eco-improvisatory practice may be the perpetuation of an ancient musical discourse between man and nature, inspired by avian utterance.⁹

Based on Schafer's observation that the authority accorded to the concert as the nodal point for musical stimulation has withered,¹⁰ new paradigms are required for analysing environmental musical phenomena. To (re)situate the improvising musician in ecological terms, we must veer towards a view that "changes the boundaries between

⁶ Andrew Munro, "Discursive Resilience," *M/C Journal* 16, no. 5 (2013), accessed October 20, 2013, <http://journal.media-culture.org.au/index.php/mcjournal/article/viewArticle/710>.

⁷ Nicola LeFanu, "David Lumsdaine: A Biographical Appreciation," *The Music of David Lumsdaine*, accessed April 9, 2015, <http://www.davidlumsdaine.org.uk/biog.php>.

⁸ Taylor notes that twenty three composers have credited the phrases of the Pied Butcherbird (*Cracticus nigrogularis*) as their source of inspiration—a bird that is believed to have considerably predated the human species in Australia. See Hollis Taylor, "Anecdote and Anthropomorphism: Writing the Australian Pied Butcherbird," *AJE: Australian Journal of Ecocriticism and Cultural Ecology* 1 (2011/2012): 3, 17.

⁹ Steven Feld theorises sound across species to research eco-aesthetic co-evolution (Feld, lecture delivered at the Sir Zelman Cowan School of Music, Monash University, Victoria, May 6, 2015).

¹⁰ R. Murray Schafer, "Music and the Soundscape," in *The Book of Music and Nature: An Anthology of Sounds, Words, Thoughts*, eds. David Rothenberg and Marta Ulvaeus (Middletown, Connecticut: Wesleyan University Press, 2001), 65.

what is music and what is not."¹¹ Bernie Krause expanded human knowledge of natural sound worlds by recording over 15,000 animal species,¹² and Paul Winter introduced audiences to "the great symphony of wildlife" through the beauty of improvised classical, jazz, and indigenous musical traditions.¹³

Introducing David Rothenberg

Building on Winter's foundation, David Rothenberg (b.1962) explores more-than-human sound as an improvising jazz clarinetist whose philosophical descriptions shape the way his recordings are appreciated.¹⁴ Rothenberg purposes to "integrate the musical, the natural, and the improvised."¹⁵ His writings likewise project nature's resilience as a basin of attraction for improvising musicians who desire to have their works

. . . sound as if they live, as breathing, pulsing beings, which . . . at their best achieve a life of their own, sailing beyond their creators and contexts. When could one think that a work might be alive? If it moves and surprises, teaches the listener, player, or composer something new with every change; if it seems to have not only its own intelligence but also an inner ability to move or transform in unexpected ways.¹⁶

"Eco-improvisation" implies an eco-poetically considerate form of engagement with nature, to which end Rothenberg broaches the axes of possibility and impossibility as an "interspecies musician" or "interspecies improviser." The author prefers to conceptualise the process via which Rothenberg and others share music with animal life as *multispecies musicking*, not least because his performances dovetail with Small's

¹¹ David Rothenberg, *Why Birds Sing: A Journey into the Mystery of Bird Song* (New York: Basic Books, 2005), 217.

¹² Bernie Krause, *The Great Animal Orchestra: Finding the Origins of Music in the World's Wild Places* (Little: Brown, 2012).

¹³ Winter released his seminal album *Common Ground* in 1978, using a live wolf during concert tours (*Common Ground*, Paul Winter Consort, A&M Records SP-4698, 1978, 33 $\frac{1}{2}$ rpm. Re-released by A & M Records, CD3344, 1989, compact disc).

¹⁴ I have corresponded intermittently with Rothenberg since the 2003 combined conference of the Australia & New Zealand Musicological Societies. I gratefully acknowledge his generous supply of materials and prompt responses to my queries.

¹⁵ David Rothenberg, *Sudden Music: Improvisation, Sound, Nature* (Athens, Georgia: University of Georgia Press, 2002), 300. Rothenberg's goals resonate with the deep ecology theory of his mentor Arne Næss, namely that human existence is dependent on the diverse organisms within the natural world, each of which plays a role in the natural economy of the biosphere.

¹⁶ David Rothenberg, "Introduction: Does Nature Understand Music?" in *The Book of Music and Nature: An Anthology of Sounds, Words, Thoughts*, eds. David Rothenberg and Marta Ulvaeus (Middletown, Connecticut: Wesleyan University Press, 2001), 5.

notion of "musicking" (music-making).¹⁷ The co-constitutive slant of "multispecies" equally situates humans and more-than-humans as biological species subject to the grand scheme of nature, whereas "interspecies" might be understood as deflating more-than-human subjectivities.¹⁸ Without being overly prescriptive, I will attempt to define and describe some general principles underpinning multispecies musicking.

Multispecies Musicking: Towards a Performance Pedagogy

Live multispecies musicking is mysterious real-time composition, the components of which are sound, environment, and a shared co-presence between species. Arons and May conceptualise human group performance as a live, phenomenological field akin to an ecosystem in its connectedness and interdependence,¹⁹ but we can only go so far in applying the templates of human musicking to the more-than-human domain without becoming anthropomorphic.

Operating within a certain radius, the human musician enters vital physical space (an autonomous open-air arena or underwater zone) to construct a sonic network with the more-than-human. Whether celestial, terrestrial, or marine in setting, and whether evolving by day or by night, this characteristically unstable one-off encounter is non-notatable in a traditional sense on account of its freedom and openness to the value of all sound. Self-generated performances might begin with a sonic ripple from a natural element such as wind or water. Ideally, a bird or animal—as lead musical persona—will vocalise a pre-existent repertoire of calls from its distinct niche, inspiring the human musical shaping of the occasion. The music is thus produced spontaneously as a chance-based leap into the unknown.

¹⁷ Chris Small, "Musicking: A Ritual in Social Space: A Lecture delivered at the University of Melbourne June 6, 1995," MUSE: Musicians United for Superior Education, accessed January 23, 2017, <http://www.musekids.org/musicking.html>.

¹⁸ This is a view shared by Canadian ecomusicologist Andrew Mark (email message to author, April 23, 2015).

¹⁹ Wendy Arons and Theresa J. May, eds, *Readings in Performance and Ecology* (New York: Palgrave Macmillan, 2012). The notion of a musical ecosystem was anticipated by Thoreau (1817–1862). See Jeff Todd Titon, "Why Thoreau?" in *Current Directions in Ecomusicology: Music, Culture, Nature*, eds Aaron S. Allen and Kevin Dawe (New York: Routledge, 2016), 71. Titon addresses Thoreau's prophetic ideas about the "earth-song," echo, experiential hearing, "unpremeditated music," and music as "the sound of the circulation in Nature's veins."

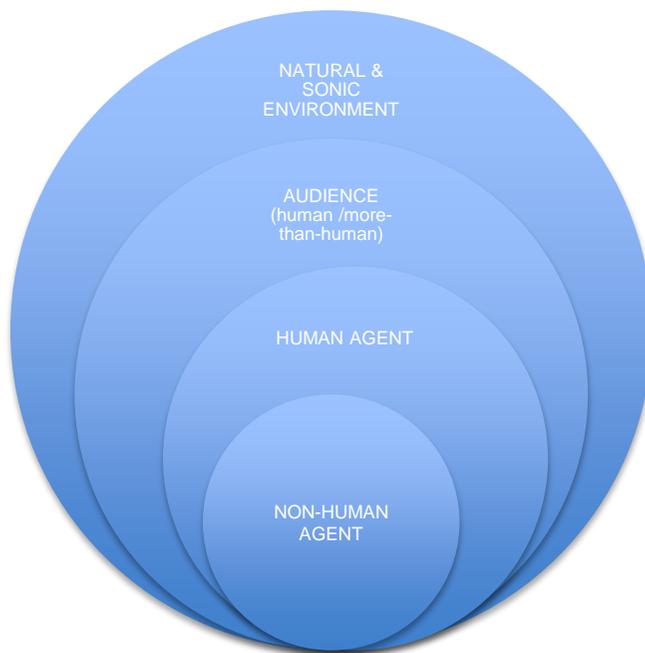


Figure 1. A spatial model for multispecies musicking

Figure 1 represents the shared domain of multispecies musicking as a quasi-theatrical network in which the human is musically energised to take up fragments of a more-than-human musical code. Each site-specific network is situationally defined by its parameters of space, time, and agency. Sound might arrive from a multiplicity of topographical points. If an audience is present the sonic experience will vary according to their location, not least because vegetation characteristics affect acoustics.²⁰ The toughest audience will be nature itself, unimpressed by and unanswerable to human miniscule efforts. All outdoor performance venues are subject to the vagaries of the elements, thus fluctuations in weather potentially minimise the sonic coherence of the exercise.

Multispecies musicking relies on, and develops, intuitive musicianship and, above all, listening acumen. A practised background in improvisation is advantageous, but a virtuosic vocabulary has no place in the scheme: "If you're listening, you will not overpower the place you're in but will make your peace with it," writes Rothenberg.²¹ He usually just introduces himself and any other musicians to the sounds and context of an environment to hear what they do without a studied plan.²² This involves picking up on

²⁰ Boyle and Waterman, "The Ecology of Musical Performance," 30, 32.

²¹ Rothenberg, *Sudden Music* 258 (2001 version).

²² Rothenberg, email message to author, April 14, 2015. Rothenberg has also used open scoring on occasion.

the structure and inflection of the sounds of an unknown musical world. Rothenberg advises: "If you're ready to play, just play a little, try things out, announce your intention. Leave space, mostly space, plenty of silence, for the other species to admit you."²³ While variously fruitful and frustrating, exhilarating and disorientating, multispecies musicking is a valuable crucible for initiating new combinations of sound.

Rothenberg's imagination lies open to the unexpected. He might try call-and-response with a bird in fragmentary conversation, leap across a widely separated interval, or emit *frissons* and other wisps of sound that are unrelated to the storehouse of jazz clichés. Such devices abound in a complex live recording from Lamington National Park, Queensland, entitled "Sheer Frustration, Really."²⁴ Sharing in the performance are George, a wild Albert's Lyrebird (*Menura alberti*); David Rothenberg (clarinet); and four Green Catbirds (*Ailuroedus crassirostris*, a species of bowerbird). George imitates the catbirds *meowing* from the trees as part of his alien soundtrack of calls and shrieks, while Rothenberg imitates George's learned "imitations" in disconnected phrases. As Borgo notes, good improvisers develop action by accepting the actions of others as dramatic "offers" and either return a complimentary offer, or re-voice an existing offer.²⁵

Rothenberg visited Victoria's Healesville Wildlife Sanctuary in June 2004 with flutist Michael Pestel to interact with a Superb Lyrebird (*Menura novaehollandiae*) at the height of the mating season when the male was unlikely to stop singing. The live recording "Trio Menura"²⁶ commemorates their conversation with the lyrebird. During the month, the author arranged for the Ganai-Kurnai Elder and gumleaf player Uncle Herb Patten to improvise with Rothenberg and Pestel in concert.²⁷ Patten understood how humans and lyrebirds could shape each other's sonic presence: a Superb Lyrebird had once tuned in to and mimicked the gumleaf when he had lain still under a mountain

²³ David Rothenberg, "Interspecies Improvisation," draft dated May 27, 2011, 7 (copy supplied to the author). The article was recently published in *The Oxford Handbook of Critical Improvisation Studies*, Vol. 1, eds. George E. Lewis and Benjamin Piekut (Oxford University Press, 2016), available at <http://www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780195370935.001.0001/oxfordhb-9780195370935-e-23>.

²⁴ *Why Birds Sing*, David Rothenberg, Terra Nova Music, TN0501, 2005, compact disc. A description of Lyrebird George and the track's recording in June 2004 is provided in Rothenberg's book *Why Birds Sing*, 211-214; 220-227.

²⁵ David Borgo, "Sync or Swarm: Musical improvisation and the Complex Dynamics of Group Creativity," accessed May 2, 2015, http://www.academia.edu/1337728/Sync_or_Swarm_Musical_improvisation_and_the_complex_dynamics_of_group_creativity.

²⁶ *Why Birds Sing*, compact disc, Track 1.

²⁷ Augustine Centre and Borderland workshop concert, Hawthorn, Victoria, June 6, 2004. Rothenberg mentions Patten's leaf birdcalls in *Why Birds Sing: A Journey into the Mystery of Bird Song*, 222.

bush and blown the Koori Lone Whistle signal.²⁸ Arguably, since lyrebirds imitate any sound around them, it is normal for them to accept human-induced sound.

Evaluating Multispecies Musicking

Rothenberg's practices nevertheless spark thoughtful questions about multispecies musicking. Ingram has interrogated the notion that birds participate with him on an equal basis,²⁹ echoing similar concerns raised by evolutionary biologists represented in the British Broadcasting Corporation documentary *Why Birds Sing* (2007).³⁰ While, in my view, too much human input diminishes the co-constitutive agency of the more-than-human, these radical eco-improvisatory practices provide unique pathways to comprehending the biota through the arts.

To pre-empt human improvisation from being seen as presumptuous or invasive, Rothenberg gives each participant—human and more-than-human—as much room as possible to expand musically. In return, he has learned to respond nimbly to any sounds and changes in direction initiated by the more-than-human.³¹ I asked Rothenberg whether he ever feels like an interloper. He replied that he tries "to make a music that no one species could make alone ... to do something where each animal (including the human) learns from each other, and starts to change the music they do."³² This is demonstrated in an online MP3 recording in which the male humpback whale (*Megaptera novaeangliae*) is able to quickly match new pitched, musical sounds it has never heard before.³³

Sound spectrograms (sonograms) have allowed Rothenberg to analyse his duets with whales in terms of identifying their musical order and meaning in real time. Hoare points out that the obsessions of creative individuals like Rothenberg can reveal inner truths as they attempt to push at the barriers between human history and natural

²⁸ The Koori men of New South Wales and Victoria disclose their identity to one another through this freemason-like signal. Detailed descriptions of Patten's eco-improvisatory practices on the gumleaf may be found in Robin Ryan, "A Spiritual Sound, A Lonely Sound: Leaf Music of Aboriginal Australians, 1890s-1990s" (PhD diss., Monash University, 1999).

²⁹ Ingram, *The Jukebox in the Garden*, 227-229.

³⁰ "Why Birds Sing," YouTube video, 14:55, British Broadcasting Corporation documentary (2007), posted February 20, 2011, https://www.youtube.com/watch?v=f_cqJsdnOrg.

³¹ Based on Rothenberg, *Sudden Music*, 9 (2001 version). [NOTE: page number now included]

³² Rothenberg, email to author, April 13, 2015.

³³ See David Rothenberg, "To Wail With a Whale Anatomy of an Interspecies Duet," *Trans Revista Transcultural de Música* 12 (2008), accessed January 23, 2017, <http://www.sibetrans.com/trans/articulo/97/to-wail-with-a-whale-anatomy-of-an-interspecies-duet>. See also David Rothenberg, *Thousand Mile Song: Whale Music in a Sea of Sound* (New York: Basic Books, 2008).

history.³⁴ In a serendipitous example of how multispecies musicking is ripe for analysis, Rothenberg discovered that the swarm tone of the 17-year periodical cicada *Magicicada septendecim* lies between C and C#.³⁵ More broadly speaking, making music with other species can make nature more valuable and more worthy of our care and attention. Rothenberg contends:

A music greater than the sensibility of one species alone might slightly show us a way to live better with nature and not destroy our planet with rampant human aesthetics, saving the Earth while there is still time.³⁶

Multispecies musicking thus resonates with Eisenberg's *Earth Jazz* metaphor for environmental harmony, namely that men and nature both play and listen to each other, alternate solos, and improvise in the manner of jazz musicians.³⁷ In the "flow-experience" articulated by Csikszentmihalyi, "technique all but disappears,"³⁸ but to achieve "flow" with the incomprehensible sound and language of another species is a near impossible task. The "White-Crested Laugh" is a classic exception.

In this impromptu performance at the National Aviary in Pittsburgh, the musicians were a White-Crested Laughing Thrush, David Rothenberg (clarinet), and Michael Pestel (flute).³⁹ Explaining how he and the caged thrush negotiated their cues around each other's arpeggio "laughs,"⁴⁰ Rothenberg writes:

When music starts to happen *between* humans and birds, you don't have to peel apart the categories of *man-made* and *natural*—the interaction appears and grows before we comprehend it ...it's the sound that counts, the rapport.⁴¹

According to my hearing of the excerpt, musical resilience is maximised by the strong positionality of the thrush (seasoned to singing structured duets in the wild); and two proficient wind players so committed to performing with the thrush that a rare and

³⁴ Philip Hoare, "Whale Music in a Sea of Sound," *The Telegraph* (London), July 25, 2008, accessed January 23, 2017, <http://www.telegraph.co.uk/culture/books/non-fictionreviews/3555453/Whale-music-in-a-sea-of-sound.html>.

³⁵ David Rothenberg, *Bug Music: David Rothenberg's Insect Choir*, Vimeo, accessed January 23, 2017, <https://vimeo.com/68859004>. Working in Virginia in spring 2012, Rothenberg and his son examined the cicada swarm tone, swarm intelligence (SI) and dynamics of collective musical improvisation. The result was the live track "Magicicada Unexpected Road" (*Bug Music*, with David Rothenberg, Robert Jürjendal, Timothy Hill, Umru Rothenberg and Charles Lindsay, Terra Nova TN1309, 2013, compact disc).

³⁶ Rothenberg, "Interspecies Improvisation," 22.

³⁷ Evan Eisenberg, *The Ecology of Eden* (New York: Alfred A. Knopf, 1998).

³⁸ Mihaly Csikszentmihalyi, *Flow: The Psychology of Optimal Experience* (New York: Harper & Row, 1990).

³⁹ *Why Birds Sing*, Track 9, recorded at the National Aviary, Pittsburgh, USA, March 2000, compact disc.

⁴⁰ Rothenberg, *Why Birds Sing*, 7; 214.

⁴¹ *Ibid.*, 10.

mysterious coupling is formed across species. This demonstrates how (where a bird's learned behaviour relates naturally to human learned behaviour, in an extended pattern of interaction) evocative juxtapositions emerge, as melody and rhythm pass from one milieu to another. In this instance, a velvety-timbred clarinet and silvery-toned flute complement the thrush's full, limpid expression.⁴²

Eco-Improvisation and Electronic Mediation

It is advantageous for these epiphanies of sound to be recorded, even though none can faithfully reproduce live eco-improvisatory events. Recordings furnish open-ended possibilities for the entry of a third creative force: an electronic environment.⁴³ Digital formats hold the key to integrating the evanescent and patchy musical practice of multispecies musicking as its sounds are stretched and looped in retrospective technological shaping of the original creative rendering.

In stretching the conventional boundaries of musical combination, digital formats thus create original musical streams—albeit imagined musical futures. Drawing on relevant electro-acoustic examples by Rothenberg and others, the remainder of this paper briefly illustrates how a new, expanded improvising dynamic might lie open to artistic, narrative, and/or activist interpretations.

In "Beezus, Beeten, Breep,"⁴⁴ for example, Rothenberg improvises on clarinet to samples of bird and insect sounds. He integrates these using a live percussionist and live electronic treatments that unashamedly modify the essence of the more-than-human contribution. Rothenberg explains:

Sometimes I have used purely electronic sounds that seem to *outbug* the real work of bugs, so close to the oscillators and filters of electronic music are the mechanisms of our ancient little friends. You won't always be able to tell what is entomological and what is technological. That matters not. As Aristotle taught us, technology finishes what nature has begun.⁴⁵

Rothenberg recently played bass clarinet and clarinet along with live nightingales (*Luscinia megarhynchos*) in the parks of Berlin. His colleague Korhan Erel sampled the birds live with an iPad, then worked in the studio using a laptop with various controllers.

⁴² For a sonogram analysis of a duet between clarinet and White-Crested Laughing Thrush, see David Rothenberg, "Interspecies Improvisation."

⁴³ Electro-acoustic compositions deliver ecological messages when electro-mechanical sounds impact the perception of natural acoustic events.

⁴⁴ *Why Birds Sing*, Track 3, recorded live at Tampere College of Art, Finland, October 2003, compact disc.

⁴⁵ Rothenberg, liner notes for *Bug Music*, compact disc.

The album *Berlin Bülbül*⁴⁶ features live human/nightingale encounters and clarinet items mixed with "electronic mysteries" influenced by the musical mind of the nightingale.⁴⁷ For example, "The Night the War Ends" is a live "duet" recorded at midnight in Treptower Park. Rothenberg repeats a nightingale's chirp and contributes bluesy runs, the whole item developing against an electronic background with live sampling including audible traffic sounds and sirens.

The English flautist Stephen Preston has researched birdsong for new improvisatory models (duetting, chorusing, aggression, defining territory, and courtship) to engage acoustic and electro-acoustic performers in "ecosonics," as he coins it. In Preston's view, these models "offer a way of approaching the affective relationship between many living creatures and their sonic and social environments."⁴⁸

The Canadian duo ~spin~ created *Birding—An Eco-Improvisational Performance* for amplified flutes (Ellen Waterman) and a computer (James Harley). Harley spatialised Waterman's flute sound (an icon of birds) around eight speakers.⁴⁹ The duo expresses a concern for the environments evoked by their recorded sounds in a programme note:

What begins as a delicate pastoral soundscape quickly evolves into a darkly chaotic sonic environment that points to the fragility of the wetlands and primary forest where Harley recorded the birds.

For Waterman,

... the most beautiful thing about the piece is the way that both the piccolo and the bird samples become so distorted, metallic, and otherworldly sounding ... it points to the mindfulness or presence of co-creation in improvised music where musicians are responding both to the sounds they are making and to the acoustics of the environment in which they are making it.⁵⁰

Australian composer Robert Burrell has harnessed electro-acoustics, live performance, and Malaysian avian motifs to manipulate what he describes as

⁴⁶ *Berlin Bülbül*, David Rothenberg and Korhan Erel, Terra Nova Music TN1511 and Gruen 159, 2015, compact disc. A film and book (University of Chicago Press) are to follow. *Bülbül* means "nightingale" in Turkish.

⁴⁷ Excerpts may be heard at: David Rothenberg, "My Big Night Out Playing With the Nightingales of Berlin," Pacific Standard, <http://www.psmag.com/books-and-culture/jamming-with-the-nightingales-of-berlin>; and "Berlin Bülbül, David Rothenberg and Korhan Erel live with birds," YouTube video, 2:50, posted March 20, 2015, <https://www.youtube.com/watch?v=72PKRimqL3c>.

⁴⁸ "Stephen Preston Ecosonics," accessed May 1, 2015, <http://www.stephenpreston-ecosonics.com/ecosonics.html>. The forms and structures for the improvisations are founded on research into bioacoustic communication, particularly birdsong and non-verbal human interactions.

⁴⁹ ~spin~ work at the University of Guelph, Ontario in an advanced digital audio production and performance studio. The Canadian Music Centre distributes ~spin~'s DVD in 5.1 surround sound.

⁵⁰ Ellen Waterman, email message to author, March 29, 2015. The author was privileged to witness a performance of the work in New Orleans in 2012.

"interspecies-consciousness-transfer,"⁵¹ while Gabriel Rimoldi di Lima of Brazil—in a piece simply entitled *Eco-Improvisation*—constructs an augmented instrument using increased transverse flute plus extra devices (sensors) which he calls "the metaflauta." The objective, in the composer's words, is "to extend the original sound-expressive possibilities of the instrument through electronic resources capable of exploring the expressive gestures of the performer as musical potential."⁵² Musical improvisation is thus used as an "exploratory resource metaflauta," understood also from an ecological bias in which performers and technological interfaces act as subsystems of the acoustical environment.⁵³

What, then, is an ecologically progressive musical improvisation? A provisional answer might be: the extent to which an improvisation sustains ecology by allowing the *genius* of the site to resonate, or to "speak from inside the soundscape," as Westerkamp would put it.⁵⁴ Eco-improvisation can lead us to appreciate the larger acoustic entity and the dramatically different natural sounds of ecosystems in which the healthier the habitat, the more "musical" the polyphony of the creatures that occupy them.⁵⁵

Conclusion

As a preliminary contribution to the pedagogy of multispecies musicking, this paper focused on the critical presence of wildlife in the work of David Rothenberg, whose performances, recordings and books provide a clear ontological definition and syntax: birds, insects and whales model a seamless expression of ecosystem in open stage for the human development of wide listening practice, intuitive musicianship, sensitivity to soundscape, and extended instrumental techniques.

It is in improvisatory musical performance that relationships between humans and their environments most cogently enrich ecology. Eco-improvisers harness nature's

⁵¹ Robert Burrell, "Becoming, Interspecies-consciousness-transfer, Live Performance with Electro-acoustics and Music Composition," paper presented at Ecomusicologies 2013: Ecosystems and Ecocriticism, Queensland Conservatorium, Griffith University, Brisbane, November 22-23, 2013.

⁵² Gabriel Rimoldi di Lima, *Eco-Improvisation: An Approach to Technological Mediation in Context of Musical Digital Interfaces* (PhD. diss. in progress, Universidade Estadual de Campinas, SP, Brazil), accessed April 30, 2015, <http://www.bv.fapesp.br/en/bolsas/155081/eco-improvisation-an-approach-to-technological-mediation-in-context-of-musical-digital-interfaces/>. Each system sound generation associated with MDI is modelled as Intelligent Agent, with the decisions taken by each guided by its history of interaction, and by environment.

⁵³ *Ibid.*

⁵⁴ Hildegard Westerkamp, "Speaking from Inside the Soundscape," in *The Book of Music and Nature: An Anthology of Sounds, Words, Thoughts*, eds. David Rothenberg and Marta Ulvaeus (Middletown, Connecticut: Wesleyan University Press, 2001), 143–152.

⁵⁵ Titon, "Why Thoreau?," 78.

resilience on location. They might record natural sounds for use in concert improvisations or re-invigorate recordings from natural environments in real-time electronic environments. Futuristically, the salience of technology may lie in its capacity to augment musical portrayals of healthy and degraded ecosystems.

Valid philosophical questions have dogged multispecies musicking, deflecting attention away from the music's own worth as an ecological product of human and more-than-human interaction. While the eco-improvisatory practices described above remain fertile for practice-led musical analysis and documentation, they nevertheless beg broader contextual and scientific analyses if they are to progress comprehensive understanding of musical interaction with more-than-human life.

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