

One “wow factor” experience for soundwalkers may include a “Listening Station” consisting of multiple headphones enabling participants to simply hear what’s around them through a high- quality stereo microphone set up to just slightly above the ambient level of the location.



Tune Your Ear to Singing Insects

ADRIAN WOOD 2019 / MIDWEST SOCIETY FOR ACOUSTIC ECOLOGY



**NEGIN
ALMASSI**



**ERIC
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Music and poetry are fundamental to who we are as human beings. The sounds around us can be inviting and comforting, or they can be distracting and at worst damaging.

Think about a time when the sounds around you have been distressing or harmful—perhaps a neighbor whose raucous party kept you from sleeping, or the painful sound of feedback from a microphone. How easy is it to think about a time when your soundscape has been calming or restorative? Sometimes it can be hard to pinpoint a specific instance, until there is a change from the soundtrack: birds suddenly go quiet, a blackout silences the hum of kitchen appliances, or a siren sets off your dogs. Those changes provide us with information, but so do the hums we think of as background noise.

The Singing Insects Monitoring Program invites listeners to tune in to the songs of summer and fall insects. In the process, listeners learn something about themselves and the insect musicians around them. It is an innovative partnership between Chicago Park District’s Night Out in the Parks program, the Midwest Society for Acoustic Ecology, the Forest Preserves of Cook County, Dr. Carl Strang, author of *Singing Insects of the Chicago Region*, visual artist Leslie DeCoursey, and iSWOOP (Interpreters and Scientists Working on our Parks).



**KATHLEEN
SOLER**



**LESLIE
DECOURSEY**

What is Listening?

“A soundwalk is,” according to Vancouver-based composer and ecologist Hildegard Westerkamp, “any excursion whose main purpose is listening to the environment. It is exposing our ears to every sound around us no matter where we are.” As such, a soundwalk is ideally suited for directly experiencing our soundscape. It is a non-invasive method for exploring, interpreting, and learning what is happening, in real time, in any environment.

In a typical soundwalk, we begin with calming breaths to welcome stillness from within. Like tuning an instrument, deep breathing allows us to better hear, listen, and decipher. Canadian composer, author, music educator, and creator of Acoustic Ecology R. Murray Schafer (1933–2021) devised many simple “Ear Cleaning” exercises for direct engagement in the reciprocal process of soundmaking and listening. These exercises provide effective ways to remove barriers and re-sensitize one’s capacity for attending to the acoustic environment in a positive way (see sidebar).

Summer and fall soundwalks are distinctively marked by the buzzing, clicking, and chirping of singing insects. When we avoid speaking while listening, we can truly attend to everything we hear.

Who Are Singing Insects?

The term “singing insect” refers to insects that produce songs within the range of human hearing. In North America they consist of crickets, katydids, and grasshoppers (Order Orthoptera) and cicadas (Order Homoptera). For the most part, males sing and females follow the song to find their mates. You have probably heard cicadas singing on warm summer days. Male cicadas have a membrane on the side of their body that they vibrate like a drumhead, and they can be really loud. The citrus cicada, found in the southwestern U.S., would violate OSHA standards if you had to listen to its song for an hour: it’s louder than a jackhammer.

Crickets and katydids, meanwhile,

Leading a Soundwalk

Doing a soundwalk is the best way to understand what listening is and its importance. Reading about it helps, but only with active participation can its full meaning be felt.

Having a group gathered for a soundwalk, with everyone attentively listening, refraining from talking unless the group’s leader signals it, is an ideal way to change our focus, slow down, and allow our listening in and with the world around us. This active participation belies the notion that listening is a passive act. It may make for a poor photo op, but that auditory scene in the minds of us each gains a sensory uplift as a result. Assembling a group requires clear, simple instructions, a certain level of prior experience helps, calmly delivered, and genuine trust in the group especially when “blind listening” in unknown or unfamiliar environments. For this to happen everyone must be sure they are safe. It is the responsibility of the group’s leader to assure this by asking participants if they have questions or concerns. Also, everyone hears differently. Some may have varying degrees of hearing loss, and impairments in mobility and visual abilities should be understood.

We start by closing our eyes, taking a deep breath, and slowly exhaling. Opening our ears, listening to sounds, listening to all sounds, we may begin by locating the most distant and draw an imaginary to the sound that is closest to us. We may notice that some sound sources are moving while others come from stationary points. They may be above, behind, to our sides, or below. We may press our fingers to close our pinnae to hear our breath and blood flow in our own head. Then we can cup our hands behind our ears to extend them outward and focus to the directions, location, and intensity of the sounds that are around. We may be surprised by how much sound and how many sources of sound are active all around us, but also by the degree to we don’t notice them. With this awareness we may begin to reconsider, and even regain some of the sensory capacity that, for those us in urban environments, we have lost.

We acknowledge the land we are on is the ancestral homeland of indigenous peoples who continue to have a relationship with this land today. (Here in the Chicago region, that is the Council of Three Fires: the Potawatomi, Ojibwe, and Ottawa tribes.) We are now ready to welcome the diversity of sounds around us, and allow it to connect us to people and place.

See R. Murray Schafer, A Sound Education: 101 Exercises In Sound-making and Listening



make their sounds in a different way. Males have a file structure on one wing, and a scraper to pull across it on the other. In crickets, this results in a musical chirping sound. Katydid, meanwhile, produce a less musical, buzzing sound.

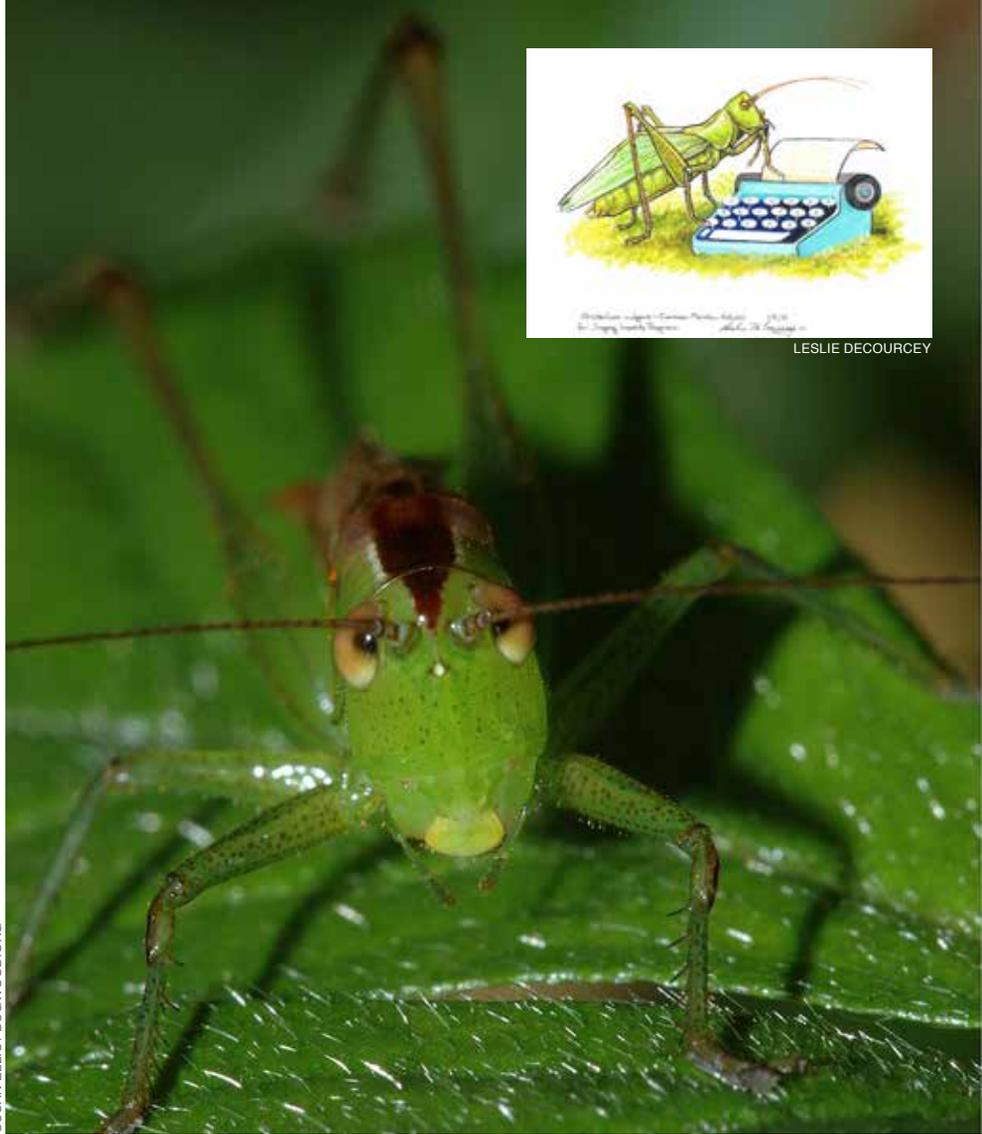
Three subfamilies of grasshoppers also sing. Band-winged grasshoppers rattle their wings while flying. Other singing grasshoppers perch, rubbing structures on their legs against the wings. A diversity of methods of singing all results in one thing if successful: finding mates.

Why Are Singing Insects Important?

Singing insects are crucial parts of the food web. They convert plant energy into available protein, fat, and vitamins. Take a look at coyote scats at the end of summer and you may see nothing but Orthopteran legs. Birds, mammals, and reptiles feast on the 17-year cicadas when they emerge en masse, but also enjoy nutrition from the annual cicadas who sing every summer. Students observing bluebird nest boxes during nesting season have found that one out of every four insects the parents bring their chicks is a cricket, katydid, or grasshopper. The carotenoid pigments in these insect bodies translate into the rich rusty color on male bluebird breasts. They pack a strong antioxidant punch too.

You can hear singing insects in a wide variety of habitats, from wetlands to woodlands to prairies and deserts. Over geologic time, insects have diversified and specialized in these varied habitats. As such, some species are important indicators of habitat quality. One example is the dusky faced meadow katydid, who can only be heard singing in high-quality wetlands with a diversity of native wetland grasses. Invasive plants such as purple loosestrife, common reed, and hybrid cattails are destroying their habitat.

Soil type and quality make a difference for those insects that associate with terrestrial habitats.



SUSAN ELLIS / BUGWOOD.ORG



LESLIE DECOURCEY

The common meadow katydid's song sounds like he is angrily typing on his old-school typewriter.

Cicadas spend most of their life cycle in the soil, as nymphs feeding on sap from tree roots. Ground and field crickets deposit their eggs in soil, and nymphs of spring field crickets overwinter in the soil or under leaves. If our footsteps or construction vehicles compact the soil, it is harder for singing insects to survive. Each successive generation of insects that we hear singing can indicate the health—or lack thereof—of these soils.

How to Find Insects Singing?

Insect musicians perform at almost any time throughout summer and fall, provided it is warm enough. Some species sing only during daylight, while others prefer the dark blanket of night. Field crickets

sing from the ground, hidden under leaves or vegetation. Meadow katydids prefer to perch among the vegetation, perfectly camouflaged with their greens and yellows.

Many insects sing from the canopy, forming an invisible orchestra. The common true katydid with his harsh “ka-ty-did, ka-ty didn’t” is but one example. The many kinds of cicadas we hear each year, from Linne’s to Dog-Day, are another group most often heard from trees.

This summer, tune in to the buzzy sprinkler-type sounds coming from prairie grasses. Can you spot the meadow katydid? If you have trouble, recruit some children to help. They have a special talent for finding these impossible-to-find musicians.

How We Have Engaged Community

As interpreters, musicians, and scientists, we have found that soundscapes are a gateway into the natural world that is all around us.

The journey of tuning in to our acoustic environments starts with soundwalks, often scheduled to begin at dusk. Cicada songs subside and allow sensitive ears to pick out the soft buzzes and clicks of meadow katydids. This gives way to a crescendo. Predators of singing insects lose their vision and nocturnal insects join the symphony. The high-energy rattle of a rattler round-winged katydid is an amusing addition. A diversity of tree crickets thankfully provides more melodious chirps and trills. As darkness sets in, the common true katydid calls out his name with a raspy interruption. Soon, many more true katydids join in, drowning out all the other musicians with their enveloping chorus.

Anyone listening to insect songs can contribute to scientific understanding of these insects' ecology and the health of the lands that they depend on. The goal of the Singing Insects Monitoring Program is to create a sound map for insect populations in the Chicago Wilderness Region, which spans southeastern Wisconsin through northeast Illinois and northwest Indiana up to Berrien County, Michigan. Monitors collect sound data, make field recordings, and share information about species heard in the research area.

Listeners who are interested in becoming monitors attend a workshop to learn a dozen commonly heard songs throughout the region. You may be surprised to learn that you already recognize songs of some singing insects. The cicada whose loud song is akin to an ambulance siren is the aptly-named scissor-grinder cicada.

We have found that visual learners enjoy our use of sonoglyphs to remember patterns of songs. (Yes, we invented that word.) These drawings by artist and naturalist

Singing Insect Exercise

Here is an exercise you can do in a singing insect interpretive program. The purpose of this simple game is to introduce the idea of picking out one small sound among many others, and it is meant to be accessible for adults and young children alike. You will need a playing area with trees, tall grass, or objects to hide behind, and objects that can be used to make sound. A small handheld tape recorder or device that can make sound recordings will enhance the experience but isn't necessary.

To play, let each person in the group find an object in the area that can be used to make sound (e.g., two sticks or rocks, or you may provide percussion instruments). Let them know that they are going to be their own species of cricket and that they should use their objects to make a sound that represents them as a unique species. They will also need to find a place to hide. They need to make their sound whenever possible, as this will allow them to find a mate, but they also need to trust their instincts and be quiet and move out of sight of potential predators. Crickets must wait five to 10 seconds after being startled to begin singing again.

Identify one person who would like to become a community scientist and capture a recording of one species against the wall of sound. Since the rest of the people in the group are crickets, they should go quiet when they hear or see the monitor walking their way, which is of course what happens in real life. The scientist should stand far away from the group of singing insects, and then try to pick out one voice. They can slowly approach the sound to either make an audio recording or listen long enough to be able to mimic the sound of interest.

After the first round of recording (each round should be no more than five minutes so that a few people can have a turn) have the scientist play back or describe the sounds they heard. Crickets who were making those sounds can identify themselves if they were making that noise, and/or repeat that sound back to the group.

For larger groups, you could modify this to be a partner-finding game. For smaller or very large groups, you might instead play a complex orchestral sound recording and ask them to follow one instrument or voice through the piece. You might also make the game easier for young children by giving one of the crickets a bell or something easily identifiable for them to search for.

Some questions to discuss after playing might be:

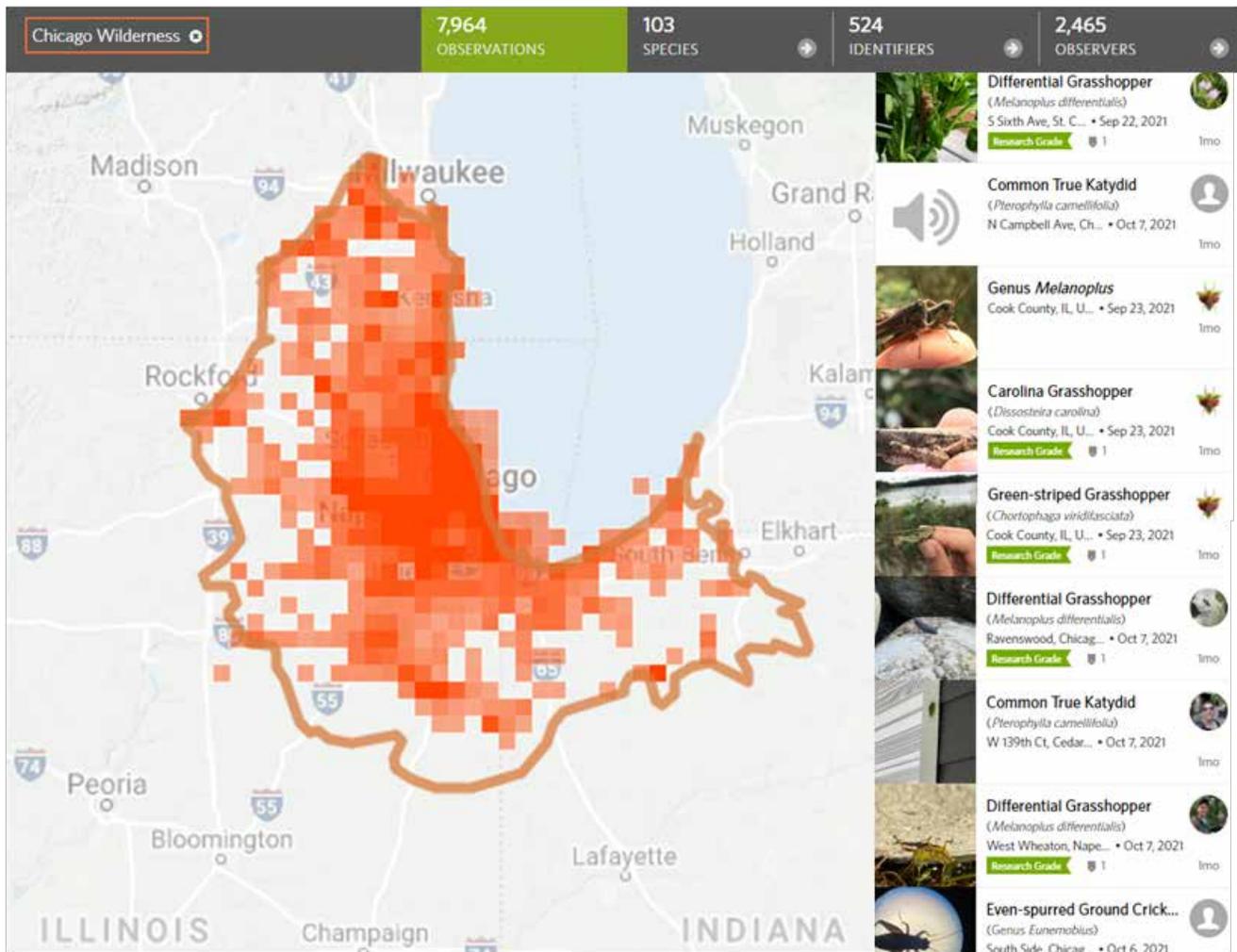
- How far away were you able to get a clear recording?
- What makes it easier or harder to approach a singing insect?
- What made the sound you chose to capture appealing to you?
- What helped you remember it?

For more teaching ideas and tools, contact singinginsects@gmail.com.

LESLIE DECOURCEY



To some, the Allard's ground cricket male sounds like a ray gun.



Leslie DeCourcy render the insects realistically, while posing them in a memorable way. For example, the Allard's Ground Cricket is a continuous triller whose song is reminiscent of an intergalactic ray gun from a B-movie. Listen to the song and then revisit this image: Is that how you think of it? Or is there a different image that you can use to help you remember the Allard's Ground Cricket?

Once listeners are ready to monitor, they select a site and commit to visiting it throughout the singing season of July–October to record the different insects they hear. Smart phones have made recording easy, but enthusiastic participants can also invest in recording equipment and software for high-quality recordings. Monitors submit their songs via iNaturalist.org.

The Singing Insect Monitoring Program is an iNaturalist project that allows anyone using the app to submit recordings and photos of singing insects in the Chicago Wilderness study region.

Challenges

Learning songs can be challenging, but also fun. The goal isn't to learn the songs of all 120-plus singing insects in our region, but to tune our ears to our soundscapes. Eventually we train our ears to pick out songs of individual insects (and frogs and birds). Monitors record different songs, find new singers (species), or notice the loss of others. Practice tuning your ears to singing insects with the sidebar activity.

Monitoring singing insects using the human ear limits involvement to those with hearing. This excludes members of the deaf community. At the same time, it invites people with visual impairments or blindness to

participate in community science and contribute to conservation.

For those of you who take hearing for granted, you may be surprised to learn that singing insects bring us face-to-face with our aging bodies. As we age, we lose high-frequency hearing and with it, the ability to hear those insects whose songs fall in that range. That can be frustrating, but it provides an opportunity to involve children with hearing in your soundwalks. Show them the superpower of their high-frequency reception.

Conclusion

The Singing Insects Monitoring Program collaboration is a work in progress. Soundwalks in local forest preserves, parks, and neighborhoods are engaging musicians, nature center visitors, and interested community members in new ways. Submissions to iNaturalist have enabled researchers to find new county records and establish species lists for their counties. We are exploring new partnerships to engage people with visual impairments in listening and community science. If you are interested in starting a program in your area, we are happy to listen. And help.

Resources & Further Listening

Singing Insects Monitoring Program, singinginsects.net

Nature Inquiries Blog by Dr. Carl Strang. natureinquiries.wordpress.com.

Midwest Society for Acoustic Ecology. mwsae.org

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