

Cedar Waxwings?—I Can't Hear Them

Digital Bird Song Hearing Aids

Laura Erickson • Duluth, Minnesota • chickadee@lauraerickson.com

In this installment of *Tools of the Trade*, we welcome Laura Erickson, a recipient of the ABA's prestigious Roger Tory Peterson Award for "a lifetime of achievements in promoting the cause of birding." When I heard that Laura was considering hearing aids, she was the ideal guest columnist to share her first-hand experiences.

—Diana Doyle

Vision is so important to birders that, in addition to the eyeglasses or contacts many of us wear, we magnify birds through binoculars or scopes. Our vision deteriorates with age, as does our hearing, yet vision aids don't have the stigma of hearing aids. In addition, high-quality digital hearing aids are much more expensive than eyeglasses, or even premium binoculars, making us reluctant to purchase them. And the first signs of hearing loss can be so subtle, and progress so gradually, that it's easy to ignore or deny, even to ourselves, that our hearing is deteriorating.

In 2013, I chatted with an octogenarian birder while we waited for a stake-out bird. When I complained about losing some of my high-frequency hearing, he boasted that he hadn't lost any of his hearing yet, despite being 20 years older than I. It was a quiet afternoon, and suddenly a nearby Common Yellowthroat started singing. I called it out and he responded with, "Where? Where?" He couldn't hear it at all. Of course, I smugly reassured myself

that my own hearing loss couldn't be that bad. But at 63, I've been noticing the loss of high-frequency sounds for a few years. One day, while mixing sounds for a radio segment about Cedar Waxwings, I realized I could not hear part of a Lang Elliott recording that I've used dozens of times over the years. Even with the volume up, I couldn't hear a note.

Digital Hearing Aids

That's when I made an appointment with an audiologist. My test results confirmed severe hearing loss at high frequencies. At mid-ranges, the loss was minimal to moderate. Hearing aids are so expensive most people wait until they have trouble hearing family members or the TV. But I wanted to hear *birds*, so she fitted me for a pair of premium digital hearing aids. There are several excellent brands. My audiologist recommended Phonak Audéo V-90, at a cost of about \$6,000 for a pair, of which \$2,500 would be covered by our medical insurance.

I'm not self-conscious about wearing hearing aids, but if I were, these would be ideal. The tiny part hidden inside the ear



Can you still hear the high lisp notes of the **Cedar Waxwing**?

If not, then it may be time to consider digital hearing aids devices, now nearly invisible when worn. Shown here is author Laura Erickson. *Right: Photo by © Russell Erickson. Left: Photo by © Marie Read.*



is connected via a clear plastic wire to a part that rides behind the ear. That outer piece is matched to hair color and is virtually invisible on me. For people who are bald or wear their hair differently, it might be more conspicuous. I studied the hearing aids of people in the audiologist's waiting room, and they were surprisingly inconspicuous.

My hearing aids have a toggle switch between the default setting and a personalized program. Phonak hasn't created a birding or nature setting, but I asked my audiologist to program mine to augment sounds above 6,000 Hz. Another option is to go to xeno-canto.org, select a couple of high-pitched familiar species that you can no longer hear, print the spectrograms (denoted by "Sono" on the website), and bring them to your audiologist to help with the programming customization.

The hearing aids arrived just in time for spring migration. When I put them in and turned them on in her office, nothing seemed much different. In the same way that eyeglasses make our vision clearer, but don't magnify objects, digital hearing aids make sounds clearer, not simply or even noticeably louder.

But when I wore the aids out into my backyard—*Whoa!* They instantly brought back the memory of when I was in third grade and put on my first pair of eyeglasses. I'd spent eight years never realizing I was missing anything until I put on glasses. My hearing aids made sounds clearer and more detailed in the same way that eyeglasses do for sights. Just as, without my glasses, the leaves of a distant tree blend together and I can't make out the texture of the bark, sounds had been blending into one another. Now, instead of amorphous background noise with a few identifiable sounds, I could pick out individual birds again. That had gone away so gradually I hadn't noticed.

I'd never lost singing robins, but suddenly robins sounded much more brilliant and beautiful. I had lost some of their high-frequency overtones without noticing. In recent years, I've only been able to hear the robin nesting in my yard or a neighboring one, and sometimes the one in the nearest adjoining territory. With hearing aids, I could pick out five different singing individuals—my circle of effective hearing widening to where it was when we first moved here when I was 29.

Although the aids don't appreciably boost volume, there is some element of amplification. The hearing in one of my ears



The SongFinder is a pocket-sized device (about 3" x 1" x 5" and 10 ounces) specifically designed for birders who suffer from high-frequency hearing loss. Shown here is Lang Elliott, who invented the SongFinder. Photo courtesy of © Lang Elliott.

has always been more sensitive than the other. My hearing aids, each programmed for its own ear, balance the sound so locating birds is easier now than when I was in my twenties.

With both the default programming and the personalized program, my hearing aids recognize and suppress noisy background sounds even as they clarify other sounds. This makes the sounds I want to hear clearer, such as when I'm birding on a windy day or while driving.

The SongFinder

There is one excellent alternative to standard digital hearing aids. The SongFinder is a digital hearing aid designed specifically for birding (hearbirdsagain.com). Rather than making

sounds clearer, it lowers the frequency of only the high-pitched sounds, leaving lower sounds alone.

Lang Elliott, who suffered severe hearing loss after an accident when he was eight, couldn't hear frequencies above about 3,000 Hz. Because of damage to his inner ear, not even the best hearing aids could help with these sounds. In college, he made a tape recording in what sounded like a quiet area, brought the tape to a studio and played it back at slow speed, lowering the frequencies. That's how he discovered how many sounds he'd been missing. If he could find a device that shifted the frequencies of high-pitched sounds in the field, he could finally hear birds, frogs, and insects that he'd never been able to hear.

In 1977, he found a pitch-shifting device built for the music industry. Elliott contacted the inventor, who built a battery-operated system just for him. It was huge and heavy, and the technology of the time made some bird sounds hard to recognize, but it was better than nothing.

By the 1990s, digital technology made a more portable system feasible. Elliott connected with Herb Susmann, an electrical engineer fresh out of Cornell University, and the two of them designed "The SongFinder—A Digital Bird Song Hearing Device." It consists of an electronic module that modifies sounds and headphones with miniature microphones. The two microphones send the sounds into the device and the shifted sounds go into the headphones. Because the microphones are right at the ears, the differences in sound in each match what we hear, so we can locate the singers as we do naturally. Over the years, Elliott and Susmann have made various improvements, and

in 2008 made the device pocket-sized. The system costs \$750 plus postage and handling.

I was reluctant to consider this option because, by lowering the frequency, SongFinder changes how birds sound. As much as I wanted to notice every Cedar Waxwing and Brown Creeper, I didn't want to lose their familiar high-pitched lisping tones.

I first tried the SongFinder in one of my favorite birding spots in northern Wisconsin, where high-frequency warblers and kinglets abound. I got out of my car without my hearing aids and listened to ravens, robins, and a Hairy Woodpecker.

When I added my hearing aids, nearby Nashville, Blackburnian, Black-and-white, and Black-throated Green Warblers came into sharp relief. I couldn't imagine that the SongFinder could do a better job than that. But when I turned it on and put on the headphones, the number of birds I heard tripled. I could hear high-pitched singers from a much greater distance, and could pick up some nearby birds that my \$6,000 hearing aids missed.

The device has three "divide-by" settings: 1/2, 1/3, and 1/4. The 1/2 setting lowers frequency by half, enabling most listeners to hear a majority of bird songs that occur in the 3,000–6,000 Hz range. That is the only setting I need, at least at this point, to bring even the highest-pitched Cedar Waxwings and Blackburnian Warblers down to my hearing range.

Another regulates the frequency at which SongFinder becomes responsive to high-pitched songs. Sounds at lower frequencies than the setting are not changed at all. These choices are 2,500 Hz, 3,500 Hz, and 4,500 Hz (corresponding to the Low, Medium, and High settings on the unit). I set mine at 4,500 Hz because my mid-range hearing is fine. Crows sound normal, many warblers sound entirely different, and robins sound normal with the slight addition of some low tones—the high overtones I'd lost.

Headphones are obviously designed to place the earpieces against the ears. But I could easily hear the sounds coming out of them when I wore them around my neck, the earpieces about five inches below my ears.

I'm still thrilled at how much better things sound with my Phonak hearing aids. The SongFinder is entirely different: It picks up bird sound from a much greater distance and detects a higher number of nearby birds. It wasn't nearly as hard to figure out and adjust to the changed sounds as I'd expected.

Two Experiments

Those are my subjective impressions of the two devices. But I also wanted objective evidence about how well my technologically-enhanced old ears stack up against young ears. So I conducted two experiments.

First, I spent a June morning in the Sax-Zim Bog with my friend Erik Bruhnke, a 29-year-old professional bird guide. When we spotted a Savannah Sparrow on a wire 60 meters away (measured using a Nikon rangefinder), Erik could easily hear it but I needed my hearing aids. With the SongFinder, I could detect five or so quick notes at the start of the song that I couldn't pick up with the hearing aids.

Erik easily heard a Black-and-white Warbler at 88 meters. I could not hear it with my hearing aids. With the SongFinder it was easy.

With my hearing aids, I could hear a Golden-crowned Kinglet at five meters, but not at 20 meters. It was easy to hear with the SongFinder. Indeed, Erik could hear both the real bird and the lowered sound from my headphones when I was standing two meters from him.

For my next experiment, I enlisted Erik and another 29-year-old, my

Continued on page 66



	29-yr-old (mean)	63-yr-old without aids	63-yr-old with Phonak aids	63-yr-old with Phonak + SongFinder	63-yr-old with Phonak + SoundFinder around neck
Le Conte's Sparrow	104 m	2.5 m	19 m	96 m	86 m
Golden-crowned Kinglet	113 m	2.5 m	19 m	150 m	135 m
Rose-breasted Grosbeak	120 m	127 m	232 m	132 m	204 m

Left: The buzzy song of the **Le Conte's Sparrow** is at a very high frequency, between 6,000–11,000 Hz. This song would be one of the first species to drop off your hearing range. *Photo by © Laura Erickson.*

Center: The **Golden-crowned Kinglet** sings with warbling pure notes, ranging between 3,000 and 10,000 Hz. As we lose some high-frequency hearing, we can't pick up some of the notes and the song starts to sound distorted. Half of all songbirds sing above 3,000 Hz. *Photo by © Laura Erickson.*

Right: The song of the **Rose-breasted Grosbeak** is mostly at mid-frequencies, between 2,000 and 3,000 Hz, so its songs are less susceptible to age-related hearing loss. *Photo by © Marie Read.*

Continued from page 64

son Tom Erickson, who does bird census work.

Erik and Tom weren't available at the same time, but on different relatively windless afternoons (the time of day when a minimum of real birds would be singing), I played three different bird recordings from The Sibley eGuide to Birds App on my iPhone 5, the volume set at maximum, first when the subject was really close, and then as he moved further and further away to the point where he lost each sound. I chose two high-pitched songs: one buzzy (Le Conte's Sparrow) and one with purr tones (Golden-crowned Kinglet), and a lower-pitched song for comparison (Rose-breasted Grosbeak). I used the rangefinder to measure the farthest distance they could hear each song.

Then my husband conducted the experiment on me, first without any hearing aids, then with my Phonak hearing aids, and then with hearing aids and the SongFinder, worn both normally and around my neck.

First the unexpected but heartening discovery: for the mid-frequency Rose-breasted Grosbeak song, my hearing without hearing aids is still comparable to that of young birders, and my hearing aids extend my hearing significantly farther than theirs! The SongFinder, which didn't alter that song at all, actually reduced the distance at which I could hear it, apparently because the headphones blocked my ears. That problem was reduced if I lowered the headphones to around my neck; doing that, I could still pick up high-frequency sounds, though not at quite as great a distance.

Now the bad news: My ability to hear Le Conte's Sparrows and Golden-crowned Kinglets without hearing aids was worse than I expected. My hearing aids extended the distance I could hear them by an order of magnitude, but that's not saying much, especially compared to the distance the young birders could

hear them. The SongFinder made a huge difference, making my high-frequency hearing reach comparable to theirs.

Why didn't the hearing aids do a better job with those high sounds? As we get older, the cochlear membrane of our inner ear gets stiffer and less responsive to the tiniest high-frequency sound waves. Eventually, even with the best hearing aids, we can't hear those sounds at all.

Two Different Tools

So what's the final answer? That varies, depending on your wallet, the severity of your hearing loss, and how you weigh detecting birds vs. enjoying their sounds at natural frequencies. Even though my hearing aids are making a huge and satisfying difference, they'll never be able to bring back some birds I once easily heard. And as wonderful for birding as the SongFinder is, it alters the sound quality of bird songs by lowering the pitch.

I've been forced to accept that I'll never hear birds in the field the way I did when I was young. But I'm not going to let the perfect be the enemy of the good. My hearing aids are giving me a lot of beautiful listening pleasure. The SongFinder is helping me find birds I'd not otherwise detect. And those are both very good things.


Note: For more Laura Erickson content in Birding magazine, please see "A Birding Interview with Laura Erickson," November 2011 issue, pp. 14-16 (tinyurl.com/Laura-Birding).

Erratum

In the August 2015 installment of "Tools of the Trade," the photo on p. 61 was incorrectly labeled as a Grasshopper Sparrow. It is a Le Conte's Sparrow.




**Caligo
Ventures**
NATURE TOURS
AND TRAVEL




Asa Wright Nature Centre
Trinidad & Tobago

Guided Tours and Independent Birding Ventures
*Discover Forty Species Before Breakfast
from our famed Verandah*

Birding Destinations Worldwide www.caligo.com



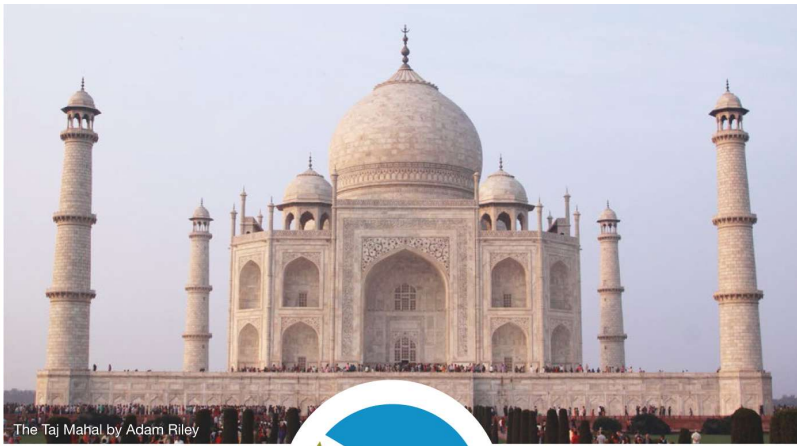



Trinidad & Tobago: Ten-day Classic Two-Island Tour / Week-long Independent Birding Ventures - Basic or Birder's Intensive / Leisurely Lodge Stays 3-10 days
New! Book a 1-3 Day extension for endemic Trinidad Piping Guan! Or, pair your visit with St. Vincent, Jamaica, or Guyana...
www.caligo.com info@caligo.com (800) 426-7781

HURRY!
Few Spots Remain



Bengal Tiger by Adam Riley



The Taj Mahal by Adam Riley



Crested Serpent Eagle by Adam Riley



Painted Spurfowl by Adam Riley



American Birding[®]
ASSOCIATION



White-throated Kingfisher by Adam Riley

ABA INDIA SAFARI - TAJ, TIGERS & BIRDING

The American Birding Association, in partnership with Rockjumper Birding Tours, welcomes you to their India – Taj, Tigers & Birding Safari.

Where:

New Delhi, Bharatpur & Ranthambhore

Tour Date:

8 - 18 Feb 2016

Tour Price:

US\$3,850 per person sharing

Home to over a billion people in arguably the world's richest cultural landscape, India is a country with no equal. This great nation boasts a staggering geographical diversity ranging from deserts and forests to tropical, palm-lined shores and snow-capped peaks. India is of course also famous for its rich avifauna and iconic mammalian megafauna, foremost of which is the regal Bengal Tiger. Starting and ending in the capital **New Delhi**, our 11-day safari explores two of the most famous birding and wildlife national parks in the northern parts of this amazing country; the royal wildfowl sanctuary of **Keoladeo National Park** at **Bharatpur** and the fabled **Ranthambhore National Park**, the tiger reserve widely considered to be one of the best places to see this most magnificent of the world's big cats. We will also ensure that we have time to marvel at the incredible **Taj Mahal** and other breathtaking historic buildings in and around **Agra**. We invite you to join us in this unforgettable celebration of India's incredible birds, iconic mammals, dramatic scenery, rich history and kaleidoscope of cultures! An exciting selection of port tour safaris throughout the Indian subcontinent are also available.

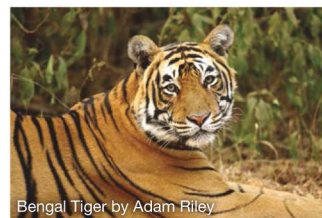
Attendance is limited so don't miss out on this unique offer, register your interest today by contacting the ABA. Phone: **(800) 850-2473** or **(302) 838-3660** • Email: garmistead@aba.org • Website: www.events.aba.org



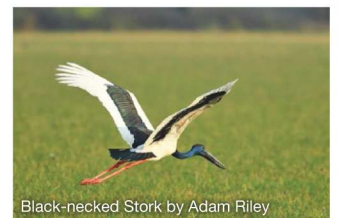
A family of Nilgai by Adam Riley



Plum-headed Parakeets by Adam Riley



Bengal Tiger by Adam Riley



Black-necked Stork by Adam Riley



ROCKJUMPER
Worldwide Birding Adventures



American Birding[®]
ASSOCIATION