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OPINION

The Sound of a Damaged Habitat



George Butler

By BERNIE KRAUSE
Published: July 28, 2012

Glen Ellen, Calif.

Multimedia

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Click on each audio clip to read the author's description of the habitat.

- Forest, Lincoln Meadow
0:23 [Morning, June 21, 1988](#)
- 0:23 [Morning, June 21, 1989](#)

- Rain Forest, Costa Rica
0:15 [Morning, April 11, 1989](#)
- 0:15 [Morning, May 18, 1996](#)

Coral Reef, Fiji

YEARS ago, when selective logging was first introduced, a community near an old-growth forest in the Sierra Nevada was assured that the removal of a few trees here and there would have no impact on the area's wildlife. Based on the logging company's guarantees, the local residents agreed to the operation. I was skeptical, however, and requested permission to [record the sounds of the habitat](#) before and after the logging.

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When I returned a year later, nothing appeared to have changed at first glance. No stumps or debris — just conifers and lush understory. But to the ear — and to the recorder — the difference was shocking. I've returned 15 times since then, and even years later, the density and diversity of voices are still lost. There is a muted hush, broken only by the sound of an occasional sparrow, raptor, raven or sapsucker. The numinous richness of the original biophony is gone.

Lesson: While a picture may be worth a thousand words, a soundscape is worth a thousand pictures.

A soundscape contains [three basic sources](#): the geophony, which includes all nonbiological natural sounds like wind or ocean waves; the biophony, which embraces the biological, wild, nonhuman sounds that emanate from environments; and the anthrophony — man-made sounds, commonly referred to as noise.

Soundscapes reveal many stories about the world's habitats, illuminating the vital signs of life at one end of the spectrum and the effects of human noise at the other. In fit habitats, the biophony shows cohesion between all of its acoustic sources. In other words, the mating and territorial calls essential to each species' survival don't get masked or drowned out by competing sounds. Insects, reptiles, amphibians, birds and mammals establish their own "bandwidth niches," which can be expressed as frequency (from the lowest to the highest sounds) and temporally (as when one creature vocalizes, followed by another, like exchanges between the chestnut-winged babbler and the Malaysian eared nightjar calling for mates in Borneo).

Graphic displays called [spectrograms](#) are used to illustrate the organization of those sounds, with each creature's voice showing a distinctive place in the chorus — an arrangement so precise that it often resembles a musical score. To the trained ear, those expressions are experienced much like instruments in an orchestra.

What happens when this orchestra is disrupted by the anthrophony: chain saws, leaf blowers or highway traffic? If an indiscriminate sound like a loud motorcycle competes with the stridulation of an insect, the croak of a frog or the song of a bird, the affected animal may no longer be able to send its signal to mates or competitors. The voices of creatures in the choir may be drowned out. And mates and competitors will no longer be able to hear them. The integrity of the biophony is compromised.

(Some of those effects you can't hear. A 2001 [study of elk and wolves](#) in national parks found that snowmobile noise raised the levels of stress hormones in their feces and that the levels returned to normal concentrations when the intrusive din was absent.)

Anything that destroys habitat — mining, pollution, deforestation and global warming — disrupts the biosphere. Mining reminds me of Aldo Leopold's sage warning that if you're going to tinker with nature, you'd better keep all the parts. In Northern California, where my wife and I live, spring occurs — according to my records — nearly two weeks earlier than it did 20 years ago. As the climate has warmed, we hear fewer Pacific tree frogs croaking in late winter and fewer birds in spring — likely because of shifts in food sources.

On June 21, 1988, I recorded a rich dawn chorus in California's pristine Lincoln Meadow. It was a biome replete with the voices of Lincoln's sparrows, MacGillivray's warblers, Williamson's sapsuckers, pileated woodpeckers, golden-crowned kinglets, robins and grosbeaks, as well as squirrels, spring peepers and numerous insects. I captured them all.

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Too little research has been done in the field of biophonics, and my personal recordings are neither comprehensive nor the results of controlled experiments. But the differences between healthy and damaged soundscapes are clear to anyone who pays attention.

If you listen to a damaged soundscape — an expression of infirmity or extinction — the sense of desolation extends far beyond mere silence. The community has been altered, and organisms have been destroyed, lost their habitat or been left to re-establish their places in the spectrum. As a result, some voices are gone entirely, while others aggressively compete to establish a new place in the increasingly disjointed chorus. In the damaged forests of Washington State and California in the summer, I have heard white-crowned sparrows learning new syntax, adjusting their voices to accommodate for the acoustic shifts in the biophony.

Still, it is from the intact creature choruses that the story of our relationship to the natural world is revealed. We dismiss the loss of those narratives at our peril. Listen. The ear never lies.

The poet Robert Hass cautioned in his poem “After Goethe”: “The birds are silent in the woods./Just wait: Soon enough/You will be quiet too.”

Bernie Krause is a musician, naturalist and the author of “The Great Animal Orchestra.”

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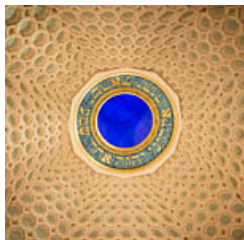


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