
BACK BAY · READERS' PICK

Reading Group Guide

The
G R E A T A N I M A L
O R C H E S T R A

FINDING THE ORIGINS OF MUSIC
IN THE WORLD'S WILD PLACES

by

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Bernie Krause shares his favorite places to listen and record

Because I live in the western United States, with spaces typically wide and open, most of the great recording spots I know are west of the Rockies and extend from the Mexican border to the Beaufort Sea. I've also recorded extensively in Africa, Central America, the Amazon, and across the Pacific to as far as Indonesia. Below I'll share some of the highlighted spots around the world that I found particularly intriguing and fairly accessible.

It is hard to name one's favorite place among such diversity, but most of us have at least one or two locations that excite or welcome us more than any other. For me, that place is Alaska because it contains *everything*—from rain forests to boreal forests to tundra, and some of the most exciting marine life on the planet. There are fewer than 750,000 human inhabitants in the whole state, which tends to make several large areas especially good places to record. Part of the discovery of wild soundscapes is learning what places are special to you. It could be the biophony in your own backyard.

Through the adventure of sound recording, you become more intimate with that place and more aware of how intricate and beautiful it is. In this section, we'll explore a few bioregions and the special opportunities they present for capturing wild sounds.

Deserts

The desert is a wonderful spot to learn to listen if you can get far enough away from roads, and from the water pumps of farms and ranches, the “grasshoppers” pumping for oil, the roar of recreational vehicles, and the sounds of domesticated animals.

A great deal of creature sound in each unique desert environment depends on each area's altitude, climate, and available food and water. Nevertheless, there are many vocal insects, birds, mammals, and even reptiles to be found in what some consider the most desolate of places.

A few sites within the transition zone of the **Sonoran and Chihuahuan Deserts** in New Mexico are some of the rare places in the Lower 48 that can remain completely noise-free for extended periods of time. The region is in the throes of recovery from several hundred years of overgrazing—a place where older bioacoustic paradigms might not apply. Within an area of five square miles, this bioregion contains many different mini-biomes, each characterized by distinctive biophonic zones. The areas with aspen, juniper and oak, mesquite, cactus, manzanita, alder, hackberry, shrub, Indian rice- and saw grasses, broom, sage, arrowweed, and ocotillo each contain their own mix of vocal creatures. The desert is populated with a wealth of species, including special mixes of cactus and rock wrens; common and Chihuahuan ravens; western meadowlarks; house, Brewer's, and sage sparrows; chipping sparrows; green-tailed towhees; blue grosbeaks; longspurs; loggerhead shrike; vermilion and ash-throated flycatchers; horned larks;

western kingbirds; common poorwills; burrowing and great horned owls; ground doves; aplomado falcons; red-tailed hawks; scaled quails; katydids; crickets; coyotes; gray foxes; mountain lions; jackrabbits; squirrels; bats; mice; beetles; ants; termites; grasshoppers; Mormon crickets; toads and frogs of many types; geckos; tortoises; and snakes. Each species has a singularly expressive voice, and the zones in which each lives are alive with enchanting creature choruses.

Depending on the amount of annual rainfall, California's **Mojave** can be full of nice recording and listening sites, and is another great desert to explore. Some good places to start on a sound safari are campsites located at Granite Pass, on Kelbaker Road off Interstate 40 between Barstow and Needles, California. The campsites are situated to the west as you come to the top of the pass from the south. From there, you will find accessible trails into the Granite Mountains, in which there are lots of birds, wild burros, and ringtail cats to see, listen to, and record.

Five and a half miles to the north on Kelbaker Road is the beginning of the Kelso Dunes, famous for their singing. If you decide to record dunes, bear in mind that the dune surfaces tend to be windy and sandy; mics do not tolerate sand well, and they won't handle the bluster unless their patterns are omnidirectional. You can lessen the effect of wind in your microphone by introducing a filter into the line, a feature that is included in many modern digital recorders. You can accomplish this by filtering out the low frequency below 100 Hz.

In California's high desert, the stunning **Mono Lake**, at nearly 6,400 feet, is set in the rain shadow of the Sierra Nevada Mountains, just to the east of Yosemite National Park. It is an eerily placid lake with magical tufa towers and is a wonderful but sometimes windy habitat to record, especially in mid- to late afternoons. Since

1984, I've recorded spadefoot toads not far from the hot springs at the north side of the lake. In the mid-'90s, the number of toads considerably diminished until the Forest Service, along with volunteers from the Mono Lake Committee, rebuilt parts of the fragile habitat by replanting native grasses and allowing more water flow so that the toads and other wildlife could coexist throughout their respective cycles, replenishing their threatened populations. Professional recordists need to get a permit to record there now, although no permit is needed if your purpose is noncommercial.

About ten hours east of San Francisco on Interstate 80 (a couple of miles due south of Wells, Nevada) and three hours west of Salt Lake City are the **Ruby Mountains**, another great high mountain desert location. Get there early in the spring before other campers, hikers, and recreational vehicles arrive. There are two accessible sites to begin exploring. On the western side, a mile to the southwest of Lamoille, take Forest Service Road 660 (Lamoille Canyon Scenic Byway) toward the Ruby Crest National Recreation Trail to find lots of campsites that provide excellent places to listen, observe, and record. Nearby, there's a ridgeline hiking trail that offers spectacular views, good recording (when the wind is light), and not too many people.

The eastern side of the mountain is also a fine place to record. To reach this area, take Highway 93 south to 229 west. When 229 dead-ends, head south on the dirt road. Take any of the accessible Forest Service roads (you'll definitely need four-wheel drive or a good pair of legs, or both), and go west up the hill to find a campsite. For those who like to hike and wish to find great spring and early-summer locations to record, there are many trails and terrific bird, mammal, and insect sites at this location.

There are, of course, deserts in many parts of the world, and because of climate change they are expanding rapidly. If you

have the money and the inclination to travel, try the Skeleton Coast in Namibia, the Kalahari (which covers parts of South Africa, Botswana, and Namibia), Australia, the Sahara, the Sinai, and the coastal Peruvian desert.

Rain Forests

North Americans commonly think of rain forests as being steamy, hot, and primarily tropical, but rain-forest biophonies express themselves as far south as the edge of Rio de Janeiro and stretch along the Northern California, Oregon, Washington, and British Columbia coasts, reaching as far north as Anchorage, Alaska. Rain forests may be “dry” (about ninety inches of rain each year) or wet, with hundreds of inches of rain, but even the dry ones tend to be pretty wet.

Just north of Rio de Janeiro, in an area called the **Rio Doce**, or the **Caratinga** region, is a dry tropical rain forest also called **Mata Atlântica**.

Known for its large howler monkeys (*Alouatta fusca*); its beautiful, tiny golden lion tamarins (*Leontopithecus rosalia*); and the many birds and insects that inhabit it, this dry rain forest is the last existing site of what once stretched about 1,500 miles from south of Amazonia down to Rio de Janeiro. Now reduced to about eighteen square miles, this biological island has been designated as a research site. However, the boundaries of the forest are constantly besieged by those living just outside its borders, who harvest the once-abundant hardwood for fuel and poach wild plants and animals with impunity.

The biophonies heard here are rich with birdsong from the pauraque, great kiskadee, rufous-bellied thrush, white-crested guan, common potoo, yellow-throated spinetail, tropical screech owl, spectacled owl, pygmy owl, black-bellied tree duck, slaty

antshrike, and Amazonian antpitta, and the sounds of dramatic parrot flyovers. A wide variety of frogs and several different species of ants also vocalize in this rain forest. As is the case with many research sites, the biologists who built the place established one-hundred-meter grids within the forest that are marked by paths that lead one from location to location. However, the bio-*phonic* territories do not follow the rational human structures we try to impose on the natural world. Instead, the territories are more amoeba-shaped—sometimes as small as a hundred square meters—and can expand, contract, and change shape according to times of day and night, seasons, and weather.

Upriver from **Port Douglas**, in the northeast corner of Australia, is a terrific riverine rain-forest habitat replete with vocal birds, crocs, ants, reptiles, and amphibians, and also crustaceans (including the best snapping shrimp sounds we have ever recorded). This habitat, like all others in Australia, is under siege, growing smaller and smaller with each passing year, and is in danger of vast alteration or total depletion within a very short period of time. It is already difficult to get far enough away from motorized river vessels, no matter how far you walk back into the forest, and it is rare that the human-induced noises cease for more than a few minutes.

Indonesia offers a wide variety of rain-forest habitats, from wet to dry. The enhanced sonic world that you can discover in places like Sumatra or Borneo will bring you deep into the rain forest both physically and emotionally. Gibbons, siamangs, orangutans, leaf monkeys, moustached babbler, white-rumped shama, rhinoceros hornbills, Argus pheasants, insects, and frogs appear to be much more present when amplified through microphones as opposed to listening with the unassisted ear.

While visiting Sumatra, you might even spot a rare clouded leopard as it stalks its way through the dense vegetation. In

observing the leopard's finely distinguished rosette patterns and catlike features, nothing stands out more than watching its smallish ears catch every nuance of movement and sound. Every twig, each slight puff of air, even the sound of your blinking eyes, will catch its attention.

In the San Juan River floodplain of the **Osa Peninsula** in Costa Rica, there is a mangrove swamp with about a six-foot tidal change. Set up your mics alongside the road in the evening as the tide begins to recede. You'll hear bats, mosquitoes, a glorious mix of insects, tinamous, various types of tree-frog action, and some owls, but you'll also hear popping and dripping sounds coming from the tendrils of the mangrove vegetation. Shining a light on the popping and dripping sounds, you will discover their source: families of crabs letting go of the tendrils and falling several feet into the outgoing tidewater and mud below to keep their bodies moist.

Mountains

Mountain habitats pose special problems of their own. Where there is wildlife, there are usually streams or wind, both of which produce interfering noise. Where there are roads, there's usually a considerable amount of deforestation, which means fewer creatures. If those hurdles can be avoided, dirt bikers, distant chain saws, faraway domestic animals, and snowmobilers will nevertheless threaten the pristine silence. Even still, I love the mountains, and I just won't give up the chance of discovering great places to listen. The Nature Sounds Society, based in Northern California, offers excellent introductory nature sound field programs and workshops during the year. Each June, around the time of the solstice, they usually offer a field workshop located at the San Francisco State University research site near Yuba Pass, just north of Truckee in the Sierra Nevada Mountains—John

Muir territory. One of the better and more accessible introductory programs offered in the world of natural sound, this annual weekend event takes beginning listeners and recordists to the coniferous forests of Yuba Pass, down to a watershed in Sierra Valley, and to other nearby locations where dawn and evening choruses are auditioned and recorded as different types of soundscapes. Once at the station, tent sites, hearty food, and a wide range of well-versed mentors and naturalists will help make things easy and informative for you—as of this writing, all for a bit under three hundred dollars for three days and two nights, with food included. You need to get yourself there.

If you want an exciting recording experience, head out to **Yellowstone National Park** between mid-September and early October to hear the elk bugle. The northeastern end of the Lamar Valley tends to be more lightly traveled and therefore generates a bit less noise than other areas of the park. From the Pebble Creek campsite, hike away from the stream to the northwest and away from the main trail until you come to a series of open meadows. Hide yourself in the tree line upwind from where you hear some bugling and hope that the elk won't catch your scent (a bit like hoping the sun won't rise in the east). Since the elk often pass through that area, you may be lucky enough to experience bugling up close and personal. However, it takes patience, and you might need several days to capture just the right sound. Dawn is best because of the reverberation, but they bugle at dusk and other times of day as well.

The introduction of the wolves has raised the elk levels of alertness even higher than they were in the past, so the elk are easily spooked. Remain very still and quiet. Along the edge habitats of the meadows, you can also record the fall voices of ravens, grouse, a merlin, geese, downy woodpeckers, larks, juncos, house

sparrows, cedar waxwings, and kingbirds. Yellowstone is a thousand miles from our home, but I'd make the trip once a week if I had the money for gas.

On your way to or from Yellowstone, stop in the **Tetons** to check for elk. As you enter the road to the park at Moose, Wyoming, heading north out of Jackson, follow your map to White Grass Meadows and hear the bugling at dusk. The Tetons comprise the only national park with a full-service jet-sanctioned airport located right in the middle of the valley and within the boundaries of the park, which ensures *lots* of noise. When a 737 or private jet takes off, it is heard ten miles away. White Grass Meadows also comes with some stream noise. So, while this is not a great place to record, it is a terrific place to listen to and observe the elk.

Also in the vicinity of the Tetons, there is a dirt road labeled Forest Service Road 30310 heading to the east off Highway 191, about eighteen miles north of Moose Junction. To hear a spring-time symphony from late May to early July, follow this road around to the north (stay to the left where the roads fork) and east about five miles, and you'll come to a watershed with marshes, a small pond, and some edge habitat that has everything you could dream of—a wealth of frogs, birds, insects, and mammals that is located in the noise shadow of most of the Jackson Hole valley. A couple of years ago, we think we recorded the thought-to-be-extinct Wyoming toad. Over a period of several days, we heard few aircraft and very light auto traffic on the dirt road leading to the site. You can record both freshwater marine and terrestrial habitats there and discover some terrific wildlife soundscapes, including elk. In addition, a newly released pack of wolves is reported to be in the vicinity, and you might be able to hear and record them.

Questions and topics for discussion

1. How do you define music? Do animals make music? If so, why? If not, why not?
2. What does the music that humans make tell us about our connection to the natural world?
3. Why have animals that live in particular habitats learned to produce sound in order to stay out of one another's vocal territory?
4. With the collective animal sound in each habitat partitioned so that each voice stays out of another's frequency or time niche, how might this separation inspire the creation of a musical ensemble?
5. What animals, or group of animals, would be the best music teachers? Why?
6. What is the value of technology in shaping modern environmental philosophy? How does it enable new bonds—or further detach us from the natural world?

7. How is a “connection to wildness” essential to our humanity? How is this expressed in the modern age or within urban life through soundscapes?
8. Krause argues that without access to natural soundscapes, our culture suffers a loss. Is there any indication of this loss within your own life? Have you ever considered this possibility?
9. How has reading *The Great Animal Orchestra* changed the way you think about music, the natural world, the creature world, noise, and/or the soundscape?
10. At the end of *The Great Animal Orchestra*, Krause offers recommendations for improved awareness and support of natural soundscapes. Which, if any, do you intend to adopt in your own life?
11. Krause often expresses the ideas of the ecologist Paul Shepard: “The more detached we become from the natural soundscape, the more pathological we become as a culture.” What is meant by this, and why is this message so important to Krause’s writing?
12. What part of Krause’s bioacoustic adventure would you most have liked to experience for yourself and why?