

## BOUNDARY THINKING TRANSFORMED

MIKE WALTON, GUEST EDITOR

# Rethinking Boundaries in a Half-Earth World

*Tony Hiss***We are all in this together.**

Not such a simple statement when it comes to saving the species of the earth. “We” is getting redefined, and so is “this.” Questions that long ago seemed answered for all time or too self-evident even to think about now are being reopened. Who is included when you say “we”? What do you mean by “this”?

Answers to these questions will change the nature of a huge push just ahead for humanity, keeping life alive—or saving enough of nature so it can continue to support life. The “enough” seems to be that, no matter what else happens, up to half of the earth’s land and water must remain permanently available as living space for other species. The goal is not to exclude people or banish people’s activities, but create a series of shared spaces where people will tread lightly.



**How much nature has been saved so far?** As the United States rapidly industrialized after the Civil War with massive alterations to the continent, the idea of conservation—that some places were so special they should never be replaced—also became a force shaping the landscape, with a lot to contend with.

“American Progress,” a once-admired painting by John Gast, showed development as inevitable, irresistible, a grand awakening, the only game in town. It dates to 1872. “Columbia,” then the female personification of the nation and the counterpart to Uncle Sam, floats serenely and confidently across the land like a Thanksgiving parade balloon. She’s of course heading west. She’s young and white and golden-haired and has clearly never done without, gone hungry, or been homeless. In her right hand she holds a schoolbook, and in the crook of her arm is a coil of telegraph wire playing out behind her like a baited fishing line. In her wake come railroads, a stagecoach delivering mail, and settlers, all men and also all white. Ahead there’s an overwhelmed Native American family, a stampeding herd of bison, and a snarling bear, all retreating into darkness.

In this vision, subtraction is what makes addition possible. Before the newcomers arrive, every scrap and feature of the countryside must be reconfigured and scraped clear. Except for a small pile of buffalo bones, all traces of former inhabitants,



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human and wildlife, are utterly erased. Conservation is not even an afterthought. There are no restrictions on what will happen next and no sense that anything can go wrong. Even memories will be foreshortened since they can't stretch back to "before." There is only "from now on."

Yet in that very same year, 1872, Yellowstone, an area about three times the size of Rhode Island, was set aside as the world's first national park, and as a result there are now more than 6,000 national parks in almost 100 countries, and over 260,000 other protected places globally. Since then, over the course of a century and a half, about 17% of the world's land and 8% of its oceans have been protected, at least officially, for the use of other species. The figures for the United States are 13% of lands and inland waters and 19% of marine and coastal areas, a monumental achievement considering Columbia's path of annihilation.



Thomas Moran, "Grand Canyon of the Yellowstone" (1872) [WIKIMEDIA COMMONS](#)



MIKE WESTON / [WIKIMEDIA COMMONS](#)

Except that now a million species of plants and animals are at imminent risk of extinction because of what people have been doing to the unprotected parts of the land, air, and water, particularly since World War II, decades during which human numbers have more than tripled. A new word has popped up into the language—"ending," meaning the very last of its kind, such as Lonesome George, *Solitario Jorge*, the last Pinta Island giant tortoise in the Galápagos, who was nearly five feet long and died at the age of 101.

This is the biodiversity crisis, the diminishing abundance of life, also called the extinctions emergency, an urgency that keeps getting overshadowed by the climate crisis, which in turn gets overshadowed by every other world crisis, week after week, one after another. Staving off the biodiversity crisis is indispensable, an earthly imperative. It's the profusion of species as arranged and organized in networks of ecosystems that keep essential life processes up and running, like having enough food to eat today and oxygen to breathe this second.

And species are irreplaceable, at least on any terms or timescales related to human existence. Giant tortoises, for instance, are believed to have inhabited the Galápagos Islands for at least two million years, an equivalent to about 80,000 human generations. But since modern human beings didn't appear until perhaps 300,000 years ago, our species can only claim to have been in any position to say what happens on earth for maybe 12,000 generations.

It's doable—the job of keeping life alive instead of trying to dream it up all over again from scratch. It's something this and the next generation of people can address even in the midst of other troubles. The solution, distilled from a wealth of studies by an extraordinary range of people—conservation biologists, ecologists, land managers, bio-geographers, etc., etc.—is to fast-track conservation now, while there's still so much left to conserve. A rule of thumb from E.O. Wilson, biodiversity's foremost champion: the current amount of conserved land only guarantees long-term survival for about a quarter of species. But bump that conservation figure up to 50%, and a surprise dividend kicks in—85 to 90% of species will survive. Not everything, but almost.

*It's doable—the job of keeping life alive instead of trying to dream it up all over again from scratch. The solution is to fast-track conservation now.*

In conversation with Wilson, I coined the phrase Half Earth for this approach. Wilson later set up the Half-Earth Project, which focuses on places most in need of protection, and celebrates Half-Earth Day each October 22, half a year after Earth Day. Other groups, such as Nature Needs Half, share their priorities: *Retain* the largest landscapes that remain wild and welcoming to other species; *restore* areas that were once wilder; *reconnect* places that will induce animals and plants to stick around. These are the 3 R's of Half Earthers.

A recent *Science* magazine study by 19 researchers on three continents, “The minimum land area requiring conservation attention to safeguard biodiversity,” puts the number at 44%. The authors point out, though, this may well be an undercount, since their estimate is based solely on the needs of animals. To include plants and fungi and other domains of life, they acknowledge, “would likely increase the area identified.” The *Science* writers have meticulously calculated just how much natural land is likely to be lost to human use by mid-century, under two different development scenarios. Either way, an extraordinary amount of land is in play.

The world could embark on a low-carbon, low-growth strategy like one from 2016 that an international group of climate scientists and economists called “Shared Socioeconomic Pathway 1” or “SSP1 Sustainability—Taking the Green Road.” Despite its name and intentions, it still would lead to a total loss of wild lands bigger than Greece by 2030 (53,000 square miles) before swelling to a loss around the size of Poland by 2050 (124,000 square miles).

Development could instead follow a path like “SSP3 Regional Rivalry—A Rocky Road,” characterized as “a pessimistic scenario where land-use change is poorly regulated.” Under that projection, which is much closer to what's actually happening across the globe, the planet would suffer the

loss of wild lands bigger than Peru by 2030 (502,000 square miles) and then somersault to a loss larger than all of Greenland, meaning the land plus the ice sheet, by 2050 (850,000 square miles).

For the *Science* writers, “the seven-fold difference between the amount of habitat converted under SSP1 and SSP3 shows there is a large window of opportunity for humanity to avert the biodiversity crisis.” In other words, let’s breathe easier in the knowledge that only the first-fold would be lost, hundreds of thousands of square miles of intact habitat. As the *Science* writers acknowledge, “Even under the most optimistic scenario (SSP1), large extents of important conservation land are at risk.”

If the aim is to put an end to endings, then even SSP1, the rosiest future thought possible, contains far too many bare branches. Pessimism is still marching in optimism’s entourage, with the expectation of Greece-sized and Poland-sized losses, inevitably, that sense of *Oh, well, take a deep sigh, it all balances out, you can’t make an omelet without breaking some eggs.*

So you have to break a few eggs. But do you have to break *chickens*, too? Land keeps on disappearing, getting plowed under, chewed up; species keep winking out. Urgency keeps calling, daily, hourly, with the tenacity of a bill collector. Urgency that can’t keep getting shunted into voicemail, the mailbox is full; urgency that won’t take its thumb off the doorbell. (It helps to have a lot of metaphors to get this across.)

Like sunlight burning through mist, the miasma of inevitability is fading, replaced by a vital element and extra dimension that comes into play as minds are stretched and an enhanced attention is applied to geography and the ubiquity of life.

These are genuine grounds for hope.



**In Thornton Wilder’s classic “Our Town,”** a play that delves into the everyday lives of people in a small New England town at the dawn of the 20th century, a letter is successfully delivered to “Jane Crofut, the Crofut Farm, Grover’s Corners, Sutton County, New Hampshire, United States of America, Continent of North America, Western Hemisphere, the Earth, the Solar System, the Universe, the Mind of God.”

That’s still pretty much the age-old, common-sense way people describe how they’re situated in space, their underlying “where-ness.” Sitting, standing, moving around—what stays constant is the gravity-assured sense of always being right on top of something solid at some spot on the surface of the rolling earth. Humans have staked out smaller and larger areas of that surface. In geometry, “area” refers to the length times the width of a flat shape, and, in a curious way, there are certain flattened aspects to the way we live.

The physical boundaries of towns and states, invented horizontal borders, are lengths and widths placed flat on earth, the thing we’re “on.” Such markers are easy to see as lines on maps; on the ground they require signs or border guards to be noticed as enforceable edges. In some ways these markers act like invisible corrals, pens, or pastures.

Poster for a Laconia, NH performance, November 19, 2021



A plaque in the lobby of the Explorers Club, in New York, records five “Famous Firsts” by its members: Getting to the North Pole in 1909; the South Pole in 1911; the top of Mount Everest in 1953; the bottom of the Mariana Trench in the Pacific, “the deepest point in the ocean,” in 1960; and landing on the surface of the moon in 1969. Only in the 20th century could these feats become achievable and, except for the moon landing, they were part of humanity’s push to lay claim to every last square inch of the earth’s surface.

Astronauts have reported that the moon landing, a first chance to look back at the world from outside, led all at once to a life-changing, protective way of thinking about the planet. The Overview Effect, it’s called. “I had a feeling it’s tiny, it’s shiny, it’s beautiful, it’s home, and it’s fragile,” said Michael Collins, who got to the moon in 1969. All told only 24 people have gotten there, and another 263 have been to the International Space Station.

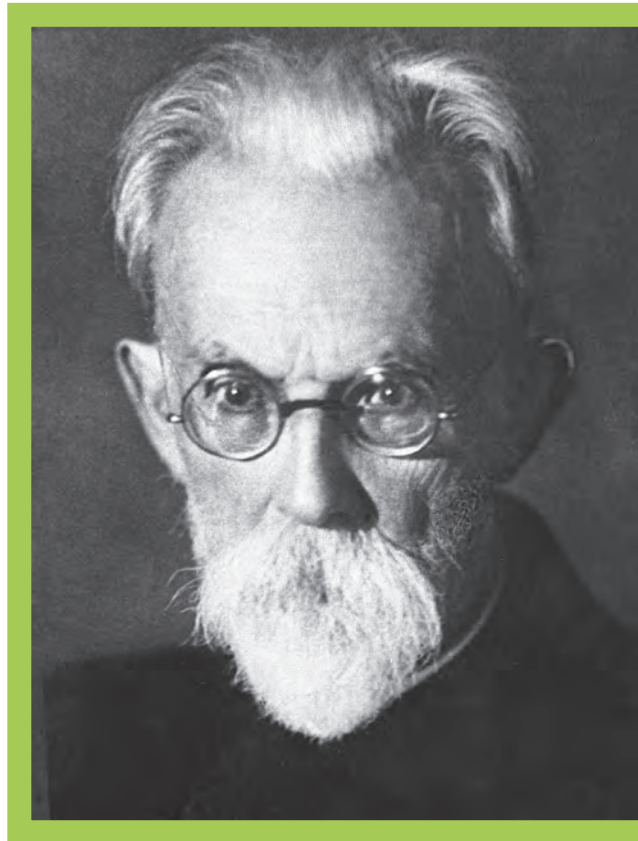
Down below on earth there’s a slowly permeating sense that we are embraced and canopied by a living, three-dimensional structure that dips below and rises above the world’s surface—the biosphere, life’s realm, the one container, as far as we know, of everything alive in the universe. We don’t so much live *on* something as we do *within* something. It’s got the strangest shape, no measurable width as such because it extends around the world. But there’s a real bottom and a real top and we are somewhere in the middle of it all.

The biosphere, a life layer almost as old as the planet, got its first thorough-going write-up in 1926 in a book by Vladimir Ivanovich Vernadsky, a Russian biogeochemist revered in both Russia and Ukraine as an Einstein or a Darwin and still little known in the West. As Vernadsky made clear, the biosphere isn’t a sphere at all, but a shell coating a sphere. Stranger still is that most life is found within a band between the top of Everest and the bottom of the Mariana Trench, a vertical distance of nearly 12.5 miles. That’s a stretch that, laid out flat, as John Gribbin, an English astrophysicist, pointed out, a car could drive across in less than twenty minutes on an open road.

So the ancient, resplendent, wondrous within-ness that envelops us and the tigers and the sequoias and the microbes also has an inherent thinness, a boundary that must be respected at all times and kept from getting any thinner.



**For René Descartes, the 17th-century French mathematician considered the father of modern philosophy,** an animal was a *bête-machine*, a machine-beast, acting only on reflex, lacking language, experience, intellect, and consciousness. For many years this seemed to justify an unspoken Declaration of Indifference to All Animals (except Pets)—postulating that it’s self-evident they have been created unequal and inadequate, and endowed by human Perception with certain unalienable Wrongs, among them Death, Confinement, and being Pursued by Misery.



Vladimir Ivanovich Vernadsky WIKIMEDIA COMMONS

That view has been in retreat for many years, as impeccable studies accumulate about the remarkable intellectual and emotional capacities and accomplishments of apes, elephants, whales, dolphins, parrots, and octopuses that indicate these fellow creatures have achieved a form of consciousness. Such discoveries, often reported as astonishing, spill over into the media. In 2022 alone there was an October *New York Times* article about how “Reptiles seem to have richer social lives than we thought”; a July *Washington Post* piece called “The consciousness of bees”; and an August *New Scientist* feature headlined “The inner mind of plants.”

“Extending the concept of cognition to plants,” said a *New Scientist* editorial in the same issue, “would mean a seismic shift in our view of humanity.” For Lars Chittka, the German zoologist and ecologist who wrote in the *Post* about his research with bees, insects whose brains are the size of poppy seeds, “The insight that bees have a rich inner world and unique perception, and, like humans, are able to think, enjoy, and suffer, commands respect for the diversity of minds in nature. With this respect comes an obligation to protect the environments that shaped these minds.”



THE BEE CONSERVANCY

Accepting that an insect has consciousness, wrote Alun Anderson, *New Scientist*'s former editor-in-chief, in a review of Chittka's 2022 book, *The Mind of a Bee*, requires a “prodigious leap: from being almost alone, we would find ourselves in a vast sea of sentience. That is radical and risks inviting ridicule. But the evidence is there, and might force us to rethink our duty towards animals.”

For the longest time, many people assumed the rest of life in all its abundance came into being solely to assist us and do our bidding. To this way of thinking, it didn't really matter what we did to other species; they weren't fully alive and besides wouldn't mind much because they didn't have much in the way of minds. Now we're hearing we have to be mindful that the biosphere is full of minds.

The practical implications of these findings are clear when it comes to any future development. We're dealing with places already in progress. There's no such thing as a vacant lot or empty land. Every unbuilt acre is teeming with life and awareness, underneath our feet, over our heads, and all around, no matter which way we look.

Over the next few decades we've got half an earth to save in order to keep 90% of life and awareness alive. After all—

**We're all in this together.**

*Tony Hiss's new book, Rescuing the Planet: Protecting Half the Land to Heal the Earth, is now in paperback.*



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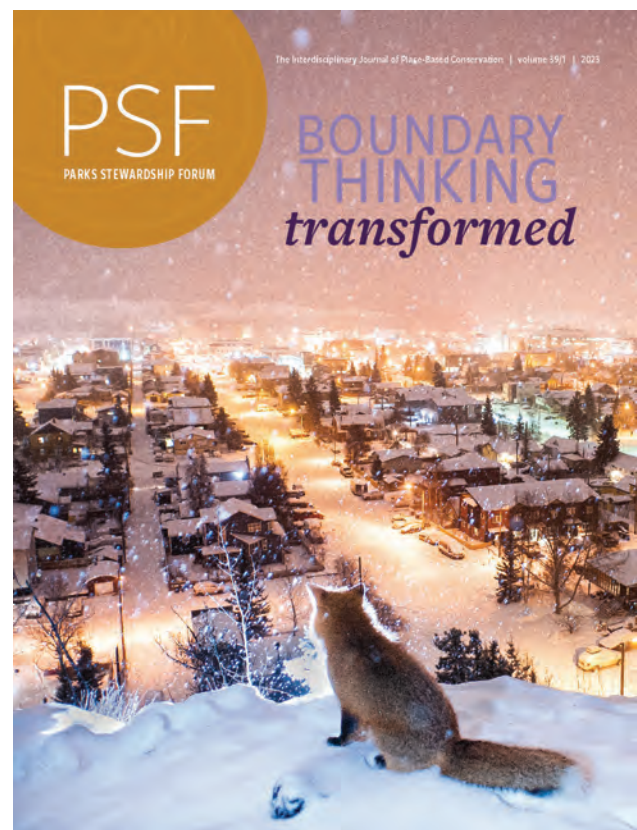
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**On the cover of this issue**

A red fox on the clay cliffs above the city of Whitehorse, Yukon Territory.  
**PETER MATHER**