

An aerial photograph showing a dark asphalt road that curves through a landscape. On the left side of the road, there is a dense forest of green trees. On the right side, the terrain is sandy and sparsely vegetated with scattered trees. A small white car is visible on the road, moving away from the viewer. The overall scene suggests a natural, possibly coastal or dune, environment.

A CLIMATE OF CONSERVATION

**The Critical Role of Land
in Confronting Our
Existential Global Crisis**

By Anthony Flint

AFTER A YEAR of intensifying drought, fires, and floods, leaders of the conservation movement are tapping into widespread concern about climate change by emphasizing that forests, grasslands, parks, and peat bogs play a critical role in both soaking up carbon and building resilience.

Last fall, scientists at The Nature Conservancy (TNC) released a list of forests from Washington to Georgia that, if properly protected, could help remove millions of metric tons of carbon dioxide from the air each year. Around the same time, a coalition of conservation groups and sustainable business organizations called US Nature4Climate launched a campaign under the banner, “Conservation IS Climate Action.” A few days after that, Cities4Forests, a group of 73 cities committed to forest conservation and restoration, issued a call to action urging urban leaders to embrace nature-based climate solutions.

With the existential threat of climate change vaulting to the top of the hierarchy of global problems, conservationists are increasingly emphasizing the critical role of land, from rural forests to working landscapes to urban street trees, in confronting that challenge. Significant ongoing work to protect land and preserve biodiversity falls under the rubric of natural climate solutions, defined by TNC as “conservation, restoration, and improved land management actions that increase carbon storage or avoid greenhouse gas emissions in landscapes and wetlands across the globe” (TNCa).

“There’s nothing better for keeping carbon in the ground and extracting more carbon out of the air than simply protecting forests,” said Mark Anderson, director of TNC’s Center for Resilient Conservation Science, which recently added carbon storage to the searchable criteria in its popular online Resilient Land Mapping Tool (TNCb). “Our most important partner is the living land.”

“There’s nothing better for keeping carbon in the ground and extracting more carbon out of the air than simply protecting forests. Our most important partner is the living land.”

Land conservation can have multiple benefits of critical value in this era, said Jim Levitt, director of the International Land Conservation Network (ILCN). In addition to carbon sequestration, “conserved coastlines can buffer us from sea-level rise. Vibrant tree growth in cities can mitigate heat-island effects. Farms with vegetative buffers can substantially reduce water pollution. Protected highlands can provide clean water to dense urban centers,” said Levitt, who coauthored a forthcoming Policy Focus Report about civic conservation groups providing climate solutions (see excerpt page 30). “The list goes on.”

Mountain road, Italian Dolomites. Credit: Anastasiia Shavshyna via E+/Getty Images.

Conservation got special attention at the COP26 climate summit in Glasgow in November, when leaders of more than 140 nations pledged to end deforestation and land degradation by 2030, expanding a commitment made by 39 nations in 2014. The Glasgow pledge followed a commitment by 50 countries to protect 30 percent of the world's lands and oceans by 2030. The Biden administration's commitment to the 30x30 campaign, America the Beautiful, will strive to protect over 720 million acres during the coming decade, in part to address "the need to fight climate change with the natural solutions that our forests, agricultural lands, and the ocean provide" (U.S. Department of the Interior 2021).

Land is not a panacea for climate change, which is a crisis that will need to be actively addressed by many sectors. But the climate advantages of preserving land are "irrefutable," says Anderson, who is the Lincoln Institute's current Kingsbury Browne fellow. It's a connection that also has emotional resonance: a recent newsletter from the Land Trust Alliance (LTA), which represents more than 1,000 land trusts and affiliates across the country, suggested land was "the answer to climate despair."

FOR FERNANDO LLOVERAS SAN MIGUEL, executive director of the Conservation Trust of Puerto Rico and a former Kingsbury Browne fellow, this moment for land conservation represents a kind of coming full circle. "Climate change is the result of a lack of land conservation," he said, pinning the global crisis on rapacious consumption and unsustainable land development practices that have ignored the functionality of ecosystems. His message: "Don't destroy the basic systems that support life."

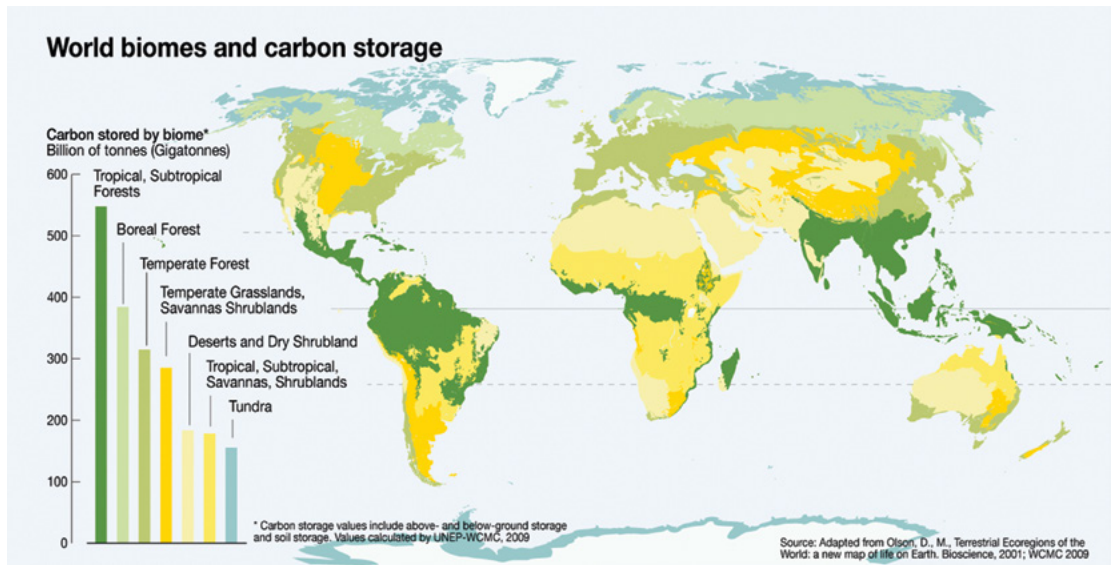
Those systems are particularly well-suited to help in the fight against climate change. Recent studies suggest that forest, grassland, and peatland ecosystems may be even more exceptional at soaking up and storing carbon than previously understood—both aboveground and underground (Gardner et al. 2021, Griscom 2021). They can create microclimates that fend off warming temperature trends and even adapt to serve the needs of animals, modifying habitats as wildlife species, by necessity, revise their own specifications for survival to make it through all the climate upheaval.

In a warming world where terrifying feedback loops are becoming commonplace, the healthy ecosystem—carefully protected and sustainably managed—promotes a virtuous cycle of biodiversity, a kind of continually improving and more efficient functionality.

Fernando Lloveras San Miguel (left), president of the Conservation Trust of Puerto Rico, assesses damage from Hurricane Maria with marine biologist Juan David Murcia in 2018. Credit: Ricardo Ramirez Buxeda/*Orlando Sentinel*/Tribune News Service via Getty Images.



"Climate change is the result of a lack of land conservation. Don't destroy the basic systems that support life."



More than 140 nations have pledged to end deforestation by 2030, in part to protect tropical forests in the Amazon and Indonesia that can store vast amounts of carbon. Credit: GRID-Arendal (<https://www.grida.no/resources/6940>).

The obvious benefits of protecting land stand in sharp contrast to what has been happening, literally, on the ground. Deforestation continues apace as land is cleared for development or agriculture, or ravaged by wildfire, drought, and mudslide-inducing floods. That destruction leads to negative outcomes, simultaneously eliminating vast carbon sinks and spewing new emissions into the atmosphere. Fires release embodied carbon in vegetation and soil, and then emissions intensive development and agriculture—including methane from cows on any land cleared for grazing—is ushered in. So it was that in 2021, the Amazon rainforest started emitting more CO₂ than it absorbs.

Similar patterns are emerging around the globe, including in the northeastern United States. Clark University researchers found that the six New England states and New York are collectively releasing an estimated 4.9 million metric tons of carbon dioxide equivalent into the atmosphere each year through forest loss. The loss of carbon storage power means the region is missing out on 1.2 million metric tons of CO₂ equivalent (CO₂e) in carbon sequestration each year.

“Deforestation is a direct source of carbon emissions, releasing the carbon stored in trees and roots into the atmosphere as carbon dioxide. It also negates one of the best tools we have for drawing carbon dioxide back out of the atmosphere,” wrote the Clark research team. “Thus, slowing the pace of forest loss is an important instrument in the fight against climate change” (Williams, Hasler, and Xi 2021).

The climate mitigating power of land is so great, economists and others argue that the value of natural ecosystems should be integrated into the global economy—to put a price tag on the climate benefits of land. This perspective was spelled out most recently in the *Independent Review on the Economics of Biodiversity* led by Sir Partha Dasgupta, professor of economics at Cambridge and fellow of St John’s College (Dasgupta 2021).

Clark University researchers found that the six New England states and New York are collectively releasing an estimated 4.9 million metric tons of carbon dioxide equivalent into the atmosphere each year through forest loss.

In the report, which some characterized as the land-oriented equivalent of Sir Nicholas Stern's watershed 2006 report about the high costs of inaction on climate, Dasgupta identifies nature as "our most precious asset," one that humanity has badly mismanaged. "My overarching aim is the reconstruction of economics to include nature as an ingredient," he said.

Land's role in the climate crisis does have its limits, some say. "There aren't enough trees in the world to offset society's carbon emissions, and there never will be," writes Bonnie Waring, an ecologist at Imperial College London (Waring 2021). "If we absolutely maximized the amount of vegetation all land on Earth could hold, we'd sequester enough carbon to offset about ten years of greenhouse gas emissions at current rates. After that, there could be no further increase in carbon capture."

Planting and protecting trees is valuable, climate activists say, but shouldn't distract from other major steps necessary to meaningful climate progress: reducing emissions in the transportation, building, and energy sectors; and decarbonizing the economy by ending government fossil-fuel subsidies and support from private financial institutions.

As the climate crisis gains speed, conservationists must also contend with emerging issues. Investors and real estate speculators are making huge acquisitions of land on higher ground that will be more productive given warmer temperatures and new rainfall patterns. And a debate has erupted over land-based carbon offsets, which allow polluters to counter their emissions by paying for greenhouse gases to be removed from the atmosphere somewhere else. Critics say the offsets let polluters off the hook, allowing them to continue to emit greenhouse gases while they support sequestration functions that would be happening in protected areas either way (Elgin 2020, Song and Temple 2021). It should not surprise that land's role in climate change would be as complex as the problem itself.

LAND CONSERVATION AND THE LINCOLN INSTITUTE

Conservation became part of the Lincoln Institute's portfolio through research on the taxation and assessment of land. In 1976, federal law began allowing tax deductions for gifts of conservation easements—donations of development rights on property that remained in private ownership. But the legislation that recognized this new instrument did not address the property tax consequences of easements, and assessors were unsure about how to value property that had a new legal status but unchanged physical characteristics. The Lincoln Institute, responding to requests for help from environmental groups and assessors, developed courses on this interplay of easements and the property tax.

During the 1980s, the organization's interest in land stewardship grew, with staff and study groups dedicated to the topic. In 1981, a Boston attorney on sabbatical to study voluntary conservation, Kingsbury Browne, organized a national convening at the Lincoln Institute's headquarters. The participants, affiliated with some 40 land trusts and related groups from Maine to California, resolved to form a national Land Trust Exchange, which became the Land Trust Alliance (LTA). Now a significant catalyst for conservation, LTA has 1,000-plus member organizations and affiliates that have protected 61 million acres nationwide. Browne's legacy lives on eponymously in an annual award from LTA and a Lincoln Institute fellowship.

Today, the Lincoln Institute has identified "sustainably managed land and water resources" as one of its six primary goals. The International Land Conservation Network, launched in 2014, builds capacity for conservation around the world; the Babbitt Center for Land and Water Policy, launched in 2017, promotes the integration of land and water planning, primarily in the U.S. West.

Learn more at www.landconservationnetwork.org or www.babbittcenter.org.



Total tons of carbon dioxide emitted by humans each year: **11 billion**

Amount from burning fossil fuels: **9.5 billion**

Amount from deforestation: **1.5 billion**

Percent of human-produced carbon dioxide absorbed by land and water: **50**

Percent by which human-produced carbon dioxide has increased since 1750: **50**

Metric tons of carbon dioxide a typical 1,000-acre forest in the eastern United States can soak up each year: **180**

Acres of land protected by civic conservation in the United States: **61 million**

Percent of oceans legally protected, globally: **7**

Percent of land legally protected, globally: **15**

Percent of land and oceans the world is working to protect by 2030: **30**

Sources: Climate.gov; The Nature Conservancy; Land Trust Alliance; International Union for Conservation of Nature.

Ecologists assess habitat conditions in the Hoh River, Washington. Credit: Joel Rogers.

“YOU CAN’T MITIGATE climate change without the land sector,” says Andrew Bowman, president of LTA. Bowman said most of the group’s members are considering climate change prominently in their stewardship practices, land management, and restoration activities. But it’s not the only thing shaping today’s conservation actions: “We have interconnected crises of climate, biodiversity, and equity.”

Add public health to that mix. The pandemic underscored the need to better understand biodiversity, habitat loss, and the interaction of humans and wildlife. “Restoring and protecting nature,” observed a National Science Foundation research announcement, “is essential to preventing future pandemics” (NSF 2021).

It could also be essential to surviving them. “Land conservation and restoration is critical to addressing the climate crisis, but is also central to the health of our communities—along that whole spectrum from urban parks

to remote wildlands,” said Jamie Williams, president of The Wilderness Society and the 2009 Kingsbury Browne fellow. “The pandemic has shown just how central time in nature is to our resiliency, emotional, physical, and mental health. Studies bear that out, so a big focus of ours has been on creating greater park equity in urban areas and securing equitable access to the outdoors.”

Equity is a critical part of the conservation-climate conversation. By drawing attention to their role in the coalescing worldwide campaign to address climate change, conservation leaders can create a bigger tent, diversifying their ranks and reaching people who might not otherwise make the link between climate and land. An increasingly intentional focus on climate equity, borne out in campaigns for equitable access to urban parks, partnerships with sovereign tribal nations, and the like, has the potential to further expand the movement’s reach and impact.



Trees in urban areas like Brooklyn, New York, can help reduce surface and air temperatures and create a refuge for wildlife. Credit: Alex Potemkin via E+/Getty Images.

Indigenous communities, in particular, are at the ready with creative, nature-based solutions (Jones 2020). Some 50 tribes in the United States have developed far-reaching, nature-based climate action plans on indigenous lands across the country, including activities from coastal restoration to prescribed burns. Tribes are “using traditional knowledge, but taking advantage of the science and the data,” said Nikki Cooley, co-manager of the Tribes and Climate Change Program for the Institute for Tribal Environmental Professionals in Flagstaff, Arizona. The approach reflects the cultural perspective of indigenous nations, she said, “that they have a responsibility to the Earth, a relationship with the Earth . . . connecting people to the land.”

In Gowanus, Brooklyn, urban landscape architects find themselves in common cause with traditional conservation organizations as they work together to protect biodiversity and build climate resilience in densely developed urban corridors. “Networks of green infrastructure in cities create a refuge for wildlife,” said Susannah Drake, adjunct professor at The Cooper Union for the Advancement of Science and Art.

“Dark skies, greenbelts, and adapted right of way corridors link [rural areas] with urban centers.” The linkages, she said, “revive the large landscape productivity of regions . . . If we can’t take all the land back [for conservation], we know enough about landscape ecology to make the urban-suburban-rural transect embody greater biodiversity.”

On an even broader scale, the Biden administration’s America the Beautiful program “presents an enormous opportunity to bring the climate and conservation agendas into better alignment, if not explicitly link them,” said Sacha Spector, program director for the Environment at the Doris Duke Charitable Foundation, who noted the existence of a longstanding division between conservation and climate funders, even within the same foundations. “That means engaging all sorts of potential stakeholders and funders in this more holistic understanding of land conservation and stewardship, from urban reforestation and greenspace advocates, to the big climate funders, to health and resilience interests. For both biodiversity and climate, this is an all-hands-on-deck moment.”

IN 2019, AS PART OF AN EFFORT to bolster support for the 30x30 campaign, the Center for American Progress issued a report on the state of America's natural areas (Lee-Ashley 2019). The report suggested that the question of how much nature to keep—in an effort to “curb wildlife extinctions, fight climate change, reduce toxic pollution, and safeguard healthy natural systems upon which future generations will depend”—should be the subject of an urgent national conversation.

“There can be no single or simple answer to a question that is simultaneously moral, economic, religious, historical, cultural, scientific, and, for many people, deeply personal,” says the report. “A discussion of how much nature to protect—and how, where, and for whom—must honor and account for the perspectives of all people, including communities that are disproportionately affected by the degradation of natural systems; communities that do not have equal access to the outdoors; tribal nations whose sovereign rights over lands, waters, and wildlife should be finally and fully upheld; communities of color; and others.” It's been only two years since the report was issued, but that discussion has taken on even greater urgency in the face of the global pandemic, widespread calls for addressing racial injustice, and the increasingly visible effects of climate change.

Ultimately, climate and biodiversity are “braided together,” says Levitt. Addressing climate change in a meaningful way requires understanding those connections—and understanding our own role in the nature of things.

“Forests are . . . the unknowably complex green webs that bind together the fates of millions of known species, with millions more still waiting to be discovered,” writes Waring, the ecology professor at Imperial College (Waring 2021). “To survive and thrive in a future of dramatic global change, we will have to respect that tangled web and our place in it.” □

Anthony Flint is a senior fellow at the Lincoln Institute, host of the *Land Matters* podcast, and a contributing editor to *Land Lines*.

REFERENCES

- Dasgupta, P. 2021. *The Economics of Biodiversity: The Dasgupta Review*. London, England: HM Treasury. <https://www.gov.uk/government/publications/final-report-the-economics-of-biodiversity-the-dasgupta-review>.
- Elgin, Ben. 2020. “These Trees Are Not What They Seem.” Bloomberg Green. December 9. <https://www.bloomberg.com/features/2020-nature-conservancy-carbon-offsets-trees>.
- Gardner, A., D.S. Ellsworth, K.Y. Crous, J. Pritchard, and A.R. MacKenzie. 2021. “Is Photosynthetic Enhancement Sustained Through Three Years of Elevated CO₂ Exposure in 175-Year-Old Quercus Robur?” *Tree Physiology* (tpab090). <https://doi.org/10.1093/treephys/tpab090>.
- Griscom, Bronson. 2021. “The Most Promising—and Proven—Carbon Capture Technology Is Nature.” Thomson Reuters Foundation News. September 17. <https://news.trust.org/item/20210917123229-wm4fc>.
- Jones, Nicola. 2020. “How Native Tribes Are Taking the Lead on Planning for Climate Change.” *Yale Environment* 360. February 11. New Haven, CT: Yale University. <https://e360.yale.edu/features/how-native-tribes-are-taking-the-lead-on-planning-for-climate-change>.
- Lee-Ashley, Matt. 2019. “How Much Nature Should America Keep?” Washington, DC: Center for American Progress. <https://cf.americanprogress.org/wp-content/uploads/2019/08/NatureAmerica-report.pdf>.
- NSF (National Science Foundation). 2021. “A Diversity of Wildlife Is Good for Human Health.” Press release. April 20. https://www.nsf.gov/discoveries/disc_summ.jsp?org=NSF&cntn_id=302530.
- Song, Lisa, and James Temple. 2021. “The Climate Solution Actually Adding Millions of Tons of CO₂ Into the Atmosphere.” *Pro Publica*. April 29. <https://www.propublica.org/article/the-climate-solution-actually-adding-millions-of-tons-of-co2-into-the-atmosphere>.
- TNCa (The Nature Conservancy). “Perspectives: Natural Climate Solutions.” <https://www.nature.org/en-us/what-we-do/our-insights/perspectives/natural-climate-solutions>.
- TNCb (The Nature Conservancy). Resilient Land Mapping Tool. <https://maps.tnc.org/resilientland>.
- U.S. Department of the Interior. 2021. “Conserving and Restoring America the Beautiful.” Preliminary report. Washington, DC: U.S. Department of the Interior. <https://www.doi.gov/sites/doi.gov/files/report-conserving-and-restoring-america-the-beautiful-2021.pdf>.
- Waring, Bonnie. 2021. “There Aren't Enough Trees in the World to Offset Society's Emissions—and There Never Will Be.” *The Conversation*. April 23. <https://theconversation.com/there-arent-enough-trees-in-the-world-to-offset-societys-carbon-emissions-and-there-never-will-be-158181>.
- Williams, Christopher A., Natalia Hasler, and Li Xi. 2021. “Avoided Deforestation: A Climate Mitigation Opportunity in New England and New York.” Report prepared for the United States Climate Alliance. <https://tnc.app.box.com/s/apncszy7yrsknlk0hix9n2bt7n6n3f9k>.