TRUST FOR PUBLIC LAND®

The Power of Land Conservation to Address the Climate Crisis

LAND AND PEOPLE LAB

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LAND AND PEOPLE LAB: GREEN PAPER SERIES

Each Green Paper is a rigorous analysis of a topic in support of TPL's mission of creating parks and protecting land for people, ensuring healthy, livable communities for generations to come. Collectively these papers advance TPL's goals and strategic commitments that parks and green spaces deliver healthier people, stronger communities, greater equity, and climate solutions. They are not an end product; they are a starting point for change.

The Land and People Lab is TPL's "think and do" tank that advances TPL's work through the power of evidence. From geospatial science to ecology, from economics to epidemiology, from social science to urban planning—we collect and analyze data, generate evidence, and get that evidence where it needs to go to influence policy and practice—all with the aim of advancing TPL's strategic commitments to health, equity, climate action, and community.

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Talking Brook in New Gloucester, Maine. © Chris Bennett

A Note from Trust for Public Land's Climate Director

Nature is one of our best allies in combating the climate crisis, and land conservation is a powerful tool in our climate action toolkit. Our protected parks and public lands have climate superpowers, addressing the very driver of global warming—excess greenhouse gases—while improving community resilience to climate-driven hazards.

This report is a call to action to ensure land conservation advocates and professionals are on the front lines of climate action.

Nature-based climate action (also called natural climate solutions) uses land conservation, restoration, and management to increase carbon storage or reduce greenhouse gases in the atmosphere. Taken together, natural climate solutions could absorb 21 percent of the United States's annual net greenhouse gas emissions.[1] Among these strategies, land conservation is one of the most cost-effective.

When we conserve lands, we're doing more than saving precious natural areas. Each acre helps address the climate crisis, as trees, plants, and soils act as a carbon reservoir. Permanently protected lands also support community resilience to climate change: improving water and air quality; protecting essential water supplies that communities depend on; and preserving biodiversity.

And this work is not just about the environment. When land conservation strategies are community-led, they create outcomes that promote public health and community connectivity along with climate action to ensure our children and grandchildren inherit landscapes where they can thrive.

Every acre conserved is more than just land; it's a commitment to the future. Trust for Public Land (TPL) recognizes the transformative role that protected natural spaces play as climate action and is committed to growing our public lands nationwide and surpassing 4.5 million acres of TPL-protected lands by 2025.

This report is a call to action to ensure land conservation advocates and professionals are on the front lines of climate action. With the commitment, collaboration, and participation of tribal and local communities, state and federal agencies, and over 1,000 land trusts—plus hundreds of millions of dollars spent on conservation annually—we have an opportunity and obligation to ensure TPL and our partners put the power of conservation to work for climate action.

Brendan Shane, Climate Director
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Miles Mountain, Vermont. © Chris Bennett

Nature-Based Climate Action

As the global climate crisis—driven by fossil fuel pollution and rising temperatures—accelerates, there is a growing sense of urgency that we must both reduce greenhouse gas emissions and help protect people from climate-driven hazards, including flooding, extreme heat, and wildfires. The transition to a clean energy economy is critical, but so is better protection and stewardship of our natural lands. In fact, the United Nations Intergovernmental Panel on Climate Change (the leading global body charged with assessing climate science) has stated that to meet the globally agreed-upon goals to limit warming, we will need to incorporate land-based mitigation options.[2]

To accomplish this, we can draw on a broad suite of strategies, often referred to as natural climate solutions (NCS), that use nature's inherent power to help combat the climate crisis. Natural climate solutions encompass everything from special low-impact agricultural practices and habitat restoration to tree planting, nutrient management, and land conservation. Thanks to the work of many scientists, nonprofits, tribes, and coalitions, NCS are relatively well understood, and they enjoy broad bipartisan support in the United States. A 2023 poll found that 92 percent of voters support NCS, and nearly half (47 percent) are in strong support.[3]

Much has been written about NCS, and significant state and federal funding has been set aside for NCS study and implementation. The Infrastructure Investment and Jobs Act, signed on November 15, 2021, included $2.1 billion for ecosystem restoration activities and over $3.3 billion for wildfire risk reduction.[4] The Inflation Reduction Act, which was signed into law by President Joe Biden on August 16, 2022, added nearly $20 billion for agricultural conservation as well as $5 billion for forest management, planning, and restoration activities.[5]

Too often left out of the climate conversation, however, are traditional land conservation strategies, such as conservation easements, community forests, and transfers of private land to public ownership.

Land conservation is a critical climate priority among NCS strategies, particularly in light of finite time and resources. According to leading research by Susan Cook Patton et al., "Counter to an emerging preference for restoration," **protecting carbon-rich landscapes should often be the top NCS priority** based on "(1) the magnitude and (2) immediacy of mitigation potential, as well as (3) cost-effectiveness and (4) the co-benefits they offer."[6]

This report synthesizes these and other findings, presenting the latest science and research that prove land conservation is a critical climate strategy. While the benefits of land conservation are often interconnected, for ease of analysis and readability, this paper focuses on five distinct benefit areas:

- CARBON STORAGE
- WATER
- AIR
- BIODIVERSITY
- HUMAN HEALTH

To further illustrate these benefits, case studies demonstrate the unique power of conservation to simultaneously improve community resilience and reduce greenhouse gases. Lastly, this paper lays out a path for TPL and our many partners to scale up the climate benefits of land conservation across the United States.

Haskill Basin in Whitefish, Montana. © Steven Gnam

Land Conservation in a Changing Climate

Conserved lands are essential to healthy, thriving communities. While the term "land conservation" can mean different things to different people, in this paper, land conservation refers to various legal methods of preserving land, ensuring it is protected forever from development and major human-caused disturbances. Land conservation prevents the conversion of natural lands to other non-natural uses, allowing nature to maximize its ability to safeguard our future from climate change.

The land protection and conservation movement has a long history in the United States, dating back to the late 1800s. Since that time, the conservation movement has deployed increasingly sophisticated tools and strategies to protect our natural resources for current and future generations. Today, we enjoy a wide range of publicly accessible lands that have been protected using more than 20 techniques and designations—from national parks, community forests, and national wildlife refuges to state parks and conservation, agricultural, and forest stewardship easements—to name only a few. Each of these techniques helps expand our collective ownership and stewardship of land.

It is also important to recognize and honor the depth and breadth of cultural practices, knowledge, and connections of Indigenous peoples to the land and waters and the important role that Tribal ownership and collaboration plays in combating climate change.

Protecting forests, in particular, is critical to absorbing (also called "sequestering") carbon dioxide from the atmosphere and providing a wealth of co-benefits. Forests and forest products already absorb approximately 13 percent of all U.S. greenhouse gas emissions.[7] These forests also help clean the air, provide critical habitat for at-risk wildlife, and filter pollutants out of water for aquatic species and for the 37 percent of Americans who get some of their drinking water from forested land.[8]

Other natural landscapes have equally impressive climate benefits. Wetlands have the highest carbon density of any terrestrial ecosystem, storing up to five times more carbon per acre than forested landscapes.[9] Coastal ecosystems, particularly tidal marshes and mangrove forests, can remove carbon from the atmosphere 10 times faster than tropical rainforests.[10] And grasslands are often cited as some of the most reliable carbon sinks due to the large amount of carbon stored belowground, where it is less likely to be released into the atmosphere as a result of wildfire or drought.[11]

In the face of climate change, more land conservation is needed. **Yet, the future of the lands we love and rely on is threatened.**

Our landscapes are already changing, and future projections are dire. According to Global Forest Watch, between 2001 and 2022, the United States lost approximately 113 million acres of tree cover—a 17 percent decrease.[12] Looking to the future, by 2050, we could lose an additional 23 million acres of forests to development, logging, and fires—enough to cover the entire state of Indiana.[13]

Now is the time to reverse these trends and put the power of land conservation to work as one of our best defenses against a worsening climate crisis.

Story Mill Community Park, Bozeman, Montana.

The Multiple Benefits of Land Conservation

Land conservation provides many benefits that should not be underestimated. The same forest that captures and stores carbon helps reduce air pollution and filter water before it reaches streams and rivers. Land protection designed to increase biodiversity can also boost equitable access to the outdoors, improving mental and physical health for nearby residents. Below, we summarize the latest research and evidence demonstrating the role of protected natural lands in addressing the climate crisis and creating healthy, resilient communities now and for future generations.

Butte Falls, Oregon. © Tideway Creative

1. Carbon Storage and Sequestration

Natural landscapes hold a vast amount of carbon. This carbon is stored aboveground in trees, plants, and other vegetation and belowground in roots, biomass, and organic soil matter. Referred to as "carbon stocks," the carbon in natural lands can be released into the atmosphere if the natural land is disturbed or converted to development. Natural lands are valuable not only for the carbon that is already stored in them, but also for their ability to sequester or pull carbon out of the atmosphere. Every year our natural landscapes absorb a massive amount of carbon, essentially vacuuming carbon dioxide out of the atmosphere and adding it to existing natural carbon stocks. As noted previously, forests currently absorb nearly 13 percent of all U.S. greenhouse gas emissions.

While wetlands don't sequester as much carbon annually, they do store a tremendous amount of carbon that is vulnerable to release if the wetlands are drained and built on. Wetlands in the lower 48 states store over 11 billion metric tons (11 gigatons) of carbon—representing one of the highest carbon stocks as measured on a per-acre basis.[a] Not surprisingly, research across the U.S. has shown that carbon stocks are often lower in wetlands that have seen major human disturbances from urban development or agriculture—further emphasizing the importance of protecting and conserving wetlands.[14]

Protecting and restoring grasslands can also have significant carbon impacts. The belowground biomass of grasslands can extend several meters under the surface, contributing carbon to the soil. The U.S. Forest

a A variety of different terms and units are used for communicating carbon statistics. See the Appendix for more information on defining carbon terms and units."

Service Climate Change Resource Center notes that restoring degraded grasslands globally could sequester approximately 3 billion metric tons of carbon per year.[15]

The U.S. Geological Survey emphasizes that conservation is an effective climate strategy that can be realized quickly and at low cost. Mature trees are stable and can store large amounts of carbon when compared to restored lands. When disturbed, ecosystems such as forests can rapidly lose carbon that has accumulated over centuries, releasing it into the atmosphere.

Furthermore, leading climate scientists have noted that strategies that prevent forests and grasslands from being converted to development are priority "lower-cost opportunities" that are "particularly promising areas for increased near-term investment." Protecting at-risk forests and grasslands in the U.S. could help prevent loss of and/or absorb up to 37 million and 24 million metric tons of greenhouse gases a year, respectively.[16]

2. Water

Clean water is critical for healthy, functioning ecosystems and protecting public health. But as the climate crisis accelerates, it is becoming an increasingly threatened resource. Drought, extreme precipitation, flooding, warmer water temperatures, and pollution threaten aquatic ecosystems and the communities that depend upon them. Intact forests, wetlands, and other protected areas can help filter and absorb a substantial amount of water. This filtering capability improves water quality, while absorption reduces the amount and severity of flooding in downstream communities. When natural areas are lost, impacts on water can lead to significant consequences for people, wildlife, and the climate.

Approximately 83 million people (25 percent of the U.S. population) get more than 50 percent of their surface drinking water from forested watersheds. And 125 million people rely on forested lands for 10 percent of their surface drinking water (37 percent of the U.S.

Miles Mountain, Vermont. © Chris Bennett

population).[17] But these water supplies are threatened by urbanization and development that often consist of vast impervious surfaces, such as concrete, roads, and buildings. Increasing the impervious surface cover of watersheds by just 10 percent can result in severely degraded stream conditions.[18] The challenge is significant: according to the EPA, only 30 percent of rivers and streams are deemed "healthy based on their biological communities," and nearly 60 percent of rivers and streams have excess nutrients that can kill fish, degrade water quality, and lead to algal blooms.[19] In addition to urbanization, agriculture runoff can have negative impacts on water quality. Even if a watershed isn't highly developed, water quality can degrade due to nearby uses or even slight modifications, such as channelization, which can affect water flow and nutrient recycling.[20] That's why land conservation in urban and rural settings is an important strategy for protecting our vulnerable water resources.

3. Air

Clean air is essential for human health and well-being. While the U.S. has made significant progress in curbing air pollution, climate change threatens to unravel some of that progress. The Fifth National Climate Assessment states: "Climate change is projected to worsen air quality in many U.S. regions.... Reducing air pollution concentrations will unequivocally help protect human health in a changing climate."[21]

Natural landscapes, the same landscapes that sequester carbon and improve water quality, can also help keep air clean. Trees improve air quality by trapping polluting particles on leaf surfaces and absorbing gaseous pollutants. Research by the United States Department of Agriculture (USDA) estimates that trees and forests removed 17.4 million tons of air pollution in 2010, providing human health benefits valued at $6.8 billion. These health benefits prevented 850 deaths and 670,000 cases of serious respiratory illness.[22]

Conservation on agricultural land also has important air quality benefits. Research conducted by the University of Idaho documented air quality benefits of the USDA Conservation Reserve Program (CRP).[23] Farmers enrolled in CRP remove environmentally sensitive land from agricultural production and plant species to improve environmental health and quality.[24] The study found that CRP enrollment resulted in lower concentrations of particulate matter air pollution and that improved air quality directly resulted in fewer deaths.[25]

Zion National Park, Utah. © Chris Hinkle

4. Biodiversity

The loss of natural biodiversity has reached a level not seen in 60 million years, the point when dinosaurs went extinct. Scientists now believe we are entering a new mass extinction—this time driven by humans.[26] The biodiversity crisis must be addressed at the same scale and with the same urgency as the climate crisis[27] and land conservation can serve both ends.

A 2023 analysis by NatureServe, one of the leading biodiversity conservation nonprofits in North America, shows that 40 percent of animals, 34 percent of plants, and 40 percent of ecosystems nationwide are at risk.[28] The analysis identified land conversion as a major determinant of the numbers of U.S. species and ecosystems at risk, with grasslands and wetlands being most affected. Additionally, climate change is causing major changes in weather patterns, from severe droughts to more extreme weather events that threaten water and food availability for wildlife and can lead to overall habitat degradation.

Land conservation is a critical tool for slowing the loss of biodiversity. Time and again, rare and threatened species have begun to flourish when given space and protection afforded by protected lands. Recognizing this, the Biden administration launched the America the Beautiful challenge, setting an ambitious goal to "restore, connect, and conserve 30 percent of lands and waters by 2030." Currently in the U.S., approximately 12 percent of lands and 23 percent of ocean areas are protected, according to the U.S. Geological Survey).[29]

Even as biodiversity efforts focus on maintaining plants, animals, and the habitats they rely on, successful biodiversity initiatives should also be viewed through the lens of people and communities. New land conservation projects often occur in areas occupied by people or on lands central to a community's livelihood and culture.

At all times, conservation must be done with respect for the human rights of the people who live there and will manage the land; when done right, conservation should amplify local voices and create broader partnerships that can ensure long-term success. When conservation projects ignore people and the way they've historically interacted with the land, those projects often fail.[30] Notably, Indigenous peoples in North America have historically been displaced in the name of conservation, even though they have developed biodiversity conservation strategies that are culturally integrated.

5. Human Health

Climate change impacts human health in a number of ways, ranging from air pollution, extreme temperatures, and floods to increasing mental health problems and stress-related disorders.[31] But nature can help. A growing body of scientific evidence shows that being in and near nature has benefits for human health across the course of life.[32,33]

Protecting and creating parks, green spaces and other opportunities for contact with nature is increasingly recognized as a public health strategy to promote physical health, cognitive performance, and psychological well-being. The physical and mental health benefits of spending time in natural environments are experienced through various pathways, including opportunities for physical activity, stress reduction, decreased exposure to air and noise pollution, attention restoration, and nurturing social connections with friends or family. There is also evidence that spending time in forests can boost our immune systems via phytoncides—airborne chemicals that plants give off to protect themselves from harmful fungi and insects.[34,35,36]

Large natural landscapes, such as those found in national parks and forests, offer immersive, potentially transformative experiences to the millions of people who visit every year. The good news: in 2022, a record 168 million people in the U.S. (55 percent of the population 6 years old or older) spent time in our great outdoors.[37] These people reaped the many health benefits associated with time spent in nature, but this record number also highlights the need for more public space to handle increased demand.

PRIORITIZING EQUITABLE ACCESS TO HEALTH BENEFITS

Beyond recreational opportunities, there are therapeutic programs that support healing and recovery in large natural settings. Wilderness immersion programs for youth struggling with behavioral and mental health challenges and veterans recovering from post-traumatic stress disorder (PTSD) have been successful.[38] Unfortunately, access to these immersive experiences is not equitable, as people face a range of barriers to accessing remote locations, including transportation, cost of outdoor gear, and fears about comfort and safety in those settings. People from communities of color, as well as immigrant and low-resource communities and those with disabilities, may face additional barriers to access. Programs that support families in overcoming transportation barriers and encourage diversity in outdoor recreation experiences away from urban centers are critical.

Little Creek, Delaware. © Taj Schottland

Conserved lands provide the direct health benefits of connecting with the natural world, but they also provide indirect benefits to human health, including economic revitalization and climate change mitigation.[39] There are positive economic impacts on nearby communities from tourism, job growth, and community mobilization, with the potential to revitalize an economically struggling area. Reducing poverty in turn confers benefits to physical and mental health.

Additionally, the ability of land conservation to mitigate climate change further promotes human health through fewer extreme weather events, cleaner air, easier access to local produce, more livable communities, and lowered risk for infectious diseases.[40] One caveat to the generally positive connection between natural areas and health is the possibility of wildfires in forests and other landscapes and the related smoke, which can negatively impact the health of nearby communities through displacement, economic impact, and direct impact on opportunities for physical activity, respiratory health, and mental health. However, this can be addressed, in part, with thoughtful forest management practices. On balance, there is now considerable evidence for and recognition of the importance of natural climate solutions as a public health strategy, with implications for health equity.

Rio Grande del Norte, New Mexico.
© Dave Cox/Mountain Media

Land Conservation in Action: Case Studies

Real-world experience from TPL's long history of land conservation tells the story of how projects deliver climate action. The following case studies highlight climate-related benefits for community resilience and reducing carbon emissions—and the critical co-benefits for communities, wildlife, and the health of our planet.

Northern California: Carbon Storage and Air Quality

Forests in California store over 3 billion metric tons of carbon—equivalent to the carbon dioxide emissions from burning over 1.2 trillion gallons of gasoline—and each year these forests sequester an additional 12 million metric tons of carbon.[41] Furthermore, these forests remove over 792,000 tons of air pollution annually (including particulate matter, sulfur dioxides, and other harmful pollutants) delivering health and economic benefits valued at nearly $43 million.[42]

However, these forests, like many others around the United States, are under threat from development and other human-caused stressors. Conservation is a critical strategy for protecting these carbon-rich landscapes and creating stronger communities.

In 2011, 11,292 acres in Northern California went up for sale. This area is part of the ancestral land of the Yurok Tribe—California's largest federally recognized tribe, with over 6,000 enrolled members. New Forests (a forestry company that works with tribal governments) bought the tract and returned 2,424 acres of Yurok ancestral land along Ke'pel Creek in Humboldt County to the Tribe. With support from TPL, the Yurok Tribe secured funding from the State of California to acquire the land and regain ownership. In 2021, these culturally and ecologically significant timberlands in Northern California were officially transferred back to the Yurok Tribe for permanent ownership and continued stewardship.

The Yurok lands, which are subject to an existing carbon sequestration project, contain highly valued mature evergreen trees that are vital for carbon storage and sequestration. They capture over 20,000 metric tons of carbon annually—equivalent to emissions from over 8 million gallons of gasoline—and provide ideal habitat for local wildlife, including imperiled species such as the Pacific fisher and Humboldt marten. The Tribe is now deploying a blend of "Traditional Ecological Knowledge and western science" to restore the landscape, reestablish old-growth forests, and create suitable habitat for rare and threatened species.[43]

Northern Montana: Water Resource Protection

Climate change is reshaping water availability and water quality globally. Extreme rain events, droughts, floods, and sea-level rise are all having a huge impact on human populations. Investments in strategic land protection can protect water resources for communities across the country—even in the face of growing climate impacts.

In Whitefish, Montana, 75 percent of the city's drinking water supply was on privately owned timberland. For years, only a handshake deal between Montana's oldest lumber company and the City of Whitefish ensured protection of this critical resource. A similarly informal arrangement allowed public access to these lands

Haskill Basin in Whitefish, Montana. © Steven Gnam

while also protecting habitat for grizzly bears, lynx, wolverines, elk, deer, and many other species.

But as times changed, so did Whitefish. It was quickly becoming a resort destination with ski slopes and golf courses driving up the demand for second-home development locations, such as Haskill Basin, located 5 miles north of Whitefish and only a couple miles south of Whitefish Mountain Resort. As property values rose, so did the risk that the lumber company would sell the property—and that the new owners might not care to honor an unwritten arrangement made more than a century ago.

If habitat fragmentation and development occurred, the city's drinking water supply would be threatened, potentially forcing taxpayers to spend over a half-million dollars a year on alternative drinking water sources. The community needed to act to protect its water supply and support local jobs in timber and tourism. It's estimated that people visit and hike the trail system in Haskill Basin 73,000 times annually, with one-third being out-of-town visitors contributing to more than half of the $6.2 million in economic spending attributed to the Haskill Basin.[44]

With the support of a broad coalition of friends and donors, TPL completed a conservation easement that limits development on more than 3,000 acres of land around lakes, rivers, and streams in the area. These lands already store approximately 127,000 metric tons of carbon and sequester nearly 500 additional tons of carbon annually. That's equivalent to avoiding the burning of 1.2 billion pounds of coal. With the land now permanently conserved and the drinking water supply protected, residents of and visitors to Whitefish can enjoy the Haskill Basin knowing the land will always serve the community.

Western New Mexico: Biodiversity & Cultural Resources

In a rugged part of New Mexico on the flank of Mount Taylor, herds of elk migrate along rock ledges through stands of ponderosa pine. Black bears and mountain lions range across grasslands and into dense valleys of pinyon and juniper. Fractured rock ledges, striated cliffs of rose, mauve, and ocher, and towering mesas add to the wild landscape.

These lands were part of an effort by TPL to protect 54,161 acres of culturally and ecologically important land bordered by national forest on one side, a state wildlife area on another, and the Pueblo of Laguna on a third. This acquisition by the New Mexico Department of Game and Fish was a major addition of wild land in New Mexico and protects a variety of mountain, mesa, and valley habitats that scientists believe are particularly important for wildlife in a changing climate. That's because most of the acquired lands lie within an area determined to be part of a "resilient, connected lands" network.[45]

This land is situated in a biologically rich region that serves as a big-game migration corridor and is habitat for over 400 plant and animal species. Of note, the

land is in the heart of an elk migration corridor linking the winter range in the northeastern foothills to the summer range on the northern plateau of Mount Taylor, west of Albuquerque. With elevation ranging from 6,000 feet in the valleys to over 9,000 feet on the high mesas, the property provides species the flexibility to move and adapt to temperature shifts driven by climate change. The land is also a major carbon sink, currently storing approximately 378,000 metric tons of carbon and absorbing an additional 1,300 metric tons annually.

In addition to its ecological importance, part of the landscape is considered a sacred site by as many as 30 Indigenous communities. In 2009, some 400,000 acres on and around Mount Taylor, an extinct volcano rising to 11,301 feet, were designated under state law as traditional cultural property. The Pueblo of Acoma, the Pueblo of Laguna, the Hopi Tribe, the Navajo Nation, and the Pueblo of Zuni have called the area home for more than a thousand years. As protected public land, members of the Tribes, Nations, and Pueblos now have access to this land in perpetuity.

New England: Community Health

Based on current rates of development and deforestation, New England could lose 1.2 million acres of forest by 2060—which would decrease natural carbon storage capacity by 19 percent.[46] In response, towns and cities across New England are turning to community forests—land that is "owned, managed, and cared for by a community."[47] Community forests are a powerful tool for residents to protect and manage their local landscapes and expand their connection to the outdoors. As a potential source of timber-related jobs and income derived from outdoor recreation, these forests also help strengthen local economies. And they preserve open space while inspiring community engagement and collaboration as people work together to identify and achieve shared conservation goals.

As a recent example of this powerful tool, TPL teamed up with the Town of Huntington and the Vermont Land Trust to create the Huntington Community Forest.

L Bar Ranch, New Mexico. © Dave Cox/Mountain Media

Immediately adjacent to the Brewster-Pierce Memorial School in the heart of Huntington, the 245-acre property provides the school with an outdoor classroom where kids can get outside and learn about the natural world every day, all year long. Providing a safe and welcoming place for children to explore the outdoors is critical to community health; countless studies have shown the mental and physical health benefits of spending time in nature, particularly for children.[48,49]

In addition to providing opportunities for kids to enjoy the outdoors, by protecting the property's riparian areas, wetlands, river corridors, and headwater streams, flood resiliency in the Huntington River Watershed is improved, as is the quality of the school's drinking water.

While the property is relatively small, its climate impact is large. The conserved lands already store approximately 24,000 metric tons of carbon and annually capture an additional 50 metric tons of carbon from the atmosphere, giving the community an active role in carbon sequestration.

Forests contribute to community health on many levels. A robust tree canopy sustains human health and well-being and protects environmental health, providing an estimated $18.3 billion in benefits each year, including air and water pollution removal, water protection, carbon sequestration, carbon storage, energy savings for buildings, heat reduction, and avoided stormwater runoff.[50] Research by TPL has demonstrated additional economic benefits of community ownership and management of local forests. These 'community forests' provide millions of dollars in economic benefits through a range of ecosystem services, increased recreation, tourism, and more.

Huntington Community Forest, Vermont. © Peter Cirilli

Conclusion–A Reason for Hope and a Time for Action

Climate change threatens the health of our communities, our children, and our future. The year 2023 was officially the warmest year on record, pushing our planet to the brink. We see the impacts almost daily—flooded towns, raging wildfires, prolonged droughts. Meanwhile, heat waves are quietly killing more people each year than any other type of severe weather in the United States.[51] In a vicious cycle, climate impacts are undermining nature's capacity to stop them. Wildfires, for instance, are turning forests from carbon sinks to carbon sources.[52] All the while, low-income communities are bearing the brunt of the climate crisis.[53] The 2022 special report by the Intergovernmental Panel on Climate Change has been called a "code red for humanity."[54]

But there is reason for hope—especially if we act now. As this report attests, there are proven nature-based options to address the climate crisis. Trees, plants, and soil can slow climate change by absorbing carbon from the atmosphere, where it contributes to global warming. At the same time, natural areas increase our resilience to climate change: wetlands and coastal lands buffer communities from flooding and sea-level rise; trees and plants alleviate health risks such as heat stroke and asthma by cooling and cleaning the air; forests and watersheds sustain us and protect us from drought. **In fact, natural solutions are the only ones that simultaneously address the causes and effects of climate change.**

While all conservation provides some climate benefits, the urgency of the climate crisis demands that we take a more strategic approach to realize the full potential of land conservation as a climate action strategy. This requires us to rethink where and how we conserve land and what happens once the land is protected.

When considering where and how we work, community and equity should be central to climate conservation initiatives. Local and Indigenous knowledge, wisdom, and perspectives should form the foundation and guide conservation. After all, local residents will be the ongoing stewards and users of these protected lands.

There are a growing number of tools, resources, and best practices that the conservation community can deploy to have a greater impact. Examples include online mapping tools that pinpoint carbon-rich landscapes, conservation easements designed to increase carbon sequestration and climate resilience of protected lands, and land management practices that reduce wildfire risk. Communities can use these resources to set conservation priorities that provide significant carbon storage and resilience benefits.

TOOLS AND RESOURCES FOR CLIMATE CONSERVATION

CONSERVATION CARBON MAP:
https://web.tplgis.org/carbonmap/

RESILIENT LAND MAPPING TOOL:
https://www.maps.tnc.org/resilientland/

CLIMATE CONSERVATION EASEMENT LANGUAGE:
https://s3.us-east-1.amazonaws.com/osi-craft/pdfs/CE-language-for-carbon-and-resilience_July-2023-FINAL.pdf

NATURAL CLIMATE SOLUTIONS TOOLBOX:
https://usnature4climate.org/toolbox/

Mill Brook Green in Windsor, Connecticut. © Richard Freeda

How we manage lands after they are conserved matters, too. Conservation is no longer a "protect it and leave it" proposition; stewardship to manage for climate-driven hazards is essential to maintain long-term benefits for water supply and quality, air quality, biodiversity and wildlife, public health protection, and equitable access. Stewardship done right requires thoughtful input from a broad array of stakeholders, adequate funding, and adaptive management to evaluate risks and adjust practices over the long term.

While historic levels of funding have supported conservation in recent years, more funding is needed to meet the challenge of the climate crisis. In the near term, Congress should continue to employ the tools at their disposal, such as the Farm Bill, as avenues to advance natural climate solutions. This includes continuing and expanding existing programs (such as Forest Legacy and Urban and Community Forestry) and creating new incentives for land protection (like adding a Forest Conservation Easement Program to the suite of Natural Resource Conservation Service programs or designing new easement tools that provide incentives for forest landowners to extend harvest timelines). States must bolster or create programs that leverage federal climate dollars and incentivize local jurisdictions to create more resilient communities. Local governments can also create funding mechanisms for conservation across urban, suburban, and rural landscapes.

With a clear understanding that land conservation can help protect our climate—and our communities—now is the time to act. Through meaningful engagement with communities and advocacy for increased funding and innovative policies, the conservation community can play a central role in tackling the climate crisis while building healthier, more equitable, and more resilient communities nationwide.

Appendix

Defining Carbon Terms and Units

CARBON POOL

A system that has the capability to accumulate or release carbon.

CARBON STOCK

The quantity of carbon in a pool, reported as a measure of mass or weight.

Carbon is measured and reported at different scales and units.

1 metric ton = 1 tonne = 1.102 short tons = 1,000 kg = 2,204.62 lbs

The carbon in a country is often reported in *million metric tons or megatons*:

1 million metric tons (MMT) = 1 megaton (Mt) = 1 teragram (Tg) = 1 x 10_{12} grams (g)

Global measures of carbon are usually reported in *billion metric tons or gigatons*:

1 billion metric tons (BMT) = 1 gigaton (Gt) = 1 petagram (Pg) = 1 x 10_{15} grams (g)

CARBON FLUX

A measure of the amount of carbon transferred between different pools in a specified time period.

1 million metric tons (MMT)/year = 1 teragram (Tg)/year

1 billion metric tons (BMT)/year = 1 petagram (Pg)/year

CARBON DENSITY

A measure of the weight of carbon per a unit of area.

10 tons/hectare (ha) = 1 megagram (Mg)/ha = 1 kilogram (kg)/m^2

1 hectare = 2.47 acres

1 ton of carbon is equivalent to 3.67 tons of carbon dioxide or CO_2=C*3.67

Source: Congressional Research Service, "U.S. Forest Carbon Data: In Brief." Updated June 6, 2023. https://sgp.fas.org/crs/misc/R46313.pdf

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