

**The Indigenous Landscape Initiative:
A project to tend land in the Northeast using traditional Indigenous
methods, for restoration, sustainable production, and knowledge**

A working paper, meant to serve as a basis for discussion and revision

VERSION OF
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*The Indigenous Landscape Initiative (In Land) aims to heal and grow our relationships
with the land and each other through reviving time-honored methods of caring for the
land as it sustains us.*

As with much of the land we now call America, the Indigenous peoples of what is now the Northeastern United States cared for their lands to produce food and other items using methods very different from European methods that form the basis for much of agriculture on this continent today. The Indigenous methods resulted in impressive productivity while, according to some researchers, avoiding a number of common sustainability problems. Many plant and animal species and ecosystem types of the region are particularly fitted to these methods, which encourage the land, such as forests, wetlands, and meadows, to produce more of its own food-bearing plants and other products, while maintaining healthy, regenerative ecosystems with large trees, rich grasses, and high levels of biological diversity. The Indigenous system was developed over millennia of learning how to meet diverse human needs in ways that maintain and even enhance the land's vibrance and provision over the long term. It has much to offer in production and environmental sustainability.

These methods have been largely out of use since Colonial times, though pieces of them are being employed in various places with good results. The Indigenous Landscape Initiative (In Land) is working to revive these traditional methods of caring for the land. The approach is expected to restore damaged ecosystems and produce items that the land historically produced in abundance, including a variety of annual and perennial food plants and other items, and to beautify the landscape, as well as keep down ticks and other pests.

Much remains to be learned about these methods that have been largely out of use for so long. How the various tending activities and species are best arranged over a landscape, how these methods affect new sustainability metrics such as carbon sequestration and

controlling invasive species, and what challenges and opportunities arise in reviving these methods on today's landscape are important questions, to name a few. The project will include ecological research to learn more about the effects of these stewardship methods and how they may be best practiced today.

Native Americans and others are and will continue to be involved in In Land's operations and decision-making, to benefit the land and all who call it home. The project draws on the expertise of ecologists, land managers, historians, and others. We further acknowledge and value Native Americans' special role as bearers of the tradition that the project seeks to echo. In Land seeks to integrate Indigenous knowledge, values, and ways of knowing throughout the project, including in the research, approaches to food access, and other aspects.

This project will contribute to the region's food production and employment ecosystems while reviving beautiful and diverse landscape types as well as generating and sharing knowledge about a form of sustainable cultivation that has been widely ignored since Colonial times. The Indigenous Landscape Initiative will bring to life ways that we can all honor, sustain, and be sustained by the land together, from Native Americans to newcomers, Indigenous to immigrants.

Organization

In Land is in the process of formation as a non-profit organization. We envision working on land across the region, with various ownerships and partnership arrangements. As the project combines restoration, production, research, and education, people tending the land, foraging or processing products, researching the ecology, and teaching and learning will all be using the spaces and will often be working together to accomplish their goals. The project will aim to be rooted in and guided by the community. The specifics of the operations will depend on each site's ecological characteristics as well as on its ownership and use structure.

In Land will emphasize honoring land and people. We will adhere to high standards of social and environmental responsibility in all of our operations. In addition to emphasizing food access, In Land will seek to create learning and employment opportunities for members of underserved communities.

Products and markets

The Indigenous peoples of the Northeast cultivated myriad products, including tree nuts such as hickory, acorn, chestnut, and others; shrubs and perennial plants including strawberries, raspberries, blueberries, and others; annual crops including the well-known corn, beans, and squash as well as many others. They cultivated game mammals and game birds, fish, maple syrup, wood, basket materials, and other products.

In Land will cultivate many of the same items over time, as appropriate to each site. Depending on each site's characteristics, ownership, and use arrangements, items may be gathered and used primarily through individual foraging or foraging as part of

educational or community programs, or they may be gathered and processed through more of a production operation. Gathering practices are an important element of how Indigenous peoples have traditionally cared for their lands to produce and sustain abundance, and In Land will work with Indigenous advisors to develop structures and guidance for gathering activities.

The project will seek to serve existing markets, such as the local foods, retail, and possibly prepared foods markets. It will also develop relationships with individuals and groups with particular interest in In Land's special approach and offerings, such as traditional healers and natural leather crafters. In Land will seek to educate the community about and develop interest in the products in ways that Native peoples traditionally used them, such as acorns as a food item. It will likely also produce and market other uses of some items, such as nut shells for cushion stuffing. Enabling economically disadvantaged individuals access to the products, as well as access to opportunities to come forage and learn, will be an important component of the project.

Research on Indigenous land tending practices and species cultivated is ongoing. In Land will incorporate new knowledge as the knowledge develops, and it will also contribute to experimentation and research.

In Land may use modern tools, as long as they adhere to high environmental standards and are determined, as far as we can know, not to interfere with the cultivation techniques and ecological systems that the project seeks to facilitate. The goal is not to reenact historical tools but rather for current restoration and cultivation work to use traditional Indigenous methods and approaches.

Education

In Land is devoted to education and having an active role in the community. In addition to foraging opportunities, we will hold events for the community to engage directly in other aspects of caring for the land, such as planting, as well as educational and cultural events, perhaps with storytelling, food processing workshops, and other components. In Land will hold lectures and seminars to educate and engage the community and for those involved in various aspects of the project to learn more about each other's work. In Land will also hold programs for youth and adults to come spend time outdoors, learn about the land, and build healing relationships.

In Land will emphasize sharing knowledge and creating replicable models; it will seek to communicate findings and practices to landowners, land managers, conservation practitioners, farmers, and others. In Land will be available to advise any group embarking on a similar project.

Selected reading

Bonnicksen, Thomas M. *America's Ancient Forests: From the Ice Age to the Age of Discovery*. John Wiley & Sons, New York, NY, 2000.

Cronon, William. *Changes in the Land: Indians, Colonists, and the Ecology of New England*. Hill and Wang, New York, NY, 1983.

Davies, Karl. Some ecological aspects of northeastern American Indian agroforestry practices. 1984. http://daviesand.com/Papers/Tree_Crops/Indian_Agroforestry

Gattuso, Reina. How did Cahokian farmers feed North America's largest Indigenous city? March 28, 2019. <https://www.atlasobscura.com/articles/native-american-farming-cahokia>

Goode, Ron W. Tribal-Traditional Ecological Knowledge. 2013. https://cawaterlibrary.net/wp-content/uploads/2017/05/Tribal_Traditional_Ecological_Knowledge.pdf

Kimmerer, Robin Wall. *Braiding Sweetgrass*. Milkweed Editions, Minneapolis, MN, 2013.

Kimmerer, Robin Wall, Frank Kanawha Lake. The role of Indigenous burning in land management. *Journal of Forestry* 99, 11, 36-41, November 2001. <https://academic.oup.com/jof/article/99/11/36/4614303>

MacCleery, Douglas W. When is a landscape natural? *Forest History Today*, 1998. https://foresthistory.org/wp-content/uploads/2016/11/MacCleery_When-is-a-Landscape-Natural.pdf

Mann, Charles C. 1491. *The Atlantic*, March 2002. <https://www.theatlantic.com/magazine/archive/2002/03/1491/302445>

Kashwan, Prakash. American environmentalism's racist roots have shaped global thinking about conservation. September 2, 2020. <https://theconversation.com/american-environmentalisms-racist-roots-have-shaped-global-thinking-about-conservation-143783>

Addendum I: American chestnut

The American chestnut was once a dominant forest tree throughout much of the Eastern United States. Beginning in the early 1900s the chestnut blight disease, caused by an imported fungus, decimated the tree's population and threatened to eradicate the species. Today, efforts to reestablish the American chestnut focus on breeding or engineering blight-resistant trees or on propagating a virus that infects the blight. A promising avenue that has received less attention involves considering the conditions of cultivation to favor the tree's natural defenses or to disadvantage the blight.¹ Strong evidence suggests that

¹ Susan Freinkel, *American Chestnut: The Life, Death, and Rebirth of a Perfect Tree*. University of California Press, Berkeley, CA, 2007.

American chestnut may be at its best in fire-maintained ecosystems,² conditions that also disadvantage many fungal plant pathogens.³

In Land plans to contribute through research on its sites to investigating the idea that American chestnut restoration may be aided by ecosystem approaches that Indigenous peoples used for millennia throughout the tree's range. This approach may also prove helpful for other American trees threatened by imported or newly virulent pathogens.

Addendum II: Climate resilience and mitigation

The Indigenous Landscape Initiative will investigate how Indigenous land tending methods may affect current sustainability challenges such as climate change. Evidence strongly suggests that Indigenous practices produce climate-resilient landscapes for healthy wildlife habitat and other ecosystem services as well as food. These methods may also result in more carbon-sequestering food production and forest land, with carbon sequestration that is itself less vulnerable to the effects of climate change. In Land intends to investigate the climate aspects of these methods and to educate land managers and landowners about its findings, to contribute to regional landscape and food system climate resilience and mitigation.

The region's Indigenous peoples tended their lands for many thousands of years, and research suggests that their stewardship supported diverse, healthy ecosystems through previous warming periods. Research has also found that effects of management on vegetation may override or negate those from climatic changes.⁴

Several dominant tree species of pre-contact Eastern forests are both fire-tolerant and drought-resistant, including species adapted to a wide range of climatic areas and site types.⁵ Without Indigenous stewardship, of which placing fire on the land was a key component, these species are diminishing and are being replaced, perhaps irreversibly, by fire and drought -sensitive species that used to occupy smaller areas of the landscape.⁶ Researchers have commented that the changes that Eastern forests are undergoing as a result of the cessation of Native American stewardship methods are “making them increasingly susceptible to future climate change (warming and drought).”⁷ As climate change brings more droughts and more climate variability, a landscape dominated by

² Jeffrey M. Kane, J. Morgan Varner, Michael C. Stambaugh, Michael R. Saunders. Reconsidering the fire ecology of the iconic American chestnut. *Ecosphere*, October 5, 2020. <https://doi.org/10.1002/ecs2.3267>

³ Karl Davies, Some ecological aspects of northeastern American Indian agroforestry practices. 1984. http://daviesand.com/Papers/Tree_Crops/Indian_Agroforestry/ (last accessed Feb 22, 2021).

⁴ Gregory J. Nowacki, Marc D. Abrams. Is climate an important driver of post-European vegetation change in the Eastern United States? *Global Change Biology* **21**, 314-334 (2015). doi: 10.1111/gcb.12663

⁵ Marc D. Abrams. Where has all the white oak gone? *BioScience* **53**, 10, 927-939, October 2003.

⁶ Gregory J. Nowacki, Marc D. Abrams. The demise of fire and “mesophication” of forests in the eastern United States. *Bioscience* **58**, 2, 123-138, February 2008.

⁷ Marc D. Abrams, Gregory J. Nowacki. Native American imprint in palaeoecology. *Nature Sustainability*, 2020. doi: 10.1038/s41893-020-0578-6

drought-resistant and broadly adapted tree species may remain healthier than the forests that are coming to dominate the landscape. These broadly-adapted and drought-resistant species are also good for food.⁸ Reincorporating these species into the landscape and the food system thus contributes to both ecosystem and food system climate resilience. In addition, though these trees' ranges include the Northeast, many of them are focused further south, so propagating them here can contribute to climate adaptation as this region's climate is predicted to shift to resemble that of areas further south, toward the center of the trees' ranges.

The Indigenous methods may contribute to carbon sequestration as well. Characteristics of these formerly-dominant tree species that contribute to their fire and drought tolerance, such as having deep and extensive root systems, also contribute to long-term carbon sequestration. Grasslands, particularly those with plant diversity, can also contribute substantially to carbon storage,⁹ and the Indigenous methods foster robust and diverse grass and forb (herbaceous non-grass) populations in meadows and on the forest floor, especially deep-rooted species, which are particularly helpful for carbon sequestration.¹⁰ Evidence also suggests that mycorrhizae (root-associated fungi), which play an important role in plant and soil carbon sequestration, have higher productivity in the presence of several of the elements of Indigenous land stewardship.^{11, 12} More investigation is needed to understand how various factors affect underground carbon storage. In addition, the Indigenous methods invite the production of food from perennial plants such as trees and bushes, which sequester more carbon than smaller plants used in agriculture, particularly those that are removed each year.

Prescribed fire may also contribute to the resilience of a landscape's carbon sequestration in the face of climatic changes. Prescribed burning reduces the likelihood of, and the carbon available to be released in, catastrophic wildfires that can occur with accumulated forest debris and that are expected to increase with climate change. Catastrophic wildfires can contribute sudden large influxes of carbon to the atmosphere, promoting climate effects. Prescribed burns release some carbon but they promote vigorous plant growth that may even sequester more carbon than is released. In addition, vegetation regrows faster, absorbing and sequestering carbon faster, with light fires such as those of prescribed burns than with catastrophic fires.

Climate change is expected to increase plant pests and diseases, while weakening trees' and other plants' resistance to them. Indigenous land practices may increase landscape

⁸ Marc D. Abrams, Gregory J. Nowacki. Native Americans as active and passive promoters of mast and fruit trees in the eastern USA. *The Holocene* **18**, 7, 1123-1137, 2008. doi: 10.1177/0959683608095581

⁹ Yongfei Bai, M. Francesca Cotrufo, Grassland soil carbon sequestration: Current understanding, challenges, and solutions. *Science* **377**, 6606, 603-608 (2022) doi: 10.1126/science.abo2380

¹⁰ Nuccio, Erin E. 2021. "Deeply Rooted: Evaluating Plant Rooting Depth as a Means for Enhanced Soil Carbon Sequestration (Full Technical Report)." United States. <https://doi.org/10.2172/1829022>. <https://www.osti.gov/servlets/purl/1829022>.

¹¹ Personal communication at North Atlantic Fire Science Exchange webinar, June 16, 2022

¹² Richa Agnihotri, Mahaveer P. Sharma, Anil Prakash, Aketi Ramesh, Sudeshana Bhattacharjya, Ashok K. Patra, Madhab C. Manna, Irina Kurganova, Yakov Kuzyakov, Glycoproteins of arbuscular mycorrhiza for soil carbon sequestration: Review of mechanisms and controls. *Science of The Total Environment* **806**, 2, 150571 (February 2022). <https://doi.org/10.1016/j.scitotenv.2021.150571>

resilience against these pests and diseases. Native American practices sought to reduce pests,¹³ and their methods, such as use of fire, have been shown to reduce pest populations. Further, the wider tree spacing of dominant Indigenous ecosystem types, such as woodlands and savannahs rather than dense forest, reduces competition among trees for resources such as water, increasing their resilience against pest and pathogen attacks; the wider spacing may also reduce pests' gathering responses.¹⁴ The Indigenous methods also created patches of different ecosystem types and different stages of succession, a landscape-scale diversity that post-contact changes have compromised.¹⁵ By creating breaks between areas of similar types or ages, this patchiness could help curb pest spread.

Indigenous land tending methods appear to promote landscape climate resilience through a variety of means. Through reviving these methods, In Land will both investigate their climate qualities and advance regional climate resilience and mitigation.

Addendum III: Alternative description of the project

Strong historical and ecological evidence suggests that the forests of the Northeastern United States can be cultivated to produce impressive yields of high-value crops such as tree nuts and berries, an array of vegetables, various specialized crops such as dyes and medicinal plants, and other commercial items, all in a way regarded as environmentally sustainable. This method is also expected to produce multiple times the normal deer population (and larger deer), and multiple times the population of game birds such as grouse and turkeys, on the same land as the trees and other plant crops. The methods to achieve this productivity, used by Indigenous peoples before Europeans' arrival, have been largely out of use and all but forgotten. The Indigenous Landscape Initiative (In Land) will revive these methods, which are an intricate but elegant form of multicropping and include elements of established successful cultivation systems such as permaculture and European silvopasture. In Land will tend land to produce marketable food and other items and with them employment, and it will track and study the production results and effects on the land to help learn more about this cultivation system and to help others wishing to use these practices.

In these methods, according to some researchers, careful burns made dead plant matter immediately available to the soil, focused growth toward plant parts that make good food for humans and game animals, killed plant diseases, and even extended the growing season by blackening the ground to absorb sunlight. Vegetable fields maintained productivity by rotating with berry bushes and other products. Firewood trees were apparently allowed to grow in dense stands along with other crops and then harvested in time not to require splitting. Berries, nut trees, and other plants were grown in open

¹³ Karl Davies, Some ecological aspects of northeastern American Indian agroforestry practices. 1984. http://daviesand.com/Papers/Tree_Crops/Indian_Agroforestry/ (last accessed Feb 22, 2021).

¹⁴ Neil Gifford, Albany Pine Bush Preserve Commission, personal communication, November 10, 2023.

¹⁵ Gregory J. Nowacki, Marc D. Abrams, Is climate an important driver of post-European vegetation change in the Eastern United States? *Global Change Biology* **21**, 314-334 (2015). doi: 10.1111/gcb.12663

stands focused on new growth that fed people and also attracted and grew abundant and large game animals, with nearby stands of small trees that both served as cover for these animals and increased soil nutrients through special action at their roots.

Components of this system are in use now. For example, years ago USDA experts writing about forests in the Southwest advised that wildlife increases from controlled burns could increase revenue from hunting licenses, and fire is increasingly recognized as an important tool to keep American forests healthy. Some blueberry growers in New England are using fire to increase production. But as far as we know no one is putting together the pieces of this intricate cultivation system for production while watching the results to learn more and make the knowledge available. In Land intends to do just that.