

Climate (not humans) shaped early forests of New England

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The long-held belief that native people used fire to create a diverse landscape of woodlands, grasslands, heathlands, and shrublands in New England has led to a widespread use of prescribed fire as a conservation tool. Research by Oswald and colleagues indicates that these openlands actually arose following European contact, deforestation, and agricultural expansion. These landscapes and their critical habitats and species are best maintained through agricultural practices like grazing, as seen here on a hillside in Chilmark, Martha's Vineyard, MA. Credit: David Foster, Harvard University

A new study in the journal *Nature Sustainability* overturns long-held interpretations of the role humans played in shaping the American landscape before European colonization. The findings give new insight into the rationale and approaches for managing some of the most biodiverse landscapes in the eastern U.S.

The study, led by archaeologists, ecologists, and paleoclimatologists at Harvard, Emerson College and elsewhere, focuses on the coast from Long Island to Cape Cod and the nearby islands of Nantucket, Martha's Vineyard, Block Island, and Naushon—areas that historically supported the greatest densities of Native people in New England and today are home to the highest concentrations of rare habitats in the region, including sandplain grasslands, heathlands, and pitch pine and scrub oak forests.

"For decades, there's been a growing popularization of the interpretation that, for millennia, Native people actively managed landscapes—clearing and burning forests, for example—to support horticulture, improve habitat for important plant and animal resources, and procure wood resources," says study co-author David Foster, Director of the Harvard Forest at Harvard University. This active management is said to have created an array of open-land habitats and enhanced regional biodiversity.

But, Foster says, the data reveal a new story. "Our data show a landscape that was dominated by intact, [old-growth forests](#) that were shaped largely by regional climate for thousands of years before European arrival."

Fires were uncommon, the study shows, and Native people foraged, hunted, and fished natural resources without actively clearing much land.



Conservationists have employed prescribed fire in an attempt to maintain openland habitats such as the Katama sandplain grassland on the island of Martha's Vineyard. Research by Oswald and colleagues indicates that, despite a large human population for thousands of years, fire was uncommon and landscapes across southern New England were heavily forested until European contact and deforestation for agriculture. Grazing and other agricultural practices can be used to maintain these uncommon habitats today. Credit: David Foster, Harvard University

"Forest clearance and open grasslands and shrublands only appeared with widespread agriculture during the European colonial period, within the last few hundred years," says Wyatt Oswald, a professor at Emerson College and lead author of the study.

The authors say the findings transform thinking about how landscapes have been shaped in the past—and therefore how they should be managed in the future.

"Ancient Native people thrived under changing forest conditions not by intensively managing them but by adapting to them and the changing environment," notes Elizabeth Chilton, archaeologist, co-author of the study, and Dean of the Harpur College of Arts and Sciences at Binghamton University.

To reconstruct historical changes to the land, the research team combined archaeological records with more than two dozen intensive studies of vegetation, climate, and fire history spanning ten thousand years. They found that old-growth forests were predominant for millennia but are extremely uncommon today.

"Today, New England's species and habitat biodiversity are globally unique, and this research transforms our thinking and rationale for the best ways to maintain it," says Oswald. "It also points to the importance of historical research to help us interpret modern landscapes and conserve them effectively into the future."



Archaeologists Dianna Doucette, Deena Duranleau, and Randy Jardin conducting investigations at the Lucy Vincent Beach Site, Martha's Vineyard. The long-held belief that native people used fire to create a diverse landscape of woodlands, grasslands, heathlands, and shrublands in New England has led to a widespread use of prescribed fire as a conservation tool. Research by Oswald and colleagues indicates that these openlands actually arose following European contact, deforestation, and agricultural expansion. Credit: Elizabeth Chilton, Binghamton University

The authors also note the unique role that colonial agriculture played in shaping landscapes and habitat. "European agriculture, especially the highly varied activity of sheep and cattle grazing, hay production, and

orchard and vegetable cultivation in the 18th and 19th centuries, made it possible for open-land wildlife species and habitats that are now rare or endangered—such as the New England cottontail—to thrive," says Foster. Open-land species have declined dramatically as forests regrow on abandoned farmland, and housing and commercial development of both forests and farms have reduced their habitat.

Foster notes that the unique elements of biodiversity initiated through historical activities can be encouraged through analogous management practices today.

"Protected wildland reserves would preserve interior [forest](#) species that were abundant before European settlement," he says. "Lands managed through the diversified farming and forestry practices that created openlands and young forests during the colonial period would support another important suite of rare plants and animals."

For successful conservation models that leverage this historical perspective, the authors point to efforts by The Trustees of Reservations, the oldest land trust in the world, which manages more than 25,000 acres in Massachusetts embracing old and young forests, farms, and many cultural resources. The organization uses livestock grazing to keep lands open for birds like bobolinks and meadowlarks, which in turn supports local farmers and produces food for local communities.

Jocelyn Forbush, Executive Vice President for the Trustees, says, "Maintaining the legacy of our conserved openlands in Massachusetts is an important goal for The Trustees and we are increasingly looking to agricultural practices to yield a range of outcomes. In particular, we are employing grazing practices to support the habitats of our open and early successional lands in addition to the scenic and cultural landscapes that shape the character of our communities."

More information: Conservation implications of limited Native American impacts in pre-contact New England, *Nature Sustainability* (2020). [DOI: 10.1038/s41893-019-0466-0](https://doi.org/10.1038/s41893-019-0466-0) , [nature.com/articles/s41893-019-0466-0](https://www.nature.com/articles/s41893-019-0466-0)

Provided by Harvard University

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