

Hoffman Evergreen Preserve: a forest for now and the future

"The best time to plant a tree is 20 years ago. The second best time is now."
—Chinese proverb

By Juliana Barrett

Hickory, dogwood, oak and loblolly pine saplings now grow where hemlock and ash trees once stood.

Shadbush, hazelnut and viburnum have begun to fill the understory, offering berries and nuts for Eastern towhees, brown thrashers and other birds that favor shrub habitats.

These are some of the hallmarks of the transformation of Hoffman Evergreen Preserve, owned by Avalonia Land Conservancy and coursed with popular hiking trails. This nearly 200-acre forest in Stonington is close enough to Long Island Sound to be influenced by salt spray from storms and ocean and air temperatures increasing with climate change.

Rather than let those and the other new realities of the changing climate dramatically alter the forest habitat unchecked, Avalonia Land Conservancy and Connecticut Sea Grant created a bold and unique plan to intervene using the principles of assisted adaptation. Assisted adaptation requires stewards to look to models that project a future affected by climate change, and to select trees and shrubs that are likely to survive and prosper now, and in 30 to 50 years. This fosters a healthy plant and wildlife community long into the future.

In the process of carrying out this plan with the help of volunteers, I witnessed a real-life manifestation of the inspiring words of Aldo Leopold, one of the nation's most influential environmentalists and foresters:

"Acts of creation are ordinarily reserved for gods and poets, but humbler folk may circumvent this restriction if they know how. To plant a pine, for example, one need be neither god nor poet; one need only own a shovel."

The story of Hoffman Preserve is one of both response to the immediate problem of an unhealthy forest, and of preemptive actions designed to accommodate projected climate conditions, some of which we are already experiencing. Many of us are dealing with hotter summer temperatures and heat waves, drought, road flooding during high tides and extreme weather events such as rain deluges and tornado watches.

We often look first at the impacts these changes are having on our lives and infrastructure—the homes we live in, the roads we travel on and our activities. But the biodiversity and natural environments around us are also impacted.

Local forests like the Hoffman Preserve are a critical resource as



In an area cleared of dead and dying trees, an Avalonia volunteer prepares a spot for a sapling during a May 2021 community planting event. Photo: Judy Benson

wildlife habitat and provide many benefits. These include carbon sequestration, water conservation and prevention of soil erosion, reduction of air pollution and as places for recreation, education, mindfulness, birding and hiking. But how is climate change impacting our forests? The U.S. Forest Service has conducted detailed climate vulnerability assessments for regions within the United States to answer this question and is partnering on forest climate adaptation projects.

But Avalonia wasn't initially considering the future of Hoffman Evergreen Preserve, which was created by Robert D. Hoffman, a mining engineer who prospected for gold in Canada during the 1920's. Five decades ago, Hoffman planted thousands of conifer seedlings across his many acres. Hoffman died in 1975, and the 142-acre property consisting of a hemlock, pine, tamarack and spruce intermixed with hardwood species, was acquired by Avalonia in 1976. Several other tracts were added in 1997 and 2013, bringing the total to nearly 200 acres.

Beth Sullivan is Avalonia's Stonington Town Chairperson and lead steward on this project. She notes that a 1984 environmental review of the preserve indicated that the conifers were mature and generally healthy, intermixed with hardwoods such as beech, oak and birch. Even then, the report included recommendations for active management, to preserve forest diversity. Undertaking and implementing the recommendations was costly, and at the time, Avalonia did not have the resources to fully execute an appropriate plan.

Then came a series of blizzards, nor'easters, hurricanes and storms including Irene and Sandy, disease, insect pests, drought and deer overbrowsing that took a toll on both the conifers and deciduous trees. This left many dead and dying trees, forest structure with little to no understory, over-mature conifers and fire and safety hazards. Invasive pests including the hemlock woolly adelgid, hemlock scale, spongy moth (formerly called



An Avalonia Land Conservancy volunteer digs a hole in preparation for planting an oak tree at the Hoffman Evergreen Preserve in May 2021. Photo: Judy Benson

gypsy moth) and emerald ash borer caused widespread damage to many hemlocks, oaks and ash throughout the preserve. In a 2014 review by the Connecticut Department of Energy and Environmental Protection, Audubon Connecticut and Avalonia stewards concluded that the preserve needed attention soon. Habitat quality had significantly declined, and there were mounting safety concerns.

Sullivan has monitored the Hoffman Preserve for several decades and participated in more recent studies and surveys which spelled out the decline in forest health. The deterioration and death in the old forest was obvious. Diversity was needed: in species, age classes and habitats. Letting sunlight into new areas would promote new growth, encourage new species, create the layered habitat required for wildlife species diversity, and begin forest restoration for better health and productivity. While moving forward was a difficult step to take, a forestry plan would provide a resource and road map for future forestry projects that would become even more important as climate change stresses forest ecosystems.

In November 2018, Avalonia's Board of Directors approved a forestry plan that included significant tree cutting and thinning by an accredited forester, paid for through the sale of harvested trees. Put into effect in 2019, the plan included clearing approximately 6.2 of the 200 acres in a series of five patch cuts. About 54 additional acres were thinned to open areas of dense growth or impacted by skid trails created to move equipment and downed trees.

As the timber harvest was taking shape, members of Avalonia's Stonington Town Committee explored next steps. They asked: do we plant? Do we seed? What evergreens could be planted? Do we let nature take its course and see what comes up from the seedbank, or be proactive by planting desirable, climate appropriate species in the new openings? Sullivan obtained and planted several loblolly pines in the thinned areas as an experiment.



A poet's view:

Connecticut State Poet Laureate Margaret Gibson, a member of Avalonia Land Conservancy, wrote and recorded a reading of her poem about Hoffman Preserve.

"Listening to the Forest"

https://youtu.be/ECWwLWU9a_k

I had worked with Sullivan and Avalonia on a resilience project at the land trust's Dodge Paddock Beal Preserve, a coastal site in Stonington. Now, the opportunity to create a healthy coastal forest in the context of resilience, climate change impacts, and forest management presented itself. As the coastal habitat specialist for Connecticut Sea Grant, I eagerly partnered with Avalonia to tackle the unique challenge of developing a future-focused plan for Hoffman. Avalonia is a land conservancy with the capacity to mobilize a seasoned group of knowledgeable and dependable volunteers.



The Hoffman Evergreen Preserve, in red, is located in the northwest corner of Stonington. Map: Avalonia Land Conservancy

"Making the decision to do this project was painful, but not as painful as watching the forest lose its life and knowing we had the ability to do something," Sullivan said. "The common-sense answer was the same as the scientific one: let in the light and create diversity. Aim for resilience. I will not be here in 30 years to see the matured results, but the Scouts, parents and other children will be, and can take ownership and pride in the forest for decades in the future."

In early winter of 2020, Sullivan, Sharon Lynch, a retired professor of science education from George Washington University and member of the Avalonia Stonington Town Committee, and I met. We discussed how we might implement a new project focused on appropriate plantings for Hoffman based on climate change projections. We located research-based lists of species that were more adapted to warmer climates, and of southern species that might ultimately expand their ranges over time into Connecticut. Lynch contacted national forestry experts and researchers involved with similar adaptation projects for input on a Hoffman Preserve plan.

A crucial consideration was the preserve's location in southeastern Connecticut, a region identified by the National Oceanic and Atmospheric Administration as an air temperature hotspot in the northeast that has already exceeded 2.9°F of average temperature change (temperature anomaly) between 1895 and 2018. The frost-free and growing seasons are expected to be longer, while precipitation patterns are less certain. Seasonal drought risk is projected to increase in the summer and fall, as is the frequency of previously rare extreme weather events. These climatic changes may impact vegetation directly through air temperature and precipitation patterns or through pests and disease. Therefore, we had to ascertain which species might grow well under these projected conditions to develop and manage a resilient forest.

Two undergraduates from the University of Connecticut Climate Corps, a class I teach that gives students the chance to work on real-world climate



adaptation projects, were added to our team. As part of their Climate Corps work, Chris Arrotti and Griffin Licari spent the Spring 2020 semester researching climate projections for southeastern Connecticut, the physical conditions of the Hoffman Preserve areas impacted by the patch cuts, U.S. Forest Service Vulnerability Assessments for the Northeast and Mid-Atlantic, and other forest-vegetation related resources.

We wanted to plant two categories of species to develop a resilient forest: 1) trees and shrubs native to Connecticut which would do well under both current and future climate conditions but may not be available in the existing seed bank for regeneration; and 2) southern natives, trees and shrubs many of which already occur in the Long Island Sound Study region. Most of these “southern natives” are already present in Connecticut, sold in nurseries statewide and planted in yards, parks and urban downtowns. Native to southeastern New York and New Jersey, they are likely to become established in coastal Connecticut as temperatures continue to warm. These species include sweet gum, persimmon and red bud. Forest experts and state ecologists provided input on the final plant list.

Some of the trees and shrubs that were planted:	Birds that are appearing in the newly opened and thinned areas (including forest birds that use the openings to catch insects):
Red oak, white oak, black oak	Bluebird
Sweet gum	Chipping Sparrow
Tulip	Blue winged warbler
Redbud	Prairie warbler
Persimmon	Eastern towhee
Loblolly pine	Goldfinch
Long leaf pine	Many types of flycatchers (phoebe, Eastern wood peewee, great crested flycatcher)
Gray dogwood	
Pignut hickory	
Black gum	
Common serviceberry (shadbush)	
Smooth sumac	

With a good idea of what we wanted to plant and where to get the plants, we needed to share our plans with the public. When the 60 acres of tree cutting was completed in late 2019, many visitors to this well-used preserve questioned it, voicing a wide range of concerns about the management actions.

Lynch led our outreach efforts which included contacting forestry experts to speak at a four-part webinar series and a workshop for resource managers working on similar forest resilience issues. The recorded webinar series, “Finding the Right Trees for the Right Time,” can be found at <https://clear.uconn.edu/2021/03/10/finding-the-right-trees-for-the-right-time/>. Participants for the webinar series, while mainly from New England states, came from across the country with questions indicating that this concept of healthy, resilient forests is critical everywhere.

For Lynch, the project itself and the webinar component matched her interests as an educator in both formal and informal community learning.

“This project taught its lessons through its webinars, as well as through the activities of the many people who helped to plant the trees and shrubs at Hoffman,” she said. “The conservation specialists and Avalonia stewards, as well as hikers, birders, and wanderers, have witnessed climate change effects in a stressed local forest. But they also can see what humans might do to alter its impact. Networked learning and action are likely crucial, not only to help our natural areas flourish, but also to help us retain the environmental health of our populated areas. We will need such smart collaborations to survive and thrive.”

Another important aspect of resilience at this preserve focuses on the wildlife of the Long Island Sound Study region. Over the last several decades, wildlife abundance and diversity have diminished at Hoffman.

Robert Askins, professor emeritus of ornithology at Connecticut College, noted that bird species that depend on dense shrub layers in the forest interior or on forest openings have declined, and should be a priority for conservation and management efforts. By providing some southern native plant species at Hoffman, we help ensure that a food source will be available even as more northerly species potentially decline. Establishment of high-, low-, and ground-level shrub layers will create habitat for insects and other invertebrates as well as small mammals, and provide missing links in the food web. Many new bird species have been recorded and documented at the preserve since the cutting.

A critical component to implementing our plan was finding volunteers to plant saplings. Stalwart volunteers repeatedly answered Sullivan’s recruitment calls. This was truly one of the most exciting parts of the project. Dozens of volunteers, from Cub Scouts to octogenarians, gathered outdoors during the COVID-19 lockdown to plant trees and shrubs, working together and looking toward the future. Over the 2021 and 2022 planting seasons, they planted more than 1,000 bare-root or small potted trees and shrubs in designated areas within the preserve, digging holes in rocky soils, hiking and lugging water to new plantings in the far reaches of the preserve. As part of the long term monitoring, GPS locations of each planting were taken.

This avid and enthusiastic volunteerism was what made this one of the most interesting and satisfying projects of my career, as the volunteers helped blaze a trail others can look to as they care for the wild places in their communities for generations to come.

Now it will be up to future generations to monitor these plantings—not just whether they survive, but whether they reproduce and truly become part of a resilient forest.

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