

Adapting Forests to Climate Change – Healthy Forests are Not a Luxury

By Keith Thompson and Joanne Garton

The two dry summers of 2016 and 2017 marked a challenging time for trees. Lack of water, high temperatures, and dry soils added to the growing list of environmental stressors that often tax Vermont's forests. Sometimes, stress can trigger development of larger-than-average seed crops, and by most reports, the maple seed crop of 2017 was massive. All over Vermont, maple seedlings sprung from the moist soils that followed snow melt this past spring.

However, most of Vermont remained in moderate drought this summer. Some foresters reported that large numbers of first year seedlings had withered and died. In Essex and other Northern Vermont counties, at least 4,500 acres of overstory maples were killed, with some patches hundreds of acres in size. The compounding stresses of forest tent caterpillar defoliation and drought stress, coupled with the loss of energy used in producing large seed crops, likely resulted in heavy crown dieback and mortality of these trees.

Fortunately, the maple tree deaths of 2018 were not widespread. The resulting landscape, however, is a reminder that chronic climate-related stresses are having real impacts. Vermonters depend on our forests for all kinds of benefits, from clean water and wildlife habitat to maple sap and sawtimber. In this real time of climate change, we also count on forests to store carbon. Vermont forests are estimated to capture more than half of the state's annual emissions. By providing so much for Vermonters, healthy forests are critical in our efforts to slow, and adapt to, climate change. As such, healthy forests are not a luxury; they are a practical imperative.

Compared to 50 years ago in Vermont, winters are warmer and shorter, summer days are hotter, and storms are more intense. The degree and rate of climate change is expected to increase. These changes will affect where certain plants can grow, and where animals thrive – or don't.

Part of the solution to climate change is to remove carbon dioxide from the atmosphere and in Vermont, trees and forests do it best. Because 76% of Vermont's forests are privately owned, some of the most important work we can do right now is to help private landowners sustain and enhance the potential of their forests to absorb and store carbon. This contribution to the climate change solution depends on a lot of healthy forest, a landscape that shouldn't be taken for granted.

For decades, foresters, biologists and researchers have been collaborating to understand how to moderate the vulnerability of forests to climate change and improve forest health. For individual landowners, helping forests adapt to climate change could include actions like:

Retain Connected Forests

Reduce or eliminate the conversion of forest to non-forest conditions and avoid dividing blocks of forest in to smaller pieces.

Reduce Stressors

Limit forest stressors like invasive plants, root damage from management activity, excessive deer browse or others.

Reduce Vulnerability

Address conditions that make forests susceptible to damage, such as the dominance of a single species, large numbers of pest-susceptible tree species (think ash trees and their pest, the emerald ash borer), overcrowding among trees, and the lack of regeneration of climate adapted tree species.

Provide Refuge

Protect habitat for rare, threatened and endangered species or currently common species that we may lose as the climate changes.

These recommendations are applicable across the landscape but the specifics of how they are achieved on a given property will depend on the characteristics of the forest and the goals of the landowner. Fortunately, there are many “right ways” to help forests adapt to climate change and many resources available to help.

The four goals identified above came from [Increasing Forest Resiliency for an Uncertain Future](#) written by Paul Catanzaro, Tony D’Amato, and Emily Silver Huff. This is a solid resource for landowners and foresters that distills the current thinking about what threatens forest health, what supports it, and what activities promote it. It also provides a process for considering these actions on your specific land. With easy-to-understand lists and helpful graphics, it puts the ideas behind forest resilience in one [readable](#) place.

A more in-depth resource is:

[Creating and Maintaining Resilient Forests in Vermont: Adapting Forests to Climate Change](#), published by Vermont Department of Forests Parks and Recreation. This report covers specific strategies to adapt forests to climate change, including a species-by-species summary of how trees are expected respond to climate change. This resource provides a level of detail that can help in developing site specific recommendations.

Forests owned and managed by private landowners are part of the solution to Vermont’s biggest challenges: flooding hazards, Lake Champlain water quality, maintaining a vibrant rural economy, providing world-class outdoor recreation, keeping our residents healthy, and addressing climate change. But our forests can only be part of the solution to the extent that they are healthy and able to adapt to the changing climate. For this reason, we need to make sure that the management we do on our own land supports, and does not undermine, forest health. By adapting our management, we can help our forests, and ourselves, adapt to a changing climate.

More information about forests and climate change can be found at:

https://fpr.vermont.gov/forest/ecosystem/climate_change .