



National Association of
Conservation Districts

An aerial photo in Rhode Island showing the brown defoliated areas caused by *Spongy Moth*. Photo taken by Paul Ricard, Rhode Island Department of Environmental Management.

Improving Oak Resiliency in New England

All of us would like to see our woodlands healthy and thriving, though today many of them—especially oak-dominated forests—are being impacted by climate change, heavy deer browsing, and defoliation from pests. Walking through our forests in New England can be both an enlightening and disturbing experience when we have an eye out for pests and pathogens that are killing our trees. Assessing our timberland in terms of forest health is an important part of responsible forest management, but how do we do it?

Working and collaborating with foresters is the optimal choice. Even a landowner who is interested in actually doing the work involved should have a forester to help them in management planning, site and damage assessment, forest inventory and a number of other critical services. Without considerable study, it would be challenging for a non-forester to acquire the planning and assessment skills needed to manage forestland of more than 10 acres.

For woodland owners who want a more hands-on experience and want to collaborate more effectively with their forester, learning tree identification is primary, as well as becoming familiar with the pests and pathogens that threaten the health of our trees. Knowing the signs of infestation and damage helps us assess the problem and for this I have always relied on our forester, and sometimes our county Extension forester for providing the necessary education and confirmation of the problem.

In recent years, I wanted to dive deeper into forest stewardship, based on the simple, basic

premise: the more we know about our land, the better! Truly knowledgeable forest stewards consider soils, water, wildlife habitat, wetlands, timber, rare or threatened plants, and historical features in learning how to protect their land. This constitutes a life-long project and a potentially satisfying one.

A forest stewardship project in Southern New England attracted my attention recently, as it is focused on oak forests, a dominant tree in my area and 70% of the forests of southern New England. ‘Increasing Resiliency in Southern New England Oak Forests’ is aimed at increasing resiliency in Southern New England’s oak forests which have suffered from pressures that endanger its long-term health and compromise its ability to regenerate. The project offers an Oak Resiliency Tool Kit for foresters and natural resource professionals along with outreach materials to landowners in the states of Connecticut, Massachusetts and Rhode Island. Primarily, it is intended to engage foresters and natural resource professionals with landowners who want to “get under the hood” and work together. To learn more about forest protection collaboratively is likely to improve outcomes and future resiliency with a more informed assessment including steps that we as landowners can take.

The project is funded through a USDA Forest Service Landscape Restoration grant and is a partnership between the nonprofit Forest Stewards Guild, state forestry agencies in Connecticut, Massachusetts and Rhode Island, the Forest Ecosystem Monitoring Cooperative (FEMC), the Northern

Institute of Applied Climate Science (NIACS), and numerous other organizations.

Conservation district outreach programs are playing a supportive role by hosting oak workshops to assist landowners suffering from the loss of oak due to moth infestation and providing resources relevant to this project. In addition, supervisors of the Northern Rhode Island Conservation District are members of the Rhode Island Woodland Partnership (RIWP), which is a partner in this project. Coalitions like this one are emerging more and more, demonstrating that partnerships are the way forward in getting more conservation on the ground.

Why concentrate on oak? Oaks play a central role in ecosystems across the country. In New England, Northern red oak (*Quercus rubra*) is one of the highest-valued species both for timber production and wildlife habitat and food. The oak-dominated forests of this region, and elsewhere, are in trouble, along with the ‘communities’ and ecosystems they support; the ecosystems we live in! As reported by Hanberry and Nowacki in *Quaternary Science Review* (2016), the percentage of oaks in eastern forests has dropped from 55% pre-European settlement to 25% today.

While recognizing all the various pressures on oaks in New England, ‘Increasing Resiliency in Southern New England Oak Forests’ was spurred primarily by the *Lymantria dispar* massive defoliation in the region in recent years. Recent outbreaks, especially 2016-2018 of *Lymantria dispar*, formerly called the Gypsy Moth, now renamed the Spongy moth, have been devastating to oak trees, resulting in an estimated defoliation of more than 2 million acres of oak-dominated forests in Southern New England alone. Two years of drought in this region paved the way for this massive outbreak. Normally, rain activates a fungus called *Entomophaga mai-maiga*, one of the most successful fungal biological control agents, that kills the Spongy moth caterpillars.

The Spongy moth is a native of Europe and Asia and was introduced into North America in an attempt to cross the species with the commercial silk moth as part of an ill-conceived plan of making a more productive silk moth. The specimens were accidentally released in Medford, Massachusetts in 1869 and continue to expand their range, killing oaks as they go—the current ‘invasion front’ stretching from North Carolina to Minnesota. The larvae can cause severe damage in years of hard mast reproduction and the species is listed as among the world’s 100



Spongy moth caterpillar, *Lymantria dispar*, larval stage, Photo by Jon Yuschock on Bugwood #1178070

most invasive alien species. Oaks are the preferred host species for the feeding caterpillars. Efforts have been underway to help reduce the public safety risk presented by dead trees and regenerate the oak lost from the last infestation. This project and its assessment Tool Kit can play an integral part in making our oak forests more resilient for future outbreaks.

With higher and growing deer populations, deer herbivory has also increased, posing a major obstacle to oak forest regeneration. Browsing by deer at high densities is also reducing diversity in the forest overstory, preventing regeneration of other desired species, and enabling invasive species to displace natives. Moreover, oaks are often selected by deer in higher proportions relative to their availability compared to ash or maple, for example. Without regeneration, oaks in deer-impacted forests face a bleak future without mitigation measures in place.

Climate change, with extreme, fluctuating temperatures, flooding, seasonal droughts, and other factors add considerably to the stress. Summer drought has a negative effect on all species. In 2000, 2016, and 2020, New England experienced historic drought conditions not seen since the 1960s (Drought.gov). Projected increases in summer temperatures will result in loss of water through transpiration from leaves. Increasingly extreme precipitation events in the Northeast, especially coupled with strong wind gusts, will also likely continue to factor into impacts on the health of our forest. As Professor Doug Tallamy relates in *The Nature of Oaks* (2021): “Add pressure from the collapse of the climate that favored oak health over the last 8,000 years, as well as the human introduction of diseases like sudden oak death, oak wilt, and oak leaf scorch, and invasive pests like the gypsy moth, and many oak species are now on the ropes.”

Fortunately, as Tallamy claims, “There is no reason why we *should* accept the loss of oaks as

inevitable; there is no trick to restoring oak populations and no shortage of places in which to restore them.” This resiliency project offers hope and a new approach, a ‘new trick,’ one could say.

Christopher Riely, of Sweet Birch Consulting in Rhode Island, is a forester and one of the project participants. He described two of the project’s main parts: outreach to landowners in southern New England, and working with professional foresters and other natural resource professions on oak resiliency topics.

Hope for the Future

The Forest Stewards Guild, principal partner in the project, described some of the events to spark collaboration and share knowledge among landowners, foresters and natural resource professionals as including:

- An oak regeneration learning exchange to foster conversation for foresters and biologists between states and agencies about oak regeneration management approaches, as well as public communication approaches.
- An oak forest resilience assessment workshop to provide hands-on training by key natural resource professionals with tools for assessing the condition of oak forests.
- Oak forest landowner stewardship summits that teach landowners to recognize signs of unhealthy oak forests; teach forest stewards how to communicate with landowners about what is happening on their land and what they can do about it; and build excitement for increasing oak resiliency.

The project will also collect, analyze and interpret data from southern New England states following the workshop and summits, and then transfer this knowledge to different audiences with reports and materials including an Oak Resiliency Tool Kit for forest landowners.



Forest managers practicing the use of the oak resiliency assessment tool. Photo courtesy of The Forest Stewards Guild.

- **The web-based Oak Resiliency Assessment Tool:** www.uvm.edu/femc/oak_resiliency/
- **The Oak Resiliency project page with more information and resources:** foreststewardsguild.org/oak-resiliency/

Through these collaborative initiatives and valuable materials, the Forest Stewards Guild and its many non-profit partners in Rhode Island, Connecticut, and Massachusetts aim to:

- increase forest stewardship activities that support oak resilience,
- empower natural resource professionals with tools for assessing oak forest health
- build landowner awareness of regeneration challenges and solutions, and
- foster communication between states and agencies about strategies for addressing oak forest resilience and regeneration challenges.



Foresters walking through a managed oak stand with vigorous regeneration. Photo courtesy of The Forest Stewards Guild.

The starting point is the assessment. Answering the questionnaire and mapping the location of the forest enables natural resource professionals and landowners to assess the resiliency of the oak forest in question and explore relevant adaptation actions. A report is provided that rates the site as High, Moderate, or Low vulnerability with a list of key considerations and potential management options that could increase oak resiliency.

Though other regions with oak-dominated forests are not in the ‘target zone’ for this grant-funded project, other areas can use the assessment tools as well

for determining the condition of their oak forest. One can do the assessment by just taking a walk through your woodland with your smart phone and answering the questions. It's easy to do and will in the end generate a report, giving a summary, an assessment of impacts, and assessment of adaptive capacity. The comprehensive quality of the report is impressive and features potential pathways to follow. Those who manage their woodlot for wildlife, for example, can find examples of adaptation actions that can help maintain oak forests to meet objectives for wildlife habitat-based on your local site conditions.

Most of us reading this magazine recognize the necessity of sustainable forest stewardship and have a love and deep appreciation for oaks. With these

tools, we can look at our oak forests with more awareness and discover what we can do to help increase oak forest resilience. Collaborating with our foresters, natural resource professionals, and other landowners in making wise forest stewardship decisions will have a greater collective impact on our forest health.



Linda Brownson lives in the western foothills of the White Mountains in Wentworth, NH, where she manages 200 acres of mixed northern hardwoods and conifers for wildlife habitat. She is NACD Executive Board member for the Northeast Region and President of the New Hampshire Timberland Owners Association.

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