

QUIET CORNER

BROUGHT TO YOU BY THE YALE FOREST SCHOOL

About the QUIET CORNER INITIATIVE

The Quiet Corner Initiative (QCI) supports local livelihoods, sustainable forest management, and rural economic development by building relationships between local landowners, conservation and forestry professionals, and the students and faculty of the Yale School of the Environment. Thank you to our alumni and the rest of the Yale community for their support.

A note from the QUIET CORNER INITIATIVE MANAGER

Greetings!

I'm excited to share that QCI is revving up education and engagement in the Quiet Corner. Last summer marked a long-awaited return to more typical life and work at Yale-Myers Forest (YMF). Our previous QCI Manager, Adam Houston, and Forest Manager, Matt Valido, ensured a smooth transition back to in-person activities. We wish them every success as they step into new careers and endeavors!

This school year, students in Management Plans explored the ridges, valleys, and drumlins of the Quiet Corner's forests, and pored over centuries-old deeds to uncover the history of ownership and land use in the region. All told, students created six management plans for over 450 acres of privately-owned forested land (learn more on page 2).

Research at YMF is back in full swing, with new projects examining the diverse flora and fauna across our managed forest landscapes. We're thrilled to welcome members of the public back to YMF for the Summer Seminar Series, which allows scientists to share forestry-focused research with the broader community (see page 5 for details).

As I write this note, students are gearing up for another summer of fun and growth at YMF. While they will soon be busy conducting research and training with Forest Crew, you may catch them in their downtime taking a swim in Bigelow Pond or eating a Nor'Easter at Buck's!

We wish you a safe and enjoyable summer – and look forward to renewed connections!

Nora Hardy

*Quiet Corner Initiative Manager
Yale Forest School*

Building opportunities around non-timber forest products in the northeast

Walker Cammack, Agroforestry Fellow, MF '22



A mature goldenseal (*Hydrastis canadensis*) plant growing at one of the Northeast Forest Farmer's Coalition's research plots. Photo by Walker Cammack

More than just wood is growing at the Yale Forests! Non-timber forest product (NTFP) is an umbrella term used to refer to any product or material of biological origin other than wood that is sourced from forests for human use. An abundance of NTFPs are grown in forests and support livelihoods all over the world – fruits, nuts, mushrooms, tree syrups, medicinal plants, handicraft materials. Two recent federal grants housed at the Yale Forest School have focused research and outreach efforts on two of the most prominent NTFP economies in US northeast temperate forests: maple syrup and medicinal forest botanicals.

The first initiative is a USDA Northeast Sustainable Agriculture, Research, and Education (SARE) grant focused on building a community of practice around forest farming, coined the Northeast Forest Farmers Coalition (NFFC). The second is an outreach and education grant administered through the USDA's Acer Access and Development Program that has been used to create Yale's Maple Education and Extension Program – a demonstration sugarbush and maple syrup operation at Yale-Myers Forest used as an educational platform for syrup producers in Southern New England.

Over the past year, as the Forest School's Agroforestry Fellow, I've been leading coordination efforts for both NTFP initiatives, in collaboration with Dr. Marlyse Duguid and Dr. Joe Orefice.

Forest farming originated as an indigenous agroforestry practice by which crops are cultivated and stewarded under a forest canopy. The NFFC focuses on promoting the cultivation and stewardship of a specific subset of plants called forest botanicals that grow in the understory of our richest northeastern forests. Many forest botanicals, like ginseng, goldenseal, black cohosh, and bloodroot, are highly valued for their medicinal properties.

At the NFFC, we focus on botanicals considered "at-risk" namely due to habitat loss and overharvesting. Humans can help counteract these pressures on wild plants by establishing new populations of forest botanicals. The potential to sustainably grow and sell forest botanical plant materials also represents new economic opportunities for land managers in the region. This process has come to be known as "conservation through cultivation" by the forest farming community.

Continued on page 3

Students explore the social and ecological histories of Connecticut's Quiet Corner properties in the Forest School's Management Plans course

Shaylyn Austin, MF '23

The Union Historical Society is in the former Town Hall building on the Town Green. The building is old, but well kept. Tables are stacked with photographs and letters from past resident's lives. It's an impressive collection.

Last November, Aaron Troncoso ('23 MF) and I visited the historical society to research "The Horton Place" — 100 acres of forest and fields with a home built by Ezra Horton in 1759. As students in the Forest School's "Management Plans" course, we were writing a management plan for the property's current owners, so we wanted to learn about the land's past stewards.

We learned that the Hortons are one of the oldest Union families. They owned and resided at the property for over 250 years before selling it in 2016.

"It was great to be in a small town with a really robust sense of itself," Troncoso said. "Being able to chat in greater depth with people who have lived [in Union] for a long time was really cool."

A management plan is a resource that provides an ecological assessment of a property and outlines management actions a landowner can pursue. Last fall, we were one of six student groups that wrote a management plan for a property in Connecticut's Quiet Corner. There



Management Plans students and instructors at one of the six properties that received a plan last fall.

Photo by Dr. Mark Ashton

were fifteen of us, four international and 11 domestic students, representing YSE's forestry, environmental management, and forest science master's programs. These management plans are certified by the state of Connecticut and free to the landowners.

Students spent around 40 hours collecting data at their properties. We classified our property's soils and assessed the land use history, forest health, and wildlife habitat. We inventoried the vegetation to characterize the species diversity and developmental stage of each stand. We also spoke to stakeholders about their hopes for the land.

Coral Keegan ('23 MEM) and Raqib Valli ('23 MF) wrote a plan for a 46-acre property in Ashford, CT owned by an animal shelter.

"Looking at the landscape holistically is a super

useful skill," Keegan said. "We learned how to tell a story about the land — going from the long geologic history to the present and understanding how each step of the way influences what you're seeing now."

Students integrated their ecological and social assessments into their management recommendations, guided by the landowner's values and goals for their woodlands. The course culminated with each group presenting their plan to their landowner and

giving them the roughly 100-page document.

"One goal our landowner had was identifying areas with high wildlife value for recreation and hunting. So we made a map that indicated areas with high recreation potential," Troncoso said. "Our landowner is likely to build out a trail system that hits those scenic recreation spots."

Fredrick Addai ('23 MF) and Philipp Hoehme ('23 MF) wrote a plan for a 12-acre property in Eastford, CT.

"I got a better understanding of the northeastern forest composition and its evolution with human interaction through time," Addai said. "Most importantly, I learned how to negotiate with landowners as a forester to come up with the best recommendations."

This course is a tremendous amount of work, but worth it. For me, it was immensely gratifying to offer helpful information to landowners who care deeply about their woodlands and their community.



Interested in a management plan for your land?

Please contact the QCI Manager, Nora Hardy:

nora.hardy@yale.edu

Aaron Troncoso ('23 MF, JD) next to a soil pit (left). Students dug soil pits to assess soil quality across their properties. Photo by Shaylyn Austin

Michael Freiburger ('23 MF) next to a yellow birch (*Betula alleghaniensis*), while conducting a forest inventory of his property (right). Photo by Emma Broderick

NTFP programs, workshops, and research (continued from page 1)

In its second year, the NFFC is going and growing strong. We have close to 500 subscribed members, have held four field-based workshops with more on the horizon, and presented at five professional conferences. Recently, we launched our inaugural forest farming mentorship program where we have connected 12 experienced forest farmers with a cohort of 30 beginning forest farmers in the Northeast.

These educational efforts complement ongoing research that generates important ecological, financial, and production data on forest botanicals at our five research & demonstration forest plots. We have also just received a second round of SARE funding that will go toward equitably addressing forest botanical planting stock shortages in the Northeast! With the support of this grant, we will launch a region-wide, grassroots effort to increase propagation and distribution efforts of seed and root stock.

Yale's Maple Education and Extension Program has also been busy this spring. With help from Emma Broderick (MF '23) and Mary Katherine DeWane (MF '23), and students from Professor Orefice's "Maple: From Tree to Table" class, we expanded the sugarbush to include 215 sugar maple and red maple trees at Yale-Myers Forest. This hard work paid off; we produced 112 gallons of delicious, Connecticut-made, maple syrup

between February and March.

The Yale-Myers sugarbush isn't just for producing syrup though. To date, we've held eight workshops aimed at educating established syrup makers, new or beginning producers, and foresters in southern New England. Workshop topics have ranged from demonstrating technical aspects of the industry, like tubing system design and sap processing techniques, to exploring methods for adapting sugaring operations for long-term sustainability in the face of climate change.

We have also collaborated with several local syrup producers to host producer-to-producer workshops that showcase their operations. We will be wrapping up these workshops this spring and summer, as well as releasing a series of online Story Maps on sap transfer, processing, and sugarbush forest management that will live on



Anna Plattner of Wild Hudson Valley leads a ginseng intensive workshop with the Northeast Farmer's Coalition in the Hudson Valley. Photo by Walker Cammack

past the life of the Acer Access Grant.

This past year, it has been inspiring to meet and work alongside so many people in the Northeast who have dedicated their lives to producing and teaching about NTFPs. It's clear these practices are key to creating a more holistic regional forest products industry that is centered around people's reciprocal relationships with their forested ecosystems. The future of NTFP-based economies in the Northeast is bright!



YSE students helped plant germinated ginseng seeds (top) and mature bloodroot (bottom) at the Yale-Myers research plot.

Photos by Walker Cammack

Yale-Myers maple syrup is now for sale!



Syrup can be purchased by the case at:
forests.yale.edu/resources/maple

All proceeds go toward maintaining the sugaring operation for years to come.

Mary Katherine DeWane ('24 MF, MBA) bottles fresh maple syrup (left).

Students in Professor Joe Orefice's "Maple: From Tree to Table" class learn about boiling sap into syrup using a wood-fired evaporator (below).



Photos by Walker Cammack

Research Spotlight

Let's talk about bugs: Advancing knowledge of nitrogen cycling in temperate forests

Janey Lienau, MEd '23

When we walk through a forest, we're typically drawn to the tall trees or the little creeks meandering through the woods. If we're walking slowly, we might even stop to look at a fern growing in the understory. **But rarely is our attention drawn to the nondescript insects blending into the background.** A little ant marching up a wildflower, the termites munching about fallen logs, or a ground beetle scavenging the forest floor, and yet the daily activities of these insects are fundamental to the growth and success of the forest we walk.

My research at Yale-Myers Forest focuses on understanding how the activities of soil dwelling insects help forests function through nitrogen cycling. If you're a gardener, you're probably aware that nitrogen is a key nutrient for plant growth. The dominant thinking about nitrogen cycling in forests is that nitrogen cycles from plant leaves that fall onto the forest floor becoming detritus litter, which are then decomposed by microbes, and subsequently released in mineral form into the soil so it can be accessed by plant roots.

However, this thinking neglects the role of soil dwelling invertebrates that may be key for linking plant litter decomposition to nitrogen release. With 40 thousand described species, the ground beetle family (Coleoptera: Carabidae) is the most abundant predator in soil food webs. **Despite a long history of study, carabid's role in nitrogen cycling remains largely undescribed.** As predator generalists, they likely control populations of ants, mites, termites, millipedes, and other invertebrate decomposer groups that fragment plant litter and influence nitrogen cycling.

I've spent the last two years investigating the role of ground beetles in nitrogen cycling by conducting two experiments at YMF. For the first experiment, I set up mesocosm cages in both an old and young forests. The old forest stand has undergone over one hundred years of growth since agriculture abandonment in the 1800s and is dominated by sugar maple (*Acer saccharum*), northern red oak (*Quercus rubra* L), black birch species (*Betula*

spp.), hickory species (*Carya* spp.), and white pine (*Pinus strobus*). The young forest stand is 14-15 years old and has an overstory dominated by birch species (*Betula* spp.), sugar maple (*Acer saccharum*), and beech (*Fagus* spp.).

Last June, I spent many nights hunting for ground beetles with my headlamp. To see how beetles impact soil nitrogen, I stocked the mesocosm cages with live ground beetles and then tracked the amount of nitrogen in the soil below the cages. Each cage had different kinds of ground beetles. The results of this experiment demonstrated dramatic changes in the amount of nitrogen in cages with predatory ground beetles in the young forest, and reduced variability when predators were present in the old forest cages. These results strongly support the idea that **predacious ground beetles are important for nitrogen cycling and forest function.**

The other experiment is ongoing, and I just started my second year of sampling this spring. In both a young and old forest, I've been collecting soil dwelling insects with special traps that fit into the ground called 'pitfall traps'. Around the traps I've placed leaves with a stable isotope of nitrogen (^{15}N) that you can 'trace' through the soil and the insects. The idea is that insects eat the plant litter that contains ^{15}N . Then I collect the insects in my trap and look for the amount of ^{15}N in both insects and the soil. From this method, we can calculate more specifically how *much* ground beetles and other soil dwelling insects contribute to nitrogen cycling. **I'll be starting my PhD here in the fall, stay tuned for updates on this project!**

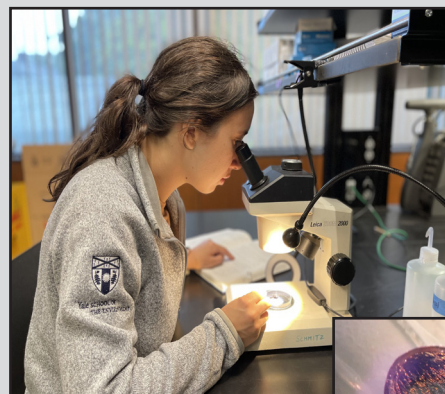
Next time you walk the Nipmuck or your other favorite trail, **try to count how many insects you see**, and appreciate them for their contributions to nitrogen cycling and the function of our beautiful eastern temperate forests.



This is what a pitfall trap looks like! The trap with a lid (above), and an exposed trap with the pink preservative (left).
Photos by Janey Lienau



Here I am measuring the soil in the cages that have live beetles for the first experiment. Photo by Sidney Axtell



Identifying one ground beetle can take up to an hour. We use microscopes to look at the details of even the hairs on their legs to make sure we have the correct identification (left).
Photo by Michael Lienau

A common forest-dwelling ground beetle (below).
Photo by Janey Lienau



Prescribed fire at Yale-Myers

In April, students conducted prescribed burns to maintain early-successional wildlife habitat and control invasive autumn olive (*Elaeagnus umbellata*) at Yale-Myers Forest. Prescribed burns are an excellent opportunity for students to put theory into practice and reintroduce 'good fire' to the forest landscape.



Kyle Richmond-Crosset ('23 MEM) lights a prescribed burn with a drip torch (top left).
Photo by Fredrick Addai

Students stand along the fire line, ready to suppress flames that jump across the line (top right).
Photo by Grace Bachmann

Grace Bachmann ('23 MF) lights a test burn while students observe the fire's behavior (left).
Photo by Alice Gerow

----- SAVE THE DATE! -----

2023 Summer Seminar Series at Yale-Myers Forest

June 14th Jumping worm invasion, impact, and solutions
Annise Dobson, PhD; Postdoctoral Researcher
Yale School of the Environment

June 28th Managing for uncertainty: How forest management strategies can influence adaptive capacity
Jess Wikle, '18 MFS; Research Associate, Manager of UVM Research Forests
University of Vermont

July 12th Beech Leaf Disease: What we've learned so far
Robert Marra, PhD; Researcher, Department of Plant Pathology and Ecology
Connecticut Agricultural Experiment Station


July 26th Establishing silvopastures increases carbon storage in the northeastern U.S.
William Weinberg, '22 MFS; Research Assistant
Yale School of the Environment

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The Forest School

Yale-Myers Campus, 150 Centre Pike Road, Eastford, CT
All seminars begin sharply at 6:30pm

Visit Us Online

For more information about the Yale School Forests' Quiet Corner Initiative, please visit our website at:
qci.yale.edu

Or **follow us** on instagram at:
"yaleforestry" 



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