2022 – Year in Review

The Farmscape Ecology Program (FEP) Team

This year has brought some changes to our FEP team, which is now comprised of six year-round staff members: Claudia, Anna, Kyle, Kenny, Josie, and Conrad.

We were sorry to say goodbye to two of our staff members in the spring, but happy they found new career opportunities to explore. Dylan Cipkowski, who started with FEP in 2015, is now a Natural Resource Specialist at the local Soil and Water District Office, while Nellie Ostow, who started with FEP in 2020, is now splitting her time between teaching at Kite's Nest and gardening with native plants at Arthur's Point Farm and with private clients. In spite of these departures, we were able to stay on course with research and outreach through the field season thanks to a motivated and enthusiastic crew of interns.

In late summer/fall, we were happy to welcome biologist Kyle Bradford and botany technician Josie Laing to the team. Kyle was an intern and then technician with FEP from 2012 to 2015, and after a period scouting for pest insects in California vineyards and graduate studies at Antioch NE, he has now joined us again as a researcher. Kyle is a well-rounded naturalist and developed an interest in ants while working with us and deepened that through an interesting Masters

The core staff of FEP (at the end of 2022): Anna Duhon, Conrad Vispo, Claudia Knab-Vispo, Kyle Bradford, Josie Laing, and Kendrick Fowler

project exploring the ant faunas of Western Massachusetts barrens. He is also an ardent and capable photographer and shares our passion for understanding the role of land use history in determining current ecology. Josie, who has deep roots in the area through her grandparent's farm, came to FEP initially as a 2022 summer intern after completing her undergraduate degree in botany from Miami University. As the botany technician, she is involved in the botany research and outreach, native plant gardening, and land stewardship, but also provides much-appreciated general office/logistics support to the entire team. She brings a special interest in fungi and is spearheading FEP's foray into this taxonomic realm. We feel blessed to have them both and are looking forward to developing the program by building on their interests and talents.

In addition to our core team, we were excited to have independent artist and researcher Jill Jakimetz join us for some field outings and discussions in an exploratory process we are calling "research as accompaniment." We hope that incorporating Jill's thoughtful perspective into our work might help us inform how we design, conduct, and share research into the future.

Finally, see the acknowledgements section to read more about our expanded team of dynamic interns and volunteers.

Sharing—in person, in print, and online

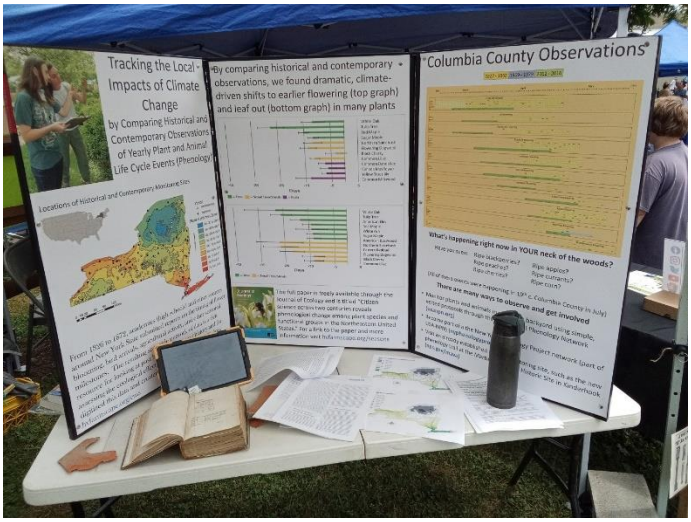
FEP Walks & Outings: Throughout the season, we led 15 free public walks focusing on spring flowers, native meadows, nature photography, on-farm biodiversity, and phenology. For some of these programs, we partnered with other organizations, such as the New York Flora Association, the Columbia Land Conservancy, Art Omi, and the Martin Van Buren Historic Site. We also offered several ecology walks for Spanish-speaking farmers at the Hudson Valley Farm Hub.

For a second time, FEP offered a popular hybrid online/in person field course on winter botany with reference trees and shrubs marked along the trails at Crellin Park and PS21 in Chatham. A group of people joined the four field sessions and numerous others utilized the course material in a self-directed way.

Farmscape Ecology Field Days: Throughout the summer, we invited the public to three engaging and interactive days at the Creekhouse, where visitors had the opportunity to tour the butterfly house and native plant garden, to view the 3D model of Columbia County, practice their phenology observation and insect identification skills, and much more.

The Large Whorled Pogonia is a rare orchid in Columbia County and was spotted during one of our public spring flower walks in the Taconics.

Displays and Presentations: FEP had a much-visited display at the First Climate Carnival in Chatham, where we featured historical weather instruments and posters documenting the changing weather and rhythms of nature in our region. We presented our agroecology experiments to the public during a field day at the Hudson Valley Farm Hub.



Part of the FEP display at the Climate Carnival in Chatham in July.

FEP staff taught modules in the WaspID Course, a 2-week, international, online course on wasp identification which had 336 participants from 39 countries; presented at the online NOFA-NY Winter Conference together with our colleague Anne Bloomfield from the Hudson Valley Farm Hub; coordinated and presented in a session at the in-person Northeast Natural History Conference; and gave a talk on ants of Western Massachusetts barrens at the Berkshire Natural History Conference. Entomology intern Timo Wayman gave a Spanish presentation about bees to the farm team at the Farm Hub.

Sharing through Social Media: Throughout the year, we shared weekly blogs/Facebook posts and Instagram posts on seasonal and place-based nature observations.


One of the most-loved posts on Instagram was of this group of Red Efts (observed by summer interns Josie Laing and Elena Kubicek) who had been feasting on maggots or snails, which—in turn—had been feeding on the Honey Mushroom.

Special Programs: We offered customized programming to Hawthorne Valley Visiting Students Program, PlaceCorps, Hawthorne Valley Waldorf School classes (including visits to the butterfly house at the beginning of the school year), and the Climate School.

Lecture Series: We have begun a four-part winter lecture series (hybrid in-person/online) on the "Little Things that Run the World" with presentations on bees (by entomology intern Timo Wayman) and ground beetles (Conrad), to be completed early next year with presentations on ants (Kyle) and wasps (Kenny).

Progress on "From the Hudson to the Taconics: An Ecological and Cultural Field Guide to the Habitats of Columbia County"

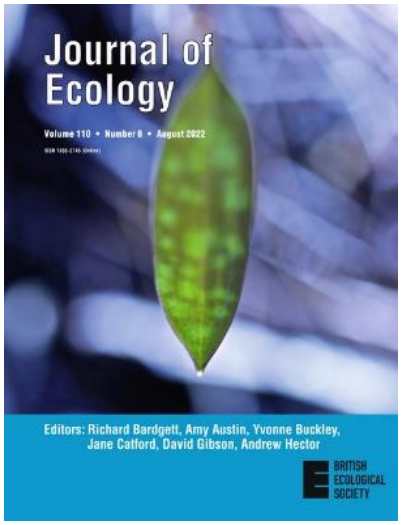
After another year of diligently working on the manuscript of this long-awaited book, we are finally getting close to sending it to the printer and are looking forward to its publication and sharing this work more deeply through a series of post-publication events and workshops.

This richly-illustrated and engaging guide will have almost 400 pages, including 34 core chapters on habitats ranging from Dry Oak Forest and Wet Meadow, to those of the Hudson River and "Ghost" habitats (now missing from our landscape). The Introduction includes sections on the physical foundation of Columbia County and its human overlay, biodiversity and conservation, and cultural considerations. It is complemented by maps and a table of public areas where examples of each habitat can be observed and experienced.

An image of Columbia County, showing the Hudson River, the Taconic Mountains, and everything in between, taken during a fly-over graciously facilitated by Ben Madey. A version of this will likely be featured on the book cover of our field guide.

Publication of our Research in Journal of Ecology

In spring**,** our research comparing current and historical phenology throughout New York State, was published in the prestigious *Journal of Ecology* in a paper titled "Citizen science across two centuries reveals phenological change among plant species and functional groups in the Northeastern US" by Kerissa Fuccillo Battle, Anna Duhon, Conrad R. Vispo, Theresa M. Crimmins, Todd N. Rosenstiel, Lilas L. Armstrong-Davies, and Catherine E. de Rivera.



The cover of the Journal of Ecology issue in which our paper was published also featured an image from the project—this single leaf the Yellow Trout Lily.

Comparing recent phenology observations throughout New York with the historical database of 19th century New York phenology records that we uncovered, digitized, and standardized (available through a searchable browser here), this paper revealed a dramatic, climate-driven shift to earlier leaf out and flowering in a number of plants. The breadth of data allowed the analysis, spearheaded by lead author Kerissa Battle, of how these shifts varied across settings, species, and functional groups. Plants in urban areas, insect-pollinated trees, and early-season species showed the greatest rate of advancement overall.

This publication is the initial fruit of our efforts to bring the historical phenology data to light and results from our long partnership with Kerissa Battle to use this data to explore important questions around the impact of climate change on local plants. It is also an exciting beginning of what we hope may be more opportunities to tell the amazing story behind this historical dataset and use it to further explore other key questions.

Completion of Hawthorne Valley Biodiversity Report for the 50th Anniversary

In 2021, FEP conducted a biodiversity survey of Hawthorne Valley Farm in its 50th year. This survey was intended to both be a snapshot for future reference and a point of comparison with earlier data.

This year, we compiled the **report**, which begins with a summary of land use history in the Valley and of existing habitats, emphasizing the ecological strengths that Hawthorne Valley can build on. It then touches on various organisms from plants to fish to beneficial insects. For each, we summarize aspects of their diversity, ecology and conservation; review our findings from Hawthorne Valley; describe what Hawthorne Valley has done, is doing and could do to conserve them; and close with some suggested student projects. The last chapter provides an overview of our results in the form of a map of ecological focal points around the property.

This report is FEP's contribution to an ongoing dialogue about how to best reconcile food production and the stewardship of wild biodiversity at Hawthorne Valley Farm. It is also an invitation to continue to learn about and monitor the wild organisms that share the Farm with us.

This Spotted Turtle lives at Hawthorne Valley Farm as part of a small, isolated population of this species of special concern in New York State.

Continuation and Evolution of the Applied Agroecology Research at the Hudson Valley Farm Hub

During the past year, we continued our long-term studies at the Hudson Valley Farm Hub, and also expanded that work in a couple of new directions. We completed our seventh year of monitoring insects along three transects that run from forest edges to the centers of farm fields, which are meant to help us detect trends in insect populations and describe how the makeup of insect communities differs along forest-to-field gradients. We also rounded out six years of observing the development of plant and insect communities in our native meadow trials, where we are trying to understand how plantings of wildflowers and of native grasses compare to fallow and hayfield controls not only botanically, but also in terms of beneficial insects, native biodiversity, and their influence on crop production. Our latest reports on this work are available on FEP's Agroecology page.

Entomology intern Kelly is sampling the insects living on experimental winter squash plants with a modified leaf blower that serves as a vacuum.

This year we also completed our first full season of ground beetle monitoring along a 900' beetle bank. Beetle banks are meant to provide refuges for beneficial ground beetles living in intensively managed crop fields. We also began our exploration of dietary interactions by collecting bird and bat droppings and ground beetle regurgitate for genetic analyses. We also reared parasitoid wasps from the eggs and "mummies" of a variety of pest insects to document pest-parasitoid interactions at the Farm Hub. It is easy to describe certain creatures as being pests or beneficials, but nature is complex and we hope these analyses are a first step in teasing apart some relationships. Stay tuned for results.

We have continued to co-coordinate the multi-institutional Applied Farmscape Ecology Research Collaborative (AFERC) together with our colleagues Anne Bloomfield and Teresa Dorado at the Farm Hub. This collaborative includes investigators from seven regional universities, colleges, and other organizations, who study aspects of the on-farm water cycle, soil microbes, soil macroinvertebrates, terrestrial and aerial insects, turtles, birds, and plants. It is aided by a statistician and a geneticist associated with two additional institutions. A highlight of this past season was an AFERC "field day" which gave students and the public a hands-on experience with the Collaborative's work.

Other Ongoing Projects

Monitoring Plant Phenology at Hawthorne Valley Farm: We have completed another year of weekly monitoring of the phenology of 70 individual plants, including species of trees, shrubs, and herbaceous plants along two phenology trails here at Hawthorne Valley Farm. Our data contribute to a national phenology database through Nature's Notebook.

Summer intern Elena and phenology volunteer Elyse monitor the phenology of a Flowering Dogwood.

FEP created the content and design for these newly installed phenology trail signs at the Martin Van Buren National Historic Site.

Collaboration with the Martin Van Buren National Historic Site: In an effort to take our work to new audiences, we also are in the third year of working with the Martin Van Buren National Historic Site, where we have helped launch a phenology trail, have been exploring the sound landscape of different habitats, and have several ecological monitoring projects.

Collaboration with Dr. Peter Dunn: In 2020 and 2021, we collected insects at Martin Van Buren National Historic Site as part of a continent-wide effort to study patterns in insect abundance during late spring, when many songbirds rely on healthy insect populations to feed their young. The findings of that study have been submitted to the journal *Ecology* for review, and will likely be published in 2023.

Overmountain Pollinator Meadow: We have planned and facilitated the seeding of a ½ acre pollinator meadow at the Overmountain Conservation Area in 2019. Since then, we have monitored the vegetation development in the meadow and advised the Columbia Land Conservancy on its management.

One of the many species of native bees documented by entomology intern Timo Wayman in the Creekhouse Garden this year. This Sharp-tailed Bee (Coelioxys sp.) is a cuckoo bee, which means it lays its eggs into the nests of other bees.

Looking Ahead

Conrad and Claudia will dedicate a few months at the beginning of next year to the analysis and preparation of manuscripts for publication of the agroecology work to date, before the next field season starts. It will also be a chance to reflect and plan. From January through May, they will be collaborating with agroecologist Megan Garfinkel to consider the most informative ways to analyze and present the data and to identify the best ways forward with this research. During their "mini-sabbatical" many of the day-to-day program responsibilities will be carried by other team members, giving other staff a chance to take the reins for a while.

We are on track for the long-anticipated publication of our book *From the Hudson to the Taconics: An Ecological and Cultural Field Guide to the Habitats of Columbia County, NY* in 2023. We are anticipating a series of events and workshops promoting its use as a tool to explore the habitats of our beautiful county and to become more familiar with some of its inhabitants, past and present, human and other-than-human.

Building on the HVF Biodiversity Report, we hope to expand our collaboration with the Farm and School at Hawthorne Valley. Derived projects may include a radio-tracking study of Spotted Turtles and an effort to monitor Hemlock Woolly Adelgid,

We are looking forward to a couple of interesting biodiversity surveys next field season, including a return to the Mountain Top Arboretum and, together with our colleagues at Hudsonia, work on two beautiful sites managed by the Dutchess Land Conservancy.

Finally, we are beginning the literature review and conceptualization of a potential research initiative, the Ancient Forest Project. Its goal would be to document the unique quality of forest patches that had not been cleared for agriculture in the last few centuries, compared to the surrounding post-agricultural forests.

This year, Columbia County experienced another outbreak of Spongy Moths (a species formerly known as Gypsy Moth). The large white females are almost flightless, while the smaller males are frequently seen fluttering about, in search of females, whose scent they sense with their feathery antenna. Let's hope that a trio of biological control agents, composed of a fungus, a bacterium, and a virus, will reduce the population of very hungry caterpillars of this species to tolerable levels again next year.

Acknowledgements

Our work this year was made possible by the generous support (some of it financial, some in-kind, institutional, and/or collegial) of Art Omi, Arthur & Eileen Newman Family Foundation, Columbia Land Conservancy, Community Greenways Collaborative, Fidelity Charitable Gift Fund, Gerda and Ole Skaarup Fund, Harvard Forest, Hudson Valley Farm Hub, Hudsonia Ltd., Hygeia Foundation, Martin Van Buren National Historic Site, PS21, Town of Chatham's Recreation Department, Sandy River Charitable Foundation, Xerces Society, and 175 private donors. We are deeply grateful for their support.

The Soil Sisters and botany interns enjoy popsicles during a well-deserved break from gardening on a hot day. From left to right: Eve Kaplan, Tracy Pennea, Elena Kubicek, Anne Codey (with Delia), Josie Laing, Deborah Thomas, and Joanne Klein.

Much appreciation goes to the lovely group of weekly volunteers, the "Soil Sisters" (Susan Arterian, Anne Codey, Eve Kaplan, Joanne Klein, Lauren Mundy, Tracy Pennea, and Deborah Thomas) who have been a tremendous help with weeding and transplanting in the Native Plant Garden and in the beneficial habitats throughout Hawthorne Valley Farm. Numerous volunteers also collected seeds of native plants to keep our seed bank well stocked for next year's planting and seed sharing. We also wish to thank Paul Wagner for generously volunteering his time to map historical field delineations throughout Columbia County. In the meteorological realm, we thank Tom Curran for his work on recreating a historical weather vane, Walt Rymarczyk for his advice on all things old and weathered, and Caroline Stewart for her continued support of these efforts. Ben Madey generously took us for a fly-over the county in his little airplane, so we could take lots of images from the Hudson to the Taconics from a bird's perspective.

Finally, a big thank you goes out to this year's group of FEP learners and summer volunteers, Kelly Holsinger, Elena Kubicek, Josie Laing, Sophia Madey, Elyse Mason, and Timo Wayman, as well as to the staff at Hawthorne Valley and at the Hudson Valley Farm Hub who helped with many aspects of our research, outreach, fundraising, program administration, and land stewardship.