Meristems

The Polly Hill Arboretum
West Tisbury, Massachusetts

Vol. 24, No. 2, Fall 2022

American beech (*Fagus grandifolia*) in autumn glory in the PHA picnic grove

PHA Breaks Ground on Staff Housing

The availability and affordability of housing on Martha's Vineyard is a challenge for the entire Island community, including Polly Hill Arboretum's staff. In an attempt to attract and retain qualified, diverse staff, PHA has embarked on an exciting staff housing project, the plans for which were approved by the Massachusetts Department of Conservation and Recreation in June 2022. Our plan includes two 1,008-square-foot, energy-efficient single-family homes, built with photovoltaic solar panels, electric heat-pumps, a state-of-the-art denitrification septic system, and an electric vehicle charging station. The surrounding landscaping will use native plants grown at PHA using wild-collected seed from across the Vineyard. These homes are meant to be transitional housing that not only provide a basic need, but allow staff to live more affordably on the Island.

We are pleased to announce that we broke ground on the project in July 2022 and hope to have these homes completed by summer 2023. In an effort to sustain our Island community, we use local contractors whenever possible. The project's designer Peter Rodegast completed construction drawings in July and soon after, we received building permits from the town of West Tisbury and began the first step of preparing the grounds for construction. Our staff and volunteer grounds crew made an extraordinary effort to remove trees that were in the construction footprint and to clear brush from the site, all while teaching valuable lessons in arboriculture to our summer interns.

The first foundation was dug by Island-based Keene Excavation at the end of August, followed by the pouring of foundations by local contractor David Whelan and electrical work by Brissette Electric and Eversource, all overseen by PHA's Facilities Manager and staff housing project manager Tucker Hubbell. "I feel lucky to have hired two experienced Island carpenters," says Tucker. "Chris Harding and Bob Murray have been building homes on-Island for many years and are a perfect fit for this project. I am excited to finally get to the building stage and to help orchestrate a top-notch group of Island contractors to construct these two homes."

We are thankful to our staff housing construction and fundraising committees for their work on finessing the details of this project, and to all the past and future contractors, members, donors, and supporters who are helping PHA provide the security our staff needs to maintain and sustain our organization in the future.

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An aerial view of the two staff housing units under construction just north of our Visitor Center

Meristems

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Message from the Director

What a spectacular fall season we had! Many exceptionally sunny, warm, and dry days extended the autumn color parade into late November. The show finally ended with a display of fiery orange leaves on our white enkianthus (*Enkianthus perulatus*). The weather brought more than spectacular fall color; it helped our progress in building two new staff housing units on our north campus. Thank you to all who have contributed to this critical project. For those who would like to know more, please visit: bit.ly/PHA-Staff-Housing.

In this issue, you will read about the return of our internship program, facilitated by Grounds Manager/Arborist Ian Jochems. Ian celebrated his 10th anniversary at PHA this year. We are grateful for his expertise and teamwork in guiding our interns and our grounds volunteer group. As a teacher, mentor, and outstanding Arboretum ambassador, the quality growth of PHA is a direct reflection of his talents and hard work. Another feature is on Facilities Manager Tucker Hubbell, who has been our builder since 2005 and is guiding our Staff Housing Initiative. People power the PHA programs, and this includes our dedicated Board members. In the pages ahead, you will read about long-time PHA Board member and Arboretum friend Gary Montrowl, who ended his term this past July. Gary has recruited many Vineyard members and continues to promote PHA as an Island resource.

The Arboretum works on wide-reaching projects at the national and regional level, as well as within the Vineyard community. We are proud of two local initiatives: planting one thousand New England blazing star plants in Katama and participating in the recently formed West Tisbury Tree Advisory Council.

Further afield, a highly successful seed expedition focusing on the conifer trees of the Pacific Northwest yielded the promise of new trees for the future. For those of you on-Island, please plan a visit to our winter landscape and greet the witch-hazels, which are making a late winter appearance with their sunset-hued flowers often accompanied by a pleasant fragrance. We hope to see you soon!

Timothy M. Boland

Arboretum Receives Third CAP Report

CAP steering committee and assessors tour the grounds and learn about *Magnolia* 'David.'

Last fall we announced that we received funding for a Collections Assessment for Preservation (CAP) grant. This grant program, administered by the American Institute for Conservation (AIC) and the Institute of Museum and Library Services (IMLS), is designed to help improve collections care for small and medium-sized collections-based institutions. Polly Hill Arboretum received two other CAP awards, in 2001 and 2008, which have been instrumental in guiding our organizational goals and securing funding for important projects.

The grant provides funding for assessors to make a site visit and create a report with recommendations for improvement of infrastructure, collections care, and overall operations. We were impressed with the credentials and expertise of our chosen collections assessor, botanist Dr. Michael Thomas from Hawaii, and our buildings assessors, the architects Mohamad and Dorienne Farzan from Newport, Rhode Island. Combined, they have completed more than 20 past CAP assessments.

The site visit is the heart of a CAP assessment. To prepare, assessors reviewed internal PHA documents such as collections policies and procedures for our living collection, herbarium, library, and archives, as well as building blueprints and maintenance plans. They arrived in early May and had two days to tour the collections and facilities, interview staff, and learn as much as possible about the Arboretum. Two days isn't much time to learn the ins and outs of an entire organization, so our days were carefully planned (and jam-packed!).

The result of all this planning and work was a 48-page document written by the assessors that details the current status of PHA and recommendations for the future. It highlights that PHA is a nearly world-class institution with beautiful and well-cared for historic buildings and respected plant collections that are expertly managed and maintained. Nevertheless, there is always room for improvement and the term "nearly" in relation to world-class is no mistake. While our living collections are in good shape, we have other essential, non-living collections—the library, archives, and herbarium—which need more attention in terms of policy and maintenance. In our library, for example, we have a number of rare and expensive books that need increased care and protection. We also have an extensive collection of historic "ephemera," including works of art, historic tools, and a garden dibble collection, which are currently under-documented.

One of the most crucial recommendations made to ensure the future success of PHA is that we develop more educational and way-finding signage via an interpretive master plan. The creation of such a plan would ensure that everything we do aligns with our mission, and it would ultimately help us to accurately and effectively interpret the space so everyone can understand the history, scientific importance, and natural beauty of Polly Hill Arboretum. We look forward to reviewing and implementing these recommendations and more over the next five years.

David Behnke Joins Board

We are pleased to introduce David Behnke, the newest member of the Polly Hill Arboretum Board of Directors. David brings extensive investment, management, and financial market experience. He is a senior advisor at Triton Resources, Inc., where he was CEO until 2015. From 2006 to 2019 Mr. Behnke was also the managing director and head of United States investments at Najeti Ventures LLC, a private equity firm investing in lower middle-market companies in the consumer/retail, industrial products, distribution, and energy/clean technology sectors.

David has also been involved in environmental, animal health, and artistic causes. He serves on the boards of the Baker Institute for Animal Health at Cornell University, the Martha's Vineyard Chamber Music Society, the Martha's Vineyard Playhouse, and the Island Community Chorus. Formally trained in the opera program at Yale, David has recently returned to singing after a 35-year hiatus. His local performances range from *Beauty and the Beast* with the Island Theater Workshop to the works of Schubert's *Winterreisse* and Schumann's *Liederkreis, Op. 39* to benefit the Martha's Vineyard Chamber Music Society and the West Tisbury Congregational Church.

David and his husband, Paul Doherty, moved to the Island year-round in 2013; they currently reside in West Tisbury with their "goofy" Gordon setter, Cooper. Their love of gardening brought them to PHA: David remembers, "I first visited the Arboretum to find new plants that would thrive on the Vineyard. While I found plenty, I also discovered that I kept going back just to walk through the gardens for peace and solitude. Now that I live close by, I get to do that more and more." We are thrilled to welcome David Behnke to our Board of Directors.

David Behnke

An Interview with First Greenhouse Intern Linnea Laux

What are three things you've learned over the course of your six-month greenhouse internship?

This is a hard question, because I've learned so much. I learned that an organization can be incredibly caring to its employees and still accomplish great work. I learned so much about plants that I could fill a whole issue of Meristems. *I also spent some time with the grounds crew and learned how to safely cut down a tree!*

What surprised you the most about the greenhouse internship?

It has been more fun than I could have imagined. I did a lot of pot-washing, watering, and other routine work, but I rarely felt bored. Every time I looked up, Tim was stopping by with a story, Emily was checking in, or Nancy had found a cool bug in the greenhouse. Nancy's endless love and care for living things was a lot of fun, as you never knew when she was going to rescue a plant out of the driveway or a songbird that had flown into the door. When our wonderful greenhouse volunteers came on Wednesday mornings we would take a cookie break and chat. There were definitely hard days, and the heat and drought this summer were not fun, but this was by far the most joyful job I have ever had.

How has your degree in landscape architecture been useful in the greenhouse internship, and how has this experience influenced your career goals?

I had a basic knowledge of woody plants and plant production from my college studies, but no hands-on greenhouse experience. Many moments, places, and individual plants at the Arboretum will stick with me and inspire my future work, and knowing plants better will make me a better designer. I enjoyed learning more about what a career in public gardens could look like and got a chance to see how landscape design plays a role in this type of work. My immediate plan is to work as a landscape designer, but this internship has opened my eyes to additional long-term possibilities, including in public horticulture.

Left: **Linnea Laux labels rhododendron seedlings with tags made on the greenhouse's new label printer.**

Gary Montrowl Steps Down from the PHA Board

After nine impactful years serving on the PHA Board of Directors, president and treasurer Gary Montrowl stepped down this past July. Former Board secretary Selena Roman has now taken on the president position. Dennis Bushe is our new treasurer and John Kennedy is our new secretary.

Gary was first introduced to Polly Hill Arboretum through his wife, Dionis (Dinny), whose parents, Bill and Ann Fielder, were longtime friends of Polly and Julian Hill. Gary joined the grounds crew as one of our first volunteers in 2005. He enjoyed the work and friendships, and as a result, he helped recruit a cadre of like-minded enthusiasts to join the crew. One was Dinny, who had started out volunteering in the greenhouse in 2006, and moved over to the grounds crew the next year.

Having developed an understanding of many of the day-to-day challenges of PHA staff as a volunteer as well as an appreciation for the historic landscape and buildings we steward, he brought a pragmatic approach to the budget during his early years as Board treasurer. "Gary championed and helped establish two critical funding mechanisms: a yearly maintenance line item, and an equipment fund. These have helped us to plan and execute critical infrastructure repairs and improvements, and they have helped us avoid surprise expenses," says Executive Director Tim Boland. In addition to his budgetary work, Gary participated with our finance committee in transitioning our investment portfolio to a new investment team with an environmental, social, and governance (ESG) focus, and served as Board co-president/president for four years.

Gary has been an advocate for PHA throughout the community by recruiting a number of Islanders as new members, making a special effort to encourage young people to join. During his time on the Board, Gary co-hosted several "Offshore Ale at the Arboretum" membership recruitment events where young families and old acquaintances came

PHA Featured in New Landscape Design Book

A new book, *Design with Nature on Cape Cod and the Islands,* includes photos and interviews with Tim Boland about PHA and the West Tisbury Library Landscape Project. This exciting new publication authored by Jack Ahern, professor emeritus of landscape architecture at the University of Massachusetts, contains strategies for ecological planting design and images of real-world examples of ecologically designed landscapes found on Cape Cod and Martha's Vineyard. "It's wonderful our work is featured in this new publication. The Vineyard does not have many designers dedicated to the art and practice of ecological design using local native plants. Perhaps this book will inspire more to get involved," says Tim. The book is published by the University of Massachusetts Press and is available at regional bookstores.

Gary Montrowl and Executive Director Tim Boland

together to enjoy the beautiful grounds and celebrate the spirit of PHA. We are eternally grateful for Gary's contributions to PHA, and we are happy that he will continue to be involved as an advisor to the Board during 2023.

PHA Seasonal Gardeners Lysbeth Abrams (*left*) and Kevin Green (*center*), pose with interns (*from left*) Linnea Laux, Lauren Townes, and Max Cordray during a tour of the Arnold Arboretum in Boston.

Thank You 2022 Interns

Polly Hill Arboretum's summer internship program, a vital part of our educational mission, has benefitted both students and the Arboretum for many years. After a two-year pandemic hiatus, we were delighted to welcome three enthusiastic and highly qualified interns—Lauren Townes, Max Cordray and Linnea Laux—to PHA this past summer. Lauren and Max joined us for three months as horticultural interns, and Linnea was at PHA for six months as our first greenhouse intern.

Lauren came to us from Lexington, Kentucky, where she is majoring in plant and horticultural science at the University of Kentucky. A true plant lover, she arrived having already completed every plant identification course the university offers! West Tisbury native Max Cordray holds an associate degree in sustainable horticulture from the Stockbridge School of Agriculture at the University of Massachusetts Amherst, and is currently pursuing a second AS degree in arboriculture and community forestry. He also brought hands-on experience working in landscaping and grounds maintenance.

PHA Grounds Manager/Arborist Ian Jochems, who works with the horticultural interns on a daily basis during the summer months, recalls how fantastic it was having them back this year and remarks that we truly lucked out with such a great pair. He adds, "Max is an uplifting and funny young man and although he arrived with prior experience, he always showed up ready to learn. And Lauren's feisty and fun personality made her a great coworker from the get-go. She quickly took initiative and excelled at picking up new skills. Together they made a fun yet professional team and it was a joy to have them as part of our PHA family this summer."

Linnea Laux, a self-described "plant nerd," recently completed her master's in landscape architecture at the University of Virginia, where she studied design of the built environment, community engagement, plant form and function, and the human experience of spaces. Our first greenhouse intern, Linnea applied for the position to gain experience in plant maintenance and cultivation in order to be a better landscape designer.

Linnea spent most of her time in the PHA nursery and production area as well as tending to our plant sale area and helped out in the PHA Visitor Center this past fall. PHA Visitor Experience, Outreach, and Membership Coordinator Ann Quigley says, "In addition to being knowledgeable about plants and the natural world, Linnea is great with people! She could often be found patiently answering questions and helping with plant selections in our plant sale area. She was a natural while staffing the Visitor Center." Linnea plans to stay local, beginning a career in landscape design in Woods Hole, Massachusetts.

We enjoyed having these three talented individuals on our PHA team this season. Their unique strengths and experience were well utilized and appreciated at the Arboretum. Thank you Lauren, Max, and Linnea!

Tucker Hubbell: Builder, Craftsman, Friend

The Polly Hill Arboretum, with its historic buildings, extensive plantings, and winding stone walls, evokes a special sense of place, in large part because the structures blend harmoniously with the rural surroundings. Tucker Hubbell, gifted Island craftsman and builder, has been renovating, improving, and overseeing the construction of PHA buildings since 2005. Maintaining the unique Vineyard vernacular of this landscape takes special care and talent and Tucker's many contributions to the built environment have enabled us to develop and expand our programs and plant collections while preserving the spirit of the place.

Tucker helps with fence construction during the renovation of Polly's Playpen.

Born on Long Island and raised in Connecticut, Tucker came to Martha's Vineyard in 1972. He and his wife, Martha, who is also involved with PHA as an herbarium volunteer, raised two children on the Island, Tim and Kate. He started his own business, Rising Sun Construction, in 1981, partnering on many of his projects with carpenter Eben Clark and designer Margaret Curtin. These days, Tucker is semi-retired and grandparent to four grandchildren—Luka, Willa, Hazel, and Juna—with whom he spends as much time as possible. Fortunately for us, Tucker still finds time to help out at the Arboretum in his current position as PHA's Facilities Manager. He provides a steady guiding hand managing and overseeing the maintenance of our buildings and structures.

Tucker enjoys the diversity of projects that come with maintaining a nationally registered historic site; each of the ten buildings have a unique character based on the period when they were built and their original intended use. "When you look at the projects Tucker has had a hand in building, renovating, or restoring, he has made an incredible impact on PHA's infrastructure and sense of place," says Tim Boland, PHA Executive Director. "It's been a rewarding and productive partnership that continues to this day."

Tucker adds his own thoughts on his tenure at PHA: "I love the community of West Tisbury, a place I've called home for 42 years, and I count myself incredibly fortunate to have found a second home at Polly Hill Arboretum. The grounds are a wonderful Garden of Eden, a sanctuary of trees and plants set among several buildings that date from the 1700s to the mid-1800s. As someone who loves reading history, it has been a dream job to be involved in the renovation of so many old buildings. The Littlefield House, originally built in 1844, and the Far Barn, in 1850, were both great projects. It was a fun challenge to renovate the structures in a way that complies with modern codes but still keeps the integrity and character of the original structure. These buildings are such an important part of the PHA grounds, and I think Polly herself would be thrilled by how her dream has turned out!"

As for our more recent buildings, Tucker and his team built the Littlefield Maintenance Building in 2009, and the Education Center and Botany Lab in 2016, from the ground up. "PHA's education program, plant conservation work, and maintenance capacity were all strengthened with the addition of these new buildings," says Tim, "and they fit in seamlessly with the centuries-older structures." Currently, Tucker is managing our staff housing initiative, including overseeing the construction of two energy-efficient homes to provide housing for employees. This essential project will stabilize our staffing in the future. Tucker is also involved in the yearly maintenance of all of the buildings on the property, which require regular attention and care.

Beyond his fine-tuned construction skills, Tucker brings his warm, easy-going attitude and a spirit of genuine kindness to PHA. He is the first person to offer advice and a helping hand to employees with a unique project or problem, and he generally has the knowledge and/or the creativity for a clever solution. It is evident that he truly cares about the place and the people at PHA. Tucker says, "The staff, both past and present, are such an integral part of what makes my job here so special. I have enjoyed the company of many hard-working and knowledgeable staff, many of whom have tried with mixed results to turn my brown thumb into a shade of green! As I have morphed from the on-site builder to the Facilities Manager, I have always enjoyed my daily interactions with a young, knowledgeable, and fun group of people." The feeling is mutual! Tim sums it up with a reflection that many members of the PHA community would agree with: "My gratitude for Tucker's years of service, good nature, and friendship cannot be understated."

Tucker reads with his granddaughter Juna during the Arboretum's Fall Color Celebration this past October.

Beech Leaf Disease: A Troubling Challenge to the Future of our Woodlands

This past spring, many Islanders were troubled by the appearance of new beech leaves in our natural areas; they were malformed, often discolored, and with distinct banding or blotch patterns. We observed in mid-May that these symptoms were not only confined to the American beeches (*Fagus grandiflora*), which are native to the Island, but also occurred on several cultivars of European beech (*Fagus sylvatica*). Upon further investigation, it was determined that beech leaf disease (BLD) and its associated nematode (*Litylenchus crenate* subsp. *mccannii*) was the cause of the symptoms displayed on our trees. First discovered near Cleveland, Ohio, in 2012, BLD has rapidly spread and was first reported in Massachusetts in August 2020.

The nematodes that cause BLD originated in Japan; they are microscopic roundworms that infect trees in the bud stage. The infestation and feeding progresses over time, damaging the internal leaf tissues, leaving a tree with deformed leaves and a thin canopy. As the pest becomes more established on a tree, it ultimately results in mortality. Death can occur within six years for mature trees, and for younger trees, it takes as little as two years.

Nematodes cannot fly or disperse far and wide on their own. One theory about how these pests have spread so fast is that they are moved by migratory bird species that feed on beech buds. Scientists have also found that white-tailed deer can host nematode populations, adding another potential mode of transfer between trees separated by distance. The nematode responsible for BLD has been found in Connecticut, Pennsylvania, New York, Massachusetts, Michigan, and Ontario.

Bartlett Tree crew leader and safety coordinator J. T. Hunt sprays an experimental nematode treatment on our oldest European beech tree.

PHA has a number of large beech trees first planted by Polly Hill in the early years of her horticultural experimentation. The first tree in the PHA records was planted by Polly in 1958. It is an upright European beech (*Fagus sylvatica* 'Fastigiata'). In total, we have 20 beech trees in our collections; not all show symptoms, however, some of the most magnificent specimens do.

Native trees in our natural areas also show signs of infestation; this is the worrisome part of this story, as it will impact the ecology of our local woodlands in the long term. Hopefully, trees will have the genetic diversity to be resistant and persist as a critical component of the Vineyard's natural flora.

Many unresolved questions remain about beech leaf disease. In response to these questions, the Arboretum hosted a workshop this past September for Island arborists. Bartlett Tree Care scientists Dr. Beth Brantley and Dr. Kevin Chase discussed the latest findings on BLD as well as spotted lanternfly and cynipid gall wasps.

We are experimenting with different treatments here at the Arboretum focused on limiting the nematode populations. PHA Arborist Ian Jochems and Bartlett Tree company are working to save some of our largest and oldest trees. PHA initially performed experimental treatments with basal root flare injections of an insecticide commonly used to fight emerald ash borer (EAB) called Tree-AGE.™ After more research by Bartlett Tree Experts and Davey Tree, we are now trying a product called Broadform™, which is both a nematicide and a fungicide. These treatments are carried out in late summer to fall when the adult nematodes begin to leave the old leaf and infect the new buds for the following year. To apply this product, we perform a foliar spray of the canopy to penetrate and cover as many leaves and buds as possible.

Currently, all treatments are experimental, and there is no guarantee that an infected tree will survive. As we learn more about their effectiveness and other viable options, we will share them on our website and with the Vineyard community.

Cone Collecting in the Pacific Northwest: A New Frontier

by Emily Ellingson

When I first arrived at Polly Hill Arboretum in November 2021, I was given the opportunity to plan a collections trip to the Pacific Northwest targeting conifers, a trip that had been delayed for several years due to the COVID-19 pandemic. This region of North America is a new frontier for PHA, which is exciting because it allows us to continue our legacy of experimental horticulture and test the success and landscape value of new species at the Arboretum.

We built a well-rounded and cohesive team with complementary collection goals and various areas of expertise, which included our former PHA Curator Tom Clark as a PHA Research Associate. We also worked with colleagues familiar with the flora of the region from the University of British Columbia Botanical Garden, curator-horticulturist Ben Stormes and research manager Daniel Mosquin, as well as the curator and arborist at the Hoyt Arboretum, Martin Nicholson.

With a top-notch crew of plant nerds in place, the planning process—finalizing a target taxa list, obtaining permits, choosing collection locations, and booking accommodations—was divided up and conquered accordingly. We soon had an impressive combined list of over 84 target taxa for southern Oregon and northern California and were ready to start our journey!

OREGON

We started and ended our expedition in Oregon; our first trial-run collection site was in the Mount Hood National Forest near the Timberline Lodge, the infamous filming location of the Overlook Hotel in *The Shining*. We visited subalpine rocky slopes with low-growing perennials and wind-swept conifers, like the mountain hemlock (*Tsuga mertensiana*) and whitebark pine (*Pinus albicaulis*) as well as mixed conifer forests with ericaceous understories.

Among PHA's most sought after plants were firs (*Abies* sp.), of which there were six on our target taxa list. Our visit to a subalpine meadow led us to the aptly named subalpine fir (*Abies lasiocarpa*) and the Pacific silver fir (*Abies amabilis*) and gave us insight into just how sticky conifer cone collection would be over the next two weeks (hint: very sticky).

We were after a triad of firs that are difficult to distinguish: the noble fir (*Abies procera*), found more commonly in northern regions of Oregon; red fir (*Abies magnifica*),

Martin Nicholson, Ben Stormes, Tom Clark, and Emily Ellingson at Little Duck Lake at the end of the Miracle Mile of Conifers in California

Emily Ellingson records locality information for the Pacific rhododendron (*Rhododendron macrophyllum*) at the Babyfoot Lake Trailhead in Oregon.

Stands of dead trees display the devastating effects of recent fire in northern California.

found in California; and a hybrid of the two, Shasta red fir (*Abies* × *shastensis*), found seemingly everywhere in between. These trees would prove to become somewhat of an ID obsession over the course of the trip, sparking many moments of hope and subsequent disappointment as we scanned the tops of trees for true noble and red firs, finding mostly the Shasta red. We celebrated our first collection of the noble fir at High Rock in Mount Hood National Forest, although we later found that at least one of the trees was the hybrid.

Our first days in Oregon were rounded out by a visit to a conifer production facility in the small town of Cottage Grove, where we learned helpful tips for the propagation of incense cedar (*Calocedrus decurrens*). We had a brief overnight stay in Josephine County before the real backcountry fun began.

CALIFORNIA

The California leg of the trip began in the way of roadside collecting. Collection expeditions can be romanticized as deep walks into the woods, but many collections originate during road-side botanizing where, with a trained eye, one can identify many plants and collect from easily accessible locations. Our first roadside sites were part of the awesome serpentine plant community.

Serpentine soils are created by the weathering of igneous serpentine rock. These soils form distinctive plant communities that contain plants that can tolerate extreme conditions such as low nitrogen and calcium, high magnesium, and high concentrations of heavy metals such as nickel and chromium. For example, plants in the genus *Ceanothus* can fix nitrogen and are often found in these low nitrogen serpentine areas. Additionally, serpentine soils in conjunction with diverse elevations, and rainfall and temperature gradients, create the perfect conditions for endemic plants. Among the interesting plants we collected in serpentine soils in the Rogue-River Siskiyou National Forest were the incense cedar, the evergreen California laurel (*Umbellularia californica*), and the California yerba santa (*Eriodictyon californicum*).

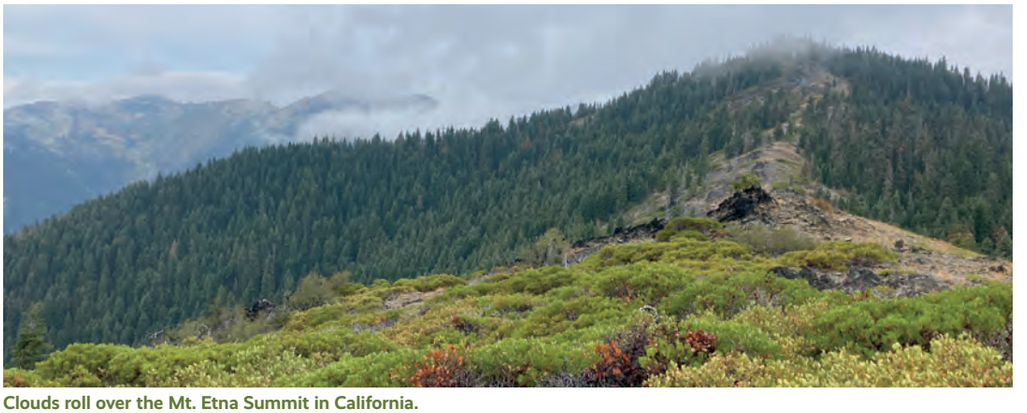
Many of the collection sites we were looking for required driving on harrowing cliff-lined gravel roads with a variety of obstacles, both floral and physical. The first of these roads brought us to a site that had been heavily burned within the last four years. We were in search of a species listed as vulnerable by the International Union for the Conservation of Nature's (IUCN) Red List, Brewer's spruce (*Picea breweriana*). When we arrived at the location of the reported Brewer's spruce, we found that the trees had succumbed to fire, highlighting the need for conservation of this species.

Martin Nicholson collects cones from the top of a Brewer's spruce (*Picea breweriana*) in Klamath National Forest.

One of our main goals in California was to collect acorns from the IUCN near-threatened Sadler's oak (*Quercus sadleriana*), for which Martin Nicholson had received a Forest Service grant. This species has no representation from California locations in *ex situ* (arboreta, botanical gardens, laboratories, collections, etc.) and part of the grant included collecting acorns and checking on reported populations in California and Oregon. Our first site in the Klamath National Forest in Siskiyou County was very fruitful; we found a population of over 50 specimens loaded with acorns. This shrub would pop up in various places along our journey, sometimes in surprisingly large numbers, and often in areas that had seen recent fire.

Our home base for three days was Somes Bar, a small town with no restaurants, cell service, or gas for 40 miles. From there we drove locally, skirting the Marble Mountain Wilderness Area, popping into campgrounds and collecting near mind-bogglingly blue swimming holes and picturesque mountain saddles. A memorable collection in the Klamath National Forest required driving up a 14% grade Forest Service road. We came to a drainage called Cedar Creek, which had a wondrous roadside seep full of water-loving plants like the California lady's slipper (*Cypripedium californicum*), the western azalea (*Rhododendron occidentale*), and a target species, the Pacific yew (*Taxus brevifolia*). This was also where we finally saw our first two Brewer's spruces, which Martin climbed skillfully to retrieve cones.

Our other home base in California was Etna, a popular town for through-hikers of the Pacific Crest Trail (PCT). Some of our most successful collecting occurred on the summit of



Clouds roll over the Mt. Etna Summit in California.

Cone Collecting in the PNW *(continued from pg. 9)*

Textured bark of a Baker's cypress (*Cupressus bakeri*) with a fruticose lichen (*Usnea* sp.) at Flounce Rock

Mt. Etna near the PCT in the Shasta-Trinity National Forest on steep, rocky, exposed slopes. Our most triumphant find was reachable cones of a sugar pine (*Pinus lambertiana*), usually the tallest and most massive of conifers. On our day off, we decided to go on a nine-mile hike (the irony!) to Little Duck Lake and the Miracle Mile of Conifers in the Russian Wilderness. This is an area with some of the greatest conifer diversity in the world where 18 different conifer species can be found in just one mile.

OREGON, REVISITED

Traveling back to Oregon, we split from Martin and met up with Daniel Mosquin at Flounce Rock, a Bureau of Land Management (BLM) property near Prospect. This particular location has a pure stand of Baker's cypress (*Cupressus bakeri*), trees with resinous needles and attractive red-brown peeling bark growing on an open, sloping meadow. This tree is listed as vulnerable on the IUCN Red List due to severely fragmented populations and overshading by other conifers. When we arrived, we were pleasantly surprised to find a group from the BLM collecting cones of Baker's cypress for restoration purposes.

Tom Clark, Daniel Mosquin, and Ben Stormes on their way to the Baker's cypress (*Cupressus bakeri*) at Flounce Rock in Oregon

The last four collection days of our trip were spent at the Siskiyou Field Institute (SFI) in Selma. SFI is an education and research-based facility dedicated to increasing the understanding of and connection to the Klamath-Siskiyou ecoregion. Nestled among mountains in the Rogue River-Siskiyou National Forest, it provided easy access to national forest land and a large classroom, perfect for spreading out our herbarium specimens and seed collections for drying and cleaning.

Our collections on the nearby Eight Dollar Mountain were not only successful but incredibly scenic. Our first stop at the Day's Gulch Botanical Area was mostly just for sights since our permits did not extend to designated botanical areas. We saw an impressive hanging bog of the carnivorous California pitcher plant (*Darlingtonia californica*) and encountered a truly puzzling conifer which was eventually identified as the red-listed Sargent cypress (*Cupressus sargentii*).

We wound up and around the mountain, collecting along the way, and eventually came to the beautiful Babyfoot Lake trailhead. We hiked through a mixed coniferous forest that was regenerating after a burn; picture dead white snags with charred bases, and a diversity of plants returning like the western trillium (*Trillium ovatum*), Sadler's oak, and knobcone pine (*Pinus attenuata*). There was an unusual, solitary clump of Pacific rhododendron (*Rhododendron macrophyllum*) off the trail, ripe for seed collection. The stunning, high elevation Babyfoot Lake was surrounded by a significant population of Brewer's spruce, but evidence of saplings being cut down for camping firewood troubled us.

Our last day of collection targeted the Sargent cypress, a vulnerable species often found on serpentine soils, which was purportedly on SFI property. A foggy morning made it difficult to find the silver-tinted foliage of the Sargent cypress, but due to some sleuthing on iNaturalist, a sort of social media network for naturalists, and a good bit of wandering in the woods, we eventually found two trees. From such a small population, we only collected three cones but are looking forward to growing this species and getting it into *ex situ* collections.

Our final days in Portland were spent at the Hoyt Arboretum, cleaning and sharing seed, shipping herbarium specimens, and last but not least, simulating natural fire by blow-torching knobcone pine cones to break down the thick resin and release seed. This trip resulted in 111 individual collections, an astounding accomplishment! I am grateful to our team of collectors whose insight, expertise, and guidance made the trip a success. We look forward to growing these plants and to future trips out west.

West Tisbury Tree Advisory Group Makes Green Progress

In the latter part of 2021, PHA Executive Director Tim Boland approached the West Tisbury Town Select Board with a proposal to create a tree advisory group to address the continuing loss of older trees within the town's historic district. The proposal was met with great enthusiasm and support. The first order of business was to meet with veteran tree warden Jeremiah Brown to understand the challenges and opportunities that exist within the historic district, an area about 237 acres in size.

The town advisory committee includes Tim Boland, Emily Ellingson (PHA Curator/Assistant Director), J. T. Hunt (Bartlett Tree Experts), Angela Lucky (WT Conservation Commission), Jevon Rego, David Fielder, Oliver Osnoss, and Jeremiah Brown (tree warden in West Tisbury).

The group began by reviewing trees within a pre-determined boundary area, primarily those highly visible to the public near streets and buildings. Street trees provide numerous benefits wherever they are thoughtfully planted and maintained. Our initial survey revealed that most trees along the streetway were never intentionally planted but were spontaneous seedling trees that, when given the opportunity, took advantage of open spaces. Over 50% of the trees are the state-classified invasive species Norway maple (*Acer platanoides*) and sycamore maple (*Acer pseudoplatanus*).

Looking at the future of urban trees in West Tisbury, our committee will recommend a diversity of appropriate replacement trees to enhance the historic district. Plantings of these new trees will begin in 2023. Arboreta are all about trees; this project demonstrates our commitment to a greener future for our town and the Island.

Planting Liatris at Bamford Preserve

In mid-June The Nature Conservancy (TNC) and volunteers planted 1,000 New England blazing star (*Liatris novae-angliae*) plants, grown by PHA, at the TNC-owned Bamford Preserve in Edgartown, MA. PHA Executive Director Tim Boland and the Arboretum's three 2022 interns were among the team of volunteers. The planting was part of a long-term effort to restore the site's native sandplain grassland—an imperiled ecosystem.

Through MV Wildtype, our native plant propagation program now in its 16th year, Arboretum staff, research associates, and volunteers have propagated thousands of plants for conservation organizations and Island landowners. *Liatris novae-angliae* is a species of special concern in Massachusetts that PHA has a permit to grow.

New England blazing star plays a critical role in sandplain grassland ecosystems. According to the Massachusetts Division of Fish and Wildlife, it has been nicknamed the "Lazarus plant" for its capacity to rebound after drought and fire. This ability is thanks to the energy stored in a thickened structure, called a corm, at the base of its stem. Blazing star flowers emerge in wands of bright purple in late summer, providing a nectar source for the monarch butterfly and other pollinators.

Tim Boland expressed the importance of growing plants from local seed in light of climate change: "These plants—more than most—have a 14,000 year evolutionary advantage of growing in these ecosystems," he said. "So there will be plants that persist even with these rough conditions coming on."

The planting received national recognition and was featured on NPR's Science Friday program.

Tim Boland and Linnea Laux plant native plant plugs at Bamford Preserve. Photo: Robin Lubbock/WBUR

Community Science: Martha's Vineyard Atlas of Life

Matt Pelikan, director of the Martha's Vineyard Atlas of Life (MVAL), spoke at PHA last summer about a new Island community science resource. The Martha's Vineyard Atlas of Life, launched in February 2021 as a joint project of BiodiversityWorks and the Betsy and Jesse Fink Family Foundation, provides a platform for nature enthusiasts to work together to document and protect the Island's biodiversity.

How does it work?

MVAL uses the iNaturalist app, a tool for identifying wildlife sightings and sharing with the community. Use iNaturalist to record interesting Martha's Vineyard wildlife sightings. Your observations will automatically be included in the Martha's Vineyard Atlas of Life project, and will be reviewed by MVAL staff. On the web, you can visit mval.biodiversityworksmv.org to see others' observations, explore species lists, access helpful resources, and check out news and events related to the Atlas of Life.

What is community science and why is it important?

Martha's Vineyard has unique and important flora and fauna. MVAL strives to make that wildlife understood and appreciated by residents, visitors, and the wider scientific community. Contributing wildlife sightings to this database improves the breadth of scientific data on which species of plants, animals, fungi, etc. live on the Island and their geographic distribution. Community science is an integral part of how organizations like BiodiversityWorks and PHA gain knowledge about the biodiversity we are working to protect. Participating in a community science platform like MVAL through iNaturalist is a simple and engaging way to contribute to conservation work on the Island. Explore nature around you—you might even discover a new Island species!

Local ecology professionals and nature enthusiasts participate in a "bioblitz" to identify Island biodiversity at the Hoft Farm in West Tisbury last July.

Right: **The purple tiger beetle (*Cicindela purpurea*) is listed as a species of special concern in Massachusetts, but is very common on Martha's Vineyard, a good example of why it is so important to protect the Island's biodiversity.**

THE POLLY HILL ARBORETUM

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ADMINISTRATIVE OFFICES
The Homestead
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West Tisbury, MA 02575

VISITOR CENTER/ VISITOR ENTRANCE
795 State Road
West Tisbury, MA 02575

ACCESSIBILITY
The Visitor Center is wheelchair accessible.

VISITOR CENTER HOURS
Open 9:30 am–4 pm daily, late May through mid-October

ARBORETUM GROUNDS HOURS
Sunrise–sunset, year-round
Please note: maintenance is often performed on Wednesdays. Check website before visiting for occasional grounds closures.

ADMISSION
$5
Free to members & children 12 and under

FREE PARKING

mer.i.stem: *n. botany*. The growing point or area of rapidly dividing cells at the tip of a stem, root, or branch.

THE POLLY HILL ARBORETUM

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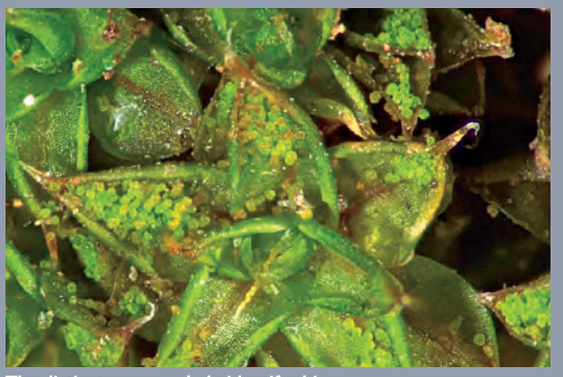
FROM THE HERBARIUM

Hiding in Plain Sight

Rich green growth of the marble screw-moss



The distinct gemmae help identify this rare moss.

The marble screw-moss favors limestone masonry, pictured here in Edgartown, Massachusetts.

Martha's Vineyard has a newly found moss! PHA research associates Greg Palermo and Margaret Curtin collected a specimen of marble screw-moss (*Syntrichia papillosa*) from a masonry wall in Edgartown last winter. Although documented in Massachusetts as far back as 1803 and previously recorded in scientific collections from eight other MA counties, *Syntrichia papillosa* had never been recorded in Dukes County before. The most striking feature of this handsome moss, typically found on limestone and masonry, is the presence on the upper leaf surfaces of numerous gemmae (asexual propagules) that look like tiny green gummies and make the moss recognizable in the field with a hand lens. Each leaf has a central rib and a long, white tip. A specimen of this new Vineyard moss will reside in the bryophyte collection in PHA's herbarium.