



LIMELEDGE
BOTANICAL GARDEN AND ARBORETUM

Volume 1, Issue 2



**Newsletter of the Limeledge
Botanical Garden and
Arboretum**

Editor's Note: Welcome to the Fall 2022 edition of *The Raccoon Den*! Our newsletter is named after one of the many unique features of the old Simmons Farm: A limestone outcrop containing many ridges and cavities serving as excellent habitat for a number of animal species... and many interesting plants as well. As activities at Limeledge get started, this newsletter is intended to be a semiannual publication distributed to local organizations, professionals, and benefactors.

Articles

Plowing Ahead	1
Meet the Board of Limeledge!	2
A Note on Monitoring for Invasive Species	5
Rare and Unusual Species Highlights	7
Fall 2022 Planting Map	11
Dr. Crim in the Field: International Oaks 2022 Conference and New Acquisitions	12

Plowing Ahead into 2023!

Since beginning operations in May, Limeledge has made excellent progress in preparing the site, installing initial plantings, and moving forward as an organization. Although much of the late Spring and Summer were too hot and dry to safely plant, the Cook Lot was successfully cleared of invasive species, plants were acquired, and an initial planting scheme was devised for Autumn.

In addition to work at the site, a professional board was recruited and a team assembled to guide and administer the nascent botanical garden and arboretum. In September, documentation was submitted to the New York State Education Department to establish a charter for Limeledge Botanical Garden and Arboretum as a 501c3 nonprofit educational organization.

With the weather finally agreeable in early October, over forty of the first specimen trees and shrubs were installed at the Cook Lot, which will be the central hub for the plantings at Limeledge. While most of these were chosen as species that should be safe for fall planting in CNY, some are a bit on the tender side and their successful establishment (or failure) will provide some information on their adaptability quite soon. These plants are just a tiny fraction of our acquisitions thus far; we expect to add as many as three times this number of new plants in the Spring and be close to 200 plants installed by the end of 2023. Please see our website for an updated list of our plant holdings.

While we await word on the approval of our 501c3 status, our first fundraising campaign is in progress to begin raising capital for trail improvements as we strive to meet our goal of opening to the public in 2024.



Figure 1. Before and after clearing invasive species from the long-neglected Cook Lot.

Meet the Board of Limeledge!

Erik Carlson, MS

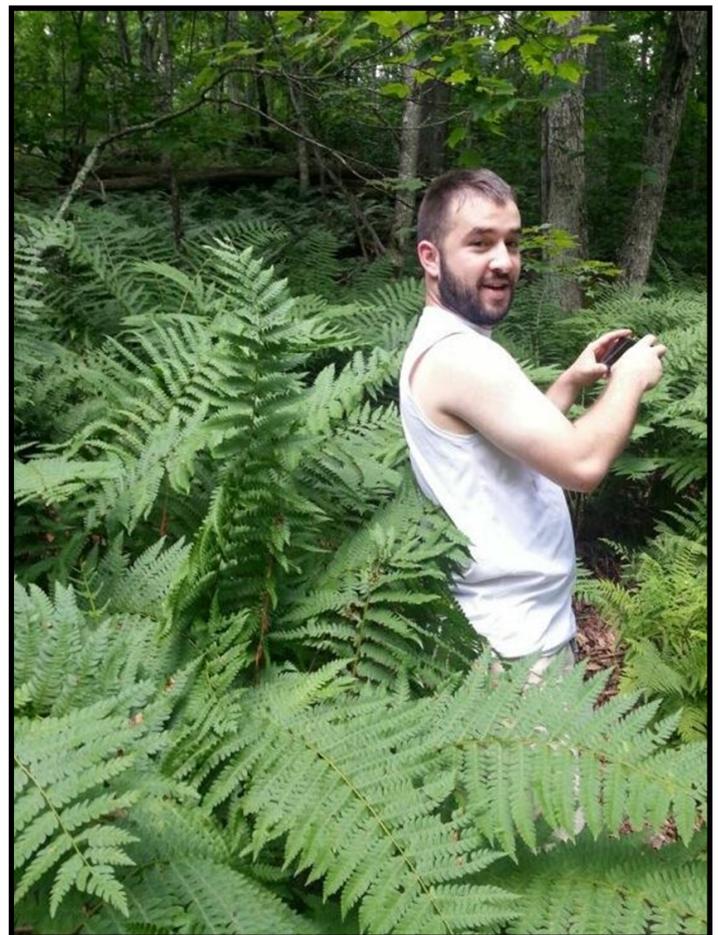
I am a tree scientist at SUNY-ESF (Syracuse, NY) where I previously earned my Master of Science degree in Plant Science and Biotechnology, and where I am currently pursuing a PhD in Forest Pathology and Mycology. I have worked on genetic research in poplar and American chestnut and my current work focuses on refining gene expression strategies for disease resistance in transgenic American chestnut. Aside from my interests in tree genetics, I have a deep fascination with trees as a whole including their horticulture, ecology, conservation, and collection. I also enjoy collecting and breeding ornamental flowering species including peonies, roses, hardy hibiscus, etc. I'm excited to watch as Limeledge develops and to contribute to its growth wherever possible.



Philip Crim, PhD

I am an Assistant Professor of Biology at The College of Saint Rose in Albany, NY. As a woody plant obsessive, I founded Limeledge to share themes of conservation and the importance of biodiversity in my Upstate New York Community. As a haven for imperiled plants and a leader in environmental education, I quickly realized that our impact can go far beyond our local community. My work aims to leverage underutilized trees and shrubs with an emphasis on native and edible species to provide a biodiversity-based approach for sustainable horticulture. This philosophy arose from my ecological research and is complemented by my interest in ex situ conservation, as I believe that the best way to protect plants in a changing world—and our own human interests with them—is to share and distribute.

I have been interested in trees since I was a small child, but my path as an ecologist and woody plant obsessive was set when I was around ten years old. My father and I discovered a Kentucky coffeetree (*Gymnocladus dioica* (L.) K. Koch) stand growing wild on the farm that would later host Limeledge. The population remains healthy, and some large trees can be seen on the edge of the Cook Lot. I'm looking forward to establishing Limeledge as an educational resource and community attraction.



Meet the Board of Limeledge!

David DeSimone, PhD

I have spent most of my professional career balancing the multiple responsibilities of teaching, research, and consulting work. I spent 16 years as a Lecturer in Geology and Environmental Studies at Williams College pursuing consulting and glacial geomorphology research during summers in Alaska, Yellowstone, and the San Juan mountains as well as NY & VT.

In 2001, I decided to consult and teach only as an adjunct; first at Rensselaer Polytechnic Institute, then at The College of Saint Rose. My consulting work is primarily as a geoarchaeologist studying soil and sediments exposed in trenches. I have mapped the surficial geology and aquifers in NY and VT for the USGS STATEMAP program. In 2015, I was a “Geoscientist in the Parks” geologist at the Saratoga National Historical Park and generated surficial and bedrock maps of the 4 quads that encompass the park. More recently, I mapped the surficial geology of Hoosick Falls, Petersburg, North Bennington, Bennington and Rutland to better understand PFAS ground water contamination. My work was co-recipient of the EPA 2020 Region 1 Environmental Merit Award for my role in the study of the North Bennington and Bennington PFOA contamination. My long career in teaching and working with small communities to solve big problems will allow me to bring a geologist’s perspective to the programming and educational activities at Limeledge.



Tasha Haynes, MBA, CPA

I’m an accountant who has been working in not-for-profit accounting, finance, and compliance for 15 years. I have a Master’s of Business Administration from SUNY Oswego and I’ve been a CPA for over 10 years. I have always been a nature lover and stargazer. I grew up a very short distance from the Limeledge property, spending a lot of time exploring and enjoying the outdoors. In fact, as children, Phil would often take me on adventures and teach me how to identify various trees! Now, as I’m raising my own family, I’m still only a few miles away from where I grew up. My husband and I have two children. We spend our summers tending to our large garden (that seems to get bigger each year!), eating mulberries, and learning how to can and preserve what we grow. We also spend a lot of time exploring our seven-acre property trying to identify what is growing. We also plant more trees and berries each year, and I dream of a large fruit orchard someday.

I look forward to bringing my accounting experience to this project. But most importantly, I’m excited about all the things I will learn along the way.



Meet the Board of Limeledge!

Alan Simmons

I grew up on the Simmons Farm (property hosting Limeledge) with my six siblings. I've been married to my bride Christine for 26 years. I have five children and nine grandchildren. I live in Cato, NY with a small acreage and have always been a tree enthusiast. I have planted many species on the property. My background is in construction equipment operation and repair. I've worked on major projects such as the Fort Drum expansion and the transformation of the former Carousel Mall into Destiny USA, and I've worked in local dealerships as both a mechanic and as a service manager. More recently, I've been with the Cayuga County Highway Department, where I recently retired from my position as General Foreman. I'm currently serving a term as a Councilman for the Town of Ira. I'm honored to be a part of this board.



Kristopher Stone

I'm a graduate of the University of Kentucky with a B.S. in Plant and Soil Science (Horticultural Science). Currently, I'm the owner of Green Vision Professional Services and Director of Boone County Arboretum, a position I've held since January of 2002. I'm highly active in various community organizations in the Greater Cincinnati area and Ohio Valley region, building community awareness and networking for the Arboretum. I serve as immediate past President of the Northern Kentucky Urban and Community Forestry Council, advisory member of Boone County Urban Forest Commission, past President and Board member of the Kentucky Invasive Plant Council, President of Taking Root, and I'm an ex-officio board member of Friends of Boone County Arboretum.



I serve on the steering committee of the Theodore Klein Plant Award Selection Committee, and the Kentucky Urban Forestry Council, ensuring the Arboretum provides full support of these efforts. I also serve on various other ad hoc committees for community and state organizations when time allows. I'm a former writer for Kentucky Gardener Magazine where I contributed monthly as the Ask the Expert columnist. I maintain certification as an ISA Certified Arborist (certification number: KY-0379A).

A Note on Monitoring for Invasive Species

A major risk of being on the cutting edge of plant introductions is that some of these introductions could become invasive species. A large portion of Limeledge's responsibilities will be to identify potential invasive threats early. In Spring 2022, much of the site prep work on the Cook Lot was devoted to removing non-indigenous species such as black locust (*Robinia pseudoacacia*), European buckthorn, (*Rhamnus cathartica*), shrub honeysuckles (*Lonicera* spp.) autumn-olive (*Elaeagnus umbellata*) and multiflora rose (*Rosa multiflora*). There is at least one patch of Common ailanthus (*Ailanthus altissima*) and wych elm (*Ulmus glabra*) in the woodlands nearby that defy easy explanation. In other words, the local woodlands are already rife with unwelcome visitors; we don't want to add even more aggressive species to the mix.

Some species will never be installed at Limeledge, even as reference specimens. Species such as a Glossy-buckthorn (*Frangula alnus*), Dahurian buckthorn (*Rhamnus dahurica*) Japanese honeysuckle (*Lonicera japonica*), and Amur porcelain-vine (*Ampelopsis brevipedunculata*) will never set root in the soil at Limeledge. These are species that have demonstrated themselves to be noxious weeds in areas that are climatically similar to Central New York and are not worth the risk of planting. In some places, they are already present in CNY. On a trip to the Arnold Arboretum in Boston, I was excited to find what appeared to be a brilliantly variegated grape seedling rising from a crack in the sidewalk next to Centre Street. A few weeks after rescuing it, the plant's identity as a variegated porcelain-vine was clear. It turns out that the cultivar 'Elegans' can set seeds that are genetically identical (apomixis), thus charming me into aiding its dispersal.

Rather than destroy this plant, I have retained it so that visitors can compare the similarities to native grapes (*Vitis*)... but as a permanent containerized specimen that is never allowed to flower or fruit.



Figure 2. The invasive *Lonicera maackii* was discovered by Philip Crim on a property adjacent to Limeledge in 2021. While beautiful, the plant has become extremely invasive in parts of the eastern and midwestern U.S.

While some species are obvious threats to the local environment, the danger of planting others is not as clear. Castor-aralia (*Kalopanax septemlobus*) is an interesting ginseng relative that is rare in North America but has become an issue in some collections. At the Arnold Arboretum, seedlings are abundant throughout the landscape and the species has clearly adopted an aggressive posture in Boston. Star Hill Forest Arboretum in Central Illinois has experienced similar issues. A tree near Limeledge across the town line in neighboring Camillus was planted in 2004 and started fruiting around 2012. Despite bearing abundant fruits for nearly a decade, only a few seedlings have been discovered in a vegetable garden next to the tree. Although it does not appear to be a problem thus far, my understanding is that it was well-behaved at Star Hill for many years as well before an onslaught of seedlings resulted in a decision to remove the species from that collection.

It is possible that the isolated Limeledge tree, originally purchased as a seedling from Forestfarm, may be less fertile than other specimens due to issues relating to inbreeding depression. In a nutshell, this is a rare species capable of generating viable seeds with only a single tree being present; if this has repeated for sever-

-al generations, the resulting seedlings may become less vigorous, less fertile, and more disease-prone. If this is the case with the Camillus tree, and a seedling from that tree is included in the Limeledge collection, the species may not become weedy as long as another castor-aralia is not introduced within pollen-distance of Limeledge. If weediness does become an issue, we will probably retain it as a cutback to prevent flowering and fruiting while still being able to show off the unique foliage to visitors.

Several groups that Limeledge would like to showcase to the public are potentially problematic. Limeledge will likely become known for its sumac (*Rhus*) and poison-tree (*Toxicodendron*) collections, and it's important to make assure the public we are not unleashing a noxious pest. The entire point of these collections is to teach the public how to identify and avoid potentially dangerous species, so we need to make sure we are not undermining that by introducing some of them as weeds. In addition to our native sumacs, Limeledge will grow nodding sumac (*R. potaninii*) and Chinese sumac (*R. chinensis*). Each of these species are cultivated in North American collections and have not shown themselves to be problematic. The *Toxicodendron* species we plan to grow are also selected with an eye towards minimizing the risk of invasion. Anybody familiar with Common poison-ivy (*T. radicans*) knows how weedy and aggressive it is, and how difficult it can be to remove. While we plan to grow the Asian poison-ivy (*Toxicodendron orientale*), it will be in the form of a variegated cultivar ('Seven Year Itch', a contender for best cultivar name ever) with weak growth that is not known to flower or fruit. Likewise, the Pacific poison-oak (*T. diversilobum*) has been a weak grower in other east coast collections, if it can be kept alive at all! We are just north of the native range of Atlantic poison-oak (*T. pubescens*), which is often incorrectly named by observers seeing deeply-lobed leaves of Common poison-ivy. Limeledge will grow both species side by side so that observers can easily spot the differences. Likewise, we will grow poison-sumac (*T. vernix*) next to the native true sumacs so that the differences are obvious. Poison-sumac is a native species with very strict and specific habitat requirements (deep, regularly flooded wetlands) and is no escape threat. Two Asian species similar to poison-sumac (*T. succedaneum* and *T. vernicifluum*) will be grown as dieback species and pose little threat, as they are likely to only be root-hardy in CNY and will never have a chance to flower or set fruit.



Figure 3. True poison-sumac is only found in high-quality wetlands, such as this one on a property adjacent to Limeledge.

Alders are not typically thought of as invasive, but black alder (*Alnus glutinosa*) has become a pest in Upstate New York. It is abundant along the Mohawk River and can be seen in large numbers along the state thruway from Utica all the way to the Capital Region. I have also noticed it in wetlands in Eastern Onondaga County. Any potentially weedy alder species should not be an issue at Limeledge since there is little suitable habitat for colonization in close proximity. Limeledge will also use its pulpit to signal caution with planting problematic species (and spotting new invasions!). Japanese tree lilac (*Syringa reticulata*) has been widely planted and is being recognized as an emerging pest. We will likely have just a single, carefully-observed reference specimen to minimize its chances of generating seedlings. Likewise, we will have a *Euonymus* (burningbush, aka wahoo or spindletree) collection showcasing our native species with just a single, closely-monitored reference specimen for some of the problematic species. Common burningbush (*E. alatus*) is probably the biggest pest but is already so abundant locally that spontaneous seedlings constantly emerge at Limeledge.

As the Limeledge plantings expand, we will provide leadership in identifying potential invasive species while publicizing the merits of planting native and making ecologically responsible selections.

Rare and Unusual Species Highlights

Public gardens allow visitors to interact with species they are unlikely to encounter in a native environment, especially if the species is protected. This can serve many purposes: professionals can use these collections to hone their identification skills; academics can use them to conduct research; and most importantly, these species can be given publicity and public interest by showcasing them to the public without imperiling wild populations and the fragile ecosystems where they are found. In part, Limeledge's mission states "*With an emphasis on rare and endangered species, native taxa, difficult species complexes, and their ecosystem services, visitors will be introduced to the importance of biodiversity and the rich tapestry of terrestrial ecosystems.*" The collections at Limeledge will serve to publicize the challenges inherent in the conservation of rare species by showcasing success stories and building public awareness and interest.

All plants at Limeledge with a legal status granting protection at the state or federal level, or classified by the IUCN as being at risk, have been obtained ethically from cultivated sources. These sources are generally other botanical institutions or Limeledge itself if we have a permit for responsibly collecting plants in the wild. Poaching is not just an issue for animals; some rare plants are so coveted that their locations must be kept secret to avoid vandalism. Even in situations where a population is more stable and the plants are less of a target for exploitation, populations can be negatively affected by collection of seed and/or whole plants. Limeledge will strive to set an example of responsibility when it comes to conserving the biodiversity of our forests.

Limeledge will host many species that are threatened, endangered, or extremely rare in either horticulture or the wild. Some of our rare and unique highlights of live plants and recent seed acquisitions include the following:

Abies beshanzuensis (Baishan fir) Said to be the rarest conifer in the world, this species was discovered on Mt. Beshanzu in China as a population of only seven individuals. Three were dug up in an attempt to cultivate them in Beijing and promptly died. All plants currently in cultivation, including the Limeledge tree, are descendants of the four surviving original plants. The Limeledge tree is likely a graft of one of those four. This fir belongs to a group of Asian species that produce stunning blue-violet cones, which we look forward to sharing with the community. SOURCE: J.C. Raulston Arboretum

Abies numidica (Algerian fir) Endemic to the Atlas Mountains of Algeria, this fir is native to a single mountain. Despite its African origins, the species appears to be cold hardy enough to grow in the Syracuse area and has survived at Pine Hollow Arboretum outside of Albany, NY for year. To my eye, specimens of this fir have more of a sea-green cast which lends some interesting



Figure 4. Many of Limeledge's rarest plants are conifers. Which ones can you identify here?

variability to a grouping of firs. SOURCE: Sheffields Seed (from a cultivated source)

Acer miaotaiense (Miaotai maple) Growing only in a small location in the Qinling Mountains of China, this maple is sometimes considered a subspecies of *Acer miyabei*. Its cultural adaptability and heat and cold tolerance as well as golden fall color have resulted in it becoming more available in cultivation. Since Limeledge has two plants from different sources, I'm hoping that we'll be fortunate to have one plant of each gender so that we can share seed of this extremely rare and interesting species. SOURCES: Arborvillage; Keeping it Green Nursery

Aesculus glabra var. nana (Dwarf Ohio buckeye) A bit of a mystery, as American *Aesculus* (buckeye) species are in dire need of a systematic study and review. In Georgia, there are a few populations of buckeyes forming small shrubs that otherwise key out to *Aesculus glabra* (Ohio buckeye). These may turn out to be a new species. Our plant is a seedling from one of the Georgia populations. Very slow growing thus far, our plant has stood out with excellent scarlet fall color; we are still waiting to see the flowers. SOURCE: Woodlanders



Figure 5. The chocolate to wine-red emerging foliage of dwarf Ohio buckeye is an early splash of Spring color while most other woody plants are fully dormant.

Berberis canadensis (American barberry) Yes, there is a native barberry from Eastern North America, and even more strange: it's not an aggressive colonizer like many of its exotic and invasive relatives. Rather, it is a rare and choice species with widely scattered populations that are struggling to survive in the wild. While not as flashy as some of the department store barberries that have become ecological menaces, this species does offer an interesting foliage color and character, good fall color, and edible fruit. SOURCE: Quacking Grass Nursery

Betula lenta f. uber (Virginia roundleaf birch) Formerly considered a distinct (and critically endangered) species, additional study has shown that this is just an unusual form of sweet birch (*Betula lenta*) likely owing to a recessive allele that became abundant in the population where a handful of plants were initially discovered. Therefore, it merits no more than the status of a botanical forma. Seeds from cultivated trees yield seedlings that are almost entirely wild-type sweet birch, and as a result the taxon is clearly just an unusual sweet birch. That said, it is an astoundingly beautiful ornamental tree, and is highly recommended. SOURCE: Forestfarm

Crataegus harbisonii (Harbison hawthorn) If ever there was a species that merited an endangered classification, it's this one; however, it appears that confusion surrounding hawthorn species may have led to its exclusion. Charles Sargent, one of the great 20th-Century Crataegophiles, described it as being common in the hills around Nashville, TN. However, by the middle of the century it had become uncommon and by the 1990s it appeared to be absent entirely, and possibly extinct. In 1997 two plants were rediscovered, propagated, and brought into cultivation. One of the two wild plants perished shortly after the discovery. The Limeledge plant is derived from these. In recent years, some additional small populations have been discovered. In cultivation, the species is a strong grower with good form, attractive fruit, and respectable fall color. The Biltmore Estate and the North Carolina Arboretum have fruiting specimens, so hopefully the future of this species is safe. SOURCE: Woodlanders

Dunnaria dunnii (Redvein whitebeam) This is my attempt at a translation from Chinese to achieve an English common name that is botanically meaningful while respecting the name used in its country of origin. The genus *Sorbus* was once considered to include both the mountain-ashes and a large, variable group of simple-leaved species often referred to as whitebeams. The latter have been formally separated from *Sorbus* (which now includes only the mountain-ash species with compound leaves) and the whitebeams themselves have been divided into a handful of new genera. Of these, *Dunnaria* is one of the most morphologically distinct in terms of fruit anatomy and contains this species alone. It is almost entirely unknown in North America, but Limeledge will change that. SOURCE: J.C. Raulston Arboretum

+ ***Laburnocytisus adamii*** (Adam's laburnocytisus) is a botanical curiosity. The + in front of the genus name is not a typo, but instead indicates that this taxon is a graft hybrid. It emerged in 1825 from grafting purple broom (*Chamaecytisus purpureus*) which is a smaller trailing shrub, on a taller *Laburnum* (golden-chain tree) standard. A shoot emerged that displayed the individual traits of each of the two grafted species, as well as branches with morphology and foliage that was intermediate. In addition to being a biological and botanical oddball (and living lesson plan!), the tree produces yellow, purple, and intermediate flowers on different branches. I've never been able to understand why this plant is so rare. Limeledge also grows +*Crataegomespilus*, which arose in a similar way. but I am less certain that it is true to type. Time will tell and perhaps it will be discussed in a future issue. SOURCE: Whitman Farms

Malus niedzwetzkyana (Blood apple) This species is often regarded as a synonym of the common orchard apple (*Malus domestica*) or its wild progenitor (*Malus sieversii*), but there is some evidence that it is distinct and the jury is still out. Most notably, all parts of the anatomy of this species are rich in red pigments, including the flowers, fruit, and the wood itself. Many apple cultivars with red leaves or red flesh inside the fruits have this species in its ancestry. Whether it is best treated as a species or as a variety, the plant has become extremely rare in its native Kyrgyzstan and there may be only a few hundred trees left in the wild. SOURCE: J.C. Raulston Arboretum.

Parrotia subaequalis (Chinese parrotia) Described as a new species fairly recently in 1960, originally as a species of witch-hazel (*Hamamelis*). As the species was observed in more detail, it was moved from *Hamamelis* to its own genus (*Shaniodendron*) in 1992 before DNA evidence was presented in a 1998 paper that placed it in *Parrotia*. Systematics aside, this is a species with incredible horticultural potential. Features such as beautiful exfoliating bark, a tidy habit and foliage, and extravagant fall color place it in the top tier of ornamental trees. In its brief time at Limeledge, our seedling has turned a rich shade of purple with scarlet undertones. SOURCE: Forestfarm.

Prunus maritima* f. *gravesii (Roundleaf beach plum) The story of this plant is very similar to that of the Virginia roundleaf birch. Like that taxon, a plant with very unusual morphology (also coincidentally in the form



Figure 6. Redvein whitebeam has gorgeous foliage that is shockingly silver-backed, turning shades of red and orange in autumn. This plant is much larger now!

of small round leaves) was discovered and described as a new species from Connecticut in 1897. Nearly 100 years later, plants were examined more closely and determined to merit only the status of a botanical variety of beach plum. By the late 1990s, the single known wild tree was dead and the taxon appeared to be extinct in the wild; fortunately some plants still survived in cultivation. To understand the true nature of this unusual plant, a study comparing the genetics of surviving plants in cultivation to typical beach plums was performed by Klooster et al. (2018). The results were clear: as with the Virginia roundleaf birch, this plant was merely a weird beach plum with a novel allele leading to the unique orbicular leaf shape. Retaining all merits of the typical species, this beach plum adds an extra bit of novelty and whimsy to the garden or permaculture plot. SOURCE: Quacking Grass Nursery

Quercus hinckleyi (Hinckley oak) A southwestern oak occupying a very limited range, Hinckley oak is extremely rare both in the wild and in cultivation. To my knowledge, it has never been cultivated in Upstate New York. Our seedlings are from open-pollinated plants at the San Antonio Botanical Garden, and from this small batch of acorns that was shared at least one of the plants is an obvious hybrid while at least two appear to be true-to-type Hinckley oak. This is a delightful shrubby evergreen species that is often a bushy plant in its difficult arid native environment but can be much more vigorous and tree-like in cultivation. Performance in New York is TBD; we'll place it on a sharply draining gravelly slope with other western oaks and hope that it is up to the challenge of our CNY winters. SOURCE: San Antonio Botanical Garden

Taxus floridana (Florida yew). Likely a victim of historical climate change, this yew is struggling to survive and reproduce in its tiny native range in the Florida panhandle. Despite being restricted in nature to such a southerly outpost, the plant is supposedly cold-hardy into USDA Zone 5 conditions and seems to grow well in much colder climates than its home. Unlike the yews planted for formal hedging in cultivation, this species is usually an unkempt, horticultural dog compared to other yews. Our plant was propagated from cultivated specimens and obtained after extensive research from the grower that it could be legally shipped across state lines from Florida to New York. Support responsible plant people! SOURCE: Mail Order Natives.

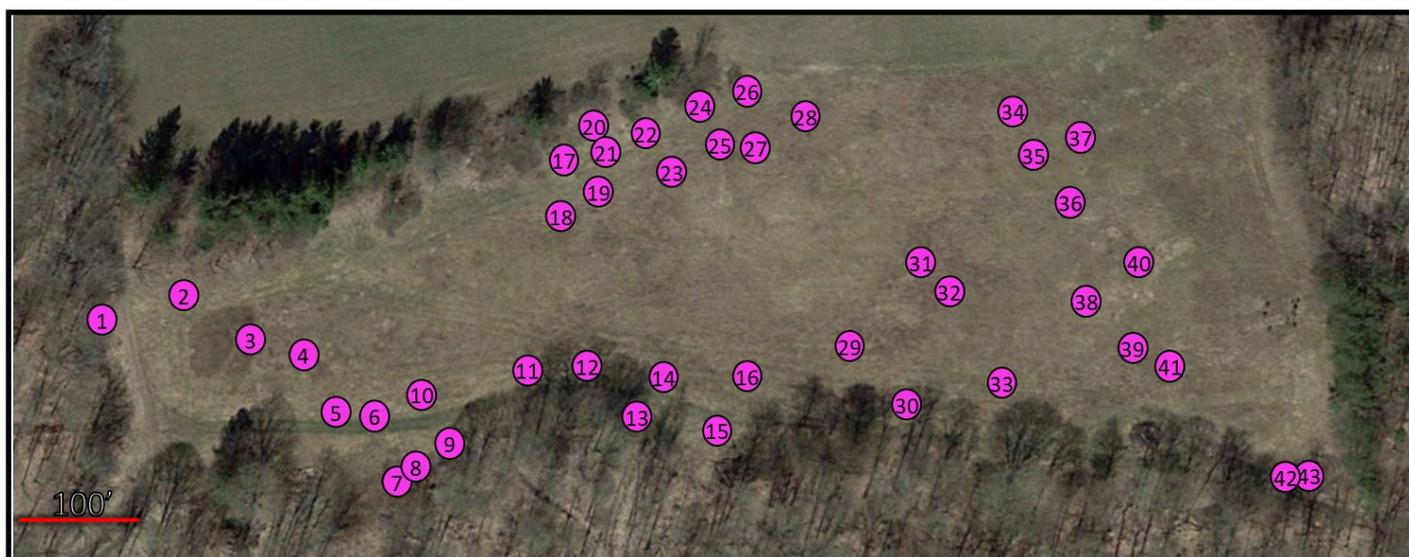
Thuja sutchuenensis (Sichuan arborvitae) Since being collected in the wild by the eminent P.G. Farges in 1900, this species was not seen again and was presumed extinct. In 1999, a single small population was discovered on the mountain near Chongqing, China where the species had been first described. Efforts were immediately taken by the Chinese government to protect the site and to propagate and cultivate the species. Little is known about how it compares to other arborvitae species in the landscape, and photos online are scarce. Fortunately, cultivated specimens have begun bearing seed and the species is now being distributed to academic institutions, arboreta, and a few collectors. Cold-hardiness is guesstimated to be USDA Zone 6, and Limeledge will be one of the first institutions in the world to test the performance of this species outside of China. SOURCE: Sheffield's Seed (from a cultivated source in China)

Tsuga ulleungensis (Ulleung hemlock) Why are most of our rarest plants conifers? Nearly as unavailable as the Sichuan arborvitae, this species was only recognized as distinct in 2017 due to a series of events stemming from breeding efforts to combat the hemlock woolly adelgid. As the danger of the insect ravaging Eastern North American forests became clear, researchers began investigating hemlocks in much more detail to devise management options for dealing with the adelgid. A researcher from Yale investigating the genetics of the genus discovered that some presumed Southern Japanese hemlocks (*Tsuga sieboldii*) in the Arnold Arboretum collection that were traced back to Ulleungdo—a volcanic island in the Sea of Japan off the coast of South Korea—did not align with other members of this species at the Arnold. Genetic analyses showed that these plants were genetically distinct and were worthy of species status, and the Ulleung hemlock was described as a new species in 2017. Although it is not immune to attacks by the adelgid, this species is resistant, and the species coexist in nature. Since being described, the species has slowly been making its way into the hands of botanical institutions, and Limeledge was very fortunate to acquire a plant. As with the Sichuan arborvitae, Limeledge will be one of the first institutions in the world to observe the behavior of this species in cultivation. SOURCE: J.C. Raulston Arboretum.

Fall 2023 Plantings and Map

Common Name Index

- | | | | |
|--|---|---|------------------------------------|
| (1) Variegated Korean forsythia | (11) 'Memmingeri' variegated horsechestnut | (21) 'Pleniflora' gypsy-rose | (31) '1BW6' aspen hybrid |
| (2) Tall indigo | (12) 'Digitata' European horsechestnut | (22) Autumn flueggea | (32) '8BG9' aspen hybrid |
| (3) American smoketree | (13) 'Variegata' common weigela | (23) Redvein whitebeam | (33) Japanese hornbeam |
| (4) 'Cameron's Weeping' American beech | (14) Painted buckeye | (24) CDHM 14599 mountain-ash (new species!) | (34) Common blackberry |
| (5) Olive maple | (15) 'Laciniata' American elderberry | (25) American mountain-ash | (35) 'Little Prospect' witch-hazel |
| (6) 'Hot Blonde' maple | (16) Korean evodia | (26) 'Lohengrin' tree hibiscus | (36) Oriental cork oak NA 64920 |
| (7) Kyushu maple | (17) American barberry | (27) Orchard plum (wild seedling) | (37) Chinese parrotia |
| (8) 'Hoyt Parent' vine maple | (18) 'WVU Seedling' higan cherry | (28) Single-seed hawthorn | (38) Paperbark hazelnut |
| (9) 'Beni schichihenge' Japanese maple | (19) 'Saint Rose Variegated' higan cherry | (29) Chinese honeylocust | (39) 'Ragin Red' flowering dogwood |
| (10) Miaotai maple | (20) 'Gebbel's Golden Spring' Colorado spruce | (30) 'Variegata' green ash | (40) Norway spruce (wild seedling) |
| (41) Ghost dogwood | | | |
| (42) American honeysuckle | | | |
| (43) Mountain holly | | | |



Scientific Name Index

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|--|--|--|--|
| (1) <i>Forsythia koreana</i> 'Kumson' | (11) <i>Aesculus hippocastanum</i> 'Memmingeri' | (21) <i>Kerria japonica</i> 'Pleniflora' | (31) <i>Populus</i> '1BW6' |
| (2) <i>Indigofera amblyantha</i> | (12) <i>Aesculus hippocastanum</i> 'Digitata' | (22) <i>Flueggea suffruticosa</i> | (32) <i>Populus</i> '8BG9' |
| (3) <i>Cotinus obovatus</i> | (13) <i>Weigela florida</i> 'Variegata' | (23) <i>Dunnaria dunnii</i> | (33) <i>Carpinus japonica</i> |
| (4) <i>Fagus grandifolia</i> 'Cameron's Weeping' | (14) <i>Aesculus sylvatica</i> | (24) <i>Sorbus</i> CDHM 14599 (new species!) | (34) <i>Rubus alleghaniensis</i> colony |
| (5) <i>Acer olivaceum</i> | (15) <i>Sambucus canadensis</i> 'Laciniata' | (25) <i>Sorbus americana</i> | (35) <i>Hamamelis virginiana</i> 'Little Prospect' |
| (6) <i>Acer</i> 'Hot Blonde' | (16) <i>Tetradium daniellii</i> | (26) <i>Hibiscus</i> 'Lohengrin' | (36) <i>Quercus variabilis</i> NA 64920 |
| (7) <i>Acer capillipes</i> | (17) <i>Berberis canadensis</i> | (27) <i>Prunus domestica</i> Feral seedling | (37) <i>Parrotia subaequalis</i> |
| (8) <i>Acer circinatum</i> 'Hoyt Parent' | (18) <i>Prunus</i> WVU Seedling | (28) <i>Crataegus monogyna</i> | (38) <i>Corylus fargesii</i> |
| (9) <i>Acer palmatum</i> 'Beni schichihenge' | (19) <i>Prunus</i> Saint Rose Variegated Seedling | (29) <i>Gleditsia sinensis</i> | (39) <i>Cornus florida</i> 'Ragin Red' |
| (10) <i>Acer miaotaiense</i> | (20) <i>Picea pungens</i> 'Gebbel's Golden Spring' | (30) <i>Fraxinus pennsylvanica</i> 'Variegata' | (40) <i>Picea abies</i> |
| (41) <i>Cornus wilsoniana</i> | | | |
| (42) <i>Lonicera canadensis</i> | | | |
| (43) <i>Ilex mucronata</i> | | | |

Dr. Crim in the Field: International Oaks 2022 Conference and New Acquisitions

Note: An abbreviated version of this piece occurs in the October edition of The Cupule, the electronic news bulleting of the International Oak Society. That article can be accessed at www.internationaloaksociety.org/content/2022-pre-conference-tour-western-texas

Participating in the West Texas pre-conference tour was a very special opportunity for me. After sharing seeds and communicating with members of the International Oak Society for several years on social media and over email, I finally became a member of IOS in 2019. Having just accepted a tenure-track faculty position at The College of Saint Rose in Albany, NY, it was finally time to begin getting more involved and planning my first IOS conference. After the lingering effects of the pandemic dashed my hopes of visiting Taiwan for the first time, I was excited to see that the rescheduled conference location in New Mexico preceded by the tour through west Texas would allow for plenty of oak viewing in other unique, oak-rich environments.

I arrived in San Antonio shortly after noon on Friday, August 26 and immediately began exploring the area around the hotels. It had been about ten years since my last encounter with the flora in this part of Texas, and I was eager to become reacquainted, even just with the plants present in a heavily urbanized area. The next morning, I was up early for breakfast in the hotel lobby, eager to see if there was anyone I could recognize as being part of the tour. I struck up a conversation with a gentleman that seemed to be prepared for a few days in the field, and indeed he was another member of the tour, Dr. Paul Manos. I had been reading Dr. Manos's publications for years, including some of his recent molecular work on *Quercus* in preparation for the conference. This was just the beginning of the introductions as our group assembled and burritos were distributed tour guides Adam Black and Michael Eason before heading out into the Texas Hill Country.



Figure 9. Journeying into the Texas Hill Country of the Edwards Plateau.

Our first stop of the tour was near Leakey, and it offered a range of interesting woody flora. Netleaf hackberry (*Celtis reticulata*) may have been the most abundant species, and I was able to collect seeds from several individuals as well *Juglans major*, *Sideroxylon lanuginosa*, and *Platanus occidentalis*. The latter looked a bit odd to my eye, and Adam noted that although the individual before us appeared to be *P. occidentalis*, the taxonomic situation within this genus is in flux, and many workers recognize *P. palmeri* as another species present in the area. Other genera such as *Forestiera*, *Rhus*, and *Juniperus* were also present.

Only a few miles from our first stop, we continued ascending the plateau and enjoying some magnificent views before pulling over at a spot Adam and Michael had identified as hosting some interesting oaks. Somebody in our van mentioned that this might be the spot where we could see the taxon known as *Q. marilandica* var. *ashei*; indeed, the roadside was flanked by several individuals that matched its description. I found this variant of *Q. marilandica* very interesting and distinct, and some of the trees were covered in smallish acorns that several members of our group collected in the hopes that they would be mature enough for viability. Also present was *Q. fusiformis*, but the individuals in this area had very few or seemingly unripe acorns. Seed-bearing individuals of *Q. buckleyi* and *Q.*



Figure 10. Lacey oak (lobed form) on the Edwards Plateau.

vaseyana were present, and we were fortunate to find two forms of *Q. laceyi* growing in close proximity: A lobed form, and an unlobed form with distinctively blue foliage. Interestingly, Adam noted that these forms generally come true to type from seed, a hypothesis that several of us will be testing.



Figure 11. Texas persimmon in fruit.

This area quite literally bore fruit in terms of collecting other woody genera. Scrambling up fence posts and through shrubbery was the Texas-endemic *Parthenocissus heptaphylla*, as well as an unidentified *Vitis*. I was excited to find several *Diospyros texana* shrubs with ripe fruits, which allowed me to both collect seed and compare the interesting and delightful flavor to the more commonly consumed Asian and Eastern North American persimmons. I had been excited to keep an eye out for the Edwards Plateau black cherry (*Prunus serotina* ssp. *eximia*), sometimes referred to as a subspecies, variety, or even synonym of a variable *Prunus serotina* ssp. *serotina*; I was fortunate to find two trees in heavy fruit from which to collect and eventually study the progeny. We encountered an excellent specimen of *Pinus remota* that was coning quite heavily, allowing members of our party to add this species to our collections. Other woody taxa on this stretch included *Dermatophyllum secundiflora* and *Zanthoxylum hirsutum*.

Once our collecting urges had been sated along this stretch, we headed west towards Del Rio for lunch and fuel before heading towards Langtry and a visit to the Pecos River Overlook. On the way, we stopped briefly at the site of a large *Q. muehlenbergii* to collect acorns, as well as some seemingly wild native pecans (*Carya illinoensis*). Once at the overlook, we took in the spectacular views of the Pecos River bridge before continuing west. On a rocky slope overlooking the Rio Grande, I was introduced to *Karwinskia humboldtiana*, a buckthorn family (Rhamnaceae) shrub with beautiful foliage, and soon became reacquainted with creosotebush (*Larrea tridentata*), which was becoming more common as we continued west. Our final stop of the day was near Sanderson to view and hopefully collect *Q. mohriana*. Unfortunately, this area appeared to have been hit hard by the recent dry weather and only a few small acorns were present on these plants. A beautiful, glossy-leaved specimen of *Cercis canadensis* var. *mexicana* appeared to have leafed out suddenly

due to recent rains, and evidence of newly spent flowers were present. I took some interest in trying to identify a shrubby and rather wickedly armed *Condalia* but was unable to identify the species with my limited knowledge of the genus and the features present. “*Why do you want THAT?*” cried one of my peers.



Figure 11. The Pecos River Bridge seen from the Pecos River Overlook near Del Rio, TX.

After spending the night in Alpine, we headed towards Big Bend National Park to spend the Sunday hiking. Although no collecting was allowed in this area, there was no loss of excitement due to the unique sky island landscape and presence of so many interesting oak species that many of us had never seen in person. Most of the group took the Pinnacles Trail to the ridge where it bifurcates into the Boot Canyon and Emory Peak trails. We began seeing interesting oaks right near the trailhead itself, with trees referable to *Q. gravesii* making an appearance as well as *Q. emoryi*, *Q. grisea*, and according to my notes, some possible *Q. pungens*. Adam took a moment to quiz the group on an unusual shrub with mostly trifoliate leaves, which turned out to be littleleaf ash (*Fraxinus greggii*); the overall presentation and character being most unusual for an ash!

Some members of the group hiked a bit past the terminus of the Pinnacles Trail, and here I made the acquaintance of *Q. intricata* for the first time. Pressing on a bit farther, we located a young specimen of *Q. graciliformis* and farther still, a shrubby plant that Adam described as being the closest individual adhering to the description of *Q. carmenensis* that he was aware of in the park. Encountering these three oaks in situ was a very special experience. Although there was thunder and lightning in the latter part of the afternoon, we largely avoided the rains that fell near the trailhead and Chisos Basin Visitor Center. The glistening trunks of *Arbutus xalapensis*, combined with some incredible rainbows over the sky island scenery on the walk back down the trail, created a surreal landscape for this New Yorker. Once off the trail, we set out for a hearty and well-earned meal at The Starlight Theatre Restaurant in Terlingua before returning to Alpine.



Figure 12. Littleleaf ash in Big Bend National Park

The next morning, we headed towards Jefferson Davis County to visit the Chihuahuan Desert Research Institute (CDRI) and Fort Davis. On the way, we stopped to see and collect from an impressive *Q. grisea* and admire some massive Rio Grande cottonwoods (*Populus deltoides* ssp. *wislizenii*). Below the poplars, I found several beautiful *Crataegus tracyi* with fruits that were close enough to ripening that I decided to collect. In Fort Davis, we stopped to see a spectacular *Q. gravesii* on the southeast corner of the lawn around the Jefferson Davis County courthouse, absolutely loaded with ripe acorns falling out of their caps and on to the ground. North of Fort Davis, we stopped to collect from a roadside *Q. grisea* which was accompanied by *Chilopsis linearis* and *Juglans macrocarpa*, among many other species. Next, we stopped at an overlook in the Davis Mountains, where we stretched our legs, enjoyed the pinyon-embroidered (*Pinus cembroides*) scenery, and watched thunderstorms moving through the area. Shortly thereafter, we stopped for a more extended lunch break off the main highway where we saw a spectacular *Q. grisea*, the local variant of *Pinus ponderosa*, and explored a creek where we saw *Juglans major*, *Vitis arizonica*, *Rhus trilobata*, *Fallugia paradoxa* and an absolute wealth of herbs and forbs. Moving on, we stopped shortly thereafter at an impressive roadside *Prunus serotina* ssp. *virens*, which many of us were interested in collecting. I'm very excited to eventually see *Prunus serotina* ssp. *eximia*, ssp. *virens*, and the native New York ssp. *serotina* growing side by side at Limeledge.



Figure 13. One of the impressive cottonwoods at the picnic area just west of the Calamity Creek Ranch on Rt. 118.



Figure 14. We were only a handful of minutes away from being caught in the initial floodwater surge at this spot. Desert flash floods can be sudden and extremely dangerous.

Storms were gathering all around us, and our driver Celeste Spivey, senior gardener at San Antonio Botanical Garden, did an admirable job navigating through some of the heavy rain we encountered. We started to see some streams beginning to overtop the road in places and drove through a few that were just barely over the pavement. At one point, however, we were very fortunate to avoid a surge of runoff that manifested as a raging torrent over the highway. After waiting on higher ground for about an hour, the waters subsided to reveal some debris and barbed-wire fencing. Ever the opportunist, I collected an attractive striped cucurbit fruit

(*Cucurbita foetidissima*) from a trailing stem that had wound around the fencing in the floodwaters. Cutting the barbed-wire fence and removing it from the road, we were on our way to our accommodations in Carlsbad for the evening.

The final day of the tour started with a trip to McKittrick Canyon. As at Big Bend, collecting was not allowed; however, the scenery, abundance of oaks, and overall richness of the flora more than made up for that. As the trail meandered over dry creek beds and through scrubby oak (*Q. grisea*, *Q. pungens*) forests and woodlands chock full of chinkapin oak (*Q. muehlenbergii*) and bigtooth maple (*Acer grandidentatum*), members of the group began to stretch apart as new treasures were spotted in seemingly every nook and cranny. The chinkapin oaks had an interesting character with glossy, jaggedly-toothed leaves and darker, more furrowed bark than I am used to seeing. Somebody remarked that these plants were perhaps of the var. *brayi* persuasion, if one subscribes to the legitimacy of that disputed taxon. We made our way to a grotto where we enjoyed lunch before making our way back out of the canyons. I spotted as many new woody plants on the way out as I did on the way in, including *Choisya dumosa*, *Ostrya knowltonii*, and an interesting and apparently native *Lonicera*. Dr. Manos insisted that we stop and smell the vanilla-like bark fragrance of the local *Pinus ponderosa*, which lived up to the hype and was a new experience for me.

Finally, we were on our way to El Paso and then Las Cruces for the opening of the conference. The final stop was a salt flats where we could take a group photo. This area was largely barren but not entirely devoid of life, as I encountered an otherworldly shrub that Michael identified as American iodine-bush (*Allanrolfea occidentalis*). At last, we were on our way to the opening festivities of the conference.



Figure 15. Species collage; top to bottom, from left: Chisos red oak (*Quercus graciliformis*), Sierra del Carmen oak (*Quercus carmenensis*) both in situ at Big Bend; buffalo gourd (*Cucurbita foetidissima*) deposited by floodwaters; Texas madrone (*Arbutus xalapensis*); Arizona grape (*Vitis arizonica*); American iodine-bush (*Allanrolfea occidentalis*) in the salt flats southwest of the Guadalupe Mountains; Arizona walnut (*Juglans major*); Southwestern chinkapin oak (*Quercus muehlenbergii* var. *brayi*) at McKittrick Canyon.

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