



## STEWARDSHIP AT ADKINS ARBORETUM 2020 ANNUAL REPORT

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Reflecting back on 2020, we had an important and productive year of organizing, restructuring, learning, and planning. With programming cancelled for the year and public

### METRICS

2,200 native plants planted  
11,124 native plants sold  
758 plant orders  
\$125,989 in plant sales  
450 donated plants received for gardens  
2 picnic tables built  
10 wave hill chairs built  
2 wigwams refaced  
1 kestrel house installed  
2 arms of entrance gate rebuilt  
1 nursery gate built  
1 three sisters garden planted  
1 gallery patched and painted  
28,786 square feet of gardens weeded  
7,000 square footage of new weed barrier  
7 black ash trees treated  
1 sandbox installed  
8,000 sq. feet of vines cleared from trails  
40,000 sq. feet of thicket cleared by the goats  
11 species of seeds cleaned for propagation  
270 plants propagated  
some awesome beaver videos  
487 ticks counted from our grounds team  
30 bluebirds fledged  
20 bluebird boxes monitored  
30 wood duck hatchlings

engagement limited to virtual and socially distanced, we were able to focus even more of our time to the grounds, nursery, and facilities.

Despite the closure of the Visitor's Center, the grounds and trails remained open to the public, free of admission.

With an emphasis on the grounds, we were able to build and repair many structures on the grounds and in the facilities. We started the quarantine in the gallery, patching the walls and covering with a fresh coat of paint. We constructed picnic tables for the Visitor's Center and wave hill chairs for the entrance bridge and back patio, which helped give people a place outside to gather responsibly. We were able to construct new arms for the entrance gate and a new gate for the Nursery Complex, as well as repair several of the woodland bridges. We organized the Visitor's Center and Nursery Complex, as well as installed security systems in each.

## STAFF

Kathy Thornton (Land Steward) and Michael Micriotti (Facilities Coordinator) remained increasingly focused on land stewardship, habitat management, nursery and plant sale operations, facility improvements, equipment maintenance and repair. Ruth Menefee continued as a seasonal employee in the nursery, providing essential support in plant care and plant sale logistics. Sylvan Kaufman, PhD provided guidance on our living collections database as well as advice on grounds maintenance and habitat biodiversity. As our Consulting Horticulturist, Leslie Cario led the sourcing and ordering of plant material for the nursery, as well as guidance on plant health and pest management. Leslie also was the lead on several grant applications for the living collections database and cultivated garden interpretation.

Our volunteer engagement was limited to January and February, before the Visitor's Center closed in March. The Phenology team completed some observations and some propagation volunteers assisted in seed cleaning.

## CULTIVATED GARDENS

Adkins Arboretum maintains an acre of cultivated gardens located in the main entrance and parking lot as well as the Visitor's Center and Nursery Complex surrounds.

The Parking Lot Alive! gardens and the entrance garden received lots of attention from our staff. The gardens were heavily weeded and some areas were replanted either with supplemental plantings, or new plant configurations depending on



the area's prior success. We found that blue mistflower and the Leavenworth's sedge have been very successful herbaceous perennials that we plan on using increasingly. The white cedars that were part of the initial planting and died were replaced with a mix of American holly trees and winterberries, which seem to be doing well.

Emily's Play Garden received a new three sister's garden, some supplemental plantings, a new wood slab bench, and a sundial! Jenny Houghton, Assistant Director, devoted time each week to weed the garden. Despite not having official programming in the space, Emily's Play Garden served as an important destination for families.

## LIVING COLLECTIONS DATABASE

We were between database grants this year. While waiting to hear about several grants, we spent some time discussing the current framework and how best to move forward. We decided that switching the platform to an existing software such as IRIS BG or ArcGis made the most sense. By the end of 2020, we received approval on our IMLS Inspire! grant, which funds our database team to incorporate information about wildlife synergies and interactions with our plant accessions. The majority of work on this grant will be in 2021 and 2022.

## WETLAND

In early 2020, the resident beavers were very active, yet mostly elusive. It took us many attempts of wading through icy cold water to find the perfect trail camera spot to catch the beaver in action. In addition to catching the beaver on camera, we also were able to record the great blue heron, an opossum, many squirrels, mallards and some mergansers enjoying the wetland. It was great to see such diversity.

In an effort to diversify the wetland plants at the Arboretum, we identified the American lotus (*Nelumbo lutea*) as a possible addition. We collected seed locally and learned how to scarify and germinate the seeds. After some trial and error, we had a few sprouts and one established plant that we planted into the Visitor's Center wetland. Not to be confused with water lilies that grow at Tuckahoe Lake, the American lotus blooms slightly later in the summer and has completely round leaf with the petiole beneath the leaf. The American lotus is considered state rare in Maryland and is pollinated by various bees. There are some bees that rely specifically on the pollen of the American lotus, a relationship called oligolecty.





## NATIVE PLANT NURSERY AND PROPAGATION

Our spring and fall native plant sales continue to be a major source of revenue and outreach. Given the quarantine closures, the plant sale was restructured to be online only with scheduled pick-ups using only staff. We had an overwhelmingly positive response and plan to continue this method. This format allowed us to be extremely organized in coordinating when customers came to pick up their plants. This format also allowed us to take better care of the plants at the Nursery Complex instead of having them on display at the Visitor's Center. In 2020, we sold over 11,000 native plants with a net revenue of \$67,000 (without staff time). Also, with an increased focus on the Nursery Complex, we were able to get the internet and phones working, which will continue to be extremely helpful in conducting plant sale.



Our staff propagated several species from collected seed, cuttings, divisions, and plugs. Our most successful attempt was with the *Passiflora incarnata*. Planted in Emily's Play Garden in 2019, the passionflower has stretched its roots and vines into many parts of the garden allowing us to pot up some of its spreading shoots. Passionflower has been difficult to consistently source from growers, so being about to propagate it ourselves with minimal effort is exciting.

## INVASIVE PLANTS

Spotted knapweed continues to persist in the parking lot meadows and in one spot in Nancy's Meadow. We have identified these areas and continue to monitor and remove them each year.

Oriental bittersweet, Japanese honeysuckle, mile-a-minute, and wavyleaf basket grass continue to be omnipresent on the grounds.

We decided to clear out all pesticides from our shop, with the exception of the natural cedar oil product Wondercide and vinegar. We felt that it creates a safer environment for our staff and our guests, as well as sets an example that relying on pesticides is not necessarily the most sustainable solution. We want to foster a healthy and biodiverse landscape of mostly native plants without having to resort to toxic chemicals. As the climate changes and our weather patterns become more extreme, we are tasked with selecting and promoting plants that are well suited to the environment, while still fostering the important plant-animal interactions and symbioses.

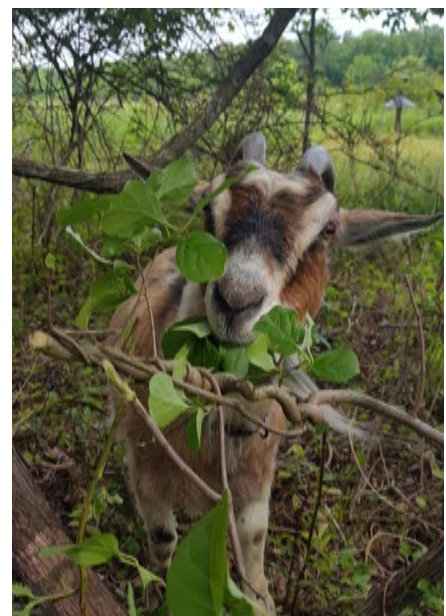
## MEADOW MANAGEMENT

Unfortunately, we were unable to burn the meadow in the spring, due to the pandemic closures. Instead, we bush hogged and cleared trees by hand to help maintain the meadows as meadow habitat. South Meadow remains a good mix of big bluestem, switchgrass, Indian grass, goldenrod, milkweed and wild blackberry. The bush hogging will help to knock back the cherry trees, black locust trees, and shining sumac that work their way into the meadow edges. Nancy's Meadow presents more of a challenge due to its larger size, topography, and more established trees. This upcoming winter, we plan to manage this area relatively aggressively opening up views into the meadow.

In November, the Tuckahoe State Park continued to build out the multi-use trail, which now extends through the Adkins entrance garden running north parallel to Eveland Road. The new trail goes through young forest as well as the area planted in 2006 along the eastern edge of Nancy's Meadow. With the path cleared, it revealed an old house site with two cement structure foundations, as well as several trash dump sites. This is in addition to the previously known structure site about 800 feet to the north, near bluebird box #5. This trail will be maintained by Tuckahoe State Park.

## GOATS AND TARGETED GRAZING

The goats browsed and removed a thick undergrowth of vines and brambles from about 47,000 square feet of forest thicket surrounding their permanent enclosure. These edge sites can be difficult for our staff to penetrate with machinery or hand tools, so the goats serve as pioneers, establishing themselves in the site and opening it up. Each site that the goats work in should be followed by our grounds staff to continue the thinning process. While we are able to continue to work in the area a bit, in the future, the possibility of replanting some of these areas to help limit the weedy



comeback should be considered.

The goats' permanent enclosure also received some improvements. Eagle Scout Ethan Tuel constructed a roof extension off the primary barn, with a rainwater catchment system to give the goats extra shelter and fresh water. He also constructed a platform for the goats to climb on, which has now become a favorite feeding platform for Rosie.

## WOODLAND

The woodland continues to evolve, as natural ecosystems do. The spring brought stunning displays of pinxter azaleas, mountain laurels, and fringe trees. The summer followed with lush green growth and the fall with the golds of tulip poplars and burgundies of sweet gums. The late summer hurricane season brought several days of heavy winds, rains, and flooding, but the floodplain is resilient. Downed trees continue to create habitat and the stream adapts and changes course as the streambed shifts.

## ASH TREE TREATMENT

As an Arboretum, we love trees. The ash trees, however, have a special place in our hearts, since they were one of our original benefactor's favorite trees. We were fortunate to have the Department of Natural Resources Forest Service come out to scout our grounds for Black Ash, *Fraxinus nigra*, and protect it against the emerald ash borer (EAB). While all ash trees are subject to EAB, there are only a few populations of Black Ash in Maryland that are healthy and protected and DNR hopes that the swampy stand at Adkins will be at least one.

Our initial May scouting adventure brought us through the swampy floodplain, as that is where the black ash thrive. Black ash are smaller, understory trees in comparison to their cousins, the green ash or the pumpkin ash. Black ash are characterized by black buds, scaly bark, sessile leaflets of 11, with serrated margins. At Adkins, they seem to grow alongside other ashes, spicebush, red maples, and swampy ferns.



With the 7 patient trees identified, we returned on June 4 to the northern edge of the Adkins Arboretum property, where Piney Branch and Tuckahoe Creek meet. Considerations for treatment involve assessing the tree to see if it is worth treating (in good or recoverable condition) or if it is too far-gone at this point (due to a variety of reasons).



Colleen Kenny, Forest Health Watershed Planner for the Forest Service in DNR, led us through the process of identifying the tree, preparing the injection site on the tree, injecting the insecticide, and then properly labeling and mapping the trees for reference.

One liter of insecticide runs about \$500 and treats 4 to 5 trees. We are fortunate to be partnering with the DNR Forest Service, where this cost is part of their budget to protect ash trees. To inject the trees, we used a plug system, in which we drilled a specific number of holes (depending on the tree's diameter) and tapped ports into those holes. Then a pump



pressurizes the hoses, which deliver the TreeAzin (emamectin benzoate) into the tree. The tree gradually takes up the insecticide based on its rate of evapotranspiration. Treatment should occur in late spring before 90°F, so that the trees “drink up” the solution. Late spring is also ideal because that is when the adult Emerald Ash Borer emerge.

At this point, insecticide seems to be the most effective and practical approach for treating EAB. There have been some trials of parasitoid wasp release programs, which have been effective, but require an established population of EAB for the parasitoids to feed on. The insecticide serves more as a preventative.

While the trees were soaking up their medicine, they were each tagged with a metal tag and mapped with a GPS. It is recommended to treat the trees every 3 years, as the treatment itself is good for 2 to 5 years.

We did not see the symptoms of EAB establishment in the forest swamps, but they are present in the ash trees by the Visitor's Center. Emerald ash borer damage is easily spotted by looking for crown dieback and sprouting. These declining trees typically also have bare spots in their bark where woodpeckers have started eating the EAB larvae.

## SCIENCE AND RESEARCH

In the summer, Christian Stoltz, an undergraduate from University of Delaware, conducted some research on which species of oaks support the greatest diversity of insects. He is still working on the data analysis but is excited about his samples from the Arboretum.

The phenology program was put on hold this year due to the quarantine and ceased volunteer activities. We were able to share the phenology data from 2018 and 2019 with the Department of Biology at Washington College for students to use in their ecology lab.

This year, we have been able to spend more time on the grounds observing different species and habitats throughout the year. These observations lent themselves to investigation and research, which then was shared through our social media outlets. We also began Mystery Monday posts, which engage our audience a little more, encouraging them to think about what they see. We now partner with The Spy!, which shares the Mystery Monday posts.

## WILDLIFE AND ECOLOGY

### DARK FISHING SPIDER

Adkins Arboretum is home to many spiders. This summer, however, we came across one that will long be remembered. *Dolomedes tenebrosus*, also known as the dark fishing spider, has beautiful dark and light brown patterning on its body, with hints of blue around its head. The females are about 4 inches across, while the males are significantly smaller. They tend to live amongst bushes and rocks near permanent bodies of water and woodlands. Our dark fishing spider was spotted just outside of a tree hollow from about 25 feet away. If you can spot a spider from that far away, it is a big spider! This particular female fishing spider went through a molt and also entertained the prospects of two male fishing spiders. We visited this spider often during our woods checks. Sometimes she was waiting by the entrance of the hollow and sometimes presumably hidden away in the trunk.

Belonging to a family collectively known as nursery web spiders, fishing spiders can rear over 1,000 baby spiders. The females can live up to two years, while the males tend to live only one year.



### MOUNTAIN LAUREL

Mountain laurels (*Kalmia latifolia*) bloom along Upland Walk and South Tuckahoe Valley Trail in May. Unfortunately, early May is always a very busy time, making it difficult to



take the time for a walk in the woods. But this year, we kept a watchful eye and were able to see their beautiful blooms. Mountain laurels have pinkish white blooms whose stamens are touch sensitive. Once triggered, the stamens spring towards the center of the bloom, releasing pollen onto whatever pollinator happened upon the flower.

## BLUEBIRD AND WOOD DUCK MONITORING

This year, the suspension of volunteer activities gave our staff the opportunity to continue the bluebird monitoring of the Arboretum's 20 bluebird boxes. While our intention is to provide important nest sites for Eastern Bluebirds, we end up getting a fair amount of other cavity nesting species as well. Overall, we had 30 successful bluebird fledges.



While 30 wood ducks successfully hatched out of our eight boxes around the property, the nest success rate was much lower than previous years. In the past, the nest success rate (number of eggs hatched versus eggs unhatched/predated) averaged about 79%, while this year was at an eight year low of 51%. Encouragingly, the number of eggs initially laid were decent compared to other years, suggesting that the wood ducks in the area are active and breeding, just not having fully successful nests.

## 10 SPECIES OF SNAKES OBSERVED

Ring-necked snake  
Rough green snake  
Eastern hog-nosed snake  
Northern black racer  
Eastern kingsnake  
Eastern ratsnake  
Common wormsnake  
Eastern garter snake  
Northern water snake  
Dekay's brown snake



## COMMUNITY SUPPORT

We are grateful to Unity Landscape Design/Build again this year for their assistance in the nursery and cultivated gardens! This year, they provided \$5,000 of in kind services to support our grounds and nursery crew. Despite our staff's best efforts to keep the weeds under control organically in the hoophouses, the seed bank and substrate provided an everlasting battle. Considering the value of our staff time, we decided to amend the hoophouse substrate. Unity's crew came through and quickly weeded all the houses and pathways and then laid weed barrier on top of the previous gravel substrate. This weed barrier should keep the weeds at bay, improving the quality of the plants we sell and the effectiveness of our staff time.

The Unity crew also spent three days in our Parking Lot Alive! gardens weeding the central beds. Each season presents different phases of weeds and so a "deep weed" in late summer was very helpful in cleaning up some of the main parking lot gardens.

