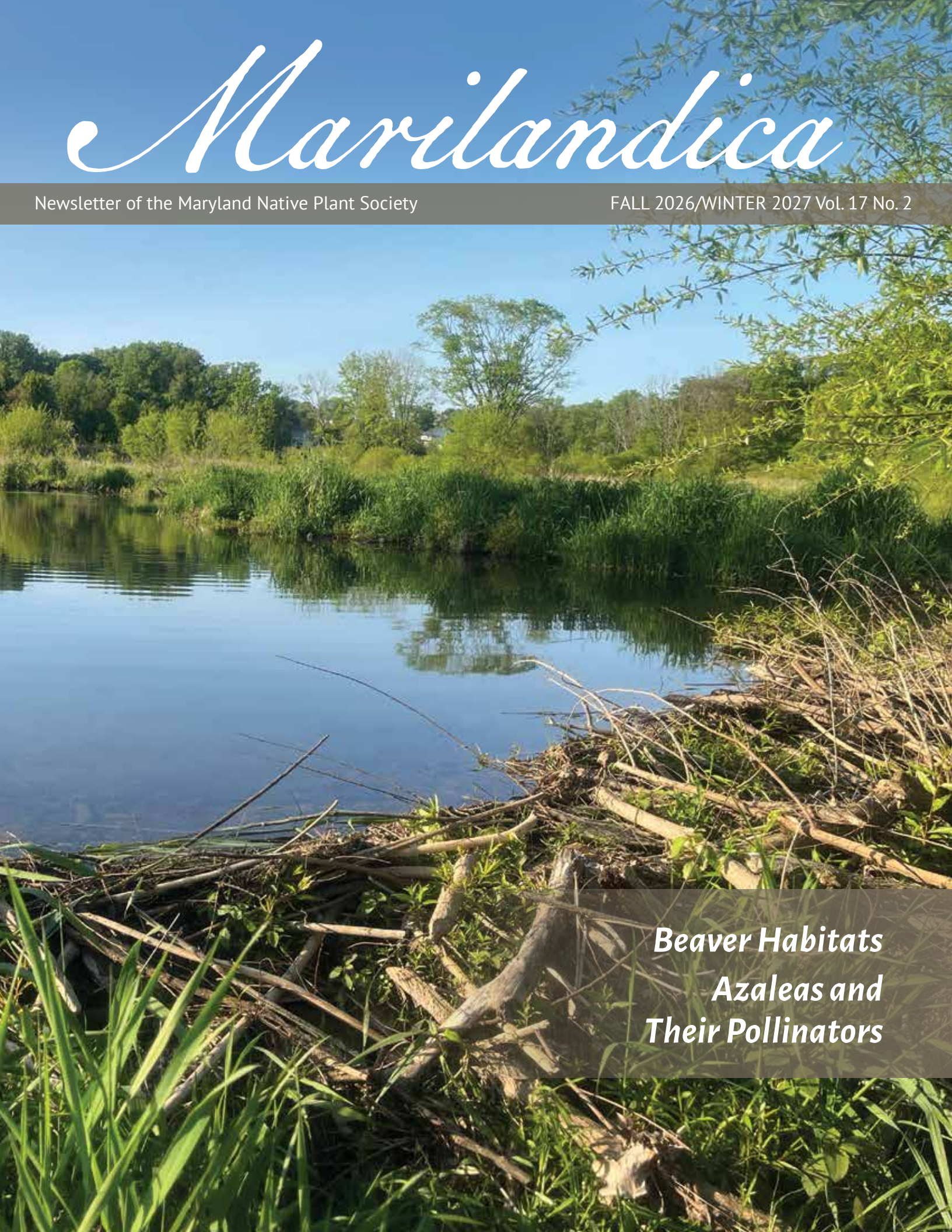


Marilyndica

Newsletter of the Maryland Native Plant Society

FALL 2026/WINTER 2027 Vol. 17 No. 2



*Beaver Habitats
Azaleas and
Their Pollinators*



mdflora.org

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info@mdflora.org

MNPS CHAPTERS

mdflora.org/chapters

Eastern Shore Chapter

Cristina Niciporciukas (Chair)

Jil Swearingen (Co-Chair)

eschapter@mdflora.org

Southern Maryland Chapter

Karyn Molines (Chair)

info@mdflora.org

Montgomery County Chapter

Jill Fonda (Co-Chair)

Heidi Hayes (Co-Chair)

mocochapter@mdflora.org

Western Mountains Chapter

Liz McDowell (Chair)

wmtchapter@mdflora.org

Marilandica is a publication of the Maryland Native Plant Society.

Editors: Pru Foster, Cristina Niciporciukas,

Jil Swearingen

Layout & Design: Liz Fisher/EC Fisher Design

Cover: Beaver dams are porous and organic, hosting their own concentrated ecosystems. Photo by S. McGill.

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Catawba Rosebay (*Rhododendron catawbiense*) in Maryland. Photo by B. Shweta.

PLANT OF THE YEAR

Farewell to Sedges, Hello to Goldenrods

Our 2026 Year of the Sedge was wonderfully intense. We quickly realized that tackling one of the largest plant families would require focus, so we narrowed in on the genus *Carex*. We published an excellent article, *The Remarkable Adaptability of Carex Sedges: The True Sedges*, by Chris Frye, and also a *Plant Match on Sedge Anatomy* in the spring issue of *Marilandica*. The Eastern Shore and Western Mountains chapters each hosted workshops on sedge identification led by Sean Sipple and Kevin Dodge, respectively. We are deeply grateful to Sean, Kevin, and Chris for sharing their expertise. Finally, the November 17 monthly meeting by Chris Frye will feature a visual tour of Maryland's extraordinary sedge habitats.

In 2027, MNPS will spotlight goldenrods—one of the most ecologically important groups of native plants in our region. These mostly late-season bloomers in two genera—*Solidago* and *Euthamia*—are foundational to Maryland's conservation landscapes, wildlife food webs, and pollinator health. We will explore the diversity, distribution, and ecological roles of goldenrods.

Huron Skipper (*Atalopedes huron*) nectaring on an unidentified goldenrod (*Solidago*) species. Photo by C. Niciporciukas.



Online Plant Tools

Welcome to the fall issue of *Marilandica*. Here we summarize native plant websites and apps that we find useful.

Plant Identification. We often get asked which plant identification (ID) app is the best. The answer is ... it depends. Are you looking for an immediate response or an accurate ID, to contribute to conservation, or to learn botany?

Rankings for plant ID apps' accuracy are entirely dependent on which plants are in a given study and even on what day you check - the apps are constantly improving. For instance, **Plant Net** ranked highest in a study of herbaceous plants (Campbell et al. 2023), whereas **iNaturalist** and **Flora Incognita** did best in a study of mixed plant types (Garden Myths). Other identification apps that correctly identified 65% or more of plants in one or both of these studies were **Leaf Snap**, **Google Lens**, and **Picture This**.

iNaturalist (iNat) is our favorite. iNat is the only plant app that has human-assisted ID, providing a place for learning and botanizing. And perhaps most importantly, verified iNat observations are used by conservationists, researchers, invasive species watch programs, and the Maryland Biodiversity Project. iNat is available in three flavors: **iNaturalist Classic** is the original community-science platform with detailed observation tools and expert-driven identifications; the **iNaturalist app**, released in 2025, has Artificial Intelligence (AI) species suggestions and automatic metadata; and **Seek** is a kid-friendly app that gives instant IDs without accounts or data sharing.

If you want to botanize, we highly recommend **FloraQuest: Northern Tier App**. With graphic and dichotomous keys, habitat descriptions, range maps, and about 30,000 diagnostic photos, FloraQuest is an excellent botanical companion. You can even use it without ongoing internet access by downloading the data for your region. The **Flora of Virginia** app is similar to FloraQuest, but just for Virginia.

Native Range. In Maryland, nativity of plants is often drawn from Knapp & Naczi's **Vascular Plants of Maryland, USA:**

A Comprehensive Account of the State's Botanical Diversity, which is an herbarium-based record of plant species. For instance, the **Maryland Plant Atlas** bases nativity status on Knapp's and Naczi's work, but the Atlas is online, so it is regularly updated with new plant observations. The Maryland Plant Atlas shows plant distributions by county, or drills down to smaller "quads" and includes observation dates.

The Maryland Plant Atlas shares a database with the **Maryland Biodiversity Project** (MBP). Their shared database considers all iNaturalist observations in Maryland and observations submitted directly to MBP. These reports are then checked by expert MBP

curators for accuracy. MBP has more user features than the Atlas and iNat, and is an excellent resource for conservationists, citizen scientists, and plant nuts.

A third website for Maryland nativity is **bplant.org**, a nationwide database of plant distributions that provides range maps for native and introduced plants at various ecoregion levels, making it useful for conservation planning and climate-tolerance forecasting.

Native Plants for Ecoregions.

The **Maryland Native Plants Program** is creating native plant guides for the State's three main ecoregions. These publications provide excellent guidance for choosing native plant species appropriate for each ecoregion, based on the Maryland Plant Atlas. The **Piedmont Guide** is available now at mdflora.org; the **Coastal Plain Guide** is expected this fall and the **Mountain Guide** is being planned for the fall of 2027.

Once you've decided you want a native garden, finding plants can be a chore. So, we are really pleased with the **Commercial Native Plant List** (go.umd.edu/CommercialMDNativePlantList) and the NEW user-friendly companion app **Maryland Native Plant Finder** (mdnative-plants.umd.edu).

Both the List and the Finder give appropriate plant suggestions based on site conditions, deer resistance, and biodiversity benefits, making it useful for both home and commercial landscapers. The Finder then directs you to certified nurseries that sell native plants (go.umd.edu/NativePlantCertProgram). The Finder then directs you to certified nurseries that sell native plants (go.umd.edu/NativePlantCertProgram).



Vernonia noveboracensis (New York Ironweed) at the Lower Meadow at Locust Grove Nature Center. Photo taken on MNPS Field Trip lead by Anne De Novo, August 23, 2026. Photo by P. Foster.

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Beavers: Nature's Wetland Engineers

The return of a once-vanished keystone species and what it means for Maryland's wetlands

For thousands of years, one animal shaped the American landscape more than any other: the North American Beaver (*Castor canadensis*). Beavers engineered wetlands across the entire continent, then all but disappeared from many states, including Maryland. Today, the beaver is quietly returning and is being recognized as one of the most effective and affordable allies we have for restoring the wetlands of the Chesapeake Bay. Understanding this history and how to live alongside beavers again is central to this story.

A Rodent That Once Ruled the Continent

Before European colonization, beavers were found across nearly all of North America, from the Arctic tundra to the deserts of northern Mexico. Historical reconstructions suggest that the continent supported tens to hundreds of millions of beavers, possibly as many as 400 million, before the fur trade decimated their populations (Seton 1929). Dam building by beavers shaped the region's

By **CLAUDIA DONEGAN**

rivers and floodplains for thousands of years. Paleoecological research, including work by Johns Hopkins paleoecologist Dr. Grace Brush (Brush 2009), provides strong evidence that the pre-colonial Mid-Atlantic was far wetter than what exists today, largely because beavers were everywhere along the nontidal waterways.

Historical Range of the North American Beaver

The beaver's dominance changed quickly once European colonists arrived. Beaver pelts, prized for making water-resistant felt hats and trimming coats, became one of the most valuable commodities in colonial North America and a major driver of the continent's exploration. Traders such as Henry Fleet and William Claiborne moved thousands of pounds of beaver pelts through Maryland and Virginia in just a few years in the 1630s along the Potomac River. A single pelt could be worth a dozen axe heads. The fur trade built fortunes. John

Jacob Astor, America's first multi-millionaire, made much of his money in furs, but it was ultimately unsustainable. By the mid-1800s, unregulated trapping resulted in local extinction of beavers in Maryland and most of the eastern United States.

The consequences went far beyond the loss of a single species. Without beavers maintaining their dams, the braided, marshy stream corridors that once spread water slowly across valley bottoms gradually gave way to the narrow, incised, single-thread channels common today (see top left image on Page 6). These channels move water and sediment quickly downstream with negative cascading effects on habitats, water quality, and wildlife.

Nature's Wetland Engineers

The beaver is one of the only animals besides humans that reshapes its own habitat on a landscape and hydrological scale. By felling trees and building dams, beavers slow down moving water and spread it laterally across the floodplain, allowing the soil to become saturated and

raising the local water table. This creates fluctuating water levels and complex habitat structure that defines a healthy wetland. Beaver ponds and associated canals also boost groundwater exchange, allowing water to flow back and forth between groundwater and surface water, creating a cooling effect. This buffers stream temperatures during low summer flows, which is increasingly critical for cold-water species like native brook trout.

These changes ripple outward. When water spreads out over the landscape, suspended sediment settles to the wetland floor before it reaches downstream waterways, improving water quality and reducing the sediment load reaching the Bay. The deep pools that beavers create rarely freeze solid in winter, offering refuge for fish, turtles, and amphibians. Meanwhile, the mosaic of open water, saturated soil, and shrubby edge habitat that beavers maintain supports far more plant and animal diversity than a single straight channel ever could, including herons, wood ducks, dragonflies, salamanders, and freshwater mussels. Beaver wetlands also store water, thereby mitigating flood peaks after storms and sustaining stream baseflow during drought, making watersheds measurably more resilient to both extremes.

Maryland's Wetlands, and a Widening Gap

Maryland has lost an extraordinary share of its original wetlands. Roughly 73 percent of the state's wetlands disappeared between the 1780s and 1980s, according to U.S. Fish and Wildlife Service records, and progress on reversing that decline has been slow. Under the 2014 Chesapeake Bay Watershed Agreement, the Bay states committed to restoring or creating 85,000 acres of tidal and nontidal wetlands and enhancing another 150,000 acres by 2025. By most measures, progress has fallen short of that goal. Only a small fraction of the new-acreage target had been met by the early 2020s.

In recognition of that shortfall, the revised Chesapeake Bay Watershed Agreement, approved by the region's governors and the Environmental Protection Agency (EPA) in December 2025, scaled the wetlands commitment back dramatically to restoring or creating at least 3,000 acres and enhancing 15,000 acres of wetlands across the watershed by 2040. Even that more modest target will be difficult to reach through engineered restoration projects alone, which are often expensive and slow to permit and build.

This is exactly the gap beavers can fill. No engineered project can match

a beaver colony's ability to create and maintain complex wetland habitat across a landscape at essentially no cost to taxpayers. Every beaver pond, canal, and abandoned wet meadow that forms Maryland's landscape moves the state closer to its wetland goals without a single excavator. And beavers aren't required to get permits!

Living With Beavers: Coexistence Over Conflict

Welcoming beavers back to Maryland's landscape raises two legitimate concerns for landowners: tree loss and flooding. Historically, the default response to both was to trap and remove the beavers or tear out their dams. But those approaches are usually only a short-term fix, as new beavers often recolonize good habitats within a year or two. Research comparing management strategies has found that removal strategies are far more expensive over time than leaving the beavers in place and addressing tree loss and flooding.

Trapezoidal-shaped culvert fences (e.g., Beaver Deceiver™) or pond levelers (large pipes inserted high in the beaver dam to allow for regulated release of water) can be used to successfully control water height. One widely cited analysis (Boyles and Savitzky 2008) found that flow devices reduce flooding and return roughly \$8 in costs for every \$1 spent installing them. Whereas repeated lethal trapping actually lost money over the long run. Other non-lethal strategies, such as strategic fencing that prevents beavers from damming culverts and wrapping or fencing valuable trees, have also proved very ecologically and financially effective. Organizations working across our region are already helping landowners put them to use.

Organizations finding solutions

The Human-Beaver Coexistence Fund, a non-profit organization that focuses on Maryland, Virginia, West Virginia, and Washington, D.C., works to educate the public about the benefits



A beaver dam impounding a Piedmont floodplain. Dams range from a meter across narrow channels to hundreds of meters across broad alluvial floodplains. Photo by S. McGill.

continued



Jabez Tributary 3 in Anne Arundel County showing channel before (left) and after (right) restoration. The first season after the project was implemented, beavers arrived! Left photo by C. Donegan; right photo by unknown.

of living alongside beavers and provides funding for non-lethal management when conflicts arise. Nationally, the Beaver Institute's Beaver Corps program trains and certifies practitioners in the

installation of low-flow devices and other coexistence techniques, building the workforce needed to make non-lethal management the default rather than the exception. The Maryland Beaver Working

Group is a coalition of environmental professionals promoting the North American Beaver as a keystone species—a species whose activities are essential for the health of an ecosystem. Together, the efforts of these groups are helping shift the conversation from “how do we get rid of beavers” to “how do we support the work beavers do while also saving money and managing our land.”

Beavers built much of the wetland landscape essential to the Chesapeake Bay ecosystem long before wetlands were measured in acres or written into an agreement. Bringing back beavers and learning to coexist with the mess as well as the magic they create is the simplest, cheapest, and most effective step Maryland can take toward a healthier, more resilient watershed.

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A classic beaver lodge constructed from interlocking woody stems and mud along a trout stream in Baltimore County, MD. The dense woody dome insulates the interior chamber and prevents terrestrial predators from digging in from above, while the secure access for the beaver remains entirely submerged beneath the water's surface. Photo by S. McGill.



Swamp Milkweed (*Asclepias incarnata*). Photo by L. Cairo.

The Botanical Legacy of Beaver Engineering

By CRISTINA NICIPORCIUKAS

Beavers leave a distinctive botanical legacy wherever they work, reshaping Maryland's landscapes in ways few other animals can. Their steady chewing of trees and shrubs opens the canopy, which allows sunlight in, stimulates vigorous coppice regrowth, and keeps riparian vegetation in young stages. Just as vital for supporting diverse plant communities, their engineering slows streamflow, elevates groundwater, and brings back the wet soils that native wetland plants depend on. All of these beaver-driven changes create diverse microhabitats and abundant edge communities, resulting in far more living space for far more species.

When beavers cut shrubs and small trees, they interrupt the march toward mature forest and maintain a perpetual early-successional mosaic along streambanks and pond edges (Rosell et al. 2005). Maryland's riparian edges commonly feature Red Maple (*Acer rubrum*), River Birch (*Betula nigra*), Box Elder (*Acer negundo*), and Sycamore (*Platanus occidentalis*), all capable of vigorous resprouting after beaver cutting. In addition, this bushy regrowth creates dense

wildlife structures which serve as nesting cover for songbirds, shaded microhabitats for amphibians, and browse for deer and small mammals (Baker & Hill 2003). High stem density

also slows water and traps sediment, helping build wetland soils and expand shallow-water habitat (Naiman et al. 1988).

Pollock et al. (2014) describe how beaver disturbance promotes a further habitat type: the shrub swamp, a shrub-dominated floodplain vegetation. In Maryland, this zone often includes Buttonbush (*Cephalanthus occidentalis*), Silky Dogwood (*Cornus amomum*), Winterberry (*Ilex verticillata*), Wax Myrtles

(*Morella cerifera*, *M. pensylvanica*), and Willows (*Salix* spp.), forming dense thickets along pond margins.

Beaver pruning also opens sunny littoral zones that favor emergent macrophytes such as Pickerelweed (*Pontederia cordata*), Arrow Arum (*Peltandra virginica*), and Broadleaf Cattail (*Typha latifolia*) (Naiman et al. 1988). As ponds age or water levels shift,



Pickerelweed (*Pontederia cordata*). Photo by C. Niciporciukas.

continued



An impounded beaver pond in Baltimore County, MD. Newly elevated water tables cause mortality in flood-intolerant upland trees, converting closed-canopy riparian forest into open wetlands. The standing deadwood provides nesting, cavity, and perching structure for wildlife while the impounded water supports wetland plants species, including submerged aquatic vegetation. Photo by S. McGill.

Botanical Legacy continued

flooded margins often transition into saturated meadows. Hood & Larson (2014) found that these beaver-created wetlands support significantly higher plant diversity than adjacent non-beaver sites. In Maryland, wet meadows commonly include Swamp Milkweed (*Asclepias incarnata*), Virginia Iris (*Iris virginica*), Golden Ragwort (*Packera aurea*), Jewelweed (*Impatiens capensis*), and Sensitive Fern (*Onoclea sensibilis*). The emergent vegetation stabilizes sediments, oxygenates water, and provides dense habitat for macroinvertebrates, amphibians, and nesting waterfowl (Naiman et al. 1988). The resulting plant diversity attracts birds, butterflies, amphibians, and other wildlife (Naiman

et al. 1988; Rosell et al. 2005), while woody debris adds further structure for fish and invertebrates (Baker & Hill 2003; Naiman et al. 1988).

And perhaps most well-known of the habitats created by beavers are beaver impoundments, more commonly known as beaver ponds. Here, deep, slow-moving water allows fine sediments and organic matter to accumulate, producing the soft substrates typical of open-water interiors in the Coastal Plain (Correll et al. 2000). These conditions support submerged and floating native aquatics such as Spatterdock (*Nuphar advena*), American White Water Lily (*Nymphaea odorata*), and Pondweeds (*Potamogeton* sp.), all well adapted to nutrient-rich, low-velocity

environments (Naiman et al. 1988).

The result is a biologically rich, structurally complex habitat that simply would not exist without beaver engineering. Beavers are more than builders. They are ecological catalysts. Healthy wetlands depend on the quiet persistence of nature's own engineers.



Table of Maryland Native Plants Across Beaver-created Habitat Zones.

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Beavers Beyond the Pond: Standing Dead Wood and Light Gaps

By WARREN E. STEINER JR.

Beavers are well known for shaping wetlands, but their activities also support insects rarely seen in the surrounding shaded woods. A study of “Beavers, Boles and Beetles” carried out at Patuxent Research Refuge near Laurel, Maryland, 2010 to 2015, showed that beavers created a patchwork of habitats different from the surrounding forest areas as a result of girdling and killing some of the larger canopy trees.

During over one hundred total visits, 10-15 beaver-girdled, standing dead trees—primarily American Beech (*Fagus grandifolia*), but also Swamp White Oak (*Quercus bicolor*), Sweetgum (*Liquidambar styraciflua*), and Black Gum (*Nyssa sylvatica*), were examined for beetles on the bark and exposed dead wood. More than 85 species of beetles in 30 families were documented, mostly species known to feed on dead wood and fungi. Some were species rarely seen or known from very few museum collections, including the colorful Six-banded Longhorn Beetle



The author at a beaver-girdled dead trunk of American Beech (*Fagus grandifolia*) showing search and sampling technique for insects on bark and exposed wood. Photo by J. Swearingen.



A beaver-girdled dead trunk of Black Gum (*Nyssa sylvatica*).



American Beech (*Fagus grandifolia*) trunks girdled by beaver with open sunlit ground and herbaceous cover.

(*Dryobius sexnotatus*) listed as endangered in Maryland.

While the dead standing wood provided food and habitat that differs



A male Six-banded Longhorn Beetle (*Dryobius sexnotatus*) on beech bark.

from fallen wood, the sunlit grounds around beaver-killed trees featured unique islands of different plants not found in shaded areas nearby. Some of these “light gaps” were scattered widely across the floodplain and into upland slopes above the main stem of the Little Patuxent River.

As the dead trunks lost bark and eventually fell, a dynamic succession of fungi, insects, and surrounding plants was observed. Beavers can be problematic to residents and land managers but in a natural forest situation, they boost biodiversity like few other animals can.

More Than Beautiful Flowers:

Native Azaleas, Rhododendrons, and Their Pollinators

By SHWETA BASNETT and ANAHI ESPINDOLA

Native azaleas are among the most widely recognized and visually striking flowering shrubs in eastern North America. Maryland has six native *Rhododendron* species: Smooth Azalea (*R. arborescens*), Dwarf Azalea (*R. atlanticum*), Great Rhododendron (*Rhododendron maximum*), Pinxter Flower (*R. periclymenoides*), Early Azalea (*R. prinophyllum*), and Swamp Azalea (*R. viscosum*). Another eleven native species occur in Virginia and North Carolina, including the rare Cumberland Rhododendron (*R. cumberlandense*). The Appalachian Mountains host a high diversity of *Rhododendron* species, and the region is known as one of two North American centers of *Rhododendron* diversification (the other is the Pacific Northwest). The primary center of diversification of the genus is southeastern Asia, where ninety percent of *Rhododendron* species occur.

Beyond their beauty, rhododendron and azalea flowers function as busy ecological hubs, providing a food resource for bees, butterflies, flies, and hummingbirds, who carry pollen between blossoms. This activity is important to the genetic diversity of the plants and the production of seed. Until our work, very little was known about the reproduction of North American *Rhododendron* species. Partly funded by a Maryland Native Plant Society grant (2022–2023), we have been studying who pollinates Maryland's native *Rhododendron* species and what floral features are associated with different visitors. Here, we report on some of our results.

For this study, we focused on a few native species: Sweet Azalea (*R. arborescens*), Flame Azalea (*R. calendulaceum*), Catawba Rosebay (*R. catawbiense*), Cumberland Azalea (*R. cumberlandense*),

Great Rhododendron (*R. maximum*), and Swamp Azalea (*R. viscosum*), which display remarkable floral diversity. For example, the spectacular orange and dark yellow flowering display of Flame Azalea makes it one of the most conspicuous native azaleas. Sweet Azalea and Swamp Azalea bear much paler white flowers and produce a lovely sweet fragrance. At slightly higher elevations, Catawba produces large clusters of pink-purple blossoms above its dark evergreen foliage. In contrast, Great Rhododendron has pale white and light pink flowers and thick evergreen leaves. To the human eye, these differences are visually striking. To pollinators, however, less obvious characteristics may be equally as important, such as the arrangement of the stamens, flower shape, how much nectar they produce, and even the concentration of sugar in that nectar.

Our Observations

During June and July 2022, our fieldwork took us to forests in Maryland and North Carolina. In Maryland, we studied sites at elevations ranging from 39 to 692 meters above sea level, including Patuxent Research Refuge (Laurel) and areas surrounding Swallow Falls (Oakland) and Big Run State Park (Swanton). The southern Appalachian sampling was conducted at higher elevation sites (1008–1820 meters above sea level) in North Carolina, in the Pisgah National Forest (Asheville) and the Nantahala National Forest (Otto).

At each locality, on clear sunny days, flowering branches were observed repeatedly during the morning and early afternoon. For each species, we observed 25–30 separate blossoms for roughly 10 to 15 hours. We recorded a pollinator visit when an animal came into contact with a flower's anthers or stigmas, providing an opportunity for pollen transfer.

Among the most noticeable visitors in our study were bumble bees, including *Bombus impatiens*, *B. vagans*, *B. sandersoni*, and *B. bimaculatus*. Bumble bees are comparatively large pollinators, ranging in size from ½ inch to 1½ inches long. When they quite literally bumble their way between stamens inside the flowers, they appear to collect large quantities of nectar, which they then transport to the next blossom. Their large hairy bodies provide ample surface on which pollen can be collected. We also recorded pollination by smaller native bees such as species from the genera *Andrena* and *Lasioglossum*. Great Rhododendron (*R. maximum*), Sweet Azalea (*R. arborescens*), and Catawba Rhododendron (*R. catawbiense*) received particularly high bee visitation.

Silver-spotted Skipper (*Epargyreus clarus*)
on Smooth Azalea (*R. arborescens*)
in Swallow Falls, MD.
Photo by B. Shweta.



We also measured the flowers' corolla length, nectar volume, and nectar concentration. Measuring nectar required preparing flowers the day before all measurements. We enclosed buds that were likely to open the following morning inside fine mesh bags. The bags allowed air circulation but prevented visitors from removing the nectar. The following morning, nectar was collected from newly opened flowers, then nectar volume (how much nectar was produced) and sugar concentration (how much saccharide the nectar had) were measured. These measurements revealed considerable differences among our North American Rhododendron species. Sweet Azalea, for example, produced relatively large nectar volumes, while Great Rhododendron produced nectar with the highest concentration of sugars.

Our analysis uncovered an intriguing connection between floral rewards and visitors. Among the North American species, higher bee visitation was positively associated with nectar concentration. Great Rhododendron illustrates this relationship particularly well. Its nectar contained about 35% sugar, the highest concentration among the North American species we sampled, and bee visitation greatly exceeded visitation by other visitors. This agrees with conceptual expectations based on floral biology and indicates that in the species studied, bees prefer to visit flowers with high sugar concentration.



R. prinophyllum species name is from the Latin for “prinos”, an old name for smooth-leaved hollies, and “phyllum” meaning leaves. Photo by L. McDowell.

Species	Number of Sites	Nectar %	Nectar volume	Corolla length	Average pollinator visits per flower			
					Bird	Bee	Fly	Butterfly
<i>R. catawbiense</i>	2	25%	8.3 µL	43 mm	0	3.6	0.02	0
<i>R. maximum</i>	3	35%	3.5 µL	34 mm	0	2.6	0.12	0
<i>R. arborescens</i>	4	25%	8.9 µL	41 mm	0.17	0.95	0.06	0.1
<i>R. calendulaceum</i>	2	16%	2.1 µL	32 mm	0	0.74	0.14	0.02
<i>R. cumberlandense</i>	2	13%	3.6 µL	37 mm	0	0.37	0.01	0.03
<i>R. viscosum</i>	4	16%	3.4 µL	33 mm	0.16	0.23	0.42	0.12

Table 1. Mid-Atlantic Rhododendron species studied, their floral characteristics, and average visitations by various pollinator groups based on observations of 25-30 blossoms per species. Species are listed in descending order of bee visitations. Nectar concentration is reported as the average percentage of nectar sugars, nectar volume as the average volume of nectar per blossom (microliters), and corolla length as the average corolla length (millimeters). Data are from Basnett et al. (2025).

Visitation numbers are not the whole story

One of the most memorable parts of our fieldwork was watching butterflies visit native azaleas. We recorded three butterfly species visiting the flowers: Eastern Tiger Swallowtail (*Papilio glaucus*), Silver-spotted Skipper (*Epargyreus clarus*), and Great Spangled Fritillary (*Speyeria cybele*). The Eastern Tiger Swallowtail is particularly striking beside an azalea. Its wings appear enormous compared to an individual flower. Large body size can be useful for pollen transfer. As a butterfly moves among flowers, its wings and body come into contact with the long, reflexed stamens and stigma. During our observations, butterflies would visit many flowers during a single encounter with a plant. Their wing movements also brought them

repeatedly into contact with floral reproductive structures allowing pollen to be transferred between the anthers and stigma during visits. Sweet Azalea and Swamp Azalea were among the species in which butterfly visitation was particularly noteworthy. Our study found that plants receiving more butterfly visitation tended to have less concentrated nectar than species dominated by bumblebee visitation, such as Catawba Rosebay and Great Rhododendron.

Bees and butterflies dominated many of our observations, but they were not the only flower visitors we saw. We also recorded the Ruby-throated Hummingbird (*Archilochus colubris*) visiting Sweet azalea, Flame Azalea, and Swamp azalea. This bird

continued



Five *Rhododendron* species studied (top to bottom) *R. arborescens*, *R. calendulaceum*, *R. catawbiense*, *R. maximum*, and *R. viscosum*. Photos 1-3 by S. Basnett, 4 by R. Simmons, and 5 by G. Dickel.

Azaleas continued



The elegant *R. periclymenoides* is native from Massachusetts to South Carolina. Photo by J. Swearingen.

visitation was uncommon compared to insect visitation, making the sudden appearance of a hummingbird especially memorable. The hummingbird would approach, hover at the flowers, feed, and disappear within moments. Frequency alone, however, does not determine the contribution of a pollinator. A relatively uncommon visitor can potentially transport pollen effectively between flowers or plants. Quantifying exactly how much pollen each visitor deposits is an important direction for our future research.

A hidden diversity of relationships

Our work found a particularly strong relationship between pollinators and nectar traits (volume and sugar concentration), whereas corolla length did not show a significant relationship with pollinator groups. This reminds us that some of the characteristics most important to pollinators are hidden inside the flower. Our research provides support for the importance of protecting native plant species and habitats in order to preserve ecological relationships.

The next time you encounter a flowering rhododendron or azalea in the woods, pause for a few minutes and watch for bumble bees, solitary bees, butterflies, or possibly a hummingbird. Rhododendrons and azaleas in flower are important meeting places and remind us that behind every blossom is an ecological partnership quietly keeping our native forests connected and thriving.

This study was conducted in part with support from the Maryland Native Plant Society.

REFERENCE

Basnett, S., J. Krpan & A. Espíndola. 2025. Floral traits and their connection with pollinators and climate. *Annals of Botany* 135:125-140.

AUTHOR AFFILIATIONS

S. Basnett: Department of Entomology, University of Maryland, College Park & Naturalis Biodiversity Center, Leiden, the Netherlands.

A. Espíndola: Department of Entomology, University of Maryland, College Park, MD.

The Maryland Plant Big Year: A Year-Long Search for Maryland's Wild Plants

By JIM BRIGHTON

IN THE LATE SUMMER OF 2025, I began toying with the idea of attempting a Maryland Plant Big Year. A true Big Year is not something to take lightly. I had already competed in a Maryland Birding Big Year back in the early 2010s, and when it was over, I swore I would never do another. That promise didn't last.

Now, eight months into my Maryland Plant Big Year, I've documented around 1,100 species. The year has taken me to remarkable places and I've observed a vast array of plants, many of which I had never seen before, but the favorite part of my big year has been spending time in the

field with other amazing naturalists. If you'd like to follow along as the adventure continues, subscribe to my Substack at jimbrighton.substack.com

Jim Brighton is co-founder and President of the Maryland Biodiversity Project. He lives with his family on Maryland's Eastern Shore.

Jim will be giving a full presentation on his adventure for MNPS on May 25, 2027.

Photos by Jim Brighton.



Nodding Wild Onion (*Allium cernuum*)



Shrubby St. Johnswort (*Hypericum prolificum*)



Vasevine (*Clematis viorna*)

Seven Invasive Plants Added to Prohibited List

By KRISTIN HOFFMAN

In July 2026, these seven invasive plants were added to Maryland's Prohibited Invasive Plant List which prohibits the sale of certain damaging plants:

Chocolate Vine (*Akebia quinata*)
Leatherleaf Mahonia (*Berberis bealei*)
Chinese Fountaingrass (*Cenchrus alopecuroides*)
English Ivy (*Hedera helix*)
Atlantic Ivy (*Hedera hibernica*)
Orange Daylily (*Hemerocallis fulva*)
Chinese Silvergrass (*Miscanthus sinensis*)

For a complete list of plants on Maryland's Prohibited List go to mda.maryland.gov/plants-pests/Pages/maryland_invasive_plant_law_and_regulations.aspx

How do invasive plants get prohibited from sale?

Plants go through a lengthy assessment process, including research on the plants' characteristics, their behavior and effects on our ecosystems, and their distribution. These assessments are then reviewed by the Invasive Plant Advisory Committee (IPAC), and if appropriate, the species are recommended for inclusion on the Prohibited List. Newly prohibited plants enter a phase-out period during which nurseries can sell off existing stock but cannot grow or acquire any new stock.

What individuals can do.

If you see these plants for sale, consider talking to the seller about Maryland's Prohibited Invasive Plant List. If you have one of these plants in your landscape, please consider removing it and bagging it up for the landfill. Plant Invaders of Mid-Atlantic Natural Areas has information on effective removal methods and also provides suggestions for replacements. In addition, we encourage you to talk to your neighbors about invasives, and record your plant observations on iNaturalist.

REFERENCES

Maryland Department of Agriculture's Prohibited Invasive Plant List

mda.maryland.gov/plants-pests/Pages/maryland_invasive_plant_law_and_regulations.aspx

Swearingen, J.M. & J.P. Fulton. 2022. *Plant Invaders of Mid-Atlantic Natural Areas, Field Guide*. Passiflora Press. 200 pp.

Montgomery County's Vine Cutting Program Needs to Exclude Natives



Clusters of large red-orange flowers of Trumpet Creeper (*Campsis radicans*) beckon pollinating bumble bees and hummingbirds. Photo by J. Swearingen.

Montgomery County's Department of Transportation (MCDOT) recently announced a new program, the Residential Vine Cutting Program (accessible via the QR code below), that urges residents to *save trees by cutting vines that grow on trees*. The program has worthy intentions, but it may be interpreted as encouraging the cutting of all vines on trees. It fails to distinguish between the destructive effect of non-native invasive vines and the ecological value of native vines. Native vines are extremely important ecologically and do not smother, choke, girdle, weigh down, or topple trees like non-native invasive vines are known to do.

In one instance, the program

description states: "*Some natives are worth saving*"--without specifying which native species are being referred to. **The Vine Cutting Program needs to clearly state that only non-native invasive vines should be cut, and that native vines should be left alone.**

In Montgomery County, there are many beneficial native vines. Some of the most common native woody vines that are likely to be encountered in suburban and urban settings are: Trumpet Creeper (*Campsis radicans*), Virginia Creeper (*Parthenocissus quinquefolia*), Cat Greenbriar (*Smilax glauca*), Roundleaf Greenbriar (*Smilax rotundifolia*), Summer Grape (*Vitis aestivalis*), and Frost Grape (*Vitis vulpina*). These plants provide



Striking floral displays of Coral or Trumpet Honeysuckle (*Lonicera sempervirens*) attract pollinating bees, butterflies, and hummingbirds. Photo by P. Foster.

Regarding the many species of native grapes in the area, local botanist John Parrish states: "Tangles of grapevines provide excellent cover and nesting sites for songbirds as well as stringy bark for nesting material. Most importantly, grapevines produce plentiful quantities of fresh fruit consumed by birds and mammals from late summer through fall. Persistent dried raisins of the winter and summer grape are a substantial food source for winter resident songbirds such as the bluebirds, cedar waxwings, hermit thrushes, mockingbirds, and robins. In addition, grape leaves serve as a primary food source for the larval stage of several native moth species."

nectar and pollen for many species of pollinators, critical food for the caterpillars of many butterfly and moth species, and high-energy fruits for resident and migrating birds.

Many of our native vines are on the Maryland Commercial Native Plant List and are sold by Maryland's horticulture industry. Native vines and substitutes for invasives are featured in the Maryland Native Plant Program's regional guides.

We applaud MCDOT's educational efforts to save native trees. However, we request that the language in the Vine Cutting Program be changed to advise that cutting be restricted to non-native invasive vines, and ideally to acknowledge the ecological value of native vines. If you wish to express your views about this new program, call MCDOT's Director's office at: (240) 777-7170 or go to tinyurl.com/3322yssr to contact your Montgomery County Council members.

Thank you to John Parrish for his valuable input.



Scan code for
Resources

Maryland's State Wildlife Action Plan: Signed, Sealed, Delivered—and Ready to Help Vulnerable Species!

By MIMI SANFORD

THE LATEST REVISION to Maryland's State Wildlife Action Plan (SWAP) was approved on July 31, 2026. The SWAP homepage (link below) includes links to current and previous plans. With the approval of the latest plan, the Department of Natural Resources (DNR) and its partners are poised to move forward with implementation of the SWAP objectives including addressing the impacts of invasive species, minimizing and reducing habitat fragmentation, and increasing coordination and funding for conservation work. By focusing on SWAP priorities, DNR and its partners believe that great progress can be made before the next SWAP revision.

Protecting vulnerable species and habitats is a daunting task anywhere, and possibly more so in Maryland. Despite being the ninth smallest state, Maryland contains an astonishing variety of habitat types within five physiographic provinces—Atlantic Coastal Plain, Piedmont Plateau, Blue Ridge, Ridge and Valley, and Appalachian Plateau—across about 12,000 square miles. The diverse habitats within these ecologically distinct regions support a large number of species not found in other comparably sized states.

Maryland's rich flora and fauna provide the basis for its State Wildlife Action Plan. Led by the DNR, the SWAP is a non-regulatory, collaborative document guiding conservation of the state's Species of Greatest Conservation Need (SGCN) and the habitats they depend upon. More than 250 people from across 100 organizations contributed to the revision of Maryland's SWAP, lending their expertise to this state-wide effort. Furthermore, each state is required to submit an updated SWAP to the U.S. Fish and Wildlife Service every 10 years

in order to receive State Wildlife Grant funding. In Maryland, this funding is critical to support the conservation of non-game species and their habitats, especially since no state general funds are provided for this purpose.

In addition to meeting basic federal requirements, states are permitted to tailor their plans to their own needs. Although not typical or required, Maryland has chosen to include plants in its SWAP. A total of 454 plant species and their conservation needs have been included as SGCN in Maryland's updated SWAP. Threats and conservation actions for the key habitats that support these threatened species, as well as for individual animal species and species groups, are a key component of Maryland's SWAP.

Because plants are intrinsically tied to their habitats, the Maryland SWAP addresses

their needs primarily at the habitat level. This influences the SWAP's objectives and the funding that supports meeting these objectives for plants. For example, for the Eastern Shore's Delmarva Bays, the State Wildlife Grant funding has gone towards the conservation and restoration of sites like the Andover Flatwoods Natural Area. In this case, by considering the habitat as a whole rather than on an individual species level, DNR and its partners are able to safeguard all 20 SGCN animals, 34 SGCN plants, and rare species like Mid-Atlantic Beakrush (*Rhynchospora mesoatlantica*) and Canby's Dropwort (*Tiedemannia canbyi*) found in Delmarva Bay habitats.

If you have questions or would simply like to chat about Maryland's SWAP, please do not hesitate to reach out to me at mimi.sanford@maryland.gov.



The front cover of the 2025–2035 Maryland SWAP.

Delmarva Bay on the Eastern Shore of Maryland. Photo credit to Kayt Jonsson, USFWS.

State Wildlife Action Plan Website

dnr.maryland.gov/wildlife/pages/plants_wildlife/swap_home.aspx

2025-2035 Maryland State Wildlife Action Plans

dnr.maryland.gov/wildlife/Pages/plants_wildlife/SWAP_2025.aspx



Marilandica

Maryland Native Plant Society
PO Box 4877
Silver Spring, MD 20914

OUR MISSION

Promote awareness, appreciation and conservation of Maryland's native plants and their habitats through education, research, and advocacy.

Become a member. To join, go to:
mdflora.org/membership

UPCOMING EVENTS (OCTOBER 2026 - JUNE 2027)

Monthly Programs

Registration is required to obtain a zoom link and also to attend in person. Talks start at 7:30 PM; board update 7:00-7:30 PM. Programs are posted in advance. Registration and recordings at mdflora.org. Usually on last Tuesdays.

October 27 Weed Warriors: Volunteers in Action -
Kerry Wixted & Corinne Stephens

November 17 Carex Hidden in Plain Sight: Exploring the Wild Homes of Maryland's Most Diverse Plant Family - *Chris Frye*

December No meeting - *Happy Holidays!*

January 26 FloraQuest apps - *Alan Weakley & Michael Lee*

February 23 Glorious Goldenrods: An Ecological Powerhouse -
Clare Walker

March 30 Wildlands, Old-Growth, and Irreplaceable Natural Areas of Mountain Maryland - *Gwen Brewer*

April 27 Panel: Early Successional Grasslands and Prescribed Burning

May 25 The Maryland Plant Big Year: A Year-Long Search for Maryland's Wild Plants - *Jim Brighton*

June 29 Rare Plants and Habitats of Maryland's Potomac Gorge -
Clara Thiel



MNPS field trip leaders Kevin Speray and Jessica Klotz point out Whorled Rosinweed (*Silphium trifoliatum*) during a July ramble in Green Ridge State Forest in Flintstone, MD. Photo by L. McDowell.

Field Trips

Registration is required. Field trips are posted at: mdflora.org
Interested in coordinating a field trip? Have a suggestion for a field trip? Send email to: info@mdflora.org