Plecker Pond Loop
Self-Guided Tour

0.25 mile wheelchair-accessible walking tour

Benches for resting or observing available throughout

Leashed dogs welcome; please pick up after your pet

There is no admission fee, but you can show your support of the Arboretum with a donation or by becoming a member!

EDITH J. CARRIER
ARBORETUM
JAMES MADISON UNIVERSITY

About the Edith J. Carrier Arboretum

Established 1989

The Edith J. Carrier Arboretum, a woodland sanctuary sitting within a 125-acre tract on the James Madison University campus, is a public, urban garden and forested greenspace that preserves native species, provides opportunities for research, and promotes knowledge of the botanical and natural world for all!

We are:

An **outdoor classroom** for learners of all ages

A vibrant, evolving **habitat** for flora and fauna

A **green corridor** for migrating birds, butterflies, and mammals

An important **stormwater detention** and management facility for ensuring watershed health

A provider of l**ectures, workshops,** and **programs**

A host of **special events**

A great place to v**olunteer** in the landscape or education

A place to exercise, play, relax, and enjoy **restoration recreation**

A source for native trees, perennials, wildflowers, and ferns for **home landscape purchase**

A **local artists' gallery** and source for **fun gifts**

Tour Route

= approximate locations of benches

Numbers indicate approximate locations.
There are no physical markers of these stops on the grounds.

1. Frances Plecker Education Center
2. Education Center Ramp
3. Bottom of the Ramp
4. Jurney Stage Garden
5. Bioswale
6. Lawn Entrance
7. Viette Perennial Garden
8. Pondside
9. “The Elder” Sycamore
10. Pond Bridge
11. Pond Patio
12. Wetland Boardwalk
13. Monarch Waystation
14. Stormwater Functions
15. A Last Look

This tour was originally written by JMU student Maya Swift during an interpretive internship in spring 2024 and has been digitized and updated by Arboretum staff.

1. Frances Plecker Education Center

Open from 8 a.m. to 4 p.m.
Monday through Friday

What's Inside?

If you're visiting on a weekday, please stop into the Frances Plecker Education Center, where our staff will be happy to assist you.

- Sign our guest book
- Enjoy the work of a local artist on our walls
- Browse our gift shop
- Learn about our plant sales or about volunteering
- See our "Explorer Backpack" selections for a future visit
- Check out our many educational and recreational program offerings for all ages

Restrooms are available outside the Frances Plecker Education Center, to the right hand side as you face the building. These are open to visitors from dawn-dusk everyday.

See our learning page about what's inside the Education Center.

Inside the Frances Plecker Education Center

Hours: 8 a.m. to 4 p.m., Monday through Friday

Say hello to our staff, ask your questions, learn more about volunteering, or become a member of the Arboretum!

Program Info

We offer many programs for education, well-being, and enrichment. Come see what we're offering this season and sign up!

Explorer Backpacks

Visitors of all ages can enhance their learning with tools, field guides, and activities on a variety of topics:

- birding
- tracks and scat
- tree id
- ...and more

FREE to borrow during business hours

Local Art Exhibit and Gift Shop

Support the Arboretum with a purchase from our local artist's mini-gallery and gift shop. Our mini-gallery features a variety of art styles and topics throughout the year, and the featured artist rotates bi-monthly. We also carry books, earrings, art prints, cards, and more.

Botanical Books

Arboretum Members may borrow books from our botanical collection. If you want to learn about a particular style of gardening, a particular genus of plant, or other topics related to the plant world, we may have something for you!

2. Education Center Ramp

Before you head down the ramp, take a look at garden beds in front of the Education Center and next to the Ernst Tree Terrace.

= approximate location of specific plants/trees highlighted in this guide

White Fringetree #1 (*Chionathus retusus*)

Find the largest tree at the top of the bed directly in front of the education center. If it's spring, you may catch the floral scent of the white fringetree (*Chionathus retusus)*. This tree is a native of Korea, Japan and China and has slightly whiter, larger, and earlier blooms than the native fringetree you'll see next.

White Fringetree #2 (*Chionathus virginicus*)

While on your way down the ramp [but still near the top], look to your left. Do you see the small tree with the multi-colored, furrowed bark that is covered in moss and lichen? This is another White Fringetree, but this one is native to Virginia with slightly less fragrant cream-colored flowers that bloom in May or early June and grow in long clusters. Which do you prefer?

Three-Flower Maples *(Acer triflorum)*

The two small trees with peely (exfoliating) bark at the bottom of the ramp are three-flower maples. These trees get their names from their flowers that bloom in the early spring and grow in clusters of three.

See our learning page about what we mean by "native," "non-native," or "invasive species!"

Native vs. non-native vs. invasive?

What's all the fuss about?

The Arboretum is home to a diverse array of trees, shrubs, and flowers sourced from around the globe. By hosting non-native specimens in the Arboretum, visitors get the opportunity to see and learn from ornamental beauty from different parts of the world right in their community. We hope our visitors will learn to appreciate and understand the plants around them as well as consider how they function locally. The Arboretum's current and future planting plans prioritize growing native species for the many benefits they bring.

"Native" Plants

A species that evolved in a particular area is said to be native to that area. Native plants generally:

- are better adapted to the climate, soil, and animals of that area
- require fewer resources--care, water, and fertilizer --once established.
- provide more ecosystem benefits for other native species such as appropriate food and shelter.

Our ecosystems have developed in a careful balance, so the loss of native species is disruptive and sometimes can not be overcome.

"Non-native" Plants

Everything came from somewhere, right? A non-native species is just from elsewhere in the world and generally:

- has been brought to an area by humans in the last 500 years or less.
- That doesn't mean the plant is "bad," just that it may or may not provide the same kind of ecosystem benefits as native species.

Many of these plants become "naturalized" over time, which means they grow "in the wild" without human cultivation. There are about 600 naturalized plant species in Virginia.

"Invasive" Plants

Within the category of non-native plants, however, are invasive plants. These plants do demonstrable damage to the ecosystem or to people. They crowd out native species due to:

- their aggressive growth and spreading habits
- lack of natural predators.
- They tend to be very hard to get rid of, too.

About 15% of naturalized species in Virginia are considered invasive.

Want to Learn More?

Virginia's Dept. of Conservation and Recreation has more about native plants and the list of plants that "don't play nicely with others."

3. Bottom of the Ramp

To your left near the bottom of the ramp, you will spot the White Oak (*Quercus alba),* a native overstory tree keystone species that can be seen everywhere around the Arboretum.

= approximate location of specific plants/trees highlighted in this guide

White Oak *(Quercus alba)*

The white oak is a deciduous tree. Its bark is gray, plated at the bottom, and gradually gets shaggier further up the tree. The white oak's leaves have smooth, round lobes that are dark green in the spring and summer, red-orange in autumn, and then fall off of the branches in the winter time.

What is a Keystone Species?

In every ecosystem, there are particular organisms without which the entire food web would collapse. In the Oak-Hickory forest, it's the oak tree. Oaks provide acorns, which are food for squirrels, deer, and all manner of other forest animals. They also provide habitat for insects and a wide range of other benefits.

See our learning page

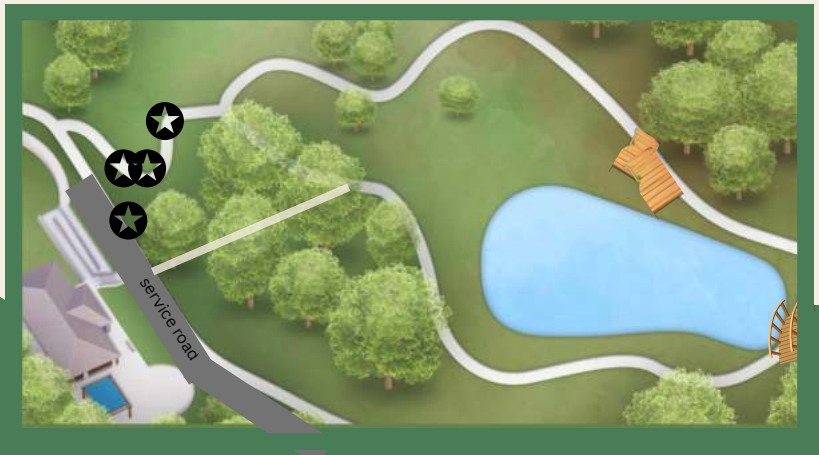
about why oak trees are outstanding plants!

Why Oaks are Awesome

"More than 90 species of oaks occur in the United States and often dominate all forest ecosystems in North American except the great coniferous forests of the North and the driest deserts of the Southwest. Ecologically, oaks are superior plants, and it would be easy to make a convincing case that they deliver more ecosystem services than any other tree genus. Many species are massive and **sequester tons of carbon** in their wood and roots, and they pump tons more into the soil. They are **long-lived** as well, with some species achieving 900 years....In many ecosystems, oaks are also superior at **stalling rainfall's rush** to the sea. Their huge canopies break the force of pounding rain before it can compact soil, and their **massive root systems**, some extending more than three times the width of the canopy from the main trunk, prevent soil erosion and create underground channels that encourage rainwater infiltration instead of runoff. Lignin-rich oak leaves are slow to break down once they fall from the tree, and they create excellent resilient **leaf litter habitat** for hundreds of species of soil arthropods, nematodes, and other invertebrates. For me, though, all of these contributions to ecosystem function pale before the contribution oaks make to food webs. Our early work showed that oaks in the Mid-Atlantic region **supported hundreds of caterpillar species--557** to be exact."

--Douglas W. Tallamy, *Nature's Best Hope: A New Approach to Conservation That Starts in Your Yard*. Portland, Oregon: Timber Press, 2019. p. 142-143.

4. Jurney Stage Garden



Take the sidewalk nearest the kiosk into the Plecker Pond Loop, and you'll see the Jurney Stage Garden on your left.

= approximate location of specific plants/trees highlighted in this guide

The Jurney Stage Garden has a miniature stage where visitors can stop and observe the beauty around them. There are a few different species of trees and shrubs in this garden. There are also a variety of perennials that bloom in spring, summer, or fall depending on the species.

Eastern Bluestar (*Amsonia tabernaemontana*)

The eastern bluestar blooms between March and April. Its flowers stay blue-purple until the fall, when they turn yellow-orange.

Purple Coneflower *(Echinacea purpurea)*

The purple coneflower is a perennial native to the Eastern United States with drooping, lavender-colored petals that bloom in the spring and last through the summer.

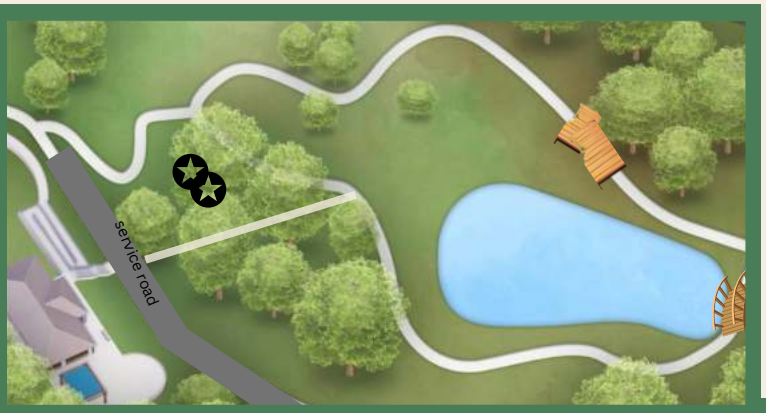
Chinese Pistache (*Pistacia chinensis*)

The Chinese pistache is a small, deciduous tree that is native to China with long leaves that have about 10-12 'leaflets.' The Chinese pistache's leaves are dark green when they sprout in the late spring. They stay this color until mid-October when they turn into a brilliant orange-red color.

Coral Bark Maple (*Acer palmatum 'Sango-kaku'*)

Leave the Jurney Stage Garden and look to your right for a tree with beautiful pink and coral-colored bark. The coral bark maple is a **cultivar**, meaning humans selectively bred it to give the tree's bark that vibrant color.

5. Bioswale



Just downhill from the coral bark maple, look to your right. Do you see the dip in the ground filled with trees that have brown, exfoliating bark that exposes the white inner layers?

= approximate location of specific plants/trees highlighted in this guide

Those exfoliating trees are river birches, and the 'dip' in the ground is called a stormwater retention bioswale. These 'swales' were constructed to collect stormwater run-off and is a Best Management Practice (BMP) at work. It is one of several stormwater BMPs in the Arboretum.

River Birch (*Betula nigra*)

These native trees thrive in moist conditions with their roots soaking up excess amounts of water, which makes them a great choice for a bioswale. According to the Indigenous Peoples' Perspective Project, river birches have traditionally had many other uses, from making syrup to tea and medicines; or for crafts such as basket making.

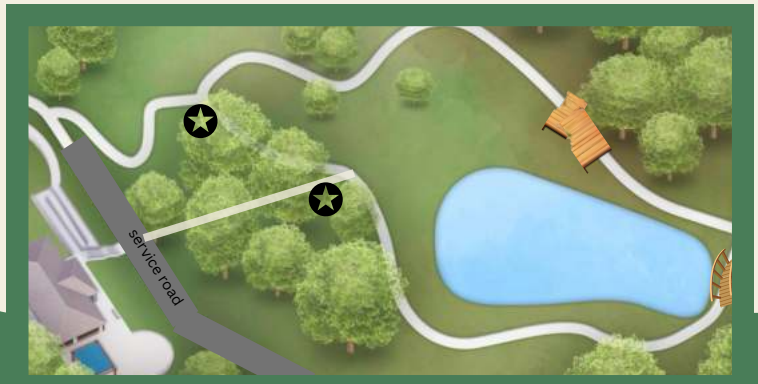
Pignut Hickory (*Carya glabra*)

You can also see native pignut hickories in the bioswale. The Arboretum features red hickory and mockernut hickory trees, too. Hickories can be difficult to tell apart, but all feature multiple leaflets on a single stem; and after they reach a certain age, diamond-shaped latticed bark. Hickory nuts are an important food source for Arboretum animals.

If you find a green hickory nut on the ground on your walk, pick it up, rub it with your thumb, and smell. Most people consider the scent a pleasant surprise!

See Stop #14 for more about the Arboretum's stormwater functions

6. Lawn Entrance



The shrub on your right as you turn the corner onto the main pond loop is a paperbush. You'll then pass three young American Sycamores on your right before approaching the Viette Perennial Garden.

= approximate location of specific plants/trees highlighted in this guide

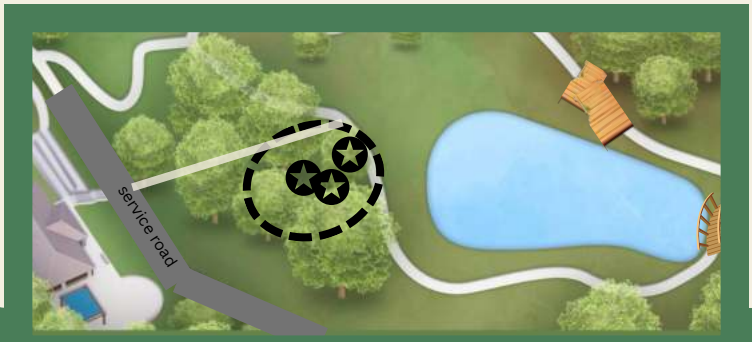
Paperbush (*Edgeworthia chrysantha*)

The paperbush has yellow-white flowers that open in February or March, but the silvery-white flower buds are visible all winter long like little holiday ornaments. If you happen to be visiting while this bush is in bloom, you are unlikely to miss the very strong sweet aroma!

Eastern Redbud (*Cercis canadensis*)

On the corner before the Viette Perennial Garden, where a steep sidewalk comes down from the education center, there is a beautiful Eastern Redbud. It is a native, deciduous, understory tree. It is a member of the legume family because of the way it produces seeds--in structures known as pods. In March or April, you will typically see the Eastern Redbud showing off its rosy pink, almost purple flowers all around its native Virginia. This particular specimen, however, is a white-flowering variety. In the summer, you will see its green heart-shaped leaves, which turn yellow in the autumn.

7. Viette Perennial Garden



To the left of the Eastern Redbud is a gingko tree, and then you'll come to a woodchipped path that winds through the Viette Perennial Garden.

= approximate location of specific plants/trees highlighted in this guide

What's Different This Month?


peony


black-eyed Susan

This garden was established with help from horticulturalist Andre Viette. It changes significantly through the seasons thanks to hydrangeas, mixed perennials, and an assortment of other ornamental trees and shrubs. In the winter, you may only see the greens and browns of the trees and shrubs, but in the spring and summer, the peonies (Paeonia), black-eyed Susans (Rudbeckia hirta), and other perennials are in bloom, making the garden an array of bright colors.

Gingko or Maidenhair Tree (Gingko biloba)

Ginkgoes are recognizable for their fan-shaped leaves, or in the winter time for their 'nubs' or spurs that protrude out of the branches. Gingkoes are native to China and are called 'living fossils' by scientists because they are perhaps one of the oldest tree species in the world. The gingko's leaves turn a vibrant yellow in autumn. When the leaves fall, they do so almost all at once. Look for two ornamental small-form ginkgoes in this garden.

Oakleaf Hydrangea (*Hydrangea quercifollia*)

Probably the most striking shrub in the garden, the oakleaf hydrangea's flowers bloom in late June or July. They start the season white, then gradually fade to purple or pink, and turn brown in the fall. Native to the southeast United States, this shrub is named after its large, leathery, oak-shaped leaves that turn strikingly red in the fall before dropping.

See our learning page about seasonal changes

Phenology: The Study of Seasonal Changes



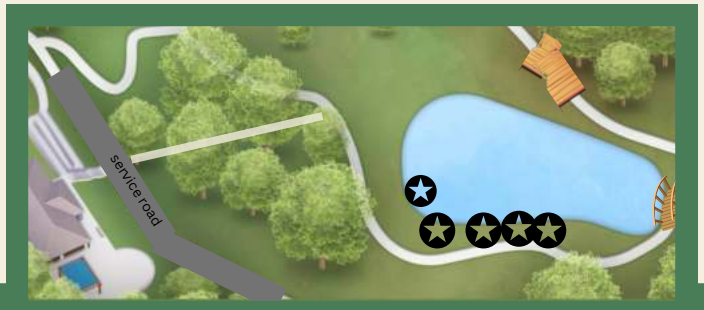

Four Seasons of Fascination

The Arboretum is a great place to visit year-round. Our staff have recently developed an interest in phenology, or studying how and when seasonal changes happen; measuring leaf budding and growth; and observing animal migration patterns. It's an awesome place to conduct some **citizen science** of your own about any of these things. What fascinates you?

We hope to offer more formal opportunities to study phenology in the future, but you don't have to wait! You can learn more at the Nature's Notebook website and get started now. Let us know what you observe!

What's "citizen science"? We're glad you asked!
Turn the page for more.

8. Plantings around Pond



The pond was constructed in the late 1980s as part of Arboretum development. As you make your way around the pond, you will notice the line of trees hovering over the edge of the pond to your left.

★ = approximate location of specific plants/trees highlighted in this guide

Pickerelweed *(Pontederia cordata)*

In and around the edge of the pond, you may spot some pickerelweed, a native aquatic plant that grows tall, blue-purple flowers in late summer to fall. It is an important late-season source of food for hummingbirds and provides good habitat for birds and pond animals.

Sweetbay Magnolia (*Magnolia virginiana*)

The first tree in the row is the sweetbay magnolia. It is a small, native tree that blooms creamy-white, bowl-shaped, fragrant flowers in the late spring, but can be identified in the off-season by smooth, gray bark. Because the sweetbay magnolia is an evergreen tree, its shiny, dark green leaves can be spotted even in the wintertime..

Japanese Maple (*Acer palmatum*)

Going down the line , the next tree is the Japanese maple, known for its spreading **crown**, or canopy. This tree's leaves emerge red in May or June, but often the leaf colors vary depending on the cultivar.

Flowering Dogwood (*Cornus florida*)

In between the two Japanese maples is the flowering dogwood, which is the Virginia state tree! This native tree is notable for having bark that looks like alligator skin. Dogwood leaves are green and ovate, but the surprise comes in its flowers.

They aren't white with four petals--those are actually bracts, modified leaves. Botanically, the flowers are actually the tiny yellow structures (petals and all!) in the center of the bracts.

See our learning page about the pond construction and renovation

Pond construction c. 1989

Since the Arboretum pond is geographically at the bottom of a big “bowl” with hills all around, it’s a good location for it--but it wasn’t naturally there. The sycamores growing nearby indicate it’s long been a moist area, though. Along with the establishment of the Arboretum, the pond was constructed.

Pond Liner Replacement 2015

Ironically, by 2015 the pond wasn’t holding water very well. The original liner needed to be replaced. In what one staff member remembers as “a party,” the pond was drained and the fish, turtles, and other resident wildlife netted and transported either to Newman Lake or a holding facility to be returned at the completion of the project. The liner was replaced and has been holding steady since. It does need occasional dredging to remove sediment from all that stormwater run-off.

9. “The Elder” sycamore

Now we’re looking at the plantings on the opposite side of the sidewalk from the pond.

= approximate location of specific plants/trees highlighted in this guide

To your right, there will be another kind of dogwood tree: the Kousa Dogwood. Just before you make the curve to the left to reach the bridge, look to your right and about 15 yards off the path. You’ll find the “Elder” American sycamore. It is over 100 feet tall, so it is fairly easy to spot.

Kousa Dogwood (*Cornus kousa*)

Kousa dogwoods are small or medium-sized trees native to East Asia with grayish-brown, exfoliating bark that appears tan-orange underneath. They have a structure similar to the North American dogwood we just observed, but their bracts are slightly yellower, their leaves slightly pointier, and their fruit is dramatically different. It looks more like a cherry than a berry, and it drops in the fall rather than persists into the winter. There are a number of Kousa dogwoods throughout the Arboretum--keep your eyes open.

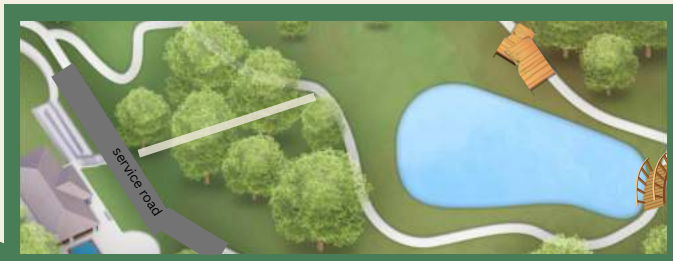
American Sycamore (*Platanus occidentalis*)

American Sycamores are native trees with scaly bark that gradually exfoliates to expose the white inner bark the further up the tree that you look. This is a natural process and doesn’t indicate a problem. Their large leaves look somewhat like maple leaves but are broader. The seedballs look, at a distance, like yellowish-brown cherries dangling high in the branches through the winter and into the spring. Sycamores are water-loving trees and typically grow in bottomlands where water collects or near streams and rivers.

“The Elder” Sycamore

This particular tree is the second biggest tree by circumference in the Arboretum. We call it the “Elder” sycamore because it is well over 100 years old; it was growing here when Harrisonburg Normal School for Women (then Madison College and ultimately JMU) opened in 1908. Its circumference is over 12 feet, and its diameter is 47 inches.

10. Pond Bridge



Besides its essential stormwater detention function, our pond is fundamental to the Arboretum ecosystem. It supports many animals directly, and its ripple effects are felt well into the woods.

What's Swimming in the Pond?

Japanese Koi (*Cyprinus rubrofuscus)* are large, colorful carp. Koi were introduced here in the 1990s and are often featured in garden ponds. As part of the Arboretum's turn toward native species, we don't intend to replace them as they disappear. Few remain.

Bluegill (*Lepomis macrochirus*)

From the pond bridge, look down carefully. You'll likely find these small, thin, native fish that can usually be spotted beneath the bridge. They are named for the blue dot on the side of their head near their gills. They are a type of sunfish. They search for food with their eyes and are likely to come over when you arrive.

Other critters that you may spot in and around the pond are red-eared sliders *(Trachemys scripta elegans),* which are semiaquatic turtles; American bullfrogs *(Lithobates catesbeianus)* and their tadpoles; and mallards *(Anas platyrhynchos)*, the most widespread duck in North America. In turn, the presence of pond life attracts water-loving predators such as the great blue heron and the green heron.

The herons aren't the only birds around. Visitors to the Arboretum have identified over 150 species of birds on ebird.org, where we are a designated birding hotspot. Check it out and add your own observations!

See our learning page about our birds

Birds at the Arboretum

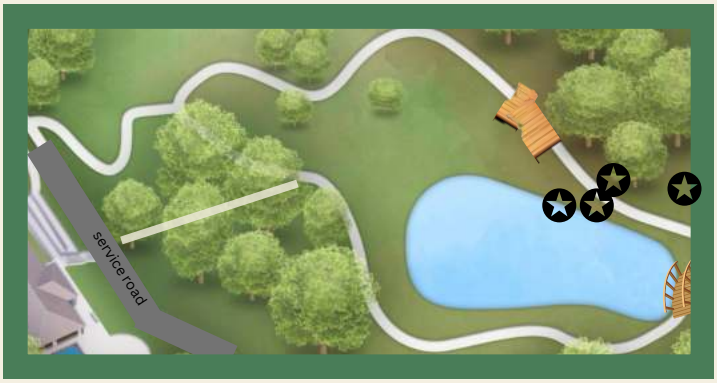
Permanent and Stop-over Habitat for Many Birds

The Arboretum has many year-round feathered residents, but it also is a location on the important Atlantic Flyway--the general path birds take along the East Coast to migrate each year. Our trees, shrubs, perennials, and water make us a great place to stop for a few days or weeks on the long trip south or north. Stop-over greenspaces like the Arboretum enable these birds to survive their journey.

We invite you to Ebird with us!

The beautiful sights and sounds of our feathered friends have encouraged many people to use the Arboretum as their birding hotspot of choice. Check out their lists of 157 finds on the citizen science website Ebird to see who has been seen lately, what birds you might expect at a certain time of year, and what surprises are out there!

11. Pond Patio



The stone patio was constructed in 2023 to rectify issues in the previous pond edge design when it comes to flash flooding. It has the added benefit of enabling visitors to get closer to the water for reflection and relaxation.

= approximate location of specific plants/trees highlighted in this guide

Star Magnolia (*Magnolia stellata*)

Once you exit the bridge, don't take the stairs. Instead, follow the sidewalk as it curves to the left. Look for the star magnolia tree to your right. It is recognizable in the winter "off-season" for its large, fuzzy buds. In the spring and summer, you might smell and see the star magnolia's large white flowers from a distance.

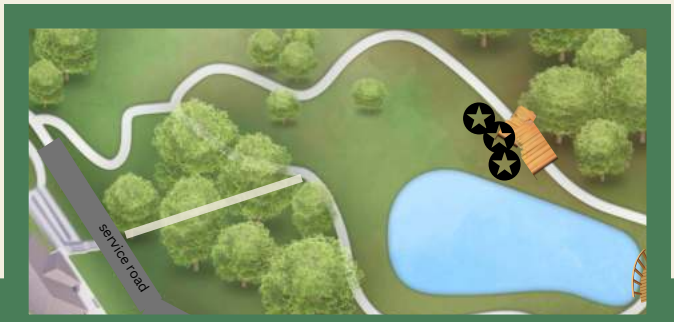
More Familiar Friends to Spot

Just past the star magnolia, do you see any more American Sycamores? Right before you reach the tree whose leaves 'weep' into the surface of the pond, you scan spot two of them--one on the left and one on the right. You may also notice another sweetbay magnolia, too!

Golden Weeping Willow (*Salix alba 'Tristis'*)

This striking tree, a variety of the white willow, is a star of the pond area with its broad canopy of graceful golden, weeping branches. Its branches droop down all year round, but this tree is named for its yellow twigs. Its leaves are spirally arranged, narrow, and long with finely serrated edges that sweep the ground and the surface of the pond. The mallards in particular seem to enjoy hanging out in the shade and cover the branches provide.

12. Wetland Boardwalk



Just past the weeping willow, you will reach the wetland boardwalk.

= approximate location of specific plants/trees highlighted in this guide

A wetland is a distinct ecosystem prone to occasional flooding, resulting in predominantly aquatic or semiaquatic vegetation that thrives in the wet soil. You'll find water-loving trees, shrubs, and smaller plants here that we don't have elsewhere.

Lizard's Tail (*Saururus cernuss)*

In the summer, you may notice the Lizard's Tail, a tall, upright perennial with seemingly hairy flowers that curl towards the top. In the fall, these flower stalks turn brown. The plant dies back for the winter and reappears in the spring.

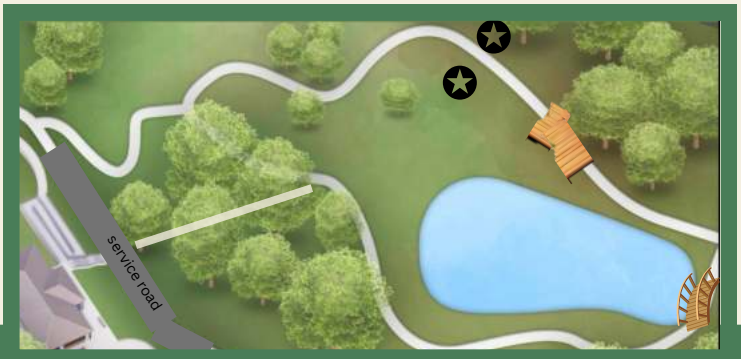
Baldcypress (*Taxodium distichum)*

Trees like the baldcypress have a symbiotic relationship with wetland environments. During flooding epidosdes, the baldcypress's roots soak up the water to mitigate the spread of floods. The baldcypress is recognizable for its massive trunk that is strongly buttressed into the ground and for its 'knees,' or the roots that protrude upward out of the soil. Scientists are still theorizing why the trees have these knees. Their best guess is that they are an adaptation to help them survive wet conditions. In winter, you may see the branchlets on the ground beneath the tree--it is a deciduous conifer with its needles spirally arranged along the branchlet, giving it a feathery look.

Horsetail Rush (*Equisetum)*

This plant is another "living fossil" because this genus existed in the Jurassic period. It is a botanical relative of ferns and reproduces by spores rather than producing seeds. The stems are rough and coated in a substance that made them useful for scouring pans in an earlier age, so they are sometimes called "scouring rush."

13. Monarch Waystation



Past the wetland boardwalk, you approach the Monarch Waystation on your right, and a second wetland cell featuring an American beech tree on the left.

= approximate location of specific plants/trees highlighted in this guide

Monarch Waystation

The Monarch Waystation is a registered habitat with Monarch Watch that provides essential food and shelter resources for monarch butterflies as they migrate across the United States to Mexico. The Monarch Waystation is designed as a pollinator garden featuring various milkweek species (*Asclepias)* and other flowering plants for nectar sources for the adult butterflies. This garden offers shelter supporting not only monarchs but also other butterfly species and their larvae.

A Space in Flux

This garden is a space in flux and shows how habitats change over time. The tree canopy around this area has grown up since the waystation was planted, so now it is a shadier location than the plants prefer. Other more aggressive plants (like cup plant) have also spread to this area, and many of the original plantings are therefore not thriving. Rehabilitation efforts, including a potential relocation of the garden to a sunnier spot, are being considered by Arboretum staff.

American Beech (*Fagus grandifolia)*

You can see the American Beech's leaves year-round because it is a **marcescent** tree, meaning its dry leaves from autumn cling to its branches throughout the winter. Young oak trees also often have this feature, though it is more pronounced on the beech. The beech is a native tree with a short, smooth trunk and a spreading crown of branches and leaves.

See our learning page about pollinators

Pollination Matters

To be able to reproduce, flowering plants need to be pollinated. The material needed to create seeds is found in the pollen. In general, pollen from one plant's flower has to find its way into the flower of another of that kind of plant. Then the plant can set seed and produce whatever vehicle it makes for getting those seeds out into the world.

What are pollinators?

Pollinators are animals (usually insects, but also birds and non-insect invertebrates, and more) who transfer pollen from one plant to another as they go about their business of survival.

For instance, as a bee visits a flower in search of nectar to eat, it inadvertently picks up the grains of pollen on its body. As it visits the next flower, it transfers that pollen to the next flower. A bee is a pollinator!

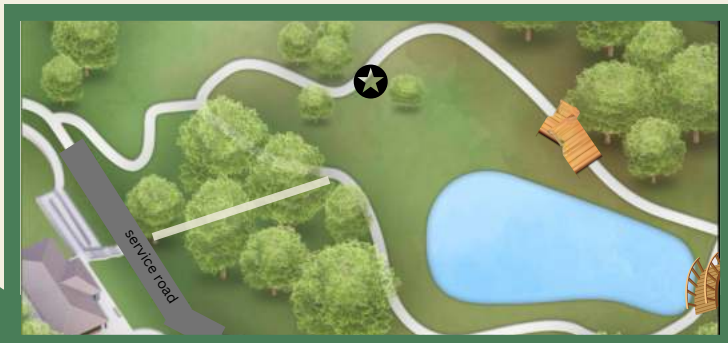
Made for Each Other....

Different shapes, sizes, scents, and colors of flowers attract different kinds of pollinators who are specially adapted to be able to reach the nectar of each. Native pollinators have developed alongside native plants, so they are particularly well-suited to the others' needs!

Who cares?

At least 30% of the food we enjoy and 80% of the world's plants require pollinators. Pollinators keep the world running.

14. Stormwater Function



As you make your way around the backside of the pond, take a look around you. What do you notice about the shape of the arboretum, or specifically where you are “planted”?

= approximate location

No matter where you look, you’ll notice that where you are standing, as well as the pond, is located in the center of what looks like a giant bowl--which is basically what the Arboretum is. This area was engineered as a flood control basin. It drains over 800 acres of developed area both of the city of Harrisonburg and JMU’s campus. It sits upstream of JMU’s main campus.

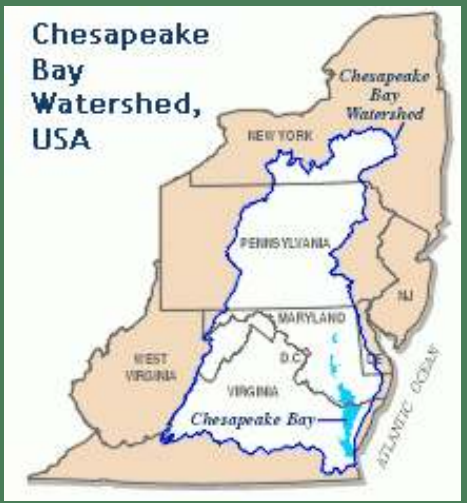
Absorbing, Intercepting, and Delaying Floodwater

The Arboretum’s trees and plants intercept and absorb approximately 825,000 gallons of rain and storm runoff a year. Having this space as a stormwater management strategy mitigates the impact of high-volume rain events on the main campus. The Arboretum is designed to flood so that the rest of the campus and its many buildings do *not* flood.

Purifying the Water, Too

The Arboretum’s trees and plants also serve as a pollution filter. Their roots remove many tons of excess phosphorus and other pollutants from the water as it enters the groundwater supply and as it moves downstream on the surface.

Connecting the Valley to the Chesapeake Bay



Map from usgs.gov

All that water ultimately flows to the largest estuary in the United States, the Chesapeake Bay. The Arboretum watershed--and what we do with it--directly links JMU and the Shenandoah Valley to the ecological and commercial health of the entire mid-Atlantic region.

See our learning page about the Arboretum’s stormwater functions

The Arboretum as a Stormwater Management Facility

Pervious vs. Impervious Surfaces

Can rain water easily soak into or through it? If not, it's an **impervious** surface--and the water will run-off. Whether it's compacted soil, roads, or building materials, much developed land has an impervious surface. This leads to significant run-off which carries pollution (sediment, chemicals, trash, etc.) with it.

The Arboretum's trees and plants soak up an estimated 825,000 gallons of stormwater run-off annually; but when the rainfall is too heavy even for the trees, flash flooding temporarily takes over the entire lawn basin. The plants growing in this area must be able to handle occasional flooding. This picture is from a rain event in May 2024. This part of the city received 3" of rain in one hour.

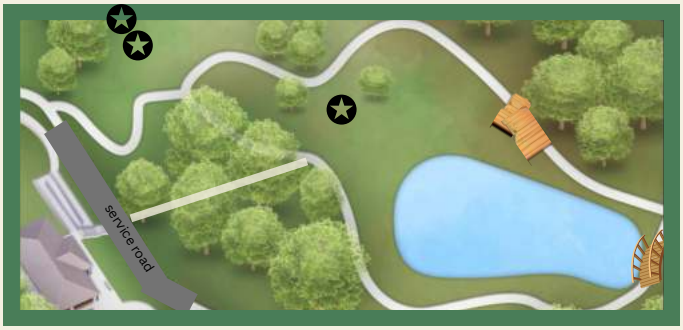
JMU's Stormwater Management

JMU's Stormwater Management website explains all of our campus's water management efforts and Best Management's Practices.

What about where I live?

You can see where the water flows where you live (your "watershed address") in this fascinating web animation.

15. A Last Look



Before going much farther, take a look at the American sweetgum near the edge of the stream in the lawn toward the pond. Then as you near the end of this tour, look up towards where you first entered the lawn at the looming evergreen trees--in this mix are Eastern White Pines and Arborvitaes.

= approximate location of specific plants/trees highlighted in this guide

American Sweetgum (*Liquidambar styraciflua*)

There is a reason that this is planted at the edge of the lawn and not near the walkway. The deciduous American sweetgum produces hard, globose fruit that is covered in spines to protect the seeds inside from being eaten. They fall from the tree, and the spikes do not feel good on the bottom of your feet! The star-shaped leaves are strikingly beautiful shades of orange and yellow in the fall.

Eastern White Pine (*Pinus Strobus*)

Eastern white pines are the large pines on the hillside over the far side of the stream, above the kiosk where you began the tour. They are native evergreen trees that grow pinecones in the spring and drop these pinecones in the fall around two years later. Its needles grow in clusters of five along the sides of its branches. The needles are thin and blue-green, and shed in the fall around two years after sprouting.

Arborvitae (*Thuja occidentalis*)

Closer to the Jurney Stage Garden are the arborvitae. They are significantly smaller than the white pines but are still native, evergreen, coniferous trees. Unlike the white pine, the arborvitae have more scale-like, laterally compressed leaves that extend outwards amongst the branchlets.

See our learning page about citizen science

What is Citizen Science?

At its core, citizen science is when the general public gets involved in scientific activities. Observations, monitoring, research, and reporting of data are all citizen science activities. It is also called community science or crowd science.

What Good Does It Do?

It's not that citizen science can be "anything," but there are a wide variety of activities possible. Citizen science harnesses the power of the crowd--many people making observations or contributing data outpaces what professional scientists can ever hope to accomplish. While citizen science data is usually not research-grade "hard" data, it does provide opportunities for scientists to notice patterns or anomalies to investigate. It encourages the public to be curious and engaged in the natural world.

What's Going On Here at the Arboretum?

Many people already participate in citizen science at the Arboretum through the use of the iNaturalist, eBird, and Merlin apps, and we hope to develop more projects in the future.

For instance, just in the Arboretum:
3,174 people have reported

observations of animals, plants, insects and fungi

of over 1,000 different species on iNaturalist!
That's a lot of eyes on our natural world.

How can I get involved?

You can download a free observation app like iNaturalist or eBird anytime.

You can also look online for specific projects going on all over the country.

Stay connected with the Arboretum's website or newsletter to stay informed about any programs or projects we sponsor.

Thank you for visiting the Edith J. Carrier Arboretum!

There's Still More to Discover!

As you make your way back towards the Frances Plecker Education Center, be sure to stop in and ask any questions that you may have pertaining to the Arboretum: our staff is always more than willing to chat! The Education Center is open Monday - Friday from 8:00 a.m. to 4:00 p.m., but the grounds and trails are open every day, 365 days a year, from dawn to dusk.

We invite you to explore the rest of the Arboretum with your newly learned botanical knowledge and see if you can spot any trees, shrubs, or flowers that we discussed. Enjoy your visit!

Other Features at the Arboretum to Check Out

- At Home in the Woods Family Garden
- StoryWalk and John Clayton Trail
- Wheeldon Rhododendron Garden
- Wood Wildflower Garden in spring
- Meditative Labyrinth, Native Shade Garden, and Black Squirrel Stumpery in the Upper Arboretum

Even more resources about plant and animal identification, classes and events, and ways to get involved at the Arboretum can be found on our website.

Please Join our Community of Supporters!

We invite you to show your support for the Arboretum by becoming a **Friend of the Arboretum Member**. We have a variety of membership levels, each with their own particular benefits. You can find more information and become a member here.