



MONMOUTH COUNTY PARK SYSTEM GREEN HERITAGE

The Newsletter of Monmouth County's Open Space, Parks & Recreation Agency

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2021: PARKS & THE PANDEMIC, YEAR II

Lisa Bonelli, Asst. Public Information Officer

As 2021 draws to a close, we note that year two of the COVID-19 pandemic presented an evolving set of challenges. On one hand, the more transmissible Delta variant emerged, and on the other, prevention strategies such as distancing, masks and vaccines were having an overall positive effect. This back and forth continued to affect the choices we made about where to go and who to see, and ultimately how visitors experienced the parks.

Last year certainly *felt* different than 2020. For one thing, the shock of the pandemic began to wear off and some calmness returned as we learned more about the virus and the effectiveness of safety measures. Regular activities resumed, venues started re-opening and our lives began to look more normal again. Yet many people had a lingering sense of caution, that only lifted gradually as the year went on.

Parks & Golf Courses Remain Unusually Busy

Park System attendance remained well-above average throughout 2021. A number of people were still working from home and most children had not yet returned to school, which may have provided a more flexible schedule to recreate. Plus, all those new park visitors who first discovered the benefits of spending time outdoors during the pandemic kept on visiting.

Operations staff continued with heightened sanitation measures and some new restrictions created by demand. Due to heavy visitation in some of our most popular parks (more cars than parking spots) staff occasionally had to shut the gates and redirect people to other parks nearby. Prime tee-times at the golf courses were also hard to come by, especially at Hominy Hill which was also undergoing renovation.



The busy starter area at **Hominy Hill** last spring.

On the upside, we introduced new visitors to cross-country skiing (and snow-shoeing) during last winter's copious snowfall. We marveled at the large spring crowds and steady stream of heavy weekday visitation (often just as busy as weekends). During summer, beach lovers, anglers and boaters queued up at our waterfront parks by day, while families came out to enjoy sunset nature programs and concerts at night. Summer camps were incredibly popular with most selling out quickly. Throughout all the seasons, we noticed an uptick in visitors walking their dogs as well as more trail users.



Ski and snowshoe rentals were incredibly popular at **Thompson Park**, while the sled hill at **Holmdel** drew the usual large crowds in 2021.



Spring in general, and spring break in particular, attracted record crowds to **Holmdel Park** and **Longstreet Farm** in 2021.

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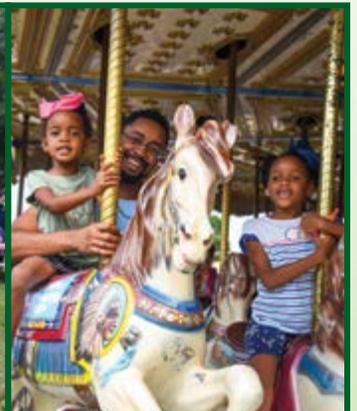
Summertime was peak season on the trails, in camps, at concerts, in programs and waterfront activities of every kind.

Early in the year, there was some tentativeness about being in groups—even outside—and about resuming large-scale outdoor events. However, with careful planning, some scaling back (e.g. reservations for the Sprayground), the Park System was able to hold most of its regularly scheduled outdoor offerings in 2021, including the Monmouth County Fair. By summer and fall, as most restrictions had lifted, park visitors and the public in general seemed more comfortable in large outdoor groups.



In autumn, as the kids returned to school, special event attendance ramped up, e.g. weddings, races, festivals, etc. (left) Harvest Home Festival (right) Thompson Park Day.

A socially-distanced group of friends sits outside in March. Masked attendees on a nature hike, and at the Earth Day Dune Planting in April. Our first indoor/outdoor event of 2021, the Creative Arts Festival in May, featured distance circles.



The 5-day Monmouth County Fair looked very much like previous years, even with extra cleaning protocols, social distancing and some mask wearing (up to individuals).

Indoors, A More Cautious Return to Normal

While visitors generally felt safe outdoors, there remained a lot of uncertainty about indoor gatherings of any size, such as family events, recreational activities (movie theaters, restaurants), meetings/services, exercise classes and most importantly, children's return to school in the fall. Indoors is where safeguards such as masks, distancing, restricting the number of participants for summer camps and programs, limiting shared supplies and the reporting/contact tracing of positive COVID-19 cases helped many people feel more comfortable in the parks.



Adapt and Carry On: Indoor programs and camps resumed with plenty of safeguards, some of which lifted by fall.

Park Improvements In 2021

Outdoor Fitness Court at Seven Presidents, Long Branch

The Park System's first all-season fitness court was completed alongside the Skateplex expansion in late 2020. But as part of another project, it didn't get the attention it deserved. We're featuring it here because an outdoor exercise facility like this may be especially important to people who still aren't comfortable exercising indoors.



<https://www.kompan.us/sport-fitness/cross-training>
<https://www.kompan.us/sport-fitness/street-workout>

Trail Markers & Maps, Park-wide

The Trail Marker program that began in 2020 with Shark River, Tatum and Huber Woods Parks continued in 2021 at Clayton, Hartshorne Woods, Thompson and Holmdel Park. So far, park volunteers and staff have installed thousands of new markers on park trails to help visitors find their way.

Kiosks are an important information source for park visitors (safety notices, park maps, emergency numbers, etc.). In 2021, new maps and/or kiosks were installed for the first time at Wultz Park, Freneau Woods Park, the Claypit Creek section of Hartshorne Woods Park (pictured) and four stations along the Henry Hudson Trail, North.



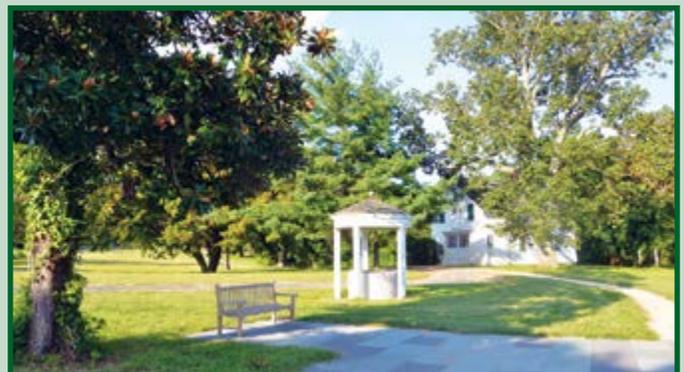
Beach Expansion at Fisherman's Cove, Manasquan

This project was completed by the state Department of Transportation in conjunction with dredging of the state navigable channels nearby. A triangular beach front area near the Activity Center was filled in using 43,000 cubic yards of high-quality sand left-over from the project. The existing beach width was expanded from 60-80' to 100-250'.



Claypit Creek Section, Hartshorne Woods Park, Middletown

Site improvements include a new access driveway and 50-car parking lot, accessible walkways and bluestone patio overlook near the water's edge, plus a 1/2 mile loop, natural surface walking path. These amenities combine to make this beautiful site more comfortable and accessible. Plus, these improvements were done in a sustainable way since the site is located on an environmentally sensitive, waterfront area.



Landscape Into Art

Gail L. Hunton, Chief Acquisition & Design

Artists have been drawn to the scenic landscapes of Monmouth County for a long time. Beginning in the early to mid-19th century, when landscape painting became fashionable, artists explored the Northeast in search of natural wonders and scenes of sublime beauty. In addition to the majestic mountains and waterfalls of upstate New York and New England, Monmouth County's light-filled coastal seascapes, woodland scenes, and pastoral fields filled artists' canvases.

Nationally known painters such as John Kensett, James Buttersworth, Childe Hassam and others painted Monmouth County landscapes, focusing on the coastal areas and the Navesink Highlands. Boosted by well-attended public exhibitions in New York and other major cities, and the widespread publication of landscape illustration in magazines, landscape art helped to popularize the area as a destination for tourists and second-home retreats.

Recent additions to the Park System's art collection have elevated our interest in Monmouth County's local landscape artists, because of their historical relationship to the land we have preserved. The focus of this article is on the work of two Colts Neck artists, William S. Bucklin and George P. Bartle. Three of their paintings were acquired because they depict woodland scenes near Thompson Park, with similar wooded character to that found along the Swimming River Reservoir.

William Savery Bucklin (1851–1928) was born in the small community of Phalanx in Colts Neck and lived most of his life there. Phalanx was short for *The North American Phalanx*, an agrarian commune founded in 1843 based on the principles of Charles Fourier that attracted many artists and writers during its short twelve-year operation. William Bucklin alternated his work as a landscape painter with assisting his father John Bucklin in the operation of the family's commercial canning business, known for their canned local tomatoes. He became one of the most accomplished artists working in Monmouth County in his time, exhibiting his work widely in prestigious institutions such as the Pennsylvania Academy of Fine Arts and the Art Institute of Chicago.

Landscape views comprised most of Bucklin's prolific output. His favorite subjects were the woodlands, streams and rural backroads of Monmouth County, particularly those near his home at Phalanx. Bucklin and his wife Anne Ashton traveled extensively to paint places as far-flung as Canada, Florida and California but the couple returned often to the farm at Phalanx, where Bucklin established a studio and saleroom in the Phalanstery.

After Bucklin died his nephew Alexander Wolcott wrote that his Uncle William "strolled happily across the map, painting desert expanses, California ranges and Florida waterfront; but his inner eye was haunted by the mild verdure of his home, and somewhere in every picture...the tall beeches of Jersey pricked up into the alien sky."



*An acknowledged master of American landscape painting, **John Frederick Kensett** is admired for his subdued almost spare seascapes that convey the qualities of coastal light on water. This 1859 painting of the Navesink River, with Rocky Point (now part of Hartshorne Woods Park) in dark profile against an expanse of pale still water, is one in a series of tranquil river views Kensett painted on a trip to this area. Courtesy of the New-York Historical Society.*



*The **Phalanstery Building in Colts Neck**, taken about 1890 when it was the home of the Bucklin family and others. The large rambling structure originally housed community functions and apartments during the life of the North American Phalanx, and was destroyed by fire in 1972.*



This autumn woodland scene, signed **W.S. Bucklin** and inscribed *Pool in the North Woods*, is an example of Bucklin's numerous studies of the beech woods near his home in Phalanx.



Through the Woods to the Village, ca. 1910-1925, refers to the village of Lincroft, not far from the former community of Phalanx and present-day Thompson Park. The back of Thompson Park today would be familiar to **Bucklin**.

Artist **George Parker Bartle (1853–1918)** was a native of Washington, D.C. where he first studied wood engraving. He became best known as a highly talented wood engraver whose illustrations were frequently published in *The Century Magazine*, one of the most popular periodicals of the day. Around 1880, Bartle moved to the Phalanx community in Colts Neck, married the daughter of William Bucklin's sister, and spent most of the rest of his life with the Bucklins. Bartle continued his work as an engraver, but later in life also devoted time to landscape painting. Bartle also served as postmaster at Phalanx from 1903-1911, and in the photograph (left) he is shown standing on the front steps of the Phalanx post office.



Artist and Postmaster George P. Bartle in a photo postcard issued about 1910. Courtesy Randall Gabrielan, Middletown, NJ.



Titled *Road at Phalanx #6*, this was apparently one of a series of impressionistic works by **Bartle** depicting the landscape around Phalanx.

Both William Bucklin and George Bartle achieved recognition for their artistic talents, and the Park System is honored to display a few of their works. Bucklin is displayed in the Thompson Park Visitor Center in Lincroft, along with several other works of art. Soon visitors will also be able to enjoy a notable collection of local landscape paintings, including Bartle, at Portland Place in Middletown. This new Park System historic site at Hartshorne Woods Park will open to the public in 2022.

¹ The biographies of William Bucklin and George Bartle were excerpted from Joseph W. Hammond, *William S. Bucklin and George P. Bartle: Accomplished Artists of Phalanx, New Jersey*, written originally for the Park System and expanded for publication in the Summer 2021 issue of *New Jersey Studies: An Interdisciplinary Journal*. For the full text see: <https://njs.libraries.rutgers.edu/index.php/njs/article/view/256/319>

More New Paintings to Appreciate

“**Ye Olde Yellow Meeting House**” is a watercolor by Isabel **Millicent Freyer** of Monroe Township now on display at the Thompson Park Visitor Center. It was commissioned by Ray and Nadine Gravatt of Upper Freehold in the late 1980s because the couple loved the building so much. Built in the early 18th century as a Baptist church, it is the only remaining example of an early traditional meeting house in Monmouth County. After many years of disrepair, the Friends of the Old Yellow Meeting House began restoring the building to its former glory in 1977, eventually joining forces with the Park System which acquired the property in 2019 to ensure its maintenance and care.



“Reflections on the Natural World in Unnatural Times,”

by **Nancie Gunkelman**, is a mixed media, abstract painting featuring a variety of colors, shapes and textures. About this painting, Gunkelman was quoted as saying, “During this last year, I have missed the freedom of communing with nature, an important source of inspiration. Bombarded by so many weighty issues, including the pandemic, political turmoil, social isolation, economic uncertainty, climate change, I turn to art to express the emotional toll, and hopefully find solace.” The painting is on display at the Thompson Park Creative Arts Center.



Deep Cut Gardens Home Gardener

152 Red Hill Road
Middletown, NJ 07748

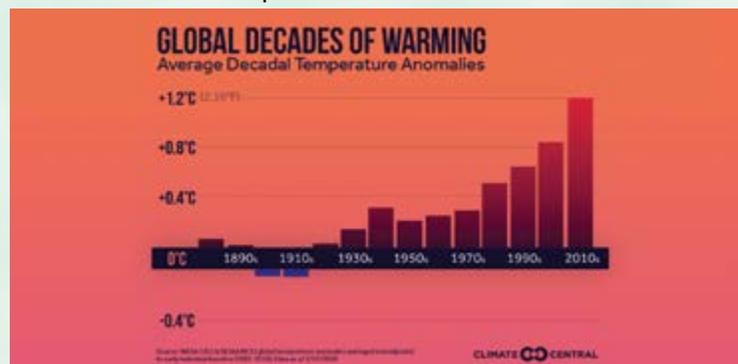
GS Parkway Exit 114, to Red Hill Road
732-671-6050

Gardening with Climate Change

Kate B. Lepis, Ph.D. Horticulturist

Gardening can be one of the most rewarding activities. There is something powerful about growing a plant from seed, nurturing it to maturity, and feasting on the bounty. Even if your passion is growing ornamentals, it is equally rewarding to watch the garden bed transform itself from a quiet bare spot in February to an overflowing, buzzing display of blooms and insects by July.

Some years when the garden struggles it is up to the gardener to figure out why. Has the soil been too wet or too dry? Was it too hot or too cold? Perhaps these plants need more sun or the protection of shade. Those less than stellar years are what make the bountiful seasons much more rewarding. Gardening is a challenge, and we may find that in the years and decades to come those challenges will intensify. As the climate shifts to some new norm, our ability to rely on timing and methodologies developed in the past may no longer be useful. The gardener's challenge today is to deal with seasons that reflect less and less the historical climatic patterns.

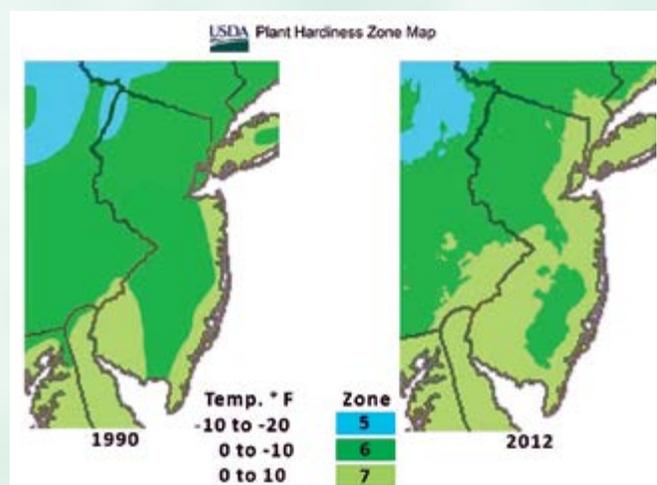


This graph shows the average global temperatures for each decade since 1880. The 0°C line (horizontal purple bar) is the average global temperature for 1881-1910; early in the Industrial Revolution and a baseline for which to compare all other decades. Maroon bars show decades that are warmer than 1881-1910 reference; blue bars show decades that were cooler. Reprinted with permission by Climate Central. (www.climatecentral.org/what-we-do/legal#content_licensing)

Garden Change Has Already Occurred

Many online plant retailers sell products all over the country. When trying to buy plants online, how do you know what you're buying can do well here in New Jersey or is better suited for a milder climate such as South Carolina? You look at the plant's winter hardiness zones.

The USDA established hardiness zones based on the coldest average temperatures expected for any given region. If you have been gardening long enough you may have a reference book in your collection with the USDA Hardiness Zone Map published in 1990¹ or perhaps 1965². Both depict NJ as a predominantly Zone 6 state, with the northwestern corner as Zone 5, and the coastal areas Zone 7.



USDA Zone Map of NJ, 1990 vs. 2012. If a plant can survive in Zone 5, it can withstand winter temperatures that dip to -10 to -20° F, in Zone 6 between -10 and 0° F, and Zone 7 from 0 to 10° F.

When you compare older maps to the more recent USDA Zone Map updated in 2012³, you see the zones have shifted northward. The warmer Zone 7 now covers a larger area of the NJ and the colder Zone 5 has disappeared altogether. This shift is not necessarily the new resting place for our state's climate either. By the end of this century, it's been predicted NJ will warm further with Zone 7 to the north and Zone 8 to the south.⁴

Plants have the ability to exist in a range of temperature zones. **Snow crocus**, one of our first spring flowers, can be grown in Zones 3-8. Many of our bedding annuals in NJ are not really annuals at all. They are perennial in warmer climates but die here with the coming of frost.



Snow crocus (*Crocus tommasinianus*) pops up in March at Deep Cut Garden.

Coleus, a favorite bedding plant used for its beautiful foliage, needs to be purchased new every spring (or wintered inside) because it can only survive winter temperatures found in much warmer Zones 10-11. **Corkscrew vine** is a tropical that usually grows in Zones 9-11 and needs to be wintered inside, but makes a whimsical addition to a local garden.



Red and Gold Coleus
(*Plectranthus scutellarioides*)
growing with sweet alyssum
(*Lobularia maritima*) in the All
America Garden.



Corkscrew vine
(*Cochliasanthus Caracalla*)
can also be found in Deep
Cut's All America Garden in
warm weather.

Plant-Insect Specific Impacts of Climate Change

There are plants that historically could not survive NJ winters that gardeners can now enjoy. Crape myrtle is a great example. With its striking flower clusters in red, pink and magenta, it is no wonder why you see this small tree growing in many yards across Monmouth County. While there are varieties that can handle Zone 6, most grow in Zones 7-10. For most of the 20th century only those who lived in milder coastal towns in our state could enjoy crape myrtle without experiencing regular winter die back. Today, with more of the state in Zone 7, you see these trees used widely in the area.



Crape Myrtl
(*Lagerstroemia indica*)

As the state's climate warms, the gardener can also expect to deal with new disease and pests that previously could not survive our winters. A warming of the coldest winter nights has allowed the Southern Pine Beetle, an aggressive tree killer, to expand its range from the southeastern U.S. into the NJ Pinelands and Long Island.⁵ Smaller than a grain of rice, its killed an average of 1000 acres of NJ pine forest each year since 2001.⁶ Gardeners can also expect pest problems that used to occur later in the season to appear earlier in the year.



Southern Pine Beetle (*Dendroctonus frontalis*) close-up. Source: E.G.Vallery via Wikicommons. Also shown embedded in pine resin.



The Role of CO₂ in Climate Change

Our atmosphere is an envelope of gas surrounding the planet, allowing life to exist. Without this layer of gas, X-ray and UV radiation from space would be so extreme that life on land would not be possible.



Earth's atmosphere, visible as the blue layer. Source:Wikicommons.

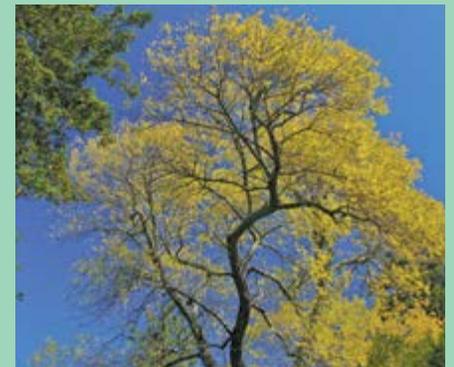
Some gasses, like carbon dioxide (CO₂) and methane (CH₄), are called "greenhouse gasses" because they trap heat on the planet.⁷ We need greenhouse gasses. They help control the Earth's temperature allowing life to flourish. The problem is that since the Industrial Revolution, society has been overloading the atmosphere with these gasses. A thicker greenhouse layer causes more heat to be trapped on Earth's surface instead of escaping into space. In essence human behavior has replaced the thin quilt surrounding the planet with a thick down comforter.

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Life on Earth Needs Balanced Carbon Exchange

Plants take in CO₂ from the atmosphere and use sunlight to combine it with water absorbed by their roots to make food (sugar). During this process, plants "exhale" oxygen (O₂). The carbon removed from the atmosphere is used to construct plant tissues. Animals also need carbon (along with other nutrients) and eat other living things to acquire them. When they eat, most of the ingested carbon is assimilated into the body and what is not needed is exhaled as CO₂.

Plants breathing in CO₂ and releasing O₂ and animals doing the opposite, is the beautiful concert that has built and maintained the atmosphere for eons.



The factors that tipped our atmosphere out of balance are two-fold. First, a massive amount of burning has taken place since the Industrial Revolution. When we burn wood it is obvious we are burning something that was recently alive, a carbon-based life form.

As the flames break the chemical bonds that hold the wood together, the carbon reacts with O₂ in the air and forms CO₂. The same happens when we burn oil, natural gas and coal. These energy sources are called fossil fuels because they developed from life that existed hundreds of millions of years ago. Second is the removal of vast areas of forest and the massive amount of carbon-based life they supported.

Overall, this has simultaneously increased the release of carbon stored underground as fossil fuels and removed life forms like trees, with their ability to take that carbon out of the atmosphere and store it within their woody tissue.

Garden Strategies for a Warming Climate

As NJ warms, gardeners may find a new suite of plants to explore, but also the need for management practices of new pests. Here are some plants that local gardeners have been growing for a while, but their ability to survive winters here without special protection is now more likely.



Hardy Fig (*Ficus acarica*)
Zone 6-9

For **Hardy Fig**, Zone 6 gardeners need to protect their trees from the coldest temperatures by wrapping in burlap and filling the winter shelter with dead leaves. Maintaining your tree in a pot (the bigger the better) is another option and sheltering in a minimally heated area like an attached garage. Without added protection plants could experience severe die back.

Zone 7 gardeners can rest a little easier, experiencing damage only in the coldest years. Provide protection against extreme winters by planting against a south facing wall. **Pansies** are typically purchased early spring for a dash of color before bedding annuals are available, but they cannot handle our summer heat and fizzle out by mid-June. Try planting pansies in the fall. This allows the root system to establish and the winter enjoyment of blooms on days in the 40s. As the weather warms, fall planted pansies will explode in growth and color outperforming those planted in spring. Watch out, the deer love them.



Garden Pansy (*Viola x wittrockiana*)
Zone 6-10

This **Dianthus** is one of several varieties developed by cross breeding *D. chinensis* and *D. barbatus*. Often sold in spring as bedding annuals, in zone 7 they survive winter temperatures and can be treated as perennials.



Dianthus (Ideal Select Hybrid)
Zone 5-9

The good news for gardeners is that the same tools and techniques that help us create a resilient landscape will simultaneously facilitate the carbon storing potential of our yards: making compost and feeding the life in soil, planting natives, and replacing lawn with trees and shrubs. Feel free to call Deep Cut with your eco-gardening questions and make sure to look for our sustainable gardening programs.

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Growing Roots in the Community

Big-hearted gardeners, artists, community members with appetite for culture and public service continue to show up and remind us of the most pure human virtue: selfless giving, generosity and kindness. This summer we received a large collection of plant materials and art supplies from Helen (Sam) Eisner, a longtime resident of Middletown NJ, and a member of the Middletown Garden Club and Sowing Circle. Mrs. Eisner was a graduate of the Art Institute of Chicago, her friend Harold says that she loved to paint, and was a passionate collector of works of art, including many of her own creations. Her artistic eye and taste for organic beauty now draw interest as part of our collection.



Repurpose Old Materials For A Happy, Functional Garden

At Deep Cut Gardens we grow more than just flowers—we are growing an ecosystem! We always try to keep a big picture perspective: to care about the health of all aspects (and inhabitants) of the gardens, and do our part to support and foster growth and prosperity. We embrace the term "eco-friendly" as we have a role to play in the protection and preservation of all our natural resources.

One way we have been successful in accomplishing this is by repurposing old garden materials to serve totally different functions. Similar to composting, where organic material is reused for soil support while saving space in the landfill, we are extending the life of as many items as possible and reducing our footprint at the same time. It's a process also referred to as "upcycling."

Wildlife conservation experts advise us to make a haven for insects, to help pollinators establish their presence in yards and garden spaces. Gardeners agree that inviting beneficial insects into the garden is a win-win, too. Many insects pollinate fruit and vegetable crops, others help with pest control and soil aeration and all of them are an integral part of the food chain. Gardens that support a diversity of native flora and fauna are resilient and more productive. Planting flowers that attract bees and butterflies is one way to provide support, but insects can't live on flowers alone. They require shelter and water as part of their essential needs.

Have you ever seen butterflies covering mud puddles? That is where they can obtain minerals as well as get a drink. Because of their anatomy, they need a shallow and still source. You can re-create this key **Pollinator Watering Source** by upcycling a pie dish. Fill the bottom with pebbles and sand, and if, like us, you enjoy artsy things, add your own decorations. The final product is a fabulous piece of garden art that functions as an essential water station for thirsty and tired insects.

A **Bug Hotel** is another opportunity to help the insects in your garden. The shelter is an essential part of survival and most necessary for procreation. Many insects, like solitary bees, need a dry, safe place for their nests. Providing a space to accommodate such needs makes things easier for insects and other wildlife. We use organic materials like straw and pine needles as well as broken clay pots, cardboard rolls, and old baskets. With a little imagination, or Deep Cut's **Hodge Podge Lodge** program (pictured), you can build your own bug hotel.

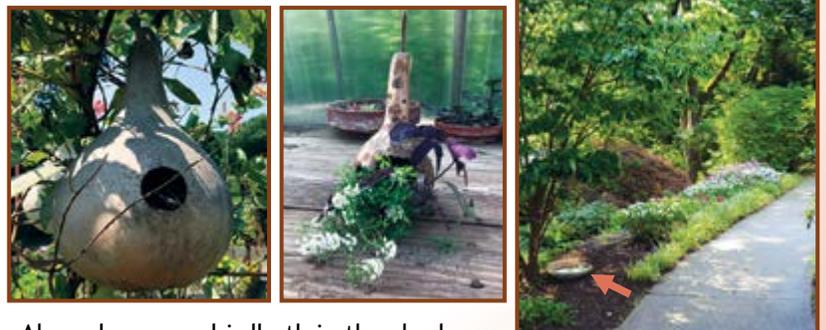
This **Gourd Birdhouse** formed when a house wren nested in the middle of our display garden this summer. After raising the new generation and leaving the gourd vacant, we turned it into a planter.

Birdbaths are a great addition to your garden landscape, but sometimes the weather and years of exposure takes its toll, creating structural damage. When the pedestal on our birdbath broke, we found the perfect new spot for the bowl, along this shady path.

When placing a birdbath always look for a nearby tree, shrub, or both. Birds and other wildlife will visit your birdbath if there is cover in the proximity. A shrub and or small tree is the perfect escape should a disturbance occur. Also, place your birdbath in the shade where visitors will be able to cool off. Finally, consider an area of the garden that is difficult to cultivate. For example, the ground under the birdbath in this photo is very compacted as it has been a part of a driveway [where is that?], so growing beautiful flowers was near impossible. Take a note from our book and adorn such areas in your yard with hardscape features instead.



Some of the creatures cared for at Deep Cut Gardens



Discovering Ferns



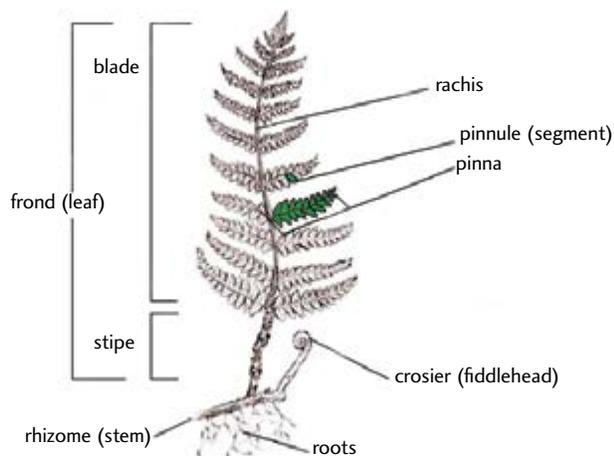
Susan Harasty, Park Naturalist

Diverse and mysterious, ferns add interesting leaf patterns and lush shades of green to any environment they are found. Usually associated with moist, warm forests, ferns are mostly found in the tropics which are home to 75% of the world's fern species. However, they also occur in a wide range of habitats including deserts, rock cliffs, fields, and even the Arctic and Antarctic. Worldwide, species counts range from 12,000-15,000 with more species still being discovered. The variety of fern species decreases as latitudes increase and as the climate becomes drier. Therefore, it is not surprising that the United States has a relatively few 360 species. New Jersey is home to approximately 80 of those.

Why Ferns Are Fascinating

Ferns are ancient. Fossil records show fern ancestors appearing 420 million years ago, predating flowering plants by about 250 million years (Note: that makes them older than the dinosaurs). They represent some of the first plants to develop a vascular system used for transferring water and food.

Ferns have their own terminology. The leaves are called fronds. Each frond consists of a stipe (lower stem), rachis (upper stem), pinna (leaflet) and pinnule (segment of leaflet).



Fern Anatomy. Source: *Native Plants for Georgia Part II: Ferns* [with minor changes] (https://secure.caes.uga.edu/extension/publications/files/pdf/B%20987-2_6.PDF)

Ferns don't have flowers and they don't produce seeds.

Reproduction is complex and can be sexual, asexual or vegetative. Sexual reproduction is by spores. Spores are produced and held in specialized cases called sporangia, which are further clustered into sori. Usually, sori are located on the underside of the frond and can be covered with protective tissue called indusium (indusia is plural).

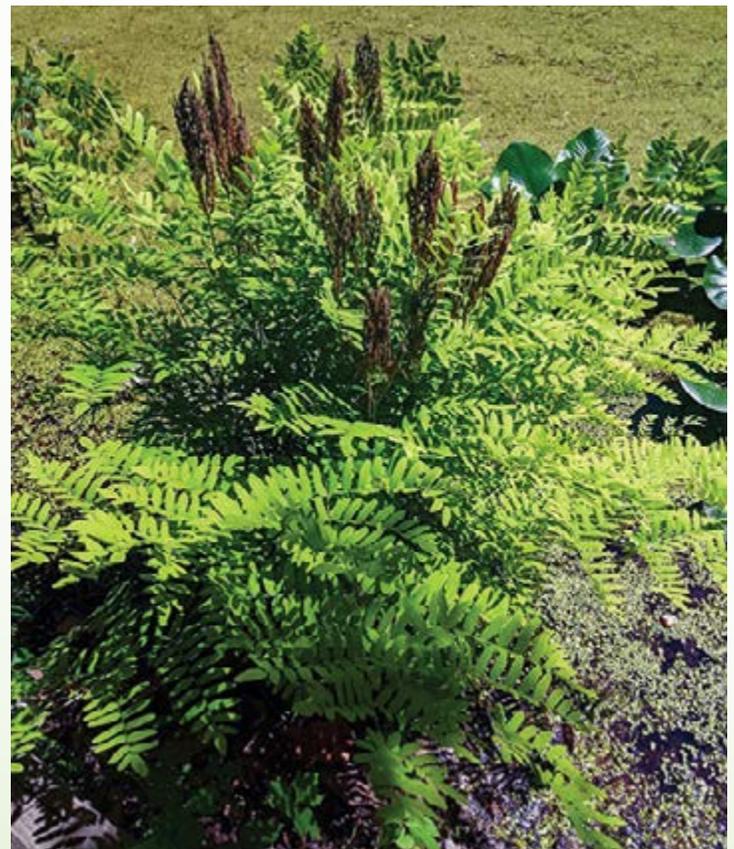
The arrangement and shape of the sori and indusia are unique to fern species and are important in their identification.



New York Fern, showing sori

When the sporangia mature, spores are released and carried by the wind. **Fertilization occurs on the substrate where the fern will grow** (not inside the parent plant, as with flowering plants). Fertilization creates sporophytes, which are tiny and seldom seen. This process is complicated and requires moisture, which perhaps it explains why ferns do not rely on sexual reproduction alone. Ferns are also exceptionally good at spreading by vegetative means such as rhizomes. Rhizomes are modified stems growing along the ground, not to be confused with roots.

Some ferns such as the Cinnamon, Royal and Ostrich fern carry spores on special frond stalks. They have two types of fronds called dimorphic fronds. Each frond looks different, one will be a fertile frond that carries the spores and the other frond is sterile.



Dimorphic fronds of Royal Fern: the brown fronds are fertile, the green fronds are sterile.

Ferns grow by unfurling from the tip. When a new fern frond emerges, usually in the spring, it unrolls from the tip forming a “fiddlehead”. This unfurling of leaves is very different from flowering plants where the leaves are folded inside a bud. Fiddleheads are sometimes called a crozier (pronounced krow-zeer). Botanically, this growth pattern is called circinate vernation.



Cinnamon Fern fiddleheads
(www.wildflower.org)

Ferns in Marginalized Environments

You may have seen ferns growing in a field, a rock crevice or even along a flooded stream bank. These ferns are colonizing marginalized or disturbed environments. Wherever they are found, their roots and rhizomes permeate the ground making the soil permeable. Insects, birds and other animals can take cover in their masses. Some birds and leaf cutter bees make use of their fronds as nesting material.

Fern Allies

Ferns are often grouped with related plants called fern allies. Historically, these include the horsetails, clubmosses, quillworts and spike mosses. However, advances in genetic information determined as recently as 2016 helped redefine these relationships. Horsetails are now considered very closely related to ferns, while clubmosses, quillworts and spike mosses are only remotely related. These later three are among the most primitive of all vascular plants.



Horse Tails (*All Scouring Rush*, *Equisetum hyemale*) & Clubmoss (*Princess-Pine*, *Dendrolycopodium obscurum*) (www.britannica.com)

Look for These Ferns in Our Parks

- **Bracken Fern** (*Pteridium aquilinum*) Large 1-5ft. Frond is broadly triangular. Grows in rows from rhizomes. Sori found in lines along frond margins. Forms large colonies in dry acidic habitat.



(gotbotany.nativeplanttrust.org)

- **Cinnamon Fern** (*Osmunda cinnamomea*) Large 2-5ft. Fertile fronds are straight and turn cinnamon color, surrounded by sterile green fronds. Clumping fern forms colonies, found in wet habitat, shade or sun.



([wikicommons, Long Valley Farm, NC](https://commons.wikimedia.org/wiki/File:Osmunda_cinnamomea.jpg))

- **Sensitive Fern** (*Onoclea sensibilis*) Medium 1-2 ft. Sterile fronds are triangular, lobed toward tip, pinnae are opposite; fertile fronds are brown with beadlike sori. Colony forming, found in wet areas, shade or sun.



- **Netted Chain Fern** (*Woodwardia areolata*) Medium 1-2 ft. Sterile fronds are glossy, dark green pinnae are alternate. Fertile fronds are erect with very narrow pinnae, chainlike sori. Colony forming, found in wet woods.



- **New York Fern** (*Thelypteris noveboracensis*) Medium 1-2 ft. Blade length tapers at both ends, lowest pinnae very small near the base of frond, yellow green. Sori are round, small. Colony forming, found in moist shady woods.



- **Hay scented Fern** (*Dennstaedtia punctilobula*) Medium 1-2.5 ft. Fronds are lacy with gland-tipped hairs, light green color. Sori found in cuplike structures at pinnae margins. Colony forming, found in partially shady to sunny woods.



- **Red Stemmed Lady Fern** (*Athyrium Filix Femina*) Medium-large 1-4 ft. Delicate fronds with minutely toothed pinnules and a smooth stalk. Stipe is very red in some forms. Sori are horseshoe shaped. Found in moist to dry woods.





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PARKS SCENES FROM 2021 - THE YEAR IN REVIEW

Snow Busy-ness, Spring Emerges Popular, Summer Soars, Fall Fishing & Events



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