



MONMOUTH COUNTY PARK SYSTEM

# GREEN HERITAGE

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

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## RUN. (thru the) FOREST. RUN!

**T**he Cross Country Trail at Holmdel Park is widely considered to be one of the best outdoor running courses of its kind on the East Coast; it is also nationally recognized. Known for its challenging, hilly terrain; consistently well-maintained trail conditions and facilities; and accommodating staff, Holmdel Park has hosted countless local, regional and national cross-country races, including NJ's annual high school sectionals and Meet of Champions, every year since the mid-1970s.

Over the past 40 years, interest in cross-country running has exploded, possibly buoyed by the growing popularity of marathons or maybe as an antidote to the increasing amount of time spent sitting indoors. Holmdel Park now regularly attracts crowds of up to 15,000 for its larger meets. These events are so well-attended that spectators must park off site and

take shuttle busses into the park, because parking lots can no longer handle the volume of traffic. This is no surprise because cross-country meets are held in the fall, when there's no prettier place you can be than Holmdel Park.



The course at Holmdel is designed so that spectators and coaches can watch the race at the start and finish, and at sites along the route.



Comfortable, well-managed facilities make race day a fun day for crowds of spectators and participants.



Holmdel Park hosts many, large NJ high school meets each fall. There's a lot of anticipation at the start of the race and before runners break away from the pack.



Continued...

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were just part of our commitment to take ownership when a project was undertaken on our property; to see that it's well-done. Over the years, Holmdel Park has continued to enjoy a rewarding relationship with athletes, coaches and spectators alike, even as the sport has grown beyond what anyone could have expected, earning praise as a "top notch" organization to work with by coaches like Bill.



NJSIAA Director Bill Bruno (left) and Holmdel Park Senior Manager Ken Olsen (right) talk over the day's lineup after laying chalk and roping off an area for the starting line. "Cross-country running is a such a simple way to enjoy the outdoors, the whole family can participate and there's almost no equipment needed to have a great time," says Ken.

## Holmdel Earned Its Reputation

According to NJ State Interscholastic Athletic Association (NJSIAA)\* Director Bill Bruno, Holmdel Park has an attractive and challenging course that's memorable and spectator friendly, with park staff who have always been helpful.

From the very beginning in the 1970s, park staff worked closely with local schools and coaches to develop the cross-country courses at Holmdel. Park Rangers did the trail work themselves, says Bill, who was an assistant coach for Christian Brothers Academy (CBA) at the time. They helped design the courses to meet standards for distance and layout, and maintained the course surfaces over time by grading and resurfacing or installing water bars (to reroute runoff from the hills), as needed. For the races themselves, Park Rangers schedule and staff the events, coordinate parking, ensure visitor safety, and clean up afterwards. It's clear this has been a real partnership all along.

According to the Park Manager in charge of Holmdel Park when the current trail was first developed (Dave Compton, who later went on to become Superintendent of Parks and is now retired), these efforts

Trail surfacing has been adjusted for cross-country: the gravel shown in this stretch is less muddy and better for screening and traction than our first choice (wood chips). Note the two water bars, installed to route rainwater off the trails.

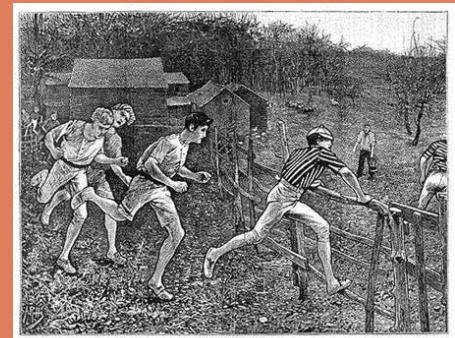


Early on, the cross country trail ran through the lower sections of park (inconveniently crossing roads and walking paths, disrupting daily use of the park). Today the trail runs mostly through upper portions of the park with no road crossings. Pictured: the first uphill stretch at **Forest Edge**, 2017 and 1979.



## THE ORIGINS OF CROSS-COUNTRY

In the 1830s, English schoolboys developed a game called 'Hares and Hounds,' (pictured) reportedly to mimic their father's sport of hunting. Hares would run about 10 minutes ahead, leaving a trail of shredded paper (their "scent") through woods and hills for the hounds to follow. A group of Londoners then took up the game as a way to stay in shape and adopted the name Harriers, establishing a national championship on December 7, 1867, held on Wimbledon Common in south-west London. The race was about 3.5 miles long, and went through boggy and hilly terrain.



[www.harrier.net/presskit/shistory.html](http://www.harrier.net/presskit/shistory.html)

Today every state in the US offers cross-country as a high school sport for boys and girls. Almost half a million high school students compete in cross-country each year, making it the sixth-most popular sport for girls, and seventh most popular for boys.

# What Makes Holmdel So Great?

From a coaching perspective, the layout of the course at Holmdel is special; it requires real strategy and competitors know they have to bring their "A game," says Bill. Runners agree. What makes this course so enjoyable and memorable is the topography, says former CBA cross-country runner Matt Coleman, who currently works as an Asst. Superintendent of Parks.

Right from the start, runners tackle an incline followed by a series of roller coaster hills as they enter the forest. Then there's the infamous "bowl," where runners are challenged to keep pace on a loop with a notorious incline at the end. The race finishes downhill for the last  $\frac{1}{2}$  mile, followed by a dramatic exit from the forest, and one last incline in the approach to the long stretch to the finish line.

"This course is going to challenge every kind of runner," says Matt, "whether their strength is uphill or downhill—it's fair to all talents." To this day, Holmdel remains one of his favorite running sites; partly for nostalgia, but also because even after decades have passed, he is still able to complete the 5K course in a decent time.

## For the Everyday Runner

You don't have to be a competitive runner to test yourself on the hills of the cross-country course at Holmdel, although some experience running outdoor terrain will help. Here's what to expect—generally—if you run this or any other cross-country course:

- At Holmdel, there's a 5K course (high school) and 7K course (college), but distance can vary from 4K-12K. The trail is usually wide enough to allow passing, and turns are smooth and wide.
- Terrain varies, from grassy fields to dirt or gravel surface, passing through woodlands, and possibly crossing water bodies; includes running both up and down hills.
- Courses may have one or more loops, with a long straight at the start (to minimize congestion) and leading to the finish line (so people can watch and time).
- If there are obstacles like tree roots, rocks, sandy soil, etc. they allow for continuous running. They do not require runners to stop and climb over barriers or through ditches etc.
- There are minimal roads or paved, concrete paths.

The course at Holmdel Park meets all these requirements plus, it has one very novel and distinguishing challenge...

## Let's Talk About "The Bowl"

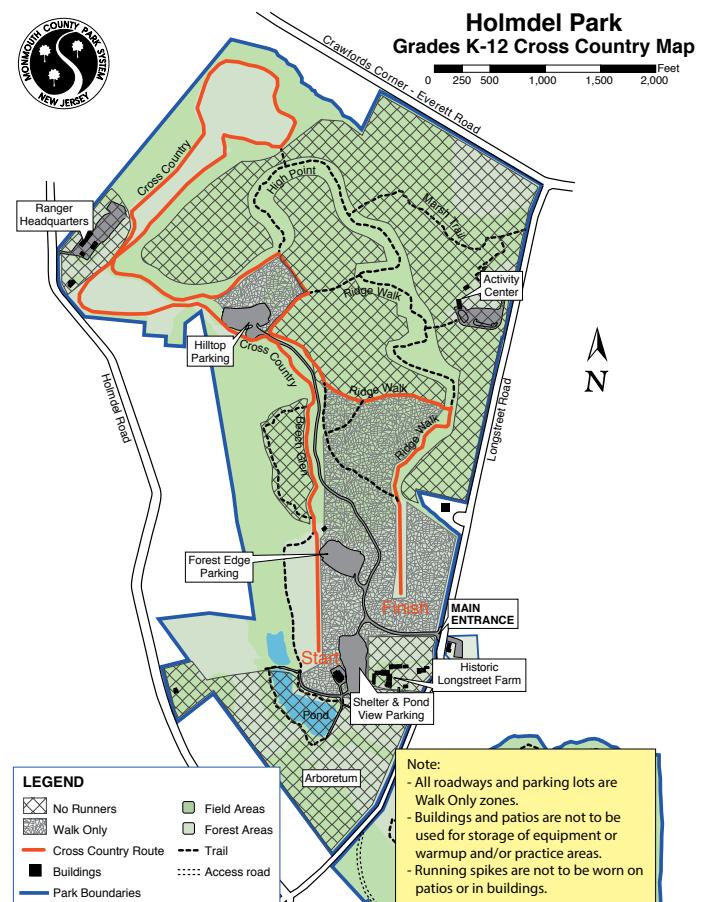
Possibly the most memorable feature for any runner who has tackled Holmdel in competition is "the bowl." Strategically located between miles 1 and 2 of the 3.1 mile (5K) course, this loop has a long straight downward lead-in to a gentle curve, and a long straight upward lead-out terminating in a significant incline just at the end that's a real burn for the weary runner.

If you plan to run the Holmdel cross-country course for exercise, or just for the experience keep in mind there's another challenge in the first big climb at Forest Edge (pictured top left, previous page). Though it doesn't have a clever name, it's still a substantial incline and maybe isn't mentioned as often only because its at the beginning of the race when winners aren't yet as tired.

\*NJSIAA is a voluntary, non-profit organization that oversees varsity championships for 31 sports, including cross-country, for the 433 accredited public, private and non-public high schools in the state of NJ. ([www.njsiaa.org](http://www.njsiaa.org))

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Cross Country Running. [https://en.wikipedia.org/wiki/Cross\\_country\\_running](https://en.wikipedia.org/wiki/Cross_country_running) NCAA Cross Country Track & Field 2015-2016 Rules. [www.ncaapublications.com/p-4360-2015-2016-cross-country-and-track-and-field-rules.aspx](http://www.ncaapublications.com/p-4360-2015-2016-cross-country-and-track-and-field-rules.aspx) IAAF Competition Rules, 2010-2011. [http://web.archive.org/web/20101217151957/http://www.iaaf.org/mm/Document/AboutIAAF/Publications/05/47/80/20091027085725\\_httppostedfile\\_CompRules-BAT\\_17164.pdf](http://web.archive.org/web/20101217151957/http://www.iaaf.org/mm/Document/AboutIAAF/Publications/05/47/80/20091027085725_httppostedfile_CompRules-BAT_17164.pdf) [www.milesplit.com/articles/195626/sub4-what-is-the-hardest-xc-course-in-the-nation-part-2](http://www.milesplit.com/articles/195626/sub4-what-is-the-hardest-xc-course-in-the-nation-part-2)



Holmdel Park maps are available online ([www.monmouthcountyparks.com](http://www.monmouthcountyparks.com)). The boy's high school record for the 5K course (shown here) is 14:53, set in 2006 by Ed Cheserek of Colts Neck HS. The girl's record of 17:28 was set in 2010 by Meagan Venables of Highland Regional. Any runner with a time under 16:00 would be considered elite, around 18:00 is exceptional, and anywhere near 20:00 is still excellent.



Approaching the final incline at the end of the bowl.

# Open Spaces, Livable Places News

## NEW PARKS NEAR YOU? THEY MAY BE FUNDED BY THE COUNTY'S OPEN SPACE GRANT PROGRAM

Now celebrating 15 years, this program starts each new year in June by mailing grant applications to all the towns in Monmouth County. The county will then award grants for local projects to acquire land or develop parks/recreational facilities. Since the program first started in 2003, 203 matching grants worth \$30 million have been awarded to 47 of the county's 53 municipalities: 147 (72%) have been for development projects and 56 (28%) have been for open space or land acquisition projects.

If these projects give you some ideas for your own town, visit the Park System's website at [www.monmouthcountyparks.com](http://www.monmouthcountyparks.com). Click "About Us," then Municipal Open Space Program. If you have questions, please call 732-842-4000, ext. 4472.

### SO FAR, SO GOOD!

Grant staff works continuously with each town to complete and close-out their projects. While some are straight forward and completed within the 2-year time frame, others run into delays and need more time. Here are some recently completed projects by way of example.

#### 2017 Open Space Grant Awards

Marlboro Township	Stattel Farm Acquisition	\$250,000
Little Silver Borough	14 Parker Ave. Acquisition	\$190,000
Millstone Township	510 Stage Coach Road Acquisition	\$113,000
Matawan Borough	Gravelly Park Improvements Phase 2	\$100,000
Neptune Township	Sunshine Field Skate Park	\$165,000
Colts Neck Township	De Angelis Property Acquisition	\$250,000
Wall Township	Municipal Park Roller Hockey Rink	\$200,000
Manasquan Borough	Mallard Park Improvements Phase 3	\$100,000
Neptune City	Multiple Park Improvements	\$175,000
Sea Girt Borough	Baltimore Park Improvements Phase 2	\$50,000
Oceanport Borough	Fort Monmouth Bldg. 918 Rec. Center	\$200,000
Long Branch City	Florence Avenue Park Enhancement	\$47,000
Middletown Township	Multiple Playground Renovations	\$150,000
Monmouth Beach Borough	Griffin Park Playground Renovation	\$100,000
Holmdel Township	Phillips Park Basketball Improvements	\$43,000
Spring Lake Borough	Divine Park Improvements Phase 2	\$100,000

### Atlantic Highlands, Harbor Park Tennis and Basketball Court Restoration

#### 2013 Grant Award: \$113,000

This project, also known as the "Marina Courts" because of location, involved the repair and resurfacing of three tennis courts and a basketball court. The project also replaced some damaged fencing, added two sets of bleachers and improved the landscape.



### Millstone, Clarksburg Cultural Center

#### 2015 Grant Award: \$250,000

This grant was awarded for historic preservation of an old church that is currently used as a recreation center. Specifically, the grant paid for structural repairs to reinforce basement walls, replace first floor framing and floors, replace the exterior stairs and roof, and improve the bell tower and steeple. This project included hundreds of hours of volunteer time and the community is rightfully very proud of the work that was done.



## Union Beach – Scholer Park

2011 Grant Award: \$142,000

2013 Grant Award: \$50,000

2014 Grant Award: \$75,000

Union Beach has very successfully used the grant program to improve Scholer Park over time, in phases. This is a perfect example of one town's long term commitment to park development.

- Phase IV was to rehabilitate and expand the existing playground, by adding equipment for multiple age groups, new surfacing, benches, fencing, litter receptacles, and landscaping.
- Phase V was for landscaping and park furniture. This included the installation of sod and an irrigation system as well as the planting beds, trees and shrubs and addition of benches, picnic tables, and litter receptacles.
- Phase VI involved rehabilitation of the roller hockey rink with resurfacing and color coating as well as replacing broken dasher boards and installing heavy duty perimeter fencing, and upgrading to the landscape area around the rink.



## VOTERS PASS ANOTHER INCREASE TO THE OPEN SPACE TRUST FUND

Just over 30 years ago, Monmouth County's Freeholders realized that a stable source of funding was needed to preserve land for parks and open space. The voters agreed, and in 1987 Monmouth County became the first county in NJ to establish an open space trust fund. Over time, the annual funding structure required some changes.

- The initial 1987 open space referendum set a fixed amount of \$4 million to be raised through a dedicated county tax.
- In 1996, the fixed amount was raised to \$10 million, by ballot referendum.
- In 2002, the fixed amount was raised to \$16 million, again by ballot referendum.
- In 2006, voters approved by referendum a change from the fixed amount to a rate of 1.5 cents/\$100 of equalized valuation.

While this last change provided \$17.5 million per year, it wasn't enough to cover the county's growing need to preserve open space. In 2017, \$14.4 million was required for debt service on land acquisition bonds, farmland preservation programs, park development and maintenance expenses, and funding for the Municipal Open Space program (see previous page). This left \$3 million per year, an insufficient amount to fund the purchase of properties currently available as additions to the Park System.

**On November 7, 2017 the citizens on Monmouth County went to the polls and elected a new governor, new state and local representatives, and answered three public questions, including the request to increase the Open Space Trust Fund levy from 1.5 cents to 2.75/\$100 of equalized valuation. The resolution passed 58% to 42%.**

The increase is expected to raise \$32.5 million in county Open Space Trust revenue in 2018.



*The number of parks in Monmouth County has doubled since the first dedicated Open Space Trust Fund passed. In addition to purchasing land for existing parks, the fund helped create 21 new parks, including (clockwise from top left) the Manasquan Reservoir, Henry Hudson Trail, Bayshore Waterfront Park and Charleston Springs Golf Course.*

Roosevelt, Asbury Park, Interlaken and Red Bank were the strongest supporters of the Open Space Trust Fund levy with over 70% support for the measure. Millstone, Manalapan, Howell, Englishtown, and Colts Neck mustered less than 50% support for the measure. The increase in funding will allow the Park System to meet its overall open space acquisition goal of at least 20,000 acres, creating new parks and expanding existing parks and greenways. It will also provide funding for the preservation of watersheds and wetlands that protect vital drinking water supplies, while serving as habitat for wildlife and much needed flood protection areas.

# Deep Cut Gardens Home Gardener

152 Red Hill Road  
Middletown, NJ 07748

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

## FLOWER'S POWERFUL MESSAGING

Ruth Carll, Naturalist and Horticulturalist

Imagine you are a bee hovering at the edge of a garden. All those flowers must look like a tantalizing buffet. You could go in any direction and sample a little of everything. But, if you are a plant in that same garden, you need that bee to visit you and others of your species without losing focus or generalizing among the array of offerings. Plants need to inspire "brand loyalty" and they do that with a powerful marketing strategy featuring flowers.



This tulip has target markings around the center bottom which draw pollinators past the male and female parts in search of nectar.

### The A, B, C's of Pollination

In order for plants to produce seeds (baby plants), they need to transfer pollen from a male flower part (anther) to a female flower part (stigma). This is a challenge because plants can't move. They need a way to "taxi" the pollen. Cue the marketing campaign!

Plants will create a loyal relationship with their pollinator through messaging, timing, access and reward. A successful marketing campaign helps the plants form a monogamous relationship with pollinators. Loyalty is vital to ensure that the pollinator will carry pollen to others of the same species and do so again and again.

The best pollinators have three common traits: (1) They fly quickly and travel to as many plants as possible. (2) They are very active, with high energy needs, and therefore are constantly searching for food. (3) They have hairs or feathers to which the pollen can adhere.

This narrows the field to three pollinating superstars: bees; butterflies and moths; and hummingbirds. Ants, flies and other animals can also serve as pollinators. Some plants even forego the pollinator relationship altogether and just dump tremendous amounts of pollen into the wind. But plants that wish to attract the best pollinators produce showy flowers, with powerfully attractive and strategic features.

## Attracting & Paying for Pollination

A flower's primary color is specifically geared to attract certain pollinators. This is a marketing fundamental; think of common brands such as Coke (red and silver), McDonald's (yellow) and Home Depot (orange). Colors that attract bees often include blue, violet and white, while hummingbirds prefer flowers that are red or pink. Butterflies are generalists, attracted to many colors.

The pollinator must be paid for its transportation service with nectar. This high sugar treat is an expensive chemical for plants to produce, so they only make tiny amounts, located deep inside the flower. This ensures the pollinator will reach all the way into the flower, picking up or dropping off plenty of pollen, before getting paid. Only a small amount of nectar is needed because once the pollen transfer has occurred, there is no need to pay for more service.



Flowers employ strategies to stand out from the crowd.  
(Deep Cut's All America's Garden).



Bees are ideal pollinators;  
note how pollen granules from  
this crocus stick to the hairs of  
this bee's body and legs.



This hummingbird easily hovers above this bright zinnia flower while searching for nectar, while the monarch butterfly clutches the petals of this viola while feeding.



# With Flowers, Timing is Everything

In the same way that stores offer convenient hours of operation, plants will time their bloom to match the needs of their pollinator and reduce competition. This is why different plants bloom at different times of year, for example crocuses in early spring, black-eyed susan in summer and heleboris in winter.

It is also why some plants bloom in the morning such as morning glory, some at mid-day such as salvias, and others at dusk or dawn, such as datura. Bees stop flying at dusk, so bee-pollinated flowers close at night, whereas moths fly in the evening, so moth-pollinated flowers open at sundown. Offering special hours of operation reduces competition and encourages pollinator loyalty.



Seasonal blooms at Deep Cut: black-eyed susan in summer and heleboris in late winter.



A silver spotted skipper can tell which flowers on this celosia have nectar by color and orientation: unopened buds are dark pink to discourage pollinators, nectar-ready flowers are pale pink with guidelines, flowers fade to drab white after pollination.

## Flowers Signal Nectar Availability

When shopping, no one wants to drive all the way to the store, park, gather their belongings and head to the door only to find it's closed, or worse it's open but the shelves are all empty. For pollinators, visiting flowers that have already been pollinated is like finding an empty store. Without a nectar reward, the pollinator will move on to a different type of flower.

In order to prevent a wasted visit, most plants will signal if the flower is ready for pollination with a color or shape change. Before the flower is ready, buds may be darkly colored or white, and hang down with tightly closed petals. Once the flower has grown the male and female parts, it will produce nectar, properly orient itself, open and become pigmented.



An orange skipper butterfly on lantana, a great example of a flower with color-changing messages. Before they are ready to be pollinated the flowers are tiny, white buds. When ready, they turn yellow and when finished, they turn orange or red.



many footholds to this cabbage white butterfly. Verbena has many footholds, plus a white throat which acts as a target. Astilbe is a shade plant whose tiny, brightly colored flowers are attractive and offer plenty of footholds.

After pollination, it is imperative that the plant prevents frustrating the pollinator, so it communicates a clear "don't visit" message. Once you know what to look for, you will see it everywhere. For example, bees can't see red and many bee-pollinated flowers have a signal petal which turns red once the nectar is gone. This allows the bees to pass over the empty flower and move on. Petals may also develop dots or other markings, or may lose the bright colors that indicate readiness. Petals may even close over the flower effectively blocking the pollinator as well.

## Flowers Provide Easy Access

Are there stores that you avoid because parking or access is difficult? Providing easy access to nectar is an important part of the flower/pollinator loyalty bond. Bees, for example, must land in order to eat and many plants have landing pad petals that serve this purpose. Butterflies need a wide, flat flower with many footholds, so they may cling to counterbalance their large wings. Hummingbirds require a flower that allows them to hover while searching for nectar.

Continued...

## Flowers Give Clear Direction

When you go into a grocery store, there are usually large signs over the bakery, deli and other departments, and smaller ones in front of each aisle, to make it easier for you to find what you are looking for. Flowers give similar direction to pollinators using nectar guides. These guides are stripes, dots, targets and other markings that align the pollinator to pass the male and female flower parts and find the nectar quickly and efficiently.

A flower isn't just a pretty face, its part of a highly complex messaging system that has, over centuries of evolution, ensured the successful reproduction of plants. The next time you are in your garden (or ours), look closely to see if you can recognize some of their powerful features.



(l to r) Grape hyacinth flowers have a collar of white only at the entrance of flowers ready for pollination. Phlox petals have nectar guide stripes leading to the center of the flower as well a ring of dots surrounding the throat which serve as a target. The obedient plant has a landing pad for bees as well as nectar guides—dots that lead from the landing pad into the flower.

## Meet the Common Meadow Violet (*Viola sororia*)

In 1971, the state of New Jersey adopted the common meadow violet as its state flower. This North American native is also the state flower of Rhode Island, Illinois and Wisconsin. There are over 400 species of violets, but this particular one is the most widespread.

The common meadow violet is a perennial that flowers during spring then on and off again throughout the rest of the season. Green, heart-shaped leaves covered with hairs, 6" across and 4" high grow from rhizomes underground. Purple, white or blue flowers with five petals grow above the leaves.

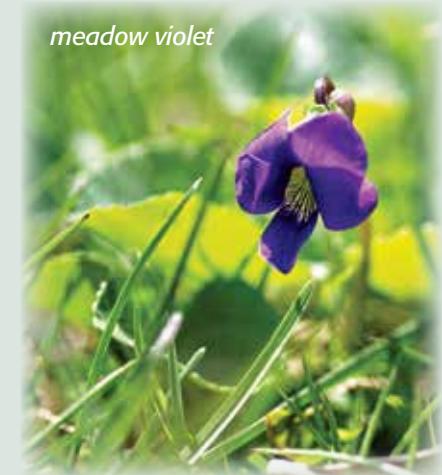
Here are some uncommon features of the common violet:

- Grows different flowers in different seasons. In addition to the tall showy violet flower pictured, this plant also produces underground flower-like buds (called cleistogamous flowers) with petals that don't colorize or open in the traditional way.
- Considered a "weed" by some. Because it's such a prolific seeder (both flower types disperse seeds), this violet can easily spread into dense patches throughout the garden and lawn, where its secondary flowers are too short to be cut by the mower.
- Good food source for wildlife. Many animals, including the larvae of fritillary butterflies, eat meadow violets. It's also an important nectar source for small, solitary native bee species.
- Edible food source for humans, too. Cooks and bakers use the petals to adorn cakes, others sprinkle the flowers into salads as a natural source of vitamins A and C.



violet's "white throat" is a signal

The common violet flower also displays some of the pollinator signals mentioned earlier: its white throat is like a bull's-eye to draw in approaching bees, the lower petal is the perfect landing pad, with nectar guide lines to lead the bee past both male and female flower parts.



## VOLUNTEER WITH US!

Deep Cut Gardens is currently looking to fill the following assistant positions. Training is provided for all positions and all abilities are welcome.

- **Administrative Assistant.** Volunteers work the welcome desk to ensure that every visitor is greeted and has the information they need, and support our staff with general office work.
- **Program Assistant.** Help our instructors conduct garden programs!

# It's Time To....

## April ✓

- Compost/manure and mulch planting beds.
- Prune roses when the new shoot growth begins.
- Divide perennials with multiple stems, such as coreopsis, bleeding heart, black-eyed susan's, herbs, hostas and lilies.
- Plant cold hardy annuals such as pansies, violas and alyssum which thrive from now until June's heat arrives.
- Apply granular, time-release fertilizer to the soil of potted plants and flower beds, avoiding contact with leaves.
- Start annual and perennial seeds indoors.

## May ✓

- After flowering is complete, prune spring-flowering shrubs such as azaleas, rhododendron and forsythia.
- Mid-month, apply weed and feed to lawns.
- When nights are above 60°F, transplant warm weather vegetables and flowers started indoors into gardens or plant starts purchased from local growers.
- Direct sow seeds outdoors for warm-weather vegetables and flowers, such as basil, beans, cosmos and coreopsis.

## June ✓

- Continue planting warm-weather flowers, vegetables and herbs.
- Watch for garden pests and act promptly when they begin showing up.
- Begin monitoring lawns for evidence of grubs.



These large Catawbiense rhododendron shrubs along the Maintenance Rd. at Deep Cut Gardens have been known to produce spectacular, picture-perfect blooms.

## UPCOMING EVENTS...

### GREAT SPRING PERENNIAL PLANT SWAP

Saturday, April 21

8:30-10 a.m. Drop off

10:30 a.m.-12 p.m. Swap

Bring 1 quart, 1 or 2 gallon containers. Please label all plants. Herb & vegetable seedlings may also be exchanged.



### NATIONAL PUBLIC GARDENS DAY & DEEP CUT GARDENS CELEBRATION

Friday-Sunday, May 11-13

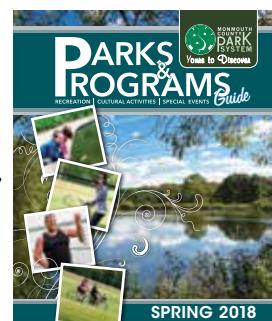
Stop by for free activities, demonstrations and tours.

Look for details online. [www.monmouthcountyparks.com](http://www.monmouthcountyparks.com)



### NEW PROGRAMS AT DEEP CUT

New classes scheduled this spring include Perfect Planters, Steampunk Terrarium (for teens), Tea Cup Gardens, Flower Arranging and more. View the guide online at [www.monmouthcountyparks.com](http://www.monmouthcountyparks.com) or pick up a copy in the park.



### 2018 VOLUNTEER DROP-IN DAYS

Wednesdays & Saturdays 9 a.m.-12 p.m.  
(starting Saturday, April 21)

Stop in to assist in the gardens on these dates and times. Work with our staff. New volunteers are always welcome. Call 732-671-6050 for more information.

There are many ways to volunteer at Deep Cut!





## NATIVE BEES ARE POLLINATING POWERHOUSES

Susan Harasty, Naturalist

**B**eans are the best pollinators. While other pollinators like wasps and flies are primarily seeking nectar, bees want pollen in addition to nectar for food. Rich in protein and fats, pollen is ideal for feeding their larvae. Because they have a use for pollen, bees have evolved unique physical and behavioral characteristics that make them especially effective at gathering it.

Bees have specially modified body hairs that are branched or feathered so pollen easily adheres. They will also deliberately come in contact with the flower's anther which holds the pollen grains. Plus, bees tend to visit hundreds of the same flower species during a foraging trip, which is called "flower constancy."

Most people believe that honey bees are our best pollinators. But honey bees aren't native to this area, they were brought here from Europe in the 1600s. In fact, our own native bees offer many advantages over honey bees. They have adaptations that help them fit perfectly into our local habitat.



Frequent Flyers—some native bees in our area: the leafcutter, known by its distinctive stripe pattern (Bob Peterson Wikicommons) and the carpenter bee, with its shiny, hairless abdomen.



## NATIVE BEES ARE ADAPTED TO LOCAL PLANTS

Consider the tomato plant. Tomato flowers have both male and female parts. The flower has to be vibrated to release its pollen (self-pollinate). For the most effective release of pollen and the greatest production of fruit, flowers must be vibrated at a specific frequency. Typically, this is done by the wind but bumble bees can also do this very efficiently by vibrating their bodies, a process called "buzz pollination."



The small, metallic green sweat bee is shown here sitting still and buzz pollinating a flower (right).



(Bob Peterson, Wikicommons)

Compared to honey bees, native bees tend to stay closer to their nests, and therefore closer to the garden, farm or natural area where they live.

- Small bees, such as sweat bees, have shorter foraging distances often no more than 200 yards.
- Medium sized bees, like mining bees, may travel 400-500 yards.
- Larger bees, such as bumblebees, may forage a distance of 1 mile.
- Honey bees may travel 3 miles to forage.

Closer nests and shorter foraging distances are great advantages. The squash bee is a good example. Squash flowers open early in the day, and squash bees are active when the flowers bloom because they nest under the plants in the ground. Squash flowers are closed by the time honey bees arrive.



Squash Bee (USDA Wikicommons)

Additionally, native bees are hearty. They remain active in lower light, cooler temperatures and in wet conditions. This increases total pollination time because they can start earlier, go later in the day and remain active during rain.

# A BEE'S LIFE

Bees are sometimes categorized based on their nesting habits as either solitary or social. Ninety percent of the 4,000 native bee species in the US are solitary.

## UNLIKE THE SOCIAL HONEY BEE (IMPORTED FROM EUROPE), 90% OF NATIVE BEES IN THE US ARE SOLITARY.

Solitary bees may live up to one year, and most of that time is spent developing. The majority of nests are underground, built and provisioned by a single female. Solitary bees may also nest inside the pith of a stick, in dead trees, wood piles or in the ground. Solitary bees are less likely to sting because they are the sole providers for their nest.



Ground nesting bee (Ma-Lisa Spring, humangardener.com)



A ground nest (Matthew Shepard, xerces.com)

By definition, social bees are at least 2 females, one queen and one worker (although usually it is many more) that live in one nest. Social bees grow faster than solitary bees in order to create the adult workers and drones. Bumble bees and some sweat bees are a good example of social bees.

Bumblebees may create a nest in an abandoned rodent hole, tree cavity or under a mound of grass. Sweat bees make their nest in underground tunnels.



Bumble bees are stout and fuzzy—generally black and yellow.

## IS IT A BEE OR WASP?

Bees, wasps and flies can be easily confused. They all are pollinators. Bees evolved from wasps and belong to the same insect order of Hymenoptera, so they look similar. So, how do you tell these insects apart?

- **Bees are generally hairy.** They have 2 pairs of wings that will often fold in line with their body when at rest. Their bodies are rounded compared to a wasp. Bees have eyes on the side of their head and long antennae. The females carry large loads of pollen either on their very hairy bodies or packed on their legs in “sacs” or “baskets.”



The wings of this endangered rusty-patched bumble bee are folded in alignment with its body. (Clay Bolt, www.xerces.org)

- **Wasps seem “armored” with intricate patterns.** Their color patterns and markings are more intricate and pronounced. They have a more “armored” or “hard” appearance with a thin waist and pointed abdomen. Similar to bees, their eyes are also on the sides of their heads, they have long antennae and they have 2 sets of wings. Their wings do not fold in line with their body when they are at rest. They never carry pollen in abundance or in pollen sacs. Wasps are carnivores—you may see the adults collecting insects and carrying them to a nest to feed their larvae.



Yellow jacket (Beatriz Moisset, Wikicommons)  
An adult wasp will eat nectar and anything with a high sugar content, for example sodas. If you are being bothered at a picnic, it is probably a wasp.

## HOW TO “BEE-HAVE”

Many people are unsure how to act around bees. If bees or wasps are foraging on flowers nearby, they are busy and not interested in you. Just stay out of their way, you will not be bothered and they will not come after you. Swatting or waving arms and hands are when stings happen. A bee or wasp may accidentally get hit by your movements and then they may sting as a defense. Sometimes people who wear sweet smelling shampoos and perfumes seem to attract wasps. In this situation, move away calmly and do not swat.

Native bees are docile. Many don't have stingers that can break the skin. Some like sweat bees, occasionally sting if they feel threatened (pinned against you). To sting is highly risky for the bee usually ending its life. In the US, only honey bees have barbed stingers that remain in the skin after a sting. Be sure to remove it to reduce the pain. Wasps and social bees release a chemical distress call when they sting that signals others for help if near the nest. With any sting, it is important to leave the area just in case.



Honey bee on milkweed

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