

# CELEBRATING

Insects on the High Line



**HIGH LINE** GARDENS

# CELEBRATING THE SMALL & MIGHTY

Held annually, the High Line's month-long horticulture celebration highlights a different aspect of the park's horticulture and sustainability initiatives. Inspired by artist Cecilia Vicuña's day-long festival *Insectageddon*, this year during the month of September we're taking a closer look at the relationships between insects, plants, and the greater web of life, including humans.

While they're small in size, the impact of insects shouldn't be underestimated—insects play critical roles in the ecosystem, including pollinating flowering plants, acting as a food source for birds and other small animals, playing a role in decomposition and maintaining soil quality, and even performing pest control.

Read on to learn more about the importance of insects, their interesting and critical relationships with plants on the High Line and how our gardeners support them, what you can do at home to support these vital creatures, and more.

Learn more about the *Insectageddon* festival and insect workshops happening all month on the High Line on page 38 and in the poetry chapbook found at the back of this brochure.

*Celebrating Insects on the High Line is made possible, in part, by TD Bank, the Presenting Green Sponsor of the High Line.*



# THE IMPORTANCE OF INSECTS IN OUR ECOSYSTEM

Plants and insects cover the globe—together they have shaped our world into what we know today and we rely on their lives and relationships to survive. Currently, they need our support more than ever.

Half a billion years ago, when life first emerged from the oceans and began to move onto land, plants were the trailblazers of transformation. Finding their way over millions of years dramatically altered the landscape and the atmosphere into the world that we know today—one that is ideal for an abundance and diversity of life.

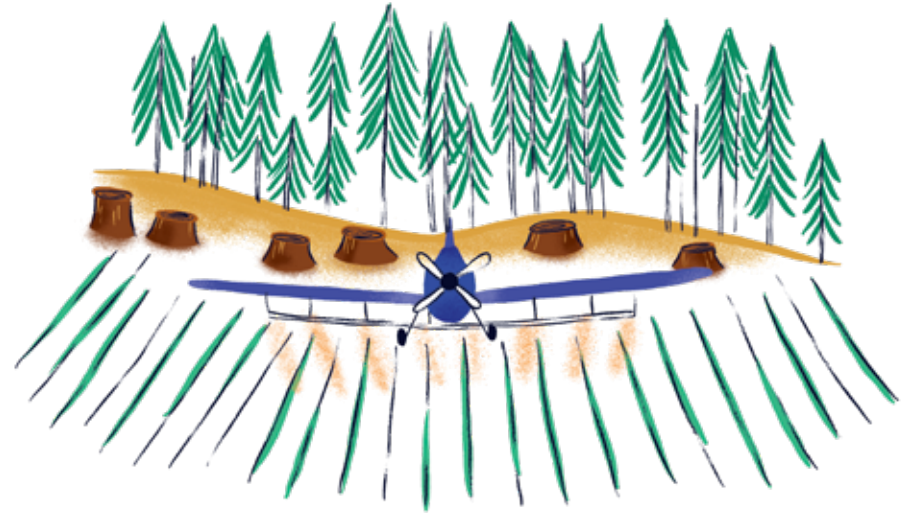
The first flowers showed up around the time of the dinosaurs and the first bees are also found in the fossil record during this period. Today, the modern plant kingdom is dominated by flowering plants, most of which require insect-facilitated pollination, predominantly carried out by wild native bees.



## FUN FACT

The oldest insect fossil dates back more than 400 million years, meaning insects were among the first animals to transition from the sea to land.

Insects are vital contributors to every ecosystem, pollinating plants and cycling valuable nutrients back into the soil and new life by assisting in decomposition. They are a source of food that is foundational to global food webs. Birds alone gobble up hundreds of millions—as many as half a billion—insects annually. And the human diet is similarly impacted, with wild bees playing an outsized role in producing the foods we love most. One notable example is bumblebees, who use their flight muscles to vibrate their wings at a frequency that triggers the release of pollen in a process called “buzz pollination.” An explosion of pollen then rains down and sticks to their fuzzy bodies. Honey bees are incapable of this amazing trick, meaning they can’t pollinate tomatoes, blueberries, zucchini, potatoes, and so much more—these flowers need a bumblebee to do the job. Still other species of plants have evolved to be pollinated by a single kind of insect, specializing over centuries to build a unique and mutually beneficial relationship. Pollination and the co-evolution of flowers and bees are often overlooked but both are vitally important to understanding how to truly help all insects.



Yes, insects need our help. They are in serious danger. We’re seeing huge declines around the world in all insect types. Most insects alive today have been around for a very, very long time—surviving previous mass extinctions, global transformation, and climate fluctuations that have erased other animals from existence. Widespread habitat loss, overuse of pesticides, the advent of monoculture crops, and climate change are just some of the causes behind the current extinction of an estimated 40% of insect species in the last few decades. The transformation of the environment that has unfolded in modern times is taking place more rapidly than ever before.

Luckily, working to fix this problem is also working to fix many of the other problems we’re facing today. For example, here in the US we are beginning to set aside more substantial funding for pollinator research, and cities are planting pollinator-supportive gardens and other habitat restoration projects. These are solutions that help mitigate some of the threats of climate change and habitat loss too. So we still have a chance; we still have hope.

Our children and grandchildren and their grandchildren deserve to live in a world where fireflies invoke wonder and magic, where butterflies, beetles, dragonflies, wild bees, crickets, and the ephemeral mayfly have a place of honor among the other kingdoms of life.



## FUN FACT

With 1.5 million named species and an estimated 10 quintillion individual insects alive at any given moment, insects greatly outnumber any other animal on the planet.

# HOW HIGH LINE GARDENERS SUPPORT INSECTS

Visitors to the High Line may notice some of the labor-intensive work of the park's gardeners—but there's so much more going on behind the scenes than the weeding, watering, pruning, and planting you might expect. Our gardeners are stewards of an entire ecosystem in the park—supporting birds, insects, and other creatures. Below are some of the ways we're specifically supporting insects.

## Integrated Pest Management

The High Line is committed to avoiding pesticides or chemical fertilizers. We follow an Integrated Pest Management program, which starts by ensuring our plants are well-adapted to the climate, and that they stay healthy and pest-resistant. We previously released beneficial insects like lacewings and native ladybugs, but as the gardens mature, we are finding that additional releases become unnecessary, as the predator populations grow to equilibrium. For instance, where there are aphids, there are ladybugs. Integrated Pest Management is a tool that approaches the park as a dynamic web of relationships, and our gardeners work hard to support those insect and plant interactions.

## Bee hotels

In the past two years, we've introduced two different kinds of bee hotels for cavity-nesting native bees. These hotels are not for brief stays though—they

provide a home for overwintering young bees, like masked bees, who emerge from eggs and develop into mature bees during the colder months of the year. Many native bee species live in small cavities, whether they're plant stems or manufactured bee houses, and these shelters provide space for many of the local bees we've observed on the High Line.

## Water features

The urban environment of New York City doesn't necessarily have many water sources for wildlife. Creating insect-friendly water sources provides a critical amenity—especially during the hot and dry days of the summer—for bees, butterflies, and other insects. We've added a water feature on the upper Sundeck to offer refreshment to our tiniest residents and visitors.

## Habitat preservation & creation

Beyond bee hotels, the plants and garden beds of the High Line provide insect



habitat naturally. We've adjusted our gardening methods over the past four years to better accommodate native bees in particular. During our annual Spring Cutback—when most grasses and perennials are trimmed back in the park—we intentionally leave certain species that are favored homes for overwintering bees. We also leave some leaf litter and plant debris in the planting beds, which provide critical shelter for insects, like our beloved fireflies and native Luna moths. The High Line also has a healthy population of sassafras trees, which supports Spicebush swallowtail butterflies. This species of butterfly overwinters in cocoons among the leaf litter. Raking up the leaves would mean removing these butterflies (and fireflies) from the park.

## Plant diversity & native plants

Some insects are specialists, meaning they may only feed on or nest in specific plants. Planting a diversity of plants—and

prioritizing native and endemic species—allows a variety of insects, including those native to New York, to benefit from the gardens. Our gardeners have observed bumblebee queens making nests in the bases of our native sedge and grass species, proving that you don't have to be pollinated by a bee to be important to bees.

## FUN FACT

All bugs are insects but, technically, not all insects are bugs. (A ladybug is actually a beetle!) Bugs belong to one group of insects in the Order Hemiptera, which includes cicadas, aphids, leafhoppers, and bed bugs.



"If all mankind were to disappear, the world would regenerate back to the rich state of equilibrium that existed ten thousand years ago. If insects were to vanish, the environment would collapse into chaos."

—E. O. Wilson, *biologist, author*



## SIGNIFICANT OTHERS: PLANTS & INSECTS

The coevolution of living things over time has created beautiful and complex relationships in the natural world. A well-known example is the relationship between flowering plants and pollinating insects—their mutually beneficial relationship ensures plants are pollinated and, in turn, rewards pollinators with food sources of nectar and pollen.

On the following pages, you'll find some of the interesting relationships between High Line plants and insects you may find in the park and in this area. The mutual benefits, or commensal benefits (meaning one party benefits and the other isn't hurt), include food sources for insects, pest protection for plants, shelter for overwintering insects, and of course, pollination.

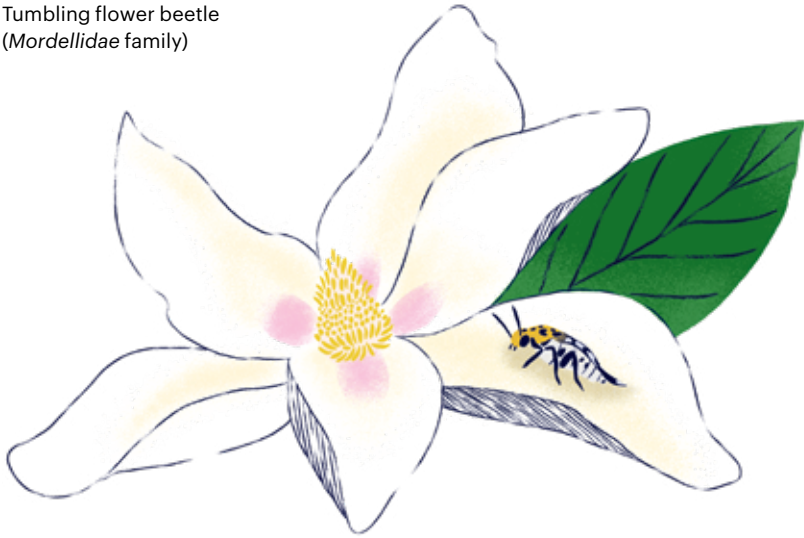
While not all insect-plant relationships are beneficial to both parties—consider the caterpillar munching on a shrub's leaves—most naturally occurring relationships maintain a delicate balance in the ecosystem. That caterpillar may one day grow into a butterfly that will help pollinate this plant or others in the area.

## Bigleaf magnolia

*Magnolia macrophylla*

**POLLINATOR/INSECT  
RELATIONSHIP:**

Tumbling flower beetle  
(*Mordellidae* family)



**LOCATION:**

Flyover, 24th to  
27th streets

**ADDITIONAL INSECT  
RELATIONSHIPS:**

Beetles

One of the oldest surviving flowering tree families, the magnolia is known not only for its big showy fragrant flowers but for its role in insect-plant coevolution. Magnolias are pollinated by beetles attracted to the flower's strong perfume and in search of their protein-rich pollen. In general, the flowers of the magnolia haven't changed much since those first flowers—male reproductive parts produce pollen first and the female organs mimic the males effectively tricking the beetle into spending time looking for pollen and pollinating the flower. The beetles that pollinate magnolias are not specialized to gather pollen, so these flowers are also designed to support the weight and clumsiness of the beetle.

## Chokecherry

*Prunus virginiana*

**POLLINATOR/INSECT  
RELATIONSHIP:**

Lunate Zale moth  
(*Zale lunata*)



**LOCATION:**

Woodland Edge,  
Little West 12th  
to 14th streets

**ADDITIONAL INSECT  
RELATIONSHIPS:**

Bees, beetles,  
butterflies

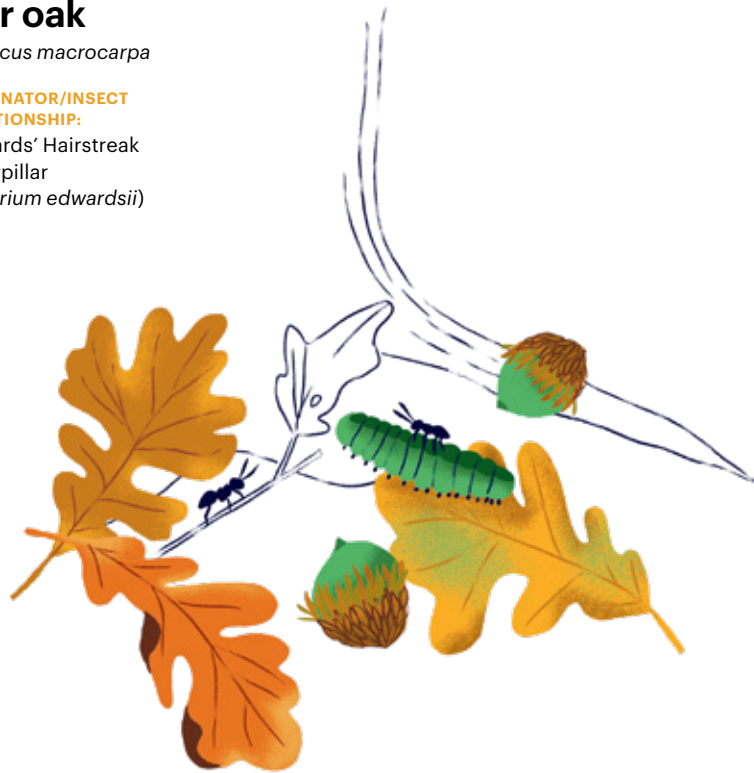
Chokecherry is versatile and hardy. It can be found in many habitat types and plant communities from Canada to Texas. It flowers profusely in the spring, providing pollen and nectar for insects, and early summer berries feed songbirds and small mammals. Chokecherry is host to the Lunate Zale moth (*Zale lunata*)—pronounced “Zah’-lay”—a member of the Owlet group of moths that find *Prunus* leaves to be a delicious meal for caterpillar larvae. Zale moths are widespread in North America but may be hard to spot since their colors allow them to blend in with tree bark.

## Bur oak

*Quercus macrocarpa*

**POLLINATOR/INSECT  
RELATIONSHIP:**

Edwards' Hairstreak  
caterpillar  
(*Satyrium edwardsii*)



**LOCATION:**  
Chelsea Grasslands,  
18th to 19th streets

**ADDITIONAL INSECT  
RELATIONSHIPS:**  
Bees, moths

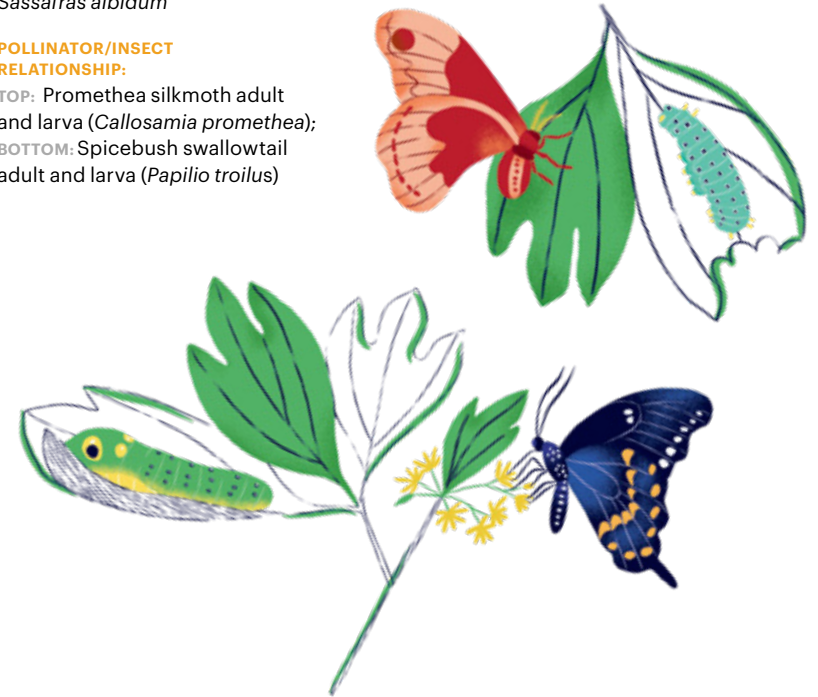
As a family, oaks support more insects in all stages of life than just about any other tree—and the bur oak is no exception. Wind-pollinated, these dramatic trees don't rely on just one insect for reproduction but rather host many, including the lovely Edwards' Hairstreak (*Satyrium edwardsii*), a butterfly that will lay her eggs within the crevices and grooves of the tree's bark. After hatching, the young caterpillars will feed on the tree's buds during the day. As the larvae mature, the caterpillars switch to nocturnal feedings, choosing to hide during the day in ants' nests found at the base of the host tree. The ants welcome the caterpillars—they benefit by dining on the honeydew the caterpillars produce and the caterpillars are equally grateful for the protection of the ants. Later, this adult butterfly pollinates other plants we have in the park like Indian hemp, goldenrod, milkweeds, New Jersey tea, staghorn sumac, and white sweetclover.

## Sassafras

*Sassafras albidum*

**POLLINATOR/INSECT  
RELATIONSHIP:**

**TOP:** Promethea silkmoth adult  
and larva (*Callosamia promethea*);  
**BOTTOM:** Spicebush swallowtail  
adult and larva (*Papilio troilus*)



**LOCATION:**  
Chelsea Thicket,  
at 21st Street;  
Flyover, 24th  
to 27th streets;  
Coach Passage,  
along 30th Street

**ADDITIONAL INSECT  
RELATIONSHIPS:**  
Bees

Sassafras is a spring bloomer (March–May), with its fragrant yellow flowers attracting many pollinators. Later in the season, these flowers produce fruits that also attract birds. The leaves of sassafras are an important larval host to several butterflies including the gorgeous Spicebush swallowtail (*Papilio troilus*) and even more dramatic looking Promethea silkmoth (*Callosamia promethea*). Both species lay their eggs on the leaves of the sassafras; the swallowtail alone on the underside of the leaf, and the silkmoth in rows of 4–10 on the upper side. Adult swallowtails will also use these flowers and many others as a nectar source (they are generalists when it comes to their nectar sources) but the Promethea silkmoth does not eat as an adult—in fact, they have evolved to eat only in their larval caterpillar stage. The adults, like some other moths, do not even have mouths!

## New Jersey tea

*Ceanothus americanus*

### POLLINATOR/INSECT RELATIONSHIP:

**LEFT:** Bumblebee  
(*Bombus* genus) and  
**RIGHT:** poor miner bee  
(*Pseudopanurgus pauper*)



### LOCATION:

Across the path  
from the Lawn,  
at 23rd Street

### ADDITIONAL INSECT RELATIONSHIPS:

Spring and summer  
azure butterfly,  
mottled duskywing  
butterfly

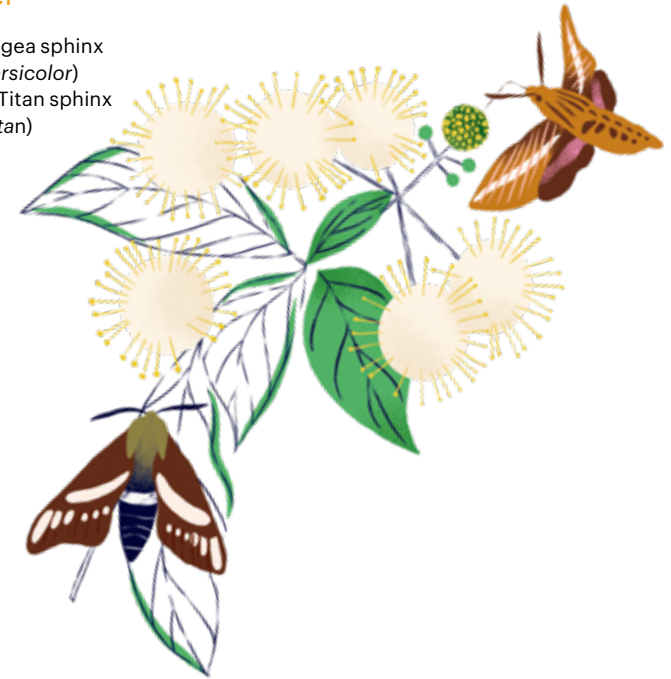
New Jersey tea is a low-slung shrub that usually remains about three feet tall and at least as wide if not more. This little bush has a storied history—the dried leaves were a favorite caffeine-free tea, popular during the Revolutionary War. The sweet smell of their spring and summer flowers may be what attracts the love of people but the nectar produced by the flowers is the allure of many long-tongued bees, butterflies, hummingbirds, predatory wasps, moths, and other insects. It has a pollen specialist—the poor miner bee (*Pseudopanurgus pauper*), an uncommon and very, very small bee. The male is five millimeters and the female just slightly bigger at five and a half millimeters. *Ceanothus* is also an important host to spring (*Celastrina ladon*) and summer azures (*Celastrina neglecta*) and the mottled duskywing (*Erynnis martialis*) butterfly caterpillars.

## Sugar shack buttonbush

*Cephalanthus occidentalis*

### POLLINATOR/INSECT RELATIONSHIP:

**TOP RIGHT:** Hydrangea sphinx  
moth (*Darapsa versicolor*)  
and **BOTTOM LEFT:** Titan sphinx  
moth (*Aellopos titan*)



### LOCATION:

Hudson River  
Overlook, at  
14th Street

### ADDITIONAL INSECT RELATIONSHIPS:

Bees, royal  
walnut moth

The unique buttonbush shrub produces a one-inch globe of small white flowers on a single long stem from June–September. They have a fringe of pistils that extend beyond the sphere of blossoms, creating a “pincushion” look. Buttonbush is also a big help in freshwater wetland habitat restoration projects where it is used to stabilize soil and prevent erosion.

One of its common names, “sugar shack bush,” refers to its production of nectar and how attractive it is to many pollinators, including hummingbirds and just about every butterfly. It is also a host plant to North America’s largest and most impressive moths including the Titan sphinx (*Aellopos titan*), the Hydrangea sphinx (*Darapsa versicolor*), and the royal walnut moth (*Citheronia regalis*).

## Summersweet

*Clethra alnifolia*

**POLLINATOR/INSECT  
RELATIONSHIP:**

**TOP RIGHT:** Organ pipe  
mud dauber wasp  
(*Trypoxylon politum*)



**LOCATION:**  
Chelsea Thicket,  
at 21st Street

**ADDITIONAL INSECT  
RELATIONSHIPS:**  
Bees, butterflies

Summersweet is an important shoreline stabilizing and reinforcing plant, critical to streams and riverbanks, as well as seaside shorelines as sea levels rise. The insects that love and utilize summersweet are too numerous to name here—they support a wide range of generalists from Texas to Maine.

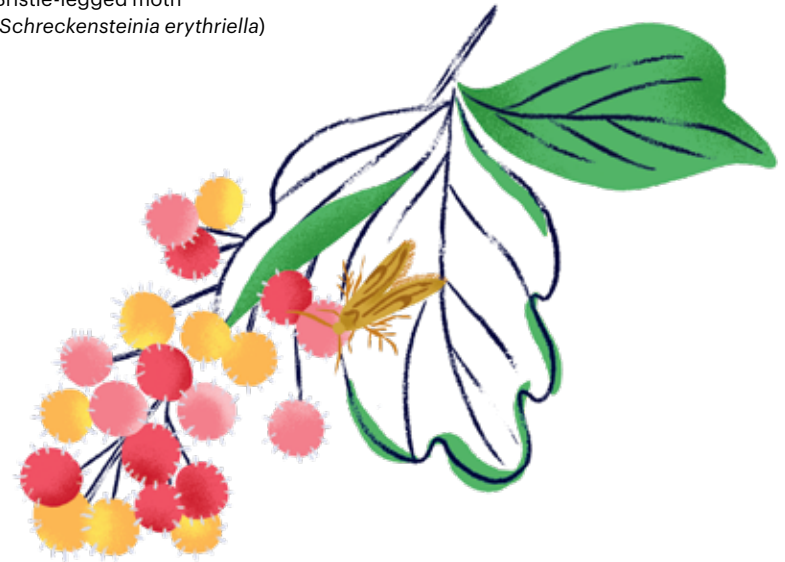
One interesting visitor to the late-blooming *Clethra* is the organ pipe mud dauber wasp (*Trypoxylon politum*). A nonaggressive iridescent black wasp that hunts spiders and sips nectar—what's not to love? The organ pipe mud dauber gets its name from the pipe organ-shaped nests it builds.

## Grow-low aromatic sumac

*Rhus aromatica* 'Gro-low'

**POLLINATOR/INSECT  
RELATIONSHIP:**

**TOP RIGHT:** Bristle-legged moth  
(*Schreckensteinia erythriella*)



**LOCATION:**  
Chelsea Thicket,  
at 21st Street;  
plantings next  
to the Pershing  
Square Beams,  
at 30th Street  
and 11th Avenue

**ADDITIONAL INSECT  
RELATIONSHIPS:**  
Moths, butterflies

Often referred to as “fragrant sumac,” this low-growing cultivar doesn't grow taller than three feet. Male and female flowers bloom in the spring (March–April), with female flowers producing fruits later in the season. When the glossy green trifoliate leaves are crushed they release a fragrance that is citrusy, spicy, and rich; they turn a vivid red-orange in the fall.

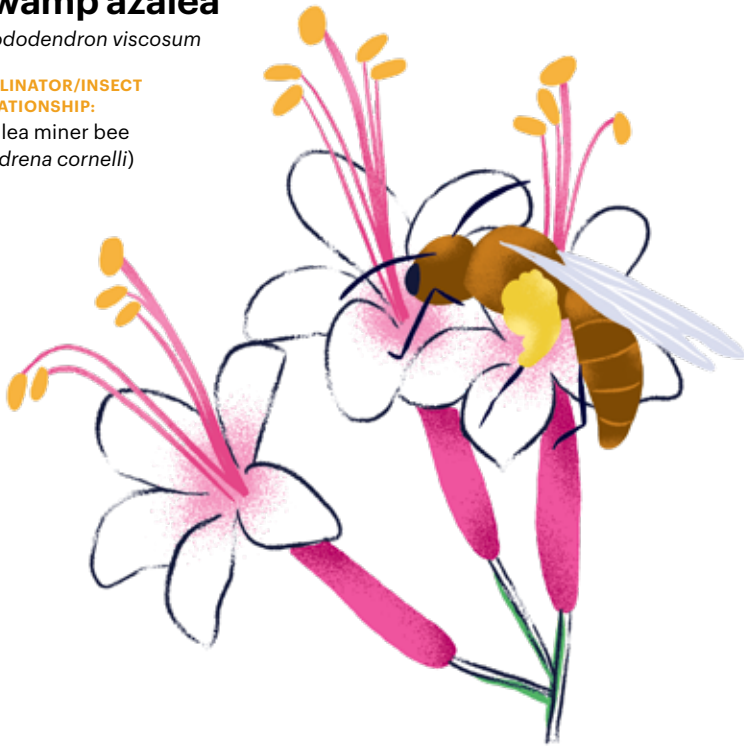
*Rhus aromatica* is also host to several moths and butterfly larvae including the diminutive bristle-legged moth (*Schreckensteinia erythriella*). About a centimeter in size, this micro moth's legs look like tiny branches that they raise in the air while at rest. They feed on the flowers and fruit of the *Rhus* genus at night and are attracted to light so they can often fall victim to light pollution.

## Swamp azalea

*Rhododendron viscosum*

**POLLINATOR/INSECT  
RELATIONSHIP:**

Azalea miner bee  
(*Andrena cornelli*)



**LOCATION:**

Flyover, 24th to  
27th streets

**ADDITIONAL INSECT  
RELATIONSHIPS:**

Bees

Clusters of irresistibly fragrant, white (often with hints of pink or lavender), trumpet-shaped flowers appear in May, after its shiny leaves come in, and last through July. The flower's corolla tubes provide a good indicator as to what may visit this flower and its value to specialized pollinators. Hummingbirds, long-tongued bees (miner bees, carpenter bees, leafcutter bees, and bumblebees all have long-tongued bees in their families), and butterflies with their long proboscis all coevolved along with flowers just like this one, allowing them to reach the nectar wells hidden deep within the throat of the flower. The azalea miner (*Andrena cornelli*) is the only oligolectic—or specialist pollinator—for azaleas and they have special scopa—or specialized pollen-carrying hairs—designed to carry azalea pollen, a critical part of their diet.

## Blue giant hyssop

*Agastache foeniculum*

**POLLINATOR/INSECT  
RELATIONSHIP:**

LEFT: Great spangled  
fritillary butterfly  
(*Speyeria cybele*)



**LOCATION:**

Gansevoort  
Woodlands,  
Gansevoort to  
Little West 12th  
streets; Hudson  
River Overlook,  
14th to 15th streets

**ADDITIONAL INSECT  
RELATIONSHIPS:**

Bees, flower flies,  
butterflies, beetles

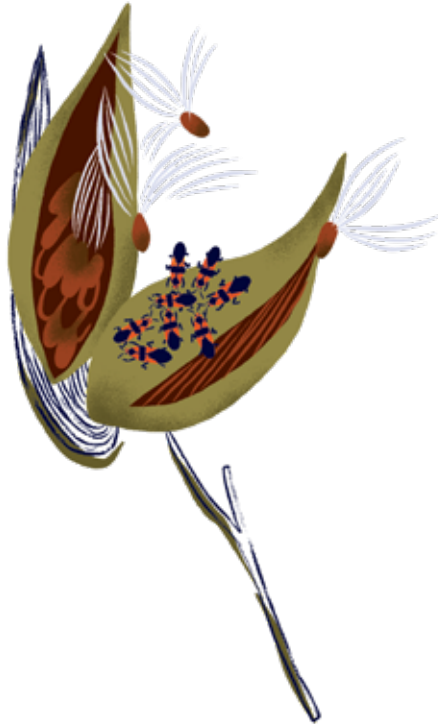
Opposite leaves that smell (and taste!) of anise when crushed, rigid square stems, prolific purple-blue blooms clustered on top of spikes July through September make this hyssop one of the most ornamental of the native mints. Most mints are highly attractive to bees and this one is a stellar example. If you're looking to support pollinators in your home garden, straight species are best—human-developed cultivars often provide inferior resources. *Agastache foeniculum* is your best bet and supports a wide range of pollinators from bees to butterflies, hummingbirds, and even beetles.

## Butterfly milkweed

*Asclepias tuberosa*

**POLLINATOR/INSECT  
RELATIONSHIP:**

Large milkweed bug  
(*Oncopeltus fasciatus*)



**LOCATION:**

10th Avenue Square,  
at 16th Street;  
Chelsea Grasslands,  
19th to 20th streets;  
Wildflower Field,  
27th to 30th streets

**ADDITIONAL INSECT  
RELATIONSHIPS:**

Monarch butterflies,  
small milkweed  
bug, bees

*Asclepias* is the host plant for the well-known and nearly endangered (currently pending review by the US Fish & Wildlife Service) caterpillar of the strikingly beautiful Monarch butterfly (*Danaus plexippus*). Monarchs get their recognizable black and orange-red coloration from the plant's poison—the orange and black are a warning signal to any would-be predator that if they were to take a bite, the taste and physical result would be very unpleasant. This type of warning coloration is called “aposematism” and Monarchs aren’t the only ones that have evolved their diet and predator deterrent methods in this way. The large milkweed bug (*Oncopeltus fasciatus*) and small milkweed bug (*Lygaeus kalmii*) share these traits and are very easy to spot on the High Line’s plants in the fall. Both bugs are often found in groups feeding on developing seed pods. They don’t interfere with Monarchs or do permanent damage to the plants as long as their populations don’t get too big.

## Purple coneflower

*Echinacea purpurea*

**POLLINATOR/INSECT  
RELATIONSHIP:**

Cavity-nesting bees’  
“bee bread”



**LOCATION:**

Washington Grasslands,  
13th to 14th streets;  
Hudson River Overlook,  
14th to 15th streets;  
10th Avenue Square,  
at 16th Street;  
Chelsea Grasslands,  
19th to 20th streets;  
Wildflower Field,  
27th to 30th streets

**ADDITIONAL INSECT  
RELATIONSHIPS:**

Bees, butterflies,  
flower flies

Purple coneflowers are crucial to many pollen specialists of the eastern US, and the special central disk shape on their densely packed flowers makes it an easy landing pad for bees, predatory and parasitoid flies, wasps, and beetles. *Echinacea* and other coneflowers also provide important habitat for cavity-nesting bees. Their stems are made up of a soft and pliable pith that several types of female bees will excavate to lay a single egg inside, and stock with a pollen ball—called “bee bread”—that the developing larvae will eat until they are ready to emerge. Leaving some stems intact all season long provides important habitat for new broods surrounded by pollen and nectar sources, as well as a place to hibernate over winter.

## Claire Grace bergamot

*Monarda fistulosa* 'Claire Grace'

**POLLINATOR/INSECT  
RELATIONSHIP:**

Eastern carpenter bee  
(*Xylocopa virginica*)



**LOCATION:**  
Chelsea Thicket,  
at 21st Street

**ADDITIONAL INSECT  
RELATIONSHIPS:**  
Bees, butterflies

Another member of the mint family (*Lamiaceae*), bergamot is a native perennial flower that is a magnet for pollinators and other important insects. The flower shape is long and tubular, perfect for butterflies and hummingbirds, and a favorite of many bees, including carpenter bees like the eastern carpenter bee (*Xylocopa virginica*) or the much smaller and metallic green spurred small carpenter bee (*Ceratina calcarata*). Many New Yorkers have encountered the eastern carpenter bee as the males have a distinctive and aggressive way of flying—buzzing loudly and hovering in front of you. The males lack stingers and don't bite so they are harmless; the females, though possessing stingers, will only sting if attacked. Carpenter bees also practice "nectar robbing"—their bodies are so big they often can't reach nectar sources if the flower tube is too small, so they use their powerful jaws to cut into the flower, getting access to the nectar by creating a "side door."

## Hoary mountain mint

*Pycnanthemum muticum*

**POLLINATOR/INSECT  
RELATIONSHIP:**

Honey bee  
(*Apis mellifera*)



**LOCATION:**  
Hudson River Overlook,  
14th to 15th streets;  
Chelsea Grasslands,  
19th to 20th streets;  
Wildflower Field,  
27th to 30th streets

**ADDITIONAL INSECT  
RELATIONSHIPS:**  
Bees, butterflies,  
beetles, flower flies,  
beneficial wasps

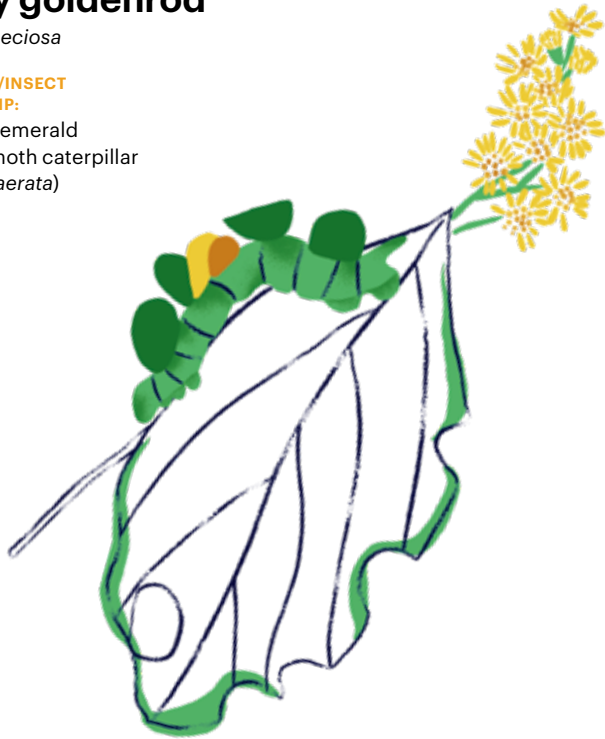
Though not related to the true mints, this plant is loved by insects and humans alike—the oils produced are an effective mosquito repellent. Due to its high nectar production, it's nearly unmatched with the number of pollinators it attracts from bees and butterflies to hoverflies, beetles, and even wasps. Bumblebees and other native species will also happily pollinate this plant when resources are available. On the High Line, you'll likely see this bush abuzz with honey bees who visit from local beekeepers, a hobby that's become increasingly popular in New York City over the last decade. These are not wild native bees, they were brought from Europe by early colonists for their honey and wax. Today, honey bees are increasingly seen as in competition for scarce pollen and nectar resources with native bees. When it comes to conservation, it's important to remember that honey bees are an agricultural staple, and other bee species are wild creatures with less systemic protections than their domesticated counterparts.

## Showy goldenrod

*Solidago speciosa*

**POLLINATOR/INSECT  
RELATIONSHIP:**

Wavy-lined emerald  
geometer moth caterpillar  
(*Synchlora aerata*)



**LOCATION:**  
Wildflower Field,  
27th to 30th streets

**ADDITIONAL INSECT  
RELATIONSHIPS:**

Bees, butterflies,  
beetles, flower  
flies, beneficial  
wasps, moths

Most all *Solidago* species bloom in late summer and early fall and are a source of nectar and pollen for many bees, beetles, ants, butterflies, and moths. Goldenrod pollen is heavy and sticky and not the cause of many fall allergies—look to wind-pollinated plants, such as ragweed, as the culprits for seasonal sneezes.

One remarkable moth that uses *Solidago* as a host plant is one particularly crafty geometer moth. The name “geometer” is derived from the Greek words “Geo” meaning “earth” and “Meter” meaning “to measure”—the caterpillars of these moths are commonly known as inchworms. The caterpillar of the wavy-lined emerald geometer moth (*Synchlora aerata*) will stick petals and other plant parts to its body using silk for camouflage as it munches away on juicy buds. As the flowers fade, they are replaced. These caterpillars will also pupate in a camouflaged cocoon over winter and hatch in the spring—another reason to leave the summer growth until the following season.

## Bluebird smooth aster

*Symphyotrichum laeve* ‘Bluebird’

**POLLINATOR/INSECT  
RELATIONSHIP:**

Syrphid fly  
adult and larva  
(*Sphaerophoria  
philanthus*)



**LOCATION:**  
Chelsea Grasslands,  
19th to 20th streets;  
Wildflower Field,  
27th to 30th streets

**ADDITIONAL INSECT  
RELATIONSHIPS:**

Bees, butterflies,  
flower flies

A perfect counterpart to the yellow blooming goldenrod, this fall bloomer is enormously beneficial to late-season pollinators like Monarchs as they make their journey south during fall migration but also to many species of bees as they make final preparations for winter. Just about every native North American bee forages for its pollen and nectar, and it is host to many moths and Syrphid flies, also known as flower flies or hoverflies. The larvae of Syrphid flies are excellent at aphid control and will eat hundreds in a month. About 40% of the world’s species belong to groups with larvae that eat aphids, scales, and other soft-bodied pests. As adults, these visual bee mimics—with their black and yellow stripes—are also effective pollinators, feeding on both pollen and nectar.



"As if all there were, were fireflies /  
And from them you could infer  
the meadow." —Rebecca Elson, astronomer, author



## GET TO KNOW INSECTS

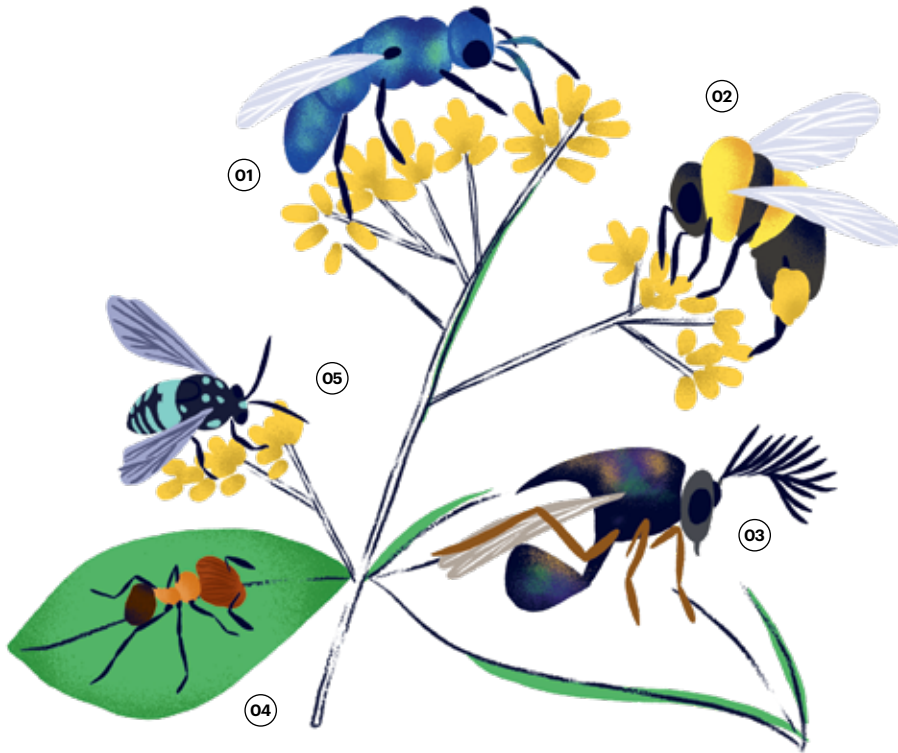
**What is an insect?** Just like all living things they have a specific definition, one that's important to understand the value they hold in ecosystems around the world and how to best support them.

A simple insect definition: a small arthropod animal that has three pairs of jointed legs, segmented bodies, an exoskeleton, one pair of antennae, and (usually) one or two pairs of wings. Other arthropods that are not insects include worms, spiders, scorpions, millipedes and centipedes, lobsters, crabs, and shrimp.

There are several Orders within the Class of Insects (Insecta), all of which are important to life on earth but with a few playing an outsized role primarily due to their relationships with plants. We'll explore a few on the following pages.

## Bees, wasps & ants

INSECT ORDER: Hymenoptera



- 01 Cuckoo wasp (*Chrysididae* family)\*
- 02 Rusty patched bumble bee (*Bombus affinis*)
- 03 Eucharitid wasp (*Eucharitidae* family)
- 04 Big-headed ant (*Pheidole megacephala*)
- 05 Neon Cuckoo bee (*Thyreus nitidulus*)

\*indicates native New York insects

All **bees**, **wasps**, and **ants** are grouped in perhaps the most important order of insects due to their mutualistic relationships with plants—this is **Hymenoptera**. This order is the third most diverse group of animals, with more than 150,000 species worldwide, 4,000 species of bees in North America alone, and nearly 500 different bees indigenous to New York and the larger Mid-Atlantic region, including sweat bees, leaf-cutter bees, miner bees, mason bees, bumblebees, and many others. These related animals share a common ancestor but it's the role they play in plant diversity and survival that is so important. Eighty percent of all plants globally are flowering plants (angiosperms). Of the world's flowering plants, approximately 80% are pollinated by native wild bees. Fruits, vegetables, nuts, and, in general, many trees exist because of the relationship between flowers and wild bees.

Bees are the vegetarian descendants of wasps, dining on protein-rich pollen, sugary nectars, and flower oils. Wasps, on the other hand, are omnivorous, also feeding on other insects. There are even parasitic wasps, creating homes for their young that rival the goriest of horror stories and zombie movies. These behaviors increase the “ick” factor we may feel for wasps but they are irreplaceable as agents for pest control. All of nature is a balancing act and without wasps, we'd soon be overwhelmed by other insects they would otherwise have as a meal. Predators like wasps are critically important for the health of gardens. Without parasitic wasps, tomato hornworms would overtake many tomato plants.

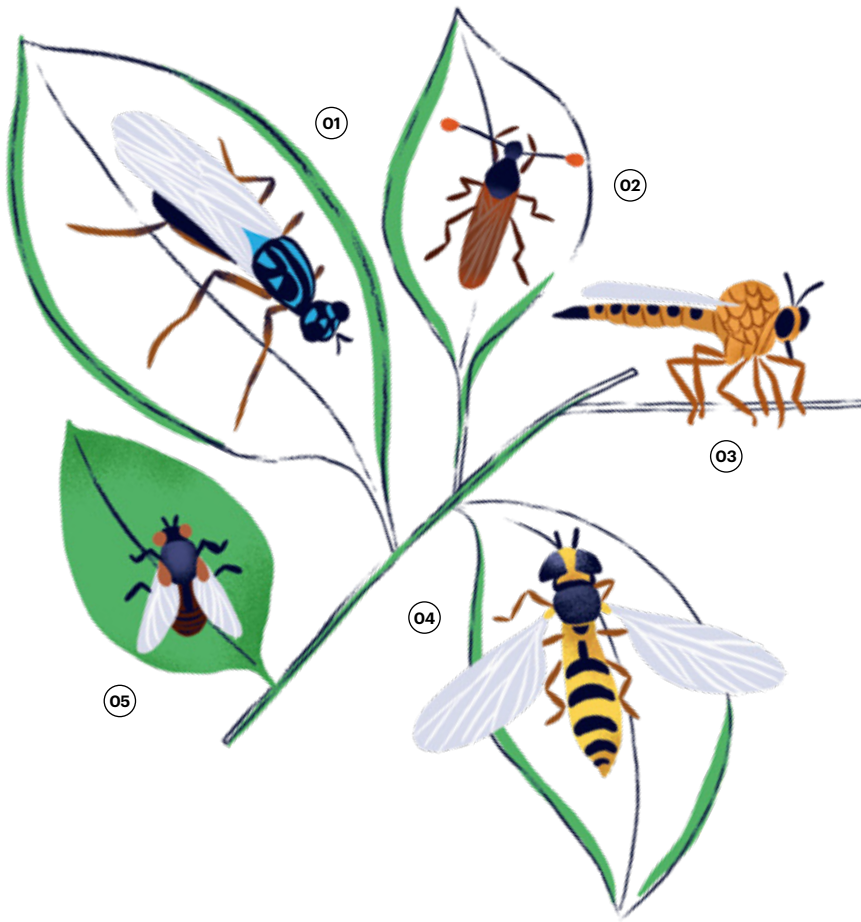
Ants are the most recent addition to the family, appearing around 100 million years ago. Ants play a special role in seed dispersal here in eastern North America. Some wildflower seeds have developed a special package of fats and proteins—called “elaiosomes”—that ants love. They collect these seeds and bring them back to their colonies, feeding the elaiosome to their young. The seeds remain intact and are in a perfect location to germinate. One example of a plant on the High Line with an elaiosome is white trillium (*Trillium grandiflorum*), a beautiful spring flower found in the Flyover.

### FUN FACT

Biologists Bert Hölldobler and E. O. Wilson once estimated that there could be 10 quadrillion ants living at any given time—or more than 1 million individual ants for every person on the planet.

## True flies

INSECT ORDER: Diptera



- 01 Robber fly (*Asilidae* family)\*
- 02 Stalk-eyed fly (*Diopsidae* family)
- 03 Flower fly (*Syrphidae* family)\*
- 04 Tachinid fly (*Tachinidae* family)\*
- 05 Blue soldier fly (*Phanerozus pampinus*)

\*Indicates native New York insects

**Diptera**, the **true flies**, is an ancient Order of insects and likely the very first pollinators. They have one pair of wings, tiny remnants of a second pair called “halteres,” and big compound eyes. They also play an important role in pollination—one group, in particular, the flower flies (*Syrphidae*), are among the most important pollinators, with 900 different species in North America alone. They’re not as specialized as many bees, but they are highly active, even when bees aren’t, so their productivity makes up for any lack of specialization. Flower flies also look quite a bit like a bee or a wasp, with their yellow, orange, black, and brown coloration. This imitation act is called visual mimicry and it serves them well as many would-be predators—and humans—will avoid the insect because it appears to have a stinger, even though flower flies are harmless. Pollination is not their only talent. As adults, they’re easy to spot hovering and darting from flower to flower, but as juveniles, about 40% of flower flies in their larval stage are voracious eaters of aphids and other plant-sucking bugs. It can be hard to recognize the larval flower fly, however, because just like moths, butterflies, bees, and beetles, all true flies undergo complete metamorphosis. They change drastically as they grow—from egg to caterpillar or larva, then pupating to emerge as a winged, mature adult.



### FUN FACT

We may think of fruit flies as a nuisance in our homes but members of the genus *Drosophila*—especially *Drosophila melanogaster*—have provided invaluable insights for scientists. Because of their rapid life cycles and the fact that about 75% of the genes that cause diseases in humans also cause diseases in fruit flies, they’ve been stars of genetic research since the early 1900s.

## Butterflies & moths

INSECT ORDER: Lepidoptera



- 01 Karner blue butterfly (*Lycaeides melissa samuelis*)\*
- 02 Luna moth (*Actias luna*)\*
- 03 Garden tiger moth (*Arctia caja*)
- 04 Rosy Maple moth (*Dryocampa rubicunda*)\*
- 05 Eastern Tiger Swallowtail butterfly (*Papilio glaucus*)\*

\*Indicates native New York insects

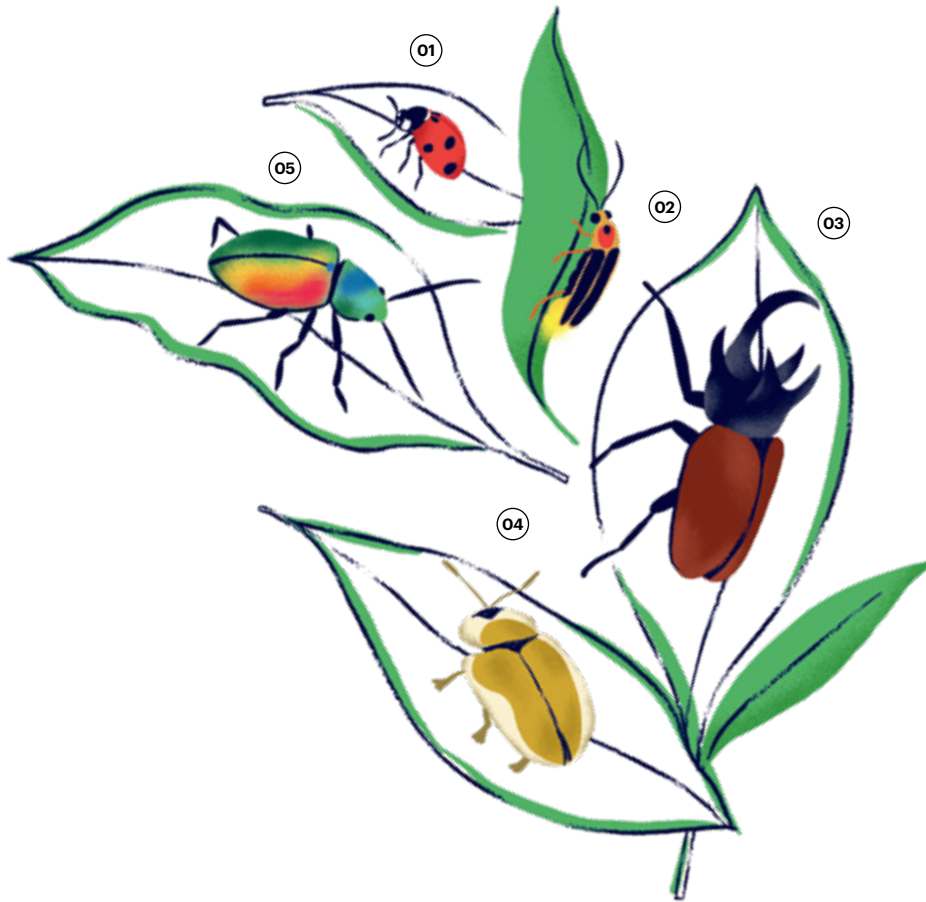
From the Order **Lepidoptera**, we have the most beloved and whimsical of all the insects—**butterflies** and their counterparts, **moths**. Both have wings covered in microscopic scales, which is the literal translation of “Lepido” (scales) and “ptera” (wings). You can tell them apart, in part, because butterflies are out in the daytime foraging among the flowers and moths are often active at night, although that’s not always the case. A more effective way to tell them apart is by taking a closer look at their antennae. Butterflies have club-shaped, continuous antennae, whereas the antennae of moths can be feathered, fringed, or even more elaborate. The science is still out on the early evolution of these animals but it’s thought that the long curling proboscis—or straw-like mouthpart—evolved as an adaptation strategy to suck up liquids. Once flowering plants came along 150 million years later, sucking up nectar (and pollinating the flower as it fed) became an adaptive advantage they still employ. And some Lepidoptera species don’t even have mouths, meaning they don’t eat at all in the adult stage of their lives! Many of these wonderful creatures are plant specialists as caterpillars, like the beautiful Monarch or the Karner Blue, and are a major source of food for birds and their young. Today, many moths and butterflies are in trouble because of climate change, habitat loss, light pollution, and pesticide use.

### FUN FACT

Most butterflies and moths have a liquid-only diet. Their long, straw-like tongue—called a proboscis—is used to suck up liquids, like nectar and sap. The Morgan’s sphinx moth has the longest proboscis at 12 to 14 inches long, which is specially adapted to get nectar from deep inside Darwin’s orchid, *Angraecum sesquipedali*.

## Beetles

INSECT ORDER: Coleoptera



01 Nine-spotted lady beetle (*Coccinella novemnotata*)\*

02 Firefly (*Photuris pensylvanica*)\*

03 Rhinoceros beetle (*Dynastinae* subfamily)

04 Golden tortoise beetle (*Charidotella sexpunctata*)\*

05 Dogbane beetle (*Chrysochus auratus*)\*

\*Indicates native New York insects

From the Order **Coleoptera**, we have **beetles**. Coleoptera is the largest of all known insect Orders with as many as 400,000 unique species including ladybugs, fireflies, scarab beetles, golden tortoise beetles, and so many more. Beetles have lived on earth for at least 330 million years, coevolving with early plants, well before dinosaurs existed. They are considered to be one of the first animal or insect pollinators, and as plants diversified, so did beetles.

Beetles have held important cultural significance since the beginning of recorded history, and their likeness has been portrayed in Egyptian hieroglyphs and jewelry, Japanese temples, and Mayan art. They have represented both the cycle of life and a harbinger of death, depending on your culture. In North America, ladybugs and fireflies are celebrated—they are often associated with luck and magic, respectively.



### FUN FACT

There are lots of beetles! They account for roughly 25% of all known species of plants and animals currently alive—there are more kinds of beetles than all plants combined.

# HOW YOU CAN SUPPORT INSECTS

As humans continue to spread out and impact every inch of the globe, it's critical that we make room for other living organisms, plants, and insects, in particular. It's a good thing that insects are so small! That means there can be plenty of room for them if we make it.

## Little things

Urban areas can provide valuable habitat for native insects. Our cities can be a refuge from single-crop agricultural plantings, and the pesticides that accompany many monoculture farms. Cities can provide diverse pollen sources that support insect populations through an entire year. That's right—many bees forage for different pollen depending on the life cycle stage they're in. Just as bears use fat stores during hibernation, queen bumblebees require high-fat pollen in autumn. Consider transforming your lawn into a native meadow, which would provide valuable foraging space for native bees and butterflies. Don't have a yard? Join your local community garden and plant a native wildflower border (added bonus: you'll attract more pollinators to your garden's tomatoes). Volunteering with local parks is another good way to practice your green thumb while supporting valuable insect habitat.

## Plant selection

If you want to start a garden or even if you're looking to bring home one plant to keep outside, opt for plants native to the region. If you're not sure, ask at your local nursery or look it up online. Native asters and goldenrod are great choices if you

have lots of sunlight and they support nearly 70 of our native specialist bees and host many butterflies and moths. Removing invasive plants is almost as important as planting native plants. Invasives outcompete and crowd out native species, and if they do provide nectar or pollen, it isn't as nourishing to insects. These plants were introduced so they didn't evolve with our local wildlife, and therefore don't support our local food webs. Grass lawns fit in here too—they don't support biodiversity at all.

## Nesting sites

Most of our native bees (70% of them!) are ground nesters, or they make their nests in underground open patches of well-draining soils. Leave some exposed soil with southern exposure when you're putting down mulch and you may welcome new neighbors. Old logs and fallen branches are great for creating safe spaces for growing beetles and many other bugs. Use them to create an interesting border or leave them under a standing tree—this simple step creates wonderful habitat. Save the cutting back of seasonal growth for the spring when temperatures are warm enough for the overwintering insects to wake up and get started (at least 55° F). Or better yet,



keep the perennial stems year-round—at least one to three feet of stems where possible. The hollow or pithy stems of many of our native plants are exactly where many of our bees make their nests—think of them as tiny apartments for their new baby bees.

## Get involved!

Join a community garden and share your knowledge and passion with other members. Help care for a school garden over the summer. Find a local nonprofit or parks group that supports and cares for native habitats and find ways to get involved with their work. Contact your local elected leaders and let them know you care about supporting native pollinators (we're not talking about honey bees!). If we are actively supporting our native pollinators through our policies and actions, all of our other insects are sure to benefit.

## Overwhelmed by where to start?

You're never too young to make a positive impact on the environment and insect conversation. Take it from 11-year-old Anusha.

My name is Anusha. I am a sixth-grader from New York and I love insects. My journey started four years ago when I was captivated by a second-grade science project on how such tiny but resilient insects survive in nature. Insects come in all shapes and sizes. Some have bright shells while others have soft bodies. Some have wings while others have spots. No matter how different, they are fascinating to me. Each insect plays an integral role in the environment.

I spend much of my free time learning and teaching others about insects. Over the years, I have visited different places to raise awareness about the sharp decline in insect populations and the importance of building urban landscapes that benefit humans and insects alike. Insects are not scary, they are just misunderstood. Join my quest for insect conservation. Many vital insects like bees and butterflies are on the verge of extinction. Help them by planting native plants in your green spaces, which will counter habitat fragmentation and act as hosts for pollinators.

Ultimately, my hope is for everyone to find insects as exciting as I do. The scariest thing is a world without insects.

Anusha Vaish, sixth-grader, insect advocate  
SaveInsects.com; LivingGreenways.com

@SaveInsectsA @SaveInsects  
 @SaveInsects

## INDEX OF SELECT PLANTS & INSECTS ON THE HIGH LINE

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*Solidago speciosa*

**Possible insect sightings:** Bees, butterflies, beetles, flower flies, beneficial wasps, moths, wavy-lined emerald geometer moth



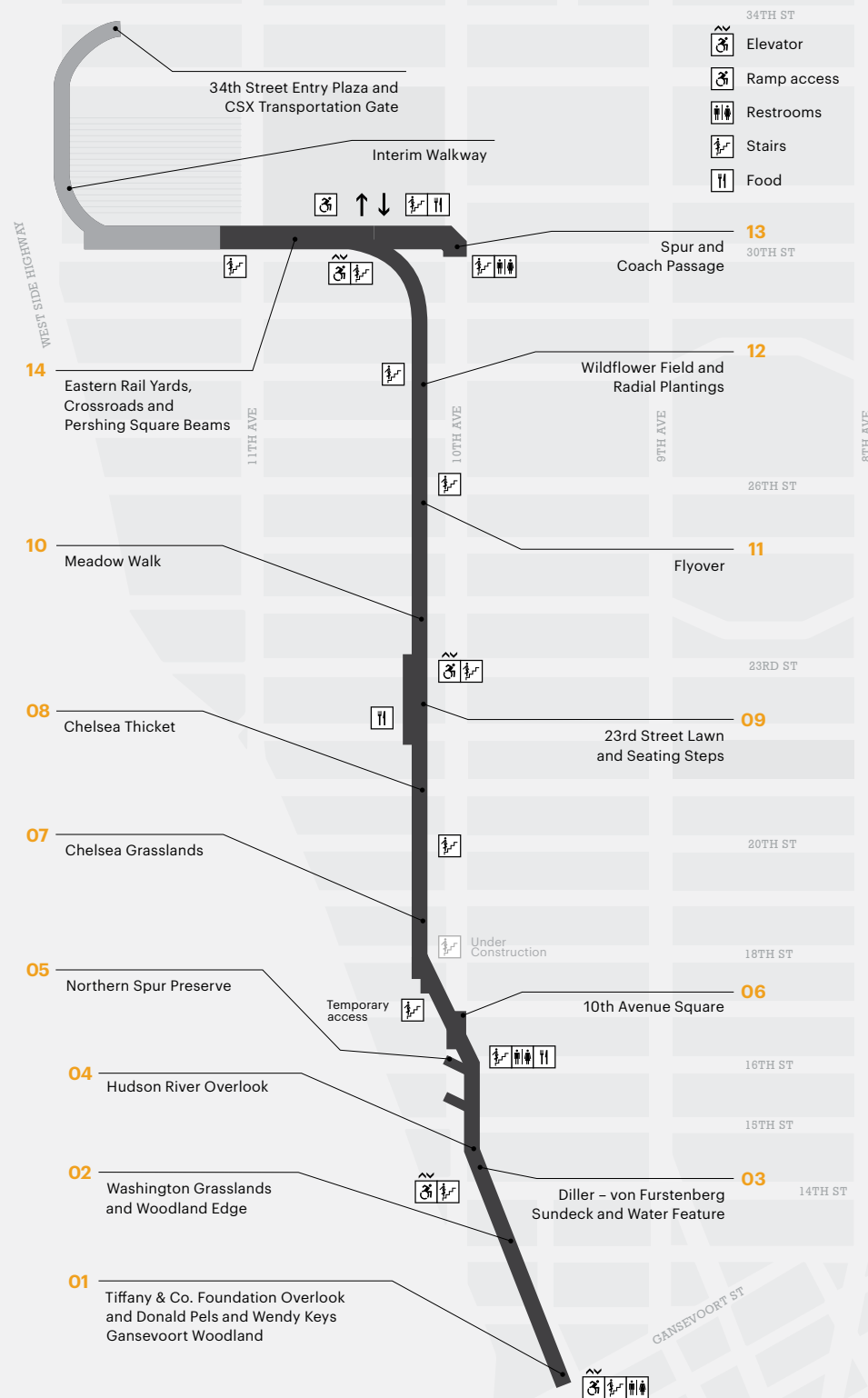
Have a good High Line insect sighting to share?  
Tag us in your park insect photos:

@highlinenyc #highlinenyc #highlineinsects

\*Please remember to respect the park rules to stay out of the planting beds and refrain from picking flowers or plants for any of your shots.

To learn more about our gardens, visit:

[thehighline.org/gardens](http://thehighline.org/gardens)



**Celebrating Insects features pop-up workshops hosted by the High Line Education team in the park every Saturday throughout the month of September and culminates with *Insectageddon*, a day-long festival of performances, workshops, readings, and films on the High Line and at partner sites across New York City and the country, envisioned by artist and poet Cecilia Vicuña.**

Learn more about *Insectageddon* through the poetry chapbook accompanying this brochure.

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**Celebrating Insects programming**

**Drop-in workshops**

Saturday, September 4, 11 & 18  
1–3pm, FREE  
On the High Line at the  
Spur, at 30th St. and 10th Ave.

Join the High Line Education team for hands-on, all-ages workshops to learn about the role native bees play on the High Line and about some of the endangered insects living in our neighborhood, and make your own insect costume to bring to *Insectageddon*!

***Insectageddon***

Saturday, September 25  
3–6pm, film screening at 7pm  
Various locations on the High Line,  
at the Sunken Overlook and  
Chelsea Market Passage at 16th St.

Come to the High Line for an afternoon festival of insect awareness and celebration: hear gardeners, scientists, activists, poets, and musicians share fascinating insect stories; take part in hands-on educational workshops for all ages; catch newly commissioned performances; and enjoy a film program of shorts and artist videos.

For event details, visit:  
[thehighline.org/Insectageddon](https://thehighline.org/Insectageddon)

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***Insectageddon* site partners**

The High Line is joined by site partners across New York City and around the country in hosting educational, literary, and artistic events for *Insectageddon*. Visit [thehighline.org/celebratinginsects](https://thehighline.org/celebratinginsects) to find details about events taking place in boroughs and cities near you!

# YOU CAN PROTECT OUR POLLINATORS

On the High Line, native bees and other pollinators are our essential partners in keeping our plants healthy. But many of the species that visit or live on the High Line are threatened by disease, pesticides, climate change, and habitat loss.

When you make a donation today, you'll help our gardeners ensure these creatures find a safe haven on the High Line. You'll support our pollinator-friendly gardening practices, help us to install bee hotels and water features along the park, and much more.

[thehighline.org/helpinsects](https://thehighline.org/helpinsects)

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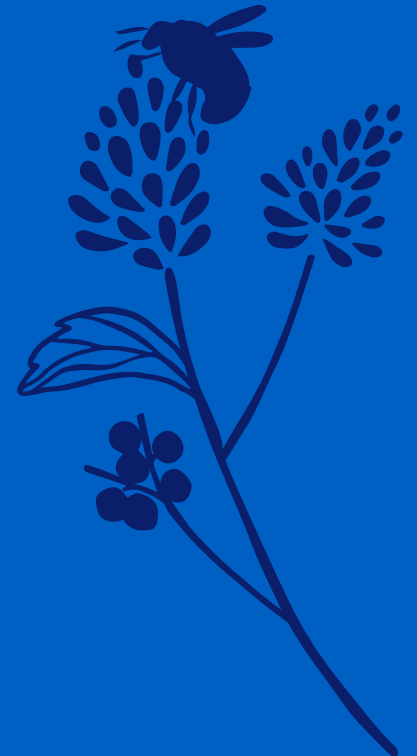


**PUBLIC SUPPORT**

High Line Programs and accessibility are made possible, in part, with public funds from the New York City Council, under the leadership of Speaker Corey Johnson.



**NYC Cultural Affairs**



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Illustrations by Marisol Ortega.

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*Insectageddon* has been developed with the support of our advisors: Anusha Vaish, sixth-grader and insect advocate; and Chrissy Word and Emily Fano of the New York City Pollinator Working Group (NYCPWG).

