

Welcoming Fireflies & Other Creatures to Your Yard

The Hospitable Gardener: *Etiquette Tips for Hosts of Curious Creatures*

Introduction: What We're Talking About

- A word about biodiversity.
- Getting to know seven creatures found in Northern Virginia including:
 - Fireflies
 - Hummingbirds
 - Ladybugs
 - Box Turtles
 - Yellow Garden Spiders
 - DeKay's Brownsnakes
 - Praying Mantises
- Discussing habitat-supporting garden practices to welcome these creatures and help them thrive.
- Recommending some specific native plants that will help support them.

Biodiversity

There's been much attention to the climate crisis, but many scientists say the biodiversity crisis is just as urgent. It's hard to quantify the biodiversity crisis when we can't even quantify the number of species on Earth. The most common number given is 8.7 million species, but reputable estimates range from 5.3 million to one trillion.

The latest estimates say wildlife figures have plunged by an average of 69 percent between 1970 and 2018.

United Nations experts say the five main drivers of loss of life are:

- changes in land and sea use,
- exploitation of natural resources,
- global heating,
- pollution, and
- the spread of invasive species.

Metaphors for why this matters:

- Douglas Tallamy's plane.
- Alonso Abugattas' jigsaw puzzle.

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This talk is based on the premise that we can do a lot to help by starting in our own yards.

Fireflies, aka Lightning Bugs

Fireflies are neither flies nor bugs but are beetles in the Lampyridae family.

They have two pairs of wings. The hard outer pair, called elytra, protect the more delicate hindwings used for flying. There are about 2,250 species worldwide, with more than 150 species in North America. The D.C. area has more than three dozen kinds of fireflies.

Some adult fireflies don't light up, including most of those west of the Rocky Mountains. Some of these are called Daytime Fireflies and Black Fireflies. The most common fireflies in North America and in our area is the Eastern or Big Dipper Firefly (*Photinus pyralis*).

Not all adult fireflies glow, but all species have eggs, larvae and pupae that do. Glowing serves both to attract mates and to warn predators that they won't taste good and are sometimes toxic. Different species have different colors, different flashing patterns, different places and times where they display.

Firefly Life Cycle

Firefly larvae are called glowworms. They are predatory, feeding on soft-bodied earthworms, slugs and snails. Most take two years to reach maturity. Fireflies lay their eggs in a moist area of soil or moss. The larvae hatch in two weeks, and crawl into the ground spending months to years eating worms, slugs and snails. The larva's light (and later as pupa) warns off predators in those dark spaces.

As adults, most fireflies don't eat or sleep. They are entirely devoted to reproduction. Some male fireflies transfer a nutrient-rich substance with their sperm, called a "nuptial gift."

Are Fireflies Endangered?

Firefly researchers Sara Lewis and Sonny Wong published an article in 2020 saying that "Despite evidence of declines, a comprehensive review of the conservation status and threats facing the approximately 2000 firefly species worldwide is lacking." A 2021 study evaluated 128 species in North America and found that 11 percent are threatened with extinction.

Another assessment published by the International Union for Conservation of Nature's Red List of Threatened Species found that one in three species of North American fireflies may be at risk of extinction.

Alyssa's takeaway: While more study is needed, action must start now.

You can participate in a Firefly citizen science tracking program at <https://scistarter.org/firefly-watch> or at <https://www.fireflyatlas.org/>.

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What Fireflies Need Now

Threats to fireflies include:

- **Habitat loss.** Particularly for the larvae and pupae, who live in the soil and need it to be organic-rich and moist.
- **Light pollution.** Fireflies think the brightest light in the night sky is the moon and can be disoriented by other lights. Light pollution also makes it hard to see each other's flashes while displaying for courtship.
- **Pesticides.** Fireflies are susceptible to most insecticides, including those for lawns and mosquitos.
- **Climate change.** With more drought-like conditions, suitable habitat has been eroded.

You can help by:

- **Mindful mowing.** Fireflies tend to crawl up grass and other plants as the day progresses in preparation for display flights. Keeping the blades high and mowing early in the day can help. Taller lawns also keep moisture levels higher.
- **Leave leaf litter and woody debris as habitat.** Not enough moisture means not many fireflies.
- **Avoid disturbing soil.** Immature fireflies live there!
- **Turn out the lights.** Use motion detectors, timers, and the lowest amount of light needed. Red lights are the least disturbing.
- **Plant highly supportive Keystone Plants** that help the environment generally, especially trees which provide habitat and biodiversity, hold moisture and reduce temperatures.

Keystone Plants

Named "Keystone" because they play the same support role that the keystone in a Roman arch plays. Not all native plants support wildlife equally. Seventy-five percent of the insect food required by native animals is supported by **just a few plant genera**.

A yard without keystone plants will fall far short of the insect abundance necessary to sustain viable food webs, even if dozens of native plant genera are present. -- *Douglas Tallamy*

- Keystone Species: White Oaks (*Quercus* spp.)

Oak trees are divided into two families: Red and White. Trees in the [White Oak](#) family support more than 530 kinds of Lepidoptera. The White Oak family in Northern Virginia includes Swamp White Oak, Chinquapin Oak, Overcup Oak, Chestnut Oak, Post Oak and Northern White Oak. There are cultivars of Oaks for small yards.

Blue Jays plant more acorns than squirrels do.

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- Sixteen Keystone Plants for Your Yard (22204 Arlington)

TREES

Oak (<i>Quercus</i>)	513 Lepidoptera species supported
Beach, Plum, Cherry, Chokecherry (<i>Prunus</i>)	390 Lepidoptera species supported
Birch (<i>Betula</i>)	321 Lepidoptera species supported
Willow (<i>Salix</i>)	316 Lepidoptera species supported
Maple, Boxelder (<i>Acer</i>)	274 Lepidoptera species supported
Apple, Crabapple (<i>Malus</i>)	264 Lepidoptera species supported
Aspen, Cottonwood, Poplar (<i>Populus</i>)	259 Lepidoptera species supported
Hickory, Pecan, Pignut, (<i>Carya</i>)	239 Lepidoptera species supported

PERENNIALS

Goldenrod (<i>Solidago</i>)	114 Lepidoptera species supported
Asters (<i>Asters</i>)	106 Lepidoptera species supported
Strawberry (<i>Fragaria</i>)	73 Lepidoptera species supported
Sunflower (<i>Helianthus</i>)	66 Lepidoptera species supported
Joe-pye weed, Thoroughwort (<i>Eupatorium</i>)	33 Lepidoptera species supported
Violet (<i>Viola</i>)	30 Lepidoptera species supported
Rose mallow (<i>Hibiscus</i>)	29 Lepidoptera species supported
Switchgrass (<i>Panicum</i>)	25 Lepidoptera species supported

From National Wildlife Federation's Native Plant Finder at
<https://www.nwf.org/NativePlantFinder/Plants>

Hummingbirds

There are more than 300 species of hummingbirds, all in the Western Hemisphere. Seventeen species of hummingbirds nest in the United States. Only Ruby-throated Hummingbirds nest in the Eastern United States.

A hummingbird must consume approximately one-half of its weight in sugar daily, feeding five to eight times per hour. In addition to nectar, these birds also eat many small insects and spiders, and may also sip tree sap or juice from broken fruits.

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They Come to Breed

Ruby-throated Hummingbirds weigh less than a nickel yet manage to fly 500 miles non-stop over the Gulf of Mexico during both Spring and Fall migration. It takes 18 to 24 hours to cross the gulf. Many Ruby-throated Hummingbirds return to the same area year after year to nest. Ruby-throated Hummingbirds show up in the D.C. area each year generally starting in mid-April. Those that stay immediately start pairing up, building a nest, and raising young.

Baby hummingbirds need a high-protein diet of insects (mosquitos, gnats, aphids and caterpillars) to fuel fast growth as well as nectar to meet their energy needs. The mother feeds them by regurgitating food into the chicks' mouths, feeding them for nearly a month.

After the babies have fledged, the "post-breeding dispersal" means that hummingbirds spread out beyond their nesting grounds, building strength until the return migration.

It's a Dangerous World for Little Birds

Strong winds can blow hummingbirds around, and downpours can potentially drown them. Trees and shrubs can provide shelter from the elements and predators.

The number one predator of hummingbirds is cats, number two is the Chinese mantis. Hawks, frogs, fish, snakes, lizards, and even dragonflies also predate them. They can get caught in spiderwebs. Opportunistic squirrels, chipmunks, jays and crows will eat eggs and baby hummers.

Pesticides poison their protein and possibly the birds themselves when a chemically treated critter is ingested.

Sugar-water in feeders can ferment in hot weather, and bacteria will grow. Black mold can be fatal. If you use feeders, change the nectar every one to five days depending on weather, and clean the feeder weekly. Soap and water are best. Never use a sugar substitute. Even better is having native plants as feeders.

Native Plants to Support Hummingbirds

- Beebalm (*Monarda didyma*)
- Blazing Star (*Liatris* spp.)
- Butterfly Weed (*Asclepius tuberosa*)
- Cardinal Flower (*Lobelia cardinalis*)
- Coral Honeysuckle (*Lonicera sempervirens*)
- Crossvine (*Bignonia capreolata*)
- Eastern Red Columbine (*Aquilegia canadensis*)
- Garden Phlox (*Phlox paniculate*)
- Great Blue Lobelia (*Lobelia siphilitica*)
- Trumpet Vine (*Campsis radicans*)

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A Closer Look at Trumpet Honeysuckle (*Lonicera sempervirens*)

- 8' to 20' high with 6' to 12' spread.
- Red flowers with yellow center.
- Semi-evergreen.
- 'John Clayton' variety was found in Gloucester, Virginia, and has a smaller height and spread and all-yellow flowers.
- Likes sun and moist soil.
- Train on trellis or use as groundcover.
- Hosts Hummingbird and Snowberry Clearwing moths.
- Almost guarantees visits from Hummingbirds.
- [Tried and True Fact Sheet](#) available.

Ladybugs

There are more than 5,000 species of ladybugs in the worldwide family of *Coccinellidae* beetles. They are typically called ladybugs in North America, and ladybirds in Great Britain. Over 450 species are found in North America, and 12 call Virginia home. Ladybugs are beetles, with hard outer wings (elytra) covering tissue-like flight wings.

Most ladybugs are considered beneficial both as adults and as larvae, because their preferred food is aphids, though they also eat mites, scale insects, thrips and other small insects and insect eggs. Children are introduced to ladybugs through nursery rhymes, leading to widespread awareness and affection for ladybugs.

A ladybug can eat nearly 5,000 aphids over the span of its life.

Ladybug Life Cycle

The ladybug life cycle starts as eggs, which are often laid near aphids. After hatching, the larvae go through four instar stages over a 20-to-30-day period. Larvae look a bit like tiny alligators. The last larval instar attaches itself to a leaf to pupate. The pupal stage lasts three to 12 days before the adult emerges. Adults live a few months to over a year.

Adults overwinter beneath leaf litter, under rocks and bark, flocking together to mate and lay eggs, then hibernate until spring, living off fat reserves.

Problem Ladybugs

Asian Multi-colored Lady Beetles (*Harmonia acxyridis*) started being imported to North America in 1916 for pest control. They are highly successful predators, who sometimes move on to human fruit crops when their preferred food is gone. Asian Multi-colored Lady Beetles are slightly larger

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than most native varieties and release a stinky yellow fluid as a defensive mechanism. In the absence of natural predators, their populations have expanded greatly.

Since the 1990s, as autumn approaches, adult beetles in large numbers are attracted to homes and other buildings for shelter. Sealing entry points and vacuuming up intruders is recommended.

It is currently unclear how much the success of Asian Multi-colored Lady Beetles will impact native species, which have declining populations. Many scientists believe the competition is already hurting native populations.

Adult Asian Multi-colored lady beetles can be identified by a series of four spots on their head that form a “W” or “M.”

Stay Away from Pesticides

- Ladybugs are killed by pesticides.
- Ladybugs are predators, and will starve without abundant insect life, especially aphids.
- Pesticides don't discriminate which insects they kill.
- Ninety-six percent of songbirds feed their babies protein. North America's insects are the reason behind bird migration in the western hemisphere. Migratory birds need protein and fat to fuel their flight.
- Pesticides kill life in the soil.
- Organic pesticides are still pesticides.
- Fungicides may be just as bad.
- Cultivate natural controls and change your standards.
- Use non-toxic controls when needed.
- If you do use pesticides, read the label and follow directions.

Swamp Milkweed - A Plant Ladybugs Will Love

Swamp Milkweed, or *Asclepias incarnata*, is one of the 14 Milkweed plants native to Virginia.

It grows four to six feet high, has pink flowers, and can take more shade and wetter soil than other Milkweeds. It attracts hummingbirds, native bees, and is host plant for the Monarch butterfly.

Swamp Milkweed is highly prone to attacks by invasive Oleander Aphids (*Aphis nerii*) and will delight your Ladybugs.

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Eastern Box Turtles (*Terrapene carolina*)

- World-wide, there are 328 species of turtles, 57 native to North America. Eleven turtles are native to the Greater D.C. area.
- The Eastern Box Turtle is our region's only completely land turtle, though they enjoy water and damp places.
- A hinged plastron (the bottom shell) allows the turtle to close the space between the carapace (top shell), to completely "box up."
- Their lifespan is usually 25 to 35 years, but some have been known to live more than 100 years!
- Mature size is 4 by 6 inches or so.
- Eastern Box turtles usually have a home range, usually less than two acres and will seek to return to their home range if moved.
- Their diet is omnivorous and opportunistic. They eat a variety of plants, mushrooms, fruits, insects, fish, eggs and even carrion. They become less carnivorous as they age.

Making Tiny Turtles...

- Male Eastern Box Turtles have reddish eyes and concave plastrons. They also tend to be more colorful than females.
- Female Eastern Box Turtles have brown eyes and a flat or convex plastron.
- They reach sexual maturity around the age of five.
- Mating season is spring through fall.
- Female turtles can store sperm for up to four years.
- Nesting season is in May and June. Females dig a nest in sandy soil using their hind legs and lay anywhere from one to 11 eggs. They may have more than one nest.
- Temperature influences whether babies will be male or female. Warmer temperatures make more females.

A Few More Turtle Facts

In northern regions, Eastern Box Turtles find a comfortable, somewhat insulated spot, known as a hibernaculum. While they don't technically hibernate, they become lethargic and enter a state known as brumation, starting in October and November and lasting until April. In warm winters, they may wake and find another resting spot.

In hot summers, they are active in the mornings then find cool areas to rest (i.e., under logs, leaves, in mud, or abandoned mammal burrows).

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Baby turtles are on their own from the time they hatch. The hinge to closing their shell doesn't develop until they are four to five years of age, and as a result raccoons, foxes, skunks, dogs and some birds will predate them.

The conservation status Eastern Box Turtles is “Vulnerable,” just below “Endangered.”

How to be a Turtle Friend

- Turn your yard into a good place for turtle to visit and live. Brush piles, native plants, leaves, and moist hiding places make good habitat.
- If you see a turtle trying to cross the road, move it to the side it's heading toward, facing the way it was heading.
- Don't keep an Eastern Box Turtle as a pet. The pet trade is a major contributor to their status as a species in decline. It is illegal to take them out of the wild, it causes them stress, and it removes them from the breeding pool.
- Don't paint a turtle's shell and discourage others from doing so. The chemicals in the paint can damage their lungs and sinuses. The paint destroys their natural camouflage which helps them stay alive.
- If you discover a turtle nest, do not disturb it.
- Do not assume a baby turtle on its own needs your help. Enjoy looking at it, but unless it is heading onto a road, don't pick it up.
- If you find an injured turtle that needs rehabilitation, make a careful note of its exact location before picking it up. After rehabilitation, it must be returned to its collection spot.

Leave the Leaves

- Insects overwinter in one of the stages of development. Many insects, including most lepidoptera, use leaf litter for cover.
- Leaves provide good mulch for plants, and provide nutrients to decomposers in the soil, creating nutritious, healthy soil.
- Leaves help conserve moisture in the soil.
- Plant stems provide nesting spaces for other insects, so leave 8” to 24” of stems on native plants that are the size of a pencil or more.
- Leaves provide nesting material.
- Wait until full spring to clean up -- if needed and only where you must.

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Mayapples (*Podophyllum peltatum*) are a Turtle Treat

- Mayapples are a charming ephemeral which is native to mixed deciduous forests from eastern Canada to Florida.
- Mayapples colonize by rhizomes to form dense mats of clones, but depend greatly on turtles to plant new, genetically diverse plants.
- Leaves are held like an umbrella from the stalk. Immature plants have a single stalk, but mature plants divide in a “Y” shape into two canopies.
- A single white bloom is formed at the center of the Y, which matures to a small fruit which turns yellow when ripe.
- All parts of the Mayapple are toxic except for the ripe fruit.
- Turtles are attracted to the fruit, which they eat. Their digestive system scarifies the seed, making it more able to sprout.

BONUS PLANT: Wild Strawberry

Yellow Garden Spider (*Argiope aurantia*)

This spider has many names: Garden Spider, Black and Yellow Garden Spider, Golden Garden Spider, Writing Spider, Garden Orb Weaving Spider, Corn Spider, Zigzag Spider and Banded Garden Spider.

Males and females are sexually dimorphic, looking very different from each other. The females are bigger (three quarter’s inch to just over an inch) and have brighter black and yellow markings. Males are about a quarter of the size of females and are a duller red-brown color.

Yellow Garden Spiders are native to North America. Their range extends from northern Central America to southern Canada. They are found in a variety of habitats, but particularly in “edge” habitats, which suburban gardens mimic.

Webs can be up to two feet in diameter and are usually built in a somewhat sheltered area attached to tall perennials or other plants. A distinctive zigzag pattern line (called stabilimentum) is woven vertically in the center of the web.

It’s a Spider’s Life...

These spiders are crepuscular (most active at dawn and twilight), and build their webs at night, often after consuming the old web.

Yellow Garden Spiders are predators, with dragonflies, damselflies, wasps and bees as favorite prey, though they also eat many other insects.

They rest in the center of the web feeling for vibrations. The spider waits until the unlucky prey stops moving, then wraps them in silken webbing. After the prey is secured, the spider envenomates by biting them, which liquefies their internal organs.

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The spider venom is not a danger to humans (unless the human is allergic to spider venom) or other mammals and feels similar to a bee sting.

Yellow Garden Spiders are not aggressive and tend to flee from humans. They only bite humans defensively when provoked.

Bringing Up Baby

Male Yellow Garden Spiders court a female by plucking at her web.

Mothers attach egg sacks to underneath vegetation or sometimes to the web. Babies hatch in late summer or autumn, or sometimes remain dormant in the egg sac through winter in cold areas.

Eggs sacs are heavily parasitized by wasps and flies.

Baby Yellow Garden Spiders release silk, which catches the wind and carries them to another location. This practice is called ballooning. The size of young spider webs increases as they grow.

Yellow Garden Spiders live about a year. Females usually die in the first hard frost after mating but may live longer in mild climates. Males usually die after mating.

How to Support Yellow Garden Spiders

Fortunately, Yellow Garden Spider populations are stable. Unfortunately, 16 species of North American Arachnids have been named as Endangered.

Don't use pesticides, which kill their food and may kill them if the pesticide gets on them directly.

Provide abundant native plants that are the basis of a healthy eco-system, especially Keystone species that support many insects.

If you're in a garden with lots of plants, look for and avoid webs, especially in the morning.

Remember that spiders function as efficient, non-polluting pesticides. They consume an estimated 400 to 800 million tons of insects every year. Fight the phobia!

Other common spiders in Northern Virginia include various Orb Weavers, Jumping Spiders, Crab Spiders, Wolf Spiders, Cellar Spiders, and Nursery Web Spiders.

Keystone Species: Goldenrod (*Solidago* spp.)

- At least 10 types native to the Chesapeake Bay Watershed.
- 1' to 6.5' - cut back until early July if you want to make more compact.
- Collectively supports 115 species of Lepidoptera.
- Often confused with hay fever-causing Ragweed.
- Great for a late season show.
- Deer rarely severely damage.
- Tried and True Factsheet available for [Solidago rugosa](#).

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Dekay's Brownsnakes (*Storeria dekayi*)

- Also known as Northern Brownsnake, Brown Grass Snake, Rock Snake and Storer's Dekay's Snake.
- Virginia has 30 native snake species, about 19 in Northern Virginia. The only locally native venomous snake is the Northern Copperhead.
- The secretive Dekay's snake is the most common snake in the National Capital area. Their range includes most counties in Virginia and much of the eastern United States
- Adults have grey-brown backs with darker spots along the back that fade towards the tail, and often have a darker head.
- While they can grow to be as much as 19" long, adults are usually 9 to 13" long.

The Life of a Snake...

- Dekay's snakes give live birth to 3 to 31 babies in summer, who are the size of matchsticks.
- Youngsters are darker in color and have a cream or yellow band around their necks.
- Dekay's snakes eat slugs, snails, soft-bodied insects and earthworms.
- These are harmless snakes who may musk (release a bad smell), or pretend to strike, or even play dead as a defense.
- Aggregations of Dekay's Brownsnakes occur year-round, but especially during winter hibernation, which is usually in abandoned ant mounds or rodent holes.
- Dekay's Brownsnakes are eaten by free-ranging domestic cats, various snakes and birds, raccoons, and opossum.
- Populations have declined in recent years, presumably from habitat destruction and use of pesticides, which kills their prey.

How to be a Friend to Dekay's Brownsnakes

Dekay's Brownsnakes are secretive and nocturnal. When found, they are usually under boards, trash, logs and rocks. They live primarily in the soil/humus layer.

- Protect the habitat snakes need by leaving fallen branches when practical and/or creating a brush pile.
- Rock piles, leaf litter and low, dense shrubs also provide valuable safety for snakes and other wildlife.
- Keep cats indoors.

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A Plant a Dekay's Snake Could Love: [Rhus aromatica 'Gro-Low'](#) (Gro-Low Fragrant Sumac)

- Low-growing shrub with branches that touch down and root as well as suckering, creating a dense thicket.
- Grows to three feet and can be used as a ground cover.
- Fragrant leaves that set in clusters of three - sometimes mistaken for Poison Ivy.
- Has both male and female flowers, which will then set red fruit which may persist into winter.
- Tolerates clay soil and drought.
- Good for erosion control.
- Arlington County is using for street-side plantings.

BONUS PLANT: [Itea virginica](#) (Virginia Sweetspire)

SECOND BONUS PLANT: [Polystichum acrostichoides](#) (Christmas Fern).

Praying Mantises

There are more than 1,500 species of mantids worldwide. (Mantids are an entire order of insects - *Mantodea*. The Mantis genus is part of that order.)

All have front legs that fold in a “praying” stance and long thoraxes that function like a neck, allowing the triangular head to swivel.

Females are generally larger than males.

All mantids are predators, feeding on anything they can catch, including smaller mantids, making them cannibals. Their indiscriminate predation makes their value for pest control questionable.

The Carolina mantis (*Stagmomantis carolina*) is the only mantis native to Virginia.

Love Hurts

Sometimes Praying mantis females practice “sexual cannibalism,” especially undernourished females.

The headless male is able to continue mating for some time, even without his head, and the extra protein for the mother may mean the offspring are more likely to survive.

Sexual cannibalism is not unique to mantises. It is a known phenomenon practiced by Black widow spiders, some Jumping spiders, Green anacondas, scorpions, some octopus and other creatures.

Get to Know the Local Guy

Our native Carolina Mantis is fairly small, with females measuring up 2 to 2.5 inches long, with the males a little shorter at about 2.2 inches. Females have much bulkier bodies than males.

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The camouflage color is brown, gray or green. The nymphs are able to adjust their color with each molt.

Wings on adult females only extend three-quarters of the way down the abdomen, and females cannot fly. Males have long wings and fly readily.

Both males and females have a dark dot on each of their outer wings.

Carolina Mantises are found from the United States southwards to Brazil.

The Interlopers

Chinese mantises (*Tenodera sinensis*) started being brought to North America in Pennsylvania accidentally 1896.

They are larger than native Carolina mantises - female Chinese mantises can reach 5 inches in length. The most distinctive difference is that the wings on a mature female Chinese mantis reach the length of her abdomen.

A Chinese mantis egg case (ootheca) looks something like a tan toasted marshmallow and is nearly as large as a ping-pong ball.

European mantises (*Mantis religiosa*) were introduced to North America accidentally in 1899 on plants intended for a nursery and later deliberately brought in hopes of controlling Gypsy Moth Caterpillars.

European mantises can be up to 3.5 inches long.

A European mantis ootheca is similar to Carolina mantises, but not as flattened or smooth and have no stripes.

These two introduced mantises outcompete the Carolina mantis for food sources and prey on the Carolina mantis.

How to Help the Carolina Mantis

- Do not purchase Chinese or European ootheca for pest control or to hatch as pets.
- If you find a non-native ootheca (usually in winter up to early May), destroy them. You can cut through them, crush them, or submerge them in water.
- If you aren't sure about your identification, use iNaturalist app for comparison photos.
- Plant native plants to support the insects they eat.

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Habitat-Supporting Practices Round-Up

- Cut down on light pollution. (*Fireflies*)
- Eliminate pesticides. (*Fireflies, Hummingbirds, Ladybugs, Yellow Garden Spider*)
- Mow high. (*Fireflies*)
- Leave the leaves. (*Fireflies, turtles, Dekay's Brownsnake*)
- Avoid disturbing the soil. (*Fireflies*)
- Plant native plants, especially Keystone Plants. (*Fireflies, Hummingbirds, Turtles, Yellow Garden Spider, Carolina Mantis*)
- Have trees and shrubs for safe shelter. (*Hummingbirds*)
- Keep cats indoors. (*Hummingbirds, Dekay's Brownsnake*)
- Keep feeders clean. (*Hummingbirds*)
- Don't purchase and release non-natives. (*Ladybugs, Carolina Mantis*)
- Create brush piles. (*Turtles, Dekay's Brownsnake*)
- Don't keep as a pet. (*Turtles, Carolina Mantis*)
- Create rock piles. (*Dekay's Brownsnake*)
- Destroy non-native eggs. (*Carolina Mantis*)

Good practices we didn't cover.

- Offer clean water.
- Keep snags.
- Remove invasive plants.

A Plant for Carolina Mantis...?

Anything native. Because our native plants create the supportive, sustaining eco-system for all our native creatures.

Find out about specific native plants at:

- MGNV Tried and True Native Plant Selections for the Mid-Atlantic Region (<https://mgnv.org/plants/native-plants/>).
- Plant NOVA Natives (<https://www.plantnovanatives.org/>).

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Resources to Look Further and Learn More

- Native Plants for Wildlife Conservation Landscaping: Chesapeake Bay Watershed. By U.S. Fish & Wildlife Service
A great native plant reference book
- Audubon Native Plant Database: <https://www.audubon.org/native-plants>
- Books by Douglas W. Tallamy: Bringing Nature Home; The Nature of Oaks; Nature's Best Hope, A New Approach to Conservation That Starts in Your Yard
- Fireflies: Silent Sparks by Sara Lewis, and "A Future for Fireflies" by Elizabeth Collaton at <https://mgnv.org/climate-change/a-future-for-fireflies/>
- Home Grown National Park website: <https://www.homegrownnationalpark.org/>
- How to make your yard a wildlife sanctuary - Audubon at Home Northern Virginia: <http://audubonva.org/audubon-at-home-1>
- Lady Bird Johnson Wildflower Center: <https://www.wildflower.org/>
- Light at Night: More info about what can be done to help wildlife is at International Dark Sky Association website <https://www.darksky.org/light-pollution/wildlife/>
- National Wildlife Federation's Native Plant Finder: <https://www.nwf.org/NativePlantFinder/>
- The local natural world: A Capital Naturalist by Alonso Abugattas at <https://capitalnaturalist.blogspot.com/>. He also runs a very active Facebook page.
- Virginia Herpetological Society: <https://www.virginiaherpetologicalsociety.com/>