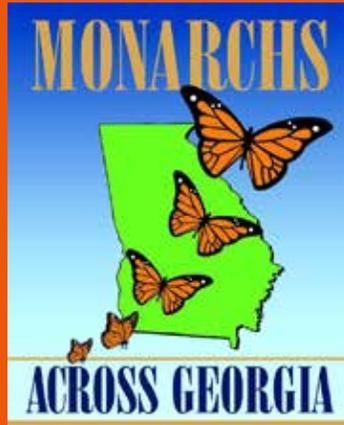


The Chrysalis

Emerging News from Monarchs Across Georgia

A Committee of the Environmental Education Alliance of Georgia



Upcoming Events

[Monarch Citizen Science Project](#)

Observation Period
(latitudes < 35°N)
August 1 - September 25

[Monarchs Across Georgia "Pollinator Symposium"](#)

Saturday, September 23
Monastery of the Holy Spirit
Conyers, GA

[Symbolic Monarch Migration Project](#)

Deadline: October 13
Read more on page 6.

[Outdoor Learning Symposium](#)

Friday, October 20
Southwest Atlanta Christian
Academy
Atlanta, GA

[EEA Annual Conference](#)

March 2-4, 2018
Unicoi State Park & Lodge
Helen, GA

Volunteers Urgently Needed for Monarch Citizen Science Project

Monarch Watch is seeking the immediate assistance of hundreds of monarch enthusiasts and citizen scientists to collect observations of monarchs in their area during the spring and fall. This project will assemble quantitative data on monarch numbers at critical times during the breeding season. The data from these observations will be used to assess their value in predicting trends in the population.

The decline in monarch numbers over the last fifteen years has inspired numerous attempts to define critical factors that explain the inter-annual variation in monarch numbers. The data sets used for these analyses have had a variety of limitations which have either been ignored or underappreciated by the authors of a number of publications. The truth is that much of the data that is available is too general and does not adequately represent important aspects of the biology that underlies the development of the population each reproductive season.

There are numerous gaps in our knowledge and some of these gaps can be addressed if we can convince a large number of monarch enthusiasts (citizen scientists) to record the number of monarchs they see each day and what the monarchs are doing, along with general information about the physical conditions associated with each observation.

Observation Periods

The observation periods depend on your location. For each day, report the number of monarchs seen.

- Observers located at a latitude less than 35°N (i.e., "South"): March 10 - April 30 and August 1 - September 25
- Observers located at a latitude greater than 35°N (i.e., "North"): April 1 - June 10 and July 15 - August 20

More information is available at:

monarchwatch.org/blog/2017/03/31/new-monarch-watch-citizen-scientist-project.



Native Bees of Georgia

by Trecia Neal

Green Gardens Education & Designs

MANY PEOPLE KNOW that bees pollinate one out of every three bites of food that we eat in the United States. This includes the pollination of almost every fruit, nut, and vegetable crop that is produced for sale or in the home garden. "If we want to talk dollars and cents, pollinators add 217 billion dollars to the global economy, and honey bees alone are responsible for between 1.2 and 5.4 billion dollars in agricultural productivity in the United States. In addition to the food that we eat, pollinators support healthy ecosystems that clean the air, stabilize soils, protect from severe weather, and support other wildlife." (Pollinator Partnership) When people think of bees, most people think of the honeybee, *Apis mellifera*, which is not a native bee of the United States. This is actually the European honeybee, and they were brought to the United States by European settlers. These bees promptly escaped from their hives after arrival and began pollinating the native landscape surrounding them.



Carpenter bee (*Xylocopa virginica*), common in Georgia.
Photo credit: Karan A. Rawlins, University of Georgia,
Bugwood.org

Honeybees, however, are unable to pollinate many of our favorite plants such as tomato or eggplant flowers. They are also not very good pollinators of some of our other native plants, such as pumpkins, cherries, blueberries, and cranberries. Because of this, and the fact that the honeybee populations are in decline, we have realized that humans should not just depend on the honeybee to pollinate all of our crops and flowers. The native bee population has been dropping since the late 1990's, and also in 2006, there were large increases in honeybee losses, up to 30-90% of any individual colony across the East Coast of the United States. These honeybee losses were attributed to the phenomenon called Colony Collapse Disorder (CCD).

This reduction in honeybee hives has caused food production costs to rise as well as reduced crop yields. Many farmers must use honeybee hives, which they rent from apiarists, in order to make sure that their crops are completely pollinated. If honeybee populations continue to drop, it could cause agricultural production to drop precipitously. It would be a good idea, then, to have other pollination strategies available for farmers and homeowners. Luckily, there are up to 4,000 native bee species that live in North America. These bees have already evolved to pollinate every fruit, flower, nut, and vegetable crop that is already growing here. However, a lack of knowledge about our native pollinators has contributed to an over-reliance on the honeybee by farmers. In order to study the native bee population in Georgia, Dr. Mark Schlueter from Georgia Gwinnett College along with Nicholas Stewart, as lead taxonomist, began the Georgia Native Bee Biodiversity Assessment Project (GNBBA) in 2010. They believe that native bees might be able replace the honeybee in Georgia as far as pollination services go. The GNBBA surveyed Georgia native bee populations during 2010-2015 in North Georgia apple orchards. There were also surveys performed in several state parks. GNBBA surveys were taken at these locations because traditionally the highest number of bee species and abundance are found around apple orchards. One of the goals for the project is to find out which native bee species are most abundant in agricultural areas and then find out which of these species might be best at replacing the European honeybee in Georgia. The GNBBA survey has determined that there are currently 542 species of bees found in Georgia. However, this number is continually changing as more surveys are conducted throughout the state. If you would like to see what species have been collected in Georgia, visit Native Bees of Georgia.

Bees can be separated into two groups based on the length of their tongues. These parts are called proboscides and are used to gather nectar. Some long-tongued bees in the family of Apidae and Megachilidae prefer long flowers like Penstemon species. These groups are also able to nectar from shorter flowers from the daisy or aster family. The other bee families are short tongued and nectar from flowers that have short rays. Therefore, when planning your garden, it is good to include flowers of many different lengths for native bees.

Native bees use many different strategies to reproduce. There are several families of bees (Apidae, Halictidae, and Megachilidae) with some species using a very unusual strategy that some bird species, such as the Brown-Headed Cowbird

and the Cuckoo, use. These species lay their eggs in the nests of other bee species and are called the cuckoo bees. The rest of the bee species all build some type of nest. These nests are provided a mix of pollen, nectar, and saliva before the eggs can be laid inside of them. Once this has happened, these nests are sealed until the young emerge. Some of the nest building bee species will build their nests underground, and others use hollow stems or holes in trees. Other bees are able to chew holes in wood with their powerful jaws.

Because of the different variety of nesting strategies native bees use, it is important to remember them when setting up and caring for gardens and farms. The inclusion of bare sandy soil is important for the five different families of miner bees, as well as leaving the dead stalks of plants up until spring so that they can be used for nest holes by other species. These nest holes are used by most species of the family Megachilidae, including the mason bees and the leafcutter bees. Mason bees use mud to make a cell wall between each egg and its provisions while leafcutter bees clip a perfectly rounded piece of leaf to line their burrows. It is also helpful to have soft chunks of wood available for nesting carpenter bees. Carpenter bees do not like stains or paint.

Native bees collect pollen and nectar from a broad variety of flowering plants. Some bees, such as bumble bees, are generalists and will use pollen from almost any flowering plants. Other bees are specialists because they will only collect pollen from one or two families of flowering plants. An example of a specialist would be the squash bees. This group of bees specializes on cucurbit plants such as squash, pumpkin, and zucchini.

There are many factors that affect how healthy our native bee populations are. The Center For Biological Diversity released a report that concludes "that of the 1,437 native bee species for which there was sufficient data to evaluate, about 749 of them were declining. Some 347 of the species, which play a vital role in plant pollination, are imperiled and at risk of extinction." (Reuters) On March 21st, 2017, the first bumble bee was listed on the endangered species list, the Rusty Patched Bumble Bee, *Bombus affinis*. Historically, the Rusty Patched Bumble Bee was found all over the Eastern United States, including Georgia. The reasons for this bee's decline are believed to be the same as for many of the other bee species (as well as butterflies including the monarch) that have declined and gone extinct. Scientists believe that disease, pesticides, effects of climate change, and habitat loss and degradation are the major causes of decline.

To help offset the decline in bee species (and butterflies), your help is needed. Here are some things that can be done to help: 1) Avoid insecticides, fungicides, and herbicides wherever possible. Particularly be aware of insecticides that belong to the class of neonicotinoids. This class has been implicated as a major cause in the decline of bees. This class of insecticide is systemic and is present in the entire plant, nectar and pollen included. 2) Climate change is causing problems for both insects and birds because it is affecting the timing of blooms for flowers. There are many other issues that climate change causes for living things, but this article is not the place to address these discussions. Please advocate for our leaders to address climate change as much as possible. 3) Build gardens and restore native habitat. Reduce the turf-grass footprint as much as possible; work with your local officials regarding road-side mowing schedules. The following link is a resource for building your own bee garden: Top Flowers For Bees.



Sweat bee (*Agapostemon virescens*), common in Georgia.
Photo credit: Johnny N. Dell, Bugwood.org

A wonderful way to learn about which native bees might be in your yard or habitat is to use Dr. Sam Droege's USGS Bee Inventory and Monitoring Lab Flickr page. This amazing website is full of detailed pictures of large numbers of our native bee species and the plants and animals that they interact with. It is not too late to save our native bee species!

Resources:

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"Native Bees of Georgia." *Bees of Georgia*. N.p., n.d. Web. 21 Mar. 2017. Service, A. Usda Forest, and Pollinator Partnership Publication.

"Bee Basics: An Introduction to Our Native Bees." *Bee Basics*. (n.d.): n. pag. Web. 21 Mar. 2017.

Service, U.S. Fish and Wildlife. "Rusty Patched Bumble Bee." *Official Web Page of the U S Fish and Wildlife Service*. N.p., n.d. Web. 21 Mar. 2017.

"Top 30 Flowers For Bees." *Urban Beekeepers*. N.p., n.d. Web. 21 Mar. 2017.

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Permission to reprint this factsheet provided by the [Monarch Joint Venture](#).



MONARCH JOINT VENTURE

Partnering across the U.S. to conserve the monarch migration

www.monarchjointventure.org

The Monarch Joint Venture is a partnership of federal and state agencies, non-governmental organizations, and academic programs that are working together to protect the monarch migration across the lower 48 United States.

MISSION

Recognizing that North American monarch (*Danaus plexippus*) conservation is a responsibility of Mexico, Canada and the U.S., as identified in the North American Monarch Conservation Plan, this Joint Venture will coordinate efforts throughout the U.S. to conserve and protect monarch populations and their migratory phenomena by developing and implementing science-based habitat conservation and restoration measures in collaboration with multiple stakeholders.

Our mission will be achieved by coordinating and facilitating partnerships and communications in the U.S. and North America to deliver a combination of habitat conservation, education, and research and monitoring.

VISION

The vision of this Joint Venture is abundant monarch populations to sustain the monarch migratory phenomena into perpetuity, and more broadly to promote monarchs as a flagship species whose conservation will sustain habitats for pollinators and other plants and animals.

Monarch Joint Venture
University of Minnesota
monarchs@monarchjointventure.org

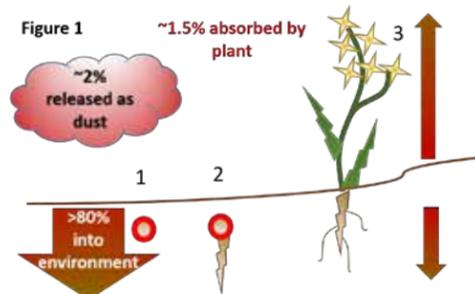
Risks of Neonicotinoid Use to Pollinators

Globally, pollinator populations are decreasing; their declines endanger food production and threaten natural ecosystems (Ollerton, Winfree, & Tarrant, 2011). Many factors contribute to these declines, including habitat loss, climate change, predators and disease, poor nutrition, invasive species and chemical exposure. A relatively new class of pesticides, **neonicotinoids**, is of growing concern as a threat to pollinators.

How Neonicotinoids Work

Neonicotinoids (neonics) are commonly-used insecticides (Goulson, 2013; Simon-Delso et al., 2015) and are used in agricultural, nursery, and private settings. They can be applied to plants many ways, such as seed treatments or spraying plants or soil.

In agriculture, seed treatments account for an estimated 60% of neonic use (Goulson, 2013). Neonics are highly water soluble, allowing the growing plants to absorb and transport the chemical to all plant tissues, from roots to shoots (Bonmatin et al., 2015) (Figure 1). While seed coatings are the most common application method, other methods often use a heavier amount of neonics.



Neonics disrupt the central nervous system of insects and other invertebrates; sufficient doses cause paralysis and death. Since small quantities of neonics are highly lethal (Goulson, 2013), their systemic movement to all tissues of treated plants offers protection against insect pests, especially during early stages of plant development. Because of differences between vertebrate and invertebrate nervous systems, neonics are much less toxic to vertebrates (Simon-Delso et al., 2015). Their low toxicity to vertebrates and systemic plant protection make

neonics appealing for pest control, but they can bring unintended harm to pollinators.

Routes of Neonicotinoid Exposure

Pollinators can be exposed to neonicotinoids in multiple ways. Pollinators may consume contaminated plant products like leaves, pollen and nectar and be killed if they consume a high enough dose of the chemical. For example, when monarch caterpillars eat neonicotinoid treated milkweed plants they are often killed. Toxic dust kicked up while planting neonic-treated seeds can also kill honeybees foraging nearby (Bonmatin et al., 2015; Goulson, 2013). Since neonics are water soluble, they can also move through environments with water (Figure 3). Surveys have documented widespread neonic residues in waterways (Bayo et al 2016, Goulson 2013, Hladik et al 2014, Morrissey et al 2015).

In the field, corn plants absorb at most 1.5% of the neonic treatment applied to seeds (Alford and Krupke, 2017). 2% of the seed coating is released as toxic dust and the rest is released into the environment in other ways (Figure 1). Neonics can also enter the surrounding area when applied by soil drenching or plant sprays. Once in the soil, neonics may persist for hundreds to thousands of days (Bonmatin et al., 2015; Goulson, 2013). Residues may leach out of treated fields into adjacent habitats and be absorbed by neighboring plants (Figure 2) (Botias et al., 2016). Contamination of nearby wild plants raises the likelihood of pollinators in the habitat experiencing unintended harm.

Finally, as neonics enter soil and waterways, they undergo different chemical breakdown processes, resulting in toxic byproducts. Due to limited research, we lack complete understanding of repercussions from application and persistence of these chemicals and their byproducts in the environment.

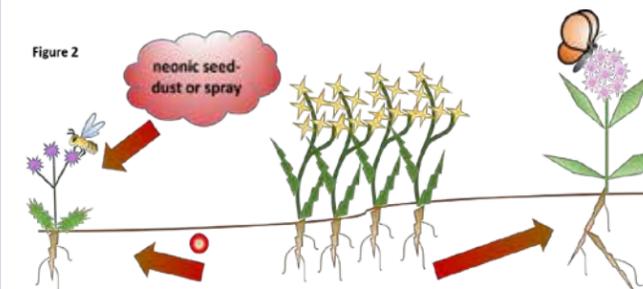
Sublethal Risks of Exposure

If exposed to neonics in sufficient quantities, pollinators and other beneficial invertebrates are killed. However, sublethal effects, such as reduced survival and reproductive success, can occur when the dose does not result in immediate death. The severity of sublethal

effects depend on exposure amount, method, and pollinator species. Relatively few studies have investigated sublethal effects of neonic exposure in monarchs, but further studies are in progress. There are also sublethal effects on vertebrates such as birds and fish (Gibbons et al., 2015).

Neonicotinoids and Agricultural Approaches

Integrated Pest Management (IPM) is an established farming approach that minimizes pesticide applications. In IPM, farmers only apply pesticides when pest populations reach levels where resulting crop damage would be more costly to profits than applying a pesticide, and use other methods first to prevent using chemicals. Reducing and preventing pesticide applications lowers the chances of selecting for pests that are resistant to chemical treatments, preserving the effectiveness of available pesticides. Fewer chemical applications also reduces the chemical burden placed on the environment, lowering exposure risks to non-target insects and to the farmers applying chemicals.



Counter to the wisdom of IPM where chemicals are applied only when necessary, neonic seed treatments are applied before planting the crops, when treatment would not always be necessary. In addition, some studies have found pest populations with evolved resistance to neonics (Goulson, 2013; Simon-Delso et al., 2015).

Farmers can contact local service providers, such as the NRCS, Xerces Society, Pheasants Forever, Pollinator Partnership, Soil and Water Conservation Districts, and others, to get guidance on IPM, reducing neonic use, and other pollinator friendly practices.

Pollinator Friendly Practices in Your Garden

The use of neonicotinoid and other pesticides is common in nurseries, and plants are often not labeled as treated when sold. This creates problems for consumers purchasing plants to support pollinators. Nectar and host plants treated with neonics and other pesticides can be toxic to pollinators and other insects long after they are purchased, and can be harmful to the insects they intend to attract. Here are some things you can do to prevent accidental neonic exposure in your pollinator habitat.

- 1) Ask before you buy:** Talk to the store manager to find out if their plants have ever been treated. Inform the store manager that you want to purchase neonic-free plants.
- 2) Shop local:** Consumer demand is an important part of making neonic-free plants more commercially available. Support local native plant growers who do not use neonics by buying their plants and encouraging others to as well.
- 3) Avoid pesticide use:** Do not use insecticides in or around your pollinator habitat. If you need to use chemicals elsewhere on your property, follow label instructions

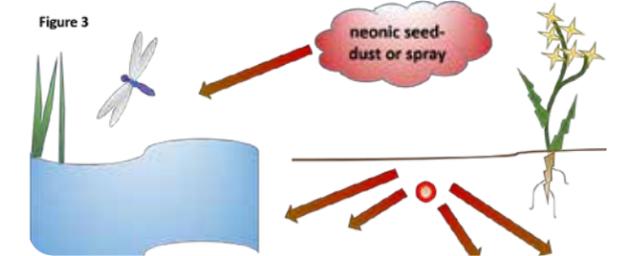
carefully and avoid neonics.

4) Educate others: Talk with your neighbors about the risks of neonics to pollinators, and ask them not to use neonics on their property. Bring these concerns to town or homeowner association meetings. For more information about educating others and advocating for pollinators visit monarchjointventure.org/get-involved.

Scaling Up Solutions

To ensure a future with robust pollinator populations, we recommend the following three large-scale actions:

- 1) Research:** Fund research identifying and mitigating causes of pollinator declines, including investigations of the risks of neonics and other chemicals. Economic analyses of neonic benefits must balance the environmental costs to health of pollinator populations and other beneficial organisms.
- 2) Habitat:** Protect existing pollinator habitats from inadvertent pesticide contamination, and create additional habitat to support healthy pollinator populations.
- 3) Extension and Outreach:** Support initiatives to educate scientists, government regulatory agencies, beekeepers, conservationists, nursery growers, farmers, agribusiness, and the general public about best management practices to improve habitat for pollinators.



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Figures: Holly Holt. Photo: Wendy Caldwell.

MONARCH JOINT VENTURE

Symbolic Monarch Migration Project

Every November, millions of monarch butterflies migrate to their overwintering sites in the mountains of Mexico. At the same time, symbolic paper monarchs made by children in the U.S. and Canada find their way to students who live in the monarch sanctuary area. These symbolic butterflies build bridges of communication between the students.

The “flight” of the paper butterflies is timed to correspond with the real monarchs’ journey south – the handmade butterflies arrive in Mexico around the time of *El Dia de los Muertos* (November 2), just as the real monarchs do. According to Mexican legend, these returning butterflies are thought to carry the souls of ancestors, and therefore play a role in the Dia de los Muertos celebrations.

Mexican students from the sanctuary region greet the butterflies and watch over them during the winter months. At the same time in the mountains nearby, the entire eastern population of North American monarch butterflies is resting in Mexico for the winter. Sometime next March, when the real monarchs leave Mexico, the paper butterflies will also return north, carrying a special message from the Mexican students to the children in Canada and the U.S. who made them. Your participation in this symbolic event represents tremendous international support for the monarch.

Mail butterflies by October 13, 2017. Read more about the Project at www.learner.org/jnorth/tm/symbolic/About.html.



Recommended Resource

The Monarch: Saving Our Most-Loved Butterfly

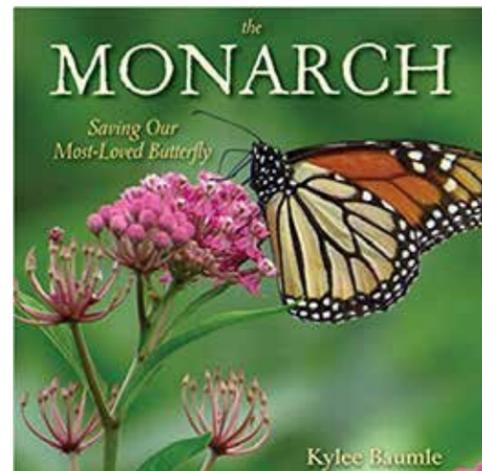
by Kylee Baumle

Every fall, spectacular orange and black clouds of monarch butterflies fill the skies as they migrate from across North America to Central Mexico. West Coast populations make a similar though much shorter trip to coastal California. The National Wildlife Federation calls the monarch migration “one of the greatest natural phenomena in the insect world.” Not long ago, monarchs numbered in the billions, but in the last 20 years their population has dropped by 90%, due to habitat loss from pesticides, modern farming practices, urban development and other human activity. An estimated one million acres of habitat are lost each year.

But today, an army of citizen scientists, students and gardeners is engaged in restoring this beloved pollinator’s habitat – the wildflowers and milkweed and feeding corridors – so that one of nature’s most beautiful creatures will still be there for generations to come. And it starts in our own backyards.

The Monarch showcases this magnificent butterfly with eye-popping photos, fun facts about a monarch’s life cycle, and things to know about the vital role that pollinators play in our ecosystem. Monarch enthusiast and nature blogger Kylee Baumle provides “action” projects for all ages, from planting milkweed and wildflowers to making butterfly watering stations...to volunteer activism.

Amazon.com



Susan Meyers receives Conservation Partner Award

On Thursday, May 11, 2017, Monarchs Across Georgia facilitator, Susan Meyers, was honored with a Conservation Partner Award at the 2015-16 Southeast Regional Director’s Honor Awards Ceremony held at the U.S. Fish and Wildlife Regional Office in Atlanta, GA. Pictured below with Regional Director, Cindy Dohner, her recognition was noted for her work with monarch butterflies.

Susan Meyers is a leader in conserving monarch butterflies and other pollinators through her hands-on work in schools and communities across the State of Georgia. She supported the USFWS in the expansion of the Rosalynn Carter Butterfly Trail, oversaw the funding and creation of twenty new monarch habitats in schools and community gardens, and led an effort that put native pollinator gardens in fifty state parks. She has taught 150 teachers the basics of monarch conservation and reached 50,000 students, parents, and community members through her workshops and outreach events. Susan was also instrumental in connecting the Service with numerous other partners to create, connect, and conserve landscapes for monarchs and pollinators.



Pollinator Habitat Certification

Do you enjoy watching and studying caterpillars on their host plants; searching for chrysalides hidden from predators; observing butterflies and hummingbirds flitting from flower to flower? Does your schoolyard, workplace or backyard have bushes, trees and flowers that provide host plants, nectar and protection for butterflies, bees, hummingbirds and other pollinators? Is there a source of water/puddling areas for thirsty butterflies? Are there places for them to roost at night? If so, you might want to look into registering your backyard/schoolyard/workplace habitat with Monarchs Across Georgia’s Pollinator Habitat Program. No garden is too big or too small!

For more details and to download the form, visit the [Pollinator Habitat Certification webpage](#).

Congratulations to the latest gardens to be certified!

Art of Landscaping, Fayetteville
 Marilyn Miller, Newnan
 Patricia Beall, Fayetteville
 drs. deb and byron rosenstein, Atlanta
 Casa Montessori, Marietta
 Rodney and Brenda Brightwell, Moultrie
 Scroggs Family, Newnan
 Beverly & Philip Ryser, Little Silver
 Wylde Center - Mulberry Fields Garden, Atlanta
 Whispering Stones - The Shires, Lilburn
 Ladybugs Garden Club, Lilburn
 Sara Minter Elementary School Garden Club,
 Fayetteville
 Diane Sartini, Fayetteville
 Chancey Residence, Fayetteville

Call for Committee Volunteers

ARE YOU INTERESTED in volunteering with the Monarchs Across Georgia (MAG) committee?

If so, please email mag@eealliance.org and let us know what volunteer opportunities interest you.

Here are many ways that we could use your help!

- Write newsletter articles
- Become a MAG workshop facilitator & co-facilitate workshops
- Review grant applications
- Become part of our Speakers Bureau
- Post information on our web pages
- Help with an event (children’s craft or answering questions)
- Become an active committee member and coordinate a project, such as...
 - Grant Administration
 - Newsletter Editor
 - Mexico Book Project
 - Plant Sales
 - Pollinator Habitat Certification
 - Volunteer Coordination

SPOTLIGHTS... For Your Pollinator Garden

Solidago ptarmicoides: A goldenrod that isn't golden

Solidago ptarmicoides, the upland goldenrod, has white-petaled, aster-like flowers. Its un-goldenrod-like flowers resulted in the plant being classified as an aster (*Aster ptarmicoides*) at one time. More recently, it has been placed in with the goldenrods. The leaves of this plant are very like those of other goldenrods, and the plant is known to hybridize with some goldenrods, but not with asters. Most garden centers do not offer plants of the upland goldenrod for sale, but seeds are readily available through seed companies online, for those who are willing to "grow their own".



Photo credit: Rob Routledge, Sault College, Bugwood.org

The upland goldenrod is a perennial, re-growing each year from long-lived roots. The plants reach 1-2 feet in height, doing best in full sun. Stems range in color from green to reddish purple. The plant is generally drought-tolerant, native to dry areas here in Georgia, with a geographic range going across to Arkansas and Colorado and up into Quebec.

The little daisy-like flowers of the upland goldenrod grow at the tips of open, flat-topped clusters, giving the effect of a small mass of blooms. Before flowering, though, the plants are pretty unremarkable, which may limit their garden-use to more naturalized or semi-wild gardens. Like many of the asters that they resemble on first glance, these plants are great bloomers for summer and early fall.

Butterflies, skippers, wasps, flies, and bees are known to visit the flowers, and goldfinches will eat the seeds formed after the flowers mature. Like some other plants in the Aster family (lettuces and dandelions, for example), each seed has a piece of "fluff" attached that aids dispersal. If you have these plants in your garden and do not want them to spring up in unexpected places, you may want to remove the fading flower-heads before the seeds mature and are released into the wind.

An unfortunate misunderstanding is that goldenrods are a major cause of hayfever/seasonal allergies. It doesn't help the reputation of the upland goldenrod that its species name, *ptarmicoides*, means "to cause sneezing." It is totally possible, of course, that goldenrods do cause allergy symptoms in some people, but these are insect-pollinated plants, which means they are not wasting a lot of pollen by letting it loose into the air other than by accident. The ragweeds that bloom at about the same time, in contrast, are wind-pollinated, producing abundant pollen that is flung freely into the wind. In general, the allergy risk of planting any goldenrod, not just the upland goldenrod, is lower than many people think.

- Amy Whitney

Polytonia comma, The Eastern Comma

The eastern comma is a relatively small, angle-wing butterfly whose common name originates from the distinct silver or white "comma" mark on the underside of the hindwing. It is found throughout most of the regions east of the Rocky Mountains, from southern Canada to northern Florida and Texas, and the Gulf Coast. The eastern comma prefers two types of habitats - rich deciduous woodlands for hibernation and aestivation, and open sunlit areas with its larval host plants for reproduction. Its host plants are stinging nettles (*Urtica dioica*), hops (*Humulus lupulus*), wood-nettle (*Laportea canadensis*), and American elm (*Ulmus americana*).

There are two butterfly broods every year – with upperside of hindwings predominantly black in the summer, and orange with black spots in the winter form. Both generations have a dark border with pale spots and brown underside with the comma. The winter form flies from early September to mid-November, hibernates over the winter, lays eggs in the spring, and flies until May. It is notable that they emerge on some warm winter days and return to hibernation. The summer generation flies from June through late August.

The eggs are barrel shaped, green in color with vertical ridges and are laid singly or in columns (2 to 9 in each) on the underside of leaves. The caterpillar can vary in color from white to greenish-brown to black, and the branching spines on the body can be black or white with black tips. They are usually solitary and feed on the leaves at night, and older caterpillars often make nests by silking together two edges of the leaves. Pupae are also variable in color but always have prominent ventral gold or silver spots. These colors were the reason the eastern comma was known as the "Hop Merchant" in the 19th century by hop growers, who thought the golden spots meant high prices and silver meant lower prices.

Eastern commas don't feed on flower nectar, preferring fermenting fruit and tree sap. They are aggressive and fly at other butterflies or insects to defend sunny patches they call home.

- Bhooma Madhavan, Cobb County Department of Transportation



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