The Potting Shed

Native plants issue, fall 2021 Master Gardeners of Bergen County

If you want to save the planet, start in your own backyard

It's good to be reminded that each of us has a role in preserving the environment, whether it's setting the air-conditioner thermostat a few degrees higher or inviting birds and pollinators into our yards by planting native trees and shrubs.

Jean Epiphan can speak to the latter. Jean's passion for the environment rings loud and clear. Jean's full-time job is ecologist and research project coordinator at the Rutgers Center for Urban Environmental Sustainability. She lives and breathes restoring the planet one woodland at a time. She's also the tree and plant curator, forest ecologist, and stewardship director at Thielke Arboretum in Glen Rock. And she's a certified arborist and licensed tree expert. Jean last spoke to the MG of BC in February 2019 about native ferns. This article is based on interviews with Jean and her written response to additional questions.

If you visit Thielke Arboretum on Saturday mornings, you may run into Jean Epiphan. She's the one in knee-high boots leading a tour group, directing volunteers, or both. Meanwhile, she's keeping an eagle eye on how the native plants are faring and what invasive is about to cause potential chaos in the arboretum's 16 acres, more than half of which comprise a forest.

Jean Epiphan at Thielke Arboretum

Jean works part-time at the arboretum — she's its only employee — and is in charge of "everything green and the trails to get to them," she said. As a restoration ecologist specializing in terrestrial habitats, Jean's focus is native trees and local plant communities and how to restore and conserve them. And do we ever need her expertise!

"Both naturalists and activists realize that the native ecosystem is so important in an urban environment," she said. "There's so much value of what's there but also so much pressure on the environment due to what we caused as humans."

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Editor's note: A few months ago, my brother-in-law Harry mentioned that he'd like to see articles in the *Potting Shed* about vegetable gardening and ecology. He's an avid vegetable gardener and packs a boatload of produce into a tiny plot in Jersey City.

I don't know any expert vegetable gardeners. If you are one, please raise your hand and identify yourself! But I did know the name of Jean Epiphan, a forest ecologist at Rutgers who has spoken to the MG of BC. Perhaps Jean would be interested in helping us understand what's gone wrong in our local habitat and how we can fix it. Jean *was* interested, and this special *Potting Shed* is the result. No, we don't have to rip out all our exotics and specimen plants. We can replace non-natives with natives at our own pace. Jean paints the big picture and she and other experts provide suggestions how and what to do. Enjoy!

- Miriam Taub, Class of 2011

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What are we doing wrong to have damaged our environment so badly?

Jean Epiphan: To know what went wrong, we must shortly explain how our natural land was beforehand.

Before colonization, no exotic plants were wreaking havoc in the landscape, earthworms did not exist in the soil locally (where glaciation occurred), and deer were not over abundant, as their top predator — wolves — kept Bambi populations in check.

The natural food web fluctuated within normal ranges of all indigenous species populations that depended on each other. Plants, our primary producers, flourished as the base of the food web feeding insects and larger herbivores while providing shelter for all critters to nest. Plant-dependent insects and vegetarian wildlife populations feed insectivores and other higher-order predators like wolves that depend on deer, and so on.

But when something in the food web goes "out of whack" — like if the top predator is removed and a species like deer have a population surge — they eat up all the plants that all the other wildlife has co-evolved with and need for survival.

A current example of the latter ecological dynamic was restored recently when wolves were famously reintroduced to Yellowstone, and they saved the forest by allowing it to regrow.

[**Editor's note:** For the PBS story about the reintroduction of wolves into Yellowstone National Park, click here.]

Nonetheless, the three main issues in our area — deer, invasive plants,

A deer in Teaneck shows up for the backyard buffet without an invitation.

and earthworms — now pose major threats to our local plant communities and all forms of restoration and conservation of them. And the way to undo or restore ecological function is complex and difficult but so vital to our local ecosystem.

In our current situation, if you do nothing about the overpopulation of deer, all the other species (plant and animal) that belong in this ecosystem are losing habitat and will become lost, extirpated, or in some cases, extinct. At the same time invasive plants, most of which are not palatable to deer, are allowed to grow and spread like wildfire and we (humans) let it happen by planting exotics instead of natives. And then, to top it all off, earthworms, brought here for agricultural purposes, change the soil structure, dynamics, and chemistry, which help facilitate exotic plant invasion.

How do invasive plants contribute to the food web going "out of whack"?

Jean: "Invasive" is a scientific designation used to classify species as harmful to ecosystems where they are not native. Invasive plants spread clonally (asexually), like running bamboo that never stops spreading like the classic horror film "The Blob," and through seeds (sexual reproduction), which are spread by wind, water movement, birds, deer, and other wildlife.

For example, here is how invasive plants contribute to the loss of a native plant species: Let's say you plant a Siebold viburnum or linden viburnum, both considered invasives in New Jersey. Native birds will prefer native viburnum, such as arrowwood viburnum, but they *will* eat the seeds of non-native species, especially if they can't find native species.

Next, birds poop out the seeds in forests and woodlands thereby increasing the population of invasive viburnum into new areas. Once established they also spread clonally and create dense thickets pushing out all other species. This is the mechanism for how many invasive plants in our area spread.

At the same time, deer continue to eat the remaining native viburnum and *don't* eat the invasive viburnum, thereby forcing the native viburnum out of existence. The same process forces out most other native species as well, as most are palatable to deer. In addition, earthworms help to change the soil, which benefits invasive plants and harms native plants. More on that below.

What are other dangers that invasive plants pose?

Jean: Invasives harm or destroy the ecosystem in other ways. Take, for example, the Norway maple, which is used as a street shade tree in many parts of North Jersey and elsewhere and has spread into most suburban yards, forest fragments, and parks.

(See 'Jean Epiphan' on page 4)

If you plant natives, the pollinators will come!

Editor's note: Lourdes Osorio, Passaic County MG, Class of 1996, created the Native Plant Channel on YouTube.

By Lourdes Osorio

Let's face it, the world is an unbalanced mess! Our ecosystems are out of whack, and events that should be occurring once-in-a-blue-moon are now commonplace (hurricanes and tornadoes in New Jersey, wildfires, unprecedented water shortage of the Colorado River, etc.). One way to help our ecosystems regain some balance is through the use of native plants.

Lourdes Osorio

Next to sunlight and water, it is plants that make life possible on our planet. Think of photos of earth from space and what you see is blue and green, the essential components of life. Except for gardeners, the majority of the population overlooks plants and doesn't comprehend that without them animal life, including human, would not exist. All life on earth is connected through complicated ecosystems and food webs that exist based on complex interrelationships where sunlight produces energy that plants convert to food upon which life depends.

Not any plant will do, and certainly large lawns won't do at all. Native plants are those that have evolved over time to support life in their area. So how does one get started? What to plant where?

Begin by evaluating your conditions such as sun exposure, soil type, etc. Reduce the size of your lawn. Not only will you save time and money by reducing lawn mowing, fertilizing, etc., but you'll also contribute through reduced use of fossil fuels, while minimizing the harm caused by fertilizers, pesticides, and other chemicals. *Native plants don't require fertilizer, saving you money and time.*

Gardeners are usually drawn to flowering perennials and plan their gardens around them. However, if you're starting a new area, consider trees and shrubs first. In a few years you'll be rewarded with a more mature garden that provides good habitat for insects and birds while providing privacy for the homeowner. The flashy perennials can be added later.

There are many excellent, free resources to help you. In order to not overwhelm you I suggest four of the best to begin with.

1. Native Plants for the Small Yard by Kate Brandes is a free, 60-page book found online that includes sample designs for various situations and useful plant charts with growing requirements. The sample designs are mainly for beds of perennials. Just remember to use the information on small trees and shrubs included in the book and add them to your plans.
2. Jersey-Friendly Yards helps gardeners create designs and search for plants based on specific requirements such as sun, shade, etc.
3. The National Wildlife Federation's website has a native plant finder feature. Enter your zip code for a list of native plants and the insects that each specific plant helps support.
4. My own Native Plant Channel on YouTube provides videos on native plants for specific situations such as deer-resistant native plants, best natives for pollinators, etc., as well as virtual tours of native plant gardens with tips from their experts and the opportunity to see what those plants look like in the landscape. Facebook users can also find information here.

Start small so as not to become overwhelmed. Select one area of your garden to begin with and add new plants over the years. If you plant it, they will come. And you'll create a habitat that supports a plethora of fascinating insects and birds!

Jean Epiphan

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Have you ever noticed that it is incredibly difficult to grow anything under a Norway maple? Well, that is because it naturally uses specific competitive strategies to succeed. One, it can survive and grow in dense shade and creates deep shade so that only younger Norway maples can survive under it. Two, it has a shallow, dense root system that, once established, hogs all resources (i.e., water, soil nutrients, space). And three, the foliage releases toxins that change the fungal and microbial composition of the soil, which inhibit the growth of nearby native plants and many non-natives, too. It's almost like chemical warfare.

[**Editor's note:** See the Global Invasive Species Database for more information about Norway maples.]

Other examples include Japanese barberry, which grows densely to physically push out nearby natives and increases soil pH once established, which is very harmful to our natives that typically prefer acidic soil. Soil pH dictates which array of nutrients are available to plants, therefore changes to pH change which plant species can thrive and which cannot. Another example — the tree of heaven — also changes the soil composition as it is allelopathic. The tree of heaven exudes chemical compounds into the soil that are toxic to our native plants, which allows it to dominate areas that are no longer suitable for growth of native species.

Just to be clear, the above mechanisms are not harmful to the respective cohorts of their native

Cardinal flower in the foreground with blue lobelia in the background at Thielke Arboretum. Go native plants!

plant communities (in Europe or Asia), because they have co-evolved together and keep each other's populations in check using these distinct strategies. However, when introduced to a new ecosystem, the natives are not equipped to face the new toxins and harmful competitive strategies.

What about earthworms? Why are they bad?

Jean: If you are interested in planting native plants, worms, especially the invasive jumping worm, are not helpful to native plants as they did not co-evolve together. Worms do not help our native plants uptake nutrients; they actually "over-process" the available nutrients and change the soil chemistry to make it more conducive to supporting invasive plants.

Earthworms were brought here for agricultural purposes and veggie gardens, of which I cannot speak to their overall benefit as millions of other organisms (most microscopic) do the important work of processing nutrients and making compost, not just the worms we can see.

But for native plant gardens, natural wildflower meadows, and indigenous forests, earthworms are a "hidden" and often overlooked threat. Earthworm activity churns up the soil horizons (the layers in undisturbed soil that take hundreds of years to form properly) that the native plants have co-evolved with. The earthworms change the structural, biological, and chemical properties of the soil.

Many native plants cannot handle this drastic change. Many people often forget how soil quality is vital to plants as it is where half their biomass resides. Furthermore, the drastic change to the soil actually facilitates invasive plant spread and success in our landscapes.

In our area, earthworms are rampant. They are a major factor that harms native plant restoration or conservation in addition to being intertwined with invasive plant spread and deer overabundance, which all together are engineering the decline of our local ecosystems as we know them.

[**Editor's note:** For a National Park Service article about earthworms, click here.]

This seems overwhelming. What can I do to help the environment?

Jean: Do not get discouraged but be hopeful and try to make small changes in your yard. Just a few natives can make a giant difference even if you do not go all native. The best thing to do in the suburbs full of exotic plants is to remove the most detrimental invasive plants from your yard first, which will make room for native plants and work little by little.

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Photo courtesy of Jean Epiphan

Asclepias tuberosa (butterfly weed) is a favorite of monarchs.

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Review the "do not plant" list of the NJ Invasive Species Strike Team [see link on page 9] to see which plants are most important to remove first. For those invasive plants referred to as "widespread" [on the list in the right column labeled "Problem Type"], get rid of them immediately because they have the fastest rates of spread and can quickly cause harm to your landscape. Examples are Norway maple, Japanese barberry, and purple loosestrife.

For invasive plants referred to as "potential" or "emerging"— such as Japanese spirea, pachysandra, and English ivy — they do pose severe threats but often spread a little more slowly which gives you a little more time to remove them.

Create a plan to remove each invasive one by one. Use the "do not plant" list to make sure you do not plant any new invasive plants in your yard. After which, some soil remediation may help to restore soil life-cycling that native plants need. You can purchase a bag of Bumper Crop or use specific products from Organic Approach. Also consider using native leaf litter as your mulch instead of foreign-processed-and-dyed wood products, which are harmful to native plant root systems.

You mentioned that invasives spread via seedlings. How can I identify the "good" vs. "bad" seedlings in my yard?

Jean: Start by learning plant IDs; nurture "free" seedlings [the ones that show up in your yard]; and consider more than aesthetics when choosing plants. And think long-term.

Homeowners and landscapers remove seedlings of native oaks, sugar maples, and black cherry trees, because items not "planted" are considered "weeds" by default. Learn to recognize them. Plant ID is incredibly important at a seedling stage. Not to digress, but one important distinction is the difference between Norway maple seedlings and native maples. Norway maples have shiny undersides to their leaves, while native maples do not.

A great tool to help is iNaturalist, a website/app to explore and share your observations from the natural world. Post a photo on iNaturalist or the app Garden Buddy and learn from others what the plant is.

How can I help native seedlings to survive and thrive?

Jean: Once you recognize seedlings, nurture them. Nature gives us what we need to bring native plants back to the area. The seedlings we find in our yards mean that the site they've "chosen" is favorable for that tree to grow to maturity. The seed wouldn't germinate in an unsuitable environment. Instead of removing these native seedlings, protect them with a chicken-wire cage or tube and in a few years that tree will be as tall as you. You'll have free trees coming into your yard all the time.

Another way to help your native tree seedlings and plants thrive, if not protected by a fence, is to regularly spray deer repellent. Do this year-round, weekly in spring and early summer as leaves are actively emerging, are tastier to deer when new, and when does are showing their fawns where to feed. The rest of the year, monthly applications should suffice. Deer teach their babies where to eat; you need to stop that cycle.

Betula populifolia (gray birch) starting to turn white and surrounded by Ageratina altissima (white snakeroot). The fence protects this young tree from the deer at Thielke Arboretum.

Nevertheless, some fantastic native plants are deer-proof or highly deer resistant. If you live in a high deer area, start by planting native perennials like short-toothed mountain mint, beebalm, or any milkweed species.

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Hitting the jackpot

Monarch caterpillar on milkweed at Thielke Arboretum Sept. 5.

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Deer will not bother with these plants, nor will they bother with the native shrub northern bayberry, which is a great alternative to a privet hedge.

Non-native plants are beautiful; natives not so much. Do I have to sacrifice the beautiful for the practical?

Jean: A plant or tree that's installed to look good isn't good enough. Our plants have to provide for the ecosystem. We have to rewrite what's aesthetically pleasing. We tend to think that natives are not as pretty or showy as non-natives and hybrids. "Showy" caters to an aesthetic developed from years of "traditional" horticulture.

Furthermore, the traditional aesthetic is still being transformed into countless new hybridized forms that, for example, boast bigger and brighter or longer-lasting flowers. Instead, use natives for their natural flower display, leaf texture, and plant structure, rather than just flower size or color. Plus, the natural showiness natives provide is beyond the plant but in the many butterflies and birds you see utilizing them.

Instead of buying exotic trees and plants whose seeds will spread into neighboring yards, parks, and forests, plant native trees. Keep in mind that all exotics eventually spread; it's a matter of time.

How can I redesign my yard using native plants?

Jean: One can redesign a yard with the native garden-like flowering plants — like woodland sunflower, cardinal flower; native ornamental grasses like little bluestem; and flowering shrubs like sweet pepperbush or highbush blueberry — and achieve the same effect as a traditional garden but with the plants that are actually supposed to be here that provide life to our ecosystem.

Consider the native plants' mature height, spread, and flower timing, which is critical to the native wildlife that are seasonally dependent on these original resources that haven't changed through hybridization. For example, pollinators are highly dependent on flower color, size, and timing. When these attributes are changed by man, pollinators may not be able to use the plants any longer. Stick to the way the original plant was for millennia rather than new, flashy versions meant to appeal to human vanity.

Over time and at your own pace, you will see that the more native plants you have, the more native wildlife you will see. It starts with some more bumblebees, butterflies, and birds. Then predatory insects move in and help you to prevent pest outbreaks.

The more native plants — oaks, maples, ferns, herbs — you bring back to your yard, the more co-evolved diversity you support. Eventually you will find yourself in a restored natural oasis for all species, not just humans. Your efforts can even be the difference between a species survival and going extinct in our area.

The best thing to do is to promote a native ecosystem because it has exponential benefits beyond even what we scientists currently recognize. When you begin to realize how all this life is intertwined, it's humbling.

Horticultural gardens vs. native gardens

Typical **horticultural gardens** are created purely for the visual and experiential enjoyment of humans only; usually no other species benefits are included in design considerations.

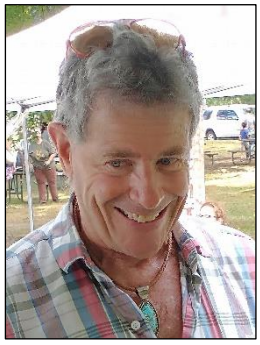
Native gardens are for all species and especially help those that have no other places to find food and shelter to survive. The few native gardens in our area are literal oases in the middle of ecological dead zones or wildlife food deserts.

- Jean Epiphan

See Jean Epiphan's list of native plant resources on page 9.

Native plants in the garden and landscape: The good, the bad, and the ugly

By Joel Flagler,
Rutgers Agricultural Extension agent, Bergen County



Joel Flagler

Much of what I learned about native and exotic invader plants comes from lessons at the NY/NJ Trail Conference in Mahwah. There, Dr. Linda Rohleder, a Rutgers graduate, promotes the use of natives and educates countless people on the risks of using introduced plants. Here are some highlights everyone should know.

New York ironweed: One of the good plants and approved by monarchs.

Native plants belong here. Native plants evolved here and are well-accustomed to the local soils and weather conditions that influence plant growth. They are part of the food chain and web of life in the local area and part of predator-prey relationships that developed over thousands of years. So, pests of native plants are often kept in check by beneficial predators and even diseases (e.g., gypsy moth wilt). Further, natives are part of the pollinator profile and may be important for bees and other pollinators. Overall, we can expect native plants to survive and thrive in the region in which they are found. They perform in a pretty predictable way over time. We encourage the use of natives in the garden and landscape for all of these reasons.

The dangers of bringing in exotic or introduced plants are many. There is always a risk the plant, for example, can overperform and become a runaway nuisance. They can disrupt life cycles of other plants as they outcompete for space and light and nutrients. Some plants can actually change the soil to inhibit the native plants that were growing there originally. We see this in barberry and other invasive mistakes.

Pollinators and beneficial predators alike may not know what to make of the “new” plant. Or, the introduced plant, like Japanese knotweed, might draw pollinators to it and offer a poor-quality pollen and honey while [pollinators] neglect the native plants they should have been pollinating.

The truth is that we never know exactly how the introduced plant will perform over time, measured in decades typically, not months or years.

We do not have to create pure native plant gardens if we don’t want to. In fact, many exotic introductions are not regrettable, and we cherish plants like kousa dogwoods and the countless hybrids. They were not native. But they add so much to our appreciation of nature and ornamental plants. The key is to do your homework and know what to expect from plants you want to bring into your living space.

Mountain mint: Another good native plant.

The Michael Dirr “Manual of Woody Landscape Plants” is ideal for trees, shrubs, and vines. And stay up to date as we continuously learn new things. One new factoid is that even the overly popular Bradford pear and ornamental broom can become runaway plants. There are now areas in neighboring downstate New York where this has become evident.

[**Editor’s note:** See Michael Dirr’s videos on YouTube.]

The bad ones: The trifecta of annoying ground covers: Ajuga, ground ivy, and creeping Jenny.

How I approached adding more natives to my garden

By Bruce Crawford, manager of horticulture, Morris County Park Commission

Edging: I had Brunnera macrophylla and Euonymus fortunei "Longwood" along the edge of my path leading to the front door. The blue flowers of the Brunnera are beautiful in spring, but the plant was becoming a bit of a thug and was seeding everywhere.

Iris cristata "Powder Blue Giant"

The Euonymus was becoming a woody mess as well, and I decided to remove both and replanted with Iris cristata "Powder Blue Giant." The arching low foliage of the iris lends itself nicely to a planting along the edge of the shady path to the front door. I tackled it over two years, since the cost of the iris — or any plant — does add up when purchasing them in groups of 24. If the area is sunny, think about Aster oblongifolius "October Skies" or "Raydon's Favorite." Growing to 18-24 inches tall, it makes a great "fluffy" groundcover.

Add vertically oriented native plants among non-natives. I had plantings of Hakonechloa macra "All Gold" planted 24 inches apart. I added in Penstemon digitalis "Blackbeard" in between the Hak to provide color contrast and interest.

Remove the dreaded buddleia or butterfly bush at the back of the border. I replaced with Coreopsis

Penstemon digitalis "Blackbeard"

tripteris (tall Coreopsis). It blooms for an extended period of time and seeds about a bit.

Coreopsis tripteris

Don't feel bad if it seeds where it's not wanted, like among the Iris cristata. A weed is a weed no matter if it's native or not. If you go with this Coreopsis, plant some near a path, too, where the sweet fragrance of the flowers can be enjoyed.

Eliminate some turf beneath the trees. Cover the turf with newspapers (not the Sunday funnies though, since the colored print contains heavy metals) and then 3 inches of woodchips or shredded mulch. In a month or so, you will have a nice area to plant. It is also the area in which a number of caterpillars pupate into moths and butterflies, so the less lawn under trees the better. It's a great spot for Solidago "Golden Fleece," a nice low-growing goldenrod that does not become weedy in my 18 years of experience with it.

Solidago "Golden Fleece"

Got mugwort or another aggressive? Plant Monarda fistulosa or Pycnanthemum muticum (mountain mint) and let the best plant win. Of course, you may wish to give the natives a bit of help along the way!

Monarda fistulosa

Photos courtesy of Bruce Crawford

Plan before you plant

Arnie Friedman

By Arnie Friedman, Class of 2004

If you want to "go native," first think about your objective: Is your purpose to help sustain the birds, butterflies, and bees? Reintroduce lost species? Salve your guilt for having all those wonderful long-flowering roses and hydrangeas and Japanese maples that beautify your garden?

Second, decide what a native is to you: A straight native species local to the East Coast? Local to NJ? Are cultivars of a native OK? Then decide how strict you want to be: Will I remove all the non-natives? Will I mix both natives and non-invasive cultivars? Then think about the deer: Do I need a fence to keep out the deer before they devour the natives? [**Editor's note:** Arnie owns a landscape design firm.]

Jean's resource list

- Friends of Hopewell Valley Open Space: A non-profit land trust based in Mercer County and parent of the NJ Invasive Species Strike Team. See the Strike Team's "do not plant" list. Jean says the majority of invasives on the list are found in North Jersey, but the list also includes invasives found in the Trenton area where the organization is based.
- Jersey-Friendly Yards: Offers the Jersey-Friendly Plant database, how to plant a Jersey-Friendly landscape, and more.
- Lady Bird Johnson Wildflower Center: Offers a native plant database, plant images, and a search feature.
- Lower Hudson Valley PRISM (Partnership for Regional Invasive Species Management) hosted by the NY-NJ Trail Conference: Offers a do-not-plant list.
- Native Plant Society of New Jersey: Offers a do-not-plant list as well as plant profiles, photos, and locations to buy native plants.
- Douglas Tallamy: Noted garden author and lecturer. Visit his website, Homegrown National Park.

Natives for a tiny space

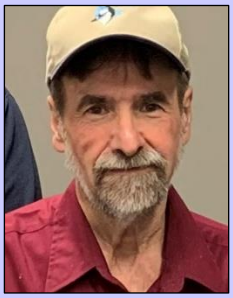
Photo courtesy of Bruce Crawford

Aster oblongifolius "Autumn Skies"

By Elaine Silverstein, Bergen-Passaic Chapter, Native Plant Society of New Jersey

I often suggest that folks can start a native plant garden in a space as small as 3 square feet. In that small area, or even in three large planters, plant a milkweed, an aster, and a native grass. You'll have flowers from May through September and host plants for many butterflies and moths.

Plant milkweed!



Don Torino

By Don Torino, Bergen County Audubon Society

Of course, milkweed is very important, which is survival for the monarch butterflies. [Also important is] cardinal flower for hummingbirds and mountain mint, obedient plant, ironweed, and goldenrods for the pollinators.

Gardening with natives is the best way to help relieve the immediate stresses from climate change for migratory birds and pollinators and restore habitat to suburbia.