



# Wild Ones

NATIVE PLANTS, NATURAL LANDSCAPES

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*A voice for the natural landscaping movement.*





Photo: Bill Buchanan /USFW on Pixnio

A ruby-throated hummingbird on cardinal flower (*Lobelia cardinalis*).

### "The Enkindled Spring"

*This spring as it comes bursts up in bonfires green,  
Wild puffing of emerald trees, and flame-filled bushes,  
Thorn-blossom lifting in wreaths of smoke between  
Where the wood fumes up and the watery, flickering rushes.*

*I am amazed at this spring, this conflagration  
Of green fires lit on the soil of the earth, this blaze  
Of growing, and sparks that puff in wild gyration,  
Faces of people streaming across my gaze.*

*And I, what fountain of fire am I among  
This leaping combustion of spring? My spirit is tossed  
About like a shadow buffeted in the throng  
Of flames, a shadow that's gone astray, and is lost.*

D. H. Lawrence



Sally Wencel

I don't usually turn to poems, but I thought a nice evocative one might be the best way to capture the joy we associate with the turn from winter to spring. Spring excitement is especially acute for Wild Ones – anticipating the flush of wildflowers, the buzzing of bees awakening from their winter torpor, the arrival of songbirds coming to their summer breeding grounds or just passing through on their journey north. Here in the Southeast, we eagerly await the red buckeye (*Aesculus pavia*) blooms, knowing that ruby-throated hummingbirds will soon arrive. As a labor of love, we invest our

time and treasure to protect and expand habitat and teach others how to be good stewards of the land. Spring is a manifestation of our efforts.

Spring invites us to fling open our doors and move out into the community as we plan for wildflower festivals and other celebrations, endemic allowing. I encourage you to also welcome new Wild Ones chapters that are springing up, well, like mushrooms (ahem – fruiting bodies) around the country. We look forward to good works from these new members, enkindling their green fire.

Also, join us in celebrating Wild Ones' 45<sup>th</sup> anniversary this year. Together, we are saving the Earth one landscape at a time.

I'm excited for spring's arrival, and I hope you are too!

Promoting environmentally sound landscaping practices to preserve biodiversity through the preservation, restoration and establishment of native plant communities

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Established in 1977, Wild Ones is a national not-for-profit organization of members who teach the benefits of growing native plants and work together to grow and restore natural landscapes.

Wild Ones' definition of a native plant:

A native plant is a species that occurs naturally in a particular region, ecosystem and/or habitat and was present prior to European settlement.

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# COOL SEASON NATIVES FOR EARLY SPRING

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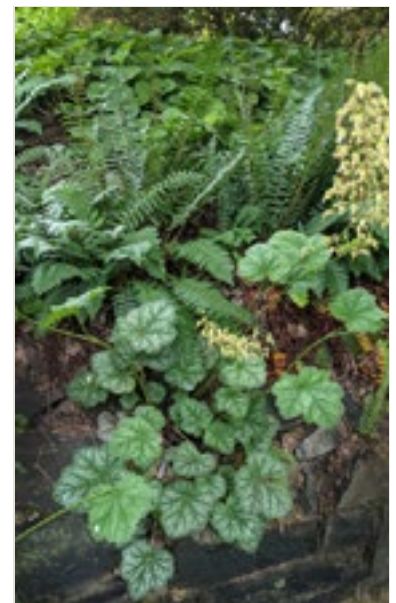
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Cool season plants are most active during early spring and fall. During the heat of summer they tend to enter a quasi-dormant state to save energy and resources. Shade-loving plants, for the most part, tend to fall into this category. They take advantage of the sunlight available to the understory before trees leaf out - or after they senesce in autumn - and are protected from direct sunlight during the hot summer months.



As with many other activities, timing is important when it comes to gardening and the establishment of new plants. There is a narrow window between when these cool season plants become available commercially in spring and when the weather becomes too hot for them to establish without taking additional precautions. This seasonality is also closely reflected in plant production. Once the spring crops are sold out, they might not become unavailable again that year until early to mid-fall, if at all.

So, if you are itching to play in the dirt after winter, working with cool season plants is a good place to start.



Top: *Polystichum acrostichoides* (Christmas fern) and *Tiarella* (foamflower)

Left: *Geranium maculatum* (spotted geranium)



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# NEWS

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## ACROSS THE NATION

### MARYLAND

The oxygen-deprived “dead zone” that plagues the Chesapeake Bay every summer was much larger in 2021

than in the year before, but similar in size with those of other recent years, the [Bay Journal](#) reported.

In 2020, the region posted the smallest observed dead zone since 1985. But in 2021, the dead zone was near average compared with historical data, although it lasted longer than the dead zones in 89% of other recorded years.

“This year’s estimate of the Chesapeake’s dead zone illustrates the challenge between Chesapeake Bay Program management actions and climate changes that bring increased rainfall volume and river flows,” said Michelle Price-Fay, acting director of the EPA’s [Chesapeake Bay Program Office](#). “While the long-term trend is toward a reduction in hypoxia due to management actions taken throughout the watershed and airshed, warming from climate change is a headwind that may increase hypoxia’s duration and extent.”

### MICHIGAN

U.S. Army Corps of Engineers researchers are working with the Lac Vieux Desert Band of Lake Superior Chippewa Indians and other Native American tribes to help improve wild rice productivity in Michigan’s Upper Peninsula.

According to a [press release](#), wild rice, or “manoom-in” in the Anishinaabe or Ojibwe language, is an important food source for the Great Lakes region Native American tribes and is used in traditional religious ceremonies. It is also important to the region’s ecology and serves as an aquatic habitat and food resource, according to the U.S. Army Corps of Engineers.

The Native American tribes harvest wild rice using traditional methods called “knocking the rice.” Harvesters gently guide a canoe through the rice while using “knockers” to carefully knock or brush ripe rice into the canoe, taking great care not to damage the plants. This centuries-old method helps sustain wild rice stands.

### UTAH

[Research](#) led by a team of biologists from the University of Utah has found that California mice eat monarch butterflies that fall to the ground, regardless of their potent “chemical armor” from eating milkweed with toxic cardenolides. The milkweed toxins build up in their

bodies and make monarchs unpalatable to most (but not all) predators.

According to [Earth.com](#), “Scientists have long ob-

served that in Central Mexico, the place with the largest winter aggregations of monarchs, the black-eared mouse (*Peromyscus melanotis*) eats up to 40 of these butterflies each night. More recently, researchers found that the western harvest mouse (*Reithrodontomys megalotis*) also consumes grounded monarchs at the Pismo State Beach Monarch Butterfly Grove in California.”

Weinstein and her colleagues found that rodents that were offered monarchs ate them, usually favoring high-calorie parts with fewer toxins such as the abdomen or thorax. “Many rodent species are likely to have some resistance to cardenolides in monarchs, due to genetic changes at the site where these toxins bind,” Weinstein said.

“The Pismo Grove is one of hundreds of western monarch aggregation sites, and it seems likely that, at least in the past, rodents throughout the western monarch range may have supplemented their winter diets with monarchs. If you can handle the cardenolides in a monarch, their bodies are full of fat and offer a pretty good meal.”

The study is published in the journal [Ecology](#).

### WORLDWIDE

Declines in seed-dispersing animal species are harming plants’ ability to move to more suitable habitats in a warming world, according to research published in the journal [Science](#).

[News 18](#) reported that the findings illustrate a worrying feedback loop between biodiversity loss and the global climate crisis, with forests being vital for trapping carbon.

“When we lose birds and mammals, we’re not just losing the species themselves. We’re losing this important ecological function, which is seed dispersal,” lead author [Evan Fricke](#) of Rice University told AFP. The paper is the first to quantify the issue on a global scale, and estimates that the ability of animal-dispersed plants to keep pace with climate change has already been reduced by 60% due to the loss of mammals and birds.

The results showed that seed-dispersal losses were especially severe in temperate regions in North America, Europe, South America and Australia, even though they’d lost only a few percent of their mammal and bird species.





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Gail and Dick Olson stand in the middle of one of their plantings, filled with color from a variety of native plants.

by Barbara A. Schmitz

When you're passionate about something, it's not work. Just ask Gail and Dick Olson, of Bristol, Virginia.

The couple purchased nearly 19 acres in southwestern Virginia in 2007 in the foothills of the Appalachian Mountains and has spent their time since turning pastures and hayfields to meadows, removing invasive species and planting native flowers, shrubs and trees. All with a goal to provide wildlife habitat.

The two always had an interest in nature, with Dick retiring as an environmental scientist. But it was after the couple married and moved to Wisconsin in 2003 that their interest in native plants grew as they learned about Wild Ones and native landscaping.

Dick said the reason they moved to Wisconsin was to help his father, who had used his forestry background to transform a 280-acre neglected dairy farm to a diverse, productive natural area. "I went from sitting down in front of a computer to managing lands and doing land improvement with my brothers," he said.

After Olson's father died in 2004, Portage County purchased the farm in 2015 to become the Steinbaugh Recreation Area, complete with wetlands, upland hardwood forest, pine plantations, prairie and open fields. The two moved to Virginia next, where it took them more than six months to find the right property.

"We wanted property with some mature trees, and not all lawn,"

## Member Garden

Gail and Dick Olson  
Appalachian Highlands (Seedling) Chapter

All photos courtesy  
Gail and Dick Olson

**Editor's Note:** We'd like to feature members' native gardens, large or small, in upcoming issues. If you're interested in sharing your native garden, send four to six high-resolution photos, as well as a brief description, to [journal@wildones.org](mailto:journal@wildones.org). Please include your contact information so we can follow up.

Dick explained. Eventually they settled on land that had 10-acres of woodlands along with hayfields and pastures, plus a restored log cabin from the 1880s. "It had great potential," Dick said.

Dick said they worked with a forester who came up with a plan



## About the property

- The Olsons own nearly 19 acres in Bristol, Virginia, near the Tennessee border, where they are converting hayfields to meadows and adding native plants to the mature woodlands.
- Their property has no lawn, just native plants and hardscape, although there are paths through the meadow.
- About 75% of their property is currently native. They have identified 38 native perennial forbes, 10 grasses and five shrubs in their meadows. In their woods, they've identified 59 forbes, three grasses, seven ferns, 24 shrubs and 46 species of trees.
- Their property is home to many butterflies and moths. They recalled bringing monarch chrysalises along for a discussion on native plants. They got a big crowd as butterflies began emerging while they talked. Their property is also home to birds such as American kestrels, red-tail hawks, pileated woodpeckers, screech owls and turkeys.
- Thanks to a game camera, the Olsons see game they don't usually find when they're out walking or working on their property, from red and gray fox, to fox squirrels, raccoons and opossums.

for their wooded area. Since he was familiar with the Natural Resources Conservation Service programs, Dick looked for state and federal funding to help make their dream a reality.

"We took advantage of their expertise, including suggestions of what species to plant and processes to use," he said.

They conducted forest stand improvements and used some of the harvested wood for remodeling their cabin. Their woods even includes American chestnut hybrid trees, as Dick has been a volunteer with the American Chestnut Foundation.

Their first project was converting a 2-acre pasture/hayfield to warm season grasses. Gail said they were lucky that the wildlife biologist didn't come in and just tell them what to do.

"He came in and asked what are you looking for?" she said. "He sent us lists and told us to do our homework on what to plant. He wanted us to take responsibility for the planting."



Can you imagine a more beautiful place to dine? The Olsons added a patio overlooking the pocket meadow.

That 2-acre upper meadow still looks good, but the two acknowledged they've struggled with controlling invasive plants.

"We burned it a few times and tried some sprays," Dick said. Now they mow it each spring, and Gail is committed to cutting and treating individual stems of woody invasives.

"You can tell a difference," Gail said, "but it is a slow-going process."

Gail said their property has become their "learning lab" as they try new things. For example, to get rid of fescue in their hayfield, she tried smothering the turf with plastic, newsprint and cardboard, then covered it with mulch starting in mid-summer. She sows seed in the winter after removing the plastic or any cardboard that didn't decompose. She still isn't sure which is best. Dick has also learned from doing. For instance, they tried to put in a meadow in an opening in the woods, but it didn't get enough sun.

"It has become a good wildlife area, filled with ferns and jewelweed (*Impatiens capensis*), and that's where we see fawns hiding," Gail said. "We dug out a small pond in a low-lying area to gather runoff for wildlife."

Their next project is continuing to expand their front meadow. "It's now about 10,000 square feet, but the majority is still a hayfield," Gail said. "That area will keep me going for several years, adding more plants, fighting invasive species, and just improving it."

Gail said her favorite plants are the grasses since they add movement in the wind and give the gardens structure. They also help to set off the other forbes that come up between them.

"But I also love cup plant (*Silphium perfoliatum*) and the finches (*Fringillidae*) that come to it when the flowers go to seed," she said. "It seems like hundreds of birds are there at once."

Dick, too, said his favorites are the grasses, particularly in the upper meadow. "The way the grass sways in the wind in the fall, backlit by the setting sun, is impressive."

They also enjoy plantings around the house and in the woods, including mountain laurel (*Kalmia latifolia*) with its pink and white flowers.

The Olsons said they love sharing their property with others, including their grandchildren.

"We take them out to the mead-





Above: The Olsons are adding pockets of native flowers to their woodland in areas where tree density allows in sunlight. Below: A water feature on the property provides an aquatic habitat that benefits amphibians, insects and birds.



ow to show them pollinators such as solitary bees on mountain mint (*Pycnanthemum virginianum*). They have also tracked animals and listened to screech owls," Gail said. Mostly, they take them out to give them experiences of interacting with nature or picking fresh vegetables from Dick's garden or fruit from his orchard.

The Olsons also share their knowledge of native plants with others. For instance, they have taught a

class on habitat gardening for wildlife to Master Gardeners. Gail, along with local Master Gardeners, is helping design the native landscaping for the Damascus Trail Center, set to open this year in Damascus, Virginia, also known as "Trail Town, USA." They have also hosted tours of their gardens for Master Gardeners and others.

For those new to native gardening and not living in an urban setting, Dick recommends people

take advantage of state and federal programs that offer help in planning and cost sharing. But for homeowners who have a small yard, proper site preparation is one of the most important things you can do, he said.

"Put in the time and effort to get rid of the turf and grass and deal with invasive species," he said. "Also look online for groups that provide specialized resources such as how to deal with particular invasive species."

Gail recommends you buy a few plants that you want, and then learn to propagate that plant either by gathering seed or cuttings. "That really helps to keep the cost down if you expand your native planting," she said. "Also, take advantage of seed swaps."

Secondly, she tells those new to native plants not to worry if they don't know everything when they start. "I'm learning as I go," she said. "For instance, I grow seed of new species in our greenhouse that I have planted so I will know what they look like as a seedling when I see it in our meadow."

Gail also encourages people to read books, talk to owners when shopping at native plant nurseries and go to Wild Ones meetings and conferences. "Not only do they have great speakers, but if you talk to the person sitting next to you, they have knowledge and information that you will find helpful," she said.

They first joined Wild Ones in 2014. The closest chapter was Smoky Mountains near Pigeon Forge, Tennessee, but the 2-hour drive made it a challenge to participate regularly.

So much of a challenge that Gail and others decided it was time to create a local Wild Ones chapter. The Appalachian Highlands seedling was formed in late 2021 and initially had 14 members and had grown to 20 members by March 2, despite not being able to hold its first meeting yet as of press deadline due to COVID-19. Gail is co-president of the seedling chapter that serves southwest Virginia and the northeastern Tennessee area.



# Inspiring native plant conservation at The Dawes Arboretum



*By Shana Byrd and Holly Latteman*

The Dawes Arboretum has a long history rooted in the conservation and wise management of natural resources that dates back to the founder's vision established in 1929. Its purpose was not only to collect trees and plants suitable for growing in Ohio's climate, but also to experiment with forestry techniques and share the outcomes of that work with the public.

Today that focus continues with a renewed strategy of managing ecosystems for resilience and biodiversity.

Encompassing nearly 2,000 acres, the Newark, Ohio arboretum is comprised of woodlands, wetlands, prairie and meadows, as well as sandstone gorges, riparian corridors and farmland. Given this, natural resources are managed as whole ecosystems. Strategies include monitoring for species diversity, targeting the removal of harmful invasive plants and replanting of native species to create healthier and more diverse habitats.

A primary approach involves studying a natural reforestation model on former agricultural land in order to plant forests that will support the greatest number of species in the future as the climate changes. To do this, Dawes' strategy includes wild-collecting seed from species of known origin from the southern range of the Ohio River Valley, growing those species in their propagation facilities and conducting annual monitoring of reforestation projects meant to help inform future planting strategies.

Another main approach is centered on Dawes' stewardship of wetland habitats, where succession is studied and waterways are continually enhanced through water qual-



Native seed is collected from the southern range of the Ohio River Valley in order to create habitat best suited for changing climates.

ity monitoring, treatment of aquatic invasive plants and transplanting native species that can serve as filtration to absorb excess nutrients, while also adding to the diversity of our stream and wetland communities. Given that species native to our prairie grasslands are among the most endangered historically, we

also prioritize the creation of prairie communities from a functional role of protecting soils from erosion to conserving the species ex-situ that once were a vast ecosystem that has since vanished from its prior range.

In particular, the long-range vision supporting native plant conservation is to collect, grow and protect



species of the Ohio River Valley ecoregion where both abundant species serve valuable roles in ecosystems and rare species are in critical need of conservation. Partnering with the founders of Ohio Native Plant Month, The Dawes Arboretum was honored to accept the designation as a Central Ohio Native Plant Learning Center where visitors can learn about the value of native species. The Ohio Native Plant Learning Centers serve as a consortium of organizations dedicated to conserving native plants. This concept brings together numerous entities from across Ohio under one umbrella with a shared passion for education and teaching Ohioans about native plants.

One of the key components of each center is to highlight the role native plants play in sustaining healthy ecosystems. As a next step in this effort, the arboretum will be expanding its partnerships to include even more stakeholders, bringing together a diverse background of native plant enthusiasts focused on increasing native plants in landscapes.

The Dawes Arboretum has historically provided numerous opportunities that connect the community to native plants; however, we aspire to do even more in the coming years. Through the expanded educational displays outlined in this effort, and additional first-hand learning opportunities, we aim to create meaningful experiences that will inspire the creation of native landscapes and ultimately benefit our entire community.

The Dawes Arboretum's goals for the future include advancing the applied science of ecological restoration for broad application to conserve native plants. The strategies outlined include educating the public on the critical need to conserve plants for our own well-being, demonstrating the value in innovative conservation and restoration approaches and training the next generation of conservation and hor-



The conservation greenhouse supports newly propagated species until plants are ready to be used in various reforestation and restoration projects and public plant sales.

ticulture professionals. Through these various approaches, the arboretum hopes to empower communities to create native landscapes that support biodiversity at home.

As we move forward, our next steps include the advancement of native plant research trials to evaluate species for beauty, form and ecological function in the landscape. These studies will allow us to expand our collections' research, focusing on the collection and preservation of imperiled native plant populations

through strategic plant expeditions. Taken together, these strategies will build our capacity, expand botanic research and provide a clear focus on creating more resilient landscapes that will thrive for years to come.

*Shana Byrd is senior director of research and plant science at The Dawes Arboretum. Holly Latteman is conservation project manager of The Dawes Arboretum, president of the Wild Ones Columbus Chapter, and a member of the national Wild Ones Board of Directors.*



# Lorrie Otto's sand sandwich method of smothering turf



Lorrie Otto, the founding inspiration for Wild Ones, was largely responsible for the nationwide banning of DDT.

Known as the founder of the natural landscaping movement, the Milwaukee native shared her "sand sandwich" method of smothering turf with Ney Collier, Wild Ones member and author of "Mending the Earth in Milwaukee." Lorrie's method is included in Collier's book.

Not only will it smother turf, but it creates an instant habitat for pollinators. Follow these steps:

- Put down cardboard cut into any shape you fancy.
- Surround the cardboard shape with logs, stones, bricks, etc.
- Order Purple Cow 70% sand/30% compost mix. Some garden centers, such as Blue-mel's Garden and Landscape Center, of Greenfield, Wisconsin, will sell Purple Cow products by the cubic yard. You can also make your own mix by layering sand with leaf mulch or fall leaves over the cardboard.
- Place an 18" thick layer of the mix onto the cardboard you have laid down over the turf or invasive plants. This will smother plants underneath the cardboard.
- Be sure to order plants appropriate to the niche where you will be creating a habitat for pollinators. Remember, each plant requires a particular habitat and shade plants will not thrive in full sun and vice versa.
- Plant plugs of native plants into the 1.5 feet deep Purple Cow 70/30 mix.
- Be sure the plugs are well hydrated for a fortnight as they establish. Do not let them wilt.



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



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# How to successfully battle a homeowners association

By Keith Hansen

When I bought my townhouse in Odenton, Maryland in early 2018, I immediately cut down the Chinese elm and removed all the turf. It wasn't a huge job as my front yard is about 10 feet wide by 25 feet long. I replaced all the turf and trees with native plants, 99% of which are straight species, local ecotypes sourced either from Chesapeake Natives, LLC, or my own seed gathering and germinating. My goal was to have flowers blooming from early spring through late fall, and I've achieved that. I also tried to create something aesthetically pleasing.

I received my first letter from the homeowners association, or HOA, about my front garden in late 2019. The letter suggested that my landscaping did not meet HOA guidelines, and stated I needed to appear before the HOA management board to address the issue. I attended the next scheduled board meeting where the board members told me they didn't want to hear how my garden was beneficial to insects. They told me my garden was problematic because it would attract rodents and other pests, and that there was no way it could be considered aesthetically pleasing. The board cited in HOA bylaws that landscaping to your property must be "aesthetically pleasing." The board said they would discuss whether to allow my garden to remain and asked me to email them a full list of planted species and a copy of the design I had built.

In early 2020, just after COVID-19 lockdown was instituted, I received a letter from the HOA board stating that if I did not remove all the plantings and replace them



The view of Keith Hansen's front garden from his front door. The path is lined with pussy-toes (*Antennaria plantaginifolia*), mountain mint (*Pycnanthemum muticum*), hairy beardtongue (*Penstemon hirsutus*), tickseed (*Coreopsis*) and native grasses. Dense plantings require far less weeding.

with plantings that grow no taller than 6" (aka turf grass), the board would hire a company to remove it and send me the bill. If I decided not to pay the bill, they would put a lien on my home.

I was crushed. I felt helpless. My garden was my sanctuary. On top of it being a beautiful place to share

with my children and my neighbors, tending to it had become a significant part of my therapy to heal my wartime military service associated PTSD. I also felt like I was being forced to contribute to the habitat destruction that is advancing at a breakneck pace all around me.

But I decided not to be helpless. I





Even though the plot is small on Hansen's front garden, large native perennials like Joe-pye weed (*Eutrochium dubium*) and rough oxeye sunflower (*Heliopsis helianthoides*) help make it seem much larger.

reached out to my elected officials at the county and state level and emailed regional veteran organizations. I also communicated with local organizations dedicated to environmental protection. The answers I got back were overwhelmingly supportive and hopeful. Individuals and organizations pledged to write letters of support and offered to come out and speak to the HOA board on my behalf. My elected leaders advised that there was a law that had been submitted in the 2020 session, HB279, "Real Property - Restrictions on Use - Low-Impact Landscaping." The law was exactly what I needed to help provide some protection from the HOA.

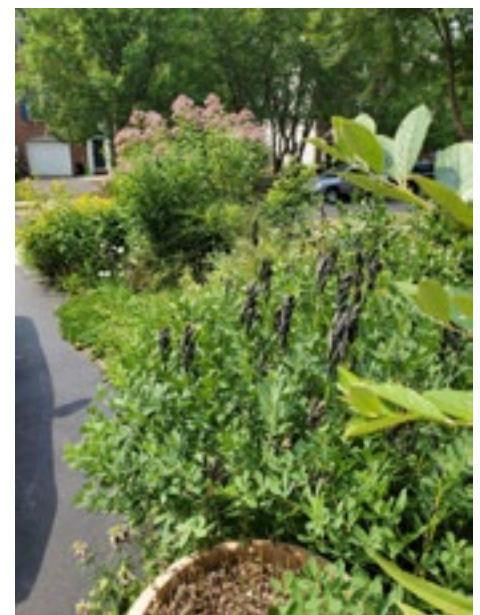
The bill specified that "restriction on use regarding land use may not impose or act to impose unreasonable limitations on low-impact landscaping, provided that the property owner:

- Owns or has the right to exclusive use of the property

- Maintains and regularly tends to the low-impact landscaping
- For purposes of Paragraph (1) of this subsection, unreasonable limitations includes a limitation that:
- Significantly increases the cost of low-impact landscaping
- Significantly decreases the efficiency of low-impact landscaping, or
- Requires cultivated vegetation to consist in whole or in part of turf grass

The bill had passed its third reading in March of 2020 with 133 yeas and two nays. This was a glimmer of hope that was quickly dashed when the Senate closed due to COVID-19, with everything needing to be resubmitted at the beginning of the next session.

Due to the pandemic, I had no idea what the HOA would do. Could they even find a landscaping firm to hire to come dig up my native



Mature seedheads on blue false indigo (*Baptisia australis*) with coastal Joe-pye weed (*Eutrochium dubium*) in full bloom during late summer in Hansen's front garden.

plants? I needed a lawyer. I had been emailing some individuals who had been fighting their own battles with HOAs and the results weren't pretty. Years-long battles. Tens of thousands of dollars spent. Many HOAs have insurance just for these types of legal battles so they have no incentive not to fight.

After some research on environmental law around the Chesapeake, I decided to throw a Hail Mary and reach out to the Chesapeake Legal Alliance (CLA) which provides pro bono lawyers who fight to protect the environment. Watershed protection and stormwater mitigation efforts were clearly in their scope, and the best solution for our stormwater issues are to treat them where they begin, on private property.

I explained to the CLA that as of 2012, 64% of the land in Anne Arundel County is privately owned. None of the counties in the state will be able to meet their Total Maximum Daily Loads (TMDL) targets without significant help from private land owners. The state and counties are addressing the symptoms with stream restorations, but they are failing to engage private land owners where the problems lie. And private



land owners that want to help are often bullied by HOAs and community associations into remaining part of the problem.

The CLA had never taken on a case in support of a private homeowner, but they were persuaded that it was within the scope of their mission to help me. I was connected with one of CLA's pro bono lawyers who was interested in my case and wanted to help. He advised that, since the bill was reintroduced into the 2021 session as HB322, and would become law if passed in October, that I wait and see what next steps the HOA would take. I waited all the way through 2021 and the HOA took no further action. HB322 passed, was enacted on May 30, 2021, and took effect on Oct. 1, 2021.

In the last year, I've made some updates to the front garden, and my back yard is now another restoration landscape. I have no doubt the HOA will come after me again at some point, but now I have some legal standing to fight back.

If you're worried about your HOA targeting you, or have already been contacted and threatened, don't get discouraged. The absolute best thing you can do is reach out to your local native plant gardening and naturalist community. You're not alone. Local university extension offices that coordinate Master Gardener and Master Naturalist groups are a great place to start. Facebook groups dedicated to native plants and ecological gardening local to your region often have members who are either going through what you are or know someone who is. Many states also have native plant societies or Wild Ones chapters with members who are incredibly passionate. An email is often enough to start things rolling.

Elected officials can also be an incredible resource. I had no idea when I contacted mine that a law was already moving through the Maryland state house to protect native landscapes from HOAs. If there are al-

ready native plant laws on the books in your area, reach out to the representatives who sponsored those bills as they are likely connected to some of the most powerful advocates in the community. Native plants may not be on your local representative's radar yet, so making them aware plants an incredibly important seed.

The native plant community is filled with some of the most passionate, generous, compassionate and selfless people I've met. Connecting to the community through volunteerism, or just showing up to listen to them share their passion, will likely leave you inspired, and surely show you you're not alone.

*Keith Hansen's passion for environmental issues and watershed pro-*

*tection/restoration was born from his childhood in the Pacific Northwest. He has been a transplant to the East Coast for the last 10 years, and involved with native plants and restoration landscaping for the last four years. Keith is a father of two, a frequent volunteer, military veteran and career IT professional.*

## Learn more

Attend "Weed Ordinances," a Wild Ones webinar with Iowa Attorney and Master Gardener Rosanne Plante, at 6 p.m. CT March 23.

Plante will explain what to do if the "Weed Police" knock on your door. To learn more or register, go to <https://wildones.org/weed-ordinances-webinar-2022/>

A bird bath is a key feature for wildlife when there are no local wild water sources. It is surrounded by turtleheads (*Chelone obliqua*), asters (*Asteraceae*), Canada wild ginger (*Asarum canadense*), violets (*Viola* spp.) and foamflower (*Tiarella cordifolia*) at the ground layer.





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# Creating a flagship demonstration native garden

*By Paul Skawinski*

For years, I had drooled over Pfiffner Pioneer Park in Stevens Point, Wisconsin, as a site for a high-visibility, demonstration native plant garden. With the popular Green Circle Trail running through this riverfront park, thousands of people would see it each month during the growing season.

The current turfgrass landscape between the water and the trail was eroding more each summer, collapsing into the river and causing issues from water quality degradation to trail stability concerns. Geese were congregating in the hundreds on and around the trail, causing conflicts between the people and geese and creating an obstacle course of smelly gifts. It was a perfect site to demon-

strate the many benefits of native plants for aesthetics, landscape stabilization, water quality protection, and even goose reduction in specific areas. But I struggled to gain support for the idea.

In December of 2020, I was delighted to get an email from the new parks director, wondering if our chapter would consider helping with a native planting in the park. We quickly developed a planting design, ran it past the Parks Committee and got to work. What this park needed so badly was finally happening!

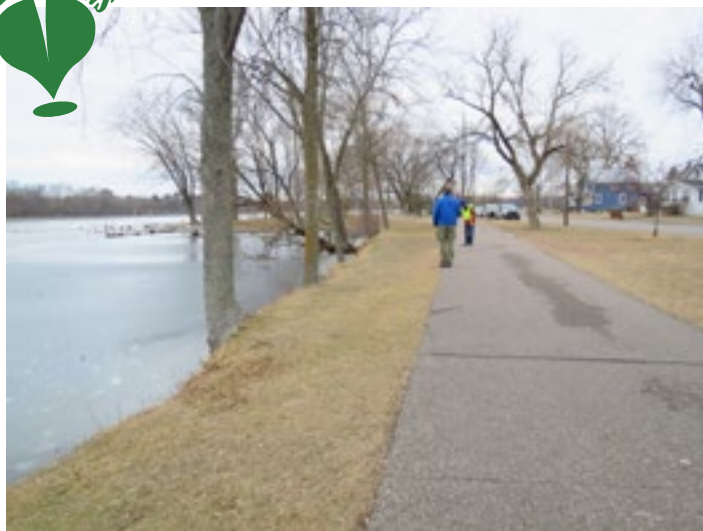
The selected site was between the asphalt trail and the river, approximately 130 feet long, 14 feet wide at one end and 6 feet wide at the other. The entire site was covered in dense turfgrass, well-nourished

A family of ducks swims by the new Pfiffner Pioneer Park Native Plant Garden in July 2021. At that time, the garden was about 2 months old.

and well-watered because of its proximity to the river. We decided to smother the site with black plastic. This would be done as soon as the snow melted in spring, which ended up being on April 14. The plastic was held down by sandbags and left until planting day on May 13. The southwestern and western exposure helped heat up the plastic nicely to kill the turf underneath.

On planting day, more than a dozen volunteers from our Wild Ones chapter, the Stevens Point Kiwanis Club, the Rotary Club of Stevens Point, and other community members came out to plant nearly 1,500 plants. Hundreds of people walked





Above, left: A before picture of the location of the Pfiffner Pioneer Park Native Plant Garden, taken in December 2020. Right: Volunteers used plastic and sand bags to kill the turf before planting the new native garden.

by, with many commenting on how excited they were about this project and asking questions about the garden. We used a cordless drill with a 2½-inch auger bit to speed things up compared to using trowels, and we watered the plants well with river water afterward. The Parks Department provided wood chips for us to lightly mulch the garden with, and they agreed to water the plants daily with a watering truck for the first month.

After planting, we installed a chicken-wire fence to keep rabbits out, and we ran two lines of twine around the perimeter to discourage people from stepping into the garden. We placed colorful signs at each end of the garden to inform passers-by of the garden's intent and some of the impressive species within.

By July, we had flowers! Community members were amazed at the quick results (thanks to using potted plants instead of seeds) and they raved about it on social media and directly to the Parks Department. Local television and newspaper media ran stories about it. A community member offered to pay for a second native garden himself if the Parks Department wanted to expand further into the park.

This demonstration garden was a major success due to careful planning. A high-visibility site has the power to rapidly change perceptions

of native gardens, for better or worse. Here were some of the key considerations we all agreed on for this site:

- We needed to use plugs/potted plants. Seeds would be too slow to establish and the public would deem the site as “ugly” and “weedy.” The site would probably fail and the Parks Department would be under pressure to remove it.
- The trail must be lined with short plants that would not interfere

with public use. Tall, floppy plants or large seed heads could litter the trail and cause negative public interaction with the garden. We chose to line the trail with two to three rows of nodding onion (*Allium cernuum*) and Bicknell's sedge (*Carex bicknellii*), which provide a short, full border and little concern for plant material impeding the trail.

- We must install colorful, attractive signage to inform the public on

More than a dozen volunteers from the Wisconsin Central Chapter of Wild Ones, the Stevens Point Kiwanis Club and the Rotary Club of Stevens Point came out to plant nearly 1,500 native plants in May 2021 at the Pfiffner Pioneer Park demonstration native plant garden.







A sign identifies some of the native plants that can be found in the Pfiffner Pioneer Park Native Plant Garden, and tells about the benefits of native landscaping.

the intent of the garden and highlight showy, colorful species within. We needed to address any beliefs that native plants are boring or ugly.

- We needed to work with local media to get the word out, not just expressing how great native plants are, but also focusing on the many benefits of natural landscaping.

- We needed to invite other community groups to help plant the garden. Members of the public may not be familiar with Wild Ones, and that may result in skepticism of the project from the outset. Involving more well-known organizations like the Rotary Club or Kiwanis Club added a layer of credibility and support.

The Pfiffner Pioneer Park shoreline restoration garden ended up being a great example of using the full potential of native plants. This section of the Green Circle Trail is now lined with a variety of beautiful

flowers, grasses and sedges. Countless people were seen stopping by the garden to take photographs of flowers and wildlife. The garden protects the shoreline from further erosion and deters geese from hanging around the trail. It provides habitat for a variety of insects and other wildlife. And it does all of this while reducing the Parks Department's mowing workload and improving public perception of native plants. We can't wait to see it blooming in 2022 during its first full growing season.

Below is a list of the species that were included in the garden:

- Anise hyssop (*Agastache foeniculum*)
- Nodding onion (*Allium cernuum*)
- Swamp milkweed (*Asclepias incarnata*)
- Butterfly milkweed (*Asclepias tuberosa*)
- Bicknell's sedge (*Carex bicknellii*)
- Bebb's sedge (*Carex bebbii*)

- Bristly sedge (*Carex comosa*)
- Northern blue flag iris (*Iris versicolor*)
- Dense blazing star (*Liatris spicata*)
- Meadow blazing star (*Liatris ligulistylis*)
- Purple coneflower (*Echinacea purpurea*)
- Sweet black-eyed Susan (*Rudbeckia subtomentosa*)
- Cardinal flower (*Lobelia cardinalis*)
- Blue lobelia (*Lobelia siphilitica*)
- Foxglove beardtongue (*Penstemon digitalis*)
- Little bluestem (*Schizachyrium scoparium*)
- New England aster (*Symphotrichum novae-angliae*)
- Golden Alexanders (*Zizia aurea*)
- Blue monkey flower (*Mimulus ringens*)

Paul Skawinski is the past president of the Central Wisconsin Chapter of Wild Ones.





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On Oct. 22, 2020, the East Troublesome fire leapt over the Continental Divide, blazed through many favorite hiking spots in Rocky Mountain National Park and reached the western edge of the town of Estes Park.

# Responding to climate crisis in Colorado landscapes

By Jim Tolstrup

Last year I wrote a book about restoring nature in the environments where we live, work and play, focusing on the use of native plants in landscaping and habitat restoration. At the end of the book, I included the following comment: *“The communities that we design and build need to have a positive effect on natural areas and resources, or nature will have a negative effect on us.”*

The previous summer hundreds of thousands of acres of forests were burning throughout the West. In cities along Colorado’s Front Range, fumes and smoke hung in the air so thickly at times that it created an otherworldly light. Air quality was in the poor to dangerous range off and on from August through much of October.

My comment was meant to be philosophical. Of course, there are feedback loops from nature, and a

species that destroys its environment will begin to die out as its ecosystem declines. But humans are good at manipulating that feedback, or so we may believe. The thought that a raging fire could consume an entire neighborhood, destroying nearly 1,000 homes in a single afternoon, as it did in Superior, Colorado on Dec. 30, 2021, was beyond anything we had previously imagined. This single event shattered the notion of a “fire season” in Colorado and in-





troduced us to the term and the lived experience of an “urban fire storm.”

The fire cycle is certainly not new to our region. Historically, lightning strikes caused low-level grass fires from the prairie to the montane zone, elevations of approximately 4,500 to 9,000 feet. The montane zone, sometimes called the “ponderosa pine savanna,” is a landscape shaped by fire. Ponderosa pines naturally lose their lower branches, which otherwise could become ladder fuel that could help a fire reach the crown of the tree. The pumpkin orange bark of a mature ponderosa pine has evolved to slough off in layers when exposed to fire, making them somewhat flame resistant.

Before the arrival of white settlers, fire shaped the montane

zone into a park-like environment with large trees spaced far apart in a grassland filled with shrubs and wildflowers. Fire helped to clear out and renew the understory periodically, and kept those trees from becoming too crowded. The wide spacing of trees helped to keep this old growth forest healthy by limiting the number of trees, thereby reducing competition for available ground moisture.

Indigenous people used fire to regenerate the land and improve habitat for the game on which they depended. The absence of these traditional land management practices, combined with the excessive suppression of naturally occurring fires within the last century, has resulted in an overgrown, less resilient forest.

Snowmelt from Colorado's subalpine forests provide water to over 40 million people in seven Western states.

It's estimated that 80% of the trees in Colorado are less than 100 years old. People who say that “trees are the answer” and apply this standard universally, regardless of the bioregion, may be missing an important point about how our ecosystem functions in the Rocky Mountain West.

When fires ignite in the overgrown forests that currently exist, they don't just burn along the forest floor. They leap up into the crowns of trees, creating such an intensity of heat that they often burn the soil, which undermines the forest's recovery. When storm events hit the scorched slopes following this type of fire, it can cause erosion, siltation





Clockwise from top left: With the growing threat of extinction facing so many species, today's gardens need to be more than just pretty; they need to serve an ecological function. Thankfully, birds like the cedar waxwing (*Bombycilla cedrorum*) are protected under the U.S. Migratory Bird Treaty Act. Top right: Hummingbirds are frequently drawn to tubular shaped garden flowers. Hummingbirds were pushed down out of the mountain during the fire and drought of 2020. Right: Holding one tiny bird while thousands of others flocked to our gardens under a smoke-filled sky.

of streams and acidification of water that corrodes the pipes of municipal water supplies.

In both the montane and subalpine forest, prolonged drought and milder winters have exacerbated the issues brought on by overcrowding leading to an outbreak of mountain pine beetle, ips beetle and other insects that have killed large numbers of trees over vast areas. In some ways it could be said that these insects are doing the work of forest thinning in the absence of fire. In many parts of the montane forest, the beetle kills resemble a burn pattern, taking out a group of trees here and leaving others there.

However, there are many places where the subalpine forest has been reduced to nothing but stands of dead trees, as far as the eye can see. But on closer examination, there is a tiny understory of forest already reestablishing in many areas. In 100 years, these large areas of dead forest may be completely regenerated. But there is some concern that rising temperatures and a continual drying



trend may not allow the subalpine forest to recover.

Water supplies in much of the West are dependent on Colorado's high-altitude forests that trap and store snowfall. As snow in the cool sub-alpine forest begins to melt, it replenishes streams and rivers, including the Colorado River, which supplies water to 40 million people in seven western states.

The growth of cities in the American West has increased water consumption from the Colorado River and pushed this critical natural resource beyond its recharge capacity. It is possible that we could reduce some of this demand within the communities that we design and

build by switching to a style of landscaping that is more appropriate for our region, thereby conserving water while restoring some of our state's unique biodiversity.

Here in the cities on Colorado's Front Range, a region that typically gets 12-14 inches of precipitation per year, the average person uses 150 gallons of water per day. About 60% of residential water consumption goes to support landscaping. This amounts to approximately 90 gallons of water per person per day used to keep exotic landscapes on life support.

Colorado's population in 1900 was 543,000. By 2019, the population had increased over tenfold to



Top Right: A statue of liberty replica with apocalyptic skies at Fort Collins City Park. Bottom right: Smoke from a nearby fire fills the sky above homes, causing air quality to plummet.

5.7 million. Over the next 20 years, Colorado's population is expected to grow by roughly 30%, increasing from 5.7 million in 2019 to 7.52 million in 2040.

Global climate change is already impacting the timing and the amount of water available in the state. Rising temperatures can lead to fewer, but more-intense, precipitation events and may alter the ways in which plants grow. The transpiration process of plants pulls water from the soil and disperses it into the atmosphere. Transpiration increases as temperatures warm, which causes the plants to use more water and further dries out the soil.

Although our growing population and a changing climate will reduce available water, we have made virtually no effort to conserve water in landscaping thus far. However, the rising cost of water is beginning to change how municipalities, developers and landscape designers are re-envisioning "regionally appropriate landscapes" that utilize native plants adapted to our high altitude, bright sun and dry climate.

Native landscapes can help wildlife survive during periods of drought. In the summer of 2020, during a prolonged drought, our gardens in Loveland, Colorado were thronging with birds and pollinators. Hummingbirds, which are usually found at higher elevations in summer, buzzed through our gardens in record numbers. Songbirds flocked to the High Plains Environmental Center gardens as well, seeking fruit, seeds and insects when many other sites were barren and dry. Hiking in the mountains to find wildflower seeds yielded nothing because many plants had flowered little, or not at all.

By late summer, the dead standing timber in the high country, fanned by a hot, dry wind, exploded into flames that burned over 665,000



acres. The resulting fires killed countless thousands of wild animals and caused \$266 million in damage. 2020 was the costliest fire season in Colorado history until the following year when the [Marshall fire](#) broke this record in a single afternoon.

After the long summer's drought of 2020, stress that resulted from fires and heavy smoke, and a sudden deep freeze in early September, sent millions of birds in the Rocky

Mountain West into a migration for which they were not prepared. Tens of thousands, perhaps hundreds of thousands, of birds were found dead in Southwestern states, where birds literally dropped from the sky.

A subsequent necropsy confirmed that the birds had died of starvation, unable to gain sufficient weight before migrating. As the effects of climate change increase occurrences such as this, it increases





Left top: An area burned in the High Park fire of 2012. Today, snow brush (*Ceanothus velutinus*) is common there since its seeds can only germinate after they are scarified, generally by wildlife. Left bottom: Western native plants are adapted to the Colorado region's bright sun, high altitude and windy and dry conditions.



the need for us to subsidize the diet of our wild birds. A study undertaken by the Audubon Society says that 389 species, roughly two-thirds of all the birds in the U.S., are threatened with extinction or significant loss of habitable range due to climate change. Providing habitat within the landscapes that we design could make an enormous difference to their survival.

Full disclosure — shifting landscape practices, although perhaps

the low-hanging fruit — is not in itself enough to solve our water supply problems. It's important to note that an estimated 50% of water used in the Colorado River Basin goes to raising cattle, and as much as 25% of our water nationwide. While it could be argued that meat is the only sustainable food in our region because grazing animals do not destroy the native plant community in the same way that cultivation does, this does not represent the facts of the

situation. Cattle are not drinking all this water. The water is used to grow crops, to fatten cattle in crowded feed lots.

Solving the problems presented by climate change is, of course, not a simple matter. It will require two things that seem to be in extremely short supply: a widespread acceptance of demonstrable facts, based on scientific research, and a willingness to work with a broad base of stakeholders and partners including businesses, farmers, citizens, political leaders and nature itself.

The simple notion that it's more beneficial and cost effective to utilize native plants vs. laying down thousands of acres of irrigated turf would seem to be a foregone conclusion, but the notion is only slowly taking hold. Nevertheless, this conversion, if only out of the necessity of water shortages, is inevitable. But this is not an argument for austerity. This is rather an invitation to celebrate landscapes that are vibrant and interesting year-round, in a way that allows other beings, present and future, to do the same.

We have observed firsthand how dramatically and rapidly our local birds and pollinators recover when we grow native plants in our gardens. Celebrating our native biodiversity can restore our relationship to the land and may allow the new civilization that we have built on this land to continue, in harmony with nature.

*Jim Tolstrup, author of "SUBURBI-TAT," is the executive director of the High Plains Environmental Center in Loveland, Colorado, a unique model for restoring nature where we live, work and play. He is also a member of the Wild Ones Front Range chapter.*



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# Tips for planning well-attended programs on native gardening

By Courtney Denning

Gardening classes are one of the most well-attended programs that the Piqua Public Library offers. Since gardening happens to be one of my favorite subjects, I was excited to put together a new gardening series in 2019 as the library's new marketing and programming coordinator.

The library had offered gardening classes and workshops for children and adults in the past. But none of the topics had focused on native plants. Thankfully, native plants are becoming a trendy topic in gardening as people discover that native plants are lower maintenance plants for their gardens. Others are switching to native plants to support insects and other wildlife or address the climate crisis in their own backyard. Regardless of how people are learning about native plants, trendy topics make for well-attended library programs.

The Native Gardening Series at the Piqua Public Library in Piqua, Ohio, had a strong start in its first year in 2019. For five Saturdays in March, from 2 - 4 p.m., a local expert presented on a topic related to native plants. In addition, I put together gift bags for participants, including purple coneflower, black-eyed Susan, common milkweed, partridge pea and other seeds, as well as catalogs and pamphlets donated by Ohio Prairie Nursery, Prairie Nursery, Prairie Moon Nursery and Wild Ones.

In the first year, I contacted presenters in the late fall of 2018, first reaching out to former co-workers from previous jobs when I worked at a nature center and a conservatory. I then reached out to our county parks, soil and water conservation district, and the Ohio Department



The Piqua Public Library purchased butterfly magnets to include in their giveaway bags.

of Natural Resources. I had a difficult time filling the last Saturday of the program series, so I searched for local native plant sellers and found my final presenter.

I asked potential speakers for native plant topics they would be comfortable presenting. A few had multiple subject areas they could discuss and allowed me to pick from a list. The lecture topics I chose for 2019 included:

- Milkweed and Monarchs
- Rain Gardens: Pretty with a Purpose
- If You Plant It, They Will Come
- Why Native Plants are Important and How to Replace Invasive Plants
- The World of Native Plants + Birds

To promote the month-long series, I wrote up a press release with a description of each lecture and a brief bio of the presenter, which was

submitted to the local media. The event information was also published on the library paper calendar, library website, Piqua Community Calendar and Facebook Events. In addition, I made graphics for each presentation, which I shared on the library's social media accounts: Facebook, Instagram, Pinterest and Twitter.

My co-workers used the native gardening theme as inspiration for book displays and our director purchased butterfly magnets to include in the gift bags.

The library usually doesn't require registration for lecture-style programs. Still, I wanted an idea of how many people to expect so I could set up our program room with the appropriate number of chairs. I used a Google Form for each program, requesting that patrons register online. All programs offered by the





Above: Courtney Denning created graphics to promote the native gardening series on the Piqua Public Library's social media accounts. Left: Chris Kline's presentation, "If You Plant It, They Will Come," was the best attended one of the series with 50 participants.

• **Adding Buzz to Your Backyard!**  
Not surprisingly, the 2020 Native Gardening Series was canceled when the Piqua Public Library closed in mid-March 2020 due to the COVID-19 pandemic. I did not plan the series for April of 2021 as we were not hosting programs inside the Library at the time.

However, not all was lost as the pandemic brought forth some new garden-related programs: Native Plant of the Week and the Piqua Seed Library. Both were no-contact programs so they were safe for staff and patrons and relatively low cost. Native Plant of the Week was a 25-week series featuring free plants or seeds from my garden with an educational handout. The Piqua Seed Library is a growing project. We have more than 300 varieties represented, from vegetables and herbs to flowers and lots of native plants.

I am hopeful that I can resume the Native Gardening Series soon, either as an in-person program or in a new format online. When it comes to native gardening programming, I've learned that if you plan it, they will come.

*Courtney Denning loves spending time in her garden. She has a background in environmental and plant biology. She has worked at nature centers, a conservatory and currently works in marketing for the Piqua Public Library. Denning is also a member of the Wild Ones Dayton Area Chapter.*

Piqua Public Library to patrons are free, outside of occasional fundraising programs.

Native gardening programs have been a great option as they are both popular with our patrons, and I can supply native plants and seeds from my own gardens. In fact, the native gardening programs were some of the most well-attended programs I have planned for the Piqua Public Library. On average, each lecture had 40 attendees, and almost all of them registered online, so I set out an appropriate number of chairs for the room.

The most popular class was about gardening for butterflies, presented by Chris Kline, director of the Butterfly Ridge Conservation Center. About 50 people attended and the program room was standing-room-only; I had to really cram the chairs into the room to get everyone inside.

For comparison, when I teach craft programs at the Library, we cap our program size at 12 people so I

have enough space in our programming room. Our most well-attended monthly book club regularly has 20 patrons. If I'm giving a lecture on a non-plant-related subject, I'm delighted if I have more than five attendees.

Our total attendance for all five lectures was 208 people. Some attendees came to each class, others came to just a few or one of the five. The gift bags were well received, and I was looking forward to planning our second lecture series for 2020.

In 2020, we moved the Native Gardening Series from March to April to coincide with Ohio Native Plant Month and National Native Plant Month. I secured two local master gardeners and two native plant growers as presenters. The lecture classes I chose for 2020 were:

- Mulching with Native Plants
- Lesser-Known Native Trees and Shrubs That Will Enhance Your Landscape
- The Potential of Native Plant Agriculture





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# Broadening our focus: Optimizing how we use native plants

By Eric Fuselier

As public awareness of the plight of pollinator and wildlife species continues to grow, more people are joining the native plant landscaping movement and are beginning to understand how landscaping practices can be a source of environmental change. But there is another benefit many of these native plant species can provide that has been mostly overlooked. That is, many of these native plants can provide other benefits besides habitat for pollinators and wildlife; they can also be used to clean up environment contaminants through a process called phytoremediation.

The general public is mostly unaware of low to moderate levels of contamination that exists in soil, air and water, in part because it isn't very obvious. At low levels, environmental contamination isn't high enough to kill off large swaths of fish or vegetation in a single day, or cause massive ecological devastation on a scale that makes the news. We typically don't experience the health effects from our persistent exposure to these contaminants until later in life.

But if you tested the soil in an urban roadside ditch or around an old building, you may be surprised at the elevated levels of heavy metals and other toxic compounds that are there. Likewise, you may also be surprised to find out what is in your rural well water, should you have it tested. Not to mention the adverse health effects from the air quality found in certain parts of the country.

Phytoremediation uses the natural ability of certain plant species to accumulate, sequester or breakdown contaminants found in the envi-

ronment. Much research has been devoted to testing the capability of certain plant species for remediating specific contaminants, and many of the species that have been studied are native to North America. We need to apply this body of knowledge so that our gardens and landscapes not only benefit pollinators and wildlife, but also improve environmental quality for all living things by transforming or removing contaminants found in the soil, air and water we use.

## The "Big Four"

This article is the first in a series on the "Big Four" native warm-season grasses and how each of these species can be used in phytoremediation to target specific contaminants. The "Big Four" refers to the four dominant grass species of the tall-grass prairie ecosystem: big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), Indiangrass (*Sorghastrum nutans*) and switchgrass (*Panicum virgatum*). The range of each of these species covers most of the central and eastern United States, and they are also commonly available for purchase through most native plant nurseries or seed providers. The decision to write about these species and their use in phytoremediation is due, in part, to their wide commercial availability and broad geographic range.

## Petroleum products and hydrocarbons

Sources of petroleum in the environment can include fuel spills from engine maintenance and repair activities, petroleum extraction activities, leaks from above- and underground storage tanks, and engines dripping petroleum products onto parking lots, driveways and road-



Indiangrass (*Sorghastrum nutans*) does most of its growing between June and August and remains green until the first frost. It also tolerates rocky and clay soil.

ways. When it rains, petroleum that is on exposed impervious surfaces such as roads and parking lots can be transported in stormwater runoff to a nearby aquatic ecosystem or otherwise be deposited in the soil adjacent to that impervious surface. Petroleum from leaking underground storage tanks can contaminate soil and groundwater.

Because of the fibrous nature of the root systems of the Big Four grasses, these species are great at facilitating the breakdown of low to

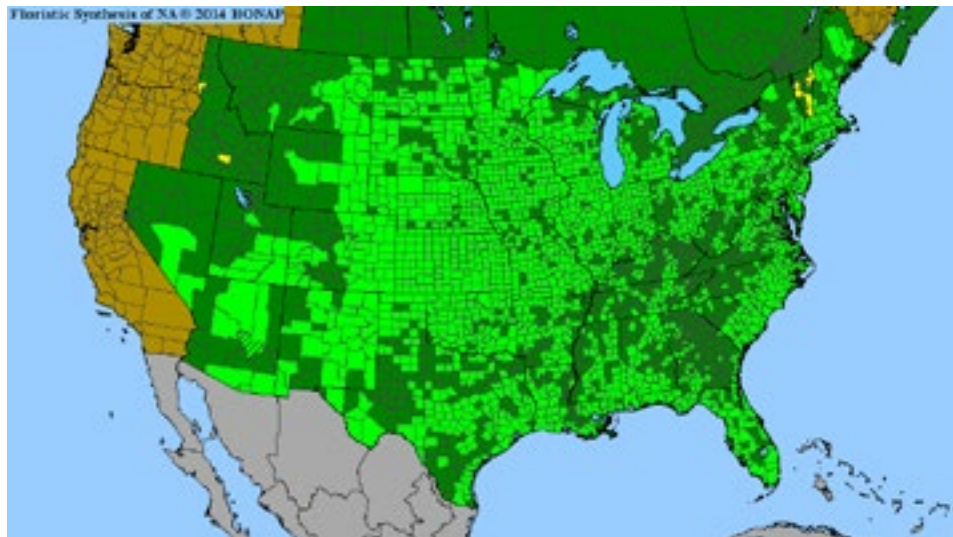


moderate levels of petroleum products in the soil through a process called phytostimulation. Phytostimulation occurs when contaminants are broken down in the soil by microbial activity that is enhanced by the compounds exuded from the roots of plants. Many of the microorganisms in the soil, such as yeast, fungi and bacteria, can utilize harmful organic substances such as petroleum as their nutrient sources, and in the process degrade them into harmless substances. Natural exudates from plant roots provide food for these soil microorganisms and enhance their metabolic activity. And since hydrocarbons are organic (i.e. carbon-based) molecules, they're also a food source for many species of microorganisms found in the soil. In short, the more that we can stimulate microbial activity in the soil, the more petroleum and hydrocarbons can be broken down and transformed into non-toxic components by these microbes.

When a plant species has fibrous root systems, there is a greater surface area associated with these roots than we would find associated with a species that has thicker, but fewer roots. This high surface area correlates to a greater volume of soil beneath the plant that is occupied by the root zone (or rhizosphere), and to a greater volume of soil with microbial activity that is being stimulated by the exudates of those roots.

Thus, while all plants are able to facilitate the breakdown of petroleum through their root systems, some species are better at it than others. In other words, species like the Big Four that have more fibrous root systems are better at facilitating the breakdown of petroleum than species that have thicker roots.

Planting the Big Four in or near areas where petroleum could potentially be released onto the ground surface, such as in the landscaped areas at gas stations, in parking lots, by railyards and machine repair shops, or near oil and gas refineries



Above: The bright green areas on the U.S. map show where switchgrass grows. Below: Switchgrass (*Panicum virgatum*) grows best in sandy loam or clay loam soils with full sun to part shade. It can grow 3-6 feet tall and has a fibrous root system that can grow as deep as 30 feet into the soil.





and locations where oil extraction is occurring, can act as the first line of defense to help break down any petroleum accidentally released into the soil from these land uses.

It's common for underground tanks used to store gas and diesel fuel at gas stations to leak after they've been in the ground for 30 years. Normally these leaks are detected during the periodic inspections required by environmental regulations. But by the time a leak has been detected, gas or diesel fuel has usually been released into the soil surrounding the underground tank. The next step is then to figure out how far the plume has spread. Planting the Big Four in landscaped areas near these underground petroleum tanks could help reduce the spread of these plumes and prevent petroleum from reaching groundwater supplies.

Most petroleum products also have a density less than that of water, and thus tend to float and spread into a thin layer on the water surface called a sheen. However, once in the water they can be harmful to wildlife and have adverse impacts to aquatic ecosystems. Stormwater runoff from parking lots, roadways and other impervious surfaces built for automobiles often contains petroleum products. Including the Big Four in rain gardens, bioswales, vegetative filter strips, riparian buffers and constructed wetlands that receive stormwater from these areas can also reduce or eliminate the amount of petroleum that enters aquatic ecosystems, helping improve or enhance the water quality of streams, rivers, lakes and reservoirs.

## Conclusion

Native plants are currently not utilized to their fullest potential when selected for native gardens or landscapes. By utilizing the growing body of research available regarding phytotechnology using native plant species such as the Big Four, and by strategically selecting and placing these species on the landscape to either degrade or extract a variety of

## For more information

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contaminants found in the soil, water and air, we can design landscapes and gardens that contribute to environmental improvements beyond the benefits they provide to pollinators and wildlife.

In time, my hope is that native plant gardeners and landscapers will become just as knowledgeable about the native plant species that are useful for remediating specific contaminants as they are about the species that are beneficial for specific pollinators. By applying these additional functions of native plant species to the landscape in a thoughtful manner, we can work not

only to improve the plight of pollinators, but to also improve the environment as a whole.

*Eric Fuselier is an environmental scientist at Olsson where he conducts environmental impact studies and works with civil engineers and landscape architects to minimize the environmental impact from the infrastructure projects they design. He chartered the Wild Ones Ozark Chapter in 2020, where he also serves as chapter president.*

Switchgrass (*Panicum virgatum*) can improve environmental quality.





# Mark Your Calendar

## MARCH

**March 12**

**National Plant a Flower Day**

**March 14**

**National Learn about Butterflies Day**

You probably already know about monarchs, but with more than 20,000 types of butterflies world-wide, it's likely that there are a few species you could learn about.

**March 23, 6 p.m. CT**

**Weed Ordinances Webinar with Speaker Rosanne Plante**

Check our [website](#) for registration information. Rosanne Plante is a Wild Lawyer and a certified Iowa Master Gardener since 2004, having been awarded lifetime achievement awards for her 10 year and 500+ community service hours. In fall of 2019, she received credentials and is now an Iowa certified Master Conservationist.

## APRIL

**National Garden Month**

**April 1**

**National Walking Day**

Enjoy the outdoors whether in your own garden, or at a local park or conservancy.

**April 7, 6 p.m. CT**

**Native Plants for Storm Water Webinar with Wild Ones National Board Member Eric Fuselier**

Check our [website](#) for registration information.

**April 14, 6 p.m. CT**

**Native Plants for Air Quality Webinar with Wild Ones National Board Member Eric Fuselier**

Check our [website](#) for registration information.

**April 21, 6 p.m. CT**

**Native Plants for Soil Contamination Webinar with Wild Ones National Board Member Eric Fuselier**

Check our [website](#) for registration information.

**April 22**

**Earth Day**

It's a great time to protect lakes and streams by planning (and planting) a rain garden!

**April 26**

**National Audubon Day**

This day is definitely for the birds.

**April 29**

**Arbor Day**

**MAY**

**Lyme Disease Awareness Month**

**National Photography Month**

**American Wetlands Month**

**May 7**

**National Start Seeing Monarchs Day**

**May 1-7**

**National Wildflower Week**

Lady Bird Johnson Wildflower Center

**May 3**

**National Garden Meditation Day**

**May 16**

**National Love a Tree Day**



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## THANK YOU FOR YOUR CONTRIBUTIONS

**Anonymous**, in honor of Elaine Maddy

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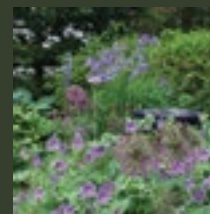
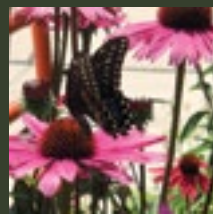
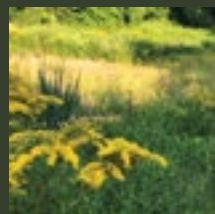
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