WILD ONES JOURNAL
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WILD ONES®

A VOICE FOR THE NATURAL LANDSCAPING MOVEMENT

Think spring!

By Barb Benish

I'm writing this as the nation is in a deep freeze with wind chills in the -40s in Wisconsin, and snow, sleet, and freezing rain forecast just about everywhere else. What a wonderful time to be thinking of the warmth of spring and the spring issue of the *Wild Ones Journal*.

And what an issue it is! In 2026, the *Journal* will be highlighting "The Year of Climate Action." We kick off our series with "Water — Managing the flow," on Page 13 by Katie Reed, Dan Beckwith and Jessica Schultz, which looks at how native plants absorb water, reduce flooding and provide drought resilience through deep roots and restored hydrology. In addition, Carol English looks at how native plants adapt to drought, heat and fluctuating seasons on Page 17. For instance, did you know that the brittlebush (*Encelia farinosa*) releases water onto the leaf surface to cause evaporative cooling similar to when humans sweat? Lastly, check out Kristine Johnson's article on Page 21 and learn how you can harvest water.

Thinking of selling your home anytime soon? If so, you'll want to read "Selling the landscape: Helping native gardens shine in the real estate market," by Lizz James on Page 4. Lizz gives helpful suggestions how to select a real estate agent who realizes native gardens are an asset, not a liability, and includes tips on how to "sell" your property by creating a binder with photos and information of your native gardens and promoting your gardens' sustainability. That's because more than three-quarters of millennial and Gen Z buyers consider sustainability an important factor in choosing a home.

Need more ideas? Then check out Regina Santore's article on Page 8, "Future proofing your native landscape." Regina believes that the best defense for the native suburban yard is a good offense, and she has taken measures to make it difficult, expensive and ultimately impractical to try to convert her property's landscape back to turfgrass, and thus increase the odds that a true land steward will purchase her property when she is ready to sell.

We're also publishing a year-long series on lawns. Benjamin Vogt kicks off the series on Page 32 with "'Unlawning' a suburban legacy," which looks at how green, manicured lawns came to be what too many people consider the gold standard for landscaping in the United States. But Benjamin also reminds us that "minimizing lawn and creating lusher landscapes means cleaner air, cleaner water, cooler air and habitat for the insects and bugs that literally make our world run."

Learn how to get your community to notice and appreciate nature in Carey Murphy's article on the International City Nature Challenge (Page 40). Murphy helped to turn her fellow Frederick, Maryland residents into community scientists, with participants making 7,114 observations of 1,332 species in just four days.

Lastly, be sure to read our regular features, including a profile on Page 25 of a Wild Ones Seed for Education grant winner and our botanical garden feature on Page 36, which in this issue highlights the Foraging Meadow and Medicine Wheel Garden at Historic Barns Park in Traverse City, Michigan.

Enjoy spring and all its beauty, and remember the impact native plants can have on your yard, city, state and nation. Encourage others to join us and take part in climate action!

Wild Ones promotes native landscapes through education, advocacy and collaborative action. Native plants help protect and restore biodiversity, improve air and water quality and provide wildlife with food and shelter. Our vision is native plants and natural landscapes in every community.

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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WINNER 2020 APEX® AWARDS FOR PUBLICATION EXCELLENCE

Taking pictures of your native plantings at different times of the year, and then placing those photos in a binder available during showings, is just one way to help potential buyers appreciate the importance and beauty of your native landscaping.

Selling the landscape: Helping native gardens shine in the real estate market

By Lizz James

Across the country, more homeowners are turning their yards into thriving native landscapes, full of coneflowers, prairie grasses, milkweed and pollinators. But when it comes time to sell, these same gardens can sometimes be misunderstood.

A homeowner sees years of care, habitat and intentional design. A potential buyer, or well-meaning real estate agent, might see "a lot of plants."

Bridging that gap is key to keeping native landscapes valued and protected through a sale. As more communities embrace sustainable gardening, real estate professionals have a growing opportunity to help buyers recognize the beauty and long-term benefits of native plantings.

What real estate agents need to know

Native gardens are an asset, not a liability. When maintained and presented well, a native landscape can increase curb appeal, reduce maintenance costs and connect a home to its region's natural heritage. Buyers are increasingly interested in properties that are pollinator-friendly, sustainable and water-wise.

The challenge lies in the presentation. A well-meaning agent might list a native garden as "low-maintenance landscaping" and leave it at that. But that misses the story of stewardship that makes these gardens special.

Tell the story of the garden

Real estate agents don't need to be botanists, but a little plant knowledge goes a long way. Knowing how to talk about the seasonal character of native gardens — the early bloom of wild columbine (*Aquilegia canadensis*), the summer height of black-eyed Susans (*Rudbeckia hirta*), the winter beauty of prairie grasses — helps buyers appreciate their year-round interest.

Encouraging homeowners to identify key species, share labeled photos or provide a plant list in the listing packet helps make the garden's design visible to those who might not yet "see" it.

Show intentional design

A simple garden map can help buyers understand how the landscape works. It doesn't need to be fancy, just a diagram showing plant zones, bloom successions or wildlife areas. When included in digital materials or open-house displays, a garden map signals that what buyers see outside isn't overgrown, but designed to thrive naturally.

Use the power of photos

Since many native gardens look their best in specific seasons, it's worth photographing them throughout the year. Those peak summer prai-

Photos of your native plants and pollinators will also help show prospective buyers the importance of your gardens in the local ecosystem. Here a bee nectars on a purple coneflower (*Echinacea purpurea*).

rie blooms or fall asters alive with pollinators can help potential buyers imagine the landscape in full color, even during a winter sale.

A real estate listing that pairs good photos with thoughtful captions ("Monarchs visiting swamp milkweed," "Winter seed heads of little bluestem") tells a story no traditional lawn can match.

Partner with the right agent

For homeowners, finding an agent who understands and values native landscaping makes all the difference. For agents, becoming familiar with the basics of native gardening is a professional advantage.

As more buyers seek eco-friendly homes, the ability to confidently market a native landscape as a living, local ecosystem sets a property apart. It could also increase your asking price, as a 2019 University of Delaware study in the *Journal of Environmental Horticulture* found. They reported that homebuyers were willing to pay up to 4–5% more for properties with well-designed native landscapes compared to those with conventional turfgrass lawns.

The bigger picture

Each time a home with a native garden changes hands, there's a chance to preserve years of ecological investment. When buyers see that value, they're more likely to continue caring for it, particularly if they understand it could save them money. For instance, the EPA's *GreenScapes* program and the U.S. Forest Service have both reported that native plantings can reduce landscape maintenance costs by 30–50% over time due to reduced mowing, fertilizing and irrigating.

Real estate agents who can help tell that story play a role in extending the impact of native landscaping well beyond one yard.

Steps homeowners can take before listing

Even the most vibrant native landscape can be overlooked if buyers don't understand what they're seeing. A little preparation helps ensure your garden's story continues with its next caretaker.

• Create a display binder. Include labeled photos, a simple garden map, plant lists and maintenance tips. Keep it available during showings or open houses.

• Highlight the seasons. If you're selling outside peak bloom time, share photos that show how the garden looks in spring, summer, fall and winter.

• Label key plants. Use small, attractive markers for signature species so visitors can identify them easily.

• Leave helpful resources. Include contact information for a local native plant nursery or designer, plus local organizations like Wild Ones. This gives buyers a sense of continuity and support.

• Work with a like-minded agent. Choose an agent who understands native gardens and can communicate their value to buyers; these are not just low maintenance, but also living landscapes. It may take multiple phone calls to several real estate companies, but your effort will help to ensure that your native plant gardens will exist even after you're gone.

Sustainability is priority for many buyers

There is good news for native gardeners looking to sell their properties. A 2023 National Association of Realtors *Sustainability Report* found that 63% of agents and brokers said promoting energy efficiency and sustainability in listings is "very" or "somewhat" valuable to buyers.

Younger buyers, in particular, are leading this shift, with Zillow reporting that more than three-quarters of millennial and Gen Z buyers consider sustainability an important factor in choosing a home.

Lizz James, of Clayton, Missouri, is a realtor with ReeceNichols St. Louis on the Breihan Malecek Petersen and James Team. She moonlights as a native plant evangelist, is a past member of the Webster Groves Greenspace Commission, current leader of a Missouri Stream Team and full-time yard steward. When she's not pulling bush honeysuckle, she's helping families, including refugee families, put down roots of their own.

COOL SEASON NATIVES FOR EARLY SPRING

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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.

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

Left: *Geranium maculatum* (spotted geranium)

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.

Izel Native Plants
Every plant counts

Future-proofing your native landscape

By Regina Santore

I've been a real estate agent for 13 years and a native plant enthusiast for just four of those years. I've been the agent who said "that's a lot of plants" while showing a property, and the agent who had to tell the client they might not get to do whatever they want with the property they wanted to put an offer on because it had a conservation easement on it, and it wasn't clear what that meant. (Outcome? They didn't buy the property.)

I'm happy to say I'm a wiser agent now, able to distinguish between "a lot of plants" and a truly native landscape. I also understand that working with a land conservancy could be a great thing, offering both ecological value and potential financial benefits.

In short, I'd be eager to guide would-be land stewards and native gardeners through a home purchase … if only there were any. Unfortunately, I've found this type of buyer to be rare.

Most homebuyers ignore the landscape; they focus on finding a house or acreage size that meets their needs. At best, plants are an afterthought, and many plants can be perceived as a negative. Many buyers are heading into a new phase of life: building a family or planning for future lack of mobility. They recognize that their time or ability will be limited, and they are interested in pressing the easy button for handling their landscaping. A lot of plants doesn't seem easy to most buyers.

As someone who has converted my half-acre suburban property to a 100% native landscape by myself, I share the fear that a future owner will not value what I have worked so long and hard to achieve. I realize I am not guaranteed that whoever purchases my home will leave my landscaping as it is, no matter how hard my pro-native plant real estate agent tries to find a true land steward for it.

A parkour course of log stump pieces allows visitors to cross through the Miyawaki forest on Santore's property without stepping on vegetation.
Photo: Macey Brown, A Wild Approach

Without a doubt, I have shrunk the potential pool of buyers for my home because of my landscape design choices, and I may have devalued my property to some extent, too, depending on the current housing market. Similarly, someone with

Top left: Early construction of the pond on Santore's property. Her Miyawaki forest is in the background.

Middle: Santore's pond takes shape, revealing the natural grade of the surrounding landscape. It's definitely not mowable!

Bottom: The pond as it looks today.

Photos: Regina Santore

acreage who chooses to enter a land conservancy easement agreement to protect their land's future may also have devalued their property.

I've concluded that the best defense for the native suburban yard is a good offense, and have taken measures to make it difficult, expensive and ultimately impractical to try to convert my property's landscape back to turfgrass and common nonnative shrubs.

Here is what I have done to future-proof my property and increase the odds that a true land steward will purchase it when I sell:

1. **Topography and hardscaping**: I added topography and hardscaping in my front yard to create microclimates for various types of native plants, but also to make it something you'd not easily mow again. That includes a long, deep trench with a natural log bridge; two curving stone walls; a Miyawaki mini-forest complete with purposefully placed "fallen" tree trunks; two ponds and a small creek; a rain garden; small hills and valleys with pathways flowing over and around them; and a wide flagstone walkway and entry patio. The backyard, still in progress, will also have similar features when finished.

2. **Cues to care and intentionality**: My front landscape is all native plants, yet nothing taller than 12 inches grows in the first 10 feet from the street, which is the municipal right-of-way. There are visually identifiable garden beds across the entire front of the yard, courtesy of 10-inch-tall wattle fences I made using branches from my overly zealous shrubs. Between and around these

A conservation easement can offer your property protection

By Shelby Lyn Sanders

Conservation easements offer landowners a powerful way to protect their property's natural character for generations to come. By partnering with a land conservancy nonprofit, landowners can create a legally binding agreement that permanently preserves their land's conservation values, regardless of future ownership changes.

Creating an easement involves costs, and usually there is a minimum acreage requirement. The process is collaborative and tailored to each property.

Working directly with the land trust, landowners develop a customized easement that balances conservation goals with their vision for the land's future. This agreement specifies restrictions — such as limits on additional home construction or timber harvesting — while also preserving the landowner's rights to continue using and enjoying their property.

Most importantly, the land remains in private ownership in perpetuity. Once the easement is in place, the land trust conducts annual site visits to monitor compliance and maintain an ongoing partnership with the owners.

While easement restrictions may reduce a property's market value, significant financial benefits to the landowner often offset this impact. Federal income tax deductions, for example, can make conservation easements an economically attractive option for landowners committed to preserving their land's ecological integrity and natural heritage.

Shelby Lyn Sanders is a board member of the Wild Ones Smoky Mountains (Tennessee) Chapter and director of natural resources for Foothills Land Conservancy, which covers East Tennessee and contiguous areas. The organization currently protects more than 200,000 acres across Tennessee and neighboring states through more than 500 conservation easements of 2 acres and larger, and safeguards diverse habitats including grasslands, forests and working agricultural lands. Learn more at www.foothillsland.org.

Frogs have become regular visitors to Santore's yard. *Photo: Macey Brown, A Wild Approach*

are wide pathways that invite you to stroll along them and observe the pollinators at work. There are obvious sitting logs, and even a parkour course of log stump pieces so you can cross through the Miyawaki forest without stepping on any plants before exiting through a natural tunnel in the elderberry patch. Who would want to rip that out?

3. **A "mullet" property**: While I am still learning, I know enough about the characteristics of native plants to edit my landscape to be "business in the front and a party in the back." The front yard is the showpiece garden where I intentionally tantalize the neighbors into loving native plants by ensuring it is maintained and manicured so that they never perceive it as just "a lot of plants." Buyers should like it, too, since it should seem like less work, not more, if I've done it right.

Santore's backyard has "wilder" landscaping. She recognizes that this may make selling her home more difficult or that the next owner could just mow everything down and replace it with turfgrass. *Photos: Regina Santore*

The backyard is a wilder place, but it can't get too far out of hand or it will frighten the neighbors with the sheer amount of biomass it could develop. The area is fully fenced, and I am careful to keep my plantings away from the fences or at least below the tops of the fencelines. When I decide to sell, I will manicure this area even further.

4. **Visual beauty and orderliness**: As I discover which native plants choose to adopt various areas of my yard, I try to ensure there is visual beauty and some orderliness, and not simply chaos. I have shown several suburban properties that had gardens full of invasive plants and randomly sized native plants, and every time, potential buyers perceived these properties as a lot of work. Had the house been right for them, they would have bought the property and worked to remove *all* the plants, regardless of their nativity. Orderliness, above all, is key to obtaining a higher market value for a "rewilded" suburban property.

5. **Open space and firewise design:** People worry when they see lots of plants or shrubs close to a house, its entrances and walkways. So, I removed the old, narrow concrete sidewalk and small native plant-unfriendly beds under the eaves and am constructing a large flagstone meeting area in front of the house. I will also make careful decisions about plant placement so there's a gradation of height from the edge of the patio toward the main garden areas, to give not only a feeling of openness and space, but also to create a natural firebreak around the building.

In summary, I don't plan to sell my property soon, but I feel that the chances of having my native landscape remain in place after I move are greater for having made these conscious choices. Taken with Lizz James' important listing suggestions (Page 4), I'm optimistic it would be possible to find a buyer who will love and care for my native landscape going forward.

Regina Santore rediscovered her passion for nature in 2021 when she and her family purchased a half-acre suburban home in a 1960s subdivision. By the end of 2021 she'd started converting the property to only native plants, and her yard - in its early transitional stage - was featured in the Fall 2023 Wild Ones Journal. Currently president of Wild Ones Smoky Mountains (Tennessee) Chapter, Santore has been a Board member in some capacity since 2022. She earned her Certificate in Native Plants from Wild Ones Tennessee Valley Chapter in October 2024. A year earlier, she became a Tennessee SmartYards-certified Realtor, one of the first to achieve this designation. Santore is also involved with Wild Ones on the national level, volunteering on the Chapter Advisory Committee.

Photos by Katie Reed

Water — Managing the flow

Native plants absorb water, reduce flooding and provide drought resilience through deep roots and restored hydrology

By Katie Reed, Dan Beckwith and Jessica Schultz

Water shapes our landscapes, our ecosystems and our communities. How it moves across the land — whether it soaks gently into soil or rushes downstream carrying sediment and nutrients — determines the health of our lakes, rivers and wetlands. Across the nation and beyond, native plants are proving to be one of our most effective tools for restoring balance to this flow.

Native plants play a vital role in protecting water quality and strengthening climate resilience. In rain gardens, prairies, wetlands, shorelines and floodplains, they function as natural sponges — absorbing excess water during floods, slowing runoff, stabilizing soil and conserving moisture during dry periods. These living systems reflect an ancient understanding of water management: slow it down, spread it out and let it soak in. As communities face increasing precipitation extremes and longer dry spells, native plants offer both time-tested wisdom and a hopeful path forward.

Indigenous peoples across many regions applied these same principles through intentional land and water stewardship, shaping soils, vegetation and waterways to retain moisture, reduce erosion and support abundant life. Their approaches treated water and land as interconnected relatives, not resources to be confined or forced.

This approach asks us to rethink how water moves across the land. Today, we try to control and direct it through pipes, channels and paved areas. But long before storm drains and sewer systems, water moved on its own terms and shaped the land, determining where it could soak in, where erosion would occur and where soil could hold life. Native plants evolved with these lessons, not by resisting water but by working with it — slowing it down, spreading it out and storing it to support life over time.

Great blue lobelia (*Lobelia siphilitica*) and brown-eyed Susan (*Rudbeckia triloba*) in bloom in front of common rush (*Juncus effusus*), brown fox sedge (*Carex vulpinoidea*) and northern blue flag (*Iris versicolor*) on the south shore of Lake Winnebago.

From rainfall to runoff: Why flow matters

When rain or snow falls on healthy landscapes, much of that water infiltrates the soil, replenishing groundwater and nourishing plants. Native vegetation — with its deep, complex root systems — creates pore spaces in the soil that allow water to soak in slowly and safely.

However, as landscapes become more developed, impervious surfaces such as roads, rooftops, sidewalks and parking lots impede infiltration. Instead of soaking into the ground, water moves rapidly across the surface as runoff. This fast-moving water gains speed and force, eroding soil and overwhelming drainage systems. Along the way, runoff picks up sediment, fertilizers, pet waste, leaves, grass clippings and other pollutants before discharging directly into nearby lakes, rivers and streams — often through storm drains that bypass any form of treatment.

Since many urban and suburban storm drains flow directly to surface waters, you don't have to live on the shoreline to affect water quality. What happens in a driveway, yard or street is closely connected to what happens downstream.

Water quality challenges

Throughout many states, surface waters are facing increasing stress. Harmful algal blooms — often referred to as blue-green algae — have become more frequent, along with declining water clarity and degraded aquatic habitat. Two primary culprits are excess phosphorus and sediment.

Phosphorus is a naturally occurring element, typically found in the environment as phosphate, and it is essential for life. In freshwater systems, phosphorus is often the limiting nutrient for algal growth. This means that algae usually have plenty of sunlight, carbon and nitrogen available. But once phosphorus is depleted, growth slows or stops. When excess phosphorus enters waterways from runoff, it removes this natural limit, allowing harmful algal blooms to multiply.

Sediment, or soil and dirt carried by runoff, makes the problem worse. Cloudy water reduces sunlight penetration, which limits the growth of

Volunteers help remove invasive species from a shoreline native plant bed in Columbia Park, Malone, Wisconsin.

Fifteen months after the initial planting in Columbia Park, sky blue aster (*Symphyotrichum oolentangiense*), New England aster (*Symphyotrichum novae-angliae*) and stiff goldenrod (*Solidago rigida*) help protect the shoreline and provide pollinator habitat.

beneficial aquatic plants. These plants compete with algae for nutrients, so when they decline, harmful algal blooms gain yet another advantage.

Together, excess phosphorus and sediment disrupt aquatic ecosystems, threaten drinking water supplies, impair recreation and degrade habitat for fish and wildlife.

Native plants as water-smart infrastructure

Native plants address water challenges at their source — on the land.

Rain gardens, prairies, wetlands and restored shorelines catch runoff before it reaches surface waters. As water slows and spreads across vegetated areas, sediment settles out, phosphorus binds to soil particles and pollutants are filtered naturally. More water infiltrates into the ground, reducing flood peaks and recharging groundwater.

Many native species — such as swamp milkweed (*Asclepias incarnata*), prairie dropseed (*Sporobolus heterolepis*), little bluestem (*Schizachyrium scoparium*) and other prairie grasses and wildflowers — develop root systems that extend several feet below the surface. These deep roots anchor soil, resist erosion and create long-term pathways for water infiltration. Some species have a few deep taproots, while others form dense, fibrous root systems. Together, a diverse mix of plants creates resilient, layered hydrology that no engineered system can fully replicate.

During periods of heavy rainfall, these plant communities absorb and store excess water, reducing downstream flooding. During droughts, their deep roots allow them to access moisture unavailable to shallow-rooted turf grass, helping maintain soil stability and ecological functions even in dry conditions.

Native plants don't just manage water; they restore relationships between soil, water, plants and wildlife.

Diversity strengthens resilience

Diversity is key. Wildflowers, grasses, shrubs and trees each play unique roles in water management and ecosystem health. Trees and shrubs intercept rainfall before it hits the ground, reduce evaporation and provide critical habitat, especially during winter months. Wildflowers and grasses support pollinators and beneficial insects while stabilizing soil at the surface.

Different root structures interact with soil in different ways, increasing infiltration and resilience across

Katie Reed, surrounded by brown-eyed Susan (*Rudbeckia triloba*) and brown fox sedge (*Carex vulpinoidea*), removes invasive plants at Columbia Park in Malone, Wisconsin, during the summer of 2025.

changing conditions. This diversity mirrors natural systems that evolved to withstand floods, droughts, fire and seasonal variability.

While larger installations generally provide greater benefits, native plantings of any size outperform impervious surfaces. Even small rain gardens or shoreline plantings can significantly reduce runoff volume and speed while improving water quality.

Local action necessary throughout the nation

Many local alliances and organizations are taking action throughout the U.S. At Wisconsin's Fox-Wolf Watershed Alliance, for example, we take a holistic, watershed-wide approach to water quality. What happens in one part of the Fox-Wolf River Basin affects the entire system downstream.

Our work spans agriculture, urban stormwater management, erosion control, shoreline restoration and aquatic invasive species prevention. We collaborate with counties, municipalities, farmers, shoreline property owners, businesses and residents to implement practical, science-based solutions that protect and restore water resources. Native plants are central to many of our projects because of their unmatched ability to capture runoff, stabilize soil and improve habitat. We incorporate native vegetation into streambank restoration efforts, shoreline projects on private property and public park installations designed to demonstrate best practices. For example:

• At Columbia Park in Malone, Wisconsin, Fox-Wolf partnered with Fond du Lac County Land and Water Conservation to install more than 1,000 native plant plugs across three shoreline garden beds. These plantings help minimize flooding and erosion, provide habitat for pollinators and wildlife and serve as a living classroom for park visitors.

• In Marble Park in Winneconne, Fox-Wolf worked with the village to establish three distinct native plant garden beds — one featuring low-growing species, one highlighting pollinator-friendly plants and a third showcasing species adapted to wet conditions. Together, these gardens demonstrate how thoughtful plant selection can manage water, enhance biodiversity and beautify public spaces.

• In May 2026, Fox-Wolf and the city of Neenah are installing three native plant beds at Doty Park as part of a larger shoreline restoration that spans most of the park. These beds will help protect water quality at the park and in Lake Winnebago.

Renewal through understanding

Today's patterns of heavier rainfall and longer dry periods are challenging communities to manage water in ways that protect ecosystems and infrastructure alike. Native plants offer a powerful, regenerative solution rooted in both ecological science and Indigenous knowledge.

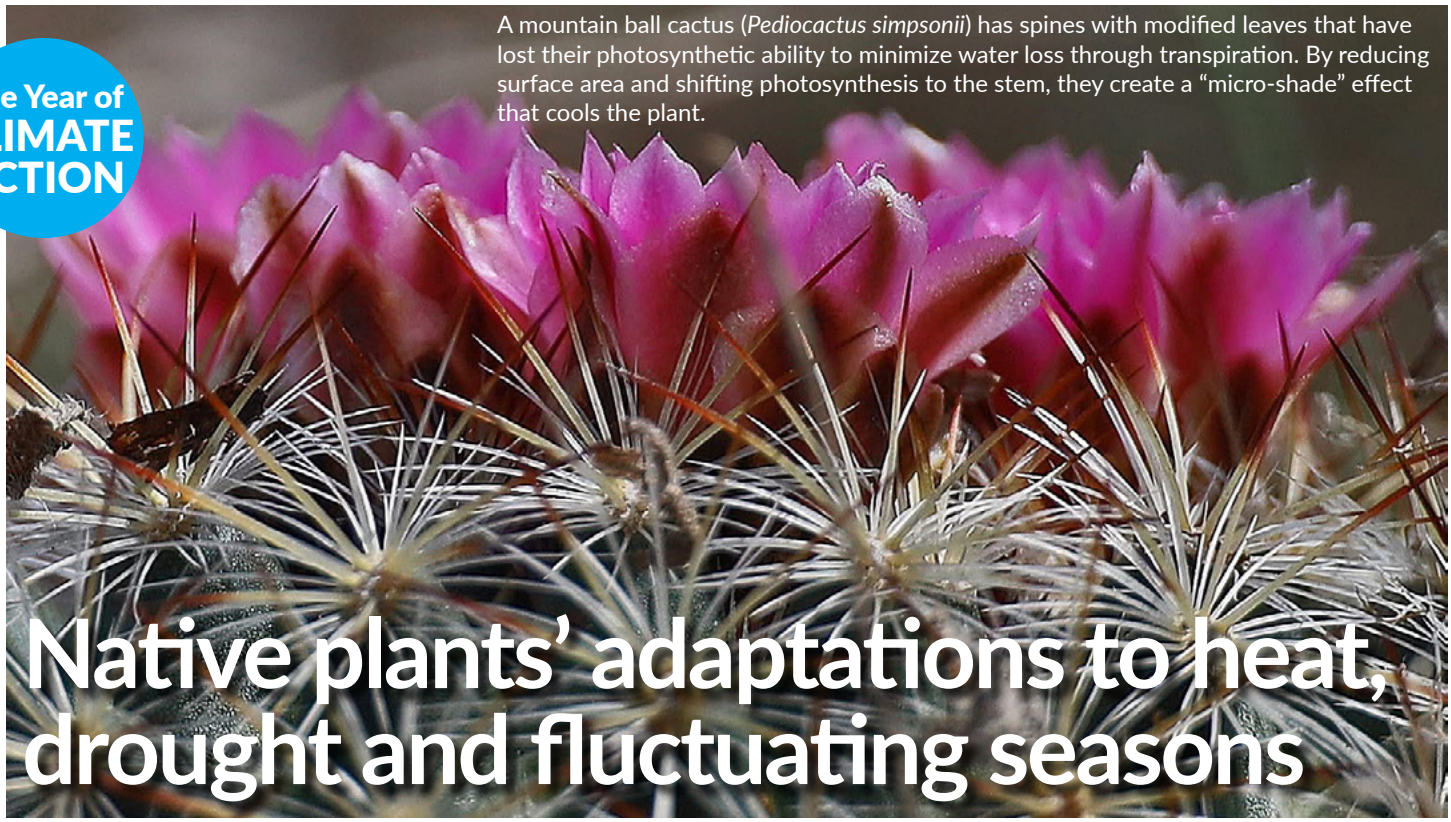
By slowing water, holding soil, filtering pollutants and sustaining life during extremes, native plants embody renewal — restoring balance to landscapes that have lost it. They remind us that effective climate action does not always require complex technology; sometimes it begins with re-learning how the land was meant to function.

Managing the flow of water is not just about preventing damage — it is about restoring understanding. When we plant native species, we invest in landscapes that are resilient, beautiful and alive, capable of adapting to change while protecting the waters we all depend on.

Katie Reed, Dan Beckwith and Jessica Schultz are conservation leaders with Fox-Wolf Watershed Alliance, a 501(c)(3) nonprofit dedicated to protecting and restoring Wisconsin's Fox–Wolf River Basin. Their work brings together communities, partners and science to advance cleaner water, healthier ecosystems and a stronger future for the region.

Photos by Carol English

The Year of CLIMATE ACTION



A mountain ball cactus (*Pediocactus simpsonii*) has spines with modified leaves that have lost their photosynthetic ability to minimize water loss through transpiration. By reducing surface area and shifting photosynthesis to the stem, they create a "micro-shade" effect that cools the plant.

Native plants' adaptations to heat, drought and fluctuating seasons

By Carol English

Late last December, in a move that felt strange and a little wrong, I watered the native prairie in front of my home near Denver, Colorado. I reluctantly uncoiled the hose and dragged it across the ground, offering sips of water to plum (*Prunus americana*), smooth sumac (*Rhus glabra*), three-leaf sumac (*Rhus trilobata*), wax currant (*Ribes cereum*) and leadplant (*Amorpha canescens*). Even the well-established perennials and native grasses were given water — an increasingly precious, life-sustaining resource.

We plant natives not only because they belong here — shaped over millions of years alongside wildlife — but also because they are remarkably adapted to survive heat, drought and fluctuating seasons. In a time when natural habitats are disappearing, these landscapes become wildlife sanctuaries. And with warmer, drier winters becoming more common, even the hardiest natives sometimes need a little help.

I wandered along the landscape, gently watering little bluestem (*Schizachyrium scoparium*), beardlip penstemon (*Penstemon barbatus*) and prairie evening primrose (*Oenothera albicaulis*). Green leaves and stems caught my eye, and my nerdy botanical mind drifted into a daydream of chloroplasts and chlorophyll at work. The warm sun on my back made it easy to imagine sunlight and carbon dioxide slipping through and entering the tiny openings called stomata on leaves and initiating the complex process called photosynthesis. As sugars are made, oxygen exits the stomata

A Zion milkvetch (Astragalus zionis), taken in Arizona, has tiny, light-colored, fuzzy leaves positioned vertically to minimize heat and water loss.

and is released into the air. I took a breath, aware of its source.

The sugars, carried through phloem by water from nearby xylem, feed flowers, roots and growing tissues, fuel all living tissues in the plant. I continued watering newly planted virgin's bower (*Clematis ligusticifolia*) and hops vines (*Humulus lupulus*), remembering a phrase I once shared with my science students: *move, adapt or die.* Animals can escape heat, drought or scarcity. Plants cannot. Their survival depends on adaptations that occur when beneficial random genetic mutations are passed down, thus increasing an organism's chances of survival and reproduction in particular habitats.

Think about how humans cope when water is scarce and the sun is relentless. We dig wells, store runoff from mountain snow, hydrate, seek shade, wear light-colored clothing and hats, and sweat to keep cool. Remarkably, plants, through adaptations, have adopted these same techniques. They have roots that can often reach deep into the soil, they store water in their tissues, and they reduce water loss with waxy coatings on leaf surfaces. Leaves are often light colored and shaped to reflect the sun. Cactus spines, which are modified leaves, provide shade to delicate tissues. In the Sonoran Desert, scientists have discovered that plants, such as the Fremont cottonwood (*Populus fremontii*) and brittlebush (*Encelia farinosa*), release water onto their leaf surfaces, causing evaporative cooling similar to when humans sweat.

Standing and watering the prairie garden, I visualized the quiet ingenuity of these plants — the result of countless genetic variations filtered by natural selection, producing adaptations that allow them to survive and thrive in challenging environments.

Roots are the quintessential water siphons, and in a way plants also design "pipes" or roots that move deep into the soil to find water. In the prairies of central North America, grasses, forbs and shrubs boast some of the deepest and densest root systems on Earth, some reaching up to 16 feet deep. Recent research in Kansas shows that many prairie grasses and forbs primarily use just the top 2–3 feet of soil to access water, while shrubs like leadplant, sumac, chokecherry (*Prunus virginiana*) and plum tap their deep roots to reach moisture below. We are still not certain why the roots are so deep in the prairie grass and forb species; however, we suspect they also improve soil structure and fertility, reduce nutrient competition and support resilience against drought and fire.

Silky prairie clover (*Dalea villosa* var. villosa) grows in the sand hills within prairie ecosystems. The plant produces numerous lateral roots extending outward 2-3 feet in the first foot of soil and a taproot system penetrating 4-5 feet deep.

A milkweed (*Asclepias*) species with light-colored, hairy leaves positioned vertically protects the plant from sun and dry conditions.

Desert plants have taken a different approach. Saguaro cacti (*Carnegiea gigantea*) in the southwestern deserts spread their roots shallow and wide, sometimes as far as the cactus is tall, ready to capture rare, brief rains. These shallow roots quickly absorb water, storing it in the cactus's sponge-like tissues, while a 2–3-foot taproot accesses deeper water and anchors the towering plant. Roots also team up with hyphae in different types of fungi. Around the world, fungal hyphae form mutualistic relationships with plant roots in a process called mycorrhizae. In ponderosa pine (*Pinus ponderosa*) forests, for example, the fungi tap into the tree's roots, feeding on sugars the tree produces, while the hyphae — smaller than even the tiniest root hairs — extract extra water and nutrients from dry soil. Ponderosa pines rely on this partnership to survive harsh conditions.

Above ground, the stem, branches and leaves — the shoot portion of the plant — face the relentless heat of the sun every day. Shrubs such as ocotillo (*Fouquieria splendens*) and creosote (*Larrea tridentata*) growing in southwestern deserts will drop their leaves entirely until more moist conditions prevail. Buckeye and horse chestnut trees (*Aesculus* spp.) in Mediterranean and temperate climates respectively, will go dormant and shed their leaves during the hottest months after they have flowered and formed fruit.

An endangered plant of sand dunes in eastern California and western Arizona, sand food (*Pholisma sonorae*) highlights extreme adaptations to heat and drought. This small, gray, pancake-like plant sends a scaly, fleshy stem up to 6 feet beneath the dune surface where it is attached to a haustorial root mass, allowing it to tap neighboring plants for sugars and nutrients. While the roots draw

Above: A rare four o'clock (*Mirabilis spp.*) species that grows in southcentral Colorado has very hairy leaves and stems, which help reduce water loss and heat stress. Below: This broomrape (*Aphyllon*) species in the Guadalupe Mountains of Texas is extremely hairy to help with heat insulation.

some moisture from the sand, most water enters through tiny stomata on its modified stem leaves. The plant's flowers are small and fuzzy, insulating against the sun, and the light-colored, hairy tissues of the rest of the plant reflect heat and provide additional protection from the harsh desert environments.

The more common native plants use similar adaptive strategies to survive hot, dry conditions, though less extreme than sand food. Leaves are especially vulnerable, so succulents often have thick, waxy surfaces that store water while shielding tissues from the sun. Some leaves curl to reduce sun exposure, while others are light-colored or fuzzy to reflect heat and provide insulation. On cacti, leaves have disappeared entirely being replaced by spines, and photosynthesis shifts to the stems to conserve water. Dense spines also cast shade, cooling the plant.

Cacti, agaves, sedums, bromeliads, orchids, euphorbias and even some ferns have evolved crassulacean acid metabolism (CAM). Simply put, CAM plants open their stomata at night to collect CO_2, storing it as malic acid, and close them during the hot day to minimize water loss while photosynthesis continues using the carbon stored overnight. In many CAM plants, stomata are sunk into pits below the leaf surface, further reducing evaporation. CAM has evolved independently over 100 times across the planet, a testament to its efficiency in extreme heat and drought.

About 97% of plants on Earth use C3 photosynthesis, capturing carbon dioxide and releasing oxygen — a process that evolved billions of years ago. Around 34 million years ago, some plant families — warm season grasses (*Poaceae*), sedges (*Cyperaceae*), amaranths and chenopods (*Amaranthaceae*) — developed an adaptive "upgrade" called C4 photosynthesis. In hot conditions, C3 plants close their stomata to save water, but oxygen builds up in the leaves. This confuses the RuBisCO enzyme, which may grab oxygen instead of carbon dioxide, wasting energy and slowing sugar production. C4 plants solved this with two key innovations: Kranz anatomy, which separates where CO_2 is captured from where it is used to make sugar, and a "smarter" enzyme, as compared to RuBisCO, called PEP carboxylase, which selectively targets and captures CO_2 and stores it as a four-carbon molecule. That molecule moves into protected bundle sheath cells, creating a CO_2-rich environment where RuBisCO can work efficiently, even in bright, hot sunlight. The result? C4 plants use about half the water of C3 plants while thriving in dry, sunny conditions. It's a complex adaptation, but a powerful example of how plants have evolved to survive in harsh, hot, dry environments.

An Easter daisy (*Townsendia spp.*) with very fuzzy leaves for insulation.

In the middle of January I was happy to see a few inches of snow fall. Yet the temperature was up again, and the unusually dry days persisted here in Colorado. Once again, I pulled out the hose hooked to my deep well and gave the native plant species extra water to help them make it through one of Colorado's warmest, driest winters on record. Maybe this time I will perform a snow dance as I roam around the landscape, offering extra water to these highly adapted native prairie plants.

Carol English has a bachelor's degree in biology and botany, and has worked as a botanist for Colorado Natural Areas Program and Yosemite National Park. In 2012 she started her own business called CoVeg, named in honor of Colorado Vegetation. She continues to work as a field botanist in Colorado and around the western United States.

Palmer's penstemon (*Penstemon palmeri*) is an excellent habitat plant for hummingbirds, native bees and other insects. It is also a good rain garden "top-of- basin" (lower water needs) plant for the Colorado climate and soil type.
Credit: Theodore Johnson Mencimer

The resilience of native plant gardening through precipitation harvesting

By Kristine Johnson

Like Wild Ones members who have tuned in with native plants, insects, birds and other wildlife unique to our areas, people like Brad Lancaster and the folks at the Watershed Management Group (WMG) have "learned" their local climate and know what it means to thrive and find abundance in what many wrongly see as unforgiving landscapes. I spoke with Lancaster, author of "Rainwater Harvesting for Drylands and Beyond" and founder of the nonprofit Dunbar Springs Neighborhood Foresters, and Jace Lankow, Desert Rivers restoration manager at the WMG, a Tucson, Arizona-based nonprofit focused on building community and prosperity around watershed restoration. Lancaster, who also shares numerous guides through his website and YouTube channel, has been practicing and advocating for water harvesting and urban greening for more than 30 years, while WMG has been working on river and watershed restoration for more than 20 years. For both experts, community, climate and native ecosystems are deeply interconnected with native plants forming the foundation of the landscapes they create and restore.

We read headlines about droughts, floods and water stress, but how much do human behavior and landscape plant choices exacerbate these impacts? Much of the western United States receives low precipitation. Moreover, our rain, hail, sleet and snow don't arrive in regular monthly increments; most places in the U.S., outside of the northeast, have at least one season that is wetter and at least one season that is drier. Native plants have evolved with their local climate patterns and have adapted to handle plentiful precipitation when it typically comes, and drought when water isn't available. They "know" larger flood and drought events in their ecoregion and can withstand extreme events that are normal for their area. In dry regions, in particular, this means deep roots and abundant below-ground growth that store what plants need to tide them over through hard times.

However, non-native plants evolved in different climates, and their water needs and growth form may not match where they are planted, requiring supplemental irrigation and care. They may not handle the extremes of moisture and aridity normal in climates alien to them. For a gardener, this translates to extra watering and amending or altering the soil to hold more water or shed excess water. This doesn't jibe with climate reality or gardening in an environmentally friendly way with growing water scarcity and concern about the impacts of pollution from excess fertilizer in return

Multiple native penstemon species bloom in June 2025. They are in a "top-of-basin" location with a great deal of direct sunlight and little additional water. Between the penstemons and the patio is a swale planted with native grasses that are not yet mature. Excess precipitation drains from the penstemon bed and the patio to support the grasses. *Credit: Kristine Johnson*

for reduced ecosystem services.

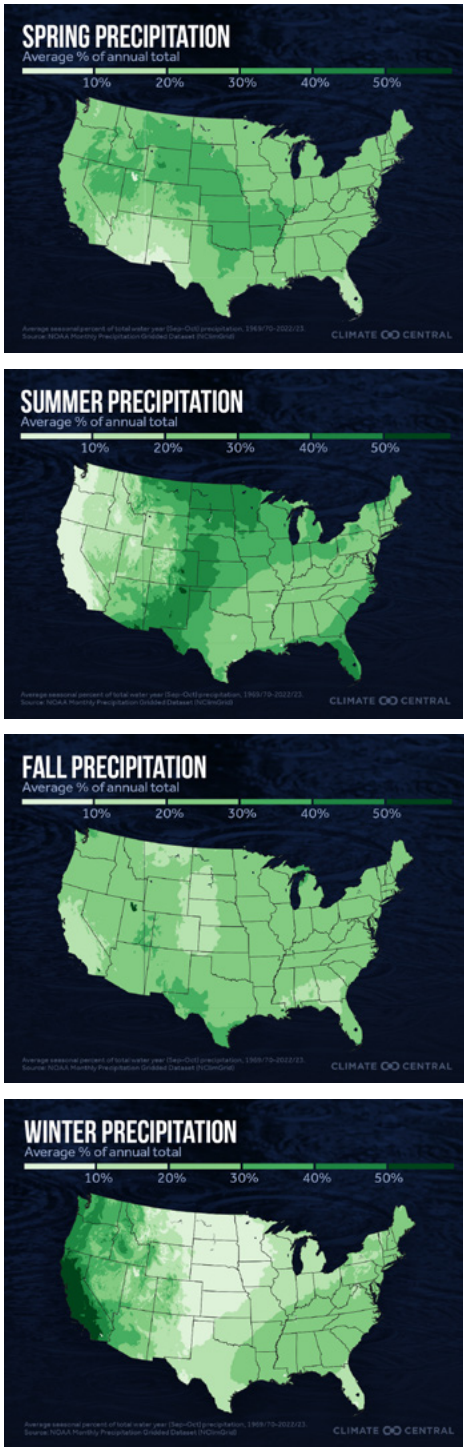
In many parts of the country, the water plants need exceeds precipitation, so a great deal of water goes into agricultural and home landscapes. In the western U.S., 40-50% or more of our urban water use is for irrigation, often for thirsty landscapes composed of non-native lawns and other plants not in tune with local climates. Ironically, when big storms do come, runoff causes flooding, especially in places not built to absorb precipitation. Alternately, rain gardening supports the use of native plants to capture storm water and reduce flooding.

What rain gardening is and isn't

What does rain gardening look like? (I say rain gardening, but I include snow and other forms of precipitation for those in colder climates.) Many of us imagine rain barrels or large tanks for storing rain water, solutions that require maintenance, can be expensive and may be subject to local restrictions. But consider that organic matter, roots, living plants and soil, contoured and shaped appropriately, all hold water. A landscape designed to direct water into an earthen "basin" filled with organic matter and the roots of living plants functions as a "tank," which can be 100% free to construct.

According to the EPA, a healthy, living landscape absorbs most of a storm's moisture. In these landscapes, only about 10% becomes runoff, while roughly 50% recharges the soil and 40% moves into and through plants. In contrast, landscapes with few absorbent surfaces — such as heavily paved urban areas with little open ground — can experience runoff rates as high as 55%, with only about 15% of the moisture infiltrating the soil. The remaining water is lost primarily through evaporation rather than being taken up by plants.

As a result, landscapes dominated by impervious, paved surfaces



U.S. precipitation by season. *Source: Climate Central*

tend to be much drier and far more likely to contribute to flooding. In built environments, when we create basins and opportunities for rain to infiltrate the soil, be absorbed by organic matter and roots, and move into plants to sustain their growth, we reduce runoff, and, in turn, flooding. At the same time, we increase the shallow and deep water

Above: A large basin in the backyard starts to take shape. *Credit: Theodore Johnson Mencimer.* Below: The same area, August 2025. The flagstone-topped berm is on the far side of the garden. The foreground is dominated by cutleaf coneflower (*Rudbeckia laciniata*), a native member of the aster family found near creeks and waterways, and which serves as an excellent habitat plant for a myriad of insects and birds. *Credit: Kristine Johnson*

stored in soil, helping to lessen the impacts of drought. When we plant native species in rain basins, we not only increase the likelihood of long-term landscape success, but also support pollinators and birds, reduce urban heat, improve air quality and so much more.

So far, this sounds a lot like what you can do at your home or business. Just like habitat gardening with native plants, rain gardening is an active pursuit. It starts with one plant, one basin and one downspout. The community side of things builds the action. Lancaster has organized and transformed his Dunbar/Spring neighborhood, greatly increasing the tree canopy of native trees, shrubs and more, while dramatically increasing stormwater infiltration and creating countless other environmental benefits. The WMG does much the same, training communities to transform landscapes in Tucson neighborhoods and beyond. While local authorities most visibly respond to large drought crises, Lancaster, WMG and their communities have been building momentum for years, empowering, reshaping and planting on streets, in neighborhoods and in cities to create abundant natural landscapes that actively recharge groundwater, support wildlife and require little or no supplemental water. Much as we in the native plant gardening movement push things forward through conversations with our friends and neighbors, they build community and living landscapes at the same time. Together, native plant gardening and rain gardening help build a strong sense of place rooted in our own communities, climates and ecoregions. Designed to sustain themselves, they bring people together and integrate human activity into healthy, living collectives.

The 'how' of building basins

Much like delving into native plant gardening, rain gardening involves a lot of "try it and see." Little actions yield little mistakes but big learning opportunities. Moreover, a self-constructed rain-harvesting basin can be tweaked at any point after a storm "tests" it out. Construction basics include:

- Understanding infiltration (How quickly does water soak into your soil?)
- Understanding local patterns of precipitation (How much rain/snow do you get? When? What does a "big" storm look like? When is your wet season? When is your dry season?)
- Understanding your topography (What are your high points, including roofs and downspouts? How does water move in your landscape and over what surfaces?)
- Understanding plant needs

Edging rain-collecting basins with dead wood creates habitat for soil fauna.
Credit: Kristine Johnson

How much rain can you harvest?

Calculate how many gallons of water you can harvest from your roof or other areas, like a patio or driveway.

What is your roof area (in square feet)?
____ ft x ____ ft = ____ ft²
Multiply the length by width of your house.

What is your annual rainfall (in feet)?
____ in : 12 in = ____ ft rainfall
Divide the inches of rain your local area gets each year by 12 inches to get feet of rainfall.

How many gallons can you harvest? Multiply your roof area (in square feet) by your annual rainfall (in feet) and then convert that volume to gallons. There are 7.48 gallons in one cubic foot.
____ ft² x ____ ft x 7.48 gallons/ft³ = ____ gallons of rainwater each year
Multiply roof area (ft²) x annual rainfall (ft) x 7.48 (gallons/ft³)

Source: Watershed Management Group

(This is where native plants really shine because they "fit" better with all of the above.)

• Put it all together. Determine how much water will need to sink into how large of a "basin" and what kind of vegetation you can support with this. This might sound complicated, but it's not. For more guidance, go to WMG's instructions how to build your own basin.

How to find out more

I went to Tucson to learn from Lancaster, Jace and others. I came back to Colorado and started to document my own climate and ecoregion. Together with my family, I've built basins and planted native plants with incredible effects. Lancaster's books and videos, the trainings available at WMG and many many conversations with other likeminded people have helped. Now that my own water harvesting gardening is 2-3 years old, I am doing more to build my own local community around this … by writing about it, by talking about it and by hosting tours of my garden and holding workshops in my region. It's easy to learn with the sources I shared. After some careful observation of your own landscape and climate, I encourage you to get out a shovel and start rain gardening yourself.

Kristine Johnson is a board member and regional coordinator for the Wild Ones Front Range (Colorado) Chapter.

Growing community on the rooftop:

How Honeygo Elementary revitalized a native learning garden

By Jaclyn Ryan

When students at Honeygo Elementary School in Perry Hall, Maryland, returned to in-person learning after the COVID-19 pandemic, one part of their building remained noticeably quiet: the school's rooftop learning terrace.

Originally designed as a flexible outdoor classroom and gathering space, the terrace had gone largely unused for years. But thanks to a 2024 Seeds for Education grant from Wild Ones and the leadership of Project Coordinator Emily Rickelton, the space is coming back to life.

What began as a modest experiment in winter sowing has blossomed into a vibrant school-wide effort involving all students, dozens of volunteers and a growing collection of native plants. Today, the rooftop is becoming a restorative space for both learning and biodiversity, demonstrating just how impactful youth-led native plant projects can be.

A school-wide sowing adventure

Rickelton's initial goal for the 2024–25 school year was simple and exploratory: introduce students to winter sowing, test which native species thrive in rooftop growing conditions and begin restoring the long-neglected raised beds on the terrace.

Honeygo Elementary students prep one of their rooftop gardens for planting.

The entire student body (approximately 675 children) participated. In 20-minute sessions, classes created winter sowing jugs, planted seeds and labeled their future seedlings with pride. For many students, it was the highlight of their week.

Teachers reported that students routinely asked, "When are we going to check on our plants?" Classrooms braved chilly days to visit the terrace and observe growth. One third-grade class even launched a companion strawberry growing project using pots.

Honeygo Elementary students plant native flowers and grasses on their school's rooftop learning terrace.

The experience had ripple effects across campus. Staff members began taking lunch breaks on the terrace, small groups used the garden during lessons, and teachers incorporated plant identification and ecology into language arts and science units. Rickelton taught students about each native species, helping them understand why these plants matter to the ecosystems around them.

Community support takes root

As with any project, surprises emerged along the way. Aster (*Symphyotrichum* spp.) seeds refused to germinate, but a local Wild Ones chapter member stepped in, giving the school a collection of healthy aster seedlings. Master Gardeners from the University of Maryland offered species-specific advice and donated cardinal flower (*Lobelia cardinalis*), lanceleaf coreopsis (*Coreopsis lanceolata*) and false nettle (*Boehmeria cylindrica*) starts.

Families also became unexpected champions of the rooftop garden. Rickelton initially worried that summer maintenance, mainly watering and weeding on a rooftop, would be difficult to staff. Instead, parents eagerly volunteered, describing it as a fun family activity.

Meanwhile, the rooftop beds revealed a few surprises of their own: pre-existing wild bergamot or bee balm (*Monarda fistulosa*), daisy fleabane (*Erigeron annuus*), sedums and an unidentified blue vervain lookalike plant emerged once the beds were cleared. As the new natives settled in, bees quickly discovered the common yarrow (*Achillea millefolium*), blue vervain (*Verbena hastata*) and spotted bee balm (*Monarda punctata*) — some of the earliest bloomers of the season.

The challenges of rooftop gardening

Transforming a rooftop space comes with unique obstacles:

Far left: This monarch caterpillar (*Danaus plexippus*) is proof that if you add native plants to your landscape, pollinators will find them. Center top: Signs identify each plant in the school gardens, like this common yarrow *(Achillea millefolium).* Center bottom: Wild bergamot or bee balm (*Monarda spp.*) seedlings are ready for planting. Bottom right: Blue vervain (*Verbena hastata*) became one of the favorite native plants

• Weeds were quick to reclaim cleared areas, especially horseweed (*Conyza canadensis*) and Japanese stiltgrass (*Microstegium vimineum*). While tedious, the weeding process turned into a valuable teaching tool for plant identification and ecological stewardship.

• Soil depth varied across beds, requiring additional compost and substrate — materials the school is still working to source through district channels.

• Sun and heat posed watering challenges, especially on long weekends when access to the building was restricted. Goldenrod (*Solidago* spp.) struggled in the early fall due to drought stress.

Future plans for the garden

With momentum growing, Honeygo Elementary is already planning its next phase of restoration:

• Expanding plant diversity with additional asters, goldenrod and other native perennials.

• Creating a sensory-friendly garden area featuring aromatic and tactile plants, along with a "dig site" designed for hands-on exploration.

• Building a lightweight, weather-resistant seating area to better support outdoor learning.

• Forming a dedicated parent stewardship group to help maintain the garden year-round.

Rickelton also hopes to continue nurturing student ownership of the space, integrating more curriculum connections and offering leadership opportunities through the school's "Honeygo Gives Back" service club.

Reflecting on Honeygo's experience, Rickelton offers this simple guidance to future Seeds for Education recipients: "Say yes to anyone who offers to help. We could not have revitalized this space without the students, staff and families who worked together. And keep learning — it's really fun."

Jaclyn Ryan is a member of the Wild Ones Mountain Laurel (Connecticut) Chapter. Passionate about native plants and backyard ecology, she documents the discoveries her family makes in their wildlife-friendly yard on Instagram @backyardscientists.

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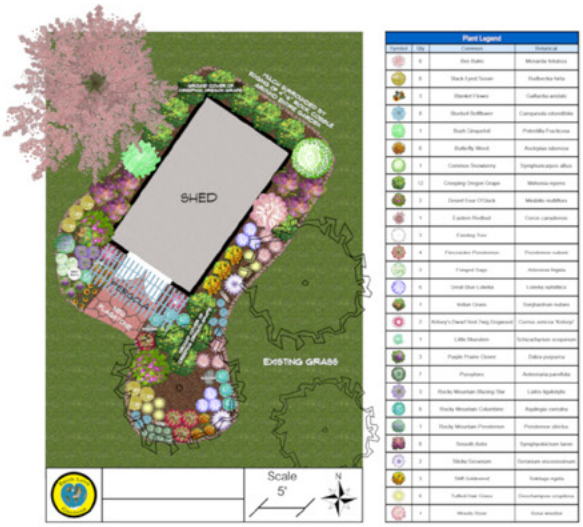

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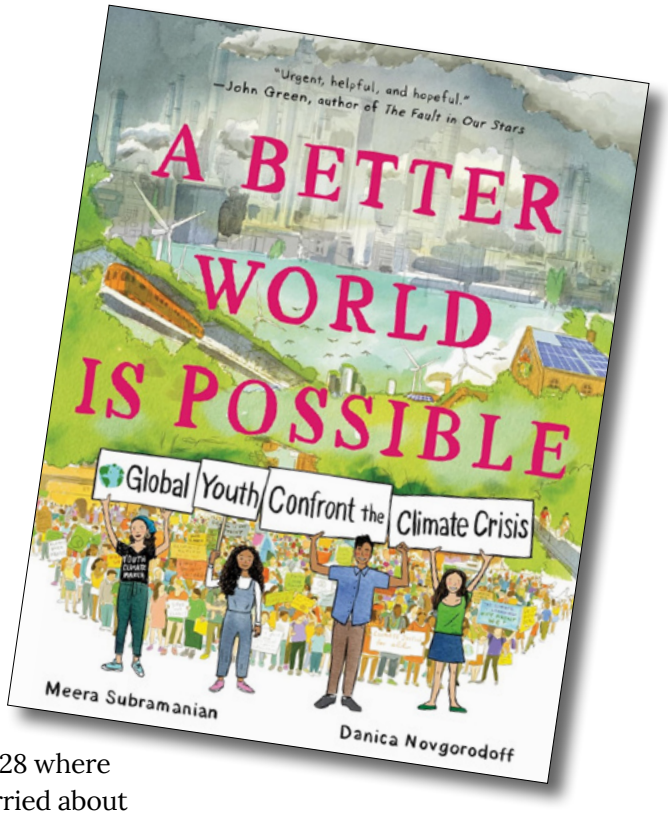
Book Review

Title: "A Better World is Possible: Global Youth Confront the Climate Crisis"

Authors and illustrator: Meera Subramanian (author) and Danica Novgorodoff (author and illustrator)

Published: 2026

Rating: ★★★★½



By Jasper Scharp

"A Better World is Possible: Global Youth Confront the Climate Crisis" is a great book for youth. I can vibe with all of the characters, but especially Xiye because she grew up in a different country (like me) and she had a strong connection with her grandmother.

The 208-page graphic novel begins by introducing a group of teenage climate change activists helping to organize the world's largest climate protest. It provides the unique backstory of each character: their origins, their families and their journey with climate change. Afterward, the characters discuss climate change prevention, and the book ends by providing many facts about climate change.

I really liked this book because it was easy to read and super engaging. The simple writing style made the topic of climate change easy to understand, even though it is a serious issue. The book also made me feel motivated to do more to help the environment.

One of my favorite parts of the book was the drawings by Danicia Novgorodoff, an artist and writer from Louisville, Kentucky and Brooklyn, New York. The illustrations were detailed and funny, and they helped explain ideas in a clear way. In fact, when I didn't completely understand what a character was saying, the illustrations helped me get a better idea of what was happening. The artwork also made the story more interesting and made the emotions of the characters clearer. I could completely understand when a character was sad or unhappy in a way that words can't always express, such as on Page 28 where the grandparents are worried about a flood.

One criticism of the book is that the way the characters talk is not always very realistic. Sometimes their conversations feel more like speeches about climate change rather than how people would talk in real life. I also feel that some of the characters' backstories were a little rushed, and I would have liked more details about them.

In addition, at the end of the book, a lot of facts are presented very quickly, which makes that section feel a bit overwhelming, even though the information is important.

But overall, I really like the book, and I would read it again. This book made me think more seriously about climate change and how it affects people's lives. Seeing the issue through the characters' stories made it feel more real and personal instead of just a list of facts. The stories reminded me to keep trying to help. Even if I don't start rallies or protests, I can still do simple things like not wasting food, picking up trash on the ground and more.

The book — a No. 1 new release for teen and young adult readers in environmental conservation and protection — is a true story based on real events, but recreated from a variety of sources that include fictional scenes and dialogue. The authors did a great job explaining climate change. It was not only entertaining but also educational. It explained climate change in a clear and simple way without being confusing. I would recommend this book to students and readers who want to learn more about climate change.

Although the book is listed as appropriate for those 14-18 years old, I believe it is appropriate for a wider age group, from advanced 10-year-olds to people in their mid-20s. I especially think my friends or peers should read it because it says and shows things about climate change in an apolitical way.

Jasper Scharp is a 14-year-old student at the University Laboratory High School in Urbana, Illinois. Jasper loves playing sports, especially soccer, is an avid reader, and is often happiest when he is outdoors hiking in a beautiful place.

Photos by Benjamin Vogt

‘Unlawning’ a suburban legacy

By Benjamin Vogt

When I was a kid, I’d sit outside on the front porch watching my mom mow the lawn. Feeling the warm sun against my skin was nice, but even more so was the sweet scent of the freshly clipped yard and the neat appearance of a lush, uniform carpet of green under my bare feet.

I did not know then, and perhaps it wouldn’t have changed my feelings anyway, that the lawn’s aromatic bouquet was a cry for help as it released volatile organic compounds (VOCs) into the air. Those VOCs were a warning to other nearby plants that the grass was under attack and to mount a defense. Looking at it now, mowing is certainly a type of violence — a weekly decapitation of a landscape that requires continual life support of water and treatments to appear like a living room carpet.

North American lawns are ubiquitous, to say the least. And for those who find their proliferation and intensive management problematic, lawns are also easy to denigrate. Many new housing subdivisions have lawn laid down as a default final touch-up, and most city ordinances are written to privilege lawns and the management companies that enforce them.

Lawn arrived in North America, and the United States in particular, in several waves. Grasses were imported as forage for European livestock that got sick on the native grasses in the New World; by 1640, there was already a thriving grass trade in the colonies. Eventually, as a way for the young nation to prove its equal sophistication with other world players, the aristocracy — among them Thomas Jefferson — created large expanses of lawn-like fields around their estates, often in the vein of trendy landscape designs by Lancelot “Capability” Brown in England, whose nickname came from his description of country estates having great “capabilities” for improvement.

Too many neighborhoods look like this, with house after house and yards filled mainly with manicured lawns.

But this is by no means the end of the lawn’s origin story, as it’s so often told. In the late 1800s, immigration surged as urban areas filled with those seeking freedom and opportunity. Now, urban areas had already seen a rise in pollution due in large

Lawns don't need to engulf your home's structure. More and more people are joining Wild Ones members in recognizing the importance of using native plants in their landscapes.

part to industrialization and factories, and sometimes a lack of trash collection. So many with financial means headed to city margins to find more pastoral and clean surroundings. Unfortunately, this escape to cleanliness was often linked to an escape from "dirty" immigrants, who were too often labeled as messy, loud and crime-riddled. Soon, city beautification groups formed — often led by upper-class socialites — to beautify cities and create a proper America. These garden clubs would target lower-class immigrant and Black neighbors to a large degree, highlighting the ideal lawn and flower bed arrangement.

The lawn origin story continued to evolve with the first U.S. golf course, Saint Andrews in New York, laid out in 1897 over a former pasture. By 1902, there were 1,000 golf clubs in the country, and by 1948 some 6,000 courses (which pales in comparison to the 16,000 courses as of 2025). The golf course soon became the public park, and as labor laws led to more disposable income and more leisure time for the middle class by mid-century, not only were more people golfing, but they were also tending their lawns around their new suburban homes to fill up their weekends.

Critical to the development of golf courses and suburban lawns were the U.S. Department of Agriculture and the U.S. Golf Association, which worked to develop turf types for every region of the country. In the early 20th century, the Garden Club of America also spurred the City Beautiful and Home Beautiful movements; these contests graded neighborhood landscapes, and lawns comprised 40% of the overall score.

Post-World War II affordable housing was hard to come by as GIs returned home and started families.

While suburbs had existed for some elites in the previous century, it was assembly-line production, popularized by the Levitt brothers in Long Island, that gave us suburban developments as we know them today. Thanks to government-backed FHA loans, more Americans could now afford a home with a mortgage, and more developers could take the risk of building those homes. Until 1948, however, Black Americans were not legally allowed to have these loans, and even afterward, William Levitt kept in place a covenant that only people of the Caucasian race could live on the property, but Blacks could work on the property. This legacy continued well into the 1970s across the country, from New York to California, but especially in the Midwest, where sundown towns proliferated and walked hand in hand with sundown suburbs where many covenants excluded any but white residents, forcing Black Americans to live outside the communities they worked in.

Levittown covenants also required strict adherence to landscape appearance, and William's brother Abe would be chauffeured around taking notes of infractions and fining residents for improper care. That care may have become more difficult as a once nearly extirpated deer population on Long Island rebounded rapidly, thriving in suburban habitats.

These early covenants created a template for other developments and towns to follow as people moved farther from the city core. From 1950 to 1970 the suburban population in America grew from 36 million to 70 million, by which time more Americans lived in suburbs than cities. By 2000, more Americans lived in suburbs than cities and rural areas combined, and between 1982 and 2001, some 43 million acres of farmland, forest and wild areas were converted to suburbs — an area equal to the size of Washington state.

This history of lawn highlights the legacy we live with today — one of segregated nature and communities, and of heavily policed vegetation types and the appearance of urban and suburban landscapes. Municipal codes are often written in vague yet threatening terms, but for some inspectors and superintendents, that vagueness can help create leniency on a case-by-case basis if the landowner stands up, makes the case via plant lists with scientific names (an effective demonstration they know what they're doing), and works to manage a more natural landscape.

Lawns use more than 20 million gallons of freshwater every year, while the entire agricultural system uses 30 million gallons. Exhaust from lawnmowers and other equipment increases urban air pollution, which exacerbates allergies and asthma and increases risks for diabetes, cancer, cardiovascular disease and low birth weight. Lawns increase stormwater runoff during extreme rainfall events, which are now more common as climates destabilize, because lawns hold and absorb less water than more diverse spaces with taller and denser plant material and deeper roots. Minimizing lawn and creating lusher landscapes means cleaner and cooler air, cleaner water and habitat for the insects and bugs that literally make our world run.

Designing a front-yard lawn-to-meadow garden conversion should employ some basic design strategies that do not reduce ecosystem functions but may help build bridges between neighbors and between wildlife and humans. These strategies include a dominant average plant height of around 18 to 24 inches, repeated massing and drifting of flower species, plant species that are less gregarious and less prone to take over the landscape, wide pathways, low-growing plants along sidewalks, streets and driveways and garden signs, benches and continual active management.

The stakes are higher as we face the specter of mass extinction and climate disruption, and as we build local mutual aid networks and foster community resilience in the face of social and environmental pressures. The legacy of suburbanization doesn't have to stay on the same trajectory. Every garden, every plant matters — especially for wildlife that are more mobile and able to find pockets of refuge in a web of "unlawned" landscapes.

When I walk in our home garden with my child, we identify butterfly and bee species, and they're eager to learn the scientific name of plants that they share with friends down the street. The neighborhood kids play hide and seek, gather swords and magical wands from the stick pile, and create petal and grass art pieces inside the concave nests of upturned novelty flying disks. As we nourish fauna, we nourish ourselves, and we turn the tide for nature and one another in ways we might not even be aware of, and that will extend far beyond the garden. That's pretty cool and loaded with a defiant compassion that fosters hope.

This essay is derived from Vogt's forthcoming book "Unlawn America: A Grassroots Guide to Rewilding Your Yard." (Timber Press, 2027). He is the owner of Prairie Up, a garden design and online educational platform. His work has appeared in Better Homes and Gardens, Dwell, Midwest Living, the New York Times, and the Wall Street Journal.

Photos by Matthew Ross unless noted otherwise noted.

The Foraging Meadow and Medicine Wheel Garden at Historic Barns Park

By Matthew Ross

The Botanic Garden at Historic Barns Park (BGHBP) is a 27-acre garden located in picturesque Northern Michigan that was developed at the former farm of the Northern Michigan Asylum.

It's hard to fathom that just four years ago the site of its Anishinabek Medicine Wheel and Foraging Meadow was a thick patch of invasive bromegrass (*Bromus inermis*) and spotted knapweed (*Centaurea stoebe*). As I find myself strolling through the spikes of three species of blazing star (*Liatris*), the mounds of dotted horsemint (*Monarda punctata*) and the silver waves of prairie sage (*Artemiesia ludoviciana*), I feel immersed in a new garden reminiscent of the parabolic dunes of Sleeping Bear National Lakeshore. But beyond the aesthetics and the resurgence of pollinators and other wildlife, there is a much deeper lesson to be learned while traversing the narrow mulch paths of this developing garden.

When discussing native plants and their role in the modern landscape, the Indigenous culture and the millennia of cultivation that has occurred in North America can be overlooked. To educate the public and design an authentic garden, our board president, Karen Schmidt, connected with Joanne Cooke, a leader and former tribal council member of the Grand Traverse Band (GTB) to help guide us as we looked for ways to celebrate the traditional knowledge of our tribal community. Through their dedicated work (along with the guidance of Tera John, GTB Tribal member and Indigenous land management professional, horticultural consultant Laurel Voran and landscape architect and BGHBP board member Maria Tucker), a garden was created, establishing a special space where tribal members and the public can explore, learn and contemplate.

An aerial view of the Medicine Wheel and early plantings of the foraging meadow. *Photo by Chris Major.*

Bringing the concept to fruition involved a lot of research, trust and hard work. Before we could even dream about starting the planting process, we had to first heal the soil. The soil, which had once been fields for potatoes and root crops

during the farm's operational years from 1885-1957, had been covered in invasive vegetation for decades. Committed to not using herbicides throughout our entire garden, we opted to scalp the plant material, hand weed and use a successive series of cover crops including crimson clover (*Trifolium incarnatum*), sun hemp (*Crotalaria juncea*), daikon radish (*Raphanus sativus* var. *Longipinnatus*) and sunflowers (*Helianthus* spp.) over a full season to help work nutrition in to the chalky gravel and sand. We also overseeded the entire garden with black-eyed Susans (*Rudbeckia hirta*), which helped prevent open spaces where weed seeds could germinate and became a golden carpet that delighted garden visitors.

The design of the garden focuses on the central nucleus of a formal Medicine Wheel Garden which includes 60 taxa core to the culinary, medicinal and spiritual traditions of the Anishinabek. Separated into four distinct quadrants, the Medicine Wheel represents the four seasons and phases of life and honors the four sacred plants: prairie sage (*Artemisia ludoviciana*), sacred tobacco (*Nicotiana rustica*), white cedar (*Thuja occidentalis*) and sweetgrass (*Hierochloe odorata*).

The foraging meadow includes flora from seven different habitats across Michigan, from barrens and dunes to the ephemeral forest floor. We worked with several nursery growers, most notably Birdsfoot Native Nursery, Black Cap Farm and Wild Type, as well as the Grand Traverse Regional Landscape Conservancy, to ensure that we planted Michigan genotypes that are as hyper local as possible. Some of the most intriguing plants in the garden include eastern leatherwood (*Dir-*

Below: A living tapestry of native plants that surrounds the traditional medicine wheel. *Photo by Steve Tavener*. *Bottom:* Butterfly milkweed (*Asclepias tuberosa*) intertwine with the dissected foliage of partridge pea (*Chamaecrista fasciculata*) amongst a mix of warm season grasses.

Tera John lays out plants and pathways during the first wave of installation.

ca palustris), birdsfoot violet (*Viola pedata*), pasque flower (*Pulsatilla nuttalliana*), prairie junegrass (*Koeleria macrantha*) and trailing arbutus (*Epigaea repens*).

A unique aspect of the garden is a space where foraging is integrated into our educational programming and outreach. Although in its early stages, much has been harvested and shared, including more than 50 gallons of prairie sage, sacred tobacco seeds for cultivation at the Gittigaan, the Food Sovereignty Garden on the Tribal Lands of Peshawbestown, and several branches of cedar for making tea for classes.

In addition to the over 6,000 individual plants and seedlings that are actively healing the soil and ecosystem in the garden, we worked together to tell the story of the Seven Grandfather teachings — love, respect, honesty, courage, truth, wisdom and humility — through seven places of pause and reflection along a passage that encircles the medicine wheel. Each Grandfather is symbolized in original artwork by Rik Yannot, a local artist and member of the GTB. Seven rocks were hand selected by Yannot from the expansive acreage of the Botanic Garden to mark each point of pause. This spring, we will install a totem that tells the story of each spirit associated with the Grandfather teachings. Yannot hand carved and painted the totem made from cedar trees harvested from tribal lands; it includes the seven spirits — turtle, wolf, buffalo, beaver, eagle, bear and "sa'be" or bigfoot.

The Anishinabek Medicine Wheel and Foraging Meadow Garden is a testament to the power of plants to bring people together and the role that public gardens play in providing living examples of healing. We look forward to watching the garden continue to evolve, sharing our story with our peers, and cultivating resources for our community through the co-management of the garden.

Wild Ones member Matthew Ross is the executive director of The Botanic Garden at Historic Barns Park in Traverse City, Michigan.

Photos by Carey Murphy

Can an annual competition to document wildlife improve our ecosystems, strengthen communities and make bugs trendy?

Residents head outdoors to discover their wild neighbors when the City Nature Challenge comes to Frederick, Maryland

By Carey Murphy

"You're so embarrassing the way you talk about insects and nature," my seventh grader told me as she gritted her teeth. "My friends think you're weird."

This admonishment came a few days after I pointed out the monarch chrysalises dangling from the milkweed (*Asclepias* spp.) plant next to the front porch and the black ratsnake (*Pantherophis alleghaniensis*) that had moved into a hollow gourd hanging from our front tree.

This insult stung since it came from a kid who started camping at 9 months and who has experienced wild lands and parks in more than 30 states. I thought I had nurtured this child with nature, inured her to the bug stigma and fear that some kids model after their own parents. Despite having a 16 year old, I wasn't prepared for my younger daughter's fierce desire to fit in with her Gen Z peer group.

For the past seven years, I've been on a mission in my neighborhood and county of Frederick, Maryland to bring nature back into our everyday vocabulary and lives. Nature can help us adapt to climate threats, improve economies and strengthen communities. Like many inspired by Doug Tallamy, I began my advocacy and hands-on restoration with a focus on galvanizing people and projects around native plants. Through large-scale plantings, many with volunteer teams consisting of pre-school students to seniors, I have helped add thousands of square feet of new native plants and thousands of trees on community properties. For youth, I have provided tools and activities like hand lenses, bio bingos and nature journaling to enhance outdoor learning in gardens.

Shea, 5, relishes in finding insects like this horned passalus beetle (*Odontotaenius disjunctus*).

Maryland's 2021 low-impact landscaping law afforded me the opportunity to buck the HOA tradition of grass and replace my front yard with a wildlife habitat of green groundcovers and carefully chosen native perennials.

From a bird's eye view, though, we are only on the cusp of much-needed changes with small pockets of nature in a patchwork of farm fields, turf, asphalt and warehouses. In Maryland's fastest-growing county, we are in need of investments and commitments to protect and enhance our wilderness.

But how do we get the general population to notice and appreciate nature, knowing it is a necessary step to largescale conservation and restoration?

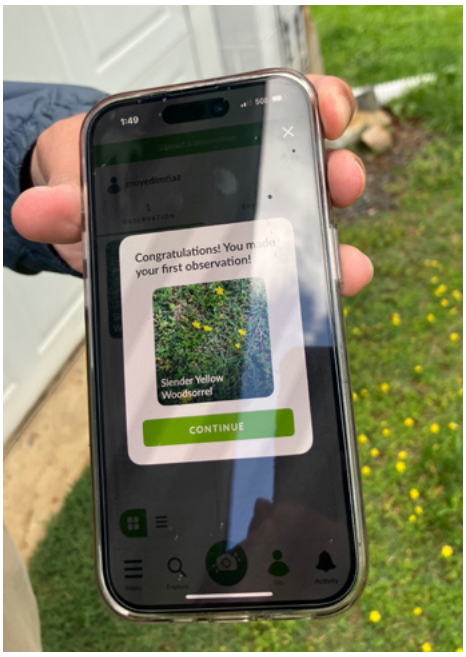
Team Frederick joins the international City Nature Challenge

The City Nature Challenge, now in its 11th year, has great potential to transform ordinary people into community scientists, nature nerds and biodiversity advocates. In 2025, we invited Sam Droege, a wildlife biologist from the USGS Bee Lab and pioneer of the bioblitz, to kick off the inaugural City Nature Challenge in Frederick, Maryland. Team Frederick was officially on a quest to make observing nature routine and fun.

Each April, cities, counties and other municipalities across the globe race to document local biodiversity — plants, animals and fungi — by as many people as they can over a long weekend by uploading images

Left: An eastern carpenter bee (*Xylocopa virginica*) singles out the native golden Alexander (*Zizia aurea*) in Stella's garden. Right: Community members, including two Hood College students, document wildlife in Stella's garden during the City Nature Challenge.

into the free iNaturalist app. It's in people's DNA to be competitive, and contests like this can be a draw even for the uninitiated. That turned out to be the case in Frederick. Close to 250 people, many new iNaturalist users, made 7,114 observations of 1,332 species in just four days. We estimate that 2,000 people participated in some fashion in either a guided nature walk, school-based activity or library story time. And the observations continued after the Challenge, ending with a 60% increase in 2025 compared to the same period in 2024.



A student uses iNaturalist for the first time in Stella's garden by photographing yellow woodsorrel (*Oxalis stricta*), a native plant that grows in her lawn. @sambiology helped to ID this plant in iNaturalist.

Scientists from around the globe take these observations, now data, from iNaturalist and determine how species are faring, how climate changes are impacting them, and how invasives are altering our ecosystems. Sometimes a new species is discovered, or a new invasive is detected encroaching an area. But even our ordinary observations can lead to new understanding and behavior changes.

Studying an urban native plant garden for native bees

For three hours on Day 2 of the Challenge last year, 20 observers catalogued the creatures and volunteer plants in Wild Ones member Stella's native plant garden, covering 2,000 square feet in the heart of downtown Frederick. Our local Greater Frederick Maryland Chapter sponsored the event in Stella's garden and assisted iNaturalist users — many of them students from the nearby Hood College — as they used the app for the first time. Droege shared that 169 native bee species had been documented in our county and suggested that our gardens could be home to about 100 of them. Having learned that the best time to see native bees is between 10 a.m. and 2 p.m. in the spring, we set out to find out how many bees we could discover on this empty lot that has been transformed into a native habitat.

By the end of our mini bioblitz, we had documented 72 species. A student found a red-backed salamander (*Plethodon cinereus*) under a pot, and another student spotted a groundhog (*Marmota monax*), but surprisingly, only five bee species were recorded in Stella's garden. The day before, I had observed more than 100 bees representing at least a dozen species in my own garden. By adding additional early blooming plants,

Carey Murphy identified this scorpionfly (*Panorpa sp.*) thanks to iNaturalist's AI feature, but she dug a bit further to learn that scorpionflies do not bite or sting humans and can help in forensic investigations.

including those needed for specialist bees, and leaving stem stalks, more bees may nest in this urban garden. A Hood graduate student's follow-up study will provide more long-term data.

How iNaturalist works

Focus your cell phone camera on a natural object and iNaturalist will use its AI technology and your location to make suggestions identifying what you've discovered. The new app even provides a percentage of how confident it is based on the details of your observation. Clear photographs from multiple angles increase accuracy. You can further your own understanding by consulting field guides to help verify the match.

Once you have uploaded your observation, a team of volunteers reviews it. If two or more agree on an identification, it reaches research grade status, indicated by a green banner, and is uploaded to the Global Biodiversity Information Facility database (GBIF) for scientists. It's often overlooked that iNaturalist was designed as a social networking app. Users can tag others to ask for help with identifying and flagging species, as well as to call out rare finds. You can also send emails; it's a great tool for finding other naturalists and organizing events. Note: It's possible to use digital cameras and batch upload photos; cell phones are not required although they do make using iNaturalist easier.

Once skillful at using iNaturalist, the process encourages looking even more closely at the wildlife around us. That's how I finally discovered a key feature of the scorpionfly. When the AI tool suggested the *Panorpa subfurcata* with a picture, I hadn't yet noticed the insect's curled-up tail — it was the mottled wings I photographed first. You can tell how common a discovery you have made by looking up the data on the desktop version of iNaturalist. There are 4,118 records of this scorpionfly that peak in May. Often, links will provide additional information about range, habitat and breeding.

Since its creation in 2008, iNaturalist has documented more than a quarter of all known species by 5 million users worldwide. Last year, iNaturalist reached a milestone for conservation. With enough data on terrestrial vertebrates (land-dwelling animals with backbones), the team created species richness maps, which indicate biodiversity hotspots. According to iNaturalist, these maps are "a powerful new tool for researchers, conservationists and policymakers to better understand and protect biodiversity — a key part of iNaturalist's mission." With only 3% of invertebrates (including insects) documented, however, iNaturalist needs more observations to add invertebrate species to these maps.

The Maryland Biodiversity Project includes confirmed records from iNaturalist by each county, including three records of purple dung beetle (*Geotrupes semiopacus*). Carey Murphy's observation from the Monocacy Battlefield in October 2025 was the first included for Frederick County, Maryland.

Confirmed firsts and creating life lists

After the City Nature Challenge, I evaluated the observations Team Frederick made to share some highlights, patterns and relevance at a post-event celebration. Our most common observation was nonnative garlic mustard (*Alliaria petiolatae*), followed by native mayapple (*Podophyllum peltatum*). Of our Top 10 observations, half were invasive plants. As I was poring over thousands of records, I realized that a beetle I had photographed had not yet been confirmed as living in my county. This striking dullish purple, oblong beetle, about the size of a nickel, scurried across the path as I was wrapping up my 2 hours of exploration at the Monocacy National Battlefield. To determine if this scarab beetle was a purple dung beetle (*Geotrupes semiopacus*), I enlisted some of the preeminent entomologists in Maryland. But my pictures were not clear enough to determine if this beetle had tiny bumps or indentations on the elytral striae, which are the grooves on the beetle's forewings. Six months later, though, while walking in the same location on the wooded trail, I found two dead beetles on the path that looked similar, though they were green. With clearer pictures, a beetle expert I tagged on iNaturalist confirmed my discovery as a semi-opaque Earth-boring beetle (*Geotrupes opacus*). It was one of only 122 confirmed records on iNaturalist and a first in my county, as green versions are rare.

Collecting is part of human nature, as is exploring new frontiers. Spurred on by my experiences with the City Nature Challenge, I have added my own ¼-acre suburban lot as a new "place" on iNaturalist. In this homegrown park, my list is up to 336 species — mostly insects and other arthropods. New discoveries are just steps away.

I have started to collect specimens the old-fashioned way, too. It turns out people of all ages get excited about a bug when it's in a jar. We learned this in schools, in visits with senior citizens, at library story times and at a corporate headquarters when preparing people for the Challenge. It's this spark of curiosity that can be built on.

"What is this?" "Where did it come from?" "What role does it play?" Talking about wildlife may not be as cringeworthy as my tween has led me to believe, but it would behoove us to be intentional in getting the conversations started and maintaining the nature-filled dialogue. Consider participating in the international City Nature Challenge this April 24-27, 2026, and see where it leads you and your community.

Carey Murphy is co-founder and vice president of the Wild Ones Greater Frederick (Maryland) Chapter, leader of Green Team Urbana, a Master Naturalist, and the education director for Mobilize Frederick, a non-profit organization that implements solutions for a changing climate.