

The Blazing Star



A PUBLICATION OF THE NORTH AMERICAN NATIVE PLANT SOCIETY

Native Plant to Know

Bur Oak

Quercus macrocarpa

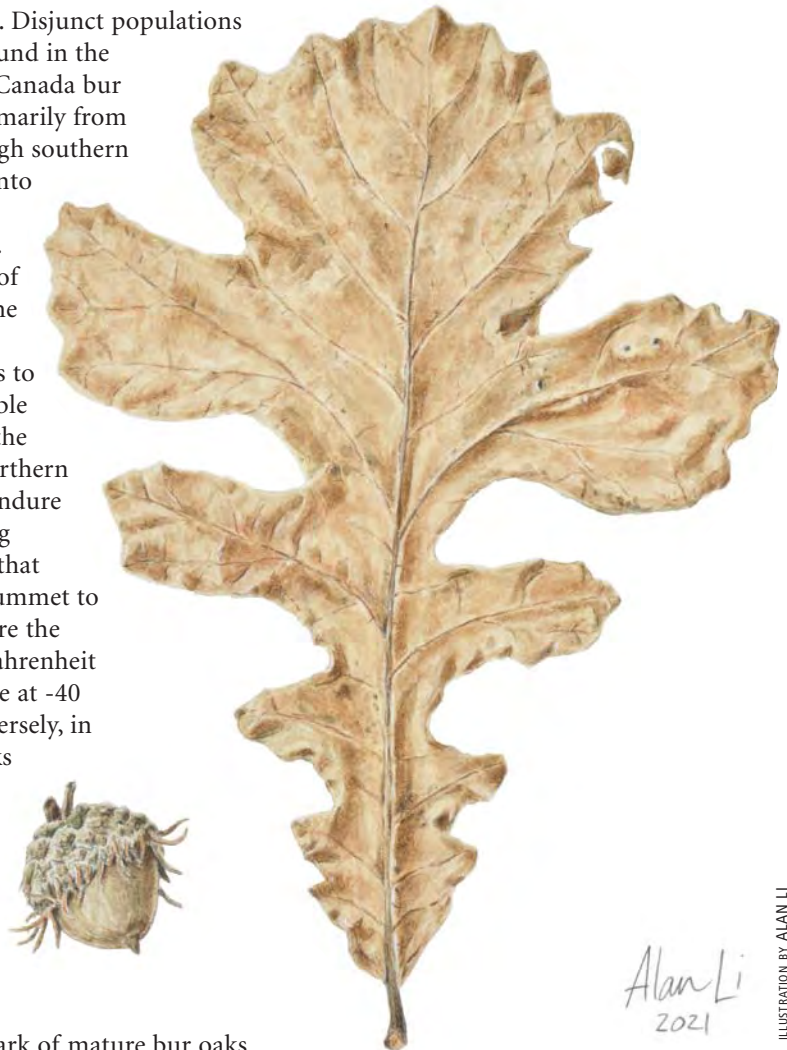
by Don Scallen

I kayaked on a gentle, sun-kissed September afternoon, the day after a raging windstorm. The stream wended its way through white oaks (*Quercus alba*) and bur oaks (*Quercus macrocarpa*) perched on a slope rising from the water. Acorns, dislodged from their branches, littered the banks and streambed. They piqued my curiosity. Both bur oak and white oak acorns were scattered on the bottom of the stream. White oak acorns were plentiful on the shoreline, but the only bur oak acorns on the bank were hidden between slabs of shale. I presented this puzzle to a friend who is a *Quercus* expert and he explained that, among the native oaks of Canada, the acorns of bur oaks are the most highly sought after by wildlife. My observation bore this out. It appeared that most of the bur oak acorns on the bank had been preferentially collected by birds and squirrels, while the ones on the streambed rested out of reach. The *Quercus alba* acorns weren't as popular.

Acorn mast is one of the significant contributions that bur oaks make to the ecologies they inhabit, throughout their extensive range. In the United States this includes a vast swath of the Midwest and eastern prairie states, from Texas north to Minnesota and

North Dakota. Disjunct populations can also be found in the northeast. In Canada bur oaks grow primarily from Quebec through southern Ontario and into Manitoba and Saskatchewan. The presence of bur oaks on the Canadian prairies speaks to their remarkable hardiness. In the windswept northern prairie, they endure bone-numbing temperatures that sometimes plummet to the point where the Celsius and Fahrenheit scales converge at -40 degrees. Conversely, in Texas, bur oaks shrug off tar-melting heat and punishing drought. They are astonishingly tough trees.

The thick bark of mature bur oaks helps them survive the periodic low intensity fires of natural savanna and prairie ecosystems. In fact, fire



Alan Li
2021

ILLUSTRATION BY ALAN LI

Continued on page 14

The Blazing Star is . . .

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NANPS News

The North American Native Plant Society recently received a generous grant from the McLean Foundation. This funding enables NANPS to expand our plant sale beyond the Greater Toronto Area into Hamilton and Brantford in the spring of 2022. Some of the funds will also support the filming of a how-to video that offers a step-by-step approach to creating a native plant garden. Our sincere thanks to the McLean Foundation for this timely donation.

NANPS online AGM took place on October 23, where participants were given the opportunity to vote for the winners in our second annual native plant garden video contest. For the second year in a row, Sayeh Beheshti of Toronto, Ontario, received the top individual prize (\$150). The winner of the institutional prize (also \$150) was the Highlands Biological Station in Highlands, North Carolina. The other three cash winners were Brenda Near of Zephyr, Ontario, Kimberlee Adams of Mulmur, Ontario (her second time in the winners' circle) and John Magee of Middleburg, Virginia. Our congratulations to all! To view the videos, visit [facebook.com/nativeplant](https://www.facebook.com/nativeplant). We hope these videos inspire more people to plant native plants and restore native ecosystems.

NANPS was pleased to offer a second plant sale in 2021, thanks to a grant from the Ontario Trillium Foundation and the assistance of so many invaluable volunteers. For the first time, the fall sale offered a curbside pickup option in Hamilton, in addition to the Toronto locations. We look forward to offering more pickup locations in the future. Thanks to all our native plant shoppers and gardeners for your support of NANPS work.

Seed Collection

Would you consider participating in the NANPS Seed Exchange this year by collecting native plant seeds from your garden or wild places? If you wish to donate or request seeds please contact seeds@nanps.org for information. Send the seeds, separated by species and identified with the source/parentage, to NANPS Seed Exchange, Box 69070, St. Clair P.O., Toronto, Ontario, M4T 3A1. To learn how to collect seeds and do so ethically, visit nanps.org/seed-collecting. Seed packets are available for a small fee. Donors get first crack at ordering the seeds. A list of last year's species can be found nanps.org/nanps-seed-exchange. For the 2021 list, please check back at the beginning of December. Thank you for your valuable contribution to native plant restoration.



Shagbark hickory nut (Carya ovata)

PHOTOGRAPH BY DON SCALLEN

Wild Plants from Seed new website up at last!

Anyone who has ever wanted to collect seeds and start their own native plants can now access wildplantsfromseed.com. The website was created by Kristl Walek, longtime owner of Gardens North (now closed), and her collaborator, Graham Page, a research forest ecologist. A great deal of academic and practical research (and lots of hiking into the wild) resulted in a website that gives clear information on site requirements and seed-growing instructions for over 650 species of vascular plants in eastern Canada, zones 3 to 7. Almost 4,500 striking, colour photos show the featured species in flower and in fruit. Guidelines for collecting fruits and seeds safely, responsibly and successfully are included. A valuable resource for native plant enthusiasts!

Small's Creek Ravine

by *Matthew Canaran*

Wandering the city below street level
I am a place where cicadas revel.

Mighty old oaks race to the sky,
Crimson-red maples please passersby,
October's display cascades below
With a brilliant blue aster and goldenrod show.

Midwinter, while much of my forest sleeps,
Sly foxes slink in snow knee deep,
Marsh marigolds in spring abound on my banks,
A salamander army assembles its ranks.

For Earth's life, I offer a home,
Including for you,
You're one of my own.

Yet, in spite of my generous gifts to you
I'm a lonely remainder of only a few.
My chattering cousins you've buried below,
My meandering kin you've straightened to rows.
Your toxic discharge flows in our veins,
You disregard us and the life we sustain.

My time is up
Now you're coming for me
You're coming for my water
You're coming for my trees.

What can I do, an endangered ravine?
Why must you order this bulldoze machine?

Maybe, just maybe, you know what's best
Maybe I'll end, just like the rest.

While I'm here, I promise delight,
While I'm still here, enjoy my respite.
Listen.

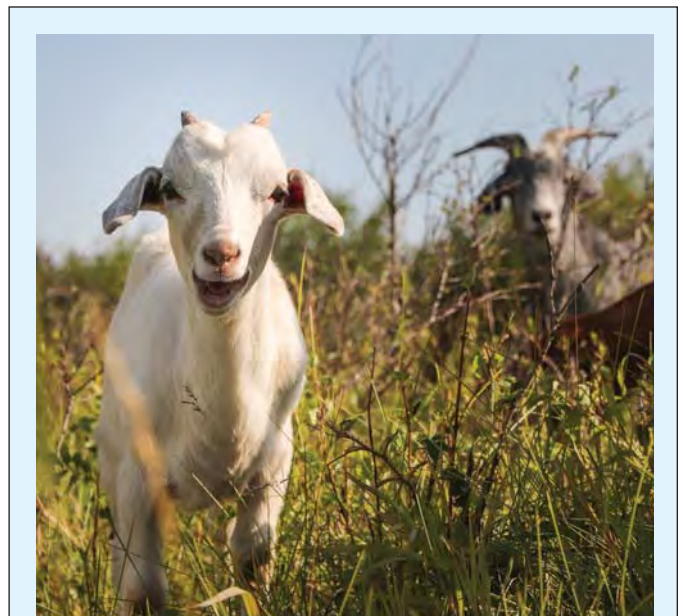
Listen to the blue jays jeer
Listen to the woodpeckers drum
Listen to the beech leaves rustle
Listen to my water run.

Matthew Canaran is a Master of Landscape Architecture student at the University of Guelph.



PHOTOGRAPH BY MATTHEW CANARAN

*Small's Creek is a ravine in Toronto's east end much loved by the local community. Metrolinx plans to remove thousands of trees, install a three-metre (nine-foot) retaining wall and realign the creek as part of their plan to build a fourth track on GO Transit's Lakeshore East Line. The ravine harbours a healthy stand of marsh marigolds (*Caltha palustris*) along with native tree species such as mountain maples (*Acer spicatum*), hemlocks (*Tsuga canadensis*) and sugar maples (*Acer saccharum*).*



PHOTOGRAPH COURTESY NATURE CONSERVANCY OF CANADA

The use of goats to remove invasive plants at habitat restoration projects throughout North America has become increasingly popular. Read about recent successes and challenges on page 8.

A Fortress among the Flowers: the Goldenrod Gall Fly

by Kyle Horner

Goldenrods (*Solidago* spp.) may be among Ontario's most underrated wildflowers. Many species are quick to colonize – and often dominate – sites of human disturbance like vacant lots, fallow fields and roadside ditches. Their conspicuous and aggressive nature leads many people to label them as weeds while their late-summer blooms have even marked them as wrongful scapegoats for ragweed-induced hay fever.

We should not be so quick to label goldenrods, though. They are attractive wildflowers that grow enthusiastically where many others would not. Their pollen is carried by insects, not the wind, so they do not cause seasonal allergies. Perhaps most importantly, they are absolutely wonderful for wildlife.

When they hit their stride as the summer wanes, goldenrods are the predominant wildflowers in many Ontario landscapes. Their abundant blooms are a rich nectar source for an enormous array of insects, including flies, beetles, butterflies and bees. In this way, goldenrods form a sturdy pillar in the foundation of our local food webs, supporting our native pollinators and fostering a rich cohort of insect life to feed our province's birds, bats and other hungry insectivores.

While their nectar stores are enjoyed by many, one insect has taken its relationship with goldenrods to a whole different – and far more complex – level. The diminutive goldenrod gall fly is not particularly interested in the goldenrods' sugary buffet, but is much more keen on how it can use the plant to make an investment in the next generation.

After goldenrod gall flies mate in the late spring, females lay their eggs individually in the buds of young goldenrod plants. While nearly any goldenrod species will do, in Ontario the goldenrod gall fly seems to prefer Canada goldenrod (*Solidago*



An intact goldenrod gall fly

PHOTOGRAPH BY KYLE HORNER



A dissected goldenrod gall showing the grub.

PHOTOGRAPH BY KYLE HORNER

PHOTOGRAPH BY KYLE HORNER



Black-capped chickadee, a predator of gall fly larvae.

PHOTOGRAPH BY KYLE HORNER



Viceroy

canadensis), tall goldenrod (*S. altissima*) and late goldenrod (*S. gigantea*). About a week after it is laid, the gall fly egg hatches and the tiny larva burrows down into the stem below the bud.

On arriving at its chosen location, the larva secretes compounds that are thought to mimic the plant's own hormones. These compounds induce the plant to grow a gall, which takes the form of a loonie-sized sphere in the middle of the stem, with a tough outer layer and hollow inner chamber. The gall protects the vulnerable, developing insect from predators and adverse weather. The plant continues to grow and flower normally, seemingly unaffected by its new resident.

Safe in its newly formed fortification, the larva spends the summer and fall feeding on the gall's tissues and growing. As cold weather approaches it must prepare to hibernate through the winter, but it first performs one last, crucial task: it chews a tunnel right to the edge of the gall, leaving only a thin layer between itself and the outside world. It then retreats into the gall and beds down for the long wait until spring.

The gall protects the sleeping grub from ice and snow, but provides no warmth. To survive the frigid winter the larva produces compounds in its body tissues that act as a sort of antifreeze, preventing ice buildup and cell damage. Thus the insect simply sleeps through the cold season in a sort of cryogenic stasis, until warming days spur it into action once more.

As spring approaches the grub forms a pupa, in which it transforms into an adult fly. Crucially, the newly formed fly does not have chewing mouthparts, so in a remarkable example of developmental foresight it uses the tunnel created by its younger self to move to the very outer edge of the gall. Once there, the fly presses its head against the thin outer skin that remains and inflates a balloon-like

Continued on page 6



PHOTOGRAPH BY KYLE HORNER

Locust borer

structure between its eyes to push its way through to the outside world. It will live for only two weeks more, during which time it must mate and lay eggs to begin the process anew.

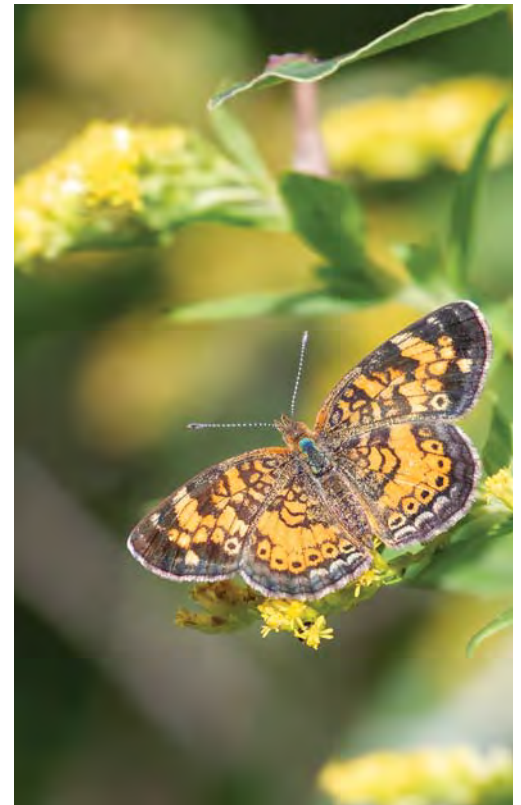
Given its life cycle and seemingly parasitic relationship with goldenrods, it would be easy to label the goldenrod gall fly a pest. It may seem counterintuitive but it's clear that the fly has no negative effect on its host plant, making their arrangement an example of commensalism – a relationship where one organism benefits and the other is simply a neutral player. Furthermore, the fly is native to Ontario and, in spite of its sophisticated strategy for self-preservation, has predators to keep it in check.

Birds such as black-capped chickadees and downy woodpeckers use the galls as a valuable food source, cracking them open to devour the protein-rich larvae hidden inside. Parasitic wasps also deposit their eggs

in the galls so that their larvae can feed on the gall fly larvae. There's even a beetle that lays its eggs on the gall so that its grubs can feast upon the gall tissues, effectively taking advantage of the fly's hard work and often killing it in the process.

The next time you find yourself in a field of goldenrod, take a moment to stop and observe. Look at the array of insects that visit the showy flowers for nectar or find safety in the forest of stems and leaves. Peek just below the flowers and you may see the tiny fortress of a goldenrod gall fly, concealing the delicate larva within. These little architects remind me that goldenrod is no weed, but an integral and vital part of Ontario's complex ecology, and worthy of much overdue appreciation.

Kyle Horner is the education coordinator for Wild Ontario.



PHOTOGRAPH BY KYLE HORNER

Northern crescent butterfly on goldenrod.

Calendar of Events

FEBRUARY 26, 2022

2022 Landscaping With Colorado Native Plants Conference

This virtual conference, organized by a coalition of partner organizations, “promotes the inclusion of native plants in our landscaping to benefit pollinators and songbirds, save water and restore the beauty and health of nature in the places we live, work and play.” Visit landscapingwithcoloradonativeplants.wordpress.com.

MARCH 3-4, 2022

Land and Water Summit Albuquerque, New Mexico

This event will be a hybrid: come in person or participate online. The GSI Field Trip to Santa Fe will be on March 2. Visit landandwatersummitnm.org for details.

JULY 20-23, 2022

Cullowhee Native Plant Conference Cullowhee, North Carolina

This conference is aimed at professionals and laypersons who wish to increase their knowledge of propagating and preserving native southeastern plant species in the landscape. Organized by the North Carolina Native Plant Society. Contact learn@wcu.edu or call 828-227-7397.

OCTOBER 20-22, 2022

CNPS Conservation Conference San Jose, California

Every three years, the California Native Plant Society brings together the state's conservation community for three days of scientific sessions and special events to benefit California's ecosystems. Visit conference.cnps.org for details.

Goats Keep Invasive Species in Check

by Irene Fedun

How do you control a burgeoning plot of phragmites that's threatening to overtake your community gardens? Bring in goats, of course. That's what *rare* Charitable Research Reserve in Cambridge, Ontario, did when the highly invasive European common reed (*Phragmites australis*) moved in.

They partnered with Growing Hope Farm, a not-for-profit social enterprise that rents out goats for birthday parties and yoga classes (among its many endeavours). Conservation Technician Sarah Marshall convinced them to rent 10 goats to *rare* for a two-week period in midsummer 2019. Before the farm would agree to this proposal, they insisted that *rare* purchase a secure enclosure to keep the goats safe and prevent them from straying into the gardens or anywhere else. Temporary fencing would not hold them in. The Region of Waterloo Community Environmental Fund provided funding that enabled *rare* to purchase a Cackellac, a barn-shaped, lockable enclosure on wheels with no floor and a roof constructed of a tarp covering a rounded metal frame and no floor. Staff would move the "tractor" after the goats had eaten one patch of phragmites pretty well down to the ground, which was every other day. The goats were particularly fond of the purple flowerheads! They worked over an area about 1,000 square metres (1,200 square yards) in size, but did not eliminate the plants with just this one treatment. However, according to Sarah, the goats' munching allowed for the regeneration of a thick layer of non-phragmites vegetation.

"The use of goats on phragmites is experimental but looks promising with a large amount of biomass removed in a season, including the dead stems, with less labour required than our usual treatment strategy (spading). There was also less soil disturbance," says conservation technician Alissa Fraser.

The goats are just one part of a research project designed to restore the ecological quality of natural areas on the 405-hectare (1,000-acre) *rare* property through the management of persistent invasive species. The overarching project tests the effectiveness of different control methods on non-native phragmites as well as common and glossy buckthorns (*Rhamnus cathartica* and *Frangula alnus*).

The plan is to bring the goats in every year until the powerful rhizomatous roots of the alien

phragmites have been irretrievably weakened by repeated removal of the photosynthesizing leaves and flowers. In the meantime, *rare* staff and community gardeners get to enjoy the company of the friendly goats and their loud bleats!

The Nature Conservancy of Canada (NCC), a non-profit organization in the business of protecting ecologically valuable land across the country, received from Ruth Fleming in 2009 a donation of 24 hectares (57 acres) west of Edmonton. The bulk of the

Continued on page 8



Sarah Marshall showing the Cackellac

PHOTOGRAPH BY TARYN JARVIS



A goat inside the enclosure munching on *Phragmites australis*

PHOTOGRAPH BY JENNA QUINN

Continued from page 7

land, 17 hectares (42 acres), was forest and wetland habitat, while seven hectares (17 acres) had been cropland for decades.

Keen to restore the fields to original forest, NCC staff, contractors and volunteers began by seeding the area with native grasses and planting white spruce (*Picea glauca*), black spruce (*Picea mariana*) and lodgepole pine (*Pinus contorta*), typical transition species in Alberta. Unfortunately, they had very little rain that year and the grass seed did not germinate. Two highly invasive, non-native species of weeds took over the area, creating challenging conditions for the tree seedlings. The vast expanses of *Cirsium arvens*, commonly known as Canada thistle — a misnomer since the plant is native to parts of Europe and Asia — and perennial sow thistle (*Sonchus arvensis*) would have taken an eternity to remove by hand.

In 2018, on a trial basis, NCC turned to BAAH'D Plant Management, a company that rents out goats. These hearty vegetarians are trained to clear out invasive plants. Two or three times a year, over one or two days, 400-500 goats are brought over to the Fleming property to target-browse the unwanted species. They are accompanied by shepherds and goat-herding dogs. The goats are “supervised” 24 hours a day and moved to the next patch once they have eaten the weeds in one area, to minimize munching on the newly planted trees. Unlike cows or horses, which graze largely on grasses, goats prefer broad-leaved and woody plants. What’s more, goats fertilize the soil with their droppings and their hooves aerate the hard ground.

Three years of target-browsing have produced “great results” with “limited damage to the planted trees,” according to Katelyn Ceh, director of conservation, parkland and grasslands for the Nature Conservancy of Canada, Alberta Region. The native grasses NCC over-seeded in 2018 are becoming established. Poplars



PHOTOGRAPH COURTESY NATURE CONSERVANCY OF CANADA

Goats controlling invasive species, Canada thistle and perennial sow-thistle, on the Nature Conservancy of Canada's Fleming property.

(*Populus* spp.) are moving into the former cropfield from the edges of the property. NCC will continue relying on the services of the goats until the saplings and native grasses can hold their own.

Major cities in Alberta, namely Edmonton, Calgary and Lethbridge, have all used goats for weed control in their parks over the past few years.

In Washington County, Idaho, the Weiser River Canyon was overrun by a tough, extremely deep-rooted weed called leafy spurge (*Euphorbia esula*), likely introduced to North America from Europe in the early 1800s. It has spread over large swaths of western Canada and the United States. The milky fluid from the stems and flowers is an irritant to most livestock and can cause rashes in humans. Goats are taken into the fields when the plants are most palatable, chewing off the flowers to prevent seeds from bursting forth and germinating. With repeated browsing, the roots will eventually die out. Leafy spurge will never be eradicated from the valley, but as the plants are weakened or substantially reduced in numbers, native vegetation begins to re-establish.

For anyone wanting to rent goats, Jeannette of BAAH'D Plant Management provides valuable advice. “It’s important to hire a team that

knows how to manage goats to produce the desired results,” she says. She has seen goat farmers offering weed control where the end result was that the goats overgrazed the area, avoiding the weeds but eating the native plants instead: “This not only destroys habitat, but can make a site more of a fire risk.” She has also seen disease spread from poorly cared-for goats to wildlife and humans. The goats must be “trained” to eat the “right” plants and the managers must have enough experience to take into account other factors such as soil and animal health.

The final word goes to Mary Gartshore of the Long Point Basin Land Trust in southern Ontario: “I grew up with goats and they are diabolical at best. They are both destructive and incredible escape artists, always keeping a sharp eye on their caretakers for any weaknesses.” That said, Mary, who believes using goats for plant management to be a timely issue, sent along articles from North America and Australia on the role of goats in protecting native species by being directed to eat the invading plants. Let’s face it, we humans need all the help we can get!

Irene Fedun is the editor of The Blazing Star.

Orchids: A Peek into Their World

by *Madison Woods*

Orchids are notable for their wildly varied shapes, sizes and growth habits.

In bloom, some appear otherworldly, with long sepals curving enticingly to lure pollinators into their bowels. Others are humble, with pale, insignificant flowers. They can be much harder to spot, especially when not in the process of securing pollination. Even tiny blooms are better at catching the eye than stems or leaves alone. When some orchids aren't in flower, there's literally nothing to see – the rhizomes are underground and there are no leaves above ground. If you're very observant, you might spot a simple, leafless finger of a vine snaking over the terrain of tree bark, a rosette of leaves or a single leaf resting on the ground.

You are more likely to encounter an aster or a sunflower in your day-to-day life than an orchid. Over 200 species are distributed across North America. Some are common, but many orchids are endangered.

Some species exist only in very specific locations – those are often the most critically imperiled. For example, *Spiranthes diluvialis* (Ute lady's tresses) is endemic to only four cienegas (isolated freshwater marshlands) in southern Arizona.

Why are some orchids so rare? Habitat destruction is a big factor. Many orchids depend upon undisturbed forests, marshes or wetlands to survive. Development can create damaging changes in forest canopy, drainage and soil makeup.

Sadly, many people dig up orchids from the wild. Don't do it! There are several reasons for this. First, orchids need specific conditions to live and it's difficult to reproduce them in other locations. Certain microbial life

interacts with the roots of both terrestrial and epiphytic orchids. These plants have specific pollinators. If you take a plant from one location and move it to your home far away, even if everything else is suitable for growth, you may well be dooming the plant. It could be the last of its genetic line if the bees or other insects adapted to pollinate this species are not present.

Sometimes orchid seeds will germinate and grow in the absence of their preferred microbial companions. Seed collection is the only responsible way to reproduce new plants, aside

from cloning them, but take care to harvest only a small

percentage of the seeds so that the mother plant can continue expanding in her home location.

Orchidaceae, the orchid family, is divided into three types. All are perennials. Epiphytic orchids depend upon other plants to act as hosts. They're the ones you'll find growing on trees. Terrestrial orchids (also called orchis) sink their roots into the ground. Aquatic orchids inhabit bogs, floodplains (which are sometimes free of water), marshes, swamps, drainage ditches, shorelines and the edges of areas that are frequently flooded or wet.

North America boasts only one aquatic orchid, the water spider orchid (*Habenaria repens*). This orchid can be found in North Carolina south to

Florida, west in Arkansas and Texas, and southwest through Mexico and Central America. It sometimes grows in dense floating mats in stagnant pools, but it can also be terrestrial.

The majority of orchid species in North America are found in Florida because the state has a wide range of ecosystems and habitats: moist pinelands, moist savannas, mixed woodlands, deep swamps with mature trees and grassy fields.

Lady's slipper orchids may well be the best known of wild orchid species. They belong to the genus *Cypripedium* and sport the bulbous labellum (the lower lip of the blossom) that many people associate with orchids. They are widespread, with different species adapted to climates ranging from arctic cold to subtropical warmth. Some of them prefer grassy glades with dappled sunlight, others are happiest in the deep shade. Spotted lady's slipper (*Cypripedium guttatum*) sends shoots up through the snow in Alaska, Yukon and Northwest Territories. Lady's slipper orchids are pollinated by megachilid bees.



Pink lady's slipper (Cypripedium acaule)

Continued on page 10

Continued from page 9

Lady's tresses (*Spiranthes* spp.) are common across a variety of habitats throughout North America. Most of them are inconspicuous. Their upright stems blend in well with tall grasses. Small flowers, ranging in colour from white to light yellow to light pink, bloom from the bottom up in a spiral pattern around the centre, with no spurs on the labellum. By the time the orchid blooms, the leaves have usually shriveled and returned to ground. All there is to show is the slender stem with flowers. Some species have slightly showier flowers with fringes and more bulk to the blossoming tops. Canelo Hills lady's tresses (*S. delitescens*) are rare, occurring in only a few wetland marsh areas of Arizona. Lady's tresses are pollinated by bumble bees.

Rattlesnake plantains (*Goodyera* spp.) are among the most widely distributed orchids, but also the least recognized. They range from Canada and Alaska in the north to Mexico. Of the four North

American species, downy rattlesnake plantain (*Goodyera pubescens*) is the rarest. This *Goodyera* inhabits coniferous and mixed forests. Look for the small, basal rosette of deep green, variegated leaves with distinct white centre veins. The flowers are insignificant on a lone plant, but a colony of blooming plants can be striking. The plant grows up to 15 inches (40 centimetres), blooming from August to September. Rattlesnake plantain is pollinated by bumble bees and other native bee species.

The ghost orchid (*Dendrophylax lindenii*) is the rarest North American orchid. This orchid grows only at the western tip of Cuba, in the West Indies and at the southwestern tip of Florida. This epiphytic species grows on trees. It has no leaves and blooms on an unpredictable, irregular schedule. Most of the time the plant is an unremarkable, greenish-gray rootlet,

high in a tree. Because it depends on air moisture and a high overhead canopy to survive, it is highly susceptible to environmental fluctuations. Land use changes and development in southern Florida have caused the ground to dry out more frequently and stay dry for longer periods than in the past. This leads to lower air humidity, which stresses the ghost orchids. It may seem counterintuitive, but wildfires help ghost orchids because they control the density of ground brush, but never reach the tree canopy. Current wildfire prevention strategies encourage brushy growth, which sucks up groundwater, reducing the amount of moisture in the air. When there are fires, the undergrowth contributes to hotter fires that last longer, creating more heat and smoke. All these factors lead to the demise of the fragile ecosystems needed by ghost orchids.

ILLUSTRATION BY MADISON WOODS



Downy rattlesnake plantain



Lady's-tresses

ILLUSTRATION BY MADISON WOODS

Scientists recently determined that the sphinx moth pollinates this flower.

The Hawaiian bog orchid (*Peristylus holochila*) is perhaps the rarest of the terrestrial types. Little is known about how it is pollinated, how it reproduces or what it needs to help it survive. It grows only in Hawaii; in 2014 there were less than three dozen plants left. The flowers are yellow-green and borne on a spike. It is not what most would consider pretty at first glance. The IUCN Red List (iucnredlist.org/species/64176722/64176727) states that the threats to this plant come from livestock farming and ranching, invasive species (such as wild pigs) and climate change. As with most other orchids, it needs certain associated mycorrhizal fungi to grow.

The eastern prairie fringed orchid (*Platanthera leucophaea*) is native to the grasslands of North America. It ranges from Ontario to Oklahoma, with a few occurrences in the Mid-Atlantic and New England states. In many of the scientific names of plants, there are clues to the plant's use or appearances. In this case, *Platanthera* means flat anthers and *leucophaea* indicates the colour of the flowers, which grow in racemes on the upper half of the stalk. The rarity of this orchid can be attributed to agricultural development. Now that the

orchids are so few and far apart, sphinx moths have a very difficult time finding them. Biologists and citizen scientists have stepped up to help by manually pollinating the flowers.

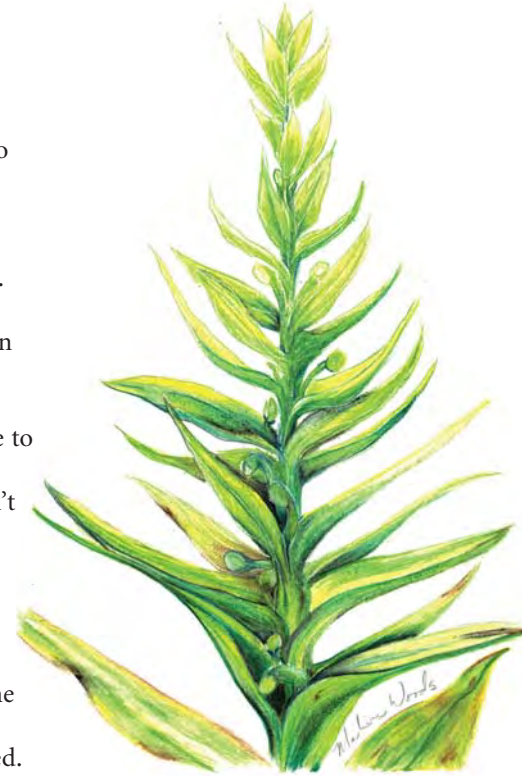
In mid-September, I spotted two lady's-tresses (*Spiranthes lacera* var. *gracilis*) growing in a new location near the end of our driveway. It's an easement space we don't own, but have the rights to use to get to our land. I have no idea how they came to be seeded there. Perhaps they've been there all along and I just didn't notice them.

Should I leave them there? They might be mowed down by the county. It's possible I didn't see them before because they were mowed down in previous years. The alternative was to move them to a location that isn't frequently mowed. Given all I've read about the finicky

nature of orchids, moving them was the least desirable option.

These particular orchids are not rare or endangered in our area. If they were, I'd go to great lengths to protect them where they stand.

I did some research to find out why they surprised me this year. It turns out certain varieties of *Spiranthes* can remain dormant underground for years. As well, *Spiranthes lacera* var.



Hawaiian bog orchid

ILLUSTRATION BY MADISON WOODS



Ghost orchid

gracilis can be reliably propagated by root division. On top of that, several of them are already growing in a location on our property, so I know the habitat requirements can be met here. This new information made the decision easier. I chose to divide the county orchids and relocate the propagates, leaving the mother plants behind.

Perhaps the county will not mow as often in the future. Or maybe the tresses will go dormant again and wait for county officials to be less diligent. At least now there's a good chance that two more new orchid plants will be growing in a wilder space beyond the property lines.

Madison Woods writes and paints from the rural Ozarks of northwest Arkansas. She currently has a painting showing at the Salmagundi Club in New York City. When she's not working on her art, she's probably smashing rocks to make more paint. Find her at wildozark.com or [@wildozark](https://www.instagram.com/wildozark) on social media.

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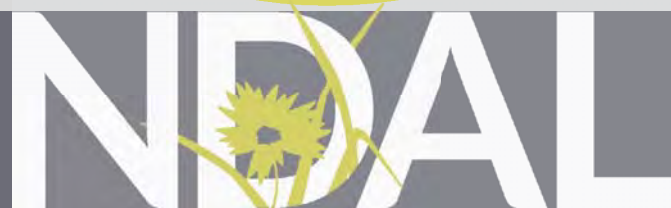
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February - March, 2022

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- Kate K., 2021 Winter Series Attendee

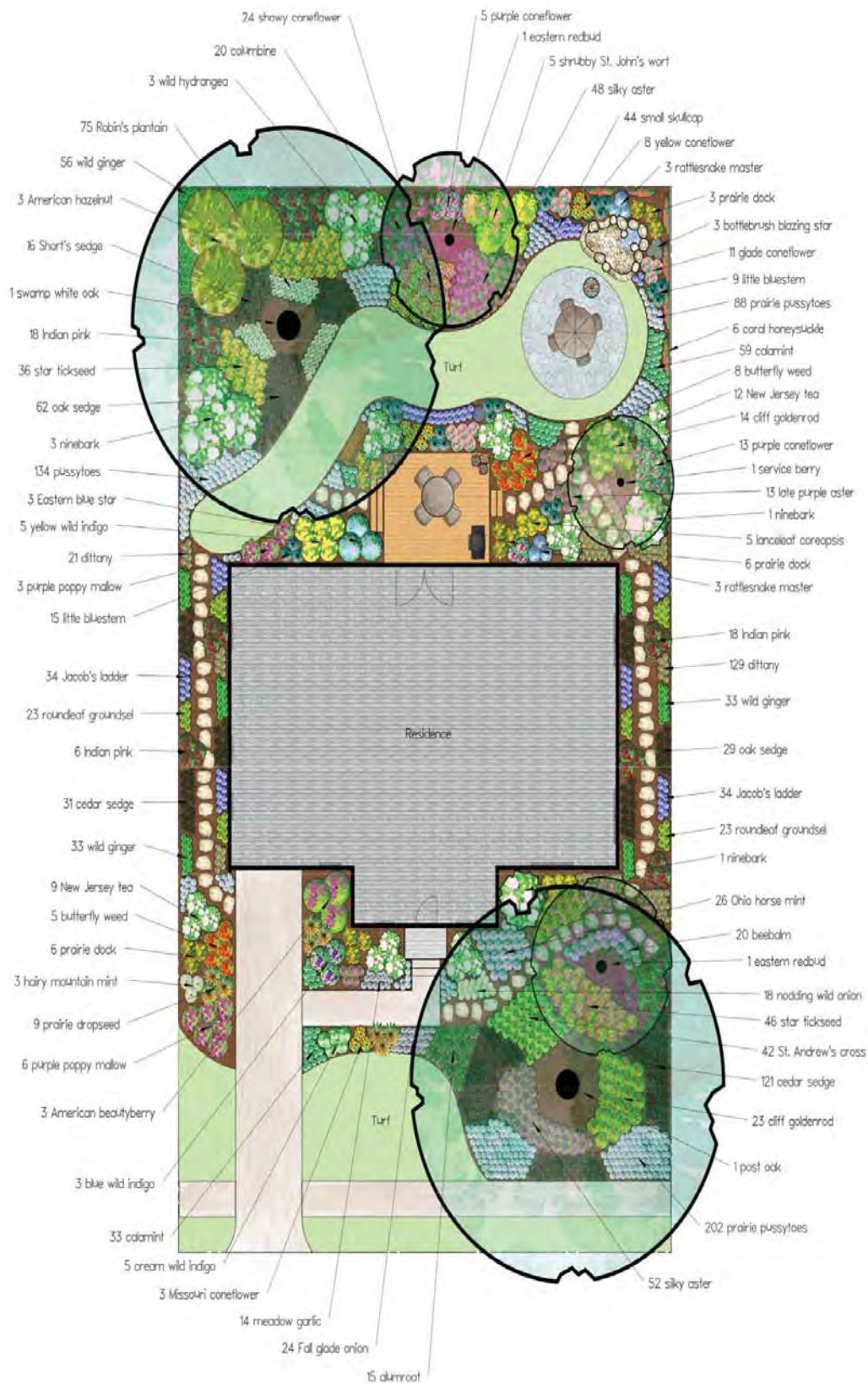
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New Directions in the American Landscape
Founded in 1990 by Larry Weaner

Native Garden Designs from Wild Ones



Wild Ones has introduced professionally designed native garden plans, free for public use, for nine ecoregions in the United States: Chattanooga, Tennessee; Chicago, Illinois; Milwaukee, Wisconsin; Minneapolis, Minnesota; St. Louis, Missouri; Tallahassee, Florida; Toledo, Ohio; Boston, Massachusetts; and Denver/Front Range, Colorado.

The plans follow these guidelines:

- Include at least 15 native plant species.
- Encourage the use of multiples of each species rather than doing “specimen plantings.”
- Favour species with long and staggered bloom times to provide pollen and nectar for pollinating insects throughout the season.
- Consider the soil (type/texture, pH), moisture and sunlight conditions.
- Take an incremental gardening approach, adding new areas and native plant species as time and funds permit.

The designs are based on the premise that using native plants in landscaping can be beautiful and support wildlife. Gardeners of all skill sets, regardless of budget or the scope of the project, can achieve great results.

The designs can be downloaded at nativegardendesigns.wildones.org. They were developed with the help of a grant from the Stanley Smith Horticultural Trust. As more funding becomes available, Wild Ones will continue to develop the program and add new ecoregion designs.

Native plant garden design for St. Louis, Missouri.



PHOTOGRAPH BY DON SCALLEN

A bur oak acorn plucked from a stream bed.



PHOTOGRAPH BY DON SCALLEN

Bur oak in Meadowvale, Ontario with a 5.5 metre (18-foot) trunk.

suppression in these settings has been detrimental to bur oak regeneration. Without fire, other tree species flourish, eventually growing large enough to shade out the sun-loving bur oaks.

Where I live in southern Ontario, the ability of bur oaks to thrive in open landscapes is evident from their dominant presence in agricultural fields. They may be the most common large tree in such settings. Some are probable survivors from the pastureland of a bygone era when the oaks served to shelter cattle from sun and rain. Many remain today, standing sentinel in fields of soy and corn.

Bur oaks are thoroughly at home in wide-open, dry environments as well as rich, moist, bottomland soils. Well-nourished bur oaks can grow to impressive sizes. One measured in Ohio in 2020 had a girth of 7.62 metres (25 feet) with a diameter of 2.4 metres (almost 8 feet). To stand beside a giant like this is to bask in arboreal glory.

Quercus macrocarpa is part of the white oak group, with acorns that mature in a single season as opposed to the two seasons necessary for oaks in the red oak group. An easy way to separate oaks in these two groups is to examine their leaves. The red oak group has leaves with pointed lobes; leaves in the white oak group have rounded lobes.

More difficult is the task of separating oaks within either of these groups. Bur oak is often misidentified as white oak. In fruit, bur oak can be readily identified by the distinctive fringed cups of its acorns, a trait that has graced it with another common name, mossycup oak. Bur oak acorns can reach eye-popping sizes of 10 centimetres (four inches) in diameter in the southerly parts of their extensive range. (Bur oak's specific name, *macrocarpa*, means big-fruited.) In the north the acorns are generally much smaller. Identification becomes more difficult if acorns aren't present. In that case look for corky ridges on



A massive bur oak on a golf course in southern Ontario.

the twigs of young trees and the dark, deeply furrowed bark of mature bur oaks – quite unlike the light-coloured, flaky bark of white oaks. The shape of bur and white oak leaves varies as well. Photographs will give you a feel for the differences.

Over lives that can exceed three or even four centuries, bur oaks play a prominent role in supporting wildlife. During heavy mast (high nut production) years, a large oak can produce 10,000 acorns, which, depending on where the bur oak is rooted in North America, feed bears, bison, deer, elk, pronghorns, rabbits and squirrels. Birds eat them too, including the beautiful red-headed woodpecker, a species that has experienced alarming declines in North America, in part because of the loss of oak savannas. An oak savanna restoration at Necedah National Wildlife Refuge in Wisconsin, managed by periodic burning, has yielded very happy results for red-headed woodpeckers and oaks alike.

Bur oak acorns nourish birds and mammals, while their leaves feed a multitude of invertebrates. Professor Douglas Tallamy, the author of *Bringing Nature Home*, found at his

eastern U.S. study sites that oaks are consumed by more caterpillar species (500+) than any other genus of tree. This number varies from region to region and by latitude, but by any measure oak trees support wonderful caterpillar diversity; those caterpillars, in turn, feed songbirds and other insectivores.

In many parts of their range bur oaks need our help to thrive. We've suppressed the fire that opened landscapes and limited competition from other trees. We've converted prairie and savanna to farmland and cities. Bur oak should be a top choice for urban forestry departments and for homeowners who can accommodate its ultimately large size. Where possible we should restore oak savanna ecosystems, as in Wisconsin.

Given space and time, bur oaks grow to be muscular, verdant giants. Their massive contribution to ecosystem health is just as impressive.

Don Scallen is a lifelong naturalist. Among other things, he is a birder, turtle watcher, butterfly tallier, fish aficionado and native plant gardener. He is besotted with the diversity of native trees that grow in southern Ontario and tries to

Bur Oak Threat

Being a tree lover in this era of environmental change can be heartbreaking, with a host of virulent pathogens ravaging our trees. Familiar villains include chestnut blight, Dutch elm disease and emerald ash borer. Bur oak's nemesis? Well, several pathogens attack our oaks but the one that focuses almost exclusively on bur oaks is called bur oak blight. It is caused by a recently identified native fungus called *Tubakia iowensis*. The species name of this fungus refers to Iowa, the state where it was first described in the early 2000's, though it was likely around long before then. It appears to affect only a small acorn variety of bur oak called *Quercus macrocarpa* var. *oliviformis*, which is nonetheless widespread in the northern plains. As of 2018 bur oak blight had been found in several Midwest states, including Minnesota, Illinois and Wisconsin. While the blight may not kill affected trees, it can weaken them, making them susceptible to other diseases. Much remains to be learned about this newly discovered disease, including the environmental factors that assist its establishment and the degree of mortality it will cause. There is some positive news. Certain bur oaks from this small acorn variety appear to have natural resistance and the trees with larger acorns appear to be immune. Hope to cling to. The widespread loss of our bur oaks would be tragic.

squeeze as many species into his yard as possible. Don writes a nature blog for In The Hills magazine inthehills.ca/author/don-scallen/. He is the author of a book of nature activities called Nature Where We Live.



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