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Indiana Native Plant and Wildflower Society Summer 2017

Rare plant profile

Prairie hyacinth: *Camassia angusta*

By Catherine Holland

I spent the summer of 2015 waist-deep in a small plot of no-mow prairie conservation near a railroad track that runs parallel to Highway U.S. 52 near Otterbein. I was studying the rare and elusive *Camassia angusta*, commonly known as prairie hyacinth. It is known to have a fairly wide range, growing in Arizona, Iowa, Illinois, Indiana, Kansas, Louisiana, Missouri, Mississippi, Oklahoma and Texas. However, in Indiana it was only known to have grown in the fragmented prairie lands of four western counties: Benton, Fountain, Tippecanoe and White.

Catherine Holland

Ranging from two to three feet tall, this Indiana native is a close relative to the well-known wild hyacinth (*C. scilloides*) whose bright purple flowers light up the understory at Prophetstown State Park in Tippecanoe County in late spring. Because wild hyacinth and prairie hyacinth are so similar in appearance and so closely related, it has brought the true abundance of the latter into question. Currently, DNR lists it as state-endangered, noting that while its global abundance is questionable, it is considered critically imperiled within the state.

Although there is some contention as to whether or not *C. angusta* and *C. scilloides* are really different species, they do have a few key differences. *C. angusta* blooms much later, in early May, with multiple lavender flowers ascending its tall stalk. Unlike *C. scilloides,* which prefers forest soils, *C. angusta* is only found on prairie remnants. Hiding among tall grasses and mustards, its thin green stem is virtually indistinguishable until the plant is in full bloom. The disappearance of our native prairies has made *C. angusta* increasingly difficult to find.

The only population still known in Indiana was incredibly small, only two yards wide by 16 yards long in a prairie remnant along the railroad tracks near Otterbein. After weeks of observations, I began to notice a few interesting things. First, new blooms tended to open between 5:30 and 7 p.m. every day. Second, these plants were exhibiting a high rate of male and female sterility. More than half the blooms failed to produce a fruit, and those that did often contained some unviable seeds. The anthers, on the other hand, had one of two forms of being sterile. Occasionally, the anthers would be fully

Rare hyacinth – continued on page 19

Inside

Plant this, not that:

By Ellen Jacquart

Gardening is a fun and relaxing hobby. Unfortunately, some of the plants available are invasive; that is, these species can move from the garden into our forests, prairies and wetlands, causing a great deal of damage to our native plants and wildlife.

Why not plant natives instead? They are often better adapted to our soils and climates than non-native species, and more and more natives are available for landscaping at garden centers. Information on where to buy natives is at *http://grownativeindiana.org/buy-native*.

Here are a few suggestions for native species you can plant instead of invasives.

Anita Bracalente

< Plant this

Dutchman's pipe (*Aristolochia tomentosa*) is a climbing vine with golden fall foliage and unusual pipe-shaped flowers.

Not that >

Asian bittersweet (*Celastrus orbiculatus*) is a climbing vine that can move into forest gaps and rapidly cover the forest canopy, ultimately smothering the trees.

Deb Maurer

Fiona Becker

< Plant this

Garden phlox (*Phlox paniculata*) forms dense clumps of 2'-3' tall plants with five-petaled flowers in a wide variety of colors, blooming in June.

Not that >

Dame's rocket (*Hesperis matronalis*) has four-petaled white to purple flowers from April to May and invades forested riparian (river or stream) areas and fens. It appears to be spreading rapidly in Indiana and is often found in "meadow in a can" wildflower mixes.

Ellen Jaquart

Landscaping with native species

Wikimedia

< Plant this

Kentucky coffeetree (*Gymnocladus dioicus*) is a beautiful shade tree easily recognized in summer by its huge compound leaves and in winter by its bold outline. It is tolerant of a wide range of conditions.

Not that >

Planted extensively in urban areas because of its ability to tolerate air pollution and poor soils, tree of heaven (*Ailanthus altissima*) can quickly take over a site and form a very dense stand. Leaves and male flowers have a strong, unpleasant odor.

Wikimedia

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< Plant this

Ninebark (*Physocarpus opulifolius*) is a 3'-9' tall shrub with flaky bark and large clusters of white flowers. Some cultivars have dramatic burgundy leaves.

Not that >

Privet (*Ligustrum obtusifolium* or *L. vulgare*) is a shrub that produces berries spread by birds. It forms dense stands in the understory of forests next to creeks and rivers.

Wikimedia

Wikimedia

< Plant this

Black chokeberry (*Aronia melanocarpa*) is a 3'-6' tall shrub with brilliant red fall color and black berries.

Not that >

Burning bush (*Euonymus alatus*) is a 3'-6' shrub planted for its red fall foliage. Birds carry its seeds from landscaped areas into forests and woodlands, where it spreads rapidly.

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Speakers announced for Oct. 28 conference

Top: Dr. Stanley Temple at Aldo Leopold's cabin

Bottom: Douglas Ladd in the field

By Tom Hohman

On Oct. 28 the INPAWS conference returns to Monroe Convention Center, Bloomington. Keynote speakers are Dr. Stanley Temple and Douglas Ladd. Other speakers are INPAWS president Michael Homoya, David Gorden and Cheryl Coons.

Dr. Stanley Temple

Dr. Temple is Beers-Bascom Professor Emeritus in Conservation in the forest and wildlife ecology department at University of Wisconsin-Madison. For 32 years he held the academic position once occupied by Aldo Leopold, author of *A Sand County Almanac*. Currently senior fellow with the Aldo Leopold Foundation, he will speak on "Aldo Leopold, Phenology and Climate Change."

Douglas Ladd

Ladd is a conservation biologist for The Nature Conservancy in Missouri. For 31 years he was director of conservation for Missouri. He serves on the boards of the Conservation Research Institute in Chicago, Harris World Ecology Center and Shaw Nature Reserve. He is an adjunct faculty member at Washington University, St. Louis, and a research associate at Missouri Botanical Garden and Morton Arboretum. He is author of two field guides, *North Woods Wildflowers* and *Tallgrass Prairie Wildflowers*. His presentation will be on "Confronting the Darkness: Organismal Biology and Saving the World."

David Gorden, ASLA

Gorden has worked as a landscape architect for Mark M. Holeman, Inc., since 1989. He is past president of the Indianapolis Museum of Art Horticultural Society and the Indiana Chapter of the American Society of Landscape Architects. He will discuss how to incorporate native plants into your "unnatural" setting.

Michael Homoya

Homoya has been a botanist and plant ecologist for the DNR Division of Nature Preserves since 1982. Past president of the Indiana Academy of Science, he is the author of *Orchids of Indiana* and *Wildflowers and Ferns of Indiana Forests: A Field Guide.* He will host a fun trivia game with questions on Indiana's plants, animals, natural areas and more.

Cheryl Coons

Coons is forest botanist for Hoosier National Forest, a steering committee member of the Southern Indiana Cooperative Invasives Management (SICIM) and past president of the Ohio Invasive Plant Council. Hoosier National Forest has 24 "special areas" designated for their geologic, archaeologic or biologic significance. She will describe the unique management measures used to protect these areas.

Venue and hotel

Monroe Convention Center is at 302 S. College Ave. INPAWS has arranged with Holiday Inn Bloomington, 1710 N. Kinser Pike, for specially priced rooms at $99 (plus taxes) for Oct. 27-28. Call 812-334-3252 to make reservations in the "INPAWS" group. To book online, go to *www.inpaws.org*. Reservations must be made by Sept. 29 to get the conference rate.

Friday event

Crazy Horse Food and Drink Emporium, 214 W. Kirkwood Ave., has again been booked for a Friday evening open house. Join us at 7:30 p.m. to meet the speakers and socialize.

Sponsors/exhibitors

Consider becoming a conference sponsor or setting up a display for your favorite non-profit. Non-profit exhibitors are allotted a table for a minimal cost. Details are at *www.inpaws.org.*

Tom Hohman is chair of the INPAWS conference committee and Central Chapter Invasives SWAT Team.

"Grow Native" initiative grows

By Ellen Jacquart

I remember the day I first made the connection. About 20 years ago I was out in a beautiful fen in LaPorte County. Sedges, swamp angelica, bottle gentians … but what was this 12-foot tall shrub right in the middle? I didn't recognize it, but after consulting some plant books I finally figured out it was non-native privet (*Ligustrum obtusifolium*). What the heck was a huge privet shrub doing in this natural area? As I hiked out of the fen, I found out. The preserve's neighbor had a 50-foot long hedge of – privet. The birds were dropping seeds all over the fen, making our control efforts a Sisyphean effort at best. So started my personal campaign against the sale of invasive plants for landscaping.

The sad reality is that most invasive plant species are horticultural escapes from landscaping. Using invasive plants in landscaping, many of which are still available for sale in the nursery trade, works against healthy ecosystems. By overtaking areas and eliminating a diverse mix of native plants, invasive plants harm pollinators and other wildlife, increase erosion and sedimentation in waterways, and even increase tick populations and the rate of tick-related diseases in local communities. The choices we make when landscaping can either sustain or harm the web of life.

Working to reduce the number of invasive plants sold has been a high priority for many who fight the battle against invasives in natural areas. These concerned individuals include members of INPAWS, The Nature Conservancy, Indiana Academy of Science, state and federal agencies, and cooperative invasive management groups across the state.

While we've been pursuing a ban on the sale of highly invasive plants in Indiana, we've also been using education and voluntary programs to slow the sale of these intruders. In 2011 the Monroe County – Identify and Reduce Invasive Species (MC-IRIS) organization started a program to promote the use of native plants in that county's landscaping. Called "Go Green, Grow Native," this program had two levels: any business that sold native plants could be a Basic member, but only those who agreed not to sell invasive plants could become Invasive-Free members. MC-IRIS then worked to encourage Basic members to sell fewer invasives and more natives. A free voluntary program, it was a non-confrontational way to start the conversation with plant sellers about the issue of invasive plants in horticulture.

Terry Howe

As word of the program spread, regional chapters of INPAWS became interested in setting up the same program in their areas. Northeast Chapter started their program in Fort Wayne in 2013; Central Chapter started theirs in Marion and surrounding counties in 2016. Since the program had grown beyond Monroe County, last year I asked INPAWS Council whether they, as a state-wide organization, would be willing to sponsor its expansion throughout the state. They said yes!

"The choices we make when landscaping can either sustain or harm the web of life."

We simplified the name of the program to Grow Native (try saying "Go Green, Grow Native" three times fast) and created a process to certify members and promote participating businesses on a web site. Invasive-Free members get extra promotion in the form of an online "Buy Native" directory at *http://grownativeindiana.org/buy-native.* Basic members are on a simple list on the "Grow Native" web site at *http://grownativeindiana.org/basic-grow-native-members*. All members get a "Grow Native" window cling to put in their business window, but the logo for the Invasive-Free members has a special yellow "Invasive-Free" banner.

Grow – continued on page 18

Japanese knotweed:

Invasive plant profile

By Anna Meer

Japanese knotweed (*Polygonum cuspidatum,* a.k.a. *Fallopia japonica* or *Reynoutria japonica*) might produce sprays of pretty white ornamental flowers during the summer; however, those beautiful flowers arise from a plant that is classified as an invasive noxious weed in eight states. It is incredibly hard to remove, regularly prevents native plants from growing in areas of infestations and often causes damage by growing

Wikimedia

up through concrete, asphalt and other man-made structures. In short, Japanese knotweed is pretty awful.

Japanese knotweed was first introduced to the United States in the 1800s. Before landing in the US, the plant was brought to the United Kingdom from Japan. Later it was brought from the UK to the US for use as an ornamental, as fodder and as a method of erosion control. It soon escaped into natural areas and began wreaking havoc in the US.[1]

Hardy by nature, Japanese knotweed tolerates a variety of habitats. These include, but are not limited to, waterways, low-lying areas, waste places, utility rights-of-way and old home sites. Additionally, it is tolerant of high temperatures, high salinity and drought. Though it prefers full sun, the plant can survive in shaded habitats.[2]

Since its introduction to the US, Japanese knotweed has spread to 36 states. It has been documented in Maine, southward along the Atlantic coast, in Louisiana, Wisconsin and various Midwest locations. It has also taken over portions of the Pacific Northwest and moved southward into California and Utah. It has been found in all but 10 Indiana counties.[3]

Japanese knotweed might be a showy plant with dense foliage, capable of growing four to 10 feet in height, but the bulk of the plant exists below ground. In fact, the plant's resiliency is largely due to its extensive rhizome. Rhizomes are root-like networks of stems that grow laterally underground. In Japanese knotweed, the rhizome may reach 45 to 60 feet long, making it incredibly hard to eradicate.[4]

Japanese knotweed is dangerous to native species for several reasons. First, and most importantly, is its persistence. The rhizome allows Japanese knotweed to reproduce asexually and with great success. It is easily introduced from one location to another. In fact, in their article "Elucidating the Population Dynamics of Japanese Knotweed…," Dauer and Jongejans report that a piece of rhizome weighing just 0.7 grams is enough for Japanese knotweed to take root in a new area.[5] Thus, it can be incredibly difficult to remove a Japanese knotweed infestation due to the sheer size of its rhizome – it is a challenge to remove every piece of it. It is equally easy to spread Japanese knotweed to a new location if just one small portion of the rhizome escapes during the removal process.

Second, the large rhizome is a storage

bad news for natives

place for the plant's energy, enabling it to survive extremely harsh conditions. This includes normal winter conditions and more severe natural disasters such as flooding. Japanese knotweed rapidly recolonizes disturbed areas before native species can do so. In fact, Japanese knotweed thrives in disturbed areas due to increased access to light and nutrients.[6]

Finally, this invasive is a threat to native species due to its rapid growth. It spreads quickly, forming dense thickets that block the sun from reaching plants below. It also carpets the ground in a thick layer of decomposing stems and leaves, preventing other plants from sprouting. To further ensure its survival, Japanese knotweed suppresses the growth of nearby competitor plants by releasing toxic or inhibiting chemicals into its surroundings – a mechanism known as allelopathy.[7] Everything about this plant is intended to help it hold on and survive.

Despite its hardiness, it is still possible to remove a Japanese knotweed infestation with persistent treatment. Chemical herbicides are considered most effective. In early- to mid-summer, prior to treatment, stems should be cut down to two inches. Immediately following, a solution of Roundup® (glyphosate) and water should be applied, per directions on the bottle. This process should be repeated with any new growth over the course of the growing season. It should be noted that this method will require repeated application over several years before results may be discerned.[8]

Japanese knotweed closely resembles other invasive knotweed species, including giant knotweed (*Polygonum sachalinense*) and Himalayan knotweed (*Fallopia polystachyum*). Though Japanese knotweed can hybridize with these species, repetitive herbicide treatment is still effective in eliminating the hybrids.[9]

When removing a Japanese knotweed infestation, it is important to remember how easily the invasive plant can be transferred between areas. Proper disposal of plant parts is essential. All stems and rhizomes should be carefully bagged before removing them from a location. Then all parts must be thoroughly dried and burned prior to disposal to prevent regeneration of the plant.

Though it may be tempting to plant Japanese knotweed as an ornamental in your landscaping, the resulting invasion of your property is certainly not worth the beauty of this plant's flowers. Consider instead native species that have some of the same positive qualities, including Virginia willow (*Itea virginica*) and sweet pepperbush (*Clethra alnifolia*).[10] Your yard, your neighbors and your plants will thank you.

Anna Meer is a 2017 graduate of Franklin College with a major in English and minors in biology and creative writing.

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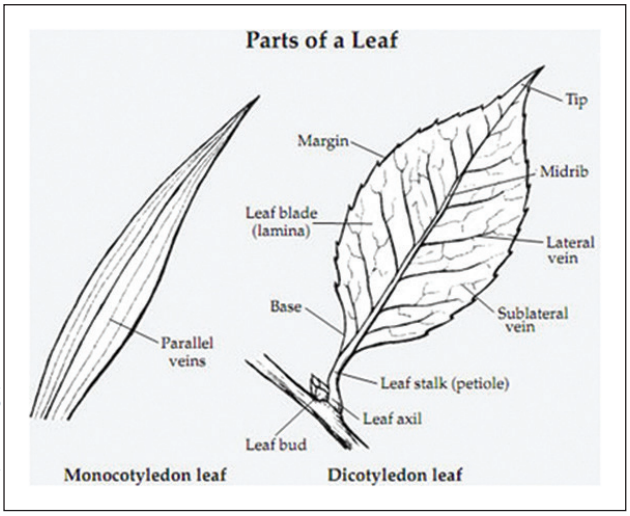
The complex lives

Botany Basics

By Adrienne Funderburg

Compared to the vibrant displays of flowers, leaves may seem mundane, but even a beginner's botanical investigation into this unassuming plant organ reveals unexpected diversity in leaves' forms and uses.

The general function of a leaf is to perform photosynthesis, the process of converting carbon dioxide and water into sugar (Berg 2008). Photosynthesis uses sunlight as its energy source, which "typical" leaves are specialized to collect. There are, however, many plants that use weird-looking, specially modified leaves for functions other than, or along with, photosynthesis. Before looking into the botanical oddballs, a basic overview of more familiar leaves will allow you to see how the organ goes about its primary jobs: collecting sunlight and photosynthesizing.



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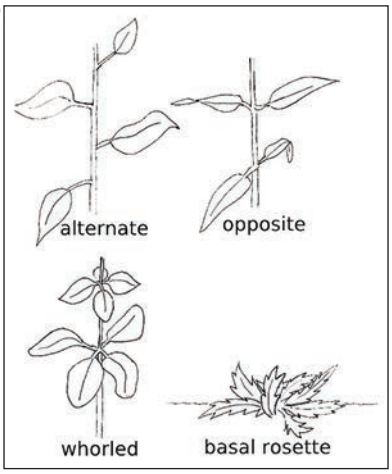

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Most leaves, notably those of deciduous trees like tulip poplar (*Liriodendron tulipifera*), have two basic parts. The first is the *blade*, which is the broad, thin, recognizable portion of the leaf. Attaching the blade to the stem is the stem-like *petiole*, which holds the blade out where it can have the greatest surface area in the sunlight. *Sessile* leaves are those that lack a petiole and attach directly to the stem instead (Berg 2008). Smooth Solomon's seal (*Polygonatum biflorum*), found in most Indiana counties from April to June, is an example of a plant with sessile leaves.

The upward-facing side of the blade, called the *upper epidermis,* is covered with a waxy coating, the *cuticle*, to limit water loss. The *mesophyll* is the middle tissue layer, where photosynthesis occurs. It is also the tissue through which the veins run, carrying water and nutrients into the leaf and sugars out of it (Berg 2008). The underside of the blade, called the *lower epidermis*, is outfitted with small eye-shaped openings called *stomata* (singular: *stoma*). These tiny holes allow for gas exchange between the air and the mesophyll. When triggered by sunlight or other environmental factors, *guard cells* on either side of the stoma slit fill with water, bowing outward and opening the stoma. Guard cells close their stomata when gas exchange is not needed or when drought conditions require strict water conservation (Berg 2008). To see stomata up close, take clear scotch tape, stick it securely to the underside of a leaf, and gently peel it away. The first layer of cells, including the stomata, should stick to the tape, and a dissecting scope or compound microscope will allow you to see the bean-like stomata and the surrounding epithelial cells.

All basic leaves have stomata, but leaf shape, venation pattern, and arrangement vary between species and are important identification tools for botanists. While there are many different vein patterns in the plant world, the following three are observable in many common Indiana plants. *Parallel* veins run straight down the blade and are displayed in many grasses. *Pinnate-netted* veins are those that branch off from a single major vein that runs the length of the blade,

# of leaves

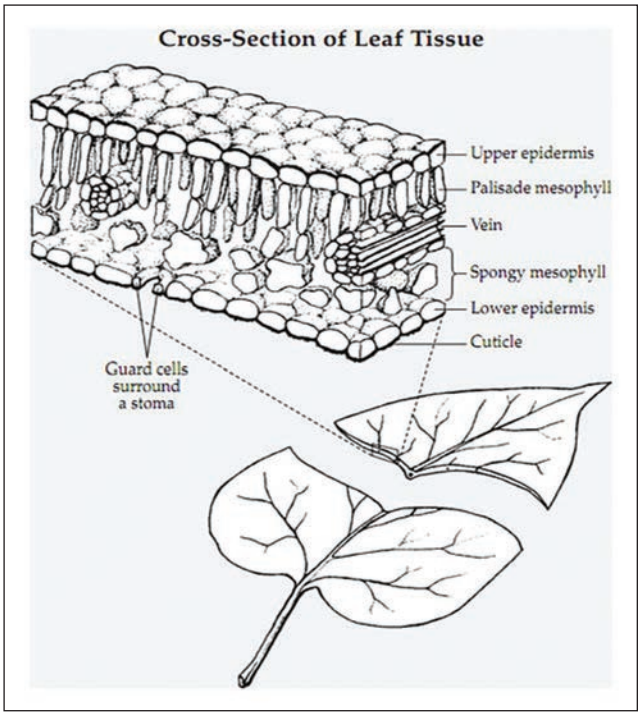
such as on black walnut trees (*Juglans nigra*). *Palmate-netted* leaves are those with a number of major veins branching off from a single point near the petiole, as sugar maples (*Acer saccharum*) display.

For leaf arrangements, leaves that have a single blade per petiole are called *simple*, and those with more than one blade per petiole are *compound*. Compound leaves are tricky because a single leaf is actually made up of a number of leaflets extending from the petiole; they may also be *pinnately* or *palmately* arranged. Pinnate leaves have leaflets all along the petiole, as on walnut trees. Palmately compound leaves have leaflets that stretch out from the end of the petiole, as on Ohio buckeye trees (*Aesculus glabra*) (Simpson 2010).

There are also terms for the ways leaves are arranged on a stem. The common arrangements are *alternate* (back and forth along the stem), *opposite* (leaves directly across from one another), and *whorled* (three or more leaves growing around a single point on the stem) (Berg 2008).

Many leaves do not resemble those of deciduous trees. These leaves often serve their plants in ways adapted for their particular environments. Conifer tree leaves take the form of needles or scales, which have low surface area to reduce water loss. These can survive winter and allow photosynthesis to resume as soon as water and proper temperatures are available. The pitchers and "mouths" of carnivorous plants, found in Indiana bogs and marshes, are also modified leaves that lure and trap insects for nutrients. Some leaves have slightly less extreme modifications. The white waterlily (*Nymphaea odorata*), for example, has stomata on the upper epidermis of its blade, which is exposed to air, rather than on the underwater lower epidermis (Berg 2008, USDA Natural Resources Conservation Service). There are also plants that have highly reduced leaves. Horsetail, or scouring-rush (*Equisetum hyemale*), is one such plant; the leaves are small, dry and encircle the green stem, which is the photosynthetic portion of the plant (Lady Bird Johnson Wildflower Center, Plant Database, 2016).

Many more examples of odd leaves can be found in your local woods and marshlands. Becoming familiar with common leaf structures, types and arrangements is greatly useful to botanists of every level for identifying species and interacting with the natural world more intimately, confidently and responsibly.



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Mission

To promote the appreciation, preservation, scientific study, and use of plants native to Indiana.

To teach people about their beauty, diversity, and importance to our environment.

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President's message

By Mike Homoya

I worry a lot. I shouldn't, I know. It does no good, nor is it beneficial for my health. But while traversing the state this spring, I've seen what Callery pear (*Pyrus calleryana)* and other invasive exotic (non-native) species are doing to Indiana's remnant natural areas. I've seen more and more natural areas being either totally converted to a non-natural state or impacted in ways that degrade their quality. The list is long. It's hard not to be concerned about their future.

Our INPAWS mission statement says that we as an organization "promote the appreciation, preservation, utilization and scientific study of the flora native to Indiana." Why native plants? Is it because native plants have some inherent superiority over exotic species? It's true, native species tend to "behave" themselves here, but exotic ones aren't necessarily bad, just certain ones of them. But it's a competitive world out there in the plant kingdom and some exotics have an unfair advantage. We don't always know which exotic species will be a problem until it's too late to stop them. Therefore, unless they're otherwise proven to be non-invasive or free of pests and diseases, the introduction of exotics is generally to be discouraged. It's not because they're non-native, but because some pose serious threats to the integrity of our natural areas. Our natural areas are the true home of the plants and animals that we call native. It is the community in which they have lived and need to continue to live.

Which brings me back to why I worry. Most people (not INPAWS members!) don't recognize the difference between a natural area and a space that is green with plants of any kind. And if they don't know the difference, they won't care about a quality natural area being overrun by exotics (It's still green, right?). Clearing a forest with a bulldozer is easily seen and understood, but the spread and impact of exotics, not so much. Folks just don't "see" exotics even though they're often right in front of their eyes. The Callery pear is easy to pick out, with its lollypop growth form and white blossoms. The public thinks, "How nice!" We see them and, well, I'd best not repeat here what we think.

I believe this is one of INPAWS' biggest challenges, to call to the public's attention the plight of our remnant natural areas. The more people who know about them, about native plants and the threat of exotics, the more that can be done to protect them. I see this as our highest calling as an organization.

DNR Field Days

Indiana DNR Division of Nature Preserves, partnering with INPAWS, will offer guided hikes in several state preserves in the coming months. Participation is free, but registration is required at *www.in.gov/dnr/naturepreserve*.

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Date	Nature Preserve	County
July 19	Biesecker Prairie	Lake
July 29	Eby Prairie & Elkhart Bog	Elkhart
Aug. 5	Chamberlain Lake	St. Joseph
Sept. 9	Bluffs of Beaver Bend	Martin

Allen County says no to invasives

By Kimberly Miser

Last year, employees of the Allen County Department of Planning Services (ACDPS) asked a few community experts a simple question: "Can you take a look at this list?" Environmental leaders in northeast Indiana jumped at the chance.

That list, titled "Zoning Ordinance Supplemental Landscape Standards," is a what's-okay-to-plant guide for Allen County. The ACDPS reviews new commercial, industrial and multi-family building plans and offers a recommended plant list to developers and landscapers.

Wikimedia

Japanese barberry (Berberis thunbergii) *was among the invasive species activists helped remove from the county's list of recommended landscaping plants.*

ACDPS specifically wanted to know if the list included invasive species. Michelle Wood, senior land use planner, says it's part of the county's push to feature Indiana-friendly plants.

"I sent the spreadsheet out for local plant experts to review," Wood says. "It was surprising to see how many invasives were hiding on our list."

The project was a success. All invasive pear trees (*Pyrus* spp.) were removed from the list, as well as Japanese barberry (*Berberis thunbergii),* and burning bush (*Euonymus alatus*). Wood notes that Allen County's "Landscape Standards" list is not an ordinance change, but she is hopeful they can make it part of the official administrative manual. Meanwhile, developers are already on board with the changes.

"When developers send us their landscaping plans we suggest changes, like plant an American basswood instead of a Callery (or Bradford) pear," Wood says. She concedes that some developers just want to meet the ordinance, but others appreciate the stewardship. "Once we educate them on why a species is harmful to Indiana, developers and landscape professionals are supportive."

For INPAWS members looking to influence change within their own communities, Wood has some advice. "Not every community has a plan commission. The task of reviewing development plans may fall on one person who's completing other municipal duties," she says. "Ask if you can review the plant standards list." If the community doesn't have a landscape standards plan, Wood encourages INPAWS members to donate their services. "Offer to help create a standards list or, at the very least, a list of invasive or harmful species to avoid."

Wood also encourages talking to local nurseries and offering plant alternatives. "The nursery owner may not know there's a native plant option or a less harmful plant that is just as beautiful," she said.

Another way she suggests to affect change is to connect the local "superstore" with a native plant nursery in the area. "You can ask the store manager to feature native plants or tell them why that pear tree is hurting Indiana's ecology," Wood says. "You can influence buying decisions through education. You never know until you ask."

"It was surprising to see how many invasives were hiding on our list."

Wood is grateful for the expertise of local environmental leaders. "I'm thankful for the reviewers who helped us," she said. "When we recommend trees, shrubs and flowers that are at home in Indiana's soil and climate, the whole community benefits."

Kim Miser is communications chairperson of INPAWS Northeast Chapter.

Field notes

By Patricia Happel Cornwell

• A team of chemists at Indiana University in Bloomington has "engineered a molecule that uses light or electricity to convert the greenhouse gas carbon dioxide into carbon monoxide – a carbon-neutral fuel source – more efficiently than any other method of 'carbon reduction.'" The milestone was reported in the March, 2017, *Journal of the American Chemical Society*. Liang-shi Li, associate professor in IU Bloomington's department of chemistry, is the team's lead scientist.

• The March/April, 2017, issue of *Outdoor Indiana (OI)*, touts the discovery of a new species of spider at Glacier's End Nature Preserve in Johnson County by University of Indianapolis professor Marc Milne. The tiny orange and yellow creature, a member of the genus Oregonetides in the family Linyphiidae (sheetweb spiders), is only 2.5 millimeters (.098 of an inch) across.

• An *OI* article in the same issue, "Native Plant Sales are Springing Up Around State," advises readers that a list of native plant retailers is available at the INPAWS web site, *www.inpaws.org*.

• Keep planting those bird-friendly, berry-bearing native shrubs! The March, 2017, Cornell Lab of Ornithology *eNews* reports that after 40 years of the Endangered Species Act, "70% of listed bird taxa are better off." The data were compiled by the non-profit American Bird Conservancy, which found that the majority of listed avian species were "increasing, stable, or delisted due to recovery."

• Dr. Robbin Moran, one of the keynote speakers at last year's INPAWS conference, will present a seminar on the taxonomy and biology of ferns and lycophytes with Dr. W. Carl Taylor, author of *Arkansas Ferns and Fern Allies*, at Eagle Hill Institute in Steuben, ME, Aug. 20-26. Moran is curator of botany at the New York Botanical Gardens and has taught fern courses in Costa Rica, Venezuela, Bolivia and Ecuador.

• The February, 2017, Xerces Society *Update* says the group has published a report on the effects of neonicotinoids and other pesticides on native bees and other pollinators. You can download the document, "How Neonicotinoids Can Kill Bees," at *www.xerces.org/neonicotinoids-and-bees*. An eight-page guide to protecting habitat from such contamination is at *www.xerces.org/pesticides/agricultural-pesticide-use*. The organization has also recently published a book, *100 Plants to Feed the Bees*.

• Legal protection for the rusty patched bumblebee (*Bombus affinis*), the first bee ever to make the federal endangered species list, had a rocky start. Per reports in the *Washington Post* and other sources, this native bee was named to the endangered species list in January, but in February the Trump administration delayed implementation of protection measures for the species for six weeks. However, in March the hold was lifted. (On a Hoosier note, INPAWS member Debra Young reported in May that she saw a rusty patched bumble bee visiting her flowers in Columbus, IN.)

Marc Milne

Newly discovered in Johnson County, this sheetweb spider measures only .098 of an inch across.

Readers: If you see an item of interest to Indiana's ecosystem in another publication, send a paragraph with source, title and date to *journal@inpaws.org*.

Chapter members listen,

Not sure who took this one

Jill Hoffman, executive director of White River Alliance, addressed members of Central Chapter with a presentation on "The State of Our Waters" in March.

Central Chapter

Central Chapter's first quarter was full of presentations, hikes and celebration of Earth Day. Jill Hoffman, executive director of White River Alliance, kicked off the year with a presentation on "The State of Our Waters" to more than 50 people at the Bier Brewery in Indianapolis March 19.

On April 1, Norma Wallman, author of *Wildflowers of Holliday Park*, led two well-attended spring ephemeral wildflower tours of that park. Among species noted were toadshade (*Trillium sessile*), large-flowered bellwort (*Uvularia grandiflora*), hepatica (*Hepatica nobilis*), swamp buttercup (*Ranunculus hispidus*) and the notorious wintercreeper (*Euonymus fortunei*).

Amanda Smith, past president of Central Chapter, offered a program on "Bird Gardening with Natives" March 18 at Hamilton County East Library and again April 23 at St. Peter's Church, Carmel.

An April 8 hike at Pine Hills Nature Preserve, coordinated by INPAWS and DNR, was led by Andrew Reuter and John Bacone. On April 29, Mike Homoya was the guide for a hike in Burnett Woods Nature Preserve sponsored by DNR and Central Indiana Land Trust.

A "pop-up" garden tour took place on short notice April 17 at the woodland home of Central member Michelle Arfman in Fishers.

With support from INPAWS Council, Central Chapter marked Earth Day April 22 with a "Celebrating Our Pollinators" booth at Military Park in Indianapolis. The booth featured crafts for kids, INPAWS volunteers sharing the importance of native plants to bees and butterflies, and a give-away of milkweed and other native plants to anyone willing to pose as a monarch butterfly and post their photo on social media.

Chapter president Jeannine Mattingly and Ben R. Hess staffed an INPAWS exhibit table at the March 25 Indiana Academy of Science annual meeting in Indianapolis, which was attended by over 350 people.

Northeast Chapter

Spring fever hit the Northeast Chapter hard. In March the chapter invited the public to hear new research about how trees communicate. Sandra Messner from the Indiana Forest Alliance spoke to more than 30 people about how trees connect with each other using underground mycorrhizal fungal pathways. So if a tree falls in the forest, the other trees actually do hear it!

In April, the chapter repeated its popular Native Plant Workshop. With 40 participants, the Fort Wayne workshop was another success. Topics included invasive plants and their impact on Indiana, why native plants are better and how to create wildlife-friendly habitats in small spaces.

Chapter members spoke at the Fort Wayne Home and Garden Show on topics that included how to container-garden with native perennials, backyard biodiversity, and invasives lurking in your yard's landscaping. Members also represented INPAWS at Little River Wetlands Project's Earth Day Fort Wayne celebration and Fort Wayne Botanical Conservatory's four-day Mother's Day plant sale.

Pam George, a coordinator for Allen County's Indiana Master Naturalist program, led an April wildflower hike at Acres Along the Wabash Nature Preserve near Bluffton. Attendees were treated to cut-leaved toothwort (*Cardamine concatenata*), sessile trillium or toadshade (*Trillium sessile*), trout lily (*Erythronium americanum*) and more.

In June, Nate Simmons of Blue Heron Ministries led an invasive species identification hike at Metea Park in Allen County. Afterwards volunteers tackled a new patch of garlic mustard (*Alliaria petiolata*) in the park.

look and learn

(Read about our first go-round with garlic mustard in the fall, 2016, issue of *INPAWS Journal.*)

Southwest Chapter

The first half of 2017 found members of SWINPAWS learning about native plants and conservation both indoors and outdoors. Regularly scheduled meetings were held at Wesselman Woods Nature Center, Evansville.

In January, members elected a new slate of officers: president Julie Smith, vice president Julie Welden, secretary Laura Lamb, treasurer Pam Drach and advisor Davie Sue Wallace.

Adam Hape gave a two-part presentation on "Native Plant Activities Online" at meetings in January and March, discussing nature blogs, the Monarch Waystation program and a citizen science project called the Habitat Network.

In mid-April, members toured the new University of Evansville (UE) greenhouse, hosted by INPAWS members Dr. Anne Powell, who conducts projects in the greenhouse, and Greg Gordon, SWINPAWS member and Master Naturalist. Ouabache Trails Park in Knox County was the site of a late April wildflower hike led by members Terri Talarek King, Mike Broz, Linda Wilcox and Linda Sutterer.

A May meeting featured a talk on the use of rain barrels by Karan Barnhill, storm water coordinator and inspector for the City of Evansville.

In June, members hiked Vectren Conservation Park in Gibson County, led by Greg Gordon and UE biology professor Dr. Cris Hochwender. After viewing an ongoing UE restoration project along the Wabash River floodplain, the group visited the university's native plants garden.

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Letha's story

By Cindy Monnier

Letha Bolles Queisser (1936-2007), an Indiana University botany major, was a wildflower aficionado who helped save huge fields of wildflowers about to be destroyed by development. According to Ruth Ann Ingraham's 2007 *INPAWS Journal* profile, Letha was known as 'Indiana's Wildflower Lady".[1] Not only did she share her knowledge with children, she recruited like-minded enthusiasts to rescue native plants as bulldozers encroached.

Kelly Queisser

Letha in the field with her grandchildren, Elizabeth and Robert Queisser

"With shovels, trowels and plastic bags," Ruth Ann recalls, "we trudged into one precious woodland after another to try and preserve fragments of our treasured heritage of spring ephemerals. The lush wildflower garden that thrives in the dense shade of my beech trees began with plants at what we called Tutweiler Woods at 96th and Meridian" (Indianapolis).[2]

Letha sought out property developers with the help of her husband David, who managed a real estate office and shared his wife's interest. Altum's Nursery approached Letha about working with the Indianapolis Art Center, then called the Art League, at their 67th St. property where they were building the Hurt Sculpture Park. The park was named for Sarah Hurt, an abstract artist and naturalist with 200 varieties of wildflowers in her collection.[3] As a result, many of Letha's transplants were moved to the Art Center grounds in the late 1980s.

Known for taking neighborhood children for nature walks in a nearby park, Letha used jelly beans as incentives for youngsters to learn to identify the plants they saw. Eventually she led Scout troops and school classes on these walks. After her death, with donations made in her honor, INPAWS established the Letha's Youth Outdoors Fund in 2008.

Letha's Fund chair Angela Sturdevant reports that from spring, 2008, to May, 2017, the fund has awarded scores of grants totaling $48,497 to Indiana schools and youth groups for outdoor education projects and field trips. These programs have benefited 14,084 children to date.

Citations

1. IN MEMORIAM Letha Bolles Queisser. Ingraham, Ruth Ann. *INPAWS Journal*, Summer, 2007.
2. Ibid.
3. "Indianapolis Woman Wild about Saving Wildflowers," Julie Goldsmith. *Indianapolis News*, May 18, 1989.

Cindy Monnier is INPAWS membership chair and a member of Central Chapter.

When you have seen one ant, one bird, one tree, you have not seen them all. ~ E. O. Wilson

Letha's grants: your generosity at work

INPAWS Letha's Youth Outdoors Fund made grants totaling nearly $8,900 in school year 2016/17.

Clark County
- ***Wilson Elementary - $600***

Elkhart County
- ***Chandler Elementary - $750***
- ***Chamberlain Elementary - $200***
- ***Goshen High School - $196***

Howard County
- ***Eastern Elementary - $500***
- ***Johnson***
- ***Westwood Elementary - $500***

Marion County
- ***IPS 84 Center for Inquiry - $600***
- ***New Augusta Public Academy South - $195***
- ***Fairbanks Elementary – $250***
- ***Kitley Elementary – $600***
- ***McClelland Elementary – $500***
- ***Indianapolis Math & Science Academy North - $311***

Monroe County
- ***Academy of Science & Entrepreneurship - $675***
- ***Bloomington High School North - $600***

St. Joseph County
- ***Penn High School - $597***
- ***Marquette Primary Montessori - $560***
- ***Greene Elementary - $750***

Donate! Volunteer!

INPAWS in action

For the 2016-17 school year, the INPAWS Letha's Youth Outdoors Fund awarded 18 grants totaling almost $8,900. Most grants were awarded to schools to offset the cost of transportation and fees for field trips to natural areas.

From kindergartners at Holliday Park Nature Center in Indianapolis, to fifth-graders at Charlestown State Park on the Ohio River, to high schoolers at Merry Lea Environmental Center in Noble County, the program connected more than 2,700 students with the outdoors.

Letha's Fund chair Angela Sturdevant says volunteers are needed: "We could use help reviewing applications, writing up summaries of grants awarded, revising the web page and doing outreach." Members interested in helping can contact Angela at *lethasfund@inpaws.org*.

Grant applications are accepted throughout the year, as are your donations. Information on applying for a grant or donating is at *www.inpaws.org/education/letha*. A check, payable to INPAWS with "Letha's Fund" on the memo line, may also be mailed to INPAWS, P.O. Box 501528, Indianapolis, IN 46250.

Delivery mystery solved

Due to an unforeseen problem with our printers and mailing service, some members have not been receiving *INPAWS Journal* on time. While this was out of our control, we regret any frustration it may have caused. We hope we have now resolved the situation.

Members who are up-to-date on their dues should receive the journal about the first of October, January, April and July. If you do not receive it within a week of those dates, please notify us at *journal@inpaws.org*.

Be sure to let us know if you prefer a digital edition rather than a print copy. And, if you do not save your print copies for personal reference, consider giving them to the local library, as some of our thoughtful members already do!

Grow – *from page 5*

As of April, 2017, the program has certified 22 Invasive-Free enterprises (11 retail, three wholesale, eight with limited sale dates, e.g., the INPAWS plant sale) and six Basic members that have added natives but not yet eliminated invasives from their inventory.

Patricia Cornwell

A crowd of about 150 people descended on Park Tudor School, Indianapolis, May 13 for the INPAWS native plant sale, co-chaired by Tammy Stephens and Kelly Spiegel.

Stephens reports that the event netted $11,763 for INPAWS.

If you see an invasive-free plant seller not yet on the list, or if you know a plant seller who sells invasives who might be interested in signing up for Basic membership, let them know they can do so at *www.grownativeindiana.org*.

We will be promoting this online directory of Invasive-Free businesses through Facebook, emails and displays at local garden events. Please help us get the word out by sharing this resource with your gardening friends and patronizing Invasive-Free Grow Native members. These are the plant sellers we want to reward with our business because they have taken an important environmental stand: no selling of invasive plants! Be sure to look for that Grow Native logo with the yellow Invasive-Free banner where you shop for plants.

Ellen Jacquart is a member of the INPAWS board of directors, chair of INPAWS' invasives education committee and a member of South Central Chapter.

Thistle – *from page 20*

where it is commonly seen. This plant does not spread like the invasive thistles, where a group of them is normally seen in full sun.

The native tall thistle is a wildflower that is a biennial or a short-lived perennial. It has a central stem and side stems that are light green with alternate leaves. According to the Illinois wildflower web site (*www.illinoiswildflowers.info*), "the alternate leaves are up to 9" long and 3" across, becoming gradually smaller as they ascend the stems. These leaves are lanceolate, oblanceolate, or elliptic in shape."

Ben identifies an important characteristic to look for: the central and side stems are "pubescent, as are the undersides of the leaves, making them white in appearance. Many of Indiana's native thistles exhibit this characteristic but non-native species lack the abundance of hair."

This plant is host to a variety of birds and insects. I will mention just a few. For the goldfinch, tall thistle's seeds are a staple of its diet. The goldfinch also uses thistle down in nest building. Clay-colored sparrows, indigo buntings, dark-eyed juncos and pine siskins also eat the seeds, making it a valuable food source for many smaller native birds. Bumblebees, hummingbird moths, and butterflies such as swallowtails, painted ladies and fritillaries are some of the insects that are attracted to the nectar of its flowers.

If you are walking along a wooded path in late summer and are lucky enough to come across a single tall thistle, I hope you will take the time to stop and study it. It is one of our rare Indiana gems.

Terri Gorney is vice-president of Friends of the Limberlost and volunteers for DNR at Limberlost State Historic Site in Geneva.

Rare hyacinth – from page 1

formed but fail to open and release pollen; but in some rare cases the anthers would form without any pollen at all. I hypothesized that this infertility was due to the constant inbreeding of such a small population.

Determined to find more specimens of prairie hyacinth, one sunny Sunday afternoon I departed in search of a historic graveyard in Tippecanoe County where it was rumored that a small population had been found years earlier. I pulled my car to the edge of a dusty gravel road and crossed to the cemetery. Not wanting to trespass, I leaned over the edge of a small fence, craning my neck and scanning the space between headstones for any sign of those unusual lavender flowers. To my dismay, the graveyard had been overrun with invasive multiflora rose. There was no sign of prairie hyacinth.

I trudged back to my car, dismayed at the loss of an entire population. Why do species such as prairie hyacinth become endangered? Whole populations can collapse because of fragmentation or loss of habitat and the genetic inbreeding that results from isolation from others of their species.

Perhaps there are more strongholds of *C. angusta* hiding out at the edges of Indiana highways, but to my knowledge there remains only one, a reminder of the fragility of our native ecosystems.

Catherine Holland is a 2017 graduate of Purdue University, where she majored in natural resources and environmental science.

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"Plant Database." Lady Bird Johnson Wildflower Center - The University of Texas at Austin. N.p., n.d. Web. 03 Apr. 2017. Https://www.wildflower.org/plants/result.php?id_plant=CAAN2.

Behind the scenes:

Unsung heroes

By Wendy Ford

Steve Sass

A preservation-minded grassroots activist, Steve co-founded the North Chapter of INPAWS and has served as its president since 2012. He helps to moderate INPAWS' fast-paced Facebook group and co-founded the popular IN Nature Facebook group. He's on the boards of the South Bend-Elkhart Audubon Society and the Friends of the Indiana Dunes; the advisory councils of the Shirley Heinze Land Trust and South Bend Venues, Parks and Arts; and partners with the City of South Bend on sustainability matters as a Green Ribbon Commissioner. Steve speaks regularly to gardening groups and land managers about the importance of native plants and models the role of citizen scientist for elementary school kids. In his spare time, Steve runs his own business as an electronic systems integrator.

Digthedunes.com

Julienne Alford

Suzanne Stevens

We know Suzanne as the queen of the INPAWS book sale, responsible for selecting and ordering books, schlepping them to the native plant sale and auction and annual conference, and overseeing the collection of and accounting for the proceeds. Many also know Suzanne as a gardening fool, presiding over hundreds of plant seedlings in preparation for the gynormous annual Hamilton County Master Gardener plant sale and graciously sharing her beautifully designed private gardens on an INPAWS garden tour. Now Suzanne has added a further jewel to her crown. She's taken on the task of writing timely thank-yous to those who donate to INPAWS!

Wendy Ford is INPAWS communications chair and webmaster.

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Native tall thistle found at Loblolly Marsh

Ben W. Hess

Tall thistle was found by DNR's east central regional ecologist Ben W. Hess at Loblolly Marsh in northern Jay County.

By Terri Gorney

Tall Thistle (*Cirsium altissimum*) is a regal woodland thistle that is native to Indiana. When the early homesteaders arrived in the Hoosier state, they would have seen this plant.

You might walk by this beautiful plant of the Aster family without a backward glance, thinking it is an invasive species. Many people believe it is a noxious weed because it is a thistle. The negative perception of the thistle is not a new phenomenon. The naturalist John Burroughs referred to September as the month of tall weeds. He listed the thistle along with pigweed, ragweed, vervain, goldenrod, burdock, nettles and asters as "outlaws" and "common tramps." But not all thistles are the same! It is too bad that Burroughs did not distinguish the natives from the invasives in his book *Winter Sunshine*, first published in 1876.

Tall thistle likes partially shaded to shaded wooded areas, such as deciduous woodlands or the edges of woodland paths, unlike invasive thistles that like full sun. It can be found in both disturbed and undisturbed areas. True to its name, the plant can grow eight to 10 feet tall depending on the environment. Tall thistle blooms between July and September and blooms usually last one to one and one-half months. The plant usually stands alone.

DNR's east central regional ecologist Ben W. Hess found a single tall thistle August 9, 2016, while working at "Woody's Retreat" at the edge of the woods at Loblolly Marsh. This is the type of habitat

Thistle – continued on page 18