



inpaws journal

Indiana Native Plant and Wildflower Society

Fall 2018

What causes fall foliage to change color?

By *Mahalah Wilson*

With the first day of fall having passed on September 22, there comes an anticipation for the signs of the season. Fall may bring to mind things such as the smell of a bonfire, the warmth of a flannel shirt on a brisk morning or the festive assortment of squash and apples at local vendors. Yet there is one trademark of the season that cannot be overlooked.

photosynthesis and responsible for the green color of leaves in the summer months. These compounds absorb the reds and blues of the visible light spectrum (May, 2018). Chlorophylls cannot absorb green light. This reflected green light gives leaves their characteristic color.

While cooler weather is one of the variables that affect the changing of leaves, the change is also dependent on length of daylight and amount of water (Palm, 2018). Plants are sensitive to the amount of sunlight they receive, and for good reason! Without sufficient sunlight, plants can die from the inability to produce their "food." As fall

Botany basics



Katherine Newkirk

From bright yellows to deep reds, the colors of the changing leaves shine in stark contrast with the bright blue of a fall sky. Their beauty is undeniable, but what causes the green of summer to give way to the colors of fall? To answer such a question, we will have to investigate the basic functions of leaves and the factors that cause them to change.

To begin, the leaves of any plant are essential in allowing the plant to convert sunlight energy, water and carbon dioxide into a more readily usable substance for growth. This is most often a form of sugar or starch, created through the process of photosynthesis. These conversions occur at the molecular level. Plants have chemical compounds called chlorophylls that are essential for

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descends upon the landscape, the length of day begins to shorten. While it may seem that shorter days would trigger such a change in plants, it is actually the length of darkness that triggers a slowing down of photosynthesis. In fact, both the onset and end of dormancy are dependent on length of night (Mauseth, 2017). With the cooler temperatures and lack of need for photosynthesis, plants no longer actively maintain their chlorophyll supplies, and the compounds begin to degrade. This then allows secondary pigments in the plant to come into view.

Secondary pigments such as carotenoids and anthocyanins are what most often present the yellow-orange-red spectrum of non-photosynthesizing leaves (O'Keefe and Lee, 2004). They are present throughout the growing season, but not in quantities as large as that of the chlorophylls. The colors of leaves can also be affected by the amount of rain in the summer months of the same year.

Botany – continued on page 3

10,000 doses of vitamin N

By Amy Perry

Once a weed-infested area relieved only by deer paths and staffed by a volunteer, Avon Outdoor Learning Center west of Indianapolis has blossomed into a multiple award-winning, vibrant and eclectic collection of habitats and educational tools supported by a full-time teacher. The Center is a powerful tool, beloved by the community and combatting the problems

discussed by Richard Louv in his 2005 book *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder*.

The success of the center is due to the vitality and vision of center coordinator Carol Ford, a 22-year parent volunteer who cleared the seven acres of honeysuckle and poison ivy; to the

knowledge and dedication of Jennifer Davies, now the full-time teacher, who has volunteered countless hours over the years; and to the support of the community, which raised funds to save the center during a financial crisis.

Located on State Road 36, the center serves students from pre-kindergarten to 12th grade in the 12 Avon schools. It boasts two miles of hiking trails, a prairie (funded in part by an INPAWS grant), riparian wetlands, lowland and upland forests, stream access for those in wheelchairs, a beehive, an insect house (also home to mice), tree identification signs, a dock next to a shallow pond, a butterfly garden, a vegetable garden, a brush pile, a bioswale and a restored 1840s cabin.

The center teaches traditional academic subjects using natural objects and phenomena. In the 2017-2018 school year alone, 10,000 children visited. Ford explains, "When a classroom teacher requests a lesson to meet a certain [state-designated] standard, Jennifer will develop a lesson plan. She connects the classroom with the out-of-doors." For example, math students learn about Fibonacci

sequences and other patterns in nature at the center.

Just by being outdoors, the students receive the intellectual, physical, developmental and emotional benefits that Louv and others have pointed out most kids today are missing.

Crouching down to make herself two feet tall, Ford says, "This looks like Brown County from a kid's standpoint. Kids never get outside — one of the things we do here is teach them how to breathe, and how to calm down, and listen, and be." She pauses. "Vitamin N."

The center receives help from many local businesses, community groups and wildlife-related professions. Duke Energy is helping create a playscape with log circles to stack and roll, sticks to build with, and puddles — things that will help the kids learn how to take risks. Hendricks County Master Gardeners and INPAWS help with invasives removal. Local soil and water conservation employees lead sessions.

Former students have told Ford that visiting the center encouraged them to go into wildlife- or nature-related professions such as forestry or conservation.

The Center is not open to the public because it is part of the school grounds. However, it will be open to INPAWS members the second Saturday of any month from 9 a.m. to 3 p.m., as long as an INPAWS member contacts the center to request a visit. It is well worth seeing.

If you would like to volunteer or donate to the center, see its web page at www.avon-schools.org/domain/108. To those who would like to start an outdoor learning center, Ford advises not to try to do it alone. She refers readers to www.in.gov/dnr/forestry/files/fo-Guidelines_Outd_Labs.pdf.

To learn more about nature deficit disorder, resources are in the book *Last Child in the Woods* and at www.childrenandnature.org, a network founded by Louv.

Carol Ford was interviewed in the fall, 2007, issue of INPAWS Journal; the article can be accessed at www.biodiversitylibrary.org, as detailed in the summer, 2018, issue.

Amy Perry is a member of INPAWS Central Chapter. She assists with the chapter's "pop-up" garden tours.



A restored 1840s cabin (top) welcomes visitors to the Avon Outdoor Learning Center. Directional signs give guidance inside the natural area.

Katherine Newkirk
Carol Ford

Botany – from page 1

Undue stress on trees can cause them to lose their leaves early and change the color effects of the various secondary pigments. A summer with sufficient rainfall and a fall with cool temperatures that remain above freezing are two of the best conditions for long-lasting, colorful leaves.

Not only do leaves change color, they are also shed by their plants, thus the coining of the season's name, "fall." This is caused by another process known as leaf *abscission*, or the programmed loss of the leaf by a plant. Because abscission is programmed by the plant and not by external forces, the plant is able to reabsorb most valuable materials before the leaf is shed. These materials can include sugars, minerals and nitrogen from the degrading chlorophyll molecules. The plant can then store these compounds in its roots for use in the next growing season. Before the leaf falls, the plant produces a layer of protection against infection. The *abscission zone* is produced where the leaf attaches to the stem and is perpendicular to the *petiole*, or stalk of the leaf (Mauseth, 2017). The plant signals this area to weaken, and the leaves are shed, commonly by rain events or wind. All that is left are the leaf scars on the tree where the abscission zone was formed.

The autumn colors of leaves can vary from the browns of oaks to the deep reds and purples of sweetgums and the yellows of birches and maples. They can even vary from year to year on the same tree. Nevertheless, the onset of autumn colors provides an outward display of a forest's fall into slumber for the colder winter months that lie ahead.

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Mahalah Wilson is a junior at Franklin College. She is pursuing a degree in biology with a focus on conservation and ecology.

First Florathon a success

By Barbara Homoya

A tisket, a tasket, how many blooming wildflowers in your basket? This could have been the rhetorical question asked of 50 native plant enthusiasts this spring. Between April 14 and May 13, 13 teams scoured 23 Indiana counties with the goal of finding (listing only – no picking) as many blooming native plants (as well as ferns) as possible.

The Bloomin' Stellarias team led by Ellen Jacquart came out on top with a total of 150 species, with We the North (leader Scott Namestnik) in second place with 128 species. The Forestry (leader Peyton Phelps) searched the most counties (six) and one team – the Fab Fords (leader Wendy) – included three generations of team members.

Over \$4,000 was raised for Letha's Youth Outdoors Fund from nearly 100 donors. In addition, INPAWS now has 19 new members and many other people learned about the organization.

Dottie Warmbier, leader of the Fish Creek Preserve Belles said, "Thank you for a super awareness-building event!" Lisa Slott, Flower Power team leader commented, "What a nice time we had. Bendix Woods in St. Joe County gave us the best show of blooms."

Several team members remarked how much they enjoyed visiting Indiana's natural areas during the Florathon. Some teams are already setting goals for next year, eager to "fill their baskets" even fuller. We hope for more teams, participants and donors for Florathon 2019 – plan now to join in the fun!

Barbara Homoya is a member of Central Chapter and was chair of INPAWS' first Florathon.



The winning Bloomin' Stellarias Florathon team found 150 blooming species. From left, David Mow, Paul Rothrock, Marc Evans, Steve Dunbar, Ellen Jacquart (front)

Ellen Jacquart

Field notes

By Patricia Happel Cornwell

New state insect! If Indiana's new state insect had a theme song, it would be "You Light Up My Life." The July/August issue of *Outdoor Indiana* reports that Say's firefly (*Pyraclomena angulata*), a lightning bug of the family Lampyridae, became our official state insect in March.

Native to Indiana, it was first identified by Thomas Say of New Harmony in 1826.



Judy Gallagher

Recently named Indiana's official insect, this firefly is named for the entomologist Thomas Say (1787-1834) of New Harmony.

Rare bee: In 2017, Hendricks County resident and entomologist Robert Jean found a single individual of a native bee (*Andrena uvulariae*) that was attracted to bellwort flowers (*Uvularia* genus). This year, however, he found them to be "plentiful in Burnett Woods Nature Preserve," a property owned by Central Indiana Land Trust. A July 4 online article by *WTIU News*, "Rare Bee That's New to Indiana Found in Avon," says the trust's removal of invasive plant species is credited with creating the habitat the bees need.

Speaking of bees: Walmart has filed a patent application for a design for drones that might be able to pollinate crops, locating flowers with tiny sensors and cameras. In "Can Robobees Solve the Pollination Crisis?" in the spring, 2018, issue of the Xerces Society's quarterly *Wings*, Eric Lee-Mäder and Scott Hoffman Black say not so fast. They write, "Focusing solely on crop pollination and failing to take the pollination of native plants into account may well lead to a deterioration in the plant communities that make up the very fabric of our environment."

Preserve grows: According to a June 9 *Herald Times* article, "Conservation group adds 84 acres to Indiana nature preserve," Sycamore

Land Trust has acquired a "swampy tract" of forest in northwestern Monroe County, expanding Beanblossom Bottoms Nature Preserve. The new section is home to state-endangered species, including Indiana bat, Kirtland's snake and rare orchids.

Is it hot out here? On the Indiana page of the summer, 2018, *Nature Conservancy Magazine*, John Shuey, Indiana TNC's director of conservation science, forecasts that climate change will bring our state hotter, wetter, stormier weather in decades to come. "The increase in precipitation," he says, "will be primarily during winter and early spring ... That translates into three perceived threats for our natural areas: increased drought stress, ... potentially increased fire frequency ... and increased severe weather damage from flash flooding and blow downs."

Speed demon: A May 23 article in the *Indianapolis Star* entitled "Indiana confirms presence of invasive 'mile-a-minute' vine," quotes our own Ellen Jacquart about the discovery of this invasive (*Persicaria perfoliata*) in Monroe County last fall, the farthest west that it has been recorded by the Early Detection & Distribution Mapping System. She says this Asian vine with triangular leaves, barbs, white flowers and dark blue fruits can grow six inches a day and has no co-evolved insect predators or herbivores here to slow it down. Ellen is INPAWS' invasive education chair.

A dam better idea: The *Herald Bulletin* reported in its May 18 article, "Environmental group, developer plan Indiana trailhead," that Hoosier Environmental Council (HEC) and Sandor Development, which owns River Ridge Plaza in Anderson, are collaborating on a proposed Mounds Greenway Trailhead District, in hopes of spurring the city's retail corridor while enhancing the White River waterway. A loop trail and improved canoe launch are planned; a playground may be added later. A previous proposal to create a \$450 million reservoir by damming the river failed to gain the support of officials in some affected towns. 🌱

INPAWS on Facebook: What's new?

By Ellen Jacquart

While in the "real world" INPAWS has just over 1,000 paid members, INPAWS also has both a Page and a Group on Facebook that are used for outreach and education to a broader audience.

New this year is a "Native Plant of the Week" post that provides an educational message on native plants consistently every week. With the help of Will Drews, Michael Huft, Martha Bishop Ferguson, Chris Neggars and Keith Board, each Monday a native plant is featured in a post on both the INPAWS Facebook Page and Group, with pictures and information about the species' ecology, use in landscaping, medicinal uses or other interesting facts. These posts have been well received and shared hundreds of times.

What's the difference between a Page and a Group?

A Facebook Page is like a business profile where INPAWS controls the message and can advertise our mission with posts about native plants, upcoming events or educational messages. Our Facebook Page currently has 2,600 "likes," a number which has increased over 30% in the last six months.

A Facebook Group is a place for like-minded people to discuss topics of mutual interest. The INPAWS Facebook Group, established several years ago by Laura Hohman, now has over 11,300 members. During the busy season (when plants are growing), there are dozens of posts by members every day. Those posts are often pictures with the question "What is this plant?" but there are also spectacular photos of native plants and native gardens, information about where to buy natives, and more.

There are challenges to administering this large group, particularly because most of these "online members" are not actual members of INPAWS and are not familiar with its mission. To keep the conversation focused on native plants, we have nine administrators – Ellen Jacquart, Velda Miller, Reni Winter-Evans, Wendy Ford, Cathy Meyer, Amy

Thompson, Nathanael Pilla, Nicole Kintzele Messacar and Laura Hohman.

Join us on Facebook! "Like" our Facebook Page at www.facebook.com/INPAWS to follow our posts, and join the INPAWS Facebook Group at www.facebook.com/groups/105273756180332 to be part of the discussions.

Ellen Jacquart is a member of INPAWS South Central Chapter and chair of INPAWS' Grow Indiana Natives program.

**INPAWS
at work**

"One of the first and most leading principles on which the commonwealth and the laws are consecrated, is lest the temporary possessors and life-renters in it, unmindful of what they have received from their ancestors, or of what is due to their posterity, should act as if they were the entire masters; that they should not think it amongst their rights to cut off the entail, or commit waste on the inheritance, by destroying at their pleasure the whole original fabric of their society; hazarding to leave to those who come after them, a ruin instead of an habitation ... No one generation could link with the other. Men would become little better than the flies of summer."

Edmund Burke (1729-1797)



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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Submissions

All are invited to submit photos, articles, news and event postings. Acceptance for publication is at the discretion of the editor. INPAWS welcomes differing points of view. Please submit text and high resolution photos (300 ppi) via e-mail to journal@inpaws.org. Submission deadlines for specific issues are: Spring – Jan. 22 for April 1 mailing; Summer – April 22 for July 1 mailing; Fall – July 22 for Oct. 1 mailing; Winter – Oct. 22 for Jan. 1 mailing

Membership

INPAWS is a not-for-profit 501(c)(3) organization open to the public at inpaws.org.

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Please direct information of interest to webmaster@inpaws.org.

Oct. 23-25

President's message

Natural Areas Conference

By Michael Homoya

I consider INPAWS to be one of the most important nature organizations in the state. It is our charge to speak on behalf of plants (and animals, too!) native to the state of Indiana, and we have worked hard to do so. It's no small challenge, as the populace is woefully unaware of our native flora and its significance. I've heard this called "plant blindness." One reason is the increasing de-emphasis of plants in biology curricula at all levels of our educational system. Animals rule, but even they have been mostly reduced to study at the molecular level. However, successes are occurring to reverse the trend. And on the local level, much of it is because of our organization.

Take for example the recent preliminary approval by the Indiana Natural Resources Commission (NRC) of the rule to ban the sale, trade or transport of various highly invasive plants. We supported approval of this rule and several INPAWS members attended the commission meeting. Kudos to our vice-president Ellen Jacquart for speaking on behalf of INPAWS. Passage of the terrestrial plant rule will be a major step towards reducing the impact of these species on the environment. Thanks to all who helped us get this far and to the NRC members. (See "Two new preserves and progress on plant rule" on page 11 of this issue.)

At the end of this year my term as president will conclude. While it has been an honor to serve you, I will not be seeking a second term. Even though I will no longer be at the helm, I still plan to be very involved. One project that I wish to see developed is one that will train and certify "ambassadors" for native plants. Graduates of such a program would educate the public about the importance of native plants and natural areas and the harm done to them by exotic plant and animal pests and diseases. Hopefully this program will be implemented in the upcoming year.

I wish to thank each of you for your support these past two years and for your work to benefit Indiana's native flora. May our efforts continue to prosper. 🌱

INPAWS is one of the sponsors of the annual conference of the Natural Areas Association (NAA) to be held Oct. 23-25 at Indiana University, Bloomington. Most conference events will take place in the Indiana Memorial Union complex on the IU campus.

NAA is focused on providing access to cutting-edge information, emerging management techniques and science-based practices for natural areas practitioners. The conference features symposia on topics such as conserving and managing karst systems, protecting pollinators in natural areas management, and collaborative approaches to conservation.

Sessions will be presented on land management in light of climate change, fire ecology, genetic diversity and biodiversity, invasive species, restoration ecology, working landscapes conservation, urban and wildland interface, endangered species conservation, monitoring species populations, communicating the importance of conservation, and the role of the humanities in conservation.

Social events will include an NAA awards dinner and reception and field workshops to the "Hills of Gold" and Indiana's karst caves and landscapes, with emphases on working woodlands, landscape-level effects of forest management and creating bat habitat. There will be programs for students and young professionals, including a student-mentor networking lunch, "Keys to Conservation Careers" sessions and a student poster/presentation competition.

Speakers will include former director of the National Park Service Jonathan Jarvis and Dr. Gary E. Machlis, co-authors of *The Future of Conservation: A Chart for Rough Water*. Scott Russell Sanders, award-winning author of *A Conservationist Manifesto* and *Stone Country: Then & Now*, is the keynote speaker.

NAA member non-member

Full registration	\$500	\$550
Student (full)	\$290	\$330
One-day registration	\$290	\$330

To register online, go to www.naturalareas.org/conference.php. On-site registration is possible for an additional \$30 fee. 🌱



Chapter news

INPAWS at work



Central

Central Chapter members enjoyed the flowers of the season at various events throughout central Indiana. In June, Ben Hess (INPAWS) and Steve Clements (Indianapolis Museum of Art) led a hike on the IMA's Newfields campus. Ben and Steve provided wonderful plant and site knowledge to those who attended.

Carol Ford opened her Plainfield garden for a pop-up tour in early July, showing her garden dominated by native plants, including royal catchfly (*Silene regia*). Members also visited Avon Outdoor Learning Center. The native garden at the center, a recipient of an INPAWS grant, has been maintained by volunteers since its planting in 2000. (See "10,000 doses of vitamin N" on page 2 of this issue.)

A mid-July picnic for members and their families at Southeastern Parkway included a hike led by Ben Hess. Anika Williams from the Irvington Branch of Indianapolis Public Library shared news about the library's new seed library; her talk was followed by a discussion on native plant issues.

Other events included an August presentation by Aaron Stump on creating an Indiana Wildlife Federation Certified Wildlife Habitat and a September talk on bees and pollination by Doug Rohde and Deborah Rood.

Northeast

Northeast Chapter held a native plant swap in June at Little River Wetlands Project (LRWP). In July, they returned to LRWP to conduct another hands-on native plant propagation seminar. As part of the seminar, stewardship co-chair Kate Sanders took participants on a walk to take cuttings of elderberry, dogwood and buttonbush, then showed the proper way to trim and plant the cuttings. The event was a follow-up to the seed-planting seminar led by Betsy Yankowiak and Kate in February.

In August the chapter held a native plant garden tour in southwest Allen County, visiting a mesic meadow, a woodland and an INPAWS-certified native pollinator garden. One of the sites, Southwest Conservation Club, had received a grant from INPAWS. After the annual picnic in September in Leo-

Cedarville, the group toured a member's prairie restoration project and an adjacent bird sanctuary.

The chapter's annual meeting in October will be at Forks of the Wabash in Huntington. Ellen Jacquart will present a program on invasive plants and members will hold their biennial election of officers.

South Central

On April 21, SCINPAWS members enjoyed a combined hike with Master Gardeners in Owen County at Fish Creek Preserve. On May 13, the chapter's Florathon team hiked at McCormick's Creek State Park, identifying 150 species of blooming plants. A June 8 work day at The Nature Conservancy's (TNC) Rabbit Hash Trail in Harrison County was followed by a glade tour led by Dawn Slack, TNC's southern Indiana land steward.

On June 16, members staffed an information table at SCINPAWS's seventh annual SNAYL (Sustaining Nature And Your Land) Day at the Bloomington farmers' market and adjacent city hall. The event teaches land-owners how to make their property as diverse and healthy as possible by controlling invasive species and planting natives. Hundreds of people stopped by the table to learn about invasive plants through demonstrations and exhibits. The most popular part of SNAYL Day was "The Weed Lab," a display of potted invasive plants and control tools staffed by the area's invasive experts. People were encouraged to "Bring Us Your Weeds!" and dozens brought plant samples for identification and control advice.

Ellen Jacquart led members on a Sept. 1 hike at Cedar Bluff Nature Preserve near Bloomington.

Southwest

Prohibiting the retail sale of invasive plants was the topic of a presentation by Ellen Jacquart, former director of northern Indiana stewardship for The Nature Conservancy and current vice-president of INPAWS, at SWINPAWS' July 21 meeting at Wesselman Woods Nature Center in Vanderburgh County.

The chapter held its 2nd annual plant sale Sept. 8 at the Southwest Indiana Master

Gardeners Display Garden in Evansville to raise money for public education about native plants and to provide native plant stock to the public. Customers were treated to a large selection of over 1,500 plants, including bare-root spring ephemerals.

On Sept. 15, Dave Dobson, plant manager for Combs Landscaping, addressed members on using native plants as substitutes for exotic ornamentals in home landscapes. Such plants, he said, can provide food and shelter to native insects and wildlife, so the results are both beneficial and beautiful.

Upcoming: On Nov. 17 at 9:30 a.m. at Wesselman Woods Nature Center, Paul Bouseman will discuss methods for propagating woody plant species from cuttings. He is botanical curator at Mesker Park Zoo and Botanical Garden in Evansville.

North

On a rainy June day, eight brave souls joined botanist Nathanael Pilla at Red Mill County Park, LaPorte County, where he highlighted the restored headwaters of the east arm of Little Calumet River. Plants discussed were common dodder, pond lilies, duckweed, skunk cabbage, coontail, wide-leaved ladies' tresses and bog twayblade. And what's a

wetland without a northern water snake and a snapping turtle?

In July, North Chapter president Jan Hunter spoke on invasive plants to 26 Master Naturalists at Wellfield Botanic Garden, Elkhart, and chapter members staffed booths at Envirofest at Wellfield Botanic Gardens and at the Elkhart County 4-H Fair "Green Day."

On August 26 members headed to Little Calumet River Prairie and Wetlands Preserve in Lake County. Spencer Cortwright, Indiana University Northwest professor of ecology, shared the restoration work he has done on this prairie.

The chapter's second annual late-summer plant sale was Sept. 8 at South Bend/Elkhart Audubon Wildlife Sanctuary in Mishawaka.

DNR regional ecologist Tom Post led a Sept. 12 hike at Hoosier Prairie State Nature Preserve in Lake County. Hoosier Prairie is a large remnant of prairie that preserves the topographic and biotic diversity of the sand plains north of the Valparaiso Moraine.

On Sept. 15 DNR regional ecologist Derek Nimitz led a hike at McCloskey's Burr Oak Savanna Nature Preserve in Lake County. This was an amazing opportunity to visit a rare mesic savanna habitat which once covered thousands of acres across Indiana. 🌱

INPAWS public policy statements – when and how

By Tom Hohman

As a 501(c)(3) non-profit corporation, the mission of INPAWS is primarily one of public education. Our focus is not political. However, at times it is very much in keeping with our mission to take a stand on a public issue, and we are allowed to do so (within limits) by IRS regulations.

INPAWS has recently undergone an organizational change to bring it into compliance with legal requirements for a 501(c)(3). That change has involved the establishment of a Board, which took on some of the legal duties and responsibilities of the INPAWS Council. However, the Council was retained as the main entity for control of INPAWS functions and programs. During this transition there was, and probably still is, some confusion on who does what.

One area of uncertainty involved when and how INPAWS takes a position on a public issue. The INPAWS Board recently developed and approved a policy to answer that question.

For INPAWS to take an official position on a public issue, two things have to happen:

First, the INPAWS Council must approve the position by a 2/3 vote.

Second, the INPAWS Board must also approve the position by a 2/3 vote.

While this may seem like a cumbersome set of requirements for INPAWS to take a public position, it is intentional. Making it a two-step process ensures that INPAWS leadership does not act impulsively. It ensures that there is ample time to discuss the proposed position statement and get input from all parts

Policy – continued on page 10

IN Natural Heritage Data Center celebrates 40 years

(DNR Division of Nature Preserves press release)

A state program that inventories Indiana's unique natural areas, including locations of rare and endangered plants and animals, fragile habitats, and uncommon ecological and geological features, celebrates its 40th anniversary this year.

The Indiana Natural Heritage Data Center (INHDC), part of the DNR Division of Nature Preserves, began on May 19, 1978, when then-Governor Otis Bowen signed it into existence. At the time, it was one of just 12 such programs nationwide.

INHDC formed as a collaboration between the State, The Nature Conservancy and the Indiana Energy Association to provide an objective, scientific basis for making conservation decisions about unique environmental resources.



Water tumbles into a lush ravine at Fern Cliff Nature Preserve in Putnam County. The preserve features steep forested sandstone cliffs and a profusion of ferns and bryophytes.

To date, INHDC has recorded the locations of 18,000+ occurrences of rare or endangered species, 1,000+ occurrences of high-quality natural communities, and 800+ significant natural areas. These include records for 80 globally critically imperiled species. This information has resulted in many places receiving protection through Indiana's system of nature preserves, which encompasses 284 properties and more than 53,000 acres.

Companies and consultants also use INHDC data when planning projects in order to avoid sensitive and rare species and sites, and the data is an essential component of DNR's environmental review process to avoid affecting

sensitive natural areas.

Current INHDC projects include surveys of natural areas in Hoosier National Forest; surveys for bees, stoneflies and beetles; monitoring of state and federally listed species; and participating with partners in restoration efforts that target several species and natural areas.

INHDC is part of a network of heritage programs in all 50 states, all Canadian provinces and many Latin American countries. The network is coordinated by NatureServe, a non-profit organization.

Policy – from page 9

of INPAWS. This does not mean that we can't act quickly, because email voting allows for timely votes if needed to meet a deadline.

The other thing that may at first seem odd is the requirement for a 2/3 vote, rather than a simple majority. This is intentional. While INPAWS taking a position on an issue does not mean that all members of INPAWS will agree with it, it should certainly mean that the vast majority of INPAWS members do. The requirement for a 2/3 vote helps ensure this. If only a bare majority of either the Council or Board supports a proposed position, INPAWS should not (and will not) take a public position on it.

The one thing that is not stated in the policy is when and how INPAWS even considers taking a position on a public issue. The Council is composed of INPAWS Board members, local chapter representatives and committee chairs. Any INPAWS member, even one who is not active on either the state or local level, can find out on our web site who the Council members are. Any member who feels that INPAWS should take an official stand on a public issue should contact someone on the Council and ask them to bring it up for consideration at the next meeting. They are also welcome to attend that meeting to help make their case on why INPAWS should take a position.

While it is sometimes difficult for a statewide organization to ensure that all members have their voices heard and are truly part of the organization, we are doing our best to make that a reality.

Tom Hohman is an INPAWS board member and past president.

Two new preserves and progress on plant rule

(DNR news release)

The Indiana Natural Resources Commission (NRC) has approved two new nature preserves. The July 17 action increases to 287 the number of state-designated sites protected by the Nature Preserves Act. The new preserves are Dewey Hickman Nature Preserve in Harrison County and Mary Gray Nature Preserve in Fayette County.

The Dewey Hickman preserve comprises 125 acres southwest of Corydon. It is named as a memorial to the superintendent of the Civilian Conservation Corps (CCC) camp that was located where O'Bannon State Park is now. Owned and managed by The Nature Conservancy, this preserve in the Shawnee Hills Natural Region is home to three bird species of state special concern, the hooded warbler, sharp-shinned hawk and red-shouldered hawk, as well as the state-endangered cerulean warbler. Noteworthy plant species include the state-rare Eastern bloodleaf.

The Mary Gray preserve southwest of Connersville is a 37.99-acre portion of the Mary Gray Bird Sanctuary. The site is included in Alton Lindsey's *Natural Areas in Indiana*. Research is being conducted at the preserve by bird banding during the spring and fall migrations of the northern saw-whet owl and ruby-throated hummingbird. A turtle population research project has been in progress since 1985. Owned and managed by the Indiana Audubon Society, the preserve consists of a high-quality mesic upland forest with a showy spring wildflower display. The forest contains many species that are area-sensitive, forest-interior plants, and animals that depend upon large, unfragmented forest ecosystems.

In other action, the NRC granted preliminary adoption of a new rule designed to remove 44 invasive plants from trade inside Indiana. The decision only starts the deliberative rules process. It does not put a new rule into effect.

Invasive species in Indiana regularly move into the forest and restrict the ability of trees to regenerate because invasives use essential nutrients and block sunlight from native species that regenerate more slowly.

Indiana land managers, private and public, currently spend an estimated \$8.6 million managing

invasive plants every year. The goal of removing these invasive species from trade is to reduce the number of such plants escaping into the wilderness, thereby reducing the amount of state and federal funding required to control them.

DNR has determined that 22 of the 44 plants identified can be found in trade in Indiana now, but only four are sold with any regularity. To decrease potential fiscal impact of the rule on small businesses, DNR would make allowance for an additional year from the effective date of the rule to sell affected stock before issuing penalties. The proposal would also allow members of the public to report evidence of terrestrial invasive species to DNR.

Next, the NRC will provide an opportunity for public comment in writing or at two public hearings. The NRC is an autonomous board that addresses topics pertaining to the DNR. More details on these actions are available at nrc.IN.gov/2350.htm under "July Agenda."

Plant rule: what you can do By Dawn Slack

The Indiana Natural Resource Commission (NRC) has granted preliminary adoption of the terrestrial plant rule, and thus begins the rule-making process.

A "Notice of Intent to Adopt a Rule to Publisher" will be submitted to the Legislative Services Agency (LSA) and then to the Office of Management and Budget (OMB). LSA will also publish a "Notice of Intent to Adopt a Rule" in the Indiana Register. A "Notice of Public Hearing" will be published after a review of documents by OMB and the sponsoring entity (DNR Division of Entomology and Plant Pathology), and it is during this phase of the process that the public may comment on the proposed rule.

I will send an email about the comment period to the Indiana Plant Advisory Listserv (IPAC) and post a blog on the IISC website (Indianainvasivespecies.org). If you have not been receiving these emails and wish to be on the list, email me at Dawn.slack@tnc.org and request to be added to the IPAC listserv. Ellen Jacquart has posted the information on INPAWS' Facebook page.

Stay tuned!



The hooded warbler is one of the species of state special concern occupying the newly protected Dewey Hickman Nature Preserve in Harrison County.

INPAWS history, part III:

Becoming an environmental force

By Ruth Ann Ingraham

This is the final article in a series that looks back at some of the highlights of the 25 years since the inception of INPAWS.

Conferences

Annual conferences bring us together, as Tom Hohman can attest, having chaired several. It was Karen Bird's quick thinking that engaged Dr. Doug Tallamy, entomologist with the University of Delaware, as keynote speaker in 2008. She first heard of him through an advertising email touting his book *Bringing Nature Home*. "He was available the date of our conference and his fee was within our budget," Bird says. "The rest is history." Attendance that year exceeded the Garrison Conference Center's capacity at Fort Benjamin Harrison State Park, signaling a need for a larger venue and earlier advance planning.

Hohman recalls, "Conferences in succeeding years continued to enjoy success, with crowds of over 200. The 2014 conference in Bloomington, the first time outside of Indianapolis in a number of years, saw attendance swell to 300. Greater emphasis was placed on staffed displays for conservation-oriented non-profit organizations, and sponsors received greater recognition. Many joined INPAWS and returned in succeeding years."

Attendees have been inspired by renowned educators and authors in addition to Tallamy: Stephen Apfelbaum, Robert Breunig, Lincoln Brower, Carole Brown, Frederick Case, Jr., Neil Diboll, Tracy DiSabato-Aust, Rick Darke, Ken Druse, Jennifer Hopwood, Douglas Ladd, Donald Leopold, Richard Lighty, Jim Locklear, Jim McCormac, Darrel Morrison, Reed Noss, Brett Rappaport, Peter Raven, Carole Summers, Floyd Swink, Stanley Temple, Andy Wasowski, Gerald Wilhelm and Jim Wilson.

Speakers have also included members: John Bacone, Jeff and Sandy Belth, Dave Benson, Gene Bush, Lee Casebere, Cheryl Coons, Rebecca Dolan, David Gorden, Carolyn Harstad, Alice Heikens, Mike Homoya, Marion Jackson, Ellen Jacquart, Bill McKnight, Paul Rothrock, Tom Swinford,

Lenore Tedesco, Kevin Tunesvick, Sally Weeks and Kay Yatskievych.

Chapters

Written history names Oakhurst in Muncie as INPAWS' first chapter. But the official first, complete with by-laws and constitution, was West Central Chapter, spearheaded in 1999 by Chris Brewster. Its president Carolyn Bryson (2000-2001) promoted local chapter development, believing every member could be involved in projects such as plant rescues and invasive species removal. In 2001, East Central and Northwest chapters formed. Though short-lived, they reemerged later in new configurations. Two others emerged in 2003, Central, headed by Betsy Wilson, and South Central, led by Steve Dunbar. From 2004 to 2006, each county's members were assigned to one of four huge chapters so no member was left out. Even so, INPAWS president Tom Hohman (2010-2011) lamented that membership was heavily weighted across the State's mid-section. Davie Sue Wallace had arranged for Dr. Doug Tallamy, University of Delaware entomologist, to speak in Evansville, so Tom drove down to promote the formation of a new chapter there. The result was Southwest Chapter. That success under his belt, Tom brought Tallamy back to speak in Indiana's north. Their collaboration resulted in another chapter in 2011, Northwest (now North), led by Steve Sass. In 2016, Northeast emerged, spearheaded by Martha Ferguson.

Newsletter/Journal

Our quarterly publication has evolved from the very first newsletter of eight pages in 1994 to a full-color journal of 16 to 20 pages. A new development this year gives credence to its growth, and to say that it greatly expands our reach is an understatement. The 2018 summer issue of *INPAWS Journal* revealed that the entire collection of our quarterly publications is to be included in Harvard University's Biodiversity Heritage Library (BHL), part of the Encyclopedia of Life Project. Our journals will soon be accessible

Tribute:

Carolyn Harstad, 1936 - 2018

Carolyn Harstad, who helped found INPAWS in 1993, died on July 24. A native of Minnesota, she was president of INPAWS from 1996 to 1998 and editor of the newsletter (with Art Hopkins) from 1999 to 2003.

INPAWS co-founder and friend Ruth Ann Ingraham called Carolyn "creative and energetic and brilliant. She inspired us all."

While serving as INPAWS president, Carolyn wrote *Go Native!*, her book on landscaping with native plants. Davie Sue Wallace, a past vice-president of INPAWS, recalls that in the book's preface Carolyn referred to an article in the *American Hosta Journal* entitled "Harstad Confesses to Having a Wild Passion." The interviewer called her a "Waldfee," German for "wood-sprite."

"This was the perfect description of Carolyn," said Davie Sue. "She had a 'wild passion' for native plants. Her enthusiasm was contagious. I joined INPAWS after meeting her at a conference. She was always encouraging and supportive of my work with INPAWS and other native plant projects. It is a sad loss for everyone in the plant world. I like to think she is in her woodland garden now, as a free Waldfee."

In the same preface, the author called herself "an ordinary, self-taught gardener." It was she who, in 1993, suggested that "wildflower" be made part of the organization's name "to encourage [such] gardeners, who were eager to learn, but fearful of being deemed 'uneducated.'"

Carolyn wrote two other books on native plants, *Got Sun?* and *Got Shade?* She also helped found the Indianapolis Hosta Society in 1986. She was a Master Gardener, a nature photographer and lecturer, and a member of the Garden Writers Association of America. She spoke on gardening with natives at INPAWS' 2013 annual conference.

"Energetic" was also the word Bill McKnight used to describe Carolyn. "In fact," he said, "she was downright feisty when she helped me with the state flower project in the 1990s. She was involved with INPAWS before it was an official organization, and we would not be what we are today without Carolyn's leadership and that of her wonderful husband Peter." (Peter Harstad died June 7, 2017.) 🌱



Carolyn and her husband Peter Harstad (1935–2017) posed in 2003 with samples of the INPAWS Journal edited by Carolyn.

Becoming an Environmental force – from left

in their entirety to readers worldwide. As of this writing, twelve volumes (years) have been digitized and are searchable and downloadable. This is a tribute to the outstanding work and journalistic excellence of our content and layout editors through the years. They are: Chris Carlson, Dan Anderson, Anne Wilson, Carolyn Harstad, Margo Jaqua, Art Hopkins, Bobbi Diehl, Wendy Ford, Nancy Hill, Kit Newkirk, Patricia Cornwell, and journal "team leader" as of 2015, Scott Namestnik.

I have said that our quarterly journal is among the best of North America's native plant society publications. No bias, of course, but inclusion in the BHL affirms the claim. Kudos to those who cajoled authors, edited articles and created layouts. Kudos to the dozens of writers who write for our edification and pleasure.

Volunteers

Yes, INPAWS is now a major environmental force in the state, focusing on native plants, from humble sedges to towering trees, and the life they support. How have we achieved so much? I attribute our success to the corps of volunteers who handle nearly 100% of our activities. We are not alone. Support for INPAWS and other organizations with similar preservation goals – land trusts, The Nature Conservancy and Indiana Wildlife Federation, to name a few – has expanded remarkably since the early 1990s.

I think back to April, 1993, when a diverse group of folks, from home gardeners to academics, came together. That diversity continues to make INPAWS the vital organization it is today.

Ruth Ann Ingraham is a co-founder and official historian of INPAWS.

Succession – from page 16

Typically, annuals are seen in the first stages of secondary succession. These are adapted to harsh conditions – intense sun, fluctuating soil moisture and temperature or strong winds. Since Europeans migrated to North America, these early successional annuals are now a mix of natives such as ragweed (*Ambrosia* spp.), horseweed (*Conyza canadensis*) and daisy fleabane (*Erigeron annuus*) and exotics such as green amaranth (*Amaranthus retroflexus*), lamb's quarter (*Chenopodium album*), common chickweed (*Stellaria media*) and various mustards (*Brassica*, *Lepidium*, *Capsella* spp.). Kricher (1988) and Squiers (1997) provide lists of succession species.

Annuals provide an environment where herbaceous biennials and short-lived perennials can establish. These include natives such as goldenrods (*Solidago* spp.), New England aster (*Symphotrichum novae-angliae*) and black-eyed Susan (*Rudbeckia hirta*). Shrubs, trees and vines may appear next, but they can take 10+ years to predominate. Initially, the landscape will be patchy, with open areas of herbaceous plants and other areas with dense woody vegetation, such as eastern red cedar (*Juniperus virginiana*), black cherry (*Prunus serotina*), sweetgum (*Liquidambar styraciflua*) and tulip tree (*Liriodendron tulipifera*). Virginia creeper (*Parthenocissus quinquefolia*) and poison ivy (*Toxicodendron radicans*) may grow up tree trunks. Shadbush, also called serviceberry (*Amelanchier* spp.), multiflora rose (*Rosa multiflora*), staghorn sumac (*Rhus typhina*), dogwood (*Cornus* spp.) and hawthorn (*Crataegus* spp.) may be found in the shrub layer. Over decades, assuming there is a nearby seed source and natural disturbance of some kind, oak and hickory will come to dominate the landscape.

Not only climate, but slope, aspect, soil type and soil moisture influence the climax mix of species (Weeks et al., 2005). Oak and hickory can be abundant on level areas, but tend to be found on dry south-facing slopes, whereas beech and maple are found on north-facing, more mesic (moderately moist) sites. Lindsey (1997) lists tree species characteristic of sites going from wet to dry.

How do successional species enter a denuded landscape? Seeds of many species can persist in

soil for years. Staggered seed dormancy means some will not germinate for many years (Kricher, 1988). Wind, water and animals may carry seeds to a bare landscape. Where present day glaciers are retreating, vegetation may be found near their edges (Melhorn, 1997). Presumably this also occurred as glaciers receded from Indiana about 13,000 years ago. As the climate became warmer, broadleaf trees replaced conifers.

Native Americans occupied North America for centuries. Although they did not alter the natural landscape nearly as much as European settlers, they did use fire in both grasslands and forests for agriculture and to drive or attract game (Barbour et al., 1999; Parker, 1997). In Indiana, such fires probably contributed to the maintenance of oak-hickory forests. With fire suppression in the 20th century, some of these woodlands are converting to beech and maple, species that can establish in shade. Cameron Clark, director of the Indiana DNR, points out that most of Indiana's current forest is second (or third or fourth) growth and has resulted from secondary succession with both natural and human disturbances contributing to the species that now occupy the land (Clark, 2018).

Humans have interrupted natural forest succession in many ways, including introduction of non-native species, habitat fragmentation, fire suppression, drainage and, more recently, climate change.

In some cases, humans have attempted to bypass natural succession by planting climax species. A large-scale example is the Tillamook Burn – 350,000 acres in Oregon's Coast Range that sustained devastating fires from 1933 to 1951. Douglas fir (*Pseudotsuga menziesii*) is the climax species in this area. Virtually every tree was killed. Secondary succession might have taken centuries. To speed things up, millions of seedlings were planted from the 1950s to the 1970s (a few by me, as a Boy Scout). Now there are dense stands of Douglas fir where only a few decades ago there were hundreds of square miles of scattered snags and brush. On a smaller, more local scale, native trees are being planted in Newfields' Virginia B. Fairbanks Art and Nature Park, Indianapolis, to speed up secondary succession in what was farm bottomland at the turn of the 20th century.



Early successional species include native annuals such as daisy fleabane (top), ragweed and goldenrod.

Howard Michaud, Hoosier conservationist

By Terri Gorney

Howard Michaud was a 20th century Indiana conservationist. He did much to promote and educate about the natural beauty of the state, yet his name is little known.

At the age of 29, Michaud, a native of Berne, was the first chief interpreter for Indiana State Parks. It was a summer position, based at McCormick's Creek State Park. A 1937 article in the *Indianapolis Star* stated that a hike with Howard was a "treasured experience."

By profession, he was a biology teacher, first at Central High School, then North Side High School, in Fort Wayne. In 1941, he wrote an article entitled "Importance of Field Work for the High School Biology Teacher" for *The American Biology Teacher* journal.

In 1946, when Michaud became a professor of conservation and forestry at Purdue University, he made West Lafayette his home. There, he co-authored *Wildlife Conservation in Indiana*. He and his wife Ruth created a weekend camp

Succession – from left

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Gregory Shaner is a member of West Central Chapter and secretary of INPAWS' board of directors.

program of nature hikes and biology lessons for the city's fifth-grade students.

In the 1930s, Michaud served on the boards of the Indiana Audubon Society and the Stockbridge Audubon Society, where he helped with the annual Christmas Bird Count in Allen County. He was a board member of the Indiana Academy of Sciences and was its president in 1963. He served on the West Lafayette park board for 23 years.

The June, 1959, issue of *Outdoor Indiana* featured an article on the state's workshops on interpretive programs for outdoor education. People from 11 states, the National Park Service and two Canadian provinces attended.

One of the presenters was Howard Michaud.

Over his teaching career, Michaud influenced many students. They include Marion T. Jackson, professor emeritus at Indiana State University and author of *The Natural Heritage of Indiana* and *101 Trees of Indiana*, and Erik Neumann, former director of the US National Arboretum in Washington, DC, and author of several books on plants.

In 1991, Governor Evan Bayh named Michaud a "Sagamore of the Wabash," a fitting honor since he grew up fishing in the Wabash River. He later received the Theodore Roosevelt Award from the North American Association for Environmental Education (NAAEE).

In his nineties, Michaud wrote, "I think a lot of kids today have lost that feeling for the outdoors, because all they see is city streets."

After his death in 1998 at age 95, the Indiana NAAEE chapter named an award in his honor.

Terri Gorney is a member of INPAWS Northeast Chapter and vice-president of Friends of the Limberlost.

Naturalist profile



Early state park interpreters pose for a group photo in 1941. From left: head interpreter Max Forsythe, Edna Banta, Howard Michaud, [first name unknown] Mills, Howard Weaver



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Studying the Indiana dunes gave Henry Cowles an insight that led to the concept of ecological succession.

By Gregory Shaner

Ecological succession is a concept formalized over 100 years ago by Henry C. Cowles, a professor at the University of Chicago. It refers to changes in species composition on a landscape over time (Squiers, 1997).

The insight came to Cowles during his studies of vegetation in the Indiana dunes. He realized that the spatial pattern in plant composition moving inland from the shore was also a temporal pattern. The youngest communities were near the shore, the older ones inland. Bare sand is an inhospitable environment, but as initial colonizing species such as marram grass (*Ammophila breviligulata*) stabilized the shifting sands, other herbaceous species and shrubs could gain a foothold. In time, trees such as cottonwood (*Populus deltoides*), jack pine (*Pinus banksiana*) and white pine (*P. strobus*) replaced these species. Later, oak (*Quercus* spp.) and hickory (*Carya* spp.) would replace these early tree species, and they in turn would eventually give way to beech (*Fagus grandifolia*) and maple (*Acer* spp.).

Another important early figure in vegetation dynamics was Frederick Clements of Carnegie Institution and later the University of Nebraska. Both Cowles and Clements believed climate was the ultimate controller of the species composition of the landscape, and that succession would terminate in a "climax" community, an assemblage of species that would predominate broad areas indefinitely – in the absence of major disturbance.

Primary succession occurs on land previously devoid of vegetation, such as bare rock exposed when a glacier recedes, or new rock laid down after volcanic eruption. Primary succession can be a long-term affair, because it requires soil building. **Secondary succession** occurs when the vegetation on a site is removed by wildfire, hurricanes, tornadoes or human activity, but the soil remains. Secondary succession is on a much shorter timetable, measured in decades.

Succession – continued on page 14