



Daylighting in the Dunes

Tom Hohman, Indiana Department of Natural Resources

Over the years, many Indiana wetlands have been drained, paved over, or otherwise converted to some modern “beneficial” use. What is rare is the reverse—converting one of man’s constructed areas into a natural area. That was the goal of an unusual project at Indiana Dunes State Park.

Wetlands are obviously much appreciated by the Indiana Department of Natural Resources, and development or enhancement of wetland areas to benefit wildlife is not unusual. However, in this case, the wetland was developed for its abilities to improve water quality.



The dunes of Lake Michigan are the site of a project to unpave a parking lot and restore a wetland. Photo courtesy of EPA.

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There had been occasional high bacteria levels at bathing beaches along the Indiana shore of Lake Michigan for some time. When levels were high, beaches had to be closed. This occurred even in locations where there was no obvious source of pollution on which to pin the blame.

For years federal, state, and local health and environmental agencies had investigated the problem, hoping to find the cause. Dunes Creek flows through Indiana Dunes into Lake Michigan immediately adjacent to the park bathing beach. It was believed that some unknown source of pollution was entering Dunes Creek and

polluting the beach area. But, failing to find any significant man-made source, they had to conclude that it was natural in origin. The inescapable fact was, animals poop too!

If humans were not the source of pollution, they certainly had contributed to the problem. When the park was first developed in the 1920s and 30s, a 1,300-foot section of Dunes Creek was routed through an 84-inch diameter steel pipe, and the area above it was paved to provide parking for beach visitors. This effectively eliminated the natural cleansing effects of the stream.

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To promote the appreciation, preservation, conservation, utilization and scientific study of the flora native to Indiana and to educate the public about the value, beauty, diversity, and environmental importance of indigenous vegetation.

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Spring... into Action!

Karen Hartlep

Green is the prime color of the world, and that from which its loveliness arises. —Pedro Caderon de la Barca, Spanish poet/playwright, 1600–1681

Last evening, as the last of the snow (the big one) melted away, I was standing in the drizzle watching the mists form and dissipate above my little stream down the hill in the woods, and I thought I could smell and feel Spring coming. What an exciting time is near! By the time you read this, all threat of snow will no doubt be gone, spring ephemerals will be popping out of the leaf litter, and there will be a hint of that gorgeous green haze on the trees. It's almost impossible to keep track of all the changes that occur—it's the time of year I most wish I had more time to spend outdoors...watching.

It's an exciting time of year for INPAWS too. Through Tom Hohman's incredible persistence, hard work, and vision, a new chapter has just formed incorporating the counties of Allen, Adams, Dekalb, Elkhart, Huntington, Kosciusko, Lagrange, Noble, Steuben, Wabash, Wells, and Whitley—the Northeast Chapter! Tom and I traveled to Fort Wayne in mid-February to meet with a group Tom had rounded up to discuss the possibility of forming this chapter; two weeks later this enthusiastic group had done it! They've already managed an INPAWS presence at the Fort Wayne Home and Garden Show and the Farm and Tillage Show in Auburn, and have several events in the works.

Congratulations and thank you to new INPAWS Northeast Chapter officers George Manning, President; Jennifer Manning, Vice President; and Cindy Loos, Secretary/Treasurer. I'm looking forward to hearing about your successes!

And although fall seems far away, planning has already begun for the Annual Conference. Our new co-chairs Kathleen Hartman and Dawn Stelts are tackling this job like a force of nature! It's going to be a very special event—stay tuned for details.

The events that most excite our members, though, are getting out there. To that end, we hope to have a couple of Plant Rescues this spring organized by David and Dawn Bauman to help supply our Plant Sale and Auction, May 12. Co-chairs Janice Gustafarro and Tom Hohman are gunning for the largest sales event ever, so arrive early and bring your checkbook! Better yet, volunteer.

Last, and perhaps best—the hikes! Mike Homoya has organized an incredible series of hikes throughout our state and beyond. They're listed on page 15. Mark your calendar, and look for details on our website and in upcoming mailings.

See you "out there"!

—Karen

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Soil & Water Conservation Districts

Soil and Water Conservation Districts (SWCDs) promote the wise use and care of soil, water, air, plant, animal, and related natural resources of their county. They provide on-site technical assistance and training to individuals and organizations and seek cost-share funding for community projects. They communicate, cooperate, and coordinate efforts with local private landowners, organizations, and local, state, and federal government agencies.

This past year, the Marion County SWCD provided some 300 direct technical assistance visits to local county residents and government agencies on such issues as erosion and sedimentation control, water quality and drainage matters, tree planting, wildlife habitat development, and loss of greenspace.

It also conducted more than 200 site reviews to assist local units of government with land use issues, permit reviews for new developments, and landfill inspections. MCSWCD helped to fund a dozen or more conservation projects through various state and federal cost-share programs; and it provided workshops for contractors on vegetative alternatives to stormwater control.

SWCD leadership recognizes that emerging conservation issues warrant more of their focus: As residential growth continues, concern is rising over the additional water quality degradation. Invasive plant species are taking over parks and areas along streams and highways. Pests such as emerald ash borer, along with increasing development, may be hastening tree canopy and forest loss. Resource issues may need to be addressed on more of a watershed basis.

This is prime time to communicate with your county SWCD on what important services they should be providing to the community. Find your county agency at www.nacdn.net/org/resources/IN.htm.

Squirrel corn (*Dicentra canadensis*) painted by Mary Vaux Walcott.



Dunes, continued from page 1

Thanks to a federal grant* and the realization that the park had more parking spaces than were normally needed, serious study began in 2004 for a project to remove 500 feet of pipe and parking lot and restore the natural stream. This type of project, called "daylighting," had been done before but, as far as anyone knew, never in a sand dune environment. Caution would be needed because the parking lot was immediately adjacent to a large dune that extended over one corner of the lot.

Two private firms were hired to evaluate what could be done. One was The Troyer Group, an engineering and architectural firm from South Bend; the other was J.F. New, an ecological consulting firm from Walkerton, Indiana. They concluded that a carefully thought-through project could successfully restore the natural ecosystem without impacting the sand dune.

Serious design work began in 2005, and after soliciting bids from contractors, DNR commissioned Gariup Construction of Gary to undertake the construction work. First they rerouted the stream to a temporary location adjacent to the parking lot, so that



BEFORE

From Parking Lot

the concrete pavement and steel pipe could be removed.

Then they constructed a new meandering channel for the stream, roughly mimicking the original route. This channel was intended to hold the stream only during normal flows, allowing for a larger area to hold flows during heavy rain events.

Construction was completed in spring of 2006, allowing planting of a mix of plants and seed native to the area and suitable for the stresses to which that sandy location would subject them. The input of both J.F. New and IDNR, Division of Nature Preserves, was sought to identify the best mix of plants for that site. And thus was a wetland reborn where once a parking lot had been!

*Partial funding for the project was provided by the National Oceanic and Atmospheric Administration (NOAA), through the Lake Michigan Coastal Program.



Daylighting Dunes Creek has been a tremendous success. A previous wetland developed two years earlier within the park on a branch of Dunes Creek showed that it takes about two years for the biological systems to develop enough to significantly improve the water quality. However, testing conducted in late summer of 2006 already showed small improvements.

As in all restorations of natural systems, there are some bare spots in the new vegetation, primarily from high water flows before the new plants could become established. To help offset this problem, Friends of the Dunes donated additional plants which the state park staff planted during the summer. Testing will continue in 2007, and it is expected that the water



...to Wetland

quality levels will continue to improve, leading to fewer (if any) beach closings.

A second bonus effect of the wetland will be public education. The wetland is located in an area more noted for sunbathing and partying than for bringing people into contact with nature. Interpretive displays have

been established, and a wheelchair accessible trail is planned.

Tom Hohman is director of the Division of Engineering of the Indiana Department of Natural Resources and an avid member of INPAWS.



How Wetlands Reduce Bacteria Levels

It was long believed that *Escherichia coli* (*E. coli*) bacteria, which originate in the intestines of warm-blooded animals, could not survive long outside the former host. Recent studies have shown this is not true. Such bacteria can survive in soil and forest debris for lengthy periods, only to be flushed away into a nearby stream when it rains or when accumulated snow melts. Of course, *E. coli* can also be introduced from poorly operating septic systems or wastewater treatment plants.

It is now known that wetlands significantly reduce levels of *E. coli* and that with sufficient retention times in the wetland, *E. coli* bacteria can be almost eliminated.

Constructed wetlands require one to three years for the ecosystem to become fully functional. The first factor to influence the *E. coli* levels, and the most significant factor during the first year, is daylight. As the wetland becomes more fully established, predation on the *E. coli* by other microorganisms becomes a significant factor. Another factor that can have an effect is sedimentation of suspended particles on which the bacteria are attached.

Source: Density and Population Structure of Stream Escherichia coli Are Influenced by Interacting Hydrometeorological Conditions. Richard L. Whitman et al. United States Geological Survey, Great Lakes Science Center, Lake Michigan Ecological Research Station, Porter, Indiana.

Dunes Creek Plant List

Forbs

<i>Alisma</i> spp.	Water plantain
<i>Asclepias incarnata</i>	Swamp milkweed
<i>Aster novae-angliae</i>	New England aster
<i>Coreopsis tripteris</i>	Tall coreopsis
<i>Eupatorium maculatum</i>	Spotted Joe Pye weed
<i>Iris virginica shrevei</i>	Blue flag iris
<i>Lobelia cardinalis</i>	Cardinal flower
<i>Lobelia siphilitica</i>	Great blue lobelia
<i>Lythrum alatum</i>	Winged loosestrife
<i>Mimulus ringens</i>	Monkey flower
<i>Penthorum sedoides</i>	Ditch stonecrop
<i>Sagittaria latifolia</i>	Broad leaf arrowhead
<i>Senecio aureus</i>	Golden ragwort
<i>Solidago rugosa</i>	Rough goldenrod
<i>Verbena hastata</i>	Blue vervain
<i>Zizia aurea</i>	Golden Alexanders

Grasses, Sedges, Rushes

<i>Carex comosa</i>	Bristly sedge
<i>Carex crinita</i>	Fringed sedge
<i>Carex locustris</i>	Lake sedge
<i>Carex stricta</i>	Tussock sedge
<i>Carex vulpinoidea</i>	Brown fox sedge
<i>Elymus virginicus</i>	Virginia wild rye
<i>Glyceria striata</i>	Fowl manna grass
<i>Juncus effusus</i>	Common rush
<i>Juncus torreyi</i>	Torrey's rush
<i>Scirpus atrovirens</i>	Dark green rush
<i>Scirpus cyperinus</i>	Woolgrass
<i>Spartina pectinata</i>	Prairie cord grass

Cracking the Nutt. of Plant Name Authorities

Rebecca Dolan, Ph.D.
Friesner Herbarium, Butler University

Novice botanizers rejoice! With this article, Becky Dolan inaugurates a new series for those of you just learning the ropes of seeking out, identifying, and appreciating plants in the field. Look for all the basics to be presented in coming issues. —Ed.

You may be familiar with the formal presentation of scientific plant names that gives every plant species a binomial (two-part) Latin name consisting of the genus and a specific epithet. But what about those mysterious names and abbreviated names that sometimes follow them, like L. or Muhl. or Nutt.?

These names, sometimes called the “authority,” carry important historical information. They are the namers or “authors” of the species. So when a botanist uses the formal presentation including the name, the botanist is referring to the plant given this name by this person.

Scientific plant naming conventions are quite precise for good reason. There can be confusion out there in the plant world. Although electronic record keeping and communication make errors less likely than before, it is still possible for different authorities to apply the same name to more than one plant. Also, concepts of species are somewhat plastic, based on opinion, so the use of an authority name means “this species as it was envisioned and described by the named authority and as is represented by the type specimen the authority assigned to it.”

The conventions of plant nomenclature dictate that new names be published, so knowing the authority can help you track down the publication in which a particular combination of genus and specific epithet was first used. That publication will have the authority’s description of the spe-



cies and often the rationale for considering the species new to science. For example, you may find a key comparing features of the species to related species, helping to define its unique features.

Confused? A few examples may help:

***Cornus florida* L. Flowering dogwood**

Flowering dogwood was first described as new to science by Carolus Linnaeus (1707–1778), a Swedish botanist credited with creating the two-part scientific name format. Before Linnaeus’ work, formal plant names could have up to 7 or 8 parts. He worked during a period of burgeoning exploration in the New World, when many newly discovered species were sent back to European experts for identification. It turns out the European flora is not very diverse, and the existing naming system, easily applied to these few species, was woefully inadequate to handle the great variety of new plants streaming in from the Americas. This influx of undescribed plants helped lead to the development of the simplified two-part system. Linnaeus named many of the plants native to Indiana, so the “L.” authority is often seen in reference books even though he never traveled to North America. (*Cornus florida* L. illustrated above courtesy of National Geographic Society.)

***Chelone obliqua* L. var. *speciosa* Pennell & Wherry Rose turtlehead**

When two botanists coauthor a paper that names a new plant, both of their names are shown, connected by an ampersand. Linnaeus described this species. Pennell and Wherry described and named the variety.

***Ranunculus fascicularis* Muhl. ex Bigelow Early buttercup**

Bigelow published the valid, accepted species description, but he credits Muhlenberg with originally recognizing the plant as new to science.

***Carya ovata* (Miller.) K.Koch. Shagbark hickory**

By the time the latter-day botanists of recent years came along, most species had already been identified and named. However, ideas sometimes change about how a species should be classified. When a species is given a new treatment that moves it from one genus to another, the original authority is retained in parentheses, followed

Speak!

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by the name of the authority who made the change. Reasons for moving species between genera include examination of specimens not previously seen that provide more information; new techniques, such as better microscopes or biochemical analysis of DNA sequences, that suggest different affinities; and the personality and philosophical bent of the authority. Some are “lumpers,” not prone to ascribe significance to minor character differences; others are “splitters” by nature.

***Platanthera peramoena* (A. Gray) A. Gray Purple fringeless orchid**

Gray first described “*peramoena*” in one genus and subsequently transferred it to *Platanthera*.

***Silene regia* Sims Royal catch-fly**

This wonderful prairie plant was reportedly first collected by Thomas Nuttall. Nuttall brought it to England, where it was described and published by Sims. Sims gets all the credit.

***Penstemon deamii* Pennell Deam’s beardtongue**

Specific epithets are sometimes based on names. A plant may be named in honor of original collectors or discoverers, like Deam’s beardtongue, named by Pennell.

***Streptanthus brachiatus* Hoffman spp. *hoffmanii* Dolan & Laprè Socrates Mine Jewelflower**

I had the chance to work with some very cool plants that grow in Lake, Napa, and Sonoma Counties in California. These are restricted to serpentine rock outcrops and are found nowhere else. A colleague and I published a paper describing a new species and a new subspecies of an already recognized plant that had been named by Hoffman (named above). Our treatment therefore was convincing to the two reviewers and editor of the journal that published our work. Later, our subspecies, but not our species, was further accepted by the experts who published the most recent *Flora of California*. By not including our new species in the book, they showed they felt it was not distinct enough to warrant a new name, most likely because they felt its characteristics were within the range of variation of an already named plant. Our subspecies *S. brachiatus* spp. *hoffmanii*, however, has come into use and is listed in the United States Department of Agriculture PLANTS Database (plants.usda.gov). I hope both our accepted subspecies and our less widely accepted species will be recognized when the *Flora of North America* publishes its volume that includes the mustard family (Brassicaceae), of which *Streptanthus* is a member. This is how new names come into use.

To help standardize the usage of abbreviated forms of names, an official list of author names is maintained by the Royal Botanic Gardens, Kew, in England. You can search for complete names to match abbreviations, and vice-versa, at www.ipni.org/ipni/authorsearchpage.do.

Next time, we’ll explore some of the more common authorities you’ll encounter when looking up names of plants that grow in Indiana.

BOOK REVIEW

Not Just for the Birds

Birding Guide to South-Central Indiana

*Compiled by the Sassafras Audubon Society
Bloomington, Indiana*

INPAWS members who live in south-central Indiana, or who have occasion to visit the area, might want to know about the new *Birding Guide to South-Central Indiana*. A collaboration by some of the area’s top birders, it lists 27 varied hotspots that are likely to yield not only unusual birds but also gorgeous scenery and interesting native plants. Among the co-authors are Don Whitehead, Lee Sterrenburg, Jim and Susan Hengeveld, David Daniels, and INPAWS’s own Cathy Meyer.

Bloomington-area sites include Griffy Lake, Little Africa at Lake Lemon, Stillwater Marsh, Cedar Bluffs, and Leonard Springs Nature Preserve. Farther afield are the recently designated Goose Pond/Beehunter Marsh Fish and Wildlife Area in Green County, Muscatatuck National Wildlife Refuge east of Seymour, and Orleans Reservoir. A helpful locator map groups 23 of the sites. The other four, more remote, have their own maps.

Descriptions have detailed directions for locating each birding hotspot, information on the type of terrain, and a helpful seasonal breakdown of what might be spotted when. A checklist of area birds shows their relative abundance in each season.

This unassuming little booklet, only 56 pages long, is full of great information for birders, native plant enthusiasts, and people who just like to be outdoors. It was published in fall 2006, and copies are available at Wild Birds Unlimited in Bloomington, and at the SAS website, www.sassafrasaudubon.org/guide.html.

You may order it by mailing a check to SAS at P.O. Box 85, Bloomington, IN 47402. The cost is \$8 for members and \$10 for non-members. Proceeds from the sale of the guide go to projects at Goose Pond Fish and Wildlife Area, SAS’s adopted Important Bird Area.

—Bobbi Diehl



The trumpeter swan was restored to Muscatatuck NWR in 1998. Artwork courtesy of www.wesave.org/swan/.

We Welcome These New INPAWS Members

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Dig!

Native plant donations are key to INPAWS' Plant Sale and Auction. Any that you care to donate will be gratefully accepted. Please label the plants and pot them several weeks before the event so they look their best.

Blissful Botanizing Conclusion

Hilary Cox, Leescapes Garden Designs

By now, we had completely revised the first impressions engendered by the prominent Queen Anne's lace and other invasives from our first trip in June. We no longer saw the erstwhile hayfield as a "poor remnant" of a prairie but knew it for what it was—the real thing!

In fact, Dee Ann and I were fairly certain we were looking at a barrens, something like Eastview Barrens State Nature Preserve in the same county. We consulted the Web and found some discussion on the term "barrens" for this area, with opinion leaning towards xeric limestone prairie instead.* Whatever the academics decide, we were just enthralled with our treasure trove! And of course we had to make yet another run south in August, just to see what we could find next.

In an effort to beat the heat, we set off very early the morning of August 22, planning to meet Andy and the luxury botanizing vehicle at the farm. One of the things I haven't mentioned, not wanting to deter putative botanists, is the discomfort we suffer both in the field and for a week to ten days afterwards.

There is not much shade in a prairie until the tall grasses actually *get* tall, which isn't until later in the year. Even in August they're not yet over our heads; they're not even up to our hips. So we're out in the sun and it's hot. Then there are the insects. You name them, we had them: ticks, large and small, lots; chiggers, mosquitoes, sand fleas (oh what misery...you think chiggers are bad?). And later—in September, I think—one we hadn't encountered before: thousands of teeny tiny tic nymphs! At least they scratch out easily, if you can see them at all...

So, to shield ourselves from the sun and keep out as many of the wee beasties as possible, we wear long, thick socks over short thin socks tucked over/under pants; thick shoes/boots; and long sleeves buttoned at the cuff. Right at that point on a 90-degree day when you are about to fling caution to the wind and remove just one layer...one or other of us would start to itch, or find a tick, and the better part of valor would prevail despite the heat!

*www.epa.gov/glnpo/ecopage/upland/oak/oak94/Proceedings/Baskin.html#Table%201

We were already well into our usual patch before Andy arrived, and once again the natural cycle of time had wrought its change. The plants that had been flowering a month before were now mostly producing seed, and there was a whole new crop of plants to work on. Some we had seen in their earlier leafy stages but were unable to identify until they flowered. There was the green-fringed orchid (*Platanthera lacera*); whorled milkweed (*Asclepias verticillata*), which is considered a noxious weed in some states(!); and the ashy sunflower (*Helianthus mollis*)—just one, I believe! The following list includes a few more of our findings, some expected, others less so:

Agalinis tenuifolia Slenderleaf false foxglove
Arnoglossum (Cacalia) atriplicifolium Pale Indian plantain
Bidens coronata Tickseed
Campsis radicans Trumpet vine/creeper
Conoclinium (Eupatorium) coelestinum Blue mistflower
Coreopsis tripteris Tall tickseed
Desmodium nudiflora Nakedflower tick trefoil
Eupatorium altissimum Tall Joe Pye weed
Euthamia (Solidago) graminifolia Flattop goldenrod
Gillenia stipulata American ipecac
Lespedeza virginica Slender lespedeza
Lobelia inflata Indian tobacco
Ludwigia alternifolia Seedbox
Solidago juncea Early goldenrod
Sorghastrum nutans Indian grass
Spiranthes lacera Northern slender lady's tresses
Strophostyles umbellata Pink fuzzybean
Strophostyles leiosperm Slickseed fuzzybean
Trichostema brachiatum Fluxweed, false pennyroyal

Also, we drove back to the pasture where previously we had mangled the green comet milkweed (*Asclepias viridiflora*) and were overjoyed to see it had developed seed pods. We hadn't totally destroyed the one example of this plant we had seen, and could hope to return next year and find at least a seedling or two in the vicinity.

By this late stage in the season, Dee Ann and I were quietly ecstatic about our discovery of this Kentucky prairie, each trip having been like dipping our arms into a treasure chest and pulling out gold, silver, and all kinds of gems. Neither one of us is a trained botanist, though we have both worked in related fields, and it naturally takes us far longer



Hike!

Tour premiere wildflower viewing areas with expert guides:

Big Walnut (Putnam County)
April 14

Twin Swamps (Posey County)
May 19

Limberlost Swamp (Adams and Jay Counties)
June 23

Ambler Flatwoods and Springfield Fen
(LaPorte County) August 11

Edge of Appalachia; Shawnee State Forest
(Adams and Scioto Counties, Ohio) September 8 & 9

Pedestal Rock Nature Preserve (Parke County)
October 20

than an experienced person in the field to grasp the ramifications of what we are seeing. It has been a major learning curve for us, but one with far-reaching implications. Where inquiry has been necessary, we have confirmed with our more informed acquaintances in the field that we really are understanding our findings correctly. Many of the plants we have “discovered” turn out to be “infrequent,” “rare,” “endangered,” or “considered extirpated/historical” in Kentucky. With the help of Andy’s brother-in-law Wayne, who has promised us that he will continue the “management” practices he has been observing for the past seven or eight years—i.e., taking the bush hog to the fields once a year in late October/early November—maybe we can change the records.

At this point we knew we would make at least two more trips this year: one each in September and October. Now armed with so much expert advice on the more unusual plants we might want to look for, using the presence of plants we had already seen as “indicator plants,” it seems strange that our penultimate “dip” into the treasure chest unearthed our most dramatic gems to date; yet we literally stumbled into them, the most unexpected and beautiful of our discoveries.

Remember the unusual plant that turned out to be in the Agave family, *Manfreda virginica*? We were returning to that area, which had proven to be the most productive in the sense of “infrequent” to “rare”

plants—and it was like walking onto bejeweled ground. The bluest of sapphires is no match for these flowers. We were looking at *Gentiana puberulenta*, almost a carpet of them, and we were down on our knees on the (wet) ground—not an infrequent occurrence for us, but unnoticed this time!—just trying to take them in: the glory of seeing something blooming this late in the year, that blue, and so many of them! We stayed for a long while and brought back many pictures, but the memory of that moment will stay with me forever.

We know we can look forward to many recurrences of our days in the prairie over the next few years, but the excitement of this first year will be hard to match. Our last trip, on October 31, 2006, showed us the sheer beauty and abundance of this type of ecosystem, the innumerable seeds designed to sustain all the life forms encompassed therein, without outside help—or hindrance. May we never again, in future natural history books, read the word “extirpated” in relation to such a place...

Our thanks to Andy Roller, his sister Mary, and her husband Wayne for encouraging and accompanying us on this adventure, and especially for their patience with us and their willingness to continue the practices that will ensure the future of this magical corner of the Midwest.



Manfreda virginica (L.) Salisb. ex Rose
False aloe. USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. Illustrated flora of the northern states and Canada. Vol. 1: 534. Photo above left by Dee Ann Peine.

Rain or Shine, They Pull and Dine

Maryland Native Plant Society member Luisa Thompson and her friend Sally Voris had a bright idea when they saw the need for a large-scale volunteer effort to remove invasive weeds from nearby Patapsco Valley State Park—and the Garlic Mustard Challenge was born!

Besides luring crowds to their aid that first year, the event continues to be one of the most popular and successful events put on by the Friends of the Patapsco Valley and Heritage Greenway. Volunteers have removed more than 3,722 pounds of garlic mustard from the park since 2000, and the annual May event has turned into a cooking contest for local professional and amateur chefs to show off their culinary talents using garlic mustard as one of the ingredients.

After the garlic mustard dishes are judged, free samples are available for the helpers, who are also entertained with stories and music. The Garlic Mustard Challenge motto: “We pull and dine...rain or shine!”

Tips on Cooking with Garlic Mustard

- Use garlic mustard in any recipe calling for mustard greens.
- Young plants have a mild mustard flavor with hints of garlic and can be used raw.
- Older, larger leaves and plants have a more bitter, stronger flavor.
- The round leaves are less bitter than the triangular ones on the flower stalk.
- If the plant is in full flower or has produced seeds, it will be much more bitter.
- DO NOT USE plants that may have been treated with weed killer.
- Pull up the entire plant gently. The roots will keep it fresh until you are ready to use it. Then cut off the leaves, discard the flower stalk, wash and use.
- Be creative; experiment with this weed while helping to control it!

Source: *Friends of the Patapsco Valley and Heritage Greenway, Inc.*, www.patapscoheritagegreenway.org/garlic07/index.html

May's the Month to

While strolling the woodland in May you come upon a vast carpet of pretty little four-petaled white flowers atop 2-foot stems, ornamenting the forest floor. A pretty sight indeed—for a noxious weed that has aggressively invaded our forested natural areas! It's that evil invasive garlic mustard, capable of dominating the ground cover layer to the exclusion of other herbaceous species. Here's what you need to know about it.

Garlic mustard or *Alliaria petiolata* (M. Bieb.) Cavara & Grande occurs most frequently in upland and floodplain forests, savannas, and along roadsides. It invades shaded areas, especially disturbed sites, and open woodland. It is capable of growing in dense shade and occasionally occurs in areas receiving full sun. Garlic mustard is native to Europe, and also occurs in northern Africa, Sri Lanka, and India. It was introduced into the U.S. in the 1800s and cultivated for food and medicinal purposes. In North America, garlic mustard is now distributed from Quebec and Ontario, south to North Carolina and Kentucky, and west to Kansas and North Dakota. In Indiana, it has been documented in almost every county and is now abundant in many of our forested areas.



Photo by Ohio Department of Natural Resources.

How will I recognize it?

Garlic mustard is generally the only tall, white-flowered, four-petaled plant that blooms in May. It is easily distinguished from all other woodland mustard plants by its characteristic odor of garlic and the 2-4 foot (0.6-1.2 m) tall flower stalks covered with numerous small white flowers. The alternate, coarsely toothed, broadly triangular stem leaves with a distinct petiole are also characteristic. The garlic odor gradually dissipates by autumn, and garlic mustard rosettes may then be mistaken for violets (*Viola* spp.) or immature white avens (*Geum canadense*).

Garlic mustard is a biennial herb. Seeds germinate in early spring, young plants overwinter as basal rosettes, and adults bloom from May-June the following year. Each plant dies after producing seed. Seeds disperse when the siliques burst at maturity in August. Seeds have a 20-month dormancy period and do not germinate until the second spring after ripening. The species reproduces readily from the numerous seeds produced.

Garlic mustard can be distinguished from other species by examining the roots. It has a white slender taproot, with a characteristic crook or “s” shape at the top of the root, just below the base of the stem. Garlic mustard should be accurately identified before attempting any control measures. If in doubt, confirm the plant's identity with a knowledgeable individual or by consulting references.

Pull Garlic Mustard

Now that I know it's garlic mustard...

If you've encountered a light infestation, remove the plants by hand-pulling. Such control is effective as long as the root is removed. If the stem snaps off from the root crown of a non-flowering plant, the plant may re-sprout. When hand-pulling, disturb the soil as little as possible, and tamp the soil firmly after removing the plant. Soil disturbance can bring garlic mustard seed to the surface and create a favorable environment for garlic mustard germination and growth.

Additional effort may be required to control garlic mustard in high quality natural communities with heavy infestations. Research indicates that cutting flowering stems at ground level results in 99% mortality, while cutting at 4 inches (10 cm) above ground level produces 71% mortality and reduces total seed production by 98%. Plants cut near ground level when in full flower usually do not re-sprout. Viable seed may be produced after stems are cut, so remove cut stems from the site when possible.

Besides manually cutting the plants, additional efforts using herbicides, burning the area, or a combination of these practices may be needed for heavy infestations, and it is recommended that you enlist professional assistance. Pesticide application and or prescribed burning should be carried out appropriately according to all state and federal laws. The Nature Conservancy has successfully controlled or eliminated this plant from several sites by a combination of spring burning, hand-pulling, and cutting flowering stems with a scythe. When garlic mustard occurs in nearly pure populations with few other plants, scything is advantageous in that large areas can be covered quickly and the soil is not disturbed.

Tell me more...

For more details about garlic mustard and other invasive species, get a fact sheet from the Midwest Invasive Plant Network at www.nps.gov/plants/alien/fact/alpe1.htm or visit the Midwest Invasive Plant Network website at www.mipn.org. For help with evaluating a garlic mustard threat in your woodland, identify your local forester at IDNR Division of Forestry by visiting www.in.gov/dnr/forestry and selecting Private Landowner Assistance from the menu. Your local Soil and Water Conservation District (SWCD) can also be of assistance; get their contact information at www.in.gov/isda/soil/contacts/map.html.

Renew!

Your membership is appreciated and important to INPAWS. Not sure if you renewed? Look for a number in the upper right corner of the address label on the back of this issue. If it says 2006, you have not renewed your INPAWS membership for 2007. Please renew now by completing the membership renewal letter mailed to you in January or the membership form available at www.inpaws.org. Return it to: INPAWS, P.O. Box 30317, Indianapolis, IN 46230-0317.

BACK BY POPULAR REQUEST

Sophia Anderson's Famous Garlic Mustard Lasagna

In a heavy skillet, brown:

2 pounds ground beef, Italian sausage, or a combination

Add and simmer 30 minutes, stirring frequently:

1 garlic clove, minced

1 tablespoon dried basil

½ teaspoon salt

1 16-ounce can tomatoes

2 6-ounce cans tomato paste

½ cup dry red wine

Cook according to package instructions, drain, and set aside in two parts:

1-pound package lasagna noodles

Thinly slice and set aside in two parts:

1 pound Mozzarella cheese

Steam until wilted and set aside to cool:

10 ounces garlic mustard leaves

Combine and blend well:

2 eggs, beaten

3 cups Ricotta or cottage cheese

½ cup grated Parmesan cheese

2 tablespoons parsley flakes

½ teaspoon salt

⅛ teaspoon black pepper

Into a 9 x 13 x 2 buttered baking dish, lay half the lasagna noodles. Spread with half the Ricotta mixture, half the Mozzarella slices, all the garlic mustard, and half the meat sauce.

Place the remaining noodles in position and cover with the remaining Ricotta mixture, meat sauce, and Mozzarella slices, in that order.

Bake in a 375-degree oven for 30 minutes or until bubbly. *Bon appétit!*

Reprinted from Indiana Native Plant and Wildflower Society News, Spring 2000.

Spotted Geranium

Gene E. Bush,
Munchkin Nursery

Geranium maculatum

Steady horses plod along, one foot in front of the other, day after day, doing the job they were assigned—reliable, dependable, steadfast, and often taken for granted. Old Ned, being a common breed, is sure to be ignored in favor of the more exotic Arabians, trotters, and show horses. In like fashion, many a durable native woodland plant is passed over with a ho-hum in favor of the more exotic names and more spectacular performances.

Geranium maculatum, our spotted wood geranium, is one such stalwart. The plough horse of geraniums, it is found in every state east of the Rockies, from Canada through Florida. In Indiana, the geranium is found growing in all but seven counties. The holes in Indiana's map are probably due more to reporting and recording than to the reality of the wild.

Large, handsome palmate leaves can be eight to nine inches across, divided into five to seven segments. Veins running through the leaves create quilting-like patterns on the leaf surface. Bright, rich green color further enhances the foliage. Well-grown stems will reach 18 to 24 inches in height.

Flowers are some shade of rose-purple with a bit of variation in color from one location to another. Each flower has five rounded petals a bit over an inch across with ten stamens. White forms are occasionally found both in the wild and in nursery catalogs. However, the white form is often confused with *Geranium sylvaticum*, the European wood geranium. If you compare the foliage of your native with the European, it is easy to recognize the difference. Look for the flowers to begin opening in April, lasting into the first part of May, depending upon how far north or south you garden.

After fertilization, seed pods form shapes resembling a long, narrow, pointed bird's beak with a rounded head. Crane's bill is a second name given to the geranium because of the seed dispenser's similarity to the long-legged bird. The beak is made up of several little catapults, all hinged at the tip of the beak. Seed rests in little half-

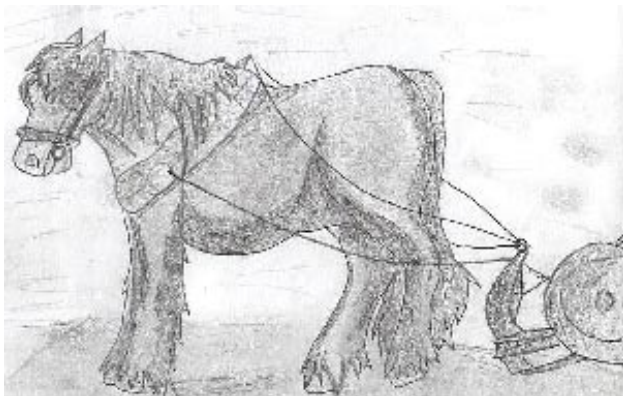


cup at the base forming the head. With maturity, straps from base to point become dry, creating tension. Eventually the pods break loose, and the sudden release of tension flings the seed up to 20 feet away from parent plants.

Spotted geranium can and will grow in varying environments as evidenced by their distribution. As with other perennials, if you want the geranium to perform and appear as in glossy gardening magazines, give it good garden soil. Decent soil and moisture levels, with all the light you can provide without being in full sun, will give you an exhibition-quality plant. I use a mulch of chopped leaves late each fall, and that is both nutrition and mulch for my geraniums. My drift of geraniums covers the ground beneath a native dogwood in open shade. It has now wandered over to mingle with the branches of a rhododendron.

Geranium maculatum can be used beneath trees in root competition where it will perform well. Perhaps not as tall or quick-spreading as in more favorable circumstances, it remains a good choice for difficult places in the garden. If the environment becomes too dry, the geranium goes dormant earlier than normal. Usually dormancy is around August in my garden.

A companion plant I especially enjoy is Solomon's seal (*Polygonatum biflorum*), which emerges to arch over the ground-covering drift of geranium. Even more showy are the blooms and berries of the *Smilacina racemosa*, or



Solomon's plume. Tall ferns are a treat, and several of the more common natives work very well. My two favorites are cinnamon fern (*Osmunda cinnamomea*) and royal fern (*O. regalis*). Contrasting textures and colors of foliage are primary, with fertile fronds of the blooming ferns adding to the show through the summer. The large leaves, length of bloom, and fascinating seed pods of spotted geranium create a native garden unsurpassed by any of its more exotic cousins.

©2007 Gene E. Bush. Gene can be reached at Munchkin Nursery & Gardens LLC, 323 Woodside Dr. NW, Depauw, IN 47115, 812-633-4858, or www.munchkinnursery.com. Photo by the author.

Help!

INPAWS Plant Sale Coming Soon

This popular INPAWS fundraiser is a great way to get to know fellow INPAWS members while learning more about native plants. It is also a wonderful way to share your own native plants and knowledge with others. It's set for **Saturday, May 12, at Indiana School for the Blind, Indianapolis.**

Volunteering for this event is fun, and a range of jobs is available, so even if you are new to INPAWS or to native plants, please feel free to join in. We can use volunteers for these tasks:

Publicity: Let us know if you have opportunities to publicize this event.

Donations: Plant donations are gratefully accepted, as well as good books or artwork related to native plants. Plant drop-off is Friday, May 11, 5:00–9:00 p.m. and Saturday, May 12, 7:30–9:30 a.m.

Setup and sales assistance: Helpers are needed to set up tables and process donated plants on Friday, May 11, 5:00–9:00 p.m. and Saturday, May 12, 7:30–9:30 a.m. Helpers are also needed to assist with checkout and customer questions during the event.

With your help, we'll have another successful event! To volunteer, please contact: Tom Hohman at hohmantr@aol.com or 317-831-1715; or Janice Gustaferro at jan_in@egix.net or 317-596-0977.

TAKE A [MINI]-HIKE!

St. Vincent's Backyard

A hidden treasure many Indianapolis north-siders may not be aware of is a small square of woodland immediately south of St. Vincent Hospital's 86th Street campus, and owned by the hospital. Bounded by Harcourt Road, Dugan Drive, Naab Road, and Katie Knox Drive, its beeches, tulip poplars, buckeyes, oaks, and maples shelter an unusually rich abundance of wild flowers in the spring. Now is exactly the right time to visit!

A marked parkour* trail manages to trace out an entire mile by winding a circuitous route through the interior of the area, and it offers an opportunity to discover the woods' ever-changing panorama of spring ephemerals. Pepper-and-salt (*Erigenia bulbosa*) makes a first appearance in mid- to late-March, followed by bloodroot, rue anemone, cut-leaf toothwort, and a veritable carpet of spring beauty and Dutchman's breeches. Other species include yellow and white trout lilies, bent and sessile trilliums, purple and yellow violets, jack-in-the-pulpit, green dragon, and may-apples. There are even a few daffodils, lavender crocus, and star of Bethlehem, possibly moved there by squirrels or raccoons.

Later in the season, a walker can observe large-flowered bellwort, Solomon's plume, waterleaf, and jewelweed. Each species tends to flower somewhat earlier on the southern edge of the area—along Dugan Drive—and spread north. While mostly level, the path is quite muddy in places; be sure to wear old shoes!

The edges of the plot are unfortunately infested with garlic mustard, which several of the regular visitors uproot from time to time, but there has been no concerted effort to eliminate it. Some places have thick stands of honeysuckle bushes as well. But, for the most part, this is one of the most accessible ways to spend a half hour—or longer—enjoying spring wildflowers rarely seen in this abundance.

—Patricia Wittberg

Directions: Take I-465 to either the Michigan Road exit or the Meridian Street exit and head south to 86th Street. At 86th, turn left from Michigan Road or right from Meridian Street and go about a mile until you reach the St. Vincent Hospital complex on the south side of 86th. Turn down either of the two streets (Naab or Harcourt) bordering the hospital. The woods are in the block immediately behind (south of) the hospital.

*I learned a new word: *parkour*, the physical art of moving from point A to point B as efficiently and quickly as possible, overcoming obstacles in the surrounding environment such as branches, rocks, and walls. —Ed.

SEEDS Millenium Seedbank Project Needs You!



Seeds of Success (SOS) at Chicago Botanic Garden seeks native plant enthusiasts to help collect native seed from 1,500 species of flora of the tallgrass prairie and surrounding Midwest ecoregions. SOS is an extension of an international *ex-situ* seed conservation initiative—the Millennium Seed Bank Project—developed and housed at the Royal Botanic Gardens, Kew, UK. This global program aims to collect and seed bank 10% of the world's flora by 2010.

CBG is recruiting and funding individuals who live locally throughout the target territory to serve as “contract botanists.” Seed collection and mileage are compensated. For information, contact Betsy Allen or Emily Yates at msb@chicagobotanic.org. Additional details are posted at www.inpaws.org.



Members Oppose Crown Hill Woods Rezoning

Selected INPAWS Executive Council officers, chapter leaders, and committee members, acting as individuals, have expressed opposition to rezoning the north woods of Crown Hill Cemetery for residential/commercial use.

In a statement sent to the Indianapolis Metropolitan Development Commission, they stated: “As INPAWS leaders, we do not presume to speak for the entire membership, but our opposition to the Crown Hill rezoning grows directly out of INPAWS’ mission of helping Indiana appreciate, preserve, conserve, utilize and study its native trees, shrubs and wildflowers. The north woods of Crown Hill constitute a unique area—one of the largest undisturbed forest areas in Marion County, with evidence of a remnant pre-settlement flatwoods and over 50 varieties of native wildflowers. If the property is rezoned, Indianapolis stands to lose 2,745 established trees between 9 and 80 inches in diameter, some of which may be 200 years old. The proposed development will

destroy a piece of Indiana's natural heritage that can never be replaced.”

The statement and its signers are posted at www.inpaws.org. Information about proposed alternative uses of the woods may be found at www.allianceofcrownhillneighbors.org.

Meijer Selling Natives

Starting this spring, Meijer shoppers will be able to purchase regionally native plants such as redbud, purple coneflower, and big bluestem. In a groundbreaking partnership, The Nature Conservancy helped Meijer garden centers select 119 trees, shrubs, and perennials that will carry a new “Recommended Non-Invasive” tag. The stores will also remove the invasive Norway maple and Lombardy poplar from their inventories. “People want to help the environment, but don’t often know how,” a Meijer spokesman said. “This will help educate consumers while they’re shopping about what plants are best-suited for their backyard to avoid a detrimental effect on the landscape

we all share.” Signs, videos, audio announcements and brochures will educate shoppers on the benefits of native and noninvasive plants, and Conservancy scientists will train garden center staff to answer customer questions.

Art Show Celebrates Central Indiana Nature Preserves

The Central Indiana Land Trust Inc. (CILTI) announces a historic coming together of environmental representatives and fine art organizations to mount a juried art show entitled “Preserving Nature.”

A select group of the state’s finest landscape artists have rendered scenes from 14 of CILTI’s scenic nature preserves. The show’s gala opening is set for Saturday, April 14, 4:30 p.m., at the Artsgarden in downtown Indianapolis. Stephanie Mills, inspiring author, lecturer, and ecological activist, will deliver the keynote address. CILTI hopes the public will take part in this extraordinary event. Tickets are \$10 at the door.

The paintings will circulate to the following central Indiana venues. **April 14–28:** Artsgarden at Circle Centre Mall, Indianapolis. **May 2–8:** Johnson Center for Fine Arts, Franklin College; reception and presentation on land conservation Monday, May 7, 7:00 p.m. **May 22–June 3:** Carmel Public Library; reception Friday, May 25. **June 4–27:** Exhibit to be split between the Greencastle, Martinsville, Danville and Greenfield Public Libraries. **June 30–July 25:** Brown County Art Gallery.

For more information, please visit www.cilti.org or call 317-631-5263.

Plant Lovers Invited to Join Phenology Network

A new USA National Phenology Network is tracking periodic plant and animal life cycle events that are influenced by seasonal variations in temperature and precipitation. Wide ranges of phenomena are included, from first openings of leaf and flower buds, to insect hatchings and the return of birds. The timings of such events are indicators of the impact of local and global changes in weather and climate on the Earth's biosphere.

The program will include indicator plants (lilacs or other species that facilitate comparisons between sites) and a small set of native plants especially suited to each region. Participation will require just a few minutes each day during the leafing, flowering, and leaf coloring periods in spring and fall. Those of you already participating in CoCoRaHS weather observations (see Spring 2006 Field Notes) are especially valuable, because the weather data you collect may help explain some of the plant behavior and changes.

Register to become a USA-NPN observer at www.npn.uwm.edu. In the "comments" box, put your name, full email address, mailing address, and, for weather watchers, your CoCoRaHS station number. If you do not have Internet access, call 414-229-2436 or write to Prof. Mark D. Schwartz, Department of Geography, UW-Milwaukee, Milwaukee, WI 53201-0413, and furnish the same contact information.

Deadline for Summer Issue of INPAWS Journal: May 23.

Coming Events

Saturday, April 14

INPAWS Field Trip: Spring Ephemerals of Big Walnut Preserve

Moderately rugged hike through ravine forests of Big Walnut Creek and Tall Timber Trail. Led by Roger Hedge, IDNR Division of Nature Preserves. Located near Bainbridge in Putnam County. 10:00 a.m. EDT.

Saturday, April 14

Preserving Nature Art Show

Gala opening 4:30 p.m. at the Artsgarden at Circle Centre Mall, Indianapolis. INPAWS is proud to sponsor this unique art show.

Friday-Sunday, April 27-29

22nd Brown County Wildflower Foray

Monitor habitat change and discover new species in bloom in this annual wildflower count. Hikes and programs take place in Brown and Monroe Counties; some require preregistration. Information at www.fs.fed.us/r9/hoosier/docs/events/wildflower.htm. INPAWS is proud to sponsor this event.

Saturday, May 12

INPAWS Plant Sale and Auction

Book sale 9:30–noon, plant sale 10:00–noon, auction 11:00. Churchman Hall, Indiana School for the Blind, 7725 North College Avenue, Indianapolis, IN 46240. Auctioneer: Mike Stelts. Purchases may be made with cash or check. Plant donation drop-off is Friday, May 11, 5:00–9:00 p.m. and Saturday, May 12, 7:30–9:30 a.m.

Saturday, May 19

INPAWS Field Trip: Twin Swamps Nature Preserve

Level, possibly muddy hike through perhaps the finest of Indiana's few naturally occurring bald cypress swamps. A short boardwalk allows for an up-close look at the swamp without getting wet feet. Led by Mike Homoya, IDNR Division of Nature Preserves. Located near Mt. Vernon in Posey County. 10:00 a.m. CDT.

Saturday, June 23

INPAWS Field Trip: Loblolly Marsh/Limberlost Swamp

Level, possibly muddy hike through the area lovingly described in Gene Stratton-Porter's stories. After nearly a century of growing row crops, this once extensive wetland is being restored to its former grandeur. Led by Ken Brunswick, IDNR Division of Nature Preserves. Located near Bryant in Jay County. 10:00 a.m. EDT.

Watch for announcements of INPAWS events and field trips in the mail, via e-mail, and at www.inpaws.org.

T.A. in Trouble *PT. 2*

Barbara E. Plampin, PhD, Shirley Heinze Land Trust



Anthropogenic disturbance and deer teeth and hooves aren't the only problems facing Duneland trailing arbutus (*Epigaea repens*). Alarmingly, most of our plants don't bloom, and the few that do usually fail to set seed. When Indiana Dunes National Lakeshore (IDNL) botanist Dan Mason sent Lydia Miramontes and me to count plants in Eastern Porter County, we found only a scattered handful in bloom. Later, Dan found none had fruited; hence, no seeds.

What was going on? It's not that Dunes T.A. lacks pollinators; the soil is suitable for the necessary ground-dwelling bumblebees (*Bombus bifarius*, *B. terricola*, *B. vagans*), says Dan. It's that T.A. is often dioecious, with male and female flowers living on separate plants. When there aren't enough flowers, bees usually don't see them, and when they do, a phenomenon called receptivity enters the picture. When female plants are over there and male plants are over here, ripe pollen and receptive stigmas are

often out of synch; that is, pollen ripens too early or too late to fertilize many or even any female flowers. When flowering populations are large, enough pollen will be ripe at enough times to fertilize enough flowers to ensure reproduction. Thus, right in the Dunes, right in our own backyard, island biogeography is at work.

In 2006, Dan became a marriage broker. In my North Central Porter County yard, which borders IDNL, flourishes an irregular 20 x 20-inch patch of very well fenced T.A., perhaps the largest around. In 2005, its numerous flowers, all female, did not fruit. The nearest T.A. plant is a non-bloomer over a thousand feet away. Dan took pollen from Eastern Porter T.A. and hand-pollinated five flowers in my T.A. patch. After using a tiny brush to remove pollen and attach it to the stigma, Dan found that plucking off an anther with tweezers and rubbing it over the stigma worked better. The result: three capsules containing viable seed.

Dan also pollinated some Eastern Porter County plants and obtained two seed capsules. Dan put the seeds in cold storage (stratification) until time to germinate them in mid-February in a mix of peaty, organic sand with some soil from the Eastern Porter County habitat to provide the necessary mycorrhizal fungus, and perhaps a commercial bacterium. Dan hopes for flowering plants in two or three years. These will probably be installed near existing plants.

What about cuttings? Dan thinks our populations are too scarce and that cuttings grow too slowly. Transplanting T.A. to get males and females closer together would almost certainly kill the transplants because of mycorrhizal fungus problems.

My hearty thanks to Dr. Dan Mason of the Indiana Dunes National Lakeshore for his help with this article. Any errors are mine.
—Barbara E. Plampin



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