ONAPA NEWS

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VOLUME 8 ISSUE 1 WINTER, 2020-21

INSIDE THIS ISSUE

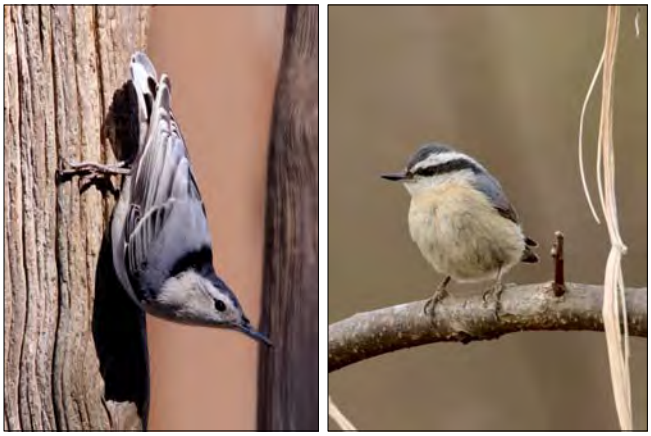
One is matter-of-fact and the other is happy-go-jolly: Ohio's Nuthatches

I sometimes think that the bird-lover finds a little more pleasure in the out of doors than any other hobby-rider. Still, let us not quarrel with the patient botanist, the studious astronomer, the ardent angler or even the golfbug! Each man to his hobby, and our motto, "Laissez-faire." Let us reserve our hatchets for the poor duffer who refuses to pursue an avocation. But the bird student can enjoy the snowstorm as well as the sunshine, or even a rainy day, mayhap. He walks erect, his head thrown back, eyes alert. There escapes him neither the glory of the sunrise nor the whispering of the leaves; neither the beauty of anemone or trillium, nor the splendor of the stars in the evening. Bird study is open to the rich and poor, old and young, and it is fascinating to the person who merely desires pleasure and relaxation as well as to the painstaking investigator.

"***Each to His Hobby**," an excerpt from Edward Sinclair Thomas, 1981,* **In Ohio Woods and Fields**, *page 1.*

By John Watts

Ohio Naturalist, Edward Sinclair Thomas first penned this essay in 1922 expressing his view of the joys of birdwatching. Annually, winter arrives and many people begin to fill their feeders with seed to attract and observe winter birds. As Thomas notes, everyone can enjoy bird watching at whichever level they choose. Watching species that occur near where one lives can be a rewarding and enjoyable learning experience. It's possible that at least 20 species of birds visit every feeding station in Ohio during our winter months.



Photos by John Watts

White-breasted Nuthatch (left) and Red-breasted Nuthatch (right) exhibit very different personalities.

Two species that are often observed at many feeders in Ohio are White-breasted and Red-breasted Nuthatches. Members of a small family of birds with only four species in North America, they are best known as the only species of bird that regularly forages while moving down a tree headfirst in search of food items. This behavior is an adaptation that is thought to allow them to locate food items missed by other birds. They possess long toes with very sharp claws that allow them to easily cling upside down on tree trunks descending from the top in a series of short, jerky hops.

Both nuthatches can be described as short, stocky birds that are blue-gray above and white beneath with long straight bills. The White-breasted Nuthatch is the noticeably larger of the two Ohio species. White-breasted Nuthatches are easily distinguished by the large white areas on the side of the face and neck and the all-white flanks and belly. In contrast, Red-breasted Nuthatches are smaller and show a prominent black eye-stripe, dark cap and buffy to red-brown wash on the flanks, chest and belly.

Of the two species, the White-breasted Nuthatch is much more common. This permanent resident of Ohio is not only a common sight at winter feeding stations, but it also nests in all 88 of Ohio's counties and has an estimated statewide population of 280,000 individuals (Rodewald et al 2016). As inhabitants of open deciduous forests, they are regularly encountered in parks, gardens, small woodlots and cemeteries. While they are generally referred to as "common", most observations and occurrences are of single or pairs of birds. They are rarely observed in groups outside of family groups at the time of fledging during breeding season. They appear to bond for life and in

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Nuthatches brighten Ohio winters

White-breasted Nuthatch foraging.

the winter, while not often seen together, the pair is generally within "ear-shot" of each other in the woodlot they utilize for breeding.

Though mostly considered a winter visitor, the Red-breasted Nuthatch is also a rare breeding species in Ohio. As a resident of mostly northern forests comprised of balsam, spruces and pines, the southern edge of its breeding range extends into Ohio. Ohio's first nesting Red-breasted Nuthatch was documented in 1929 by Lawrence Hicks in Ashtabula County (Hicks 1933). Most records of breeding Red-breasted Nuthatches are from the northern third of Ohio; however, there are a few records from the Hocking Hills and adjacent region which suggest a small localized breeding population in this area (Rodewald et al 2016). Their winter movements into Ohio span the range from winters with very few, if any, individuals observed to invasion years where they are very widespread and can be observed in good daily numbers. An indication of an invasion year, beyond cone crop failure forecasts, is the arrival of Red-breasted Nuthatches as early as late August with numbers increasing throughout September.

Both nuthatches are cavity nesters often using deserted woodpecker holes at least 15-feet above the ground. Red-breasted Nuthatches are also known for utilizing the pine pitch residue of their coniferous forest trees to smear around the nest hole to discourage predators from attacking their nesting cavities. When approaching a nesting cavity, Red-breasted Nuthatches especially are known for folding their wings and flying straight into the cavity in a straight dive without touching any of the edges of the nesting hole.

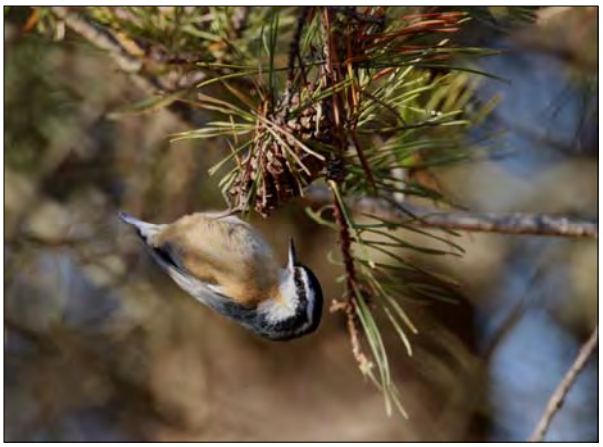
Both species of nuthatches are known to cache food items for future meals. While foraging for food items, they will often take a seed and wedge it into the bark of a tree and break off smaller pieces to eat. Sometimes they leave a piece behind to come back for retrieval later. The photo at right shows a piece of sunflower seed that a White-breasted Nuthatch was observed using when performing this characteristic behavior.

Nuthatch cache.

Their common name nuthatch is a corruption of "nuthack" referring to the habit these birds have of securing a seed in a crack in a log or back then "hacking" away at it with its beak until it opens. The Cherokee Indians called the nuthatch *Tsuliena* meaning deaf, a reference to their tame nature around humans and appearing deaf to man-made noises.

The specific genus name for the nuthatches *Sitta*, is from Greek and was used by Aristotle for "a bird that pecks at the bark of a tree", possibly referring to the nuthatch. The White-breasted Nuthatch's scientific name is *Sitta carolinensis*, suggesting a more southern "of Carolina" range; however, it ranges throughout a large portion of the United States and central Canada. *Sitta canadensis*, the Red-breasted Nuthatch refers to "of Canada" due to its more northern breeding range, which extends south in the upper elevations of the Appalachian Mountains.

Both species of nuthatches that occur in Ohio are fairly vocal and as winter residents calling throughout the season. The White-breasted Nuthatch call has been described as a high-pitched "*nit-nit-nit-nit*" or "*yank-yank-yank-yank*". A louder call often heard on sunny days is paraphrased "*what-what-what-what-what*". Arthur Cleveland Bent notes that some consider the White-breasted Nuthatch as a very "matter-o-fact bird". These plain loud calls would seem indicative of such a bird. The Red-breasted Nuthatch on the other is felt to be "a happy-go-jolly bird" with a variety of nasally short "*yna-yna-yna*" or longer nasally "*yaaaaaa-yaaaaa-yaaaa*". In migrating flocks or loose groups, Red-breasted Nuthatches tend to be very vocal with a variety of nasally squeaks continually repeated to each other by all in the group.



Red-breasted Nuthatch feeding on a pine cone.

Ohio has one other nuthatch record. A Brown-headed Nuthatch visited a feeder in Geauga County between November 21, 2001 and January 15, 2002 (*Rosche 2004*). Brown-headed Nuthatches are commonly found in the southern oak-pine forest of the southeastern United States with only a few records outside of its normal range.

2020 was certainly a trying year. However, one positive aspect is that families, as they were locked down at home, began to notice the birds in their yard. The Cornell Laboratory, who operates eBird, reported more than 150,000 people downloaded the Lab's free Merlin smartphone app for bird identification in April 2020, which is the largest monthly increase in the app's six-year history. (*Lots of People Are Discovering the Joy of Birding from Home During Lockdown*, June 6, 2020, Cornell Laboratory). The National Audubon Society reported in August 2020 that while many sectors of the economy continued to struggle, "backyard birding" has hit an all-time high. They report that May sales of supplies such as birdseed, birdbaths, feeders, etc. were up by 50-80% in many areas. (*Birdwatching is a Bright Spot in a Pandemic-Stricken Economy*, August 6, 2020). The more people, and especially children, who find the joy and calm of bird watching, the more likely this will result in the recruitment of new supporters to the overall pool of those promoting preservation and conservation efforts in Ohio and across the country.

That is a true win for Ohio's natural areas.

John is a retired Resource Manager with the Columbus Metro Parks and serves on the ONAPA Board Advisory Committee.

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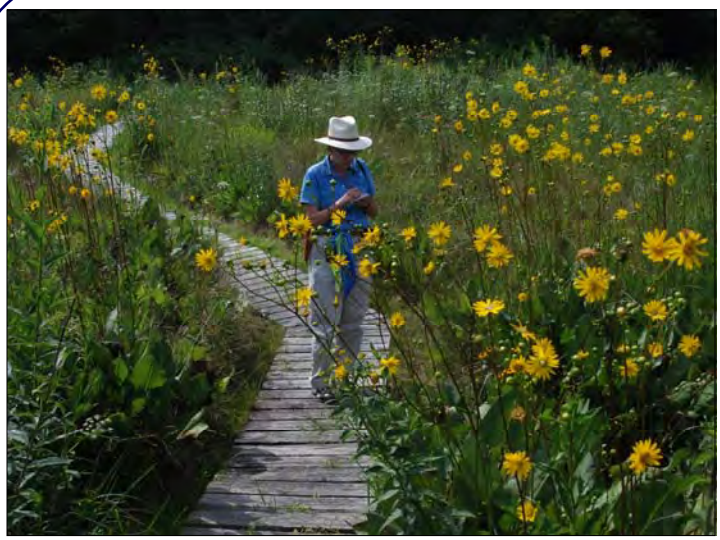

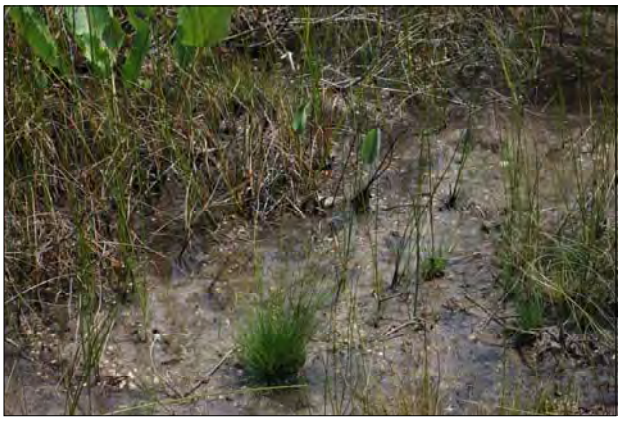

Photos by Guy Denny

Jan Kennedy at Prairie Road Fen SNP (left) where open marl flats (above) are characteristic of Ohio fens.

What the heck is a Fen?

By Guy Denny

In 1909, State Geologist J. A. Bownocker of the Ohio Geological Survey commissioned Dr. Alfred P. Dachnowski (1835-1949) botanist with The Ohio State University to do an "estimate of the extent and value of the peat-bog and marshland in Ohio, to determine the depth of these deposits, their general physical and chemical characters and in particular to study them with a view to their fuel, commercial and agricultural utilization." This survey included developing a comprehensive list of peatland plants occurring in each of the various sites visited. Dachnowski's work culminated with the 1912 publication Bulletin 16, of the Geological Survey entitled "Peat Deposits of Ohio." The text of this book is still available free on line and provides a remarkable comprehensive accounting of peatlands and peatland vegetation in Ohio during the early nineteen hundreds.

In Bulletin 16, Dachnowski states, "According to the preponderance of certain plant forms two types of bog meadows may be recognized. They should properly be regarded as separate associations. Since they exhibit distinct differences among themselves. The one is a bog produced; principally by sedges (Carex sp.) and other similar plants; while in the other, the cranberries and sphagnum mosses are the chief peat formers." He classified these distinctive types of peatlands as "**sedge bogs**" and "**cranberry-sphagnum bogs**". Even though these two types of peatlands were very different from one another based on their plant associations and physical settings, peatland scientists in North America continued to collectively refer to such peatlands simply as "bogs" for the next 31 years.

Although the term "fen" had been used in Great Britain to describe their calcareous, sedge-dominated peatlands for quite some time, it wasn't until 1943 that this term was first used to describe sedge-dominated calcareous peatlands in North America. The first ecologist to use the term in this country was Professor W. A. Anderson who in 1943 published "A Fen in Northwestern Iowa" in the journal, *American Midland Naturalist.* The description of the vegetation and physical structure of Anderson's fen generally fits the description of Great Britain's fens but, even more so, they accurately described what Dachnowski had labeled as "sedge bogs" in Ohio. American botanists soon realized these calcareous minerotrophic fen peatlands were not unique to Iowa but occur throughout most of glaciated North America. Such mineral-rich peatlands are now universally recognized by peatland ecologists and botanists as fens and more specifically minerotrophic or calcareous rich fens. Minerotrophic simply means receiving nutrients from groundwater and therefore rich in minerals. Cranberry-sphagnum bogs by comparison are based on acidic sphagnum peat, are nutrient deficient and are structurally quite different, being confined to mostly glacial kettle-hole lake basins.

Fens and sphagnum bogs are both survivors, living relicts of the last Ice Age, which may share a few of the same species of plants. However, they are two different and distinctive kinds of ecological peatland communities just as Dachnowski pointed out in 1912. Fens occur on mineral soils in association with flowing alkaline mineral rich groundwater. They are based on a substrate of calcareous marly graminoid sedge peat (peat comprised of partially decomposed sedges, rushes and grasses) rather than on acid sphagnum peat moss contained within a deep lake basin as are sphagnum peat bogs or what Dachnowski called cranberry-sphagnum bogs.

Canadian plants, initially forced southward by the Wisconsinan Glacier as it first slowly moved across the landscape, were probably among the first species to then re-colonize the newly exposed wet calcareous mineral soils emerging from beneath the melting ice sheet with the final retreat of the glacier. Fen plants would have been especially prevalent along the shores of the meltwater lakes paralleling the continental glacier as it made its retreat back north thousands of years ago. This continuum of newly exposed mineral soils and bare glacial lake shorelines extending between the Rocky Mountains and the Atlantic Ocean apparently provided a corridor for certain western species to migrate eastward and certain Atlantic Coastal Plain species to migrate westward. Consequently, in addition to boreal species, both prairie and coastal plain species are represented in our present-day fen communities.

As the climate in North America continued to warm and the Wisconsinan Glacier continued melting, a band of fen vegetation recolonizing the newly exposed mineral soils and glacial lake shores would have receded northward in close proximity to the glacier. However, northern fen species left well behind in what was a gradually warming landscape perished in the absence of the effects of the glacier and were ultimately replaced by more southern species of plants. Only in disjunct isolated sites where cold alkaline spring waters seeped out of the ground thus simulating environmental conditions like those occurring adjacent to the melting glacier, were pockets of fen plant communities able to survive long after the disappearance of the Wisconsinan Glacier. These are our fens occupying today's landscape.

Fens are a specific assemblage of plants growing in association

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18 stewardship projects wrap up 2020 in preserves

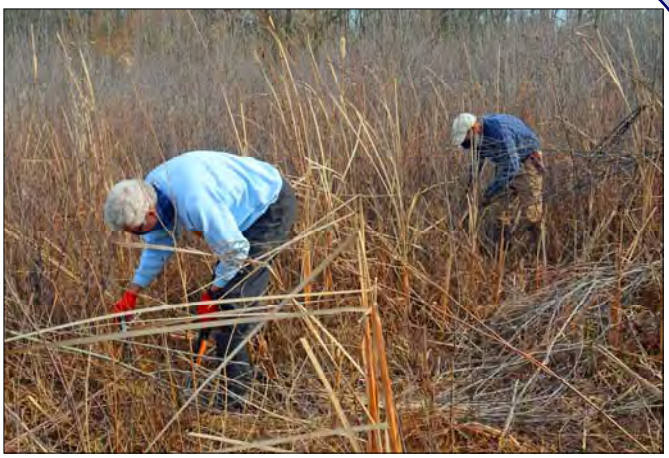
By Jennifer Windus

September through November has seen more than 18 stewardship projects conducted with our Stewardship Assistants, Maddie and Landon (see article below), and our loyal volunteers. Some of these projects were advertised on the website and some were done with just a few volunteers and the stewardship assistants to keep group numbers low in these COVID times. More photos from some of these projects can be found on our website at www.onapa.org. In September, our trips included Brinkhaven Oak Barrens, Cranberry Bog, Crane Hollow, Erie Sand Barrens, Gallagher Fen, Herrick Fen, Kelleys Island, and Kiser Lake Wetlands.

For most of these trips, we were conducting habitat management, removing invasive plants and restoring important habitat. Our trip to Crane Hollow was specifically to help with Northern monkshood monitoring, one of only two locations in the state for this Federal listed plant. Crane Hollow is a state nature preserve, but it is owned and managed by Crane Hollow, Inc., a private organization and the preserve is accessible by permit only. We continue to partner with the Killbuck Watershed Land Trust at Brinkhaven Oak Barrens and partnered with The Nature Conservancy at Herrick Fen.

In October, our trips included Brinkhaven Oak Barrens, Cranberry Bog, Karlo Fen, Lakeside Daisy Preserve, and Richfield Heritage Preserve. We are still cooperating with the Friends of Crowell-Hilaka to help them identify and control invasive plants at Richfield Heritage Preserve. This project focused on woody invasives such as glossy buckthorn, Amur bush honeysuckle, autumn-olive, and Amur corktree. At Lakeside Daisy Preserve, we did some habitat management on the new addition and transplanted Lakeside daisies from the Lafarge Quarry to increase the population on the new addition.

In November, our trips included Brinkhaven Oak Barrens, Cranberry Bog, Killbuck Marsh Wildlife Area, Medway Prairie Fringed Orchid Site, Kelleys Island, Lakeside Daisy Preserve, and Prairie Road Fen. Trips to Kelleys Island State Park in September and November were to conduct cedar removal in the Lakeside daisy areas and disperse daisy seeds collected from the Lafarge Quarry. At Killbuck Marsh and Medway, we were removing invading woody species to improve habitat for the Eastern prairie fringed orchid, another Federal listed plant. This season included 3 trips to Cranberry Bog where we are working hard to re-open the bog meadows by removing poison sumac, glossy buckthorn, and alders. ONAPA is committed to working with DNAP to restore the meadows, improving habitat for two orchids, pitcher-plants, large cranberry, round-leaved sundew, and several rare sedges. NOPES, the Native Orchid Preservation & Education Society, based in Cincinnati has been helping us at Cranberry Bog and we are delighted to work with them as a new partner.



Volunteers cut and treat invasives at Prarie Road Fen SNP.

We will take a short break from stewardship in December, but watch for more projects to be posted on our website, Facebook page, and eNews for January-March. We are always looking for new volunteers and can guarantee you will have fun and feel good about restoring Ohio's natural areas!

Stewardship assistants' work not slowed by COVID 19

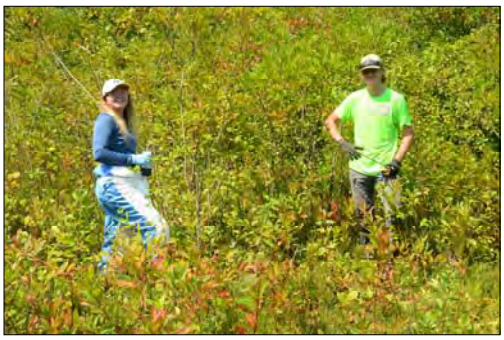
"One of the penalties of an ecological education is that one lives alone in a world of wounds. Much of the damage inflicted on land is quite invisible to laymen. An ecologist must either harden his shell and make believe that the consequences of science are none of his business, or he must be the doctor who sees the marks of death in a community that believes itself well and does not want to be told otherwise." ***- Aldo Leopold***

By Madison Brown and Landon Lemmens

The Ohio Natural Areas and Preserves Association contracted with four stewardship assistants this year: Jason Short, Landon Lemmens, Madison Brown, and Mariola Castrejon. The stewards focused their work on ecological management, preserve monitoring, and rare plant monitoring. Both Jason and Mariola completed their hours in August and returned to their schooling soon after. Landon and Maddie continued to work alongside Jennifer Windus for the rest of the field season and into November.

The COVID-19 pandemic did not slow volunteer projects. Despite the restrictions from Governor Mike DeWine, volunteers and stewardship assistants worked on average, 2-3 days out of the week, with most volunteers becoming weekly regulars. Stewardship trips to Brinkhaven Oak Barrens, Lakeside Daisy State Nature Preserve and Jackson Bog State Nature Preserve were large in number throughout the field season.

Landon and Maddie quickly became familiar with invasive species that reside in Ohio. Many of the scheduled work projects revolved around removing invasive species through mechanical and physical means. Other than removing invading species, the stewardship assistants created microhabitats for rare or threatened flora, such as Lakeside daisies (*Tetraneuris herbacea*) and the Northern pitcher plant (*Sarracenia purpurea*). Both assistants have worked together with the Ohio Division of Natural Areas and Preserves (DNAP), the United States Fish and Wildlife Service (USFWS), The Nature Conservancy (TNC), Killbuck Watershed Land Trust (KWLT), and local Ohio park districts throughout the season.



Maddie and Landon at Cranberry Bog.

The stewardship program started at Gorman Nature Center where the assistants were given a rundown of the summer itinerary, herbicide application training, and background of ONAPA and their goals.

Throughout the month of May, the assistants carried out invasive plant management at

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Dandelions can bloom every month of the year

By Jeff Frischkorn

Dandelion blooming in November.

My friend Pat's extensive grounds are clipped properly though often enough they are crowned with half-dollar-sized explosions of sunburst yellow.

His colorful yardscape will never be confused for Claude Monet's "Poppy Fields Near Argenteuil." Yet, the oft-time infusion of Pat's several acre yard with dandelions provides a perfect contrasting tapestry of grass-green and flower-yellow.

Asked why he doesn't slime the lawn's extensive crop of non-native dandelions with herbicide, Pat will shrug his shoulder and say simply enough, "I think they are pretty."

Indeed, dandelions are attractive, too. And maligned, though without just cause.

Few are the plants – either native, introduced intentionally, or else secretly having hitched a ride - that are so beneficial to so much in nature.

The word "dandelion" is an anglicized corruption of the French word "dent-de-lion," which itself means, easy enough, "lion's teeth," or "teeth of the lion." This interpretation refers to the plant's jagged broad leafage shape, which in an imaginative sort of way does appear to resemble a mouthful of lion's teeth.

Of course, Pat is not alone in his eyeful appraisal of the dandelion. Botanist and former chief of the Ohio Division of Natural Areas and Preserves, Guy Denny, maintains a massive native prairie on his Knox County homestead. Even so, he doesn't mind that his lawn includes an abundant welcome mat of dandelion.

"Heaven's no," Denny says.

Denny says it seems the only people who do want to exterminate dandelions (though only ever temporally successful) are those individuals who want their lawns to "look like AstroTurf" or a homogeneous and bland "lawn full of Kentucky bluegrass."

Which is neither blue nor originated in Kentucky, having itself arrived from Asia, come to think of it. But I digress.

Denny further notes the dandelion poses no threat to native plant species.

"It's a great plant to have around, and I don't try to eradicate it all," Denny said.

In North America, the commonly encountered form of dandelion is of Eurasian stock, one of about 2,000 such microspecies if you're a botanical taxonomist splinter or only about 60 if you're a botanical taxonomist lumper.

Humble and ubiquitous, the dandelion is nevertheless a rather unique and peculiar flowering plant. For openers, has said Allison Cusick, retired chief botanist for the Natural Areas Division and now a research botanist with Pittsburgh's Carnegie Museum of Natural History, the dandelion is one of the few flowering plants that can bloom every month of the year.

Think of that for a moment: the dandelion's yellow flowering head popping out on a warmish Christmas Day or making an appearance for a Fourth of July picnic.

And what about that flowering head? It's really a collection, or cluster, of what are called "florets," or miniature true flowers. This head rises from the plant on a hollow stem that contains a latex-like substance. All of which climbs skyward from a ground-hugging network of leaves, called bracts.

This entire product originates from a perennial taproot, so what shot up last May more than likely will return next May, or possibly December, as Professor Cusick has noted.

Oh, yes, another thing, the flowering head retreats after dark and reemerges upon the next dawn.

Once the flowering head has finished its job the affair turns into that familiar "puffball," scientifically called a cluster of "pappus." Here the seeds and their respective dispersal system of fuzzy parachute-like devices soar into the wind with the smallest of a small child's exhaled squirt of breath.

Dig a little deeper and you'll find these pappus likewise have the ability to cast themselves off when their hardwired genetic coding says that environmental conditions are primed just right. Again, imagine that.

The dandelion was brought over by European settlers who wanted more than just a familiar flowering face to enjoy seeing, however. They also brought dandelions to our shores for the plant's medicinal and nutritional values which has proven a good thing for both man and beast. The dandelion has become an important food source for everything from mice to rabbits to white-tailed deer.

Denny is quick to note the dandelion is among the first flowers in the spring to attract a host of pollinating insects. Among them being honey bees and native bumble bees, along with butterflies, certain moths, fritillarys, and skippers.

For humans, virtually every component of a dandelion is available for eating. The laundry list of possibilities is endless, and the plant appears in a plethora of ethnic dishes and products along with recipes that stretches to the exotic, plus being rich in various vitamins and minerals.

Dandelion wine? Yep, the plant has that covered. Dandelion jelly? Oh, yes, and colored a rich yellow; sort of like corncob jelly, which is a subject for another day, but I digress, Part II.

Oh, the lion-toothed leaves can be blanched, sauteed, and cooked in the same way a chef does spinach, or served up in a tossed salad.

Eat the flowering heads raw or cook them up. You can even make a syrupy "honey" from the flowers.

Dried and ground, the roots can become a caffeine-free coffee substitute. Or else a diuretic that increases urine flow along with helping ease constipation.

Not bad for a plant that suffers from uncharitable publicity brought to you by the local lawn care service.

You know, instead of painting a hillside of poppies, perhaps Monet should have put his artistic talents to work praising the lowly dandelion's majesty.

Jeff Frischkorn is a retired writer for the Willoughby, Ohio based News Herald and now Columnist/Contributing Writer for Ohio Outdoor News *in which this article about dandelions first appeared. Jeff is also a member of ONAPA.*

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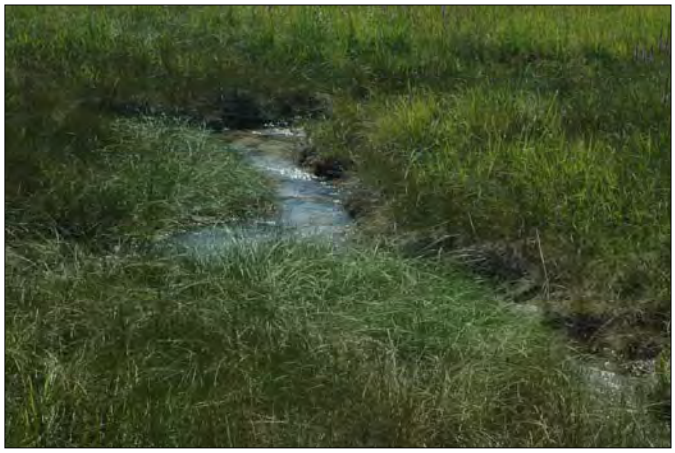
Fens are highly diverse ecosystems

with one another and their abiotic environment. They occur around cold springs and seeps usually associated with glacially deposited limestone-rich gravel deposits. Extremes in wetness, nutrient availability, temperatures and alkalinity limit which species can or cannot survive in the harsh environment of a fen. As rainwater falls through the air, it combines with carbon dioxide in the atmosphere to form mild carbonic acid. As this acidic rainwater enters the ground to become groundwater percolating through highly permeable deposits of limestone-rich gravel, it dissolves limy materials and becomes highly charged with calcium and magnesium bicarbonates which accounts for its high alkalinity. As these cold, oxygen deficient spring waters rich in soluble bicarbonates reach the surface, carbon dioxide is lost either by surface warming or by the activity of certain plants. Plants, especially an alga known as *Chara*, extract the carbon dioxide during photosynthesis leaving behind insoluble carbonates in a bed of grayish-white, lime-rich mud known as marl and also as solid calcium carbonate deposits known as tufa and travertine.



Walking-spike Rush thrives in cool water of fen streamlets.

The earliest stage or zone in fen development is the marl meadow where groundwater emerges and spreads out across the surface of the ground forming shallow pools, marl flats and streamlets. Here on fresh marl exposures, flowing spring waters are the coldest, least oxygenated and most alkaline often having a pH of around 8 or so. Vegetation is sparse typically consisting of such characteristic fen species as Arching or Walking Spike-rush (*Eleocharis rostellata*), Kalm's Lobelia (*Lobelia kalmia*), Grass-of-parnassus (*Parnassia glauca*), Small Fringed Gentian (*Gentianopsis virgata*), Grass-pink Orchid (*Calopogon tuberosus*), False Asphodel (*Tofieldia glutinosa*), White Death Camas (*Anticlea elegans*), Marsh Arrow-grass (*Triglochin palustre*), Ohio Goldenrod (*Solidago ohioensis*), Riddell's Goldenrod (*S. riddellii*) and various species of sedges and rushes commonly including Yellow Sedge (*Carex flava*), Brown Bog Sedge (*C. buxbaumii*), Knotted Rush (*Juncus nodosus*), and Short-headed Rush (*J. brachycephalus*).

Farther away from the flushing actions of the springs and streamlets, a thin to then thickening layer of marly graminoid peat paves the way for the next zone of plants called the fen meadow. This zone is characterized by such commonly encountered fen species as Shrubby Cinquefoil (*Dasiphora fruticosa*), Alder-leaved Buckthorn (*Rhamnus alnifolia*), Ninebark (*Physocarpus* opulifolius), Marsh Fern (*Thelypteris palustris*), Fen Indian-plantain (*Arnoglossum plantagineum*), Swamp Thistle (*Cirsium muticum*), Cowbane (*Oxypolis rigidor*) and Canada Burnet (*Sanguisorba* canadensis). There are also a number of sedges, rushes and grasses growing here as well. Some fen meadows, especially those in west central Ohio, also have a variety of tallgrass prairie species present including Big Bluestem (*Andropogon gerardii*), Little Bluestem (*Schizachyrium scoparium*), Indian Grass (*Sorgastrum nutans*), Spiked Blazing-star (*Liatris spicata*), Prairie Dock (*Silphium terebinthinaceum*), Queen-of-the-prairie (*Filipendula rubra*), Prairie or Linear-leaved Loosestrife (*Lysimachia quadriflora*), and Nodding Wild Onion (*Allium cernuum*). These fens are often referred to as "prairie fens".

Other fen meadows, especially those in northeastern Ohio, additionally support a variety of more northern species including Tamarack (*Larix laricina*), Bog Birch (*Betula pumila*), Hoary Willow (*Salix candida*), Shinning Willow (*Salix lucida*), Poison Sumac (*Toxicodendron vernix*), Green Cotton-grass (*Eriophorum viridicarinatum*), Showy Lady's Slipper (*Cypripedium reginae*), and clumps of Shrubby Cinquefoil around the base of which sphagnum mosses often grow supporting colonies of Round-leaved Sundew (*Drosera rotundifolia*). These fens are often referred to as "boreal fens" or "bog fens".

As graminoid peat continues to acuminate and thicken, some distance from flowing water that would otherwise flush these peat deposits away, the thick blanket of sedge peat insulates roots from the effects of the cold, alkaline spring waters beneath. Fen communities then give way to marsh and swamp forest communities more typical of these latitudes. The only remaining evidence of a fen com-

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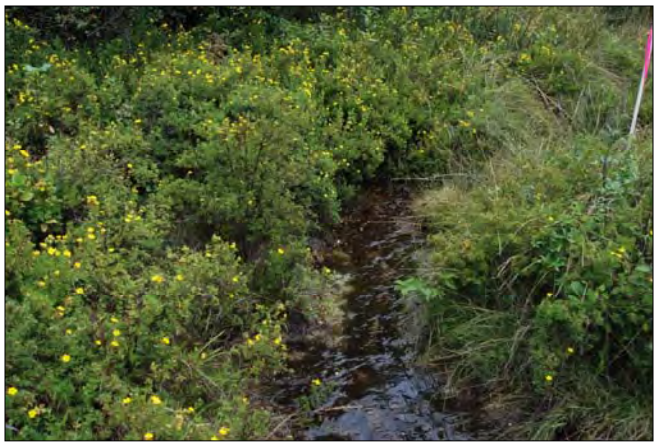
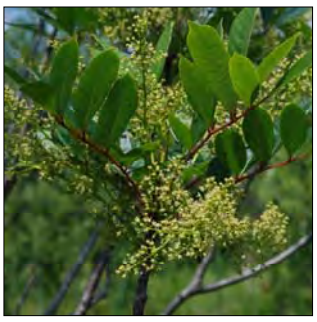
(Left to right) Grass-pink Orchid, Grass-of-Parnassus, Kalm's Lobelia, and Small Fringed Gentian backed by Riddell's Goldenrod.





Fen streamlet (top, left): Species more common in Ohio's northern fens include (from top, clockwise) Bog Birch, Hoary Willow, Poison Sumac and Green Cotton-grass.

munity having ever occupied the site is the underlying layer of dark black organic soil below which lies a layer of marl.

Fens appear to have the highest species diversity of any of our ecosystems. They are extremely rare in our state with many small ones having yet to be discovered. Fortunately, many high quality fens have been protected and are now available providing boardwalks to accommodate public visitation. The highest quality fen and perhaps best known is Cedar Bog State Nature Preserve in Champaign County south of Urbana, Ohio. Others include Prairie Road Fen and Gallagher/Springfield Fen state nature preserves in Clark County as well as Jackson Bog State Nature Preserve in Stark County. Resthaven Wildlife Area located in Erie County is an excellent example of a very extensive tallgrass prairie/prairie fen.

These are just a few of Ohio's fens that are in public ownership. We are fortunate to have such a diversity of fens occurring in Ohio. These very special botanically diverse and fascinating ecosystems are definitely worth your time to get out and explore. Nature preserves are living museums which provide visitors the chance to discover and learn about the complex wonders of the natural world around us.

(Below, left to right): Species found in prairie fen meadows include Canada Burnet, Fen Indian-plantain, Swamp Thistle, Queen-of-the-Prairie, Spiked Blazing-star.

Stewardship assistants

Continued from page 4

various locations such as Bonnett Pond Bog, Milford Center Prairie, and Brinkhaven Oak Barrens. Management techniques varied based on the preserves' ownership and type of plant communities that inhabit there. Going into June, the assistants continued invasive plant control as well as specialized projects such as transporting loosestrife beetles, Eastern prairie fringed orchid surveys and preserve assessments of high-quality areas. July was spent tackling more invasive species such as Japanese stiltgrass (*Microstegium vimineum)* at Brinkhaven Oak Barrens and woody removal of species such as glossy buckthorn (*Frangula alnus)* at wetland preserves.

Heading into August, the assistants became familiar with more preserves in the state. Tours given by Coleman Minney, the preserve manager, at Lake Katherine and Friends of Crowell Hilaka at Richfield Heritage Preserve gave the assistants an inside look of native plant communities and geologic and hydrologic properties of these natural areas. September included woody removal days, involving opening up alvars to more sunlight and monitoring one of Ohio's rare plant species, Northern monkshood (*Aconitum noveboracense*) at Crane Hollow. October began with a day spent cutting and treating the infamous poison sumac (*Toxicodendron vernix*) at Cranberry Bog. Throughout the month, the assistants were given tours at the Dawes Arboretum, Lou Campbell Preserve, Kitty Todd, and Oak Openings Metropark. The assistants also dispersed Lakeside daisy seeds at several sites on Kelleys Island and conducted woody species removal at Killbuck Marsh Wildlife Area, Brinkhaven Oak Barrens, and Cranberry Bog (three times this fall).

Overall, Landon and Maddie began their environmental careers with some of the most knowledgeable and outstanding people in Ohio. Both can agree that the opportunity to work with ONAPA has helped them learn the importance and urgency of ecological management in natural areas as described above. The time for restoration and preservation is ever present.

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