



ONAPA NEWS

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INSIDE THIS ISSUE

Marcescence	1-2
Stewardship	2-3
Monitoring a preserve	3
Winter orchids	4
Prickly subject	5
Meadow vole	6-7
Blackhand Gorge	7
Membership Application and Renewal	8

Marcescence: a way to hang on

Story and photos by Guy Denny

Late last season during one of those windy late autumn days, I developed a finer appreciation for the true meaning of the term “fall” as I watched thousands of brightly colored leaves fluttering to the ground *en masse* in all their full fall-color glory. In autumn with shorter days and colder nights, water and sap transferred from the roots of trees to their leaves slowly shuts down for the growing season. This enables a layer of special cells called the abscission layer to form at the base of the leaf petiole, completely closing off this flow forcing the leaf to break free and fall to the ground. At least this is what normally happens but with a few notable exceptions. Some young deciduous woodland trees, especially American beech (*Fagus grandifolia*) and all species of oaks (*Quercus* Sp.), conspicuously stand out in the winter woods by holding on to their dead, brown leaves throughout the winter well into early spring until finally falling to the ground. This phenomenon always puzzled me as to the “why”.

As it turns out, no one knows for certain why this happens, but there are a number of theories behind it. Nevertheless, there actually is a name for this phenomenon. Ecologists call it “marcescence” (mar ces cence) which is the retention of dead leaves that are normally shed in fall. Marcescence is most often seen on young or immature trees and usually disappears as the trees start reaching maturity, but occasionally some of these full-size trees retain partial marcescence on their lower limbs. Marcescence is derived from the Latin word *marcesco* meaning “to fade or

wither” and more specifically in a botanical sense, “withering but not falling off”. In Ohio, it is mostly American beech trees and all species of oaks that most often have marcescent leaves at least when young.

So why is it that some species of young deciduous trees retain their leaves when most all other trees drop their leaves in fall? Well, again, no one definitely knows for sure, but ecologists have come up with a few probable explanations.

Among them, perhaps the most common hypothesis is that marcescence plays a role in protecting vulnerable, low-growing young growth branchlets and buds from being grazed during winter months by large browsing herbivores such as deer. Keep in mind that thousands of years ago, in addition to deer,

large herbivores also included, elk, moose and high-reaching grazers such as mastodons, mammoths, and giant ground sloths. This hypothesis reasons that in order for browsers to reach and feed upon the nutritious newly developing tender leaf buds of a young and vulnerable low-growing tree possessing marcescent leaves, that effort also includes their inadvertently getting a mouthful of the neither nutritious nor tasty dead and dried-out marcescent leaves protecting the nutritious tasty branchlets and buds. Much better for a grazer to move on to some other tree like a maple whose tasty palatable leaf buds are not protected by dried-out marcescent leaves. An additional thought advanced by some ecologists is that dried

(Continued on page 2)



Young beech trees retain leaves through the winter.

Woody species control top priority for stewardship projects

Story and photos by Jennifer Windus

During October-December, our stewardship effort switched more to woody species control.

In October, we worked at Cranberry Bog, Lakeside Daisy Preserve, Cedar Bog, McCoy Fen, and Brinkhaven Barrens to remove and treat invading woody species. We also conducted our annual fall Lakeside daisy transplant, moving almost 300 plants from the Lafarge Quarry to the new addition of the Lakeside Daisy Preserve in Marblehead.

The stewardship assistants engaged in educational days during visits to Lake Katharine and several sites in the Oak Openings, including Irwin Prairie and Oak Openings Metro Park.

In November, woody species control was again the focus of projects at the Medway Prairie Fringed Orchid site, Cranberry Bog, Kelleys Island State Park (in the Lakeside daisy locations), Karlo Fen, Lakeside Daisy Preserve again, and Springville Marsh. Volunteers continue to supplement our



Woody species cut and treated at TNC's Herrick Fen.

efforts, including new volunteers this year.

There were only four projects in December before the holidays, going to Herrick Fen, Sears and Carmean Woods, the Medway site again, and Myersville Fen.

Several projects this fall involved working with partners, including the Cedar Bog Association, Cleveland Museum of Natural History, Killbuck Watershed Land Trust, City of Dayton, Summit County Metro Parks, The Nature Conservancy, and Crawford Park District.

Continued on page 3



Beech leaves (top) and oak leaves (below) in winter.

Continued from page 1

Many explanations for tree marcescence adaptation

leaves clattering in the wind and being noisily moved about during grazing activities create more noise than a timid browser like a deer, listening for the approach of predators, might normally tolerate.

Another reasonable hypothesis advanced by ecologists is that marcescence provides an adaptation advantage for trees like beech and oaks often occurring on dry, nutrient-poor soils. Leaves falling to the ground in fall actively decompose faster on the wet, snow-covered ground during winter than those remaining on a tree. Marcescence leaves dropped in early spring rapidly decompose thereafter providing a nutritious leaf mulch around the base of a tree when and where most needed.

Another hypothesis is that marcescent leaves allow a tree to trap more rainfall and snow during winter months thus providing more soil moisture around its base in early spring when new growth begins and sufficient moisture is critical for development of that new growth.

Clearly, there doesn't have to be any one simple explanation why marcescence occurs. Events in nature can be rather complex and there are still events in nature beyond our current understanding. None of the above hypotheses excludes another. Rather, they all seem plausible and may play a collective role in explaining marcescence.

Think about this the next time you are walking through the woods in winter and encounter a tree bearing marcescent leaves. At least you will know what this phenomenon is called even if you don't know with certainty why this occurs. Such mysteries are interesting to ponder and make exploring nature all the more fun.

Preserve monitoring designed to protect natural areas

By Lydia Radcliffe

During a blustery November day this fall, my fellow stewardship assistant Maddie and I hiked through the sun-patched woods at Rockbridge State Nature Preserve and Shallenberger State Nature Preserve.

We marveled at amazing geological features carved into the sandstone as relics of Ohio's glacial history. We stopped to investigate which wintering birds flitted in the branches above us. We appreciated the huge cottonwood and a graceful towering beech along the path. However, our purposes weren't purely to enjoy the landscape and living inhabitants of the preserves we visited. We were conducting preserve reviews to complete preserve monitoring reports, assessing the condition of the preserves and noting any concerns needing attention, so we can share them with DNAP staff if appropriate.

Preserve monitoring reports were designed by ONAPA leadership to assist DNAP by collecting data about preserves that may not be frequently visited by DNAP staff. A preserve monitoring report is a guided assessment that includes spaces to record information regarding invasive species present in the preserve; conditions of kiosks, parking lots, and trails; as well as other information useful in determining work that may be necessary in the preserve. For preserves which are not visited by DNAP staff very often, these reports could report fallen trees on trails, vandalism, dumped trash, and untreated invasive plants. Are you interested in helping ONAPA collect and update preserve monitoring reports for preserves near you? We need your help! The report form and further instructions about preserve monitoring can be found online at ONAPA's website (www.onapa.org) under the "VOLUNTEER" tab in the category "PRESERVE MONITORING". If you are interested, let us know by sending us a message on the "CONTACT US" tab. We can tell you which preserves are in need of checking in your region. We hope you might take the time to explore some preserves and help us in our monitoring efforts.



Relaxing for a minute during preserve monitoring under the Lawrence Woods "Rhino Tree," a massive white oak.



Above, cedars are removed to allow more light for the federally listed Lakeside daisy in the new addition to the state nature preserve near Marblehead. Plants were also rescued from the local limestone quarry and re-planted in the new addition during another day's project.

Continued from page 2

More stewardship needed in preserves

ONAPA stewardship assistants and volunteers are keeping busy on state nature preserves with DNAP staff, as well as with a number of other partners and on natural areas around the state. Due to the amount of stewardship needed in Ohio's preserves, we are planning a pilot project next year to establish a second stewardship team in the central and southern part of the state. Watch our website for the January-March winter schedule, with weekly project postings coming soon.

Our Development Committee will be campaigning to raise additional funds to support more stewardship assistants. We hope you will support these efforts, as there is much to be done to restore our natural areas in Ohio. You can contribute to this critical mission by either volunteering with us and/or making a donation.

Winter orchids adorn the forest floor with green

Story and photos by John Watts

Although our winter season is a time of rest for most plants, at least one species of orchid continues photosynthesis as its green winter leaves absorb sunlight throughout the season. As long as there is no snow covering the forest floor, two of these species are easily located this time of year. The green leaves stand in contrast to the browns and tans of the winter forest floor. Locating them during your winter hikes can lead to rewarding visits when these species bloom during the next growing season.

Downy Rattlesnake Plantain – *Goodyera pubescens*

While many of our native orchid species possess leaves that are not particularly showy, the white veins against the dark green ground color of this species' leaves places it as possibly our most attractive native orchid leaf. The leaves are the source of its common name in reference to the leaf shape and pattern resembling that of a rattlesnake's head. The name plantain comes from its likeness to the common plantain leaves of the genus *Plantago*. This species can be found throughout eastern and southern Ohio's forests, blooming from early July to mid-August. It is generally a good indicator of acidic soils and often located in shaded areas.

Puttyroot Orchid – *Aplectrum hyemale*

The genus name *Aplectrum* is derived from the Greek words "a" (meaning without) and "plektron" (meaning spur), a reference to the spur-less flowers of mid-May and early June. The leaves of the Puttyroot Orchid are longer than wide, pale green with lines of white highlighted veins that run lengthwise from end to end of the 4.5 to 6-inch long leaves. Puttyroots may be found in a variety of rich mesic forests often near ravines and stream terraces; however, nearly any forest may host a few of these plants. This species is known to be completely capable of conducting photosynthesis during the winter, even though it slows during the coldest times. By taking advantage of the leafless winter trees to absorb sunlight, it reduces its competition for light with the forest overstory. The leaves appear in late fall and persist through early spring, completely decaying by the time the flowering stalks begin to emerge. Generally, most leaves do not produce flow-



Puttyroot Orchid – *Aplectrum hyemale*



Downy Rattlesnake Plantain – *Goodyera pubescens*

ering stalks, so finding a patch with many larger leaves should result in finding a few blooming individuals.

Crane-fly Orchid – *Tipularia discolor*

The scientific and common name both refer to the resemblance of this flower to the insect known as the Common Crane-fly. Crane-fly Orchids are typically found in southern and eastern Ohio's oak-hickory ridgetop forests and are a good indicator of acidic soils. The solitary leaf is described as "oval and only slightly longer than wide". Instead of the pale green shown by the Puttyroot, the Crane-fly Orchid is dark green above, often with purple spots or bumps, and a solid wine-purple color on the underside. Crane-fly and Puttyroot Orchids may occasionally be found growing together, especially in mesic coves just below the oak-hickory ridges. Crane-fly Orchids bloom from mid-July to late August. Similar to the Puttyroot, most of the leaves will not flower, so finding a large patch increases the chances of finding blooming individuals. Crane-fly Orchids tend to be more common than Puttyroots when found and generally produce more leaves over a much larger part of the forest.



Crane-fly Orchid – *Tipularia discolor*

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Even thistles have a positive side, if you are a goldfinch

Story and photo by Tim Snyder

Never grab a thistle by the stem. That is a lesson I have to learn every year about this time. Thistles have a pernicious determination to survive in my garden, and they are no respecter of gloves.

If there is such a thing as a violent weed, thistles are it. Well armed with spikes on leaf, stalk and even flower, they repel all advances. In the Victorian language of flowers, they stand for surliness—not exactly the message you'd want to send to your beau or belle. Cows wisely refuse to eat them and so they will be found standing alone like silent sentinels in otherwise low-shorn meadows, earning their common name of Bull Thistles.

And yet even thistles have their positive side. Anything that attracts flocks of darting Goldfinches, those connoisseurs of thistle seed, cannot be all bad. The Scots think highly of the thistle, having made it their national flower, in part, perhaps, because of its rugged, independent character. Traditionally, the Scottish reverence for thistles goes back to the depths of the Middle Ages when a Danish raiding party, trying to creep into a sleeping village of Scots, took off their boots to silence their advance, only to encounter a phalanx of thistles. The resulting commotion roused the Scots to a successful defense.

Thistles belong to the Composite family, as a close look at their flowers will show. What appears to be a single feathery bloom is actually a tightly clustered congregation of tiny flowers held together by a cup made of tiny, overlapping, leaf-like and spine-tipped phyllaries. Flower heads commonly range in color from pink through rose to purple, but white versions are found now and then. While we may consider thistles a nuisance, bees are quite enamored of them, especially bumblebees, for the flowers are sweet-scented and contain an abundance of both pollen and nectar.

The most common thistles we encounter in Ohio are imports. Bull Thistles can be 3 to 6 feet tall. Canada Thistle—which, in one of the perplexing oddities we find in common names, is not from Canada at all, but from Eurasia—thrives in roadsides, abandoned fields and other disturbed ground. Its small flower heads color whole swaths of ground dull pink while the massed ranks of their spiny stems give full expression to the scientific name of one of its varieties, *horridum*.

The native varieties are not much friendlier. There are at least five thistles considered to be original to the state, all of them sharing the prickly disposition of the imports, along with the typical tufted purple to pink flower heads. The rarest of these are the Carolina Thistle, a southern species that can be found in the southeast quadrant of the state, and Hill's Thistle which prefers sandy open fields in the eastern-central counties.

The most elegant of our native thistle (at least to my eye) is the Swamp Thistle. Found in calcareous wetlands, it is in Ohio limited almost entirely to fens, those spring-fed, cold-water refuges that hold so many of our interesting northern species. Their purple flowers have the richest color of any of our thistles. Not content with that show, the points of the phyllaries surrounding the base of the flower head like the shingles of an upside-down roof are also flushed with purple, as are segments of the relatively unarmed stem. Of interest also is the stickiness of the flower head base, which prompted its species name of *muticum*. It is an altogether strikingly handsome, friendly plant...for a thistle.



Swamp thistle at Gallagher Fen



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Eastern meadow vole plays a vital role

Story and photos by Guy Denny

Although often referred to as a field mouse or meadow mouse, this little rodent inhabiting grassy meadows neither looks nor acts like what typically comes to mind when most of us visualize mice.

The mice with which most of us are familiar are pesky, fast scampering, tiny rodents with long pointed noses, conspicuous large ears, and long, largely hairless tails. They look like miniature rats. Mice are a major nuisance with their tendencies to invade our homes, especially as winter approaches.

Meadow mice, more properly called Eastern Meadow Voles, do not fit the typical description of a mouse, especially like the more familiar non-native house mouse (*Mus musculus*), or the native deer mouse (*Peromyscus maniculatus*) and white-footed mouse (*P. leucopus*). Nor do meadow voles behave like any of these mice that often find their way into our homes. Actually, the bodies

of voles are more hamster-like in appearance than mouse-like. Voles also shy away from human habitations and activities and are not climbers as are mice. You are not going to find one in your home unless your dog or cat kills one outdoors and brings it back to proudly present its trophy to you.

Eastern meadow voles (*Microtus pennsylvanicus*) are the most widely distributed and perhaps most abundant of all the numerous species of voles in North America. The term "vole" comes from a Scandinavian word meaning "meadow".

Meadow voles range from Alaska, throughout Canada, across the northern tier states of the United States, eastward along the east coast states southward to extreme northeastern Georgia. They commonly occupy dense, often moist grasslands throughout their extensive range which includes all of Ohio. Only rarely are they found living in woodlands. Eastern Meadow voles are small lemming-like mammals with cylindrical compact bodies (3-6 inches long), a large head with a blunt face, small beady black eyes, small ears, short legs and a relatively short, sparsely furred tail. They are dark brown above with slightly paler sides and a lighter grayish colored belly. The genus *Microtus* comes from the Greek words *mikros* meaning "small", and *ous* meaning "ear". Their small ears only protrude slightly above their furry body. The specific epithet *pennsylvanicus* is a reference to the first recorded specimen being collected in Pennsylvania.

Eastern meadow voles can be confused with both the southern bog lemming (*Synaptomys cooperi*) rarely found throughout Ohio, the prairie vole (*Microtus ochrogaster*) sparsely occurring in such habitats as mesic to dry prairies in southwestern Ohio then westward, and the rarely encountered woodland vole (*Microtus pinetorum*). Each of these species has the general appearance of the eastern meadow vole but all

have much shorter tails than meadow voles and are typically not as commonly encountered in Ohio.

Meadow voles are active year-round both day but more often at night, feeding primarily upon species of grasses and sedges, as well as on grain, and the leaves, flowers, fruits, roots and bulbs of various flowering plants. They also are known to occasionally consume insects and snails, and even occasionally feed upon small animal carcasses. During winter, under the cover of snow when food is scarce, they can cause damage by girdling and eating the inner bark of woody plants including orchard trees and newly planted pine seedlings in pine plantations. Voles are voracious eaters and have to consume their own body weight in food every day.

The presence of meadow voles can easily be detected by the conspicuous presence of extensive networks of ground-level, grass-covered paths or runways along which they move

about to feed. These runways connect to shallow but extensive tunnel systems providing underground shelter, and where winter food supplies are often stored.

The above ground pathways are made by nipping grass closely at the base and then trampling it into a well-worn pathway about 1 to 2 inches in diameter. Nests are built above ground as well as in underground chambers. Above ground, inconspicuous nests are woven of dry grass and weed leaves in a distinctive spherical

shape about 5 inches in diameter and 4 inches high containing a nesting chamber within its center. The home range of eastern meadow voles is typically about an acre or less. Voles tend to live in close proximity but can be aggressive towards one another, with females dominating males and males fighting amongst themselves.

Voles are at the bottom of the food chain and serve as an important and consistent food source for a large number of predators including but not limited to foxes, coyotes, weasels, skunks, short-tailed shrews, mink, snakes, owls, northern shrikes, red-tailed hawks, sparrow hawks, marsh hawks, dogs and cats. Crows, gulls and even great blue herons are also known to take voles. Voles often inhabit areas near water and are good swimmers. However, swimming makes them vulnerable to large fish such as bass and pickerel as well as to ambush by bull frogs.

Snow cover during the winter months provide meadow voles with some shelter as they forage for food above ground. However, some predators such as foxes, coyotes and some large owls have such keen hearing they can track voles beneath the snow, pinpoint them, pounce on, and catch their prey even through several feet of snow.

Fortunately, eastern meadow voles are incredibly prolific



Eastern meadow vole in its nest



Photo by Jennifer Windus

Blackhand Gorge hike delights members on fall field trip, last of the year

Eleven ONAPA members joined Dick Moseley for an easy interpretive hike through Blackhand Gorge Nature Preserve on October 9. The morning was misty and wet, but beautiful with falling leaves of various shapes covering the trail.

Moseley discussed the history of the purchase of the preserve and its significance geologically. He reviewed how the construction of Dillon Reservoir made major changes to the town of Toboso which was originally located where the entrance of the preserve is now.

The group toured the narrow gorge cut by the Licking River through the famous Black Hand sandstone formation. In addition to seeing fall wildflowers and glacial relic plants, members enjoyed their visit to see the remnants of the Ohio Erie Canal tow paths and canal Lock 16, as well as the Interurban railway tunnel and the “Deep Cut” through the Black Hand Sandstone.

After the tour ended, Jennifer Windus took some of the members to the top of “council rock” where they enjoyed a spectacular view of the Licking River narrows.

If you have not visited this beautiful and historic preserve you should add this to your “to do” list.

At left, hikers follow the path of the old interurban railway through Blackhand Gorge.

Continued from page 6

Vole is prolific little critter

breeders. They breed year round, but mostly during March through November. The gestation period is 20-23 days averaging about 3-8 litters a year with typically 5-6 young in each litter. Reportedly, females can produce a new litter every three weeks. Females may mate again almost immediately after giving birth. Weaning takes place in 12-14 days. Meadow voles, on average only live a year and a half to two years at the most in the wild; most don't even make it that long. Yet, young female meadow voles are sexually mature at 20-28 days of age, and may begin breeding immediately when only half grown. Populations of meadow voles' peak and then crash at 2-5 year intervals depending on various environmental factors. In times of high populations, studies have shown there may be as many as 60-250 meadow voles per acre; in some cases, many more. In years of low populations, there still may be as many as 15-40 voles per acre.



Out in the open, vole is fair game for many.

Although usually taken for granted, eastern meadow voles play a critical role in providing nourishment for numerous carnivores for which they are a mainstay.

Fortunately, within the natural world, meadow voles are one of the most prolific breeders in North America which allows them to be heavily preyed upon while at the same time being able to sustain their own populations.

It is interesting how this works as nature's way of maximizing biodiversity for an array of various species of wildlife, including the meadow voles themselves.

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