



# Natural Ohio

Bob Taft, Governor • Sam Speck, Director  
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## FIRE prescription for a healthy landscape?

Every summer, news reports from the western states carry disturbing details about wildfires and the catastrophic damage they can cause. So, it may be surprising to learn that here in Ohio, fire is just the medicine required to cure what ails some of our most unique habitats.

### Historical role of fire

Using fire to affect the landscape is not a new idea. Early settlers found the Native Americans setting fires to clear the woods of undergrowth and promote grasslands attractive to game, according to S.P. Hildreth, one of Marietta's first historians. The pioneer's attitude toward fire was more ambiguous. On one hand, it could destroy homes, barns and crops. On the other hand, they used fire to help clear their land for farms, eliminate brush and rid the woods of "vermin."

This broad view survived until 1910 when brutal wildfires ravaged the west, leading to the first major attitude change regarding fire in the

environment. Fire became an enemy. It ruined valuable timber, opened land to erosion, destroyed wildlife and cost money. Popular opinion held that fire degraded ecosystems and reduced biodiversity. As a result, fire as a major force affecting the landscape was soon eliminated.

However, after decades of battling every fire into submission, researchers began to notice some disturbing changes: ecosystems were degrading and biodiversity was being reduced. Could it be that fire actually played a role in maintaining natural systems? Might its elimination be doing more harm than its presence? Officials

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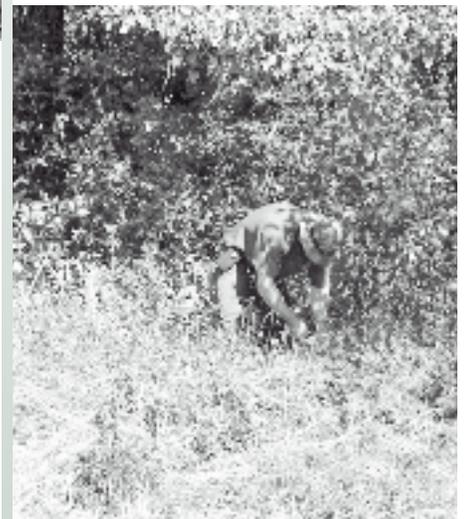
## The Eco-management Season

District preserve managers wear a variety of hats in the performance of their job. At times, they are teachers, engineers, law enforcement officers, naturalists, maintenance workers, foresters, researchers, surveyors and last, but not least, eco-managers.

### What is an eco-manager?

Many of our preserves are threatened by any number of invasive plant species. It is the responsibility of the preserve manager to identify the problem species, determine the severity of the threat to the ecosystem and implement the

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Today, most land managers agree that, given the right circumstances, fire is an important eco-management tool for natural areas preservation.

There are four major landscapes in Ohio that appear to be fire-dependent: prairies, savannas (widely-scattered trees with a prairie understory), oak-hickory woodlands and barrens (a general term

**FIRE-PRESCRIPTION**  
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began to reappraise the policy of total suppression.

In Ohio, studies of the vegetation cover of the state as it existed at the time of settlement have given clues as to the possible role fire played in shaping the environment. Contrary to the popular image of the primeval forest, it had not been one solid, heavy blanket of trees. It had been torn here and there by ragged openings, some of them, such as the Darby, Pickaway and Sandusky plains, of considerable size. Even the forest itself was in many places open and airy, with little underbrush.

As historical writings, memoirs and journals of eighteenth and early-nineteenth century soldiers, missionaries, traders and government agents were scoured for information, it became obvious that much of this open landscape was due to fire.

For example, James Smith, writing of his life as a captive of the Indians between 1755 and 1759, tells of participating in a ring hunt in the Sandusky Plains where...

“...we kindled a large circle in the prairie...as the fire burned in towards the centre of the circle, the deer fled before the fire... The rain did not come on that night to put out the outside circle of the fire, and... it extended thro the whole prairie which was about fifty miles in length, and in some places nearly twenty in breadth.”

that early surveyors used to describe everything between a savanna and a woodland; the Oak Openings near Toledo are perhaps the most familiar example).

The importance of fire to these ecosystems is emphasized by the fact that, once it was eliminated, these open areas quickly grew into forest unless they were grazed or kept open by some other management technique.

**Fire uncovers preserve’s original landscape**

A study of the original vegetation in a small part of eastern Clark County, done to develop management plans for Gallagher Fen State Nature Preserve, shows how the various fire-adapted landscapes intermixed and hints at the role fire played in maintaining them.

Land surveys dating to 1805 and 1806 indicate a variety of habitats—prairie, swamp forests, savannas, oak-hickory forests and barrens. Mapping these habitats has shown how fires started on the prairie could have easily spread into the adjoining oak-hickory forest to create open woodlands, savannas and barrens.

Today, the stream valleys in Gallagher Fen are filled with swamp forest, and the former savannas and barrens of the high ground are thick with

young trees and invasive honeysuckle. During the past 20 years an extensive program of cutting and treating invasive woody growth, and reapplying fire has been maintained. As a result, the prairie, savanna and barrens have reappeared. The original landscape was still there, hidden beneath the accumulated results of fire suppression.

**The essentials of a prescribed burn**

Fire’s importance in the landscape goes far beyond eliminating brushy undergrowth. It eliminates dead, matted growth shading the ground. It releases nitrogen and other nutrients back into the soil in the form of mineral-rich ash, making them readily available for new plant growth. Fire raises soil temperature, encouraging the sprouting of seeds, especially in prairies. It top-kills invading woody trees and shrubs which could eventually crowd out species intolerant of shade.

Fire can also reduce the populations of some invasive and non-native plants. At Gallagher Fen, fire has been indispensable in keeping a rampant bush honeysuckle problem under control, allowing native prairie plants to thrive.

Concern is often raised over the effects of fire on the animals inhabiting an affected landscape. Native animals



living in fire dependent areas have adapted to its presence over the millennia. Some retreat to burrows as the flames approach, or simply leave the area. Even during an intense fire, not everything burns. Fires are patchy affairs, leaving behind islands of barely scorched or even untouched habitat where animals can survive. Once the flames pass, fire-dependent habitats quickly bounce back and animals move in to take advantage of the bounty of fresh greenery.

Gallagher Fen is just one of a dozen sites where the Division of Natural Areas and Preserves utilizes prescribed fire for ecosystem management. Some sites are burned annually, but most are on a multi-year schedule. Weather determines if and when a site will burn during any given year, just as it did when Indians were doing the burning.

Things are more complicated for us now. Before a controlled fire can be lit in Ohio, a detailed burn plan must be completed. In addition to describing the site, fuel type and purpose of the burn, it must outline the steps that will be taken to control the fire, weather conditions required, sensitive areas to be avoided, smoke control, safety considerations and exactly how the burn will be implemented. Then permits to burn must be obtained from the Ohio Environmental Protection Agency and the Ohio Division of Forestry.

The division's burn team has been extensively trained to handle prescribed fire. Each member has completed the Wildland Firefighter course offered by the Division of Forestry. Most have several years of experience under their belts. Three members have taken additional training and been certified as prescribed fire managers, authorized to lead the team. Some of us have experience with the Ohio Interagency Fire Crew fighting wildfires in the west.

Controlled burning is vital to managing the land for biodiversity. It is a tool which will undoubtedly see greater use in the future as its benefits become more apparent. ✓

*Tim Snyder*  
DNAP Burn Boss &  
West Central District Preserve Manager

## Invasive Plant Alert #15

### *White and Yellow sweet-clover*

**Description:** Both white and yellow sweet-clover are herbaceous, non-native biennials and are members of the pea family. In their first year of growth, the plants are small with smooth multi-branched stems. The leaves are alternate and divided into three finely toothed leaflets. The second year of growth is characterized by rapid growth of the root system and an overall bushy appearance with the plant reaching 3-5 feet tall by May. From May to September, flowers are produced on the second year plants. Flowers are borne on irregular spikes on the ends of the elongated stems. Each flower spike will bear 40-80 flowers. The flowers are either white or yellow, the most obvious difference between these two species. Seed is set in summer with up to 350,000 seeds per plant.

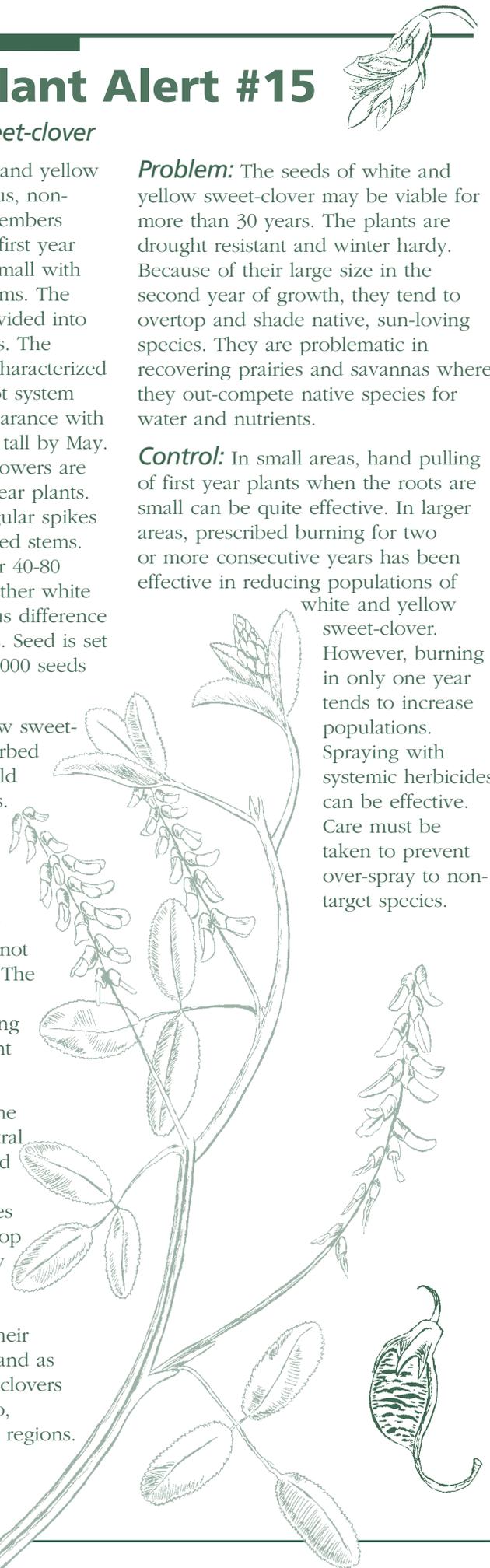
**Habitat:** White and yellow sweet-clover grow in open, disturbed areas, such as roadsides, old fields and utility easements. Intolerant of shade, sweet-clover invades upland habitats including prairies, savannas, dunes, alvars and meadows. They seem to grow best in, but not limited to, calcareous soil. The roots of sweet-clover fix nitrogen in the soil, allowing the plants to live in nutrient poor areas.

**Distribution:** Native to the Mediterranean region, central Europe and Asia, white and yellow sweet-clover were brought to the United States in the 1600s as a forage crop for livestock and for honey production. Found in all 50 states, they are used as a soil builder because of their nitrogen fixing capability, and as wildlife cover. Both sweet-clovers are found throughout Ohio, especially near agricultural regions.

**Problem:** The seeds of white and yellow sweet-clover may be viable for more than 30 years. The plants are drought resistant and winter hardy. Because of their large size in the second year of growth, they tend to overtop and shade native, sun-loving species. They are problematic in recovering prairies and savannas where they out-compete native species for water and nutrients.

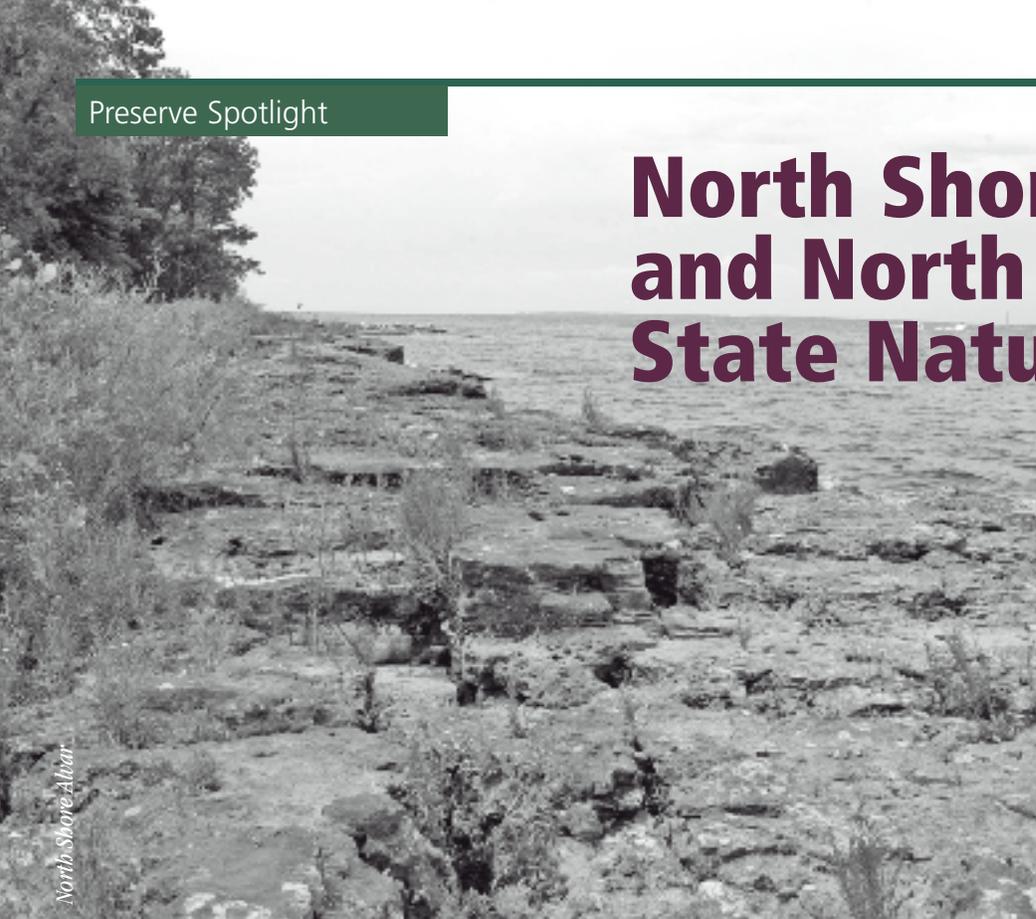
**Control:** In small areas, hand pulling of first year plants when the roots are small can be quite effective. In larger areas, prescribed burning for two or more consecutive years has been effective in reducing populations of white and yellow sweet-clover.

However, burning in only one year tends to increase populations. Spraying with systemic herbicides can be effective. Care must be taken to prevent over-spray to non-target species.



# North Shore Alvar and North Pond State Nature Preserves

Take time to discover the beauty hidden in these two natural areas when visiting Lake Erie's Kelleys Island.



North Shore Alvar and North Pond state nature preserves are located on Kelleys Island, which is just a short ferry ride from Marblehead in Ottawa County. Both areas protect unique Lake Erie coastal habitats, but that's where their similarities end.

I visited both preserves in late August, but the visit would be just as satisfying in any spring, summer or autumn month. Seasonal changes would only enhance, rather than detract, from the natural life that surrounds you at each site.

Despite its appearance—barren rocky landscape—North Shore Alvar State Nature Preserve is brimming with a life of its own. A few hardy plants grow and even bloom along cracks in the limestone rock and cling to mossy patches. Rare orange lichen covers the sides of rock walls in some areas. Sometimes pollywogs and other small critters can be found living in the rain water pooling in the terrain's dips and crags. More than a few different butterflies, including swallowtails and monarchs, could be seen flitting from plant to flower along the alvar.

North Shore Alvar is one of the few alvars in Ohio. Only found in the Great Lakes region, Ohio's other alvars

on Marblehead Peninsula have been destroyed or disturbed by human activities.

Alvars are very rare areas of relatively flat, shallow limestone or dolomite bedrock which were exposed by glaciers and kept open by a variety of environmental factors. The alvar also features shallow glacial striations. North Shore is constantly scoured by wind, waves or ice.

On a late summer's day, Kalm's lobelia (*Lobelia kalmii*), Pringle's aster (*Aster pilosus var. pringlei*) and balsam squaw weed (*Senecio pauperculus*) can be easily identified along the shore of this special 2-acre preserve. Surprisingly the site is home to a few prairie species including nodding wild onion (*Allium cernuum*), and big bluestem (*Andropogon gerardii*). Endangered plants growing here include northern bog violet (*Viola nephrophylla*) which blooms in late May. Later in autumn the large sumac and cottonwood trees

provide a colorful backdrop to the alvar.

Owned by the Ohio Division of Parks and Recreation, the site is jointly managed by Parks and the Division of Natural Areas and Preserves. If you visit when the adjacent state park is staffed with a seasonal naturalist, I highly recommend checking out their interpretative hikes at the preserve.

After walking the glaciated terrain of North Shore Alvar, prepare for a riot of growth and color at North Pond State Nature Preserve, which is located about 1.5 miles away on Ward Street. You'll be able to leave your bike, car or rented golf cart in the parking lot across from the preserve entrance.

The preserve's 1-mile path turns into an easily traversed recycled plastic boardwalk. The easy walk is accented with interpretive bulletin boards and a myriad of natural features. And on a hot summer day, the tree canopy



North Pond State Nature Preserve

provides shade throughout much of the trail.

A loop trail takes visitors to a barrier beach, which in late August was alive with birds, butterflies and the last colors of summer wildflowers. My untrained eye spied more than four different butterflies in one visit, as well as a variety of birds flying from shrub to tree top.

North Pond protects one of the very few natural wetlands directly connected to Lake Erie. Water levels in the pond are greatly affected by changes in Lake Erie's water levels. The size of North Pond changes as lake levels rise and fall. However, there is always an area of open water surrounded by shallower marshes and shrub-choked swamps. This rather intimidating feature has protected North Pond from overuse, and it remains one of the true natural features on Kelleys Island.

North Pond is home to many unique plants and animals. Wapato (*Sagittaria cuneata*) and eel-grass (*Vallisneria spiralis*) grow in the marsh. Along the beach, visitors might spot bushy cinquefoil (*Potentilla paradoxa*), silverweed (*Potentilla anserina*), inland sea-rocket (*Cakile edentula*),

purple sand grass (*Triplasis purpurea*) and seaside spurge (*Euphorbia polygonifolia*).

Snakes can be seen sunning themselves along the boardwalk. The preserve is home to the federally threatened and state endangered Lake Erie water snake. Two species of concern in Ohio also dwell here--the melanistic, or all black, Eastern garter snake, which is unique to the southern shore of Lake Erie, and the beautiful Eastern fox snake.

There's plenty for bird enthusiasts to enjoy during the spring and fall months when bird migration comes to North Pond. Many species of warblers and waterfowl stop at North Pond to feed and rest as they island-hop their way across Lake Erie to their northern breeding grounds. It is not uncommon to see more than 50 species. A total of 243 bird species has been recorded on the island, including the federally endangered Kirtland's warbler.

To learn more about North Pond and North Shore Alvar state nature preserves, please visit our website at [www.ohiodnr.com/dnap](http://www.ohiodnr.com/dnap). ✓

*Heidi Hetzel-Evans*  
Public Information

## Management shift at Old Woman Creek

On October 3, the Ohio Department of Natural Resources shifted administrative responsibility of the National Estuarine Research Reserve at Old Woman Creek State Nature Preserve to the Division of Wildlife. The move will enable the department to consolidate its coastal wetlands and aquatic research programs. The estuary's protection as a dedicated state nature preserve will be maintained.

The Division of Wildlife currently manages coastal wetlands and research operations at Magee Marsh, Metzger's Marsh and Pickerel Creek state wildlife areas along Lake Erie, and conducts fisheries research at Sandusky and Fairport Harbor. Administrator Frank Lopez and the rest of his staff at Old Woman Creek will remain.

The facility will continue to serve as a field laboratory where scientists conduct coastal wetlands research and where students may learn about the critical role of estuarine habitats in coastal ecosystems. The reserve and its nature trail are open to the public daily from sunrise to sunset. The newly renovated visitor center continues to operate as before.

For more information, contact the Old Woman Creek National Estuarine Research Reserve at (419) 433-4601. ✓

**NOT  
We've ^ Moved!**

**BUT OUR STREET ADDRESS AND ZIP CODE HAVE CHANGED...**

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2045 Morse Rd, Bldg. F-1  
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Our phone number is still  
(614) 265-6453

## ECO-MANAGEMENT

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necessary methods to maintain the integrity of the natural community.

### Employing many techniques

Protecting differing habitats calls for various means of eco-management techniques. For example, to protect a bog and its special species, it may be necessary to remove the invasive species, or even native, woody species that might shade out the sun-loving plants in a bog meadow. This could be accomplished by several different methods.

Woody species could be cut and treated with a safe application of a systemic herbicide, usually applied sparingly by brush to the root collar and stem. The plant could also be removed through the use of a low volume foliar (leaf) spray application where there is little danger of drift and damage to nearby desirable plants.

Another method may be hand removal of the entire plant from the meadow. In areas where the invasive plant is in low concentrations, this is the preferred control method. All preserve managers have extensive training in herbicide use and safe practices, and all are fully licensed applicators.

As our cover article discusses, in prairie and fen preserves, a prescribed, controlled burn may be the most effective way to eliminate woody species.

### The battle season begins soon

The eco-management season begins in the dead of winter while most of the plant world is dormant. Throughout the off season, preserve managers attend workshops and classes, and update their license requirements. Managers also refer to reports they filed in previous years to measure the success of eco-management activities in past seasons. They then develop a calendar for dealing with all the various invasive species throughout the control season.

### Invasives challenge managers year-round

As spring nears, managers begin preparing for the upcoming battle. The first enemy—garlic mustard (*Alliaria*

*petiolata*)—is a hardy biennial plant which is native to Eurasia. This plant has become a significant problem in many of our native woodlands.

Garlic mustard grows in dense stands and displaces native spring wildflowers. Recognized by large, heart-shaped leaves and clusters of small, white flowers, garlic mustard can grow to 5 feet tall and produces a tremendous number of seeds. The viability of the seed bank may last up to 10 years or more, so removing existing plants is only part of the job. Controlling garlic mustard runs from mid-March to mid-May.

Another plant that receives attention early in the season is Japanese knotweed (*Polygonum cuspidatum*), a real problem along stream banks and wooded hillsides. Cutting the stems and treating them early in the spring is an effective way to eliminate their dominance in these habitats.

As spring moves into summer, some of the grassy plants, such as reed canary grass (*Phalaris arundinacea*), Phragmites (*Phragmites australis*) and cattail (*Typha* spp) are next targeted. Foliar spraying in dense stands and hand-wicking applications in more sensitive areas are the methods of choice to combat these pests.

In upland areas, honeysuckles, multiflora rose and other woody invasives are fair game from early summer to autumn. In wetland areas, glossy buckthorn and highbush cranberry are targeted species. Usually a treatment of cutting or treating the stem and root collar or a foliar spray can be quite effective in controlling these interlopers.

By the end of June, purple loosestrife (*Lythrum salicaria*) begins to appear in wet meadows, along streams and around the margins of lakes and ponds. This aggressive European perennial grows from a root crown that can produce multiple stems and shoots as it ages. In some areas, the purple haze from the flowers dominates the plant community in and around a wetland.

Purple loosestrife can grow to 8 feet tall. Where the stands are thick, other plants can completely disappear. In



these situations, a foliar application of a glyphosate herbicide can be very effective. Seed viability can be a problem, and follow-up techniques are usually required for several years. In areas where control has been instituted and few plants remain, hand removal is the preferred method for eradication. This poses little threat to nearby desirable plants and ensures that community integrity is restored to the site.

### Reducing next season's growth

As summer turns to autumn, chemical effectiveness diminishes as plants dry and harden. Woody plants, such as glossy buckthorn, can still be targeted, especially with cut and treat methods and hand pulling. As the days shorten, most plants become dormant and the leaves fall from trees and shrubs. Yet, this is still an effective time of the year for eradicating garlic mustard. This biennial plant will revive in the autumn and first-year plants can grow quite vigorously. Late autumn spot treatments and hand pulling can make next spring's work easier for managers.

As the snow begins to fall and the landscape rests, the preserve manager can kick back and reflect on the season past and prepare for the season to come. Eco-management is a never-ending role in preserve management. ✓

*Emliss Ricks  
Northeast District  
Preserve Manager*

# An Ancient River

Lake Katharine State Nature Preserve in Jackson County protects a veritable cornucopia of state-listed rare plants. Most of them are of southern extraction and the story of how they came to these sheltered hollows along Rock Run is one of time, ice and an ancient river.



If we could step into a time machine and transport ourselves back several hundred thousand years to the Tertiary Period, we would see a landscape that was in some ways very familiar, and in others, very different. We would recognize many of the trees and flowers, but the geography would confuse us.

Most obviously, there would be no Ohio River. In its place, we would find a much larger river heading from the mountains of North Carolina and flowing north into what is now Ohio, then bending west into Indiana and Illinois. There were no humans around then to give it a name, but the Denison University geology professor William George Tight who rediscovered its existence in the late 1800s called it the Teays River after the Teays Valley in West Virginia, its largest remaining segment.

Close observers had always puzzled over why so many of Ohio's streams seemed to flow backwards—from the plains into the hills—and why so many of their valleys pinched together in places, looking like hourglasses. Tight's revelation solved the problem. The present river system of Ohio is not the result of uninterrupted stream erosion

over millions of years, as is found in much of the rest of the country. River life here was broken by a cataclysmic event of continental proportions—the Ice Age.

As the glacier moved south over what is now Ohio, gravel washing out of its melting face poured into the valleys ahead of the ice, damming the rivers that flowed in them. Even the mighty Teays was overcome by gravel and eventually by the ice itself, which completely covered its valley.

Behind these natural dams, the waters of the rivers ponded into lakes that grew deeper and longer, filling the ancient valleys until they overtopped the lowest point in the surrounding hills and poured over into neighboring streams. The mighty rush of gravel-laden water through these narrow “cols” quickly eroded the bedrock saddles down. By the time the ice finally retreated, the old stream valley had been so filled with silt and gravel that drainage seeking its way out of the newly-exposed land found it easier to use the gorges cut through the cols. Thus, many of our modern valleys are patchworks of old valleys stitched together by narrow gorges.



*Bigleaf magnolia*

The Teays valley itself is still visible south of the glacial boundary, its wide expanse occupied in most places by tiny streams that often cut across it rather than follow it. North of the glacial edge, the ancient valley exists as a trough in the bedrock, buried under hundreds of feet of glacial debris.

Perhaps the most interesting artifact of the ancient Teays River is the suite of southern plants that can still be found in Ohio, many of them listed as rare in the state and most at the northern limit of their range.

Before it was filled, the broad valley offered a convenient passage for seeds, root stocks and other means of propagation. Plants colonizing the valley floor and its steep sides were no doubt bathed in warmer southern air funneling up the river which allowed them to move far beyond their normal homes. All this was disrupted by the ice.

Now only in a few select sites where conditions are just right do any of these fascinating species survive, species such as rhododendron, flame azalea, bigleaf magnolia (found at Lake Katharine) and Canby's mountain-lover. Some of the finest populations of these relic species are protected in state nature preserves. ✓

*Tim Snyder*  
West Central District  
Preserve Manager



## Natural Areas Discovery Series Ends

On an exceptionally beautiful late summer day on the dunes of Lake Erie, more than 65 visitors learned about the unique ecology of Headlands Dunes State Nature Preserve.

An early morning hike drew nearly a dozen birders who caught sight of warblers, including the Wilson's warbler, resting in the shrubs of the preserve as they make their way south. The bird hike was led by Jim McConnor from the Blackbrook Audubon chapter.

Later, Preserve Manager Charlotte McCurdy led two interpretative hikes along the dunes and shoreline of the preserve, which is adjacent to Headlands Beach State Park in Lake County. More than two dozen hikers learned about the fragile and highly

specialized coastal plains plants. Visitors learned to recognize such rarities as seaside spurge and beach pea, as they grew along the open dunes, as they were surrounded by grasses, such as little bluestem.

The division's 2004 Natural Areas Discovery Series ended with dual events at Fowler and Johnson Woods in October, but plans are already being made for next year. We hope you'll consider joining us for the 2005 Natural Areas Discovery Series. ✓



### PRESERVING NATURE TODAY FOR THE NEEDS OF TOMORROW

The Division of Natural Areas and Preserves' Mission Statement  
Administer a system of nature preserves and scenic rivers by identifying and protecting Ohio's significant natural features.

Vision Statement  
Leading Ohio in the stewardship of its natural heritage.

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Ohio Department of Natural Resources  
Division of Natural Areas and Preserves  
2045 Morse Road, Bldg. F-1  
Columbus, Ohio 43229-6693  
(614) 265-6453  
Bob Taft, Governor  
Sam Speck, Director  
Nancy Strayer, Acting Chief

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