

Why Burn? Part 1: An Overview of Prescribed Fire in Ohio's Prairies and Grasslands

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As land managers, the use of fire, and more specifically prescribed fire, has been conducted as a management tool in a variety of habitats across Ohio for decades. Fire has a place in the management tool box for habitats such as oak-hickory forests, prairies and prairie savannas, grasslands, and possibly some wetland types. More recently, prescribed fire has been applied to various prairie and prairie wetland restorations, warm season grassland plantings (e.g., CRP) and in the control of non-native invasive species.

It is important to remember that while fire is a very useful management tool, fire is a mechanism that creates disturbance. With this in mind, it is critical to note that historically in Ohio, other activities and even some species likely created disturbance that benefited Ohio's habitats. One example is water. We may never be able to conceptualize how wet Ohio's original landscape was before the installation of an extensive drainage system that included subsurface tile, ditches and channelization of streams and other water patterns. This excerpt from *The History of Madison County (1883)* provides some insight:



“It is a well authenticated fact that a great portion of Madison County was, originally covered with water most of the year. The first settlers called these lands “barrens” and looked upon them as utterly unfit for farming purposes.”

The occurrence of bison historically in Ohio is noted by several historical references. Most of these references refer to them as “common and widespread in Ohio” south of Lake Erie. If one considers the day to day activities of grazing, scratching at the ground with their hooves and their creation of wallows, a herd of bison can create a reasonable amount of disturbance. This likely created areas for nesting birds, plant colonization by species that benefit from disturbance, and a mosaic of ground cover with small bare areas.



Bison rutting and wallowing in South Dakota.

Other species that created disturbance locally might have been species such as badgers in northwest Ohio, where they have always been most common in Ohio. In the southern part of Ohio, the mounds of the Allegheny Mound Ant create large areas of nearly bare soil around their large mounds. If these are scattered through the open oak woods, they could create an interesting mosaic of ground conditions.

In some habitats and for some species, especially grassland birds, fire may not be the best tool and seasonal mowing may be the selected management tool. The advantage of seasonal mowing is that the window of opportunity to mow is much larger. Mowing can be completed between August and early April with little or minimal impacts to wildlife. In some years, it may be necessary to delay mowing later into August to allow for grassland and open field species of birds to complete nesting. Conversely, an early spring may support the decision that mowing should be completed by April to avoid American Woodcock nests and the migration to breeding pools of several species of amphibians. Where seed production of grasses and wildflowers is a priority, mowing should be delayed in the fall until late October and early November. The mowing process will also spread the seed.

We know that fire has played a role in Ohio's landscape throughout history. Many surveyors and early Ohio explorers noted the use of fire by native Americans. Two references from central Ohio note:



“It was a grand sight to see those prairies on fire, especially at night, when hundreds of acres were surrounded by the destroying element, whose forked tongs shot upward above the interspersed oak openings, and its light almost equal to that of a mid-day sun, revealing the rapid retreat of the deer and other wild animals to some secluded place of safety. The very nature of the vegetation that grew upon these prairies made the fires formidable and to be dreaded by the first settlers.... ” (History of Madison County, Brown, 1883).

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:

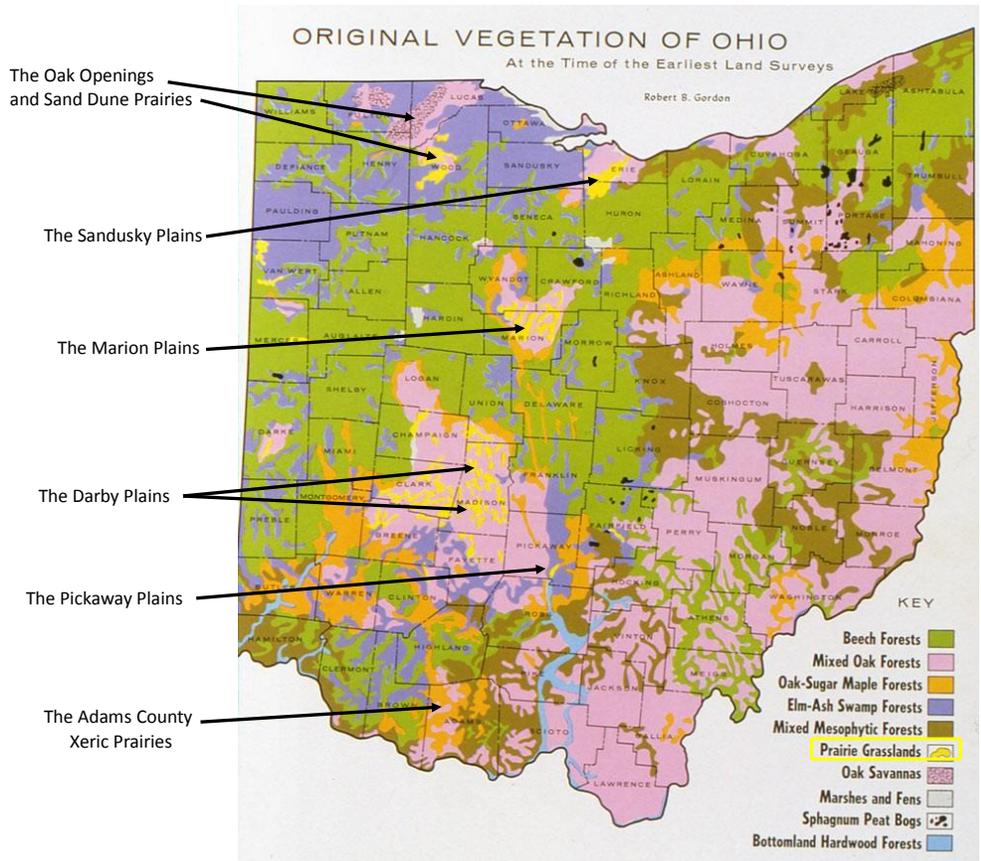


“we kindled a large circle in the prairie....as the fire burned in towards the centre of the circle, the deer fled before the fire: the Indians...shot them down every opportunity... The rain did not come on that night to put out the outside circle of the fire, and as the wind arose, it extended thro the whole prairie which was about fifty miles in length, and in some places nearly twenty in breadth. This put an end to our ring hunting this season.....”

Fire has a place in nearly all of the prairie management in Ohio. Proper management planning and specific goals and objectives for each site will help one determine how often prescribed fire should be applied to the land. This will include a determination of whether spring or fall burning is best for a specific site. For example, if a site hosts the State Endangered prairie violet (*Viola pedata*), a burn should take place as early as possible (possibly early to mid-March) to avoid potentially damaging emerging plants. A fall burn on this site might also be possible, but one might evaluate the potential impacts of open post-burn ground all winter and the possibility of blowing seeds of invasives and soil erosion. In addition, it is worth considering what other types of rare plants and animals may inhabit the site and how a poorly timed burn may greatly affect these species. This also applies to common species and should be reflected in the management goals.

So, why use prescribed fire? Fire as a management tool can create unique results versus other management options. A well-executed fire will create enough heat to consume much of the underlying dead vegetative material or “litter” whether it is grass or forest floor leaf material. The removal of the litter often promotes the growth of some plants, which may be suppressed, to once again bloom and set seed. The resulting exposed blackened ground warms quicker under the spring sun promoting early season germination of some plant species. Fires that generate enough heat can top kill, and sometimes permanently kill, unwanted woody species (native and non-native species) that shade out sun-loving vegetation. Combining this with the fact that some species of plants require exposure to fire to germinate can often result in a rebirth of native prairie and other fire-adapted vegetation. Some species may lay dormant in the soil for years until exposed to fire and then reappear on their native landscape, sometimes responding in a massive bloom the first year.

Fire, while detrimental to some wildlife species, can also be beneficial to species such as some grassland nesting birds. Some species prefer a sparse ground cover under and between clumps of vegetation so they can walk for foraging and to and from nests. Many ground nesting birds land several feet away from a nest and approach the nest in a secretive fashion to conceal the actual nest location. Well timed burns, not only seasonally but in a proper rotation, can benefit insect species that in turn provide food for other species.



At the time of settlement, there was just over 1,000 square miles of native prairie in Ohio. Today, it is likely that no more than 1,000 acres of native prairie remains statewide. A number of restoration efforts throughout the state has restored a few thousand acres of prairie that provides opportunities to preserve original genetics, reintroduce rare plants, manage for related wildlife species, and provide great educational and hiking areas to enjoy this important feature of Ohio's natural heritage and landscape.



The Darby Plains

The Darby Plains at the time of settlement represented Ohio's largest prairie region and covered 380 square miles west of Columbus, Ohio. The area contains one of only two original prairie savannas remaining in Ohio, the Pearl King Prairie Savanna (owned and managed by the Columbus and Franklin County Metro Parks) that was recently dedicated as a State Nature Preserve. Other examples of the prairies of the Darby Plains include Bigelow Cemetery State Nature Preserve, Smith Cemetery State Nature Preserve, and Milford Center Prairie Natural Area. The Ohio to Erie Bike Trail west of London towards Clark County also contains a number of small prairie remnants and examples of native Darby Plains' prairie vegetation. Signature prairie plants include royal catchfly, prairie dropseed, and Sullivant's milkweed.

The Sandusky Plains

The Sandusky Plains of Crawford, Marion and Wyandot Counties were similar to the Darby Plains being wet, mesic prairies and likely flooded annually. While much of the original prairie area has been drained, cropped or allowed to revert to woodland several very significant sites are still present in the area. The Daughmer Prairie Savanna State Nature Preserve is Ohio's largest native remnant unplowed, deep soil prairie savanna. The 33-acre Bur Oak Savanna preserve is open to the public with trails that wander through numerous bur oaks over 3-feet in diameter. Scattered remnant prairies can also be found at the Killdeer Plains Wildlife Area on the Marion-Wyandot County line. This area contains large populations of Sullivant's milkweed. Other species encountered include prairie dock, stiff goldenrod and gray-headed coneflower. The most diverse prairie remnant remaining in the area is the Claridon Railroad Prairie. This one-mile prairie remnant sits between Marion County Road 114C and the CSX railroad line just east of the State Route 98 and 309 intersection. It hosts at least 60 species of prairie plants that include several species of prairie grasses, Sullivant's milkweed, Ohio spiderwort, prairie dock and whorled rosinweed.

Castalia Prairies

Located in north central Ohio, the prairies of the Sandusky Plains are of two types: 1) those that formed in the sand deposits of glacial lake beds that pre-dated Lake Erie as found at Erie Sand Barrens State Nature Preserve and 2) those that formed in the calcareous wet region of the western portion of the area near Castalia. The Resthaven tallgrass prairie near Castalia represents one of the largest native prairie remnants in Ohio. Signature prairie plants include the endangered small white lady's slipper, several species of blazing-stars, butterfly-weed, and a diversity of tallgrass prairie species.

The Oak Openings

The prairies of northwest Ohio's Oak Openings Region support dry and wet sand prairies that contain some of Ohio's rarest and most interesting prairie plants. While the signature prairie species of this region is the wild blue lupine, this area supports other species such as soapwort, prairie and fringed gentians, orange-fringed orchid, and wood lily. Many of Ohio's rarest butterflies inhabit this region as well. The Karner blue butterfly, frosted elfin, duskywing, silvered-bordered fritillary, dusted skipper and purplish copper all can be found in this region, although several of them are vanishing now. Examples of this region's prairies can be visited at Irwin Prairie State Nature Preserve, The Lou Campbell Prairie at Oak Openings Metro Park, and Kitty Todd Prairie owned and managed by The Nature Conservancy.



Kitty Todd Prairie

The Adams County Xeric Prairies

These Ohio prairies represent a group of prairies that formed south of the glacial boundary on much shallower and drier soils than the prairies of central and northern Ohio. The famous Ohio ecologist, E. Lucy Braun who studied these prairies extensively, believed that prairie species of dry xeric remnants represented an earlier invasion of western prairies that pre-dated the Illinoian glacial period (2,000,000 to 200,000 years ago). Braun also suggests that a second invasion of prairie flora occurred during a dry period post-Wisconsinan glacier that included species of more mesic to wet habitats. Signature species include Virginia agave, spider and green milkweed, and pale-spiked lobelia. Other oak woodland species associated with these prairies contain blackjack and post oak and the spectacular crested coral-root orchid. Examples of these prairies can be visited at Adams Lake and Chaparral State Nature Preserves and the Lynx Prairie owned and managed by The Nature Conservancy.



Adams County Dry Xeric Prairie Opening

Wildlife Species of Ohio Prairies

While a number of prairie species of wildlife adapted and evolved in the fire-dependent prairie habitat, it is important to consider that the original prairies were much larger in size than today's remnants. While fires occurred in the original prairies, it is unlikely that "the entire prairie" burned. These unburned areas or even mosaics of unburned areas within the prairie provided either refugia or additional populations of wildlife to recolonize burned areas. Today's remnants are generally very small in nature, so we should evaluate the potential impacts of fire to rare and endangered prairie species such as the various prairie butterflies, the Eastern plains garter snake and the massasauga rattlesnake. Since some of these populations are often very localized and intense fire can cause mortality. When planning a burn, it is critical to create refugia and burn at times most likely to result in minimal, if any, impact to these species. In the case of species that may be listed federally, there will be established standard dates when burning is not permitted to protect their populations, as determined by the US Fish & Wildlife Service. Some species of grassland nesting birds are very fire-adapted and greatly benefit from regular burning. Other species, while requiring open grassland habitat also utilize a thick structure of ground vegetation for nesting. Understanding the life histories and habitat requirements of all species in an area being evaluated for a burn is critical. Considering the effects on all species, positive and negative, is an important aspect of applying any management tool, especially prescribed fire, to the landscape.



Savannah Sparrow eating Indian Grass.



Frosted Elfin laying eggs on Wild Blue Indigo.

As we always must remember, fire is a tremendous management tool, but it is very unforgiving of poor planning and human error. When we as land managers decide to use prescribed fire, we should be responsible, cautious, and well-trained. Planning should be taken very seriously as any prescribed fires which escape the intended units may be determined to be negligent, potentially threatening the very use of prescribed fire as a management tool in Ohio.