

Natural Communities Restoration and Management – Prairies and Savannas
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Written in September 2010

During pre-settlement times in Illinois, the creatures of the prairie were a wonderfully diverse lot. Each species was well adapted to extreme temperatures, drought, wind, fire, and high light intensity. Plant-eating animals were abundant, and so were the animals that preyed upon the plant-eaters. Consider this scenario; large number of grasshoppers fed upon plant material while upland sandpipers, prairie chickens, quail, loggerhead shrikes, and meadowlarks fed upon the grasshoppers. There were the small mammals digging tunnels beneath the grasses and being preyed upon by the carnivorous animals such as foxes and wolverines. Yet, soon the prairie region of Illinois became the “Corn Belt” and a land of urban development, and consequently diversity declined. In fact, truly cataclysmic changes in the tallgrass prairies, which once covered much of Illinois, took place in a very short span of time. Yet, it seems we human beings have noticed the absence of the tallgrass prairie and have realized the loss because now many people are dedicating their energies to the restoration of the prairie ecosystem. Fortunately, sometimes certain ecological changes, brought about by human beings, are reversible. True, bison herds may never again roam freely across the extensive prairies of Illinois, but prairie plants are growing prolifically on land that was once row-cropped fields at Ballard Nature Center.

The First Step

The first step in the process of ecosystem restoration is research. BNC’s land management team sought to discover the natural history of the Southern Till Plain region of Illinois and to understand the nature of the prairie ecosystem which once flourished in the area. “There is no single model of a tallgrass prairie but rather an endlessly variable, dynamic tapestry of plants and animals that for thousands of years have been responding to and in turn influencing their landscape and each other” (Doug Ladd, *Tallgrass Prairie Wildflowers*).

The team learned that the historical tallgrass prairie plant species included grasses, of course, but also many species of forbs or wildflowers and some woody plants. The tallgrass prairie community is generally characterized by an abundance of grasses growing three or more feet tall, including Big Bluestem and Indian Grass; shorter grasses, such a Prairie Dropseed Grass; an extensive variety of flowering plants, such as Blazing Star and Purple Coneflower and Compass Plant; and a myriad of other creatures, insects, mammals, birds,...



The Restoration

To create prairie habitat upon the land newly designated as Ballard Nature Center in 1997, several acres were taken out of agricultural production and planted using a prairie seed mix containing grasses, dominated by little bluestem *Andropogon scoparius* and big bluestem *Andropogon gerardi*, and containing forbs such as black-eyed Susan, *Rudbeckia hirta*, Illinois bundleflower, *Desmanthus illinoensis*, and sunflowers (*Helianthus spp.*) Repeatedly over the years additional plant species indigenous to the region have been planted by sowing seed or by planting seedlings and rootstock.

Management Practices

Once the grasses and forbs became established (growing from root each spring and forming seed at the end of each growing season), prescribed fire was utilized as a management practice to reduce the encroachment of less desirable woody species, such as maples, *Acer spp.*.

Despite the use of fire, two woody species that have been particularly invasive, spreading rapidly in the center's prairies, are black locust, *Robinia pseudoacacia*, and the exotic autumn olive, *Elageagnus umbellate*. Application of herbicide, either by spraying on the saplings' foliage or by basal bark methods, has proven effective in limiting woody colonization but



only because of the diligence of the land management team and concerted efforts of a dedicated volunteer.

At Ballard Nature Center prescribed burns are executed with extreme caution by trained specialists. A "burn plan" with safety as the first priority is developed. The procedure often includes the

establishment of fire breaks,

which are created by mowing and/or tilling a strip, ranging from six to fifteen feet wide, around the section of prairie to be burned. Wind velocity and direction are significant factors in determining whether or not a prescribed fire will be utilized on a particular day. The fire is first ignited at one edge of the prairie so that the fire burns toward the wind as a "backfire." Fire is an effective tool in the eradication of certain tree and shrubs from a grassland. Fire destroys the apical meristem or bud (point of growth) which is terminally located (situated at the end of stems) on woody species. The buds of those herbaceous plants that are best adapted for survival in prairies are beneath the surface of the ground, protected from intense heat.

Natural Community and Human Community

In an effort to increase the botanical diversity of the restored prairie areas at Ballard Nature Center, staff members enlisted the help of volunteers. Students were invited to engage in BNC's habitat management programs, especially efforts to preserve prairie habitats. Educators and BNC's naturalists collaborated, creating a service-learning project, so that youth could learn valuable lessons, both about ecology and about themselves, while they served their own communities through works at Ballard Nature Center. Now young people are gaining self-confidence as they discover





One beautiful evening in early spring, following a prescribed burn conducted by the area's natural heritage biologist and his burn crew, a troop of Brownies, getting their little tennis shoes black from sooty grass clumps, spread prairie forbs seed. The purpose was the augmentation of the prairie's aesthetic value, or in the words of the little girls, the purpose was "to plant pretty wildflowers all over." Over the years, youth volunteers have also helped collect seed from the more established prairies to later sow on the center's newer restored prairie areas and have conducted botanical inventories to assess diversity.

The Prairie

Now visitors walking along trails that border the prairies at Ballard Nature Center may be likely to agree with a statement written by Eliza Steele in 1840, "... I started with surprise and delight. I was in the midst of a prairie!" At Ballard Nature Center, the early blooming Golden Alexander, *Zizia aurea*, provides nectar and pollen as insects first become active in the spring. Soon bees and butterflies move from bloom to bloom along the rose-purple colored spike of flowers on Blazing Star, *Liatris pycnostachya*. Later, the eggs of monarch butterflies hatch into yellow-and-black striped caterpillars which begin munching upon Butterfly Milkweed, *Asclepias tuberosa*. During late summer, coneflowers and sunflowers provide many birds with their favorite seeds to eat. In September the goldfinch still bedecked in its breeding plumage may be seen flying over the prairie to alight upon a bloom every bit as yellow as the bird, a bloom on one of the tallest of prairie wildflowers, Prairie Dock, *Silphium perfoliatum*. Eliza Steele's statement about prairie wildflowers rings true:

"When the sun flooded this Mosaic floor with light, and the summer breeze stirred among their leaves the iridescent glow was beautiful and wondrous beyond anything I had ever conceived..."

Prairie Community—Successful Restoration and Management

The summer of 2010, a group of teachers, attending an ENTICE workshop, were following the lead of the guides, three entomologists and the two naturalists on staff at Ballard Nature Center, when a resounding drone or buzzing began emanating from the prairie. It was a remarkable sound, one that the scientists delightedly recognized. The prairie cicada, a rare insect which frequents only high-quality prairies, had made a home in the prairies of Ballard Nature Center.



Savanna Restoration

During a savanna restoration procedure, funded through Conservation Practice 25 – Rare and Declining Habitats, a field was first planted to native prairie grass and wildflowers in late winter, a practice called “frost seeding,” and was treated with Plateau herbicide in early spring for the control of annual weeds. In October of that year, fire tolerant trees such as oak were planted. The thick, corky bark of an oak protects the tree’s cambium layer from fire damage and its deep roots enable the tree to survive fire events. Historically, oak trees grew in prairies despite the frequent lightning-ignited fires that once swept across the prairies of the past.

In 2009 and 2010 Ballard Nature Center was awarded a grant, the Illinois State Wildlife Preservation Fund, for shrubland restoration. The funds enabled the purchase of several shrubs indigenous to Illinois and adapted to growth in edge communities between forest and prairie. Lead Plant, New Jersey Tea, Shrubby St. John’s Wort, Witch Hazel, and Shadbush were obtained in the form of RPM® plants or saplings in containers and in the form of potted plants. These woody and herbaceous plants were installed by use of shovel and manual labor in the savanna restoration area and in the center’s prairies near the forest edge.

Into the Future

Ballard Nature Center’s staff and volunteers continue to find ways to improve the quality of the natural community restoration areas for the benefit of wildlife populations and for the enjoyment and education of both the individuals who currently explore the outdoors at Ballard Nature Center and those who will be the outdoor enthusiasts in the future.



Image of a shrub planted at prairie’s edge during Shrubland Restoration Project