Iowa Prairies

Iowa Association of Naturalists

Iowa's Biological Communities Series

Iowa Association of Naturalists

The Iowa Association of Naturalists (IAN) is a nonprofit organization of people interested in promoting the development of skills and education within the art of interpreting the natural and cultural environment. IAN was founded in 1978 and may be contacted by writing the Conservation Education Center, 2473 160th Rd., Guthrie Center, IA 50115, 515/747-8383.

Iowa's Biological Communities Series

Iowa's natural beauty has long been a great factor in drawing people to the state. But there is more to that beauty than meets the eye. To assist Iowa educators in teaching their students about the complexities of Iowa woodlands, wetlands, waterways, and prairies, the Iowa Association of Naturalists has produced a series of booklets which offer a basic, understandable overview of Iowa biological communities. The five booklets in this series are:

Iowa's Biological Communities (IAN-201)
Iowa Woodlands (IAN-202)
Iowa Prairies (IAN-203)
Iowa Wetlands (IAN-204)
Iowa Waterways (IAN-205)

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Iowa Prairies is one in a series of five booklets that are part of the *Iowa's Biological Communities Series.* The booklets in the series include:

Iowa's Biological Communities

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Iowa Prairies	(IAN-203)
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Iowa Waterways	(IAN-205)

The Iowa Association of Naturalists has produced six other booklet series that provide readers with a clear, understandable overview of topics concerning the Iowa environment and conservation. The booklets included in each of the other five series are listed below.

Iowa Physical Environment Series

Iowa Weather	(IAN-701)
Iowa Geology and Fossils	(IAN-702)
Iowa Soils	(IAN-703)

Iowa Wildlife Series

Iowa Mammals	(IAN-601)
Iowa Winter Birds	(IAN-602)
Iowa Nesting Birds	(IAN-603)
Iowa Reptiles and Amphibians	(IAN-604)
Iowa Fish	(IAN-605)
Iowa Insects and Other Invertebrates	(IAN-606)

Iowa's Natural Resource Heritage

Changing Land Use and Values	(IAN 501)
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Iowa's Environmental Laws	(IAN 503)

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Misconceptions About Iowa Wildlife	(IAN-403)
State Symbols of Iowa	(IAN-404)
Iowa Food Webs and Other Interrelationships	(IAN-405)
Natural Cycles in Iowa	(IAN-406)
Iowa Biodiversity	(IAN-407)
Adapting to Iowa	(IAN-408)

Iowa Plants

Iowa's Spring Wildflowers	(IAN-301)
Iowa's Summer and Fall Wildflowers	(IAN-302)
Benefits and Dangers of Iowa Plants	(IAN-303)
Iowa's Trees	(IAN-304)
Seeds, Nuts, and Fruits of Iowa Plants	(IAN-305)
Iowa's Mushrooms and Other Nonflowering Plants	(IAN-306)
Iowa's Shrubs and Vines	(IAN-307)

Iowa Environmental Issues

Iowa Habitat Loss and Disappearing Wildlife	(IAN-101)
Iowa Air Pollution	(IAN-102)
Iowa Water Pollution	(IAN-103)
Iowa Agricultural Practices and the Environment	(IAN-104)
People, Communities, and Their Iowa Environment	(IAN-105)
Energy in Iowa	(IAN-106)
Iowa Waste Management	(IAN-107)

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Iowa Prairies

Iowa was once a land covered by vast prairies. While thick woodlands bordered the many rivers and streams and covered much of northeast Iowa, prairies still dominated the landscape. Prairie grasses and flowers covered approximately 85 percent of Iowa. Wetlands dotted the prairie landscape, and a large variety of wildlife lived in Iowa's prairies and prairie wetlands.

When European settlers first encountered the prairies of Iowa they were unable to express what they saw. The vast sea of grasses and flowers had no counterpart in Europe. "Prairie," the French word for "meadow," was used to describe the awesome spectacle which met settlers as they moved west out of the eastern forests.

The landscape of Iowa has undergone a drastic change in the past 160 years. Iowa's prairies, woodlands, and wetlands all have been greatly reduced. Prairies have suffered the most destruction. Of the 30 million acres of prairie that covered Iowa at the time of European settlement, less than one-tenth of one percent remains.

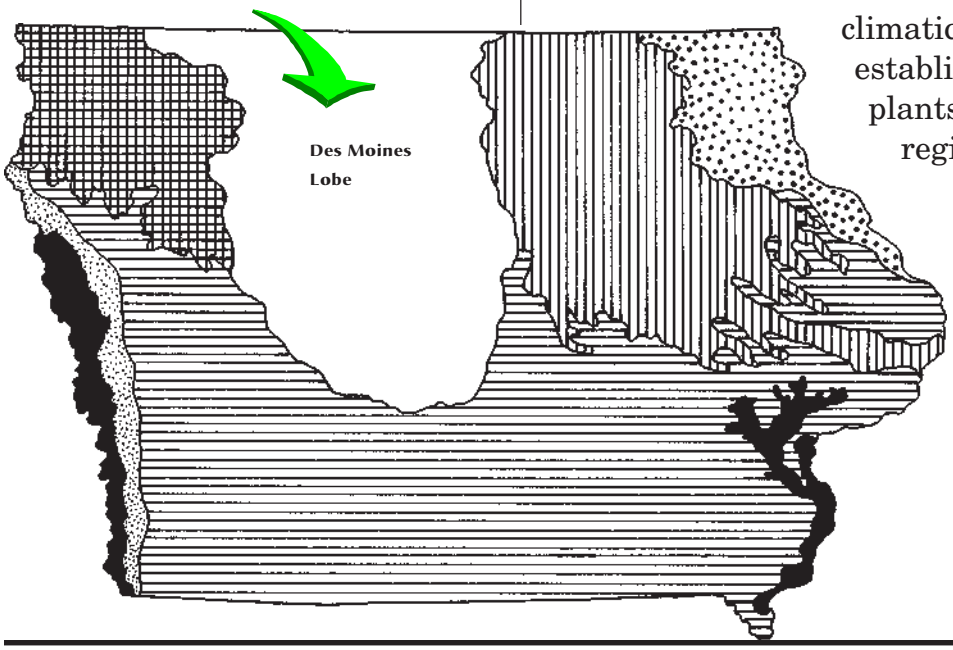
The Loess (pronounced "luss") Hills of western Iowa contain the largest remaining prairies in Iowa. Other prairie remnants are found along railroad rights-of-way and roadsides, and in forgotten nooks and crannies scattered across the state. Still, prairies are making a comeback. During the past decade, prairie acreage has increased as Iowans have restored and reconstructed many prairie areas.

Types of prairies

Although the processes that created the Iowa prairie are not entirely known, it seems a variety of factors, including climate, soil, and topography, played major roles. In North America, prairies exist in the "rain shadow" of the Rocky Mountains, an area drained of moisture by air currents rising over the mountains. Prairies tend to outcompete woodlands in areas that are in direct sunshine and strong winds, where moisture is a limiting factor. Trees tend to establish themselves in river bottoms, along streams, and on the more damp north and east slopes of hills.

The Iowa prairie originated nine to ten thousand years ago, following the retreat of Iowa's most recent glaciers. The glaciers left behind a landscape that became a productive prairie ecosystem over time. The prairies often were dotted with wet depressions, known as prairie potholes, which covered much of north and central Iowa. Warm, dry climatic conditions favored the establishment of prairie plants in this prairie pothole region and elsewhere throughout the state.

The origin of Iowa prairies followed the retreat of recent glaciers. Prairie wetlands were common in the north and central part of the state, known as the Des Moines Lobe.

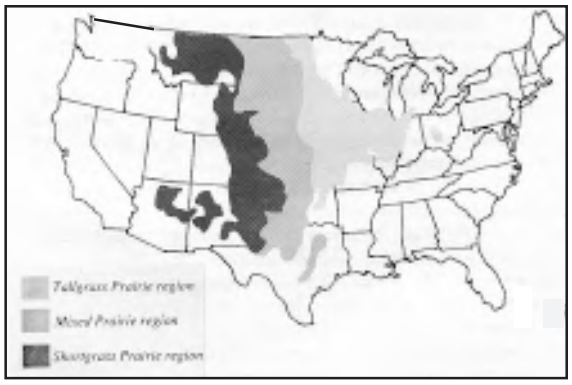


Once established, prairie plants held their ground. The dense roots of prairie plants did not allow invading trees and shrubs to grow. An important factors in

maintaining the prairie ecosystem was fire. Prairie plants are adapted to surviving frequent prairie fires, while many woody plants are not.

The amount of prairie in Iowa reached its peak approximately four to five thousand years ago, and still dominated the Iowa landscape when Europeans arrived some 300 years ago.

The grasslands of the United States are divided into three general categories, distinguished by their dominant grasses. The first, and possibly most astonishing of the prairies to greet westward-moving settlers, was the **tallgrass prairie**. Great expanses of tallgrass prairie covered much of the northern two-thirds of Illinois, nearly the entire state of Iowa, then stretched north into southwestern Minnesota and south into northwestern Missouri. Tall grasses, sometimes reaching 12 feet into the open prairie sky, were dominated by grasses such as Indian grass, big bluestem, and switchgrass. Today, a tall grass called corn dominates this area.



The great grasslands of the United States are divided into three general categories, distinguished by their dominant grasses.

Lying west of the tallgrass prairie was the **mixed prairie**, composed of a variety of medium sized grasses. Little bluestem and varieties of wheat grasses were most common in this area, which today is known as the wheat belt. The western grasslands, known as the **shortgrass prairie**, contained buffalo grass and other short grasses that were favorite foods of the wandering bison herds. Most of this area is now rangeland for cattle and sheep.

Tallgrass prairie is the most common type of prairie in Iowa, and once dominated the state. Tall grasses, such as big bluestem and Indian grass, and prairie flowers, such as compass plant and blazing star, grew throughout most of the prairie pothole region of north and central Iowa.

The **Loess Hills prairie** is a vast dry prairie containing a mixture of both tall and short prairie grasses. The Loess Hills were formed over time as windblown soil, called loess, was deposited on the eastern edge of the Missouri River. The rugged landscape contains the largest area of remaining Iowa prairie. Little bluestem dominates the Loess Hills prairies and, along with sideoats grama and other grasses, stabilizes the steep landscapes. Many of the plants found in the Loess Hills are uncommon elsewhere in the state. Some seem to have come from the semi-arid West. Yucca, bluets, large-flowered beardtongue, and skeleton weed grow in the loess deposits of these prairies.

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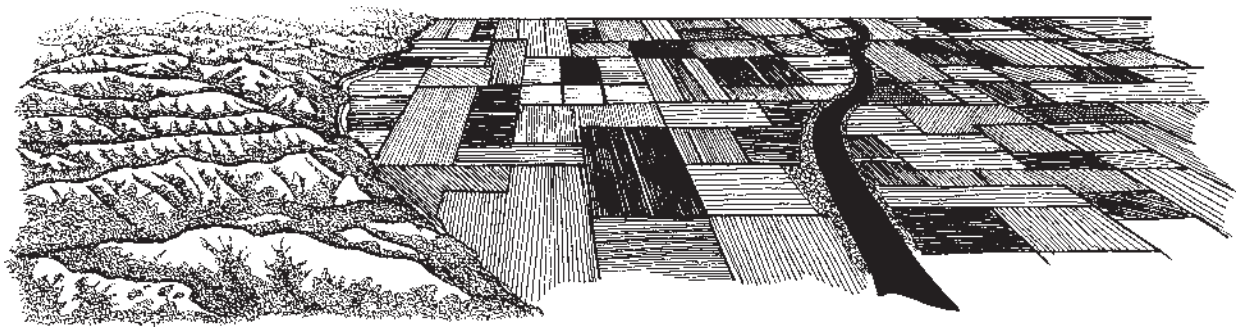


Hill prairies are small islands of grassland often surrounded by woodland and are more common in the eastern part of the state. Like the Loess Hills prairies, they are found in rugged terrain and have well-drained soils. They are often somewhat dry and contain both tall and mid-height grasses.

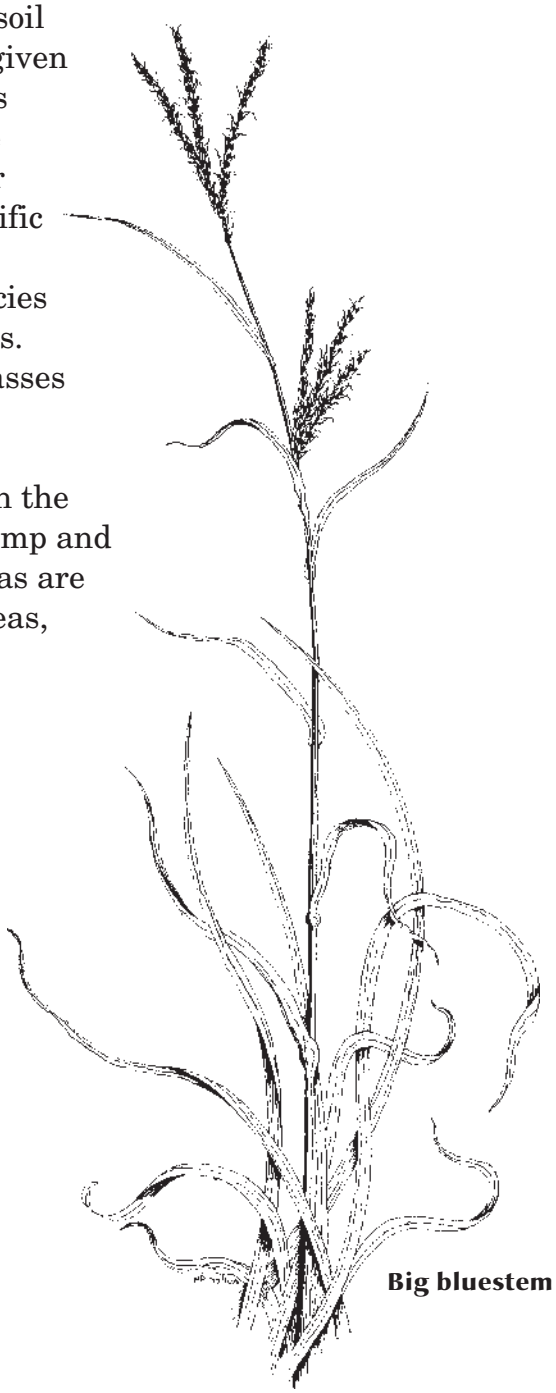
Some pieces of the Iowa prairie were too dry and sandy to be good for farming. These **sand prairies** are sometimes found as small relics containing rare prairie plants and animals.

Savannas are areas composed of a mixture of grassland and scattered burr oak trees and shrubs. Elk depended on Iowa savannas, where they lived in the open grassland and fed on the leaves of trees and shrubs.

Plants of Iowa prairies

Whereas trees dominate and define wood land, grasses dominate and define a prairie. Climate, moisture and soil determine the types of grasses found in a given prairie. In general, tall grasses and sedges are found in moderate to damp soils, while shorter grasses are more common in dry or sandy prairies. Some grasses require specific conditions, while others are found in a variety of prairie types. More than 70 species of grasses are known to grow in Iowa's soils. Only a few of the more common prairie grasses are discussed in this booklet.

Vast areas of the Iowa prairie, especially in the prairie pothole region, were historically damp and contained many wetland areas. These areas are where the tallest grasses grow. Wetter areas, especially common in low prairies, contain sedges and other wetland plants. Shorter grasses are more typical on dry or sandy prairies.



Big bluestem

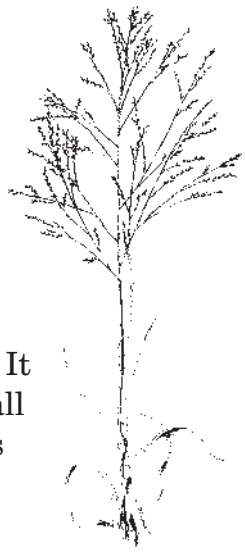
Grasses of Iowa prairies

Big bluestem is the chief grass of the tallgrass prairie and was once the dominant plant of the Iowa landscape. The plant is sometimes called turkey foot because the seed head is usually branched into three parts, resembling a turkey's foot. Big bluestem varies in color from bronze to lead-gray and commonly grows to a height of six to eight feet. It is found in a variety of prairies throughout Iowa.

Indian grass

Indian grass is distinguished by its long, golden, plume-like seed head, which can be 4 to 12 inches long. It grows on a stiff, erect stem to a height of four to eight feet. The leaves spread from the stem at approximately a 45 degree angle. Indian grass is often found growing in areas dominated by big or little bluestem.

Cordgrass, also called slough grass, grows in moist prairies. Cordgrass grows three to six feet tall and has leaf blades three to five feet long that taper to a whip-like point. It is also called "rip gut" due to the pointed teeth of the rough leaf blades, which are said to have cut the bellies of horses as pioneers traveled across the prairies.

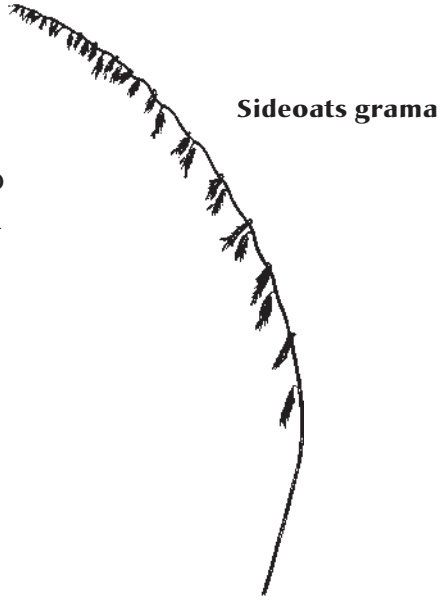


Switchgrass

Switchgrass is well adapted to moist areas, but can be found growing in a variety of conditions. It is identified by the presence of small hairs where the leaf blade attaches to the stem. The wide, loose seed head may be six to 20 inches long. Switchgrass grows three to six feet tall.

Little bluestem

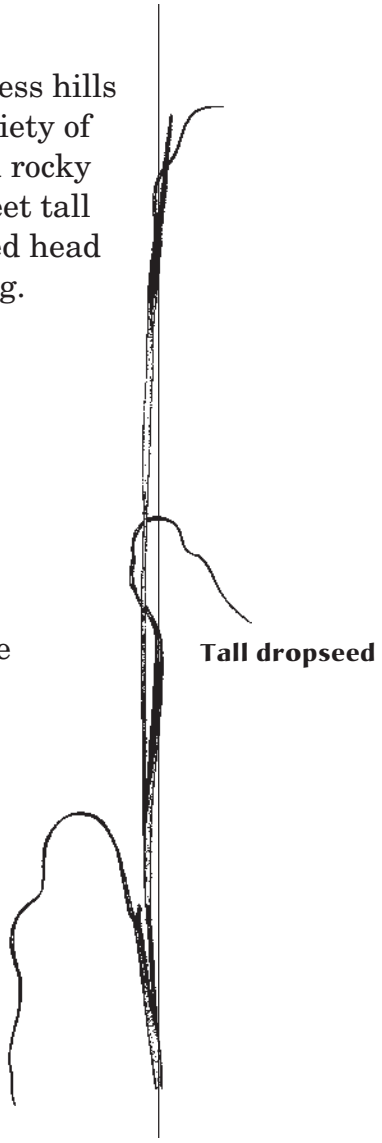
Little bluestem grows two to five feet tall. It often dominates dry prairie areas and can be identified by its flat, bluish colored shoots at the bottom of the plant. After an October frost, the plant takes on a reddish tint.



Sideoats grama is identified by drooping seeds that line one side of each stem. It reaches a height of 18 to 36 inches and is especially common on well-drained hill or sand prairies.

Tall dropseed is a drought-resistant grass that rarely dominates a prairie. Stout, wiry stems grow two to four feet tall and contain seed heads that may be three to ten inches long. In winter, the stems and long leaves turn a whitish color.

Muhly grass grows in the loess hills prairie. It grows under a variety of conditions but favors dry and rocky areas. It grows two to four feet tall and has a dense, compact seed head that is three to six inches long.



Wildflowers of Iowa prairies

Prairies are more than a sea of grasses. They are places of beauty, filled with the colors of showy flowers. A parade of prairie wildflowers begins in April and marches through to October. Prairie wildflowers have adapted to life in an open environment, exposed to sun and wind. Most have slender leaves that reduce moisture loss from evaporation. The flowers usually are pollinated by insects and are showy and colorful to attract them. Seeds often are spread by birds and other animals or by the strong prairie wind.

Compass plant

Prairie wildflowers can be found growing in all types of prairies. Some common Iowa prairie flowers are described on the following pages.

Compass plant is a tall member of the daisy family, sometimes growing eight feet tall. Its name comes from the special characteristic of the plant's lower leaves to grow in a general north-south direction. The leaves may be a foot long and six inches wide. Several large, yellow flowers alternate up the plant stem. Compass plant blooms in July through August.

Black-eyed Susan

Black-eyed Susan is a showy, daisy-like yellow flower common throughout Iowa prairies. The "black eye" refers to the dark brown center of the flower. The stems and leaves are hairy and give the plant a coarse texture. It blooms from June to September.

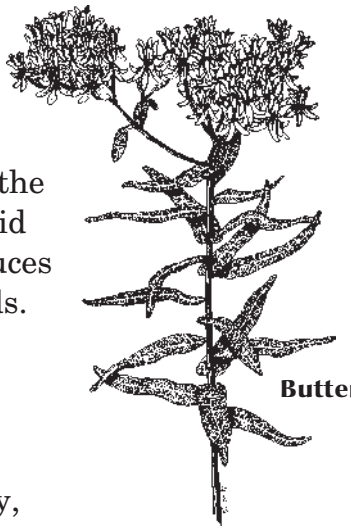
Prairie coneflower

Prairie coneflower is identified by long, drooping yellow "petals" (actually ray flowers). It otherwise resembles black-eyed Susan. The flower disk is a grayish color that darkens to brown as the petals fall off. It grows under a variety of conditions in both moist and dry prairies and blooms from June to September.

Prairie blazingstar

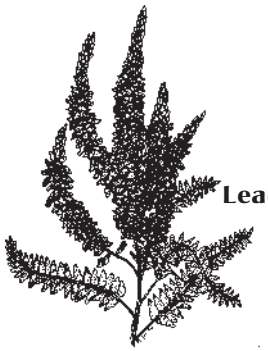
Prairie blazingstar may grow five feet tall, with two-thirds of the plant consisting of a spike of purple flowers. The blooming begins with flowers at the top of the spike. The flowers at the base of the spike are last to bloom. It is one of the showiest flowers found in damp and low prairies. It blooms from late July to October.

Butterfly milkweed is a tall member of the milkweed family that may grow to a height of more than two feet. The orange flowers are arranged in clusters at the top of the plant. Most members of the milkweed family have a white milky liquid in the stems and leaves. The plant produces pods that contain many silky-haired seeds. Butterfly milkweed is found blooming in Iowa prairies from June to September.



Butterfly milkweed

Lead plant grows in large patches in dry, sandy prairies. It gets its name from the gray-green, lead-like color of its leaves. The purple flowers are borne as two to seven-inch spikes at the end of each stem. Lead plant blooms from late May to August.



Lead plant

Purple prairie clover is found throughout the prairie but prefers dry soils of hill prairies. The purple flower head is about two inches long and begins blooming at the base and works its way upward. It blooms from June to September.

Purple prairie clover

Prairie sage is easily identified by its pale, whitish green color and strong sage odor. The stem and underside of the leaves are covered with a fuzzy mat of grayish hairs. It is found throughout the prairie, wherever there are dry, rocky, or sandy soils, and blooms from August to September.

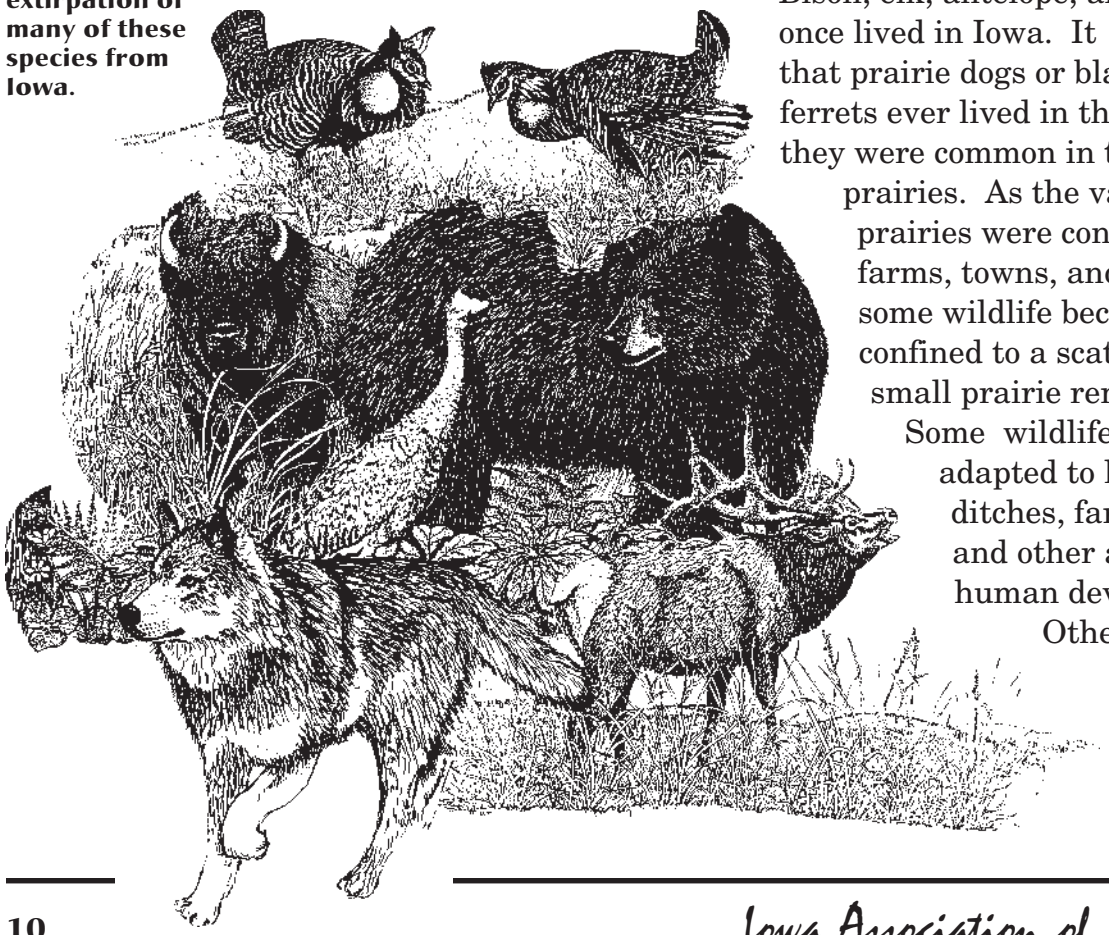
Prairie sage

Wildlife of Iowa prairies

Although grasses and a lack of trees may identify a prairie at a glance, animals are an integral part of an Iowa prairie. Plantings of prairie grasses and wildflowers throughout the state demonstrate, on a smaller scale, what a prairie may have looked like. However, a true prairie is a community of plants and animals interacting to make a diverse and complex natural community.

Animals of the prairie depend on plants and other animals for survival, and can be found using specific types of prairies. Historically, Iowa prairies contained a large variety of wildlife specially adapted to life in the open grasslands. Bison, elk, antelope, and wolves once lived in Iowa. It is unlikely that prairie dogs or black-footed ferrets ever lived in the state, but they were common in the western prairies. As the vast Iowa prairies were converted to farms, towns, and roads, some wildlife became confined to a scattering of small prairie remnants. Some wildlife species adapted to life in road ditches, farm pastures, and other areas of human development. Others did not.

Historically, Iowa prairies contained a large variety of wildlife specially adapted to life in the open grasslands. During the 1800's, market hunting and habitat destruction caused the extirpation of many of these species from Iowa.

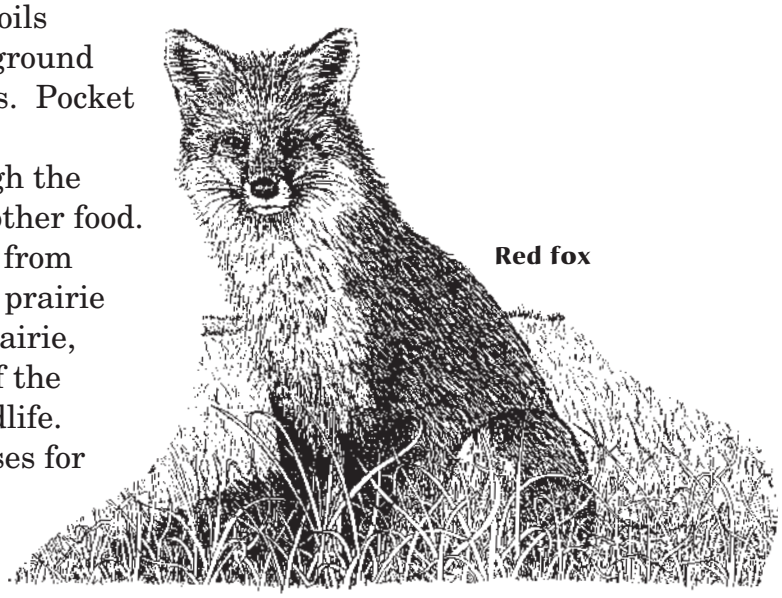


Mammals of Iowa prairies

Great bison herds once wandered through the tall grasses of the Iowa prairie. Wolf packs followed the herds, preying on the young and feeble. This was a piece of the picture of an Iowa prairie – a piece that now will be forever missing. The bison and wolves were destroyed by unregulated sport and market hunting, as well as predator control during the period of European settlement. Similarly, pioneer hunters extirpated elk at the turn of the century. These large mammals were lost from Iowa prairies as a result of unregulated hunting and habitat loss.

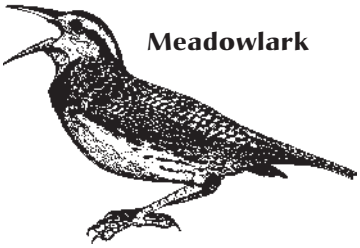
It is doubtful large prairie mammals will ever again roam freely in Iowa. Although these animals still exist in wilderness grasslands, they cannot survive in isolated prairie remnants or strips of grassy road ditches that characterize modern Iowa prairies. They cannot maneuver through fences, towns, and interstate highways. They were specially adapted to life under a vast prairie sky, in a prairie wilderness that is no more.

Although some mammals could not adapt to life in small pieces of the modern Iowa prairie, others have. Tall grasses and loamy soils provide "under cover" or underground protection for smaller mammals. Pocket gophers, ground squirrels, and grasshopper mice scurry through the grasses in search of seeds and other food. White-tailed deer venture out from their woodland cover to feed on prairie plants. Badgers live in Iowa prairie, especially in the western half of the state, and feed on smaller wildlife. Coyotes and foxes hunt in grasses for their prairie meals.



Red fox

Birds of Iowa prairies

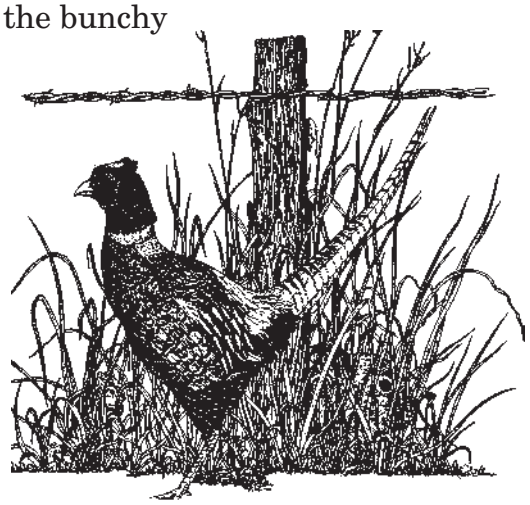

Meadowlark

Prairies produce an abundance of food for a variety of birds. Prairie plants produce a tremendous amount of seeds for birds such as dickcissels, red-winged blackbirds, and goldfinches. Prairies attract a multitude of insects, and many prairie birds feed on the insect smorgasbord. Meadowlarks, bobolinks, bluebirds, nighthawks, and grasshopper sparrows feed on insects and keep insect populations in check. Above the prairie, larger birds such as red-tailed hawks, northern harriers, and American kestrels survey the open prairie landscape in search of their prey.

Bobolink

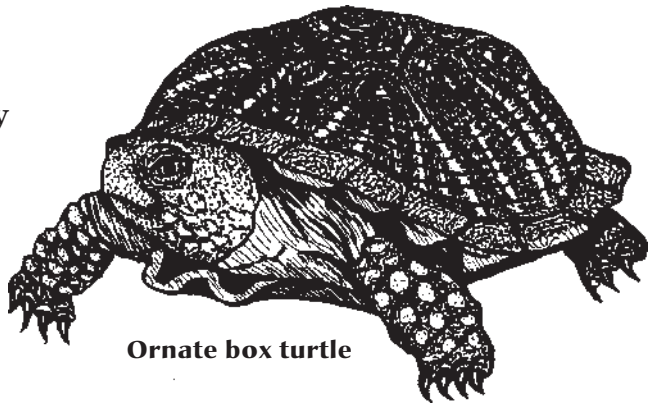
The vast Iowa prairie is an important migration route for ducks, geese, and shorebirds. The prairie of the Midwest provides a relatively safe north-south corridor for these birds. There are no large bodies of water or deserts to cross. There are many rivers and streams that provide food and water. And the few remaining prairie wetlands provide rest stops for the weary travelers.

Prairie provides wildlife cover, an important requirement for many songbirds and smaller animals. In winter, grasses provide a durable one to three-foot cover to ward off snow and cold winds. In spring, the bunchy growing pattern of grasses provides both areas of concealment and bare areas where birds can dust themselves, and can move about more freely in search of food.



Prairie reptiles and amphibians

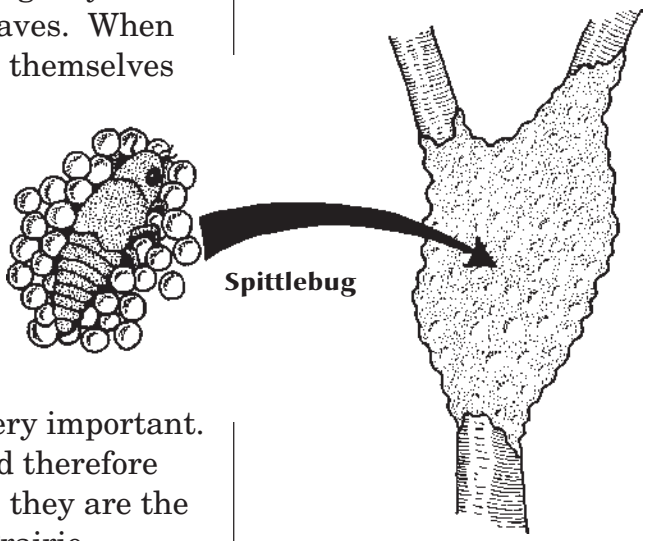
Prairie is home to many scaly and slippery creatures able to adapt to dry conditions. An occasional box turtle may make its burrow in a sand prairie. Skinks move quickly through the grasses of dry prairies. Where a wetland is nearby, garter snakes and hognose snakes hunt for frogs, mice and other small animals. Chorus frogs and American toads feed on the numerous insects.



Ornate box turtle

Prairie insects

Insects are the most numerous of the prairie animals. Moths, butterflies, bees, and wasps are attracted to showy prairie flowers. The great mass of grasses, leaves and stems provides an abundance of habitat for grasshoppers and other insects. Spittlebugs lay their eggs at the base of grass leaves. When the young hatch they cover themselves with a frothy, bubbly liquid which protects them from predators, parasites, and the drying wind and sun. The liquid resembles saliva and may dampen the leg of a person walking through the prairie.

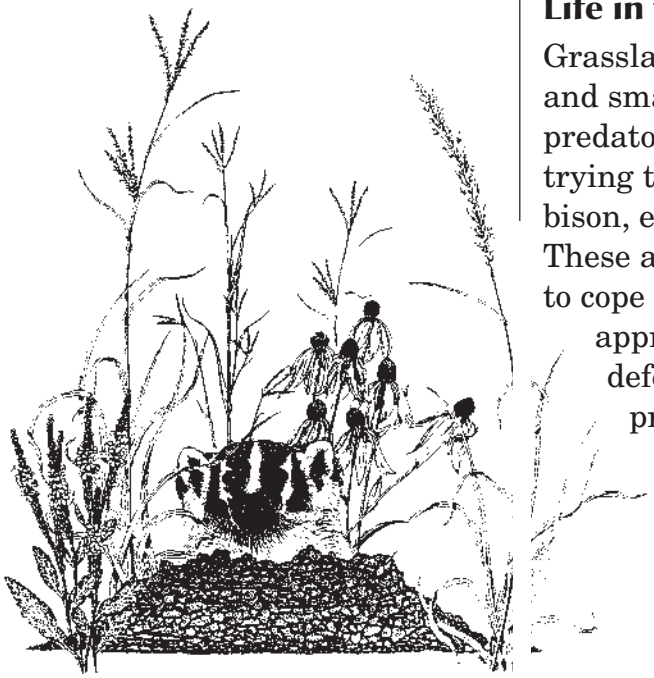


Spittlebug

The role of insects on the prairie is very important. Not only do they pollinate flowers and therefore determine which flowers are present, they are the basis for many prairie food chains. Prairie mammals, birds, reptiles, and amphibians need an abundance of insects in their food chains. Multitudes of ants aerate and mix the rich prairie soil. Insects are at the center of life on the prairie. As prairies have been destroyed, so have some species of butterflies, beetles, and other insects.

Prairie ecology

Plants and animals relate to each other in many ways to form a healthy prairie community. The variety of relationships among plants and animals make prairies very complicated, yet resilient. People need to understand these relationships before they can understand how a prairie community works.



Many prairie animals, such as the badger above, take on the colors of their surroundings and may have spots or stripes to further aid in their camouflage.

Life in the open

Grassland vegetation provides cover for birds and small animals to conceal themselves from predators. It also provides cover for predators trying to sneak up on prey. Large animals such as bison, elk, and antelope cannot hide in grasses. These animals have developed several strategies to cope with life in the open. They are alert to approaching danger and quick at outrunning or defending themselves from would-be predators. They are equipped with excellent senses of smell, eyesight, and hearing. They also live in herds, which offer protection to young animals, allow individuals to alert each other of danger, and create confusion when the herd is chased and scattered.

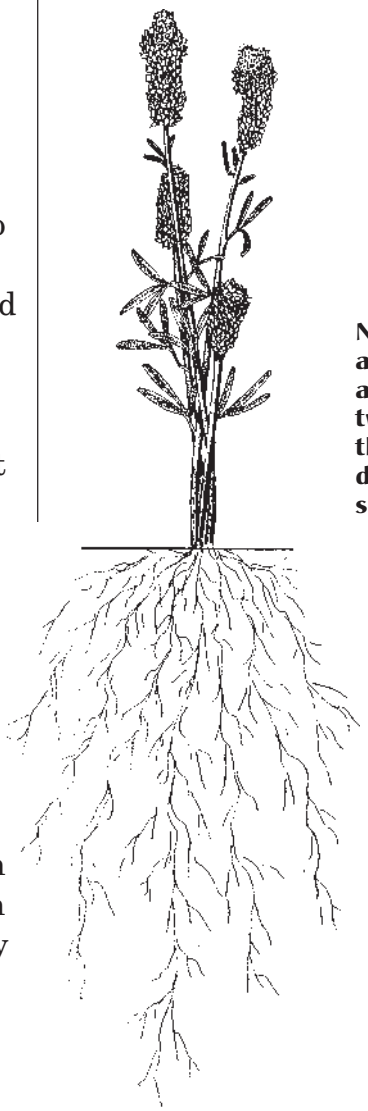
The majority of prairie animals take on the colors of their surroundings and may have spots or stripes to further aid in their camouflage. Although moths and butterflies might be brightly colored, their caterpillars usually blend in with the leaves on which they feed. Rabbits, mice, and meadowlarks have evolved a strategy of "freezing" when danger approaches. Larger animals, such as bison, antelope, and elk, have evolved a strategy of "flight or fight".

Prairie plants need to cope with extremes of heat and cold. They grow under direct sunlight, constantly losing moisture to the sun's heat and the ever-present prairie wind. Prairie plants make use of free prairie winds and the abundance of prairie insects to pollinate their flowers and spread their seeds.

Fire and sunlight

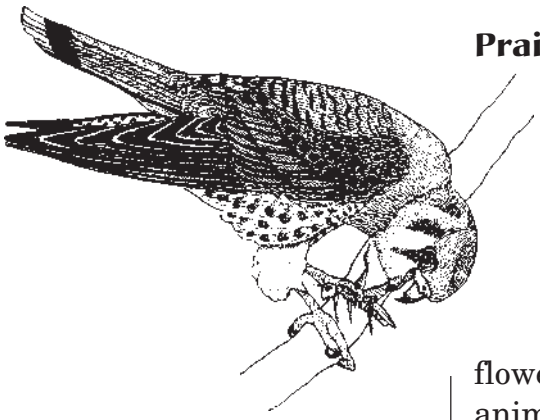
Prairie plants take root in the open prairie landscape. Most are perennials that grow and die each year, producing a thick mat of ground vegetation that excludes any invading plant. Adaptation of plants to prairie conditions is an amazing achievement.

Historically, prairie fires were a common occurrence. Native grasses and flowers put approximately two-thirds of their growth deep into the soil. The long roots reach deep for moisture, store food reserves for the plants, and are protected from the extremes of climate and prairie fire. Although the leaves and stems may be destroyed by fire, large root systems and underground buds allow the plant to quickly spring back to life. Most non-prairie grasses, and even trees, do not make such a large investment below ground.



Native grasses and flowers put approximately two-thirds of their growth deep into the soil.

Constant sunlight and wind drain plants of moisture quickly. Prairie plants keep their exposure to these elements at a minimum. Most grasses have leaves that are finely divided, vertical, and slender. Some plants roll up their leaves and others have fuzzy hairs, further protecting them from losing moisture. Plants such as prickly pear cactus and yucca are more common in desert conditions but are also found on some dry Iowa prairies. These plants have sticky plant juices that are less likely to dry out.



Prairie predators and prey

In a healthy prairie community, there are enough food sources and predators in a sufficient space to keep populations of plants and animals healthy. Plants are the primary producers of food that fuels prairie food chains. Mice, rabbits, insects, and other wildlife feed on prairie grasses and flowers and then become food (prey) for other animals. Predators such as shrews, spiders, coyotes, snakes, and hawks feed on this prey. Historically, bison were an important forager of prairie grasses and prey for wolves, bears, and humans.

Cougars, wolves, and bears once sat on top of prairie food chains, but these large predators no longer exist in Iowa. Natural predators now at the top of the food chain include coyotes, red-tailed hawks, and an occasional harrier or badger. Without a proper balance of predator and prey species, overpopulation and overcrowding can lead to starvation and disease epidemics among wildlife populations.

Eventually all plants and animals in a prairie die, and it is the role of various decomposers to return these organisms to the soil and to refuel food chains. Turkey vultures soar as they search for carcasses, and scavenging insects and fungi serve in this important part of a prairie community. A variety of food chains combine to make an intricate food web. The many strands of the web create health and stability within prairie communities.

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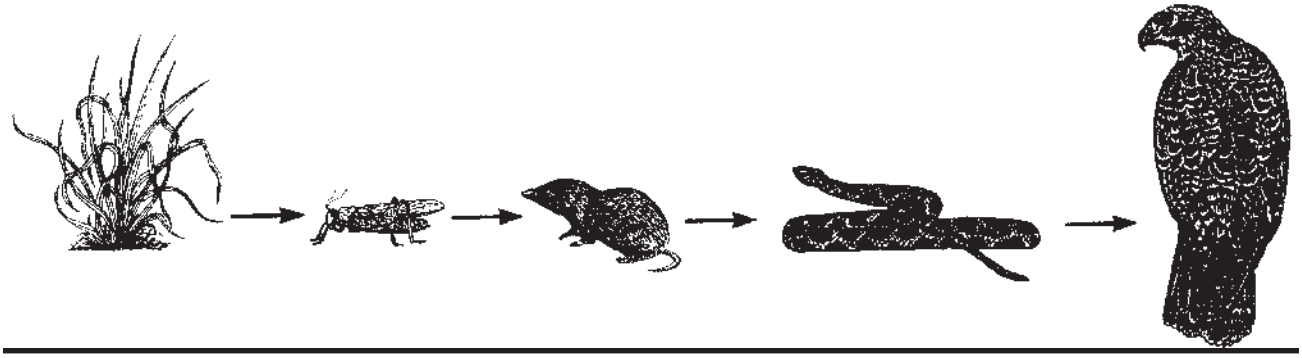
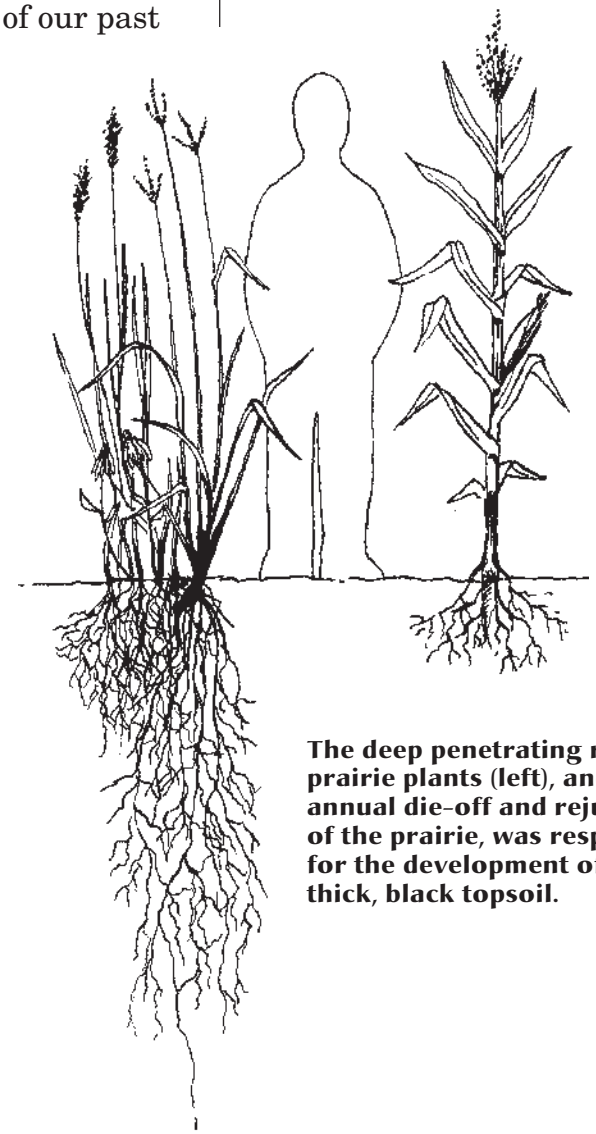


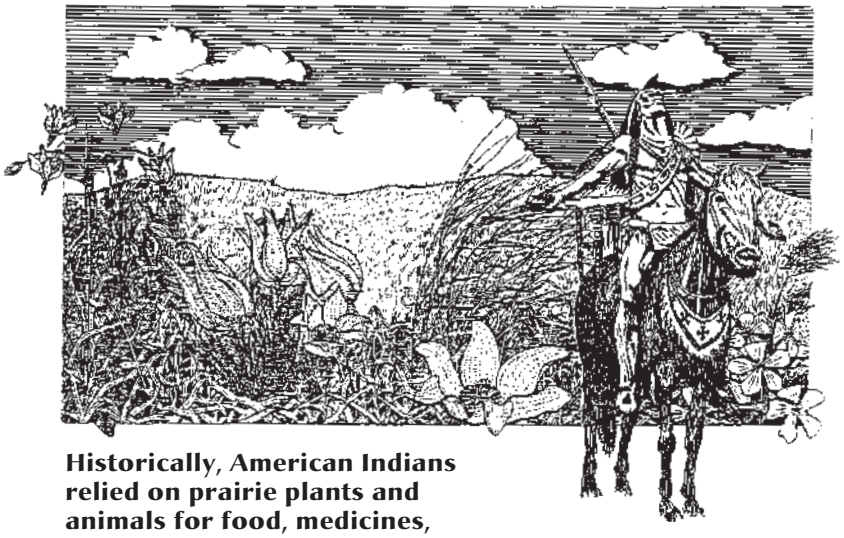
People and prairies

Vast prairies, beautiful woodlands, dynamic wetlands, and meandering rivers are all part of Iowa's heritage. When we lose these natural areas, we lose part of ourselves. We may forget that the land has helped shape what we are. When we lose prairies, our feel for Iowa history is lost. It is difficult to picture pioneer settlers crossing the endless prairie, or American Indians hunting the great bison. The materials, foods, medicines, pleasures, and fears of our past are burned away as if in the flames of a prairie fire.

Perhaps the greatest legacy of the Iowa prairie is the fertile soil – the basis for Iowa's economy. The deep penetrating roots of prairie plants, and the annual die-off and rejuvenation of the prairie, was responsible for development of a thick, black layer of topsoil. Where eight-foot-tall big bluestem once grew, Iowa crops now flourish. Most settlers, who had come from wooded eastern states or Europe, did not feel comfortable on the open prairies. There was also a bias for woodland soils. Many pioneers believed soil "too poor to grow trees" was not fit to produce crops. Had they known the world's most fertile soils lay under the open grasslands, it would have made little difference. There were no devices the pioneer farmer could use to plow through the thick prairie sod.



The deep penetrating roots of prairie plants (left), and the annual die-off and rejuvenation of the prairie, was responsible for the development of Iowa's thick, black topsoil.



Historically, American Indians relied on prairie plants and animals for food, medicines, materials, and clothing.

People have historically used prairie plants and animals for food, medicines, materials, and clothing. American Indians and European settlers quickly learned special uses for a variety of plant and animal species. Prairie mammals, especially bison, were the center of life for some people of the prairie. They provided clothing, shelter, food, tools, and weapons. Prairie plants were used for food and in American Indian and pioneer medicines.

An important environment

Prairie plants, with their vast root systems, are excellent at building soil and keeping it in place. They are also homes to many beneficial insects that pollinate crops and birds that control insects.

Iowa's remaining sanctuaries of wildlife habitat are important to our environment. The health of a prairie community is linked to many interdependent factors, and is especially important due to the rarity of remaining Iowa prairies. Intricate food webs and natural cycles make biological communities more resistant to attack from plagues and pathogens than does a monoculture of corn or soybeans.

The prairie resource

Prairie grasses such as big bluestem, Indian grass, and switchgrass were important food for bison and make good pasture for cattle. Once they become established, these prairie pastures are well adapted to keeping out weeds and thriving in extremes of climate. Iowa farmers are using prairie grasses for filter strips, field borders, and grass waterways.

Due to their vigor and the ability of prairie plants to exclude weeds and stop soil erosion, many agencies use techniques of prairie management to establish prairie grasses and flowers in road ditches. Prairie grasses and flowers not only exclude weeds and reduce erosion, but also provide habitat for wildlife and beautify roadsides.

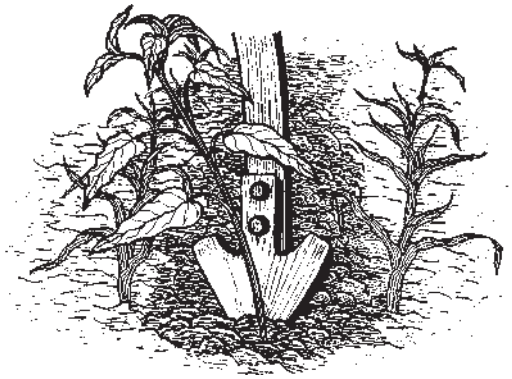
Many county, state, and federal highway departments use prairie plants to exclude weeds and reduce erosion along roadsides.

Managing Iowa prairies

In less than a century of settlement, nearly all Iowa prairie vanished. Prairies, which were largely ignored by early pioneer farmers, were later found to provide some of the most fertile agricultural land in the world. Where prairie had occupied the land for thousands of years, crops would flourish.

The main obstacle to agriculture in the prairies was the prairie sod, with its thick mat of grasses and dense, deep network of roots. The tough sod acted as a barrier to the plows of the early 1800s.

John Deere invented the steel moldboard plow in 1837. By the 1850s, the moldboard plow was readily available to Iowa farmers, and in the 1860s the plow was perfected. The new technology made some of the most productive land in the world available to farmers. It also marked the end of the prairie. By the beginning of the 20th century, the Iowa prairie was essentially gone. Thirty million acres of prairie were converted to farm land in less than 80 years. All that was left were a few pieces of the prairie that once dominated the Iowa landscape.

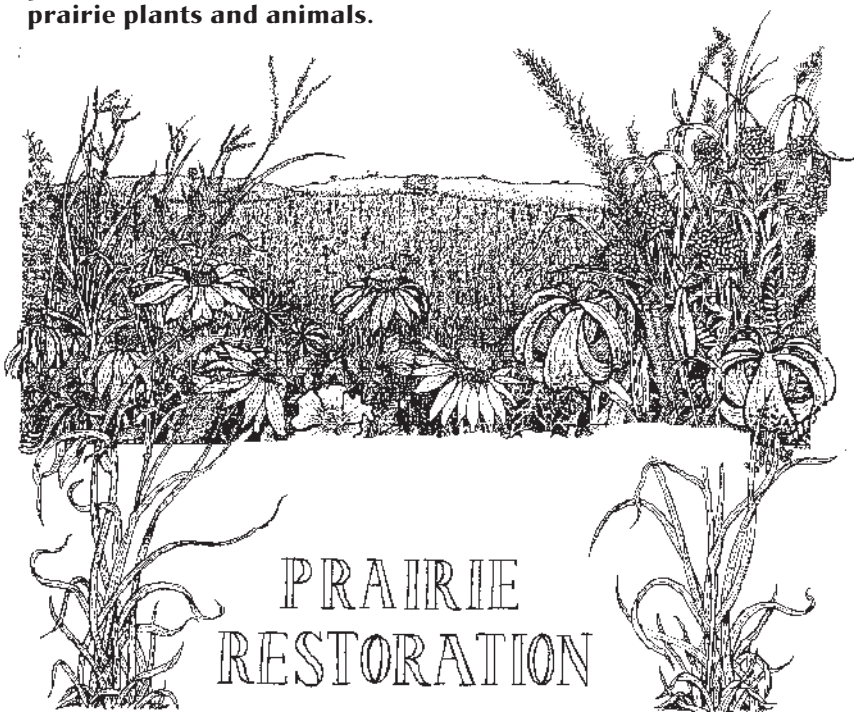


The tough prairie sod acted as a barrier to the plows of the early 1800s. The invention of the steel plow made productive farm land available.

As prairie became rare in Iowa, people became concerned about what was being lost. The state acquired its first prairie preserve, Hayden Prairie, in 1946. Other prairies, ranging in size from less than two acres to 240 acres, have since been preserved by the state, county conservation boards, and the Iowa Chapter of The Nature Conservancy. In all, some 5,000 acres of prairie are being preserved by these agencies in the public interest and in the interest of future generations of Iowans. People are also making attempts to bring back prairies by seeding areas back to prairie plants. Scientists estimate that up to 30,000 acres of prairie may exist in Iowa, much of which is tucked away along railroad right-of-ways, in old cemeteries and prairie pastures, around a few remaining pothole wetlands, and especially on the slopes of the loess hills in western Iowa.

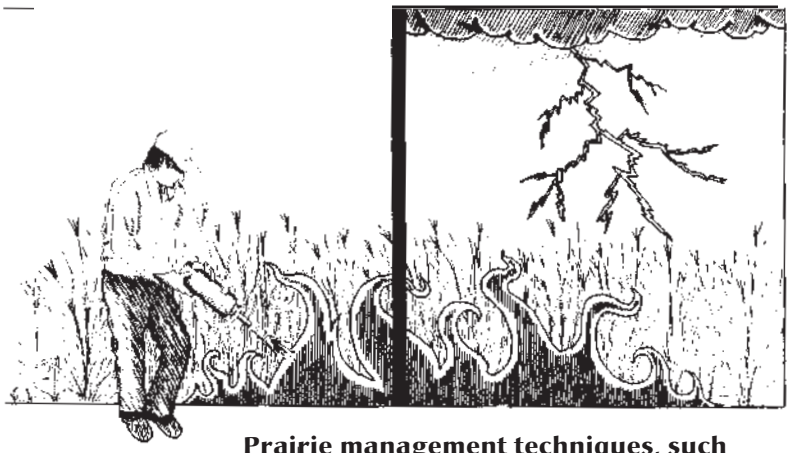
It is not possible to restore the vast biological community that was once the Iowa prairie. However, it is possible to create a place for some of our native prairie plants, to provide habitat for some grassland wildlife, and to restore some of the fertility of prairie soils on a small scale. Prairie reconstruction often consists of preparing a site, seeding it with native grasses and flowers, and maintaining the area through prairie management. Successful prairie reconstruction has been carried out in many sites across Iowa. The largest reconstruction project has yet to be completed. The Neal Smith National Wildlife Refuge near Prairie City includes 6,000 acres of prairie.

Prairie restoration and reconstruction are providing places for some of our native prairie plants and animals.



Prairie Management Techniques

Remaining prairie areas are rare and special places that need to be carefully managed. Management techniques center around the natural role of fire and the grazing of bison in maintaining the prairie environment. Most prairies are managed using a variety of techniques best suited to a specific area. Three techniques include controlled burning, light grazing, and haying or mowing.



Prairie management techniques, such as burning, mimic natural processes.

Prairie areas left unmanaged may accumulate a thick mat of plant litter that slows the growth of prairie plants. These dense prairies do not offer wildlife enough space to move around, find cover, and locate food. Left unmanaged, a prairie area may slowly be taken over by shrubs and trees through the natural process of succession.

One of the most important tools in managing prairies is fire. Controlled burning stimulates the growth of fire-adapted prairie plants while retarding the growth of non-native plants. Burning also opens up areas for wildlife. Controlled burns are often carried out once every three to five years. When possible, only a portion of the area is burned at a given time. This allows wildlife to escape from the fire and find refuge in the unburned section of the prairie. It also allows invertebrates in the leaf litter an opportunity to complete their life cycle. By burning prairies in early spring, prairie managers reduce the chance of harming nesting birds. Spring burning is also the best time to reduce non-native, cool-season grasses. There is, however, concern over the effects of spring burns on populations of butterflies and other prairie insects.

Forty million bison once grazed on prairie plants. Today, moderate grazing by cattle can be an effective tool in managing some prairie areas.

Forty million bison once grazed on prairie plants. Therefore, it should come as little surprise that moderate grazing can be an effective tool in managing some prairie areas. Grazing creates diversity in plant heights and plant species, and provides more dependable cover and food supplies for wildlife. Prairie managers stress that grazing should be practiced in moderation. Grazing should be stopped when the stubble reaches an average height of 12 inches.

Prairie management may involve mowing to simulate moderate grazing. It is important that managers mow only after the nesting season of most birds, usually in mid to late July. As with burning, prairies should be mowed one portion at a time to allow wildlife a safe refuge. Big bluestem and switchgrass make good hay and should be baled immediately after mowing to reduce damaging or disturbing nesting wildlife.

Prairie roadside management

State and county agencies throughout Iowa are planting prairies in roadsides. Establishing prairie plants in roadsides helps reduce erosion and exclude weeds, and reduces the need for chemical applications and mowing. Prairie plants also provide beauty along Iowa roads.

Roadside management usually begins with a survey of existing roadsides, noting the types of plants already present. Where prairie plants already exist, roadside biologists may use techniques of prairie management, including controlled burning and targeted chemical application, to maintain or enhance the prairie species already present. Other areas may require seeding to establish a prairie roadside.

Summing it up

Prairies are natural communities dominated by grasses and wildflowers, containing a variety of wildlife. Approximately 85 percent of Iowa was once covered by prairie. Grasses such as big bluestem and switchgrass dominated the Iowa landscape. Insects were especially abundant in the prairies and attracted a variety of birds and small mammals. Bison grazed on the prairie while wolves hunted in the grasses.

Prairie habitat is important to both people and wildlife. Historically, people have depended on prairie plants and wildlife for food, medicines, and materials. Prairie plants are responsible for the fertile soil that has become the basis of Iowa's economy. And prairie provides important habitat for rare grassland-adapted wildlife, thereby helping maintain diversity of life.

Only a small fraction of the original Iowa prairie remains today. Remnants are found in small pieces lying in forgotten places throughout the state and in a handful of prairie preserves. Thanks, in part, to recent programs of roadside management, prairie grasses and flowers can be seen growing along some Iowa roadsides.

Prairies are often carefully managed using controlled fires, grazing, and mowing to maintain a diversity of plants and wildlife. Special efforts are being made to reconstruct prairie and carefully manage existing prairies throughout Iowa.

Useful resources

Agricultural Pesticides and Wildlife: A Balancing Act; Iowa State University Extension.

A Country So Full of Game; James J. Dinsmore; University of Iowa Press, Iowa City, Iowa; 1994.

The Field Guide to Wildlife Habitats of the Eastern U.S.; Janine M. Benyus; 1989.

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See list of titles and ordering information on the following page of this booklet.

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Landforms of Iowa; Jean Prior; University of Iowa Press; Iowa City, IA; 1991.

Living on the Edge: Endangered Species in Iowa; Daryll Howell and Mark Leoschke; Iowa Department of Natural Resources, Des Moines, IA; 1992.

Natural Resource Conservation: An Ecological Approach; Oliver S. Owen; Macmillan Publishing Co., New York, NY; 1980.

Prairies, Forests, and Wetlands: The Restoration of Natural Landscape Communities In Iowa; Janette R. Thompson; University of Iowa Press, Iowa City, IA; 1992.

Saving Soil and Wildlife: The Promise of the Farm Act's Conservation Title; Ann Robinson; Izaak Walton League of America; 1987.

Where the Sky Began; John Madson; Houghton Mifflin Company, Boston, MA; 1982.

Why Preserve Natural Variety?; Bryan G. Norton; Princeton University Press, Princeton, NJ; 1987.