

Prairies of the Midwest



**US Army Corps
of Engineers®**
Rock Island District

Objectives:

To identify the history of Iowa and Illinois prairies.

To become familiar with the three types of prairie found in Iowa and Illinois.

To identify a few of the grasses, flowers and wildlife found in prairies.

To be aware of how the prairie community of plants and animals work together.

To be familiar with the human effect on prairies and how prairies are managed today.

Activities:

Students will receive a "Prairies of the Midwest" study guide. Eco-test questions will be taken from the guide. Before the test, a short presentation including identification of prairie plants and animals will take place. Students will learn to identify prairie plants and animals.

Study Questions:

How much original prairie existed in Iowa and Illinois 150 years ago? How much exists today?

What are the types of prairies found in Iowa and Illinois? Which type is the most common?

Name three common prairie grasses.

Name three common prairie flowers.

What are five types of prairie wildlife? (Ex: mammals) Give an example of each type.

Name an animal that is at the top of today's prairie food chain.

What are three techniques used in prairie management?

The Prairie Landscape

Grass, it covers the bare earth, softens the beat of the rain, soaks water gently into the ground and protects the soil from the wind. Prairies are vast areas of level or rolling land, with deep fertile soil, and covered with grasses and flowers, mostly without trees. Prairies dominated the landscape of Iowa and Illinois reaching their peak four to five thousand years ago, and still dominated the landscape when the first Europeans arrived 300 years ago. Large amounts of prairie existed in Iowa and Illinois only 150 years ago, in the 1850's. Almost 85 percent of Iowa and 62 percent of Illinois were covered with prairie grasses and flowers. In places, the grass was so tall that it was necessary to stand on the back of a horse to see over the top of the grass. There was nothing to compare to the sea of grass they encountered so the settlers used a French word, "Prairie", which means meadow. To the early explorers and settlers, the prairie was a place of beauty and a source of plentiful game.

The landscapes of Iowa and Illinois have undergone drastic changes in the last 150 years. Prairies, woodlands and wetlands have been greatly reduced. Prairies have suffered the most destruction. Of the 30 million acres of original prairie that once covered Iowa, only about 10,000 acres remain. The same holds true for Illinois, once having 22 million acres of original prairie and now reduced to 2,500 acres.

History of the Prairie

Scientists believe the Midwestern prairie was created by a variety of factors, including climate, soil, and topography (shape of the land). In North America, prairies were formed east of the Rocky Mountains, in an area that receives less rain due to rising air currents over the mountains. Prairies tend to grow better than woodlands in areas with strong winds, direct sunlight and little moisture. Woodlands grow better near river and streams, and on damper north and east hillsides. Prairies originated over 9,000 years ago following the retreat of the great glaciers. The glaciers left behind a rich prairie ecosystem with wet areas called prairie potholes. A warm, dry climate with strong winds soon followed, which favored the establishment of prairie plants. The dense deep root systems of prairie plants did not allow trees or shrubs to grow in large numbers. The hot, dry summers with strong winds promoted fire, one of the most important factors in the maintaining of the prairies. Prairie plants will survive frequent fires, but woody plants do not.

The Great Grasslands

Trees dominate and make up most of the woodland, but grasses dominate and make up the prairie. Climate, moisture and soil type, determines which type of grasses are found in a given prairie. In general, tall grasses are found in medium to wet soils, while shorter grasses are found on dry or sandy soils. Certain types of grasses grow only in specific prairie conditions, while others are found in a variety of conditions.

The great grasslands of the United States are divided into 3 categories distinguished by their dominant grasses. Dominant grasses are those plants, which occupy the most space in the prairie because of their size and numbers.

The first and most impressive category is the TALLGRASS prairie, which once covered the northern 2/3 of Illinois, and nearly the entire state of Iowa. The Tallgrass prairie is the most common type of prairie found in Iowa and Illinois today, though little prairie now remains. These tall grasses can reach 12 feet into the sky and are dominated by Big Bluestem, Indian Grass and Switchgrass. Today many of these prairie plants have been replaced by another tall grass called corn.

Lying west of the Tallgrass is the MIXED prairie made up of a variety of medium sized grasses. Little Bluestem, and wheat grasses are the most common grasses in this area. Today, many of these plants have been replaced by wheat.

The western grasslands, known as the SHORTGRASS prairie, are made up of Buffalo Grass, and other short grasses that were a favorite food of great herds of buffalo. Today this area is rangeland for cattle and sheep.

Other Prairies

Within the Tallgrass prairie region of Iowa and Illinois, various combinations of grasses and landforms exist which create other, less common prairie types. Pockets of wetlands exist, known as prairie potholes, here LOW prairies become home to a variety of moisture adapted plants and animals.

The **LOESS HILLS** prairie of western Iowa contains the largest area of remaining Iowa prairie. The Loess Hills prairie is a vast, dry prairie, containing both tallgrass and mixed prairie grasses, with Little Bluestem being the most common variety. The hills were formed by wind blown soil, called loess.

HILL prairies are small islands of grassland, surrounded by woodland, and are common in eastern Iowa and western Illinois. They are found on rugged, dry land and contain tall and mid-sized prairie grasses.

The **SAND** prairies were too dry and sandy to be good for farming, and thus were not disturbed. These small prairies contain rare prairie plants and animals. Plants such as the prickly pear cactus, which are normally found in desert areas, can be found in sand prairies. The prairie near the Thomson Causeway is a Sand prairie, as are many prairies along the Mississippi River.

The **SAVANNAS** are areas composed of a mixture of grassland and woody plants. Elk depended on savannas to live in the open grassland and feed on the leaves of trees and shrubs. Bur oaks are the dominant trees in a savanna. Savannas are more commonly found on the African Plains.

Prairie Plants

Prairie plants have learned to live in an open environment, exposed to the sun and wind, which dry the plants very quickly. Prairie plants keep their exposure to the elements at a minimum since they have slender, finely divided, vertical leaves. Some plants roll up their leaves or have hair that reduces moisture loss.

Most of the prairie grasses and flowers are perennial, which means that they come up each year from long-lived roots, which can be fifteen to twenty feet deep. About two thirds of the growth of prairie plants is below ground. By using these roots, prairie plants can draw ground water in times of drought, and also protect the plants from extremes in climate and fire. After prairie fires the plants can grow from their deep roots the following growing season.

Prairies are more than a sea of grasses; they also contain beautiful and colorful flowers or forbs. The beautiful display of wildflowers begins in April and lasts through October. Prairie vegetation in Iowa and Illinois consists of over 300 different species of native grasses and flowers, with flowers making up the majority of the different species. The flowers are pollinated by insects, which make them very colorful. Birds, other animals, and strong winds spread the flowers seeds around.

Prairie wildflowers can be found growing in all types of prairies. The most common Tallgrass prairie flowers of Iowa and Illinois include the Compass Plant, Blazing Star and Prairie Coneflower.

Prairie Grasses



Big Bluestem is the chief grass of the tall grass 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 and resembles a turkey's foot. Big bluestem varies in color from bronze to lead-gray and commonly grows to a height of 6 to 8 feet. It is found in a variety of prairies throughout Iowa.



Indian grass is distinguished by its long, golden, plume like seed head which can be from 4 to 12 inches long. It grows on a stiff, erect stem to a height of 4 to 8 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 to a height of 3-6 feet and has leaf blades 3-5 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 is well adapted to moist areas, but can be found growing in a variety of conditions. It can easily be identified by the presence of small hairs where the leaf blade attaches to the stem. The wide, loose seed head may be from 6 to 20 inches long. Switchgrass grows to a height of 3 to 6 feet.



Little bluestem grows to a height of 2 to 5 feet. 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 gamma is easily identified by the 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.

Prairie Flowers



Compass plant is a tall member of the daisy family, sometimes growing to a height of 8 feet. 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 6 inches wide. Several large, yellow flowers alternate up the plant stem. Compass plant blooms in July through August.



Black-eyed Susan is a showy, daisy-like yellow flower that is 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 is easily identified by its long, drooping yellow "petals" (they are 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 may grow to a height approaching 5 feet with two-thirds of the plant consisting of a spike of purple flowers. The blooming begins with the flowers at the top of the spike. The flowers at the base of the spike are the last to bloom. It is one of the showiest flowers found in damp and low prairies. It blooms from late July to October.



Swamp milkweed is a tall member of the milkweed family that may grow to a height of 5 feet. The pink flowers are arranged in clusters at the top of the plant. In most members of the milkweed family a white milky liquid is found in the stems and leaves, and the plant produces long, narrow pods (2-4 inches) that contain many silky-haired seeds. Swamp milkweed is found at the edges of prairie potholes and marshes and in low prairies. It blooms in July and August.



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 2 to 7-inch spikes at the end of each stem. Lead plant blooms from late May to August.



Purple prairie clover is found throughout the prairie but prefers the dry soils of hill prairies. The purple, cone-shaped flower head is about 2 inches long and begins blooming at the base and works its way upward. It blooms from June to September.

Prairie Animals

Grasses and a lack of trees may identify a prairie to most of us, but animals are a very important part of the make up of a prairie. Animals depend on prairie plants and other animals, for food and shelter, and often use specific types of prairies for their homes. Prairies contain a large variety of wildlife such as birds, mammals, reptiles, amphibians and insects.

Grazers such as buffalo, elk, and antelope were once permanent residents of Iowa and Illinois prairies, as were wolves and cougars, which followed the herds, preying on the young, old, and sick animals. As people changed the prairies into farms, towns and roads, we lost these large mammals from the prairies of Iowa and Illinois. These mammals needed large areas of open prairie to survive. Over hunting, as well as habitat loss, caused these mammals to vanish from the prairies. Medium sized animals such as the coyote, fox and badger are the prairie mammals that are in danger today, due to changes and destruction of their habitat. Some smaller prairie wildlife has adapted to life in small prairie remnants, road ditches, farm pastures, and other areas developed by people. Tall grasses and loamy soils provide cover and underground protection for smaller mammals such as pocket gophers and ground squirrels. Whitetail deer, a larger animal that has adapted to the prairie's changes, venture out of the woodlands to feed on prairie plants.

Prairies produce an abundance of food for a variety of birds. Prairie plants produce a large amount of seeds for birds such as red-winged blackbirds, and goldfinches. Large amounts of insects will feed on prairie plants. This will attract bluebirds, meadowlarks, and sparrows, which eat the insects and keeping insect populations from becoming too large. Circling the prairies high above, are birds of prey such as the red-tailed hawk and American kestrel, looking for smaller animals, which are their prey. The Midwest prairies provide an important north-south migration route for ducks, geese, and shorebirds, since the prairies have no large bodies of water to cross. The many streams and rivers provide food and water, and the prairie potholes provide rest stops for the weary travelers. Prairies, with their tall grasses, provide cover for birds and animals, which are important in cold winter months and spring nesting months. Prairies are home to many reptiles and amphibians that are able to adapt to a lack of moisture. Box turtles make their burrow in a sand prairie and skinks (lizards) move quickly through the grasses of dry prairies. Where water is nearby, garter and hognose snakes hunt for frogs, mice and other small animals. Frogs and toads feed on the numerous insects.

Insects are the most numerous of the prairie animals, and their role in the prairie is very important. Moths, butterflies, bees and wasps are attracted to the pretty prairie flowers and will pollinate the flowers.

Grasses, leaves and stems provide habitat and a food source for grasshoppers and other insects. Ants and other insects create tunnels, which mixes and supplies air to the rich prairie soil. Insects also serve as food sources for many prairie animals. Prairie mammals, birds, reptiles and amphibians all feed on insects. As prairies have been destroyed, some species of butterflies, beetles and other insects, have been destroyed, which will in turn effect the animals that feed on them.

Today, prairies have many species of animals listed as endangered or threatened. Animals are considered endangered if they have very few individuals, or if the place they live in is very limited in size. Animals are considered to be threatened if their numbers show signs of an unnatural decrease. Endangered prairie wildlife includes the marsh hawk, upland sandpiper, wood turtle, and prairie chicken. The spectacular breeding display of the prairie chicken was well noted by the early settlers. Threatened wildlife includes the box turtle, western hognose snake, and badger.

The Prairie Community

Plants and animals relate to each other in many ways to form a healthy prairie community. Grassland provides cover for birds and small animals to hide from predators. Most prairie animals are the color of their surroundings. Many animals have spots or stripes that add to their camouflage. Even the brightly colored moths and butterflies start life as caterpillars that blend in with the plants on which they feed. Rabbits and meadowlarks have a strategy of "freezing" when there is danger. Large animals such as bison and elk cannot hide in the grasses, but they have several ways to cope with life in the open. They are very alert and very quick at outrunning or defending themselves against would-be predators. They have excellent hearing, eyesight and sense of smell. They live in herds, which protect the young and allow them to alert each other of approaching danger. It also confuses predators when the herd scatters when being chased. These larger animals have a strategy of "fight or flight" when danger approaches.

In a healthy prairie community, there are enough food sources, predators, and open space to keep the population of plants and animals healthy. Plants are the primary producers of food in the prairie food chain. Plants use sunshine to produce their own food energy. Plants, are then eaten by mice, insects, and other animals. The plant-eaters are then eaten by the animal-eaters, such as spiders, coyotes, snakes and hawks. Many years ago, bison were important plant eaters and became prey for wolves, bears and humans. Cougars, bears and wolves once sat atop the prairie food chain, but now no longer exist in Iowa and Illinois. Today, the top of the prairie food chain belongs to coyotes, red-tailed hawks and badgers. Without a proper balance of predator and prey species, overpopulation can quickly lead to disease and starvation.

All plants and animals in a prairie will eventually die. Various organisms help decompose the dead plants and animals and return them to the soil to refuel the food chain. Fungi, insects and earthworms are important prairie decomposers, converting dead plants into soil. Turkey vultures search for dead animals to clean up the prairie. Many food chains combine to create a healthy and stable prairie ecosystem.

People and Prairies

Perhaps the greatest legacy of the Midwestern prairie is the fertile soil, which is the basis of our economy. The deep roots of prairie plants and the annual die off and rebirth of the prairie each growing season, is responsible for the development of the thick, black, topsoil. The prairie soil, where once eight foot tall Big Bluestem grew, now successfully grows crops, such as corn and wheat. People have historically used prairie plants and animals for food, medicines,

materials and clothing. Prairie mammals such as the bison were the center of life for Native Americans, providing them with clothing, shelter, food and tools. Pioneers used the thick sod to build their first homes.

For many years, anyone who ventured out onto the prairie to build a home and farm was thought to be crazy. There were biting flies, wild animals, hot and dry weather, strong winds and fires. The land was thought to be infertile because no trees would grow there and the early wooden plows were no match for the dense prairie sod. Then came the invention and perfection of the self cleaning steel plow, by John Deere in 1837, and it paved the way for converting the rich prairie soil into the rich agricultural fields of today.

Only a little prairie of any kind is left today, usually found along the sides of railroad tracks, in old cemeteries, along farm fencerows, on steep, undisturbed, hillsides or near wet areas, such as pothole marshes. Even less appealing land with low prairies and marshes are being drained and filled. Sand prairies are disappearing as homes and industrial plants are being built.

As prairies became very rare in Iowa and Illinois, people became concerned about what was being lost. State and private conservation agencies acquired and established prairie preserves ranging in size from a single acre to thousands of acres. These areas are being preserved in public interest and in the interest of future generations.

It is not possible to restore the vast Midwestern prairies and their plant and animal communities. It is possible to create a place for some of our native prairie plants, which will provide habitat for wildlife. It is also possible to restore some fertile prairie soils on a small scale.

Prairie reconstruction consists of preparing a site, seeding it with native grasses and flowers, and wisely managing the area. Successful prairie reconstructions have taken place in many sites in Illinois and Iowa.

Prairie Management

Prairie areas are rare and special places that need to be carefully managed. Three management techniques include controlled burning, light grazing and haying or mowing. Left unmanaged, prairie areas may get a thick mat of plant litter and slow the growth of prairie plants. Dense prairies do not have enough space for wildlife to move around, find cover and locate food. Left unmanaged, a prairie area may slowly be taken over by trees and shrubs.

One of the most important prairie management tools is fire. Controlled burning, which are controlled fires set by people, will stimulate the growth of fire adapted prairie plants, and at the same time slow the growth of non-prairie woody plants. Fire kills off invading trees and shrubs, which stimulates prairie growth. Nutrients are released in the ash of a fire, which increases the growth of prairie plants. Burning also opens up areas for wildlife. These fires occurred on the original open prairies, either by lightning or set by Native Americans. When possible, prairies are burned sections at a time to allow wildlife to escape the fire to the unburned section. The fires are burnt in the early spring or late fall to reduce chances of harming nesting birds.

Grazing can be an effective tool in managing prairies. Forty million bison once grazed on prairie plants. Grazing lowers the heights of plant species and provides cover and food supplies for wildlife.

Mowing is a management tool that takes the place of grazing. Mowing occurs mid to late July, after the nesting season of birds. Mowing is done a section at a time to allow wildlife a safe refuge.

Today, many agencies are using prairie plants for Roadside Management. Prairie plants with their vast root systems are excellent at keeping soil in place, building soil and reducing

erosion. Prairie plants are used in road ditches, which not only reduces erosion, but also provides wildlife habitat and beautifies the roadways.

Summary

Prairies are natural areas of life dominated by grasses, wildflowers and wildlife. Historically, prairies once covered much of Iowa and Illinois. Tall grasses such as Big Bluestem and Switchgrass dominated the landscape. Abundant insects attracted a variety of birds and small mammals. Bison grazed on prairies while wolves and bears hunted in the grasses.

Prairie habitat is important to both people and wildlife. People have depended on prairies for food, medicine and materials. Prairie plants are responsible for the rich, fertile soil, which allow agricultural crops to flourish. Prairie is important habitat for rare grassland wildlife.

Only a small amount of original Midwestern prairie remains today. Prairie remnants are found in small pieces; lying in remote places throughout the Midwest, and in a handful of prairie preserves. Roadside management has brought prairie grasses and flowers back to some Iowa and Illinois roadways.

Today, prairies are often carefully managed using fire, grazing and mowing to maintain plant and wildlife populations. Special efforts are taking place to reconstruct prairie and to carefully manage existing prairies throughout Iowa and Illinois. There are many challenges ahead for the prairie movement and the public can help by getting involved. Start by visiting a prairie near you. A list of local prairies is included in this study guide. The future of the prairie that remains depends on public involvement and how much we care.

Prairie Facts

- Approximately 30 million acres of prairie existed in Iowa and 22 million acres of prairie in Illinois existed at the time of European settlement.
- Approximately 30,000 acres of prairie exist in Iowa and 8,000 acres of prairie exist in Illinois today. (These acres include prairie restorations and reconstructions, as well as original prairie).
- Approximately 10,000 acres of original prairie exist in Iowa and 2,500 acres of original prairie exist in Illinois today.
- 5,000 acres of original Iowa prairie is protected by private and public agencies.
- The largest publicly owned prairie tract in Iowa is the 240-acre Hayden Prairie located in Howard County.
- The largest privately owned prairie in Illinois is the Nature Conservancy's 1,020 acre Nachusa Grassland located in Lee County
- An 8-foot tall big bluestem grass may have roots that reach 12 feet underground.
- There are 72 species of grasses and 250 species of flowers native to Iowa and Illinois prairies.
- Desert like plants such as the yucca and prickly pear cactus grow in some IA. and IL. prairies. The prickly pear cactus can be found in the Thomson/Fulton Sand Prairie.

References

- Cohen, D. 1993. Iowa Prairies. Iowa Association of Naturalists, Biological Communities (IAN 203). Iowa State University Extension Service, Publications Distribution. Ames, Iowa. 25pp.
- Fleckstein, J. 1992. Iowa State Preserves Guide. Iowa Department of Natural Resources. Des Moines, Iowa. 200pp.
- McClain, W.E. 1986. Illinois Prairie: Past and Future - A Restoration Guide. Illinois Department of Conservation Division of Natural Heritage. Springfield, Illinois. 28pp.
- McFall, D. 1991. A Directory of Illinois Nature Preserves. Illinois Department of Conservation Division of Natural Heritage. Springfield, Illinois. 382pp.
- Miller, L. 1996. Thomson Sand Prairie Fact Sheet. U.S. Fish and Wildlife Service, Savanna District. Savanna, Illinois. 1pp.
- Shafer, M. 1996. Prairie Ecology. U.S. Army Corps of Engineers, Lake Shelbyville. Shelbyville, Illinois. 15pp.
- Stein, S. 1996. Nachusa Grasslands Fact Sheet. The Nature Conservancy of Illinois. Chicago, Illinois. 2pp.

Manikowski Prairie

Type of Preserve: Geological, Biological

County: Clinton Acreage: 40

Owner: County Conservation Board

Manager: County Conservation Board

Year of Dedication: 1985

Directions: Access is across private land. Contact the County Conservation Board for information.

Description: Manikowski Prairie is a dry prairie with vegetation more typical of prairies on steep hillsides or in western Iowa. Silurian Age dolomite is near the surface and outcrops in ledges on the site. There is only a thin layer of soil over the bedrock, causing the dry conditions. The outcrops mark the eastern edge of an ancestral valley of the Mississippi River, known as the Goose Lake Channel. The bedrock is covered with only a thin layer of soil, so little moisture is available for plant growth. It is dominated by little bluestem. Several of the forbs found here are rare in this part of the state but more common farther west.

For More Information:

Clinton County Conservation Board

Box 161

Grand Mound, IA 52751

(563) 847-7202

Thomson/Fulton Sand Prairie Nature Preserve – Whiteside County

Location and Access: From the intersection of Highway 84 and Highway 136 in Fulton, take Highway 84 North for 3 miles to a county road (Lock Rd.) Turn west on this road, cross the railroad tracks and turn north again on the sand road that parallels the railroad. Drive north on this sand road 1.25 miles. The preserve is on the west side of the road.

Description: This site contains 212 acres of sand prairie that is recovering from past grazing. Little bluestem, three awn grass, plains prickly pear cactus, and June grass are some of the common plants in the preserve. The big flowered penstemon also occurs on this site.

The preserve is also habitat for several unusual reptile species. The western hog-nosed snake (state threatened), the six lined race runner, and bull snake are known to occur here.

Ownership: IL Department of Conservation

Dedicated: October 1970

Size: 37 acres

Topo Map: Clinton 7.5

For Further Information Contact:

IL DNR, Natural Heritage Biologist

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Site Superintendent

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