



## Prairies and Native Plantings as Outdoor Classrooms





A prairie outdoor classroom enables children to experience nature firsthand, such as a monarch caterpillar feeding on its host plant, common milkweed (*Asclepias syriaca*).

## INTRODUCTION

Native plants are those that were growing naturally in prairies and woodlands before European settlers arrived. The prairie plants that were part of this vast ecosystem are as important to us today as they were over a hundred years ago when 85 percent of Iowa was covered by tallgrass prairie. Today, original remnants of this special ecosystem can be found on less than 1 percent of Iowa's land.

Native plantings on school grounds and other educational facilities provide hands-on settings for children to learn and experience the natural world. It is important for children to learn about the plants and wildlife of the prairie because this ecosystem created the rich and productive soils that dominate and define Iowa. These outdoor classrooms offer applied learning opportunities in many subject areas: science, math, language arts, social studies, and the arts. What better way to teach Iowa history, the land and its people, than to have the students experience the sights and sounds that early settlers saw and heard?

There are several advantages to having an outdoor classroom of native plants:

- The prairie is a living, ever-changing, interactive science and history museum of plants that provide a habitat for birds, butterflies, and other wildlife.
- It offers year-round interest and educational opportunities.
- Native plantings and natural areas provide an attractive, minimal maintenance alternative for the unused area of the school ground that is typically covered in turfgrass. These converted areas save energy and fuel costs as well as labor costs required for mowing.
- Time and funding concerns often restrict field trips to off-site locations. Having the native area just outside the classroom increases its educational use.
- Natural areas on school grounds serve as an example of environmental responsibility for the students and the community.
- School gardens, including prairie gardens, appeal to many types of learners, make learning fun, encourage curiosity and lifelong interests, and provide memorable experiences. Students can develop life skills such as respect, responsibility, cooperation, decision making, and problem solving. These outdoor classroom opportunities improve student achievement.

*" . . . Another thing I shall remember as long as I live with unalloyed and inexpressible pleasure was the magnificence of the wildflowers that made the prairies for miles in all directions one gorgeous mass of variant beauty."*



Butterfly milkweed  
(*Asclepias tuberosa*)

—Written by Joanna Harris Haines recalling her move from Pennsylvania to Iowa in 1855. Excerpt from *Prairie Voices: Iowa's Pioneering Women*, edited by Glenda Riley.

Cover image: Meredith Borchardt, Trees Forever

## PRAIRIE RECONSTRUCTION

A reconstructed prairie that simulates the way the area looked more than a century ago is a valuable resource and educational tool. Although this may require extra effort or additional expense, it will be worth the effort in the long run. Prior to getting started, it is worthwhile to visit one of the remnant prairies scattered throughout the state to observe the unique ecosystem.

The research necessary to reconstruct a prairie is an excellent project for upper level biology students, extended learning program (ELP) students, or clubs. The objective of this project would be to plan the reconstruction of a prairie ecosystem that looks and functions as much as possible like the prairie ecosystem that originally existed on that site before settlers arrived. As students and others research and study the former prairie community in their area, they will need to select the appropriate species to plant based on the soil conditions, topography, and ecotype. This research project could include a field trip to the Tallgrass Prairie Center at the University of Northern Iowa in Cedar Falls, Iowa.



A well-planned, reconstructed prairie can effectively simulate the native prairie that dominated the plains.

## Getting Started

The following checklist will help you develop and implement a meaningful proposal or plan that will increase interest and gain support for an outdoor classroom.

Form a “Friends of the Prairie” committee consisting of individuals who have an interest in planning and implementing a school prairie. Members can be students, parents, teachers, PTO/PTA, administrators, after-school groups, and county and community businesses or agencies. Local conservation agencies and county ISU Extension staff can help identify prairie enthusiasts who would be willing to share their expertise and time on your project.

### PHASE ONE: Goal Setting and Developmental Planning

#### A. Goal Setting

- Create a list of reasons why a prairie is important for your school, community, and the local environment.
- Write a **vision** of what you would like to see happen in the outdoor classroom five years from now. Who is benefiting from the outdoor classroom—the school students, after-school program participants, and/or the community? Why is the project important to the school and community? What are the students doing with the prairie? What are they learning? How is that improving their interests, curiosity, and classroom attendance and achievement? What does the prairie look like? Who is working with the students? Who is maintaining the prairie area?
- Write a one-sentence, easy-to-understand, “marketable” concrete **goal** related to your vision. For example, your goal may be “to reconstruct a prairie with native plants where all students will interact with nature to study science and history while they learn environmental stewardship and problem solving.”

## B. Developmental Planning and Leadership

- Identify the **project leader** or “go to” person who will coordinate the project. The project leader can guide discussions at meetings, coordinate efforts with school staff, and help everyone focus on the goal.
- Together, as a group, the committee should write the **plans** according to the goal. The plans should include answers to the following questions:
  - How will the prairie be integrated into school classroom or educational program expectations and guidelines? (See “Curriculum and Application” section on page 10.)
  - Where is the site going to be located, and how will it be obtained and secured for long-term use?
  - What needs to happen for soil preparation, planting, and maintenance?
  - Will the planting consist of plants native to the area, or is the intent to reconstruct the prairie to simulate the way it was on the site 100 years ago? (See “Species Selection” on page 6 for more information.)
  - Where will we get the seeds or plants?
  - Who needs to be involved with the project in all steps from site selection to maintenance?
  - Do the plans involve the students in fund-raising, preparation, planting, and maintenance of the area?
  - How much will the project cost? Before any fundraising can be done, the cost of the project must be determined or closely estimated. Develop a detailed, itemized spreadsheet that includes material costs, water, consultation and soil preparation fees, and other anticipated expenses. You may find that some of the items on the list can be donated as in-kind contributions to the project.

- What are potential funding sources?
- How will the project be publicized and promoted as an educational tool?



The prairie landscape is ever-changing beauty from season to season and year to year.

## PHASE TWO: Determine Funding Sources and Volunteers

### A. Fund-raising

- Like most school projects, outdoor classrooms require financial resources for establishment and maintenance that school districts typically don't have in their budgets. Financing varies from penny collecting, business sponsors, and raffle sales to grant writing. Get the word out to build awareness of your project. This will be valuable for attracting donors as well as volunteers. Contact your local media and request that they do a public interest story on your project.

□ Many agencies and organizations throughout the country are concerned about the continued loss of native prairies and recognize the need for educating young people on the value of native plants and the prairie. Some of these organizations assist schools with prairie simulations or reconstruction. There may be civic groups or organizations in your area that provide financial support or gifts-in-kind. Refer to the section “Grant Opportunities” on page 11 for a partial list of agencies, businesses, and organizations that support native plantings for educational demonstration.

### **B. Recruit Volunteers**

- Identify specific tasks that need to be done and the jobs the volunteers will be performing. Let potential volunteers know if any special skills are required. Some volunteers prefer physical activities, such as planting, weeding, or burning; others prefer to assist with the paper work, phone calls, or even teach and share their expertise in the classroom.
- Contact local service groups, 4-H clubs, scout troops, garden clubs, ISU Extension Master Gardeners, city parks and recreation offices, or other organizations that may be able to donate time or resources. Remember to include youth who will benefit from the prairie.
- Students of all ages can become involved in the planning and establishment of the prairie. When they are actively involved in the project from the beginning, the students will have an ownership in the area and are more likely to maintain a long-term interest in it. Lessons can be oriented around each part of the establishment process. For example, elementary students

can explore and discuss the different sizes and shapes of the seeds, planting depth, and the types of plants that grow from the seeds. Older students can assist in the soil preparation and planting process.

### **PHASE THREE: Site Selection**

- **Size.** Selecting the right site for a school prairie is critical in its success and usefulness as an outdoor classroom. Native plantings can be as small as a 10 foot by 20 foot entrance to the school. Although a small garden containing a few native species introduces students to the types of plants that once inhabited the prairie, it may not provide a good simulation of a prairie community and it may not attract the variety of wildlife, such as butterflies and birds, a larger planting would. The original tallgrass prairie stretched for miles, supporting a large diversity of plant and animal life. A reconstructed prairie requires at least  $\frac{3}{4}$  to 1 acre to simulate the prairie ecosystem and wildlife habitat.
- **Accessibility.** If possible, locate the prairie in close proximity to the school so that it is easily accessible during class time. It may not be used by teachers and students if it requires too much class time to get there. However, stay at least 400 yards away so that a planned burn of the prairie would not threaten the facilities.
- **Water source.** Although some native plants are adapted to dry conditions, it is important to locate the prairie near a water source. Several garden hoses linked together and connected to the school’s outdoor spigot will provide water to the young seedlings and for fire safety when needed. Connection to a nearby fire hydrant



Youth and adult volunteers and committed leaders are vital to the success of a school prairie project. Their assistance is needed during the planning and planting process and various times throughout the season.

also may be a useful and convenient water source. It is a good idea to consult your local fire department for the best site selection near the school and water source.

☐ **Sun and soil conditions.** Select a well-drained site that receives full sunlight. Even partial shade may affect the growth and establishment of prairie plants. There are advantages and disadvantages to planting in nutrient-rich soil and poor soil. The plants will become well established in a rich soil, but there will be significant weed pressure the first few years. Prairie plants seeded in a poorer soil may be slower to grow, but there may be fewer weed problems.

#### **PHASE FOUR: Species Selection**

☐ Select plant species that are appropriate to the soil conditions in the planting area. Native prairie plants are grouped in three categories, based on their preferred soil

moisture levels: dry, mesic or moderate, and wet sites. For information and an index of selected native prairie species for these conditions, refer to the ISU Extension publication SUL 18, *Introduction to Iowa Native Prairie Plants* (available for order at [www.extension.iastate.edu/store](http://www.extension.iastate.edu/store) or download at [www.extension.iastate.edu/publications/SUL18.pdf](http://www.extension.iastate.edu/publications/SUL18.pdf)).

Prairie restorationists attempt to use plant species that reflect the original flora as exactly as possible. Plants of the same species but grown from seed adapted to a different area will likely be different from those adapted to the local area. Prairie experts believe this creates problems such as reduced tolerance to environmental extremes and susceptibility to pests. Also, plants from a different origin may be more aggressive than local plants of the same species and may crowd out other species in the reconstructed prairie.



The origin of common names of prairie plants is an interesting lesson. For example, pioneers referred to the big blue stem (*Andropogon gerardii*), left, as “turkey foot” because the branched flower inflorescence resembles a turkey foot. Compass plant (*Silphium laciniatum*), right, gets its name from the way its leaves stand upright on the stem with their edges oriented north-south.

The Tallgrass Prairie Center at the University of Northern Iowa coordinates the Iowa Ecotype Project, which collects, identifies, and produces source-identified seed. Funded in part by the Iowa Department of Transportation's Living Roadway Trust Fund, seed collected from three different climatic zones in Iowa—north, central, and south—are propagated. The Tallgrass Prairie Center documents the origin of the seed and the zone in which it was collected. That seed is then provided to commercial growers for production. Seed growers apply for certification through the Native Species Program with the Iowa Crop Improvement Association. This certified seed, known as “Yellow Tag” seed, is available from various seed dealers. For more information on the Native Species Program and sources of specific certified native plant seed, go to [www.agron.iastate.edu/icia/PDFs/Seed\\_Directory/NativeSpecies.pdf](http://www.agron.iastate.edu/icia/PDFs/Seed_Directory/NativeSpecies.pdf).

A list of Iowa and local ecotype seed dealers is available through the Iowa Prairie Network [www.iowaprairienetwork.org/mgmt/seeddealers.htm](http://www.iowaprairienetwork.org/mgmt/seeddealers.htm).

An excellent fall field trip prior to planting may be going to a nearby prairie remnant and hand-collecting the seed. Your local department of natural resources or county conservation board may be able to help you locate private or public prairies in your area. Prior to the field trip, the class will need to obtain permission



Collecting seed from prairie plants in the fall can be an educational lesson on plant life cycles, prairie conservation, and the importance of local ecotypes.

from the land owners, learn about collecting seed, and understand the importance of conservative collecting. For information on collecting prairie seed, go to [www.sustland.umn.edu/implement/wildflower.htm](http://www.sustland.umn.edu/implement/wildflower.htm).

## PHASE FIVE: Site Preparation and Planting

### A. Site Preparation

Preparing the soil for planting may be the most labor-intensive phase for planting, depending on the existing vegetation. If the site is covered in turfgrass, pasture, or other perennials, it will be necessary to prepare the soil a month or more ahead of planting. It will require a few steps in early spring or fall:

- Mow the turfgrass or other vegetation to about 6 to 8 inches in height.
- Apply a nonselective herbicide, such as glyphosate (Roundup®), to destroy the existing vegetation. This is most effective when done in the fall.
- Ten days after spraying, till small plots or lightly disk large areas. Several shallow tillings will reduce surface weed banks.
- Just prior to seeding, lightly cultivate the soil and harrow if necessary to provide a smooth seedbed. Roll the soil with a cultipacker to firm the planting area and reduce erosion.
- Do not** fertilize. Added fertilizer will stimulate growth of weedy annual plants.

### B. Planting

**Timing.** Prairies can be successfully seeded in the spring, summer, or fall, allowing for a flexible planting schedule around the school calendar. Seeding in late fall is often the optimal time because students can be involved in the planting process and allows many species to germinate in the spring, resulting in a good stand of variety of species. Fall planting also gives students an opportunity to identify prairie seedlings in the spring and assist with weed control. In addition, fall seeding allows natural stratification through the winter that can improve germination.

• **Seed mix and rate.** The seed mix depends on the appropriate species for the site. A blend of five to eight species of grasses and 15 to 20 flowering species will be a good start for a reconstructed prairie. The seeding rate for native plantings is about 10 to 15 pounds of mixed forbs and grasses per acre. It is recommended to plant at least twice the weight of mixed forbs compared to that of grass seed. Most often, school prairies will be mesic—intermediate between wet and dry. If the site is wetter, add one or two plants that prefer those conditions. If drier, select a few dry-mesic species. Refer to the list in the Iowa State University Extension publication, SUL 18, *Introduction to Iowa Native Plants*.

□ **Planting method.** Depending on the size of the prairie, seeding can be done using specialized native seed drills or by broadcast spreaders. Ideally, students can be involved in the planting process by using hand spreaders or scattering the seed by hand. It will be necessary to calibrate the spreader and hand-sowing rate to achieve an accurate seeding rate and uniform stand. Divide the seed in half and spread half in one direction and the other half perpendicularly to the first. After the seed is broadcast, roll or cultipack the soil or rake it gently to ensure good seed-soil contact. Keep a record of what species was planted in each location and who planted it.

## **PHASE SIX: Establishment and Maintenance**

The first few years will require diligent and selective weeding. Educate upper elementary students to identify prairie plant seedlings and weed seedlings so that they can assist with weed control. This activity can lead to discussions on growth rate, seed dispersal, plant populations, and competition for light, water, and nutrients. There are resources available to help identify prairie seedlings. An excellent resource is available free from the Iowa Living Roadway Trust Fund, *Prairie Seedling Guide and Seeding Evaluation*, which can be viewed or ordered online at [www.iowalivingroadway.com/PrairiePosters.asp](http://www.iowalivingroadway.com/PrairiePosters.asp).



Butterfly milkweed (*Asclepias tuberosa*) produces nectar that attracts butterflies, especially monarchs.

For additional information and resources, refer to SUL 20, *References and Resources for Prairie and Native Plantings* at [www.extension.iastate.edu/store](http://www.extension.iastate.edu/store) or download at [www.extension.iastate.edu/publications/SUL20.pdf](http://www.extension.iastate.edu/publications/SUL20.pdf).

□ **First year.** During the first year, adequate water and weed control are critical. It may be necessary to water deeply and infrequently if dry conditions persist the first growing season. Be on the alert for perennial weed species, such as crown vetch, turf grasses, sweet clover, and Canada thistle, and destroy them by hand weeding or spot spraying when they are still small. Expect a population of annual weeds to flourish, but with mowing, these should not be a serious problem in the long run.

Whether the prairie was seeded in the fall or spring, mow the area when the weeds are about a foot tall. At first, set the mower height to 3 to 4 inches, then in late summer, raise the height to 6 inches. It may only be



necessary to mow four or five times during the growing season, so long as the weeds do not exceed 6 to 8 inches before mowing. Occasional mowing not only keeps weeds from setting seed, it is important for the growth and establishment of several prairie species.

□ **Second year.** Mow the site once or twice during the growing season, only if weeds are a problem. Don't mow at a height of less than 8 inches.

□ **Third year and beyond.** Once the prairie planting is established, students can harvest seed in the fall, either to sell or reseed into their prairie. Maintenance becomes easier as the prairie matures. Beginning the third year, the prairie area can be burned.

### **Burning the Prairie**

The original tallgrass prairie would not have existed without occasional fire. There are many advantages to fire on the prairie:

- Fire exposes the soil surface to more sunlight and heat, resulting in early growth and development.
- Fire kills most saplings of woody species, removes thatch to aid nutrient cycling, and promotes early-flowering spring species.
- Fire stimulates grasses to produce more plant shoots or tillers, thus more grass growth.
- Fire controls non-native herbaceous and woody species that can invade prairie remnants.

Contact your local county conservation board for expertise and assistance with planning and conducting a prairie burn.

Controlled burns should be conducted in the spring between March and late April. Before you burn, it is very important that you find out if there are ordinances you must follow. Contact your county conservation board and fire department to find out which regulations and ordinances pertain to burning your site. Obtain the appropriate permits from your fire department. It also is important to notify neighbors about the burning, and answer any questions or concerns they have.

Since it isn't safe to burn in close proximity to buildings, mowing a native planting in mid-spring is a good alternative. Mowing can be done in late fall after plants have set seed and animals are through nesting. Although not quite as effective as fire, mowing in the spring removes the old plant debris and weeds that have already begun active growth. Mow close to the soil surface, at least within one inch of the ground. Rake off all the cuttings to expose the soil to the sun, enabling it to warm the ground and encourage the growth of prairie plants.



Burning helps maintain the health and diversity of a prairie.



Volunteers are needed at a prairie burn to keep the fire under control.

Some experts recommend burning or mowing only half of the prairie every other year. This simulates the patchy areas of burned and unburned areas of the original tallgrass prairie. Their reasoning is that different species will thrive, maximizing plant species diversity in the landscape and diversity of habitat for wildlife. It may prevent any given species from dominating an area. Also, leaving unburned sections preserves overwintering butterfly, moth, and other invertebrate pupae and eggs that would otherwise be destroyed by burning.

## CURRICULUM AND APPLICATION

One of the major obstacles in the success of a native planting as an outdoor classroom is the teachers' reluctance to use it because they are not familiar with the subject area or do not have the appropriate curriculum. Before the prairie is planted, find a curriculum that can be integrated into your school district's expectations. Iowa State University Extension 4-H Youth Development's "History of the Land" from the *Where We Live* curriculum for grades 4–6, is an excellent example. For more information, go to [www.extension.iastate.edu/learningandliving](http://www.extension.iastate.edu/learningandliving).

Below are subject matter standards and benchmarks and student objectives that can be met using the prairie as an outdoor classroom. For specific activity ideas, go to the Lessons page on [www.extension.iastate.edu/GrowingintheGarden](http://www.extension.iastate.edu/GrowingintheGarden).

### Science

**Life Science** (characteristics of organisms, life cycles of organisms, organisms and environments)

- Students will learn about plant parts, plant identification, life cycles of annual and perennial plants, prairie ecosystems, food webs, nonbiological stresses (climate, grazing, fire) on plants and animals, succession, emergence, plant stand, and diversity.

**Earth and Space Science** (properties of earth materials)

- Students will learn about the types and importance of natural resources, how the prairie was formed, how the rich soil developed, characteristics of soil and soil types, and how soil characteristics affect plant growth.



Wild bergamont (*Monarda fistulosa*)

**Science in Personal and Social Perspectives** (types of resources, changes in environments)

- Students will learn about how and why the Iowa landscape has changed over the past 100 years and how that has changed the way people and animals live.

**Social Studies** (time, continuity, and change; people, places, and environments; civic ideas and practices)

- Students will study the changes in life on the prairie and in Iowa communities.
- Students will explore pioneer life on the prairie.
- Students will work with other community members to plan, plant, and maintain a prairie near their school.
- Students will learn about the process of burning the prairie, including the necessary permits and assistance needed to conduct a controlled burn.

**Language Arts** (reading, creative writing, poetry, vocabulary)

- Students will learn about life on the prairie by reading stories and through creative writing activities. Suggested reading: *Prairie Voices: Iowa's Pioneering Women*, edited by Glenda Riley, or the tragic, true story of the Swearingen family from Story County, Iowa, in 1860.

**Math** (measurement, record keeping, data analysis, problem solving)

- Using prairie plants, students will learn to measure and record growth rate, analyze data, and develop problem-solving skills

**Art**

- Students will use the prairie as an inspiration to draw, paint, or make clay structures.
- Students will learn how sun, seasons, and plant cycles affect color, shadows, and plant characteristics in art.

**GRANT OPPORTUNITIES**

Mini-grants are available from the Iowa Conservation Education Council for nature-based service learning projects that promote awareness of our natural resources. Projects involving native plantings must be integrated with some kind of environmental education project. Application forms are available through the Iowa Conservation Education Council at [www.extension.iastate.edu/iowace/minigrants.html](http://www.extension.iastate.edu/iowace/minigrants.html).

Iowa Living Roadway Trust Fund is a competitive grant program that recognizes the value of restoring and preserving native plant populations. It encourages the use of outdoor classrooms containing native plant communities and provides funding for their establishment. For more information, go to [www.iowalivingroadway.com/GrantApplication.asp](http://www.iowalivingroadway.com/GrantApplication.asp).

The Lorrie Otto Seeds for Education Fund gives small monetary grants to schools, nature centers, or other nonprofit educational organizations for the purpose of establishing outdoor learning centers.

[www.for-wild.org/sfecvr.html](http://www.for-wild.org/sfecvr.html)

Lowe's Charitable and Educational Foundation, International Paper, and National Geographic *Explorer!* classroom magazine have partnered to create an outdoor classroom grant program to provide schools with additional resources to improve their science curriculum by engaging students in hands-on experiences outside the traditional classroom. All K–12 public schools in the United States are welcome to apply.

[www.lowes.com/lowes/](http://www.lowes.com/lowes/)

[lkn?action=pg&p=AboutLowes/outdoor/index](http://lkn?action=pg&p=AboutLowes/outdoor/index)

Local chapters of Pheasants Forever

[www.iowapheasantsforever.org](http://www.iowapheasantsforever.org)



All visitors to the prairie classroom can learn about the prairie community with educational tools such as an information kiosk (left) and plant identification boxes (right).

## EDUCATIONAL RESOURCES

*America's Lost Landscape: The Tallgrass Prairie*. 2005. Award-winning, 60-minute program broadcast on PBS, available on DVD/VHS. To order, go to [www.newlightmedia.tv/nlm/shop.html](http://www.newlightmedia.tv/nlm/shop.html).

Iowa Department of Transportation. *Iowa's Living Roadway: Plant Profiler*. This is a valuable guide to understanding the Iowa Department of Transportation's roadside management programs. In addition to planting plans, this reference includes an excellent profile of several native plants and their contribution to our environment and society. Free copies are available to order (one per household, Iowa residents only). [www.dot.state.ia.us/plant\\_guide/profiler\\_order3.htm](http://www.dot.state.ia.us/plant_guide/profiler_order3.htm)

Iowa Living Roadway Trust Fund. A set of six, beautifully illustrated, educational prairie posters is available free upon request. The "Kids and Education" Web site provides many useful links to curricula and resources. [www.iowalivingroadway.com](http://www.iowalivingroadway.com)

Iowa Prairie Network Web site. The Iowa Prairie Network provides valuable information on planting and maintaining a native planting. [www.iowaprairienetwork.org/](http://www.iowaprairienetwork.org/)

Neal Smith National Wildlife Refuge. Located in Jasper County, near Prairie City, Iowa, it includes 5,500 acres of land that have been reconstructed to Iowa's original rolling hills and tallgrass prairie. The Learning Center offers many educational programs for children of all ages. Their Web site contains useful information for educators and children, including *Project Bluestem: A Curriculum on Prairies and Savannas*. [www.fws.gov/midwest/NealSmith](http://www.fws.gov/midwest/NealSmith)

Tallgrass Prairie Center. University of Northern Iowa, Cedar Falls, IA 50614, (319) 273-2238. [www.tallgrassprairiecenter.org](http://www.tallgrassprairiecenter.org)

Trees Forever, through Iowa's Living Roadway Trust Program, has created several publications to aid volunteers, and other individuals and organizations, in developing and maintaining local planting projects. This

Implementation Guide Series includes: *Maintenance of Small-Scale Native Plant Gardens*, *Maintenance of Large-Scale Prairie Plantings*, *Why Plant Native?*, *Prairie Seedling Identification*, and *Finding and Selecting Native Plant Material*. Downloadable versions of these guides are available at [www.treesforever.org](http://www.treesforever.org).

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The prairie is not only home to nearly 200 plant species, but it also can be home to many animals.

## GLOSSARY

**Annual** is a plant that germinates, grows, flowers, sets seed, and dies within the same year.

**Biennial** is a plant that germinates and grows the first year (leaves are often a low-growing rosette), then overwinters and in the second year bolts (sends up a flower stalk to bloom), sets seed, and then dies.

**Forb** is a dicot or “broadleaved” plant, as opposed to grasses and sedges.

**Invasive species** is a species that is not native to an area, and that is known to aggressively compete to the potential detriment of some more desirable species.

**Invertebrate** is an animal that has no internal supporting bone structures. Insects, spiders, millipedes, and crawfish are examples of invertebrates.

**Native** means a plant, animal, or microorganism that is found within its historic range, which is basically the area occupied at the time of European colonization of an area. In Iowa, colonization occurred between about 1810 through the 1880s. The opposite of native is introduced.

**Prairie** is an extensive area of flat or rolling, predominantly treeless grassland, especially the large tract or plain of central North America, populated with a diverse group of native species that function together as an ecosystem. Iowa is at the heart of the traditional “tallgrass” prairie.

**Reconstructed prairie** means an area that had been tilled or the native prairie was eliminated and now has been planted to prairie species. Classroom prairies are almost all small reconstructed prairies and can become reasonable facsimiles of the native prairie that once dominated the plains.

**Remnant** refers to a small, surviving group or unit. A remnant prairie is a native plant community that has survived on a site, undisturbed, to the present day.

**Scarification** is a process to break tough seed coats on some plant species. Roses, puccoon (“stoneseed”), and hard-seeded legumes like wild indigo benefit greatly from scarification. Scarification techniques to break or often the seed coat include presoaking seed overnight and physically filing an opening in the seed coat.

**Species** is a fundamental category of taxonomic classification, ranking below a genus or subgenus and consisting of related organisms that are capable of interbreeding.

**Stratification** is needed for successful seed germination of some species. Stratification is passing the seed through a period of cool or cold temperatures; think of it as simulating winter. Generally, freshly harvested seed is best kept in a mouse-free, cold place for at least a few weeks to simulate winter. Fall prairie seedings will tend to favor species that need seed stratification to germinate.

**Succession** refers to more-or-less predictable and orderly changes in the composition or structure of an ecological community. Species will flourish in environments that are best suited for them. As the prairie establishes and develops, the environment changes, which encourages some different species and suppresses others. A mowed turf has a pretty constant environment that favors the monoculture of bluegrass, so it remains consistent year to year. An example of prairie succession in a reconstruction is:

*Year 1:* Annual weedy species that establish quickly and fill bare ground between desirable species.

*Year 2:* Biennial plants will start flowering, and some rapid establishing perennials will start to replace the annuals.

*Year 3:* Slower-to-establish perennials will start to show up and take their place in the prairie.

*Years 4 and on:* Other species will show up adding to the diversity, and you will start to see micro-environments filled with patches of the species that are most adapted to those sites.

# Seasons in a School Prairie

## APRIL



Funding support for this publication provided by Iowa Living Roadway Trust Fund, Iowa Department of Transportation.

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## MAY



Spiderwort  
(*Tradescantia ohioensis*)



Early in the season



Prairie phlox  
(*Phlox pilosa*)

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## JUNE



Leadplant  
(*Amorpha canescens*)



Pale purple coneflower  
(*Echinacea pallida*)

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## JULY



Gray-headed coneflower  
(*Ratibida pinnata*)

Black-eyed Susan  
*Rudbeckia hirta*



Purple prairie clover  
(*Dalea purpurea*)



False sunflower or oxeye  
(*Heliopsis helianthoides*)



Culver's root  
(*Veronicastrum virginicum*)

## AUGUST



Rattlesnake master  
(*Eryngium yuccifolium*)



Big bluestem  
(*Andropogon gerardii*)



Prairie blazing star  
(*Liatris pycnostachya*)



Common milkweed  
(*Asclepias syriaca*)

Gray-headed coneflower  
(*Ratibida pinnata*)

## SEPTEMBER



New England aster  
(*Aster novae-angliae*)

Canada goldenrod  
(*Solidago canadensis*)



Stiff goldenrod  
(*Solidago rigida*)



Indian grass  
(*Sorghastrum nutans*)



Pohl Preserve (prairie remnant)  
Ames High School, Ames, IA



“ . . . the magnificence of the wildflowers . . . ”

