

# Prairie Investigators



**Using Plants and  
Animals to Uncover  
the Mystery of the Prairie**

*What do you see?*

# Can You Identify These Prairie Plants and Animals?



Left top down: Garden Spider (*Arigoepe aurantia*), Bumble Bee (*Bombus on Baptisia lactea*), Dogbane Beetle (*Chrysochus auratus*), Red-legged Grasshopper (*Melanoplus femurrubrum*), Leafhopper (*Graphocephala sp.*); Center top down: Blazing Star (*Liatris pycnostachya*), Spiderwort (*Tradescantia bracteata*), Black-eyed Susan (*Rudbeckia hirta*), Prairie Rose (*Rosa sp.*); Right top down: Bird nest, Eastern Cottontail (*Sylvilagus floridanus*), American Toad (*Bufo americanus*), Fox Snake (*Pantherophis vulpina*), Chrysalis.

# What Is the Mystery of the Prairie?

Explorers and pioneers described their first views of the prairie using words such as “abundant,” “luxurious,” “magnificent,” “gorgeous masses of variant beauty,” birds singing “their songs of jubilee.” They reported seeing fox, wolves, reptiles, and badgers roaming free. If we investigate the plants and animals of the prairie, we might reveal the connections between the creatures and this amazing habitat.

## Looking for Clues on the Prairie

Biologists are a lot like police detectives. Detectives need to examine things closely, gather clues, and evaluate evidence to solve a case. In much the same way, biologists need to carefully observe what is happening in the natural world to monitor changes and learn how to care for the prairie.

Use guides, books, the Internet, and conversations with prairie specialists to do background checks on prairie plants and animals. **Then practice your observation skills by spending some time searching the prairie. Use the list below to check off the plants, animals, and other clues you find in the prairie.**

### Objectives:

- Identify five plant and five animal species found on the prairie.
- Recognize indicators or clues in the prairie environment that indicate the presence of plant and animal species.
- Theorize what species are present based on bioindicators.

### Hints:

- Use a book or field guide to help you identify your clues.
- Use a hand lens to inspect plant stems and flowers.
- Use a net or jar to catch insects for a closer look before releasing them.

### PLANTS

#### Grasses

- Big Bluestem
- Canada Wildrye
- Indian Grass
- Little Bluestem
- Sideoats Grama
- Switchgrass

#### Forbs (Flowers)

- Bee Balm
- Black-Eyed Susan
- Blazing Star
- Compass Plant
- Cone Flower
- Goldenrod
- Milkweed
- Rose
- Spiderwort
- Thistle
- Violets
- Wild Rose

#### Shrubs

- American Plum
- Lead Plant
- New Jersey Tea

### ANIMALS

#### Arthropods

- Crayfish
- Daddylong-legs
- Millipede
- Pillbug
- Spider

#### Insects

- Ant
- Assassin Bug
- Bee
- Bumble Bee
- Butterfly
- Caterpillar
- Cricket
- Dragonfly
- Grasshopper
- Ground Beetle
- Hover Fly
- Ladybug
- Moth
- Planthopper
- Stink Bug
- Wasp
- Weevil

### ANIMALS

#### Birds

- Bobolink
- Bobwhite Quail
- Common Yellowthroat
- Dickcissel
- Meadowlark
- Red-tailed Hawk
- Sparrows

#### Mammals

- Badger
- Bison
- Fox
- Ground Squirrel
- Meadow Vole
- Mouse
- Rabbit

#### Amphibians

- American Toad
- Leopard Frog

#### Reptiles

- Box Turtle
- Fox Snake
- Garter Snake
- Skink

### OTHER CLUES

- Animal Nests
- Animal Tracks
- Chrysalis/Cocoon
- Feathers
- Fur
- Mound of Soil
- Scat
- Snags

#### Others

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

This activity can be used as you visit the prairie. You can do the activities by yourself or with a group.

# Putting the Pieces Together



Compass plants (*Silphium laciniatum*) are characteristic prairie plants.

Photo: Wayne J. Ohnesorg

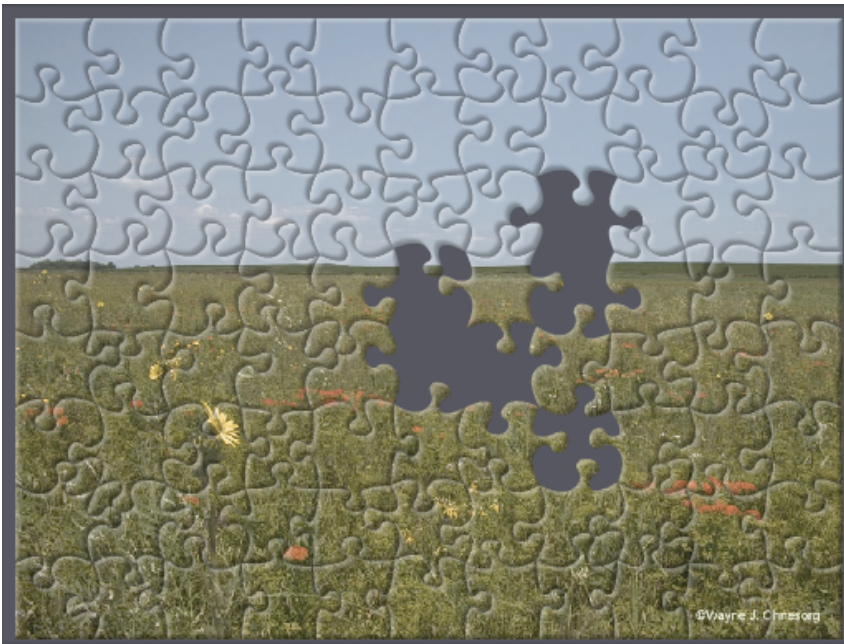
Decoding the meaning of the clues is often the most difficult part of detective work.

Plants can be used to indicate soil characteristics, including soil type, depth, and moisture. Different species of plants can suggest the type of climate that occurs in the region. Specific species of plants can even be associated with animals that use them as food or shelter. Prairie plants also are sensitive to natural processes like fire and grazing. These factors change the types of plants that occur on the prairie.

Arthropods, including insects, can be a sign of more specific conditions on the prairie. Wetland species, such as dragonflies, may suggest the presence of water, while most prairie insects are adapted to dry conditions. Many prairie insects can be used to predict the presence of host plants for feeding or as territories to hunt in. Some prairie arthropods also are sensitive to disturbance and take years to return following a fire. Some insects use soil to deposit eggs, construct burrows, and bury prey. These insects can be used to identify soil characteristics.

Grassland birds respond to plant structure, prairie size, and prey availability. Birds announce their presence to attract mates, defend their territory, protect their nests, and distract intruders.

Mammals, reptiles, and amphibians often are difficult to find in the prairie. However, you may be able to find holes in the soil, fur or shed skin, droppings (scat), and tracks. These clues lead to the animals, which can tell you about how the prairie is functioning. In order to have predators, such as snakes and badgers, the prairie also must include smaller animals (prey), such as frogs, voles, and insects.



Exposed soil, charred trees and shrubs, and nipped off plants all indicate disturbance from wallowing animals like bison, fire, or feeding by grazers.

By looking at different types of organisms, a picture begins to emerge about how things are connected on the prairie.

Some plants and animals are not native to the prairie. If you find a non-native plant or animal in the prairie, how do you think it got there?

Photo: Wayne J. Ohnesorg

# Following the Clues

The checklist on page 3 is only the first step to understanding the mystery of the prairie. The plants, animals, and other clues you discovered provide biologists with additional information.

When you are trying to find out what a place is like, it makes sense to ask the people who live there. In the same way, you can find out what the prairie is like by observing the prairie environment, including plant and animal interactions.

Look at your checklist. What could these clues mean?

Try your best to answer the questions below to help decipher the message that the clues might reveal to you.

- Grasses are often the most common prairie plants. What is special about grasses that helps them grow in prairies? (Hint: consider their growth habit.)
- Many prairie plants have brightly colored flowers. What purpose do the bright colors serve? (Hint: What do they attract and why?)
- Thistles are covered with stiff hairs, spines, and thorns. Why might these plants need protection?
- Crayfish are usually found near water. What does it mean if you find them on the prairie?
- Carefully watch the bees as they visit the plants. Bees collect pollen and nectar. Where do they take it?
- Butterflies have complete life cycles. They go through four different stages or forms. When you see an adult butterfly flying on the prairie, what stages might you look for and where?
- Red and black spotted ladybird beetles (ladybugs) are easy to see crawling on the green plants. If you look closely at the plants they are on, what else might you see and why?
- Bobolinks, red-winged blackbirds, and other birds call loudly when you get near them. Why do you think they are singing?
- You find a large pile of soil in the prairie. Why is it there?
- A lonely tree stands on the prairie; its limbs and trunk are black. What happened?



*Prairie flowers come in all colors.  
Prairie blue-eyed grass (*Sisyrinchium campestre*)  
Hoary puccoon (*Lithospermum canescens*)*

Photo: Wayne J. Ohnesorg

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An organism that integrates ecological qualities, reflects changes in the habitat, or can be used to find other organisms is a **bioindicator**.



*Several milkweed species occur on prairies.  
Common milkweed (*Asclepias syriaca*)*

Photo: Wayne J. Ohnesorg

# Clues Revealed

The notes below provide some possible answers to the questions on the previous page. Were you on the right track?

How does the time of year or weather change what you see on the prairie?

Clue	Message
Grasses	They can tolerate hot, sunny, dry environments because they have a deep root system. Also, they survive disturbances, such as fire and grazing, which actually help the grasses sprout and grow.
Flowers	Pollinators are present
Thistles	Grazing animals visit prairies
Crayfish	Water may be near by, or a shallow temporary prairie wetland has dried up
Bees	Flowering plants are in bloom; there may be nesting sites available like sandy soil or dead trees
Butterflies	Host plants for the caterpillars may be present on the prairie
Ladybird Beetles	Prey items may be on the plant, including aphids and other insects
Birds	Defending its territory or nest
Soil Mounds	Ants or mammals may be present
Snag (dead tree)	Indicate fire has occurred

## Decipher Your Own Clues

Based on your own observations, make a list of some of the clues (organisms) you saw. Suggest the message/factor.

<i>Clue/Organism</i>	<i>Message/Factor</i>
Example: <u>Ladybird Beetle</u>	<u>Small insects, such as aphids may be feeding on the plants</u>
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____
4. _____	4. _____

# Ecosystem Investigators

Prairies are just one type of **ecosystem**: a collection of plants, animals, and fungi, shaped by the non-living factors, such as climate and disturbance. The prairie we have focused on is the tall-grass prairie in the eastern portion of the North American grassland where rainfall is plentiful. As you travel further west it gets drier and the prairie community changes; grasses become shorter and the types of animals change as well. You can use the same skills you developed in this exercise to study other types of prairies and other ecosystems. The identities of the organisms may change—along with the messages they convey—but you can use your observation skills to uncover the clues and determine the message.

**What environment do you want to explore next?**

**What is the weather like?**

**What animals live there?**

**What plants live there?**

## Evidence of Change

Prairies change over time and with human influence. You can monitor changes to the prairie by paying attention to the plant and animal clues each time you visit. Keep a notebook with a list of things you see each time you visit.

**Date:** \_\_\_\_\_

**Weather Conditions:**

\_\_\_\_\_

**Observations**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

*Wetlands, forests, and deserts are different kinds of ecosystems.*



Butterflies can be used as bioindicators.  
*Monarch (Danaus plexippus) on  
Butterfly Milkweed (Asclepias tuberosa)*

Photo Wayne J. Ohnesorg

*When you visit the prairie throughout the season are different flowers blooming?  
Are different insects visiting the flowers?*

**Make a drawing of what the prairie looks like today.**

# Resources:

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**File:** Youth and 4-H 4 and Wildlife 2



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## Web Sites

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- Insects of Iowa*  
[www.insectsofiowa.com/](http://www.insectsofiowa.com/)
- Iowa Association of Naturalists Booklet Series*  
[www.ianpage.20m.com/IANBookletSeries.html](http://www.ianpage.20m.com/IANBookletSeries.html)
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- Iowa Natural Heritage Foundation*  
[www.inhf.org/](http://www.inhf.org/)
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[www.iowaprairienetwork.org](http://www.iowaprairienetwork.org)
- Iowa State University Department of Ecology, Evolution, and Organismal Biology*  
[www.eeob.iastate.edu/](http://www.eeob.iastate.edu/)
- Iowa State University Department of Entomology*  
[www.ent.iastate.edu](http://www.ent.iastate.edu)
- Iowa State University Extension Distribution Center (Search on "prairie")*  
[www.extension.iastate.edu/store](http://www.extension.iastate.edu/store)
- Neal Smith National Wildlife Refuge*  
[www.fws.gov/Midwest/NealSmith/](http://www.fws.gov/Midwest/NealSmith/)
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