

Grade Level **5**

Class Periods **3-4**

### Goals/Objectives/Student Outcomes:

- Students will:
- Learn how Iowa's land has changed since the time of settlement.
- Recognize some plants and animals that were abundant 150 years ago that are no longer here today.
- Explain the differences between prairie, wetland, and woodland.

### Materials:

1. Paper
2. Research materials, including historic accounts of Iowa's plants and animals:
  - local county histories
  - Journals from early explorers and settlers
  - Books listed in resource section

### Background:

The landscape of Iowa plants and animals today greatly differs from that of 1846, the year of statehood. As more people came to the state to live and work, significant changes occurred in the diversity of the native flora and fauna, largely due to the alteration and destruction of many natural habitats.

While through the years many species native to Iowa have disappeared, other non-native species have been introduced to the area's biological communities. Plants or animals that have disappeared from a biological community are either extinct or extirpated. Extinct species are no longer found on earth. Extirpated species are no longer found in a certain area. For instance, since 1914 passenger pigeons have been extinct, whereas bison are extirpated from Iowa.

At the time of European settlement, Iowa's landscape was dominated by prairie. It is believed that 85% of the state was covered with a prairie mosaic of grasses and flowering plants. Wetlands were interspersed among the prairies, and forested areas existed along streams and rivers.

Once the agriculturally rich soil created by the prairie was discovered, a rapid transition from wild land to cultivated land occurred between Iowa's border rivers. It is estimated that 99.9 percent of our original prairies has vanished, while approximately five percent of our original

wetlands remains. Such statistics indicate that Iowa is one of the most biologically altered states in the nation.

In *A Country So Full of Game*, James Dinsmore reports that of 456 vertebrate species (mammal, bird, reptile, amphibian, and fish) living in Iowa at the time of European settlement, 29 are now extirpated. In addition, 38 species are endangered and 19 are threatened. It is clear that as habitats change so too do the numbers and species of animals that can survive.

In 1948 University of Iowa Professor of Natural Science Bohumil Shimek wrote the following about Iowa (see p. 122 of *Iowa's Natural Heritage*):

"There were then still miles upon miles of almost undisturbed timber, fine white oaks predominating on the uplands, the hard maple occasionally dominating the river-bluffs, and the red cedar finding an anchorage on the limestone ledges, while the black walnut and various softwood trees occupied the narrow bottom lands.

Nor did plant life furnish the only interest. The wild turkey persisted, at least as late as 1886, the drumming of the ruffed grouse, now almost extinct, was one of the most familiar sounds in our woods, and the passenger pigeon still came in great clouds to seek shelter amid the oaks of our uplands.

There were still remnants of prairies, even in eastern Iowa, and in the year 1882 the writer found large areas of native prairie in the counties north and northwest of Wright County, and for more than 20 years thereafter (in constantly diminishing amount) in the Northwestern part of the state.

The waters, too, were largely unchanged. The mania for draining every wet spot had not fully developed, and there were oxbow lakes along our streams, then still undisturbed and unpolluted."

The amount and kind of animals that can live in an area depend upon the amount and kind of plants that inhabit the area. Although there are a number of reasons why plant and animal populations change, many of those changes in the past 150 years have been determined by humans. People introduce non-native plants and animals both purposefully and accidentally. Extirpations and extinctions have been caused by human activities such as habitat alteration, overhunting, introduction of non-native competitor species, and mismanagement.

*The following lists indicate species that have been introduced to or extirpated from Iowa.*

### Introduced Plants and Animals—A Partial List

Ring-necked pheasant	Alfalfa
Gray partridge	Dandelion
Starling	Crab grass
European carp	Green foxtail
White amur (grass carp)	Kentucky bluegrass
Norway rat	Oats
Zebra rat	Purple loosestrife

### Extirpated Species

Bison	Whooping crane
Black bear	Long-billed curlew
Mountain Lion	Marbled godwit
Gray wolf	

### Procedure:

1. Invite students to imagine they are traveling with their families to a new home in Iowa in the year 1846. Ask them to draw a picture of what they believe they would see as they travel.
2. Display the artwork around the room and compare and contrast what students have placed in their drawings. Look to see what plants and animals the students encountered.
3. Begin a discussion about how Iowa has changed in appearance since 1846. Share with students parts of the background information included with this lesson. Then have the students research what Iowa looked like in 1846.
4. Talk about the characteristics of each of Iowa's main biological communities: prairie, wetland, and woodland. Students should understand that different environments sustain different life forms. Ask the students to list at least three plants and three animals that were found in each of the three environments. This might be done best in chart form.
5. Ask the students to draw another picture using their new information about Iowa plants and animals 150 years ago. This time have them select one of the three communities and draw two adjacent views of the land as it would have appeared in 1846 and as it appears today.

### Assessment of Outcomes:

The art work from the "imagining Iowa in 1846" and "how Iowa looks today" exercise will be displayed and the class will discuss the reasons for differences in the drawings. List three plants and three animals that were found in Iowa's main biological communities: prairie, wetland, and woodland.

### Extensions and Adaptations:

- Have students read background material before they visit a prairie or wetland:
- For prairies: "Life on the Iowa Prairies," *The Goldfinch* 7 (November 1985) and "Iowa's Environment," *The Goldfinch* 15 (Summer 1994): 18-20.
- For wetlands: "Life on the Prairies," *The Goldfinch* 7 (November 1985) and "Iowa's Environment," *The Goldfinch* 15 (Summer 1994): 8-10.

Visit a native prairie or wetland to see first-hand the diversity of the land. Discuss how rare prairie plants have become. Emphasize that they are visiting a place of historic significance—a part of Iowa's natural heritage.

Encourage students to read early settlers' accounts that include descriptions of Iowa's plant and animal life at the time. A particularly good source for this might be your county history book available at your local public library or the State Historical Society of Iowa.

Learn more about extinct, endangered, extirpated species. Plant a Prairie (see attached instructions).

Have a discussion or ask students to write essays about what it means to change the environment. What are benefits to changing the environment? What are the drawbacks? Who might win when the environment is altered? Who might lose?

Give students an oral history assignment. Students can interview older residents in their communities and ask them to describe the area when they were children. Compare the results of these interviews with others conducted by students and using their parents and high school students as sources.

### Resources:

James J. Dinsmore. *A Country So Full of Game: The History of Wildlife in Iowa*. Iowa City: University of Iowa Press, 1994.

*Iowa's Natural Heritage*. Iowa Natural Heritage Foundation and Iowa Academy of Science, 1982.

Mary Norton and Jay Norton. "Project Land Stewardship," 1992.

Iowa Association of Naturalists. *Biological Communities Booklets*, 1993. (Copies of this resource can be obtained through the Iowa State University Extension Publication for \$1 each; also check school and public libraries for copies as well as local county conservation boards.)

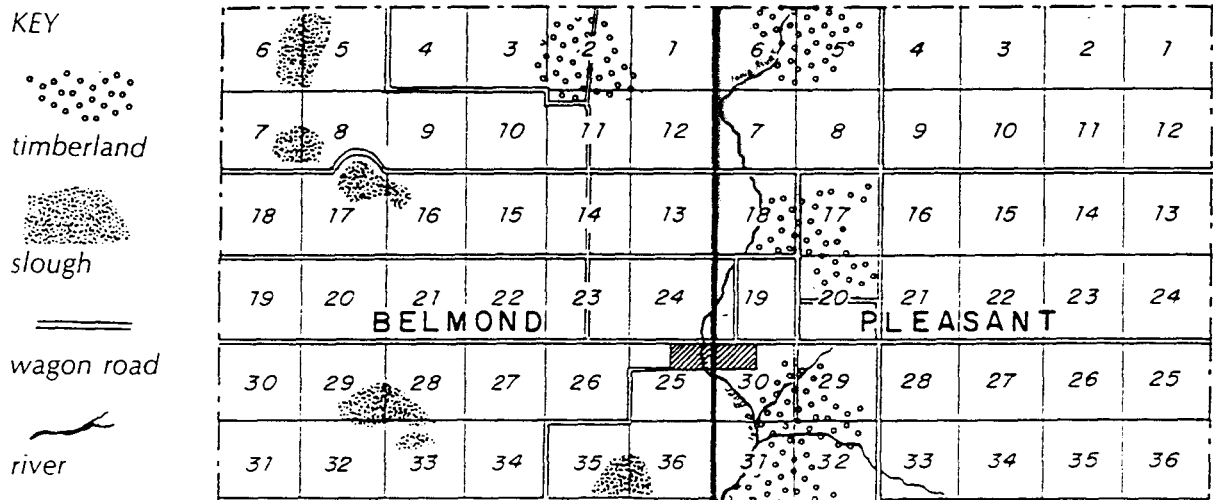
1. *Iowa's Biological Communities*, Dan Cohen, 1993.
2. *Iowa Prairies*, Dan Cohen, 1993.
3. *Iowa Wetlands*, Dan Cohen, 1993.
4. *Iowa Woodlands*, Dan Cohen, 1993.
5. *Iowa Waterways*, Dan Cohen, 1993.

Stephanie Wald and Jim Pease. "4-H Ding Darling Soil, Water, Wildlife Project." Cooperative Extension Service, Iowa State University, 1983.

"Life on the Prairies." *The Goldfinch* 7 (November 1985). "Iowa's Environment." *The Goldfinch* 15 (Summer 1994).

# Map Game

You are a settler in 1875 in northwest Iowa. To decide what land to buy, play this game. This map shows features created by nature (rivers, timberland, and sloughs). It also shows features created by people (roads and boundaries). Iowa is divided into *counties*, *townships*, and *sections*. This map shows Belmont Township and Pleasant Township in Wright County. Each township has 36 sections.



Kay Chambers

1. Which township has more timberland? \_\_\_\_\_
2. Which township has sloughs? \_\_\_\_\_
3. If you settle in Section 32 of Pleasant Township, will you live near a slough or near timberland? \_\_\_\_\_
4. Why does the road curve in Section 8 of Belmont Township? \_\_\_\_\_
5. In which township is the Iowa River? \_\_\_\_\_
6. Where else would you find timber besides at the places marked on the map? \_\_\_\_\_
7. Which land would probably cost more—land in Section 17 of Belmont Township or Section 17 of Pleasant Township? Why? \_\_\_\_\_
8. How many miles wide is Pleasant Township? (Hint: Each section is one mile long.)  
\_\_\_\_\_
9. Mark the section where you would like to buy land.

## THREATENED AND ENDANGERED SPECIES IN IOWA

### Mammals

Bobcat  
Grasshopper Mouse  
Indiana Bat  
Least Shrew  
Plains Pocket Mouse  
Red-Backed Vole  
River Otter  
Spotted Skunk  
Woodland Vole

### Birds

Bald Eagle  
Burrowing Owl  
Common Barn Owl  
Cooper's Hawk  
Double-Crested Cormorant  
Henslow's Sparrow  
King Rail  
Least Tern  
Long-Eared Owl  
Northern Harrier  
Peregrine Falcon  
Piping Plover  
Red-Shouldered Hawk  
Short-Eared Owl

### Fish

American Brook Lamprey  
Black Redhorse  
Blacknose Shiner  
Bluntnose Darter  
Burbot  
Chestnut Lamprey  
Freckled Madtom  
Grass Pickerel  
Lake Sturgeon  
Least Darter

Orangethroat Darter  
Pallid Sturgeon  
Pearl Dace  
Pugnose Shiner  
Weed Shiner  
Western Sand Darter

### Reptiles and Amphibians

Blue-Spotted Salamander  
Central Newt  
Copperhead  
Crawfish Frog  
Diamondback Water Snake  
Earth Snake  
Great Plains Skink  
Masasauga  
Mudpuppy  
Yellow Mud Turtle  
Ornate Box Turtle  
Prairie Rattlesnake  
Slender Glass Lizard  
Speckled Kingsnake  
Stinkpot  
Western Hognose Snake  
Yellow-Bellied Water Snake

### Butterflies

Baltimore  
Bunch-Grass Skipper  
Dakota Skipper Dusted  
Skipper Mulberry Wing  
Olympia Marblewing  
Silvery Blue  
Swamp Metalmark

Source: Iowa Department of Natural Resources

## PRAIRIE PLANTING INSTRUCTIONS

### I. Mixing your seed:

- A. Thoroughly mix your seed. Use ten parts of moist sand to one part seed. By mixing your seed with moist sand, you will be able to hand seed the site easily without wasting any seed. On small plots you can go over the area several times making sure that you have complete coverage. Do not attempt to spread your seed without mixing with moist sand or you will waste much of it and not get good coverage.

### II. Preparing the seedbed:

- A. Till up the soil making sure that you have eliminated as many weeds as possible. Use a contact herbicide may also be used to kill sod and weeds before and after tillage. Roll or pack seedbed just before planting, making sure soil is firm, not loose.

### III. Seeding:

#### A. Frost seeding (February-March)

1. Broadcast your seed onto a seedbed that was prepared in the fall or previous year and allow freezing and thawing to work your seeds into the soil.

#### B. Spring and Summer seeding (April-July)

1. Broadcast your seed onto well-prepared seedbed and lightly rake in the seed
2. Roll or compact seedbed after broadcasting and raking seed into soil.
3. Supply adequate water during first few weeks, but do not overwater.

#### C. Fall Dormant Seeding (October-December)

1. Broadcast your seed onto a firm well-prepared seedbed.
2. Allow Mother Nature to work seed into soil by freezing and thawing action.

### IV. Maintenance:

- A. First year - keep mowed to 4 to 6 inches the whole first season
- B. Second year - keep mowed to a 6 or 8 inch height the entire season.
- C. Third season - burn area off in March or April. Prairie plants thrive on fire. If burning is not possible, mow only if weeds become a problem.
- D. Third year and beyond - burn your plot every year in the early spring. Be patient, your prairie will bloom and become better each year. A prairie does not happen "overnight."

## SOURCES OF NATIVE VEGETATION IN IOWA

Osenbaugh Grass Seeds  
R. R. 1 - Box 76  
Lucas, Iowa 50151  
515-766-6476  
John Osenbaugh, Owner

Nature's Way  
R. R. 1 - Box 62  
Woodburn, Iowa 50275  
515-342-6246  
Dorothy Baringer, Owner

Ion Exchange  
R. R. 1 - Box 48C  
Harpers Ferry, Iowa 52146  
319-535-7231  
Howard Bright, Owner

Naylor Seed Company  
Box 16  
Scotch Grove, Iowa 52331  
1-800-747-7333  
Jerry Naylor, Owner

Allendan Seed Company  
R. R. 2 - Box 31  
Winterset, Iowa 50273  
515-462-1241  
Dan Allen, Owner

Van Gundy Seed Farm  
6650 SE 6th Avenue  
Des Moines, Iowa 50317  
515-266-6739

Shivver's Seed Farm  
614 W. English  
Corydon, Iowa 50060  
(no phone number)  
Doug Shivers, Owner

Iowa Prairie Seed Company  
110 Middle Road  
Muscatine, Iowa 52761  
319-264-0562  
Daryl Kothenbeutel, Owner

Strayer Seed Farms, Inc.  
162 West Highway 58  
Hudson, Iowa 50643  
1-800-772-2958  
Wendell Holmes, Seedsman

Heyne Seed Company  
R. R. 1 - Box 78  
Walnut, Iowa 51577  
712-784-3454  
Bruce Heyne, Owner

Franklin Grassland Seed Company  
R. R. 2 - Box 132  
Hampton, Iowa 50441  
515-456-2988  
Dennis Strother, Owner

McGinnins Tree and Seed Company  
309 East Florence  
Glenwood, Iowa 51534  
Keith Mc Ginnins, Owner

Hadfield Prairie Seed  
R. R. 1 Box 132  
Mc Clelland, Iowa 51548  
712-484-3326  
Allen Hadfield, Owner

Stoner Seed Farms  
R. R. 1 Box 48  
South English, Iowa 52335  
1-800-383-2089

## SOURCES OF NATIVE VEGETATION OUTSIDE OF IOWA

Prairie Moon Nursery  
R. R. 3 - box 163  
Winona, Minnesota - 55987  
507-452-1362

Stock Feed Farm, Inc.  
R. R. 1 - Box 112  
Murdock, Nebraska 68407  
402-86703371  
Lyle & David Stock, Owners

Blue Stem Seed Company  
R. R. 3 - Box 32  
Grant City, Missouri 64456  
1-800-BLU-STEM  
Dave Kean, Owner

Sharp Bros. Seed. Co.  
P. O. Box 665  
Clinton, Missouri 66735

Mohn Seed Co.  
R. R. 1 - Box 152  
Cottonwood, Minnesota 56229  
507-423-6482  
Robert Mohn, Owner

Prairie Nursery  
Box 306  
Westfield, Wisconsin 53964  
608-296-3679  
Brian Bader, General Manager

Prairie Ridge Nursery  
R. R. 2 - 9738 Overland Road  
Mt. Horeb, Wisconsin 53572-2832  
608-437-5245  
Joyce Powers, Consultant

LaFayette Home Nursery, Inc.  
P. O. Box IA  
LaFayette, IL 61449  
309-995-3311  
Ingels Bros., Owners

Johnson Prairie Seed Company  
R. R. 1  
Windom, MN 56101  
Judy Johnson, Owner