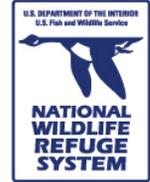


# Habitat Basics



Grade: 1<sup>st</sup>  
Group Size: one class

Season: Fall      Time: 1½ hrs  
Ratio: 1:5, adults to children

## For the Teacher:

|                                       |   |
|---------------------------------------|---|
| <b>Overview</b>                       | During an investigation, students ask and answer their own questions about prairie and wetland plants and animals. Students then search for plants and animals in the prairie and a wetland. Using movements, they vote on the level of food, water, shelter, light, and air each plant and animal needs. Lastly, they review which animals and plants were found in which habitats and why.                            |
| <b>Subjects Covered</b>               | Science, Language Arts  |
| <b>MN Science Standards Supported</b> | Helps support two standards. See section "Minnesota Academic Standards in Science"  |
| <b>Skills Used</b>                    | Critical thinking, observation, listening, team work, following directions, team work, exploration, discovery, matching, questioning, using senses, compare and contrast, concluding  |
| <b>Performance Objectives</b>         | After completing this activity, students will be able to... <ul style="list-style-type: none"> <li>• Differentiate between prairie and wetland habitats</li> <li>• Name one animal and one plant that lives in the prairie</li> <li>• Name one animal and one plant that lives in a wetland</li> <li>• List five basic needs of prairie and wetland plants and animals (food water, shelter, light, and air)</li> </ul> |
| <b>Vocabulary</b>                     | Habitat, prairie, wetland   |

## For the PWLC Instructor:

|                           |   |
|---------------------------|---|
| <b>PWLC Theme</b>         | The Prairie Pothole Region  |
| <b>Primary EE Message</b> | The Prairie Pothole Region is valuable and in need of restoration and protection.   |
| <b>Sub-message</b>        | Habitat: The prairie pothole region is a unique and rare ecosystem.   |
| <b>PWLC EE Objective</b>  | Describe and apply basic ecological concepts such as energy flow, community, biodiversity, change, interrelationships, cycles, and adaptations.   |
| <b>Materials</b>          | <ul style="list-style-type: none"> <li>• Laminated prairie and wetland animal and plant photos</li> <li>• Clipboard, paper, pencil for PWLC staff person</li> </ul>   |
| <b>Locations</b>          | <ul style="list-style-type: none"> <li>• Amphitheater or alternative indoor classroom site</li> <li>• Tatanka Trail (one-mile in length) for both prairies and wetlands</li> <li>• Wetland habitat: Mallard Marsh bridge or Adams Pond dock</li> <li>• Prairie habitat: Mallard Marsh Trail or prairie on the big hill or prairie between the barn and Adams Pond.</li> </ul> |

## Background Information

In this field investigation, students will observe and make connections between organisms' basic needs for life and two habitats where they might meet those needs. Habitat may be defined as the place where living things obtain their requirements for life: food, water, shelter, and air in the appropriate arrangement or amount. Habitats found at the Prairie Wetlands Learning Center primarily include prairie and wetlands. Since the Prairie Wetlands Learning Center is located in the tallgrass prairie (grassland) biome and within the prairie pothole region of North America, our field investigation will

focus on our local prairie and wetlands.

### Examples of Most Commonly Observed Fall Prairie Wetlands Plants and Animals

| Prairie Plants         | Wetland Plants         | Prairie Animals | Wetland Animals | Both Habitats                |
|------------------------|------------------------|-----------------|-----------------|------------------------------|
| Stiff goldenrod        | Cattail                | Ant             | Goose           | Dragonfly                    |
| Big bluestem           | Willow                 | Grasshopper     | Leech           | Mink                         |
| Grey-headed coneflower | Coontail               | Cricket         | Water boatmen   | Tiger salamander             |
| Common milkweed        | Duckweed               | Sparrow         | Duck            | White-tailed deer            |
| New England aster      | Pondweed               | Goldfinch       | Scud            | Ring-necked pheasant         |
| False sunflower        | Reed canary grass      | Butterfly       | Snail           | Leopard frog                 |
| Compass plant          | Northern water milfoil | Millipede       |                 | Weasel                       |
| Cup plant              | Dogbane                | Spider          |                 | Snapping and painted turtles |

Prairie and wetland plants and animals must obtain their basic needs from their habitats in order to survive, grow, and reproduce. The most significant difference between prairie and wetlands for most plants and animals is the presence or absence of water.

### Examples of Basic Needs of Prairie and Wetland Plant and Animals

|                | Prairie Plants  | Wetland Plants                               | Prairie Animals   | Wetland Animals                                    |
|----------------|---|--|---|--|
| <b>Air</b>     | Cold air in winter for some seeds to sprout; wind to help disperse some seeds | Wind to help disperse some seeds             | Need air to breathe oxygen  | Breathe oxygen from water or air                   |
| <b>Water</b>   | Lower levels of moisture  | Need higher levels of moisture               | Need lower levels of moisture   | Need higher levels of moisture                     |
| <b>Food</b>    | Full sunlight   | Full sunlight                                | Need plants and animals for food                                      |  |
| <b>Light</b>   | Full sunlight   | Full sunlight                                | For warmth, to find food, digestion of food (reptiles and amphibians) |  |
| <b>Shelter</b> | Roots in ground, rest of plant in open, somewhat protected by each other      | Somewhat sheltered in water or by each other | Underground or in grasses and flowers                                 | Underwater, in ground, in houses, or within plants |

Some plants and animals are found only in one habitat because their needs for life and related adaptations are specific to that habitat. For example, many prairie plants would not survive wetland moisture conditions but most wetland plants are adapted with weak, hollow, and flexible stems, and stomata on the top side of their leaves to prevent drowning. Prairie habitat is far too dry for most of these wetland plants to survive in; however, many prairie plants have deep and extensive root systems to find moisture and leaf adaptations which allow them to prevent moisture loss.

Some animals may be found in both habitats, such as dragonflies, leopard frogs, mallards, and white-tailed deer. As these animals' needs vary with the seasons, they may move from one habitat to another to complete their life cycle, or find food or appropriate cover. For example:

- Dragonflies lay their eggs in water, wetland soil, or in aquatic plants. The eggs

hatch and the larvae live in the water as predators. They leave the water to metamorphose into adults which fly in the air over both prairie and wetland habitats defending a territory, hunting, and mating. Adult females return to wetlands to mate and lay their eggs, possibly with males protecting them, and the cycle begins anew.

- Leopard frogs lay globular masses of black eggs in shallow water. The eggs hatch and tadpoles emerge, living in the water as omnivores and breathing dissolved oxygen with gills. They develop lungs to breathe atmospheric oxygen and legs, and then leave the water to live on land as predators, especially in wet meadows and tallgrass prairies near ponds and lakes. They prefer grasses six to 12 inches tall to allow cover for hiding but short enough to allow adequate movement. Leopard frogs over winter on the bottom of deep ponds, lakes, and streams. By the spring thaw, they are moving overland to breeding ponds, and the cycle begins anew.

- Painted turtles and snapping turtles spend most of their life foraging for food and finding shelter in ponds. However females move away from the pond into the prairie to dig a nest and lay their eggs. The eggs may hatch that same year with the young turtles emerging from the nest right away. Or if the eggs are laid late in the season, the hatched young will over-winter in the nest, emerging in spring. Young turtles travel overland to a pond to feed, find shelter, and mature.

- Mallards build nests in prairie associated with small ponds where they are better protected from predators by upland grass cover. After their eggs hatch, hens move their broods to the ponds to feed. As the season progresses to hotter, drier weather and small ponds dry up, hens move their broods to deeper wetlands to feed. Once ducklings grow flight feathers and adults complete their annual feather molt, they can fly to upland fields to feed on waste grain, to upland grasses for cover and loafing, and to other wetlands to feed and loaf (including during fall migration and at wintering areas). In spring mallards return and the cycle begins anew.

- White-tailed deer are land mammals which also forage aquatic plants and seek cover in cattails from blizzard conditions and hunters. Likewise ring-necked pheasants are land birds which seek food and cover in cattails.

From an ecological standpoint, the matrix of prairie and wetlands are important to wildlife and plants, because it is their home, their habitat, where their basic needs for life are found. Without these habitats, wildlife must find other places to live, if possible. Grassland and wetland restorations, prairie gardens, rain gardens, and other such sites, provide new alternatives for wildlife and plants alike.

### *PWLC Instructor Preparation*

Prepare and organize photos of prairie and wetland animals and plants that are easily observable on that day, particularly bugs and plants.

### *Field Investigation Procedure*

1. In the amphitheater or classroom, welcome students, teachers, and chaperones to the Prairie Wetlands Learning Center. Review rules for the trail.
2. Organize the class into smaller groups with one chaperone for every five children. The role of the chaperones will be to manage their small group of

children and make sure they are following through with directions given by the PWLC staff instructor. Their job is not to provide the answers but to guide students to make their own discoveries. The PWLC staff person's job is to manage and guide the entire large group, distribute equipment to chaperones, and provide trail leadership.

3. Ask students what every animal and plant needs to live? (air to breathe, water to drink, food to eat, shelter to rest or hide in, light) Review the meaning of the word "habitat" with them as an animal or plant's neighborhood where it finds its basic needs for survival (air, water, food, shelter, light).
4. Do they know the names of the two habitats at the PWLC? (prairie and wetlands)
5. Ask them what they already know about prairie and wetland plants and animals? What kinds of animals live in those habitats? Find out what questions they have about prairie and wetland plants and animals. Write down these questions on the clipboard.
6. Explain that in each habitat, they will explore and look for plants and animals and find the answers to their questions. They will also decide how much food, shelter, water, air, and light each plant and animal needs to live.
7. In each habitat, first prompt them with questions to examine the air, water, and light. Model how to use the sense of touch, sight, and smell:
  - Squeeze the soil between your fingers for moisture and smell it – is this habitat dry or soggy?
  - Feel the air/wind against your cheeks as you turn in a circle – is it windy or calm? Both, if you sit and stand?
  - With eyes closed, turn in a circle again – where is the sun the brightest? Is this habitat shady or sunny? Both, if you sit and stand?
8. Next, in each habitat, ask students to vote. Their choices are: SIT (has a little), KNEEL (has some), or STAND (has a lot). For each habitat, ask them to show you how much air, light, and water it provides to plants and animals.
9. Last, in each habitat, search for a few plants and animals (or evidence of animals). Show photos of them as well. Wonder what kind of food this animal or plant eats – can they find any? Wonder where this animal finds shelter – can they find any?
10. Back at the amphitheater or classroom, allow students to share their discoveries. To wrap up as a whole class, review the photos – which animals and plants were found in the prairie? In the wetland? Were any found in both? Ask them what we could now say about these animals and plants? (Some live in wetlands, some in the prairie, and some in both possibly.) Could New England aster survive in a wetland? Could a leech survive in the prairie? Why not? Are prairies and wetlands important? If so, why? Review the original questions they had about prairie and wetland plants and animals and provide answers as time allows. How can they be a friend to prairie and wetland plants and animals?
11. Thank the class, chaperones, and teachers for coming. Invite them to come back again to visit.

## Weather Alternatives

Field investigations take place rain or shine. Everyone should dress appropriately for the weather. In the event of unsafe weather (lightning, high winds) or pouring rain, everyone must come indoors. PWLC staff make every effort to make your travel worthwhile despite the weather and prepare indoor, age-appropriate plans. PWLC staff welcome teacher input into these plans. Some possible alternatives might include:

- Go outside for a very short amount of time, even if only under the deck, to observe the prairie and small animals like insects and their needs for life.
- Tour the exhibit area and watch prairie wetlands videos with the objective of finding examples of prairie and wetland animals and their needs for life.
- Using large cut-out letters, challenge students to unscramble the mystery word which means the place where an animal or plant finds its basic needs for life (habitat).
- Read Squish! A Wetland Walk by Nancy Luenn and Ronald Himler. Look for examples of wetland plants and animals and their basic needs for life.

## Teacher-Led Extensions/Adaptations/Assessment Ideas

- To maximize outdoor classroom time at the PWLC, teachers may conduct steps 3 through 5 in the section "Field Investigation Procedure" at school. Upon arrival at the PWLC, teachers may provide PWLC staff with a written list of what students know and wonder for quick review before completing the remaining steps.
- Allow students to create hand-drawn pictures or paintings of animals that use the prairie and wetlands. Using these images, make a collage or giant mural of animals that live in the prairie and wetlands habitats. Students could paint the background for each habitat and then add their plant and animal, and even the pictures of basic needs (food, water, shelter, air, light) around the background mural. This could be displayed in the hall for other classes to see, or displayed at the PWLC for a time.
- Before and after your visit, ask students to draw two pictures, one of prairie, one of wetlands. Ask them to include animals and plants that live in those habitats. They should also draw examples of the basic needs that those plants and animals have for life and if they are found in those habitats.
- Back at school, challenge students to include conjunctions in concluding statements about their visit, such as "before, after, although, while, or, when, but, except, since, because, whenever," etc., to further their logical thinking process. They could be written on the whiteboard and copied for concluding statements for everyone to take home and share with families.
- Make pop-up 13-lined ground squirrels by adapting "Pop-up Prairie Dog" in the book *Animal Habitats!* by Judy Press and Betsy Day.
- Provide magazines or photos to students of animals and plants that live in the forest (such as burr oak tree, maple tree, paper birch, grey squirrel, eastern cottontail rabbit, eastern chipmunk, jack-in-the-pulpit, wild grape, white-tailed deer, house wren, black-capped chickadee, downy woodpecker, great-horned owl, etc.) What is the name of the habitat they live in? How is that habitat

different from the prairie and wetlands?

- Make a life-sized outline of each student's body using end roll newsprint or other large format paper. Ask each student to color in their face and clothing. Then ask each student to write or draw their basic needs for life in the background. Ask them to draw or write the name of the habitat they live in.
- Invent a new kind of habitat and create a creature adapted to living in that habitat based upon its needs for life. Use arts or crafts materials to depict the habitat and to construct the animal. Name the plant and animal.

## *Minnesota Academic Standards in Science*

This lesson helps support the following state standards.

### **Strand I. HISTORY AND NATURE OF SCIENCE**

#### **Substrand B. Scientific Inquiry**

**Standard:** The student will raise questions about the natural world, make careful observations, and seek answers.

**Benchmark 1.** The student will observe, describe, measure, compare and contrast common objects, using simple tools including but not limited to ruler, thermometer and balance.

### **Strand IV. LIFE SCIENCE**

#### **Substrand F. Flow of Matter and Energy**

**Standard:** The student will understand that organisms have basic needs.

**Benchmark 1.** The student will know that animals need air, water and food and that plants require air, water, nutrients and light.

## *RESOURCES*

[Animal Habitats! Learning About North American Animals and Plants Through Art, Science, and Creative Play](#) by Judy Press and Betsy Day.

<http://www.dfr.state.nc.us/stewardship/wwwildlife/www13.htm>

<http://www.scienceclarified.com/Bi-Ca/Biosphere.html>

<http://www.enchantedlearning.com/biomes/grassland/prairie.shtml>

<http://www.lethsd.ab.ca/mmh/grade5/wetlands/page4.htm>

<http://www.rbnc.org/schoolunits/forestbiome.htm>

### **Wetland Resource Books for Children**

[America's Wetlands, Guide to Plants and Animals](#) by Marianne D. Wallace

[Around the Pond](#) by Ann Cooper

[One Small Square Pond](#) by Donald M. Silver

### **Prairie Resource Books for Children**

[America's Prairies and Grasslands, Guide to Plants and Animals](#) by Marianne D. Wallace

[America's Prairies](#) by Frank Staub

[A Walk on the Prairie](#) by Rebecca L. Johnson

[An American Safari, Adventures on the North American Prairie](#) by Jim Brandenburg

## *Credits*

This field investigation was developed and written by Prairie Wetlands Learning Center Staff, U.S. Fish and Wildlife Service. Thanks to Prairie Science Class Naturalist Tia Thysell for contributing to and reviewing this lesson plan. Thanks to the following teachers for reviewing this lesson plan: Deborah Strege, Fergus Falls; Tricia Hamann, Heart of the Lakes/Dent Elementary Schools; Gay Eckberg, West Central Area Schools; and Renee Larsen, Adams Elementary in Fergus Falls. Thank you to PWLC volunteer Rita Loftness for reviewing this lesson. Thanks to Beth Franklin and Laura Handergaard, Underwood Elementary, for informally field testing this lesson.