

# Habitat Basics - Spring

*1:00 p.m. – 1: 25 p.m.	Getting 'In the Moment'/ Introduction to Lesson
1: 25 p.m. – 2:00 p.m.	Outside Investigation in Two of Three Habitats– Wetlands, Prairie, or Oak Savanna
2:00 p.m. – 2:20 p.m.	Wrap-Up Inside with Venn Diagram

\*Sample schedule; plan for as much time outside as the schedule and weather will allow.

## ***Learning about and Comparing Habitats at Sherburne NWR***

Grade: First Grade

Group Size: 1-2 Classes

Time: 1-2 hours

Season: Spring

### **Summary:**

During an investigation, students ask and answer their own questions about prairie, oak savanna, and wetland plants and animals. Students then search for plants and animals in the prairie, oak savanna, and a wetland. Using movements, they vote on the level of food, water, shelter, light, and air each plant and animal needs. Finally, they review which animals and plants were found in which habitats and why.

### **Performance Objectives:**

After completing this activity, students will be able to...

- Differentiate between prairie, oak savanna, and wetland habitats.
- Name one animal and one plant that lives in the prairie.
- Name one animal and one plant that lives in a wetland.
- Name one animal and one plant that lives in the oak savanna.
- List five basic needs of prairie and wetland plants and animals (food, water, shelter, space, light, and air).
- Enjoy exploring oak savanna, prairie, and wetlands in early spring.

### **Materials Needed:**

- White board and dry erase markers
- Nature Journal Sheet
- Pencils and clipboards
- Hula hoops

### **Background Information (Adapted from Prairie Wetlands Learning Center):**

In this field investigation, students will observe and make connections between organisms' basic needs for life and three habitats where they might meet those needs. *Habitat* may be defined as the place where living things obtain their requirements for life: food, water, space, shelter, light, and air in the appropriate arrangement or amount. The main habitats found at the Sherburne National Wildlife Refuge include prairie, wetlands, and oak savanna. They make-up the transition zone in Minnesota, where the forest in the northeast and the prairies from the southwest meet geographically. During this investigation, students will explore the wetland, prairie, and oak savanna habitats.

**Examples of Most Commonly Observed Early Spring Prairie, Oak Savanna, and Wetland Plants and Animals**

Prairie/Savanna Plants	Wetland Plants	Prairie/Savanna Animals	Wetland Animals	Both Habitats
Prairie Smoke	Cattail	Ant	Goose	Dragonfly
Pussytoes	Willow	Burrowing Animals	Leech	Mink
Columbine	Blue Flag Iris	Caterpillars	Water Boatman	White-Tailed Deer
Thimbleweed or Wood Anemone	Coontail	Woodpeckers Squirrels	Trumpeter Swan Muskrat	Leopard Frog
Wild Strawberry	Marsh Marigold	Snakes	Snail	Spider

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

Habitat Components	Prairie/Savanna Plants	Wetland Plants	Prairie/Savanna 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; light shade OK for savanna plants	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; nest in savanna trees	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; most wetland plants have 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 there; however, many prairie plants have deep and extensive root systems to find moisture and leaf adaptations 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 to find food or appropriate cover. Oak savanna plants can tolerate some shade as well as dry soil.

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 that 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 legs and lungs to breathe atmospheric oxygen, 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 that also forage aquatic plants and seek cover in cattails from blizzard conditions and hunters. Likewise **ring-necked pheasants** are land birds that seek food and cover in cattails.

From an ecological standpoint, the matrix of prairie, oak savanna, and wetlands is 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/savanna and wetland restorations, prairie gardens, rain gardens, and other such sites provide new alternatives for wildlife and plants alike.

**Procedure:**

1. **Refuge Volunteer:** In the classroom, welcome students, teachers, and any chaperones to Sherburne National Wildlife Refuge. Remind them of your name. Explain traits of a naturalist and expectations for behavior: calm and quiet, inquisitive, respectful, prepared, use all of their senses.
2. **Teacher:** Explain to students that today they are going to be doing an investigation about three different habitats. Write the word *habitat* on the board. Ask a student volunteer to explain what the word *habitat* means and its components (food, shelter, space, light, water, air). Another way to phrase it: What does every animal and plant need to live?
3. **Teacher, with assistance from volunteer:** Draw a Venn diagram on the board. Explain to students that they will be investigating different habitats at Sherburne NWR. Invite them to guess which ones might be here (wetlands, prairie, and oak savanna). Then ask students what they already know about these habitats. What plants and animals do they know? What do they know about non-living factors in these habitats—for example, weather, moisture, rocks?
4. **Teacher, with assistance from volunteer:** Help the students brainstorm questions about the habitats. For example, will we find the same plants and animals at the top and the bottom of a hill? Will the soil be the same at different habitats?
5. **Volunteer:** Explain that soon the class will be splitting into groups and heading outside to explore and try to answer our questions. Some groups will be making observations at the top of a hill in the prairie habitat, some at the bottom of a hill in the wetland habitat, and some in the oak savanna. Afterward, we will compare our observations to answer our questions about how elevation affects prairie and savanna life.
6. **Volunteer, with assistance from teacher:** Help students prepare their journal entries by modeling on the board. Ask students what they think will be the most important observations to record while outside. Have students split a page of their nature journals into four boxes and label each box with one important thing to observe outside. Examples might include: plant life, animal life, soil observations, and weather (temperature and moisture).

7. **Volunteer, with assistance from teacher:** Tell students that they are now almost ready to go outside to explore. Put students into small groups, and put a volunteer or teacher with each group. Make eye contact with the group leaders. Explain to them that they will each get a small group of students. When the class gets outside, some groups will go to the top of a hill, some to the bottom of a hill, some to the oak savanna.

8. **Volunteer:** Distribute one hula hoop and a thermometer (if needed) to each group. Have all the groups form a single file line to get ready to head outside. Make sure that the students have all of their materials. Remind students that naturalists are happy outside, explorers, adventurers, respectful, prepared, responsible, and quiet. They ask questions, use words, numbers, and pictures, and share their discoveries.

9. **Volunteers and Teacher:** When outside, provide groups with boundaries. While the students are journaling, rotate among groups. First-graders may sketch or write a few words.

**Adults (volunteers, teachers, chaperones) ask students questions like:**

- How many types of plants have they found? What types of insects have they found? Squeeze the soil between your fingers for moisture and smell it – is this habitat dry or soggy?
- What is the soil like at their habitat (hard/soft, wet/dry, silt/sandy/clay)?
- Have they found any signs of animal life? Why or why not?
- Feel the air/wind against your cheeks as you turn in a circle – is it windy or calm? How does it feel to sit vs stand?
- Next, in each habitat, ask students to vote. Ask them to show you how much air, light, and water it provides to plants and animals. Their voting choices are: SIT (has a little), KNEEL (has some), or STAND (has a lot).
- 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 eats – can they find any? Wonder where this animal finds shelter – can they find any?

10. **Volunteer and Teacher:** After about 45 minutes, ask students and adult leaders/chaperones to line up to head back inside. Instruct students that while they are walking to go back inside, they should think about the discoveries they made and get ready to share them with the other naturalists.

11. **Volunteer and Teacher:** Once inside, have students sit down. Draw a Venn diagram on the board, and ask students to create a similar Venn diagram on a blank page of their journals. Title the diagram “Habitat Comparison.” Label one circle “prairie,” another circle “wetland,” and a third “oak savanna.” Ask students to share their observations and discoveries and to record their responses in the appropriate place.

12. **Volunteer and Teacher:** To wrap up as a whole class, review the photos – which animals and plants were found in the prairie? In the wetland? In the oak savanna? Were any found in all three? Ask them what we could now say about these animals and plants? (Some live in wetlands, some in the prairie, some in oak savanna, some in all three.) Could a pasque flower survive in a wetland? Could a snail survive in the prairie? Why not? Are prairies, wetlands, and oak savanna important? If so, why? Review the original questions they had about prairie, wetland, and oak savanna plants and animals and provide answers as time allows. How can they be a friend to prairie, wetland, and oak savanna plants and animals?

13. **Volunteer:** At the end of the lesson, explain to students that today they discovered how magical habitats can truly be if they just look closely. They are so much more than grass, trees, and cattails, and they can even be very different at different locations! There are endless discoveries to be made about different habitats. Students don’t even have to come to Sherburne NWR to track these changes; they can do it in their very own yard, at a park, or anywhere outside. Explain that the world needs more naturalists who will stop to examine the beauty of different habitats and that, because they did such a good job today, they seem like perfect candidates.

14. **Volunteer/Teacher:** Remind students to have a caring adult help them check for ticks when they undress later and also recommend that they put their field clothes in the wash pile.

**Core Standards:**

<b>Grade</b>	<b>Strand</b>	<b>Substrand</b>	<b>Standard "Understand that ... "</b>	<b>Code</b>	<b>Benchmark</b>
<b>1</b>	1.The Nature of Science and Engineering	1.The Practice of Science	1. Scientists work as individuals and in groups to investigate the natural world, emphasizing evidence and communicating with others.	1.1.1.1.1	When asked "How do You Know?", students support their answer with observations. <i>For example:</i> Use observations to tell why a squirrel is a living thing.
<b>1</b>	4. Life Science	1. Structure and Function of Living Systems	1. Living things are diverse with many different observable characteristics.	1.4.1.1.1	Describe and sort animals into groups in many ways, according to their physical characteristics and behaviors.
<b>1</b>	4. Life Science	2. Interdependence Among Living Systems	1. Natural systems have many components that interact to maintain the system.	1.4.2.1.1	Recognize that animals need space, water, food, shelter and air.
<b>1</b>	4. Life Science	2. Interdependence Among Living Systems	1. Natural systems have many components that interact to maintain the system.	1.4.2.1.2	Describe ways in which an animal's habitat provides for its basic needs. <i>For example:</i> Compare students' houses with animal habitats.