Wildlife & Water HABITATS

4-H YOUTH CURRICULUM

NATIONAL
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WILDLIFE & WATER HABITATS

4-H YOUTH CURRICULUM

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TABLE OF CONTENTS

SECTION 1: WILDLIFE HABITAT

SECTION 2: WATER HABITAT

APPENDICES

SECTION 1

CHAPTER 1
WHAT IS A HABITAT?

CHAPTER 2
HUMAN IMPACTS, YESTERDAY AND TODAY

CHAPTER 3
SOIL SCIENCE

Marcie Galbreath-Rawls created all the activities in section 1. Used with the author's permission.

Wildlife HABITAT

SECTION 1 INTRODUCTION

Logan and Emily grew up as neighbors. By the time they were eleven, they were old friends. Both of their parents moved to different parts of the state. Logan's family lives in a small, hilly, forested town by a big lake and Emily's family lives in a small city of about 50,000 people in the plains, but they stayed in touch and visit each other a couple of times each year.

Foresttown

Logan lives in a small house in town with a yard six blocks from a lakeshore. His town receives about 32 inches of precipitation each year, including over 70 inches of snow. When it rains, hardscape like roofs, sidewalks, and streets prevents water from seeping into the ground. Instead, water runs into the street, along the gutter, and into a storm drain. Permeable surfaces like lawns, garden beds, and gravel driveways are better at accepting rainwater into the soil. Many of the neighborhood yards along the lake, Logan's included, are mostly lawns that run all the way to the shore. Natural vegetation that exists along this shore, which some of the families have taken the time to maintain, helps to prevent rain runoff. During the winter, dealing with the runoff becomes more challenging. Sometimes after a snow, the weather warms above freezing, making it possible to receive rain. If the storm drains are clogged, these rain-on-snow events cause local flooding. Widespread flooding in low-lying areas can also occur. This is due to natural stream channels or undersized driveways and road culverts that can't handle the precipitation and meltwater.

Meadowville

Emily lives in a farmhouse built in the early 1900s just outside a small city of 50,000 people. Her family's house sits next to a potato farm and across the street from a local dairy. Emily's close proximity to the river, farms, and natural spaces provides her with different habitat types to explore. Meadowville only gets about 9.5 inches of precipitation a year, including about 28 inches of snow. So rain-on-snow events happen here, too. But flooding because of them occurs less frequently than in Foresttown. During one winter, however, a series of severe rain events that melted snow caused widespread flooding in the area, the worst of which caused a dairy lagoon in a nearby town to overflow and almost burst.

Both are learning about the water cycle and how water moves around the Earth—that it's been recirculating since shortly after the planet was formed. That is, the Earth uses and reuses its water over and over again.

CHAPTER 1:

What Is a Habitat?

HABITAT DIVERSITY

Emily is studying ecosystems in her science class at school. Ecosystems contain many different types of organisms (like plants, animals, and people) as well as natural resources (soil, water, and air).

There are several kinds of ecosystems—forest, grassland, desert, and freshwater. Each ecosystem plays a key role in living things' subsistence (maintenance or support). Biodiversity, which is diversity within an ecosystem or the diversity of several ecosystems within the world, is important. The stability of an ecosystem depends on the diversity of the natural resources that thrive within it. Next time you are outside stop and notice the diversity in your location. How many different plants and animals can you identify?

You may have heard the term *habitat*, but do you know what it means? Emily does. In her science class, she learned that habitat is often defined as the natural environment or home base within which an organism lives—or as a natural place that supports the growth and life of an organism.

Emily also learned that ecosystems contain several habitats. She decided to use the internet to learn what kind of habitats exist along the river near her home. She compared them to the habitats along the lake near Logan's house. In her journal, Emily took notes and made sketches about the similarities and differences. She was really interested in the plants and animals found in both regions.

How can you discover what kind of habitats are near your home or school? This activity will help you answer that question while exploring more about habitats.

Anticipated Time
45–60 minutes

Learning Objectives
- To understand habitat assessment
- To understand and construct arguments around animal behavior, survival, and reproduction

Materials
- paper (plain and cardstock)
- hole punch
- colored pens or pencils
- clasps or string

LEARNING/INQUIRY ACTIVITY 1: ***ALL KINDS OF HOMES***

Procedure: Develop a Research Tool

What is a habitat? The following activities will help you answer this question. Start by taking two cardstock paper halves and punch three holes down the left edge. Punch three holes in the plain paper halves to match the holes in the cardstock. Use clasps or string to attach your field journal together. If you would like a larger field journal, use a small 3-ring binder.

In addition to the usual 4-H presentation, we expect you to **develop one of the following research tools** to record the information you gather during your field investigations:

- Design Portfolio
- Engineering Notebook
- Field Journal

The exact "look" or style of your portfolio, notebook, or journal is less important than capturing your learning experiences in it as you progress through the program. These are commonly used types of documentation (see Figure 1). Do what feels right for you. The goal is to capture all the work that you did for this project in an organized format (see Research Tool Options 1–3 on the next page).

Remember, the research tool you create will house and show all your work, including drafts of your maps and any and all of your reflections as you work through each assignment.

Figure 1. Portfolio/Notebook/Journal example. *Photo Credit: Marcie Galbreath-Rawls.*

In addition to your portfolio/notebook/journal, you will also develop and keep a regular 4-H Record Book.

Let's Do It!

Use colored pens or pencils to **decorate the cover of your field portfolio/notebook/journal**. Make sure to include a title for your portfolio/notebook/journal and your name.

On page 1 of your field portfolio/notebook/journal, **answer (in your own words) the following question: What is a habitat?**

On page 2, **list at least five different habitats and who or what lives in them**.

Reflection

In your portfolio/notebook/journal: Choose one of the habitats you listed on page 2 of your portfolio/notebook/journal. Write a description of that habitat. Include what (animal or person) lives there, what plants live in or near the habitat, what the habitat is made of, what food and water is in or near the habitat, and any other details you can think of.

So, now that you have explored different habitats, look around your house and yard and think about all the habitats that are located there. Reflect on the ways they affect you. List as many of these ways as you can.

Research Tool Option 1: **Design Portfolio**

A person with a more **artistic bent** might develop a design portfolio, heavy on labeled drawings, sketches with written descriptions, and other images with some context. There are many ways to create a design portfolio, including using a 3-ring binder, plain paper (no lines) drawing journal, or hardcover composition notebook. Whatever you choose, it will need to have enough pages to complete this three-year curriculum. Make sure you create a label for your portfolio—include your name, 4-H club or other affiliation, title: *Wildlife and Water Habitats Curriculum Design Portfolio*, and any other identifying information.

Research Tool Option 2: **Engineering Notebook**

A person with a more **mathematical mind** might develop an engineering notebook with formulas, graphs, tables, and scale drawings, again with notations and context included. Like the portfolio, there are many ways to create an engineering notebook. You can use a hardcover or softcover graph paper notebook, 3-ring binder, plain (drawing) or lined (writing) journal, or hardcover composition notebook. Whatever you choose, it will need to have enough pages to complete this three-year curriculum. Make sure you create a label for your notebook that includes your name, 4-H club or other affiliation, title: *Wildlife and Water Habitats Curriculum Engineering Notebook*, and any other identifying information.

Research Tool Option 3: **Field Journal**

A person who **likes to write narrative descriptions** might develop a field journal with written reflections about her/his experiences, but also include sketches, drawings, and mathematical formulas. There are many ways to create a field journal, including using a plain (no lines) drawing journal, hardcover or softcover graph paper notebook, 3-ring binder, or journal you create from scratch (described at the beginning of this *Procedure* section) using cardstock (or other equally thick paper) for the cover and plain paper for the inside. Whatever you choose, it will need to have enough pages to complete this three-year curriculum. Make sure you create a label for your journal that includes your name, 4-H club or other affiliation, title: *Wildlife and Water Habitats Curriculum Field Journal*, and any other identifying information.

WHO LIVES THERE?

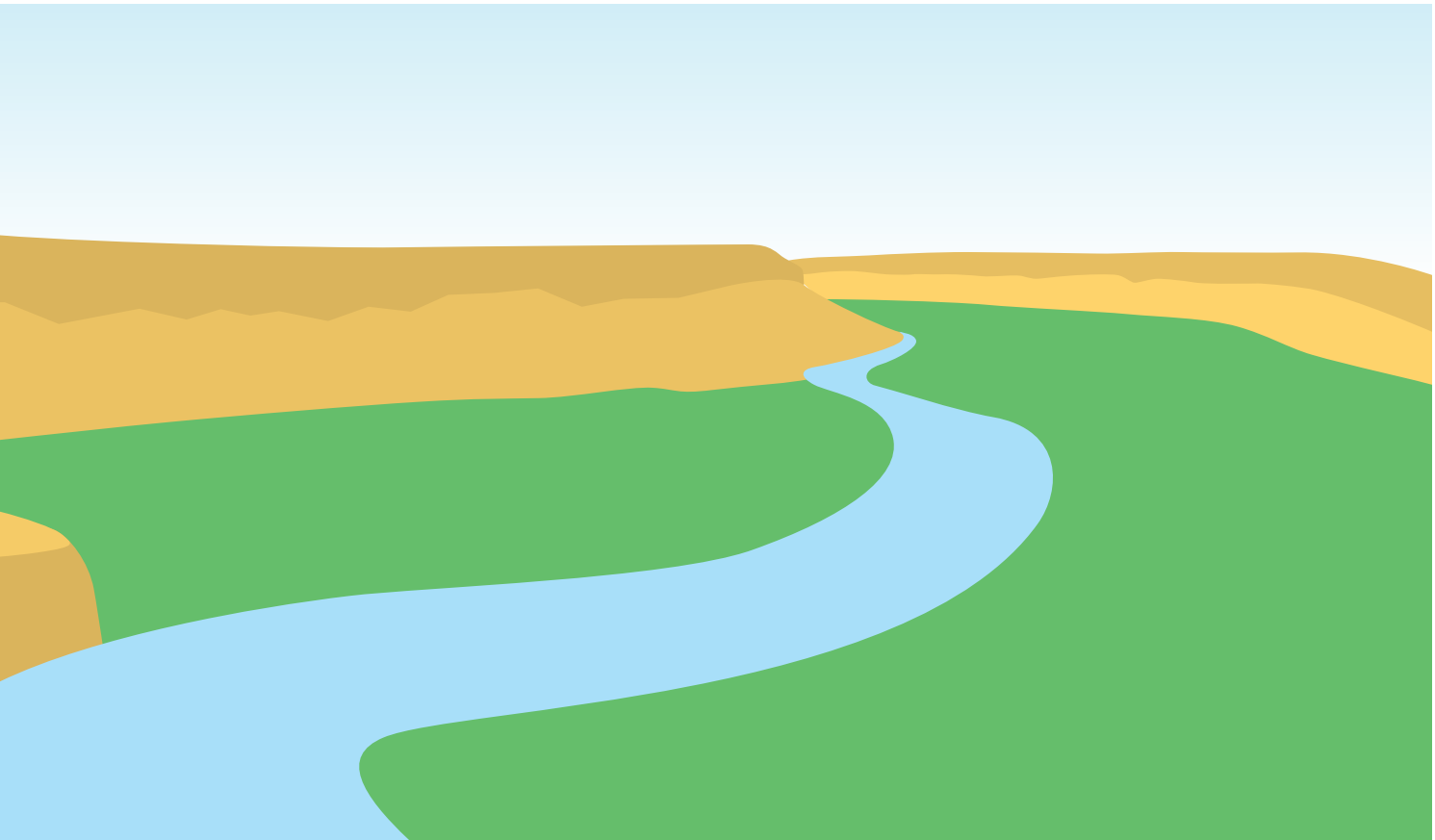
Emily decided to continue exploring habitats in and around her community by observing and comparing those in urban and rural areas. She took walks around town after school and hiked places near her house on weekends.

After spending two afternoons walking around town, Emily noticed that human habitats are not all the same. Although she noticed some single-story houses, most people near her school live in two-story dwellings. The area further from the school, toward the downtown area, showed even more diversity. There are many apartment buildings, some older single-story houses, and some of the older houses are now businesses. Soon, Emily started to think about what makes a home.

Take a moment and think about your idea of what makes a home. During her walks around town, Emily stopped to journal about the different kinds of human habitats she was seeing. She also drew pictures and wrote notes about the animal habitats she saw. She recorded several bird nests near the school. A few blocks from the downtown area, she observed a dog sitting outside his doghouse under a tree behind a small single-story house. While waiting to cross the street, she looked down and observed ants busily running in and out of a small mound in the dirt.

When Saturday came, Emily woke up early. She was excited to go on a hike. At breakfast, Emily told her family she wanted to hike up to the top of the ridge behind their house. Her parents said it was okay. With the family dog running ahead, Emily headed out toward the ridge. She knew there was a narrow trail that would take her to the top of the ridge. As she walked through her family's property, she noticed several habitats. Every time she spotted one she stopped and recorded it in her field journal. She wanted to capture as much information as she could about each habitat she saw so when she talked to Logan on the phone the next day she could tell him all about it.

By the time Emily reached the bottom of the ridge, she had documented a snake hole, three bird nests, and the henhouse her chickens live in. With her dog staying nearby, Emily began walking up the rocky ridge, stopping to record any habitat she saw. When she reached the top of the ridge, she sat on a large rock and looked around. She could see much of the valley from here. Opening her field journal, she took another look at the habitats whose details she had just documented. Emily started to notice the differences between the habitats on



the ridge compared to the ones in the grassy fields below. Habitats higher up the ridge are largely located in the trees (such as squirrel and bird nests) or hidden among the rocks (such as spider or snake holes). Low on the ridge, Emily spotted evidence of deer living in an "edge" habitat. An *edge habitat* is a natural or human-made habitat break. Emily was very excited to share with Logan everything she had seen in town and around her home.

Anticipated Time
45–90 minutes

Learning Objectives

- To develop reasoning and critical thinking skills
- To understand and construct arguments around environmental phenomena as well as cause and effect relationships
- To understand interdependent relationships in ecosystems

Materials

- Your field journal and pencil/pen

LEARNING/INQUIRY ACTIVITY 2: ***HABITAT HIKE***

Procedure: Explore, Observe, and Record

Find a natural location (hiking trail, urban forest, unpaved/natural area of your schoolyard, etc.) to explore with your education leaders, clubmates, family, or friends. Bring your field portfolio/notebook/journal and pencil/pen so you can record your observations and make sure you are wearing appropriate clothing for the location.

Let's Do It!

What can be a habitat? What signs can you see in nature that a habitat is nearby?

Hike the location, looking for different kinds of habitats. Stop and record the habitats as you find them. You can record them in many ways: (a) **draw the habitat**, (b) **write a poem or short story about the habitat**, or (c) **write a song about the habitat**. Include as much information about the habitat itself, the surrounding area (is it protected from weather, predators, etc.?), the availability of food and water, and so on. Find and record at least six different habitats.

Figure 2. Students hiking.
Photo Credit: Jim Ekins.

Reflection

In your portfolio/notebook/journal:

Answer the following questions baseds on your reflections from the beginning of this activity.

What makes a home?

Are habitats (human and animal) impacted by the geography around them? Explain.

Does weather impact how and/or where animals build their habitats? Explain.

Activity Extension: You may choose to hike more than one location and compare the habitats you see across them.

HABITAT MODELING

Emily was inspired by the habitat hike. She decided to create a 3D model of one of the habitats she had observed and sketched. Emily created the model using materials she found around her house, in the yard, and a few things from the hobby store near her school.

Pleased with her completed model, Emily took pictures to add to her field journal. She then emailed the photos to Logan. He was so excited by her model he created one of the mallard duck's nest he spotted while hiking along the lake.

This activity offers you the opportunity to create your own 3D habitat model.

LEARNING/INQUIRY ACTIVITY 3: ***CREATE YOUR OWN HABITAT MODEL***

Procedure: Collect and Create

Gather all supplies needed for model making. Put butcher paper or other protective material on your table. Have your portfolio/notebook/journal and any pictures (as a resource/reference) of habitats you'd like to refer to near your workspace.

Let's Do It!

Look at the different habitats you recorded in your portfolio/notebook/journal. Select one that you want to create as a 3D model using the supplies you have collected for this activity. Create the 3D model in your protected workspace.

If you have the time and supplies, include environmental elements into your model. Examples of environmental elements are plants, geographic markers (rocks, rivers, hills, etc.), and man-made structures.

Reflection

In your portfolio/notebook/journal:

Explain why you chose that habitat from all the ones you recorded in your portfolio/notebook/journal.

Anticipated Time

30–60 minutes

Learning Objectives

- To understand modeling: design, materials, construction
- To understand measurements and engineering principles

Materials

Various materials that can be used to construct a 3D model of a habitat. Materials include clay, sand, feathers, string, moss, small rocks/polished glass, twigs (If you choose to collect materials from nature, make sure you do not collect on private land or in state parks. Also, only collect items that are already on the ground.)

Figure 3. Outdoor science activity. *Photo Credit: Jim Ekins.*

LOOKING AT PIECES OF THE WHOLE

Emily's science class began exploring biodiversity. Then she started looking at the areas around her home and community differently. She noticed that many kinds of plants and animals live in her neighborhood. Since she lives several miles out of town, there are few man-made features near her home. The area around her school, however, barely contains any natural space. It mostly has sidewalks, blacktop, and other concrete areas, with few manicured grassy areas. An exception is a small creek located a short walk from her school. Just as she remembered that it runs through town and ends at the river, Emily noticed landscapers spraying insecticide on the school grass. She began to think about how what happens at her school may impact the small creek.

A few days later she called Logan to discuss her thoughts on ecosystems. She was thinking about how they interact. Logan's science class had just finished a unit on humans impacting nature. He told Emily about a project he did, which focused on microhabitats within an ecosystem. A *microhabitat* is a small area that differs from nearby larger areas. Logan and his classmates each chose an area of the school campus. They examined it in detail. They journaled about several aspects of the microhabitat. These notes included information on plants, animals/insects, geography, and erosion. His class then came back together. They discussed how changes in one of the microhabitats impact neighboring habitats.

LEARNING/INQUIRY ACTIVITY 4: ***MICROHIKE***

Procedure: Take a Closer Look

Take all your supplies outside to a location you have chosen to hike. Find a spot you want to hike that is near, but not right next to, other members/participants.

Let's Do It!

All members/participants go out to a field location (for instance, a natural location, community nature trail, or unpaved schoolyard/campus area). Think about the kinds of things you should be recording in your portfolio/notebook/journal (education leaders may help with prompts). Lay your string/marker on the ground in the area you selected to "hike" and, beginning at one end, use the magnifying glass to view your part of the "place." Record your observations in your field portfolio/notebook/journal as you "hike."

Note: Make sure you are within earshot or eyesight of the adult leader at all times.

Reflection

Come back together with the other members/participants for a postactivity discussion.

The instructor/facilitator will begin the discussion by posing inquiry questions (questions like: Did hiking only 12, 18, or 24 inches of the place make you see it differently? Did you see organisms like insects or plants that you didn't know would be there?) Share your observations about your 12, 18, or 24 inches of the place with all members/participants. Then, tie all the individual hikes together by focusing on how any individual part makes up one larger place (make connections to which fellow students will relate; that is, a town is a part of the state, a state is a part of the United States).

If you are completing this activity on your own, answer the above questions in your portfolio/notebook/journal. Include any other thoughts you have at activity's end.

Anticipated Time

20–30 minutes

Learning Objectives

- To understand and interpret effects of resource availability on populations in an ecosystem
- To understand and explain biodiversity and interactions among differing ecosystems

Materials

- 12 inches (possibly 18–24 inches for larger "hikes") of string/cord
- A ruler, a marker, magnifying glass, field journal, and pencil/pen

Figure 4. Outdoor science activity. *Photo Credit: Jim Ekins.*