

# HABITAT DIVERSITY



*Ranger Led  
Program*

THEME: Animals and Habitats

GRADE LEVEL: Third

BEST TIME TO PLAN TRIP: Fall or Spring

## UNIT RATIONALE

Soil is the basis for all life. Plants grow in it. Animals sometimes live in it or build their shelter on top of it. The smallest plants and the tallest trees depend on healthy soil. Students will have the opportunity to explore and take inventory of the soil and determine the ingredients of a healthy soil.

Habitats are numerous and diverse within Great Smoky Mountains National Park. Animals and plants alike need habitats. Habitats will be defined and students will take time to seek out clues from animals sharing habitats.

The Great Smoky Mountains are world-renowned for the diversity of plant and animal species found here. This great variety makes the park an exemplary outdoor laboratory for the study of relatively undisturbed native flora, fauna, physical environs; and processes of the Southern Appalachian Mountains.

## STATE CURRICULUM STANDARDS - TENNESSEE (THIRD)

### SCIENCE

#### Embedded Inquiry (0307:1, 2,4,5,6)

- Explore different scientific phenomena by asking questions, making logical predictions, planning investigations, and recording data
- Select and use appropriate tools and simple equipment to conduct and investigation
- Identify and interpret simple patterns of evidence to communicate the findings of multiple investigations
- Compare the results of an investigation with what scientists already accept about this question

#### Embedded Technology and Engineering (0307.T/E.1)

- Describe how tools, technology, and inventions help to answer questions and solve problems

#### Interdependence (0307.2.1, 0307.2.2)

- Categorize things as living or non-living
- Explain how organisms with similar needs compete with one another for resources

#### Flow of Matter and Energy (0307.3.1)

- Describe how animals use food to obtain energy and materials for growth and repair

#### Biodiversity and Change (0307.5.1)

- Explore the relationship between and organism's characteristics and it's ability to survive in a particular environment



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# PLANNING A SUCCESSFUL TRIP

## HABITAT DIVERSITY



### AT METCALF BOTTOMS

#### SCHEDULE FOR A DAY OF ACTIVITIES IN GREAT SMOKY MOUNTAINS NATIONAL PARK

##### Morning:

- Arrive at program site
- Use restrooms
- Large group introductory activity
- Split into 2 sub-groups, participate in soil study and habitat exploration
- Lunch
- Participate in large group activity
- Return to School

### AT COSBY

#### SCHEDULE FOR A DAY OF ACTIVITIES IN GREAT SMOKY MOUNTAINS NATIONAL PARK

##### Morning:

- Arrive at program site
- Use restrooms
- Large group introductory activity
- Split into 2 sub-groups, participate in soil study and habitat exploration
- Lunch
- Participate in large group activity
- Return to School

#### Planning a Successful Trip

• Check the weather before you come. Temperatures in the mountains can be 10 to 15 degrees cooler than at your school. Usually park rangers can reserve the covered pavilion at the program site. Therefore portions of the program may still be conducted in inclement weather. If the pavilion has been reserved by another group, rangers will move the program location to an uncovered area. If hazardous winds, thunder, or lightning should occur, the program will be cancelled

• School buses are not allowed to cross the one lane bridge in the Metcalf Bottoms picnic area from Wears Valley. Buses must enter the park either from the Gatlinburg entrance or from the Townsend Wye.

• We recommend that for the purposes of safety and supervision of activities, a minimum of one adult should be available for every 8 students.

• Flush toilets and sinks are located in the picnic area.

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• We recommend that for the purposes of safety and supervision of activities, a minimum of one adult should be available for every 8 students.

• Flush toilets and sinks are located in the picnic area



# SAFETY CONSIDERATIONS AND OTHER IMPORTANT INFORMATION



- Great Smoky Mountains National Park is a federally protected public use area. Please help the rangers keep all of the plants and animals protected in the park by not picking the plants or taking anything from the park.
- Please remind your students to wear appropriate footwear and clothing for this extended outdoor experience. Flip flops, slip-on shoes, or sandals are not appropriate for the program.
- Temperatures in some parts of the park can be 10-15 degrees colder than at your school. Long pants and layers are suggested for the program. Pants are the best precaution against cool temperatures, bee stings, ticks, and poison ivy.
- Within the park, cell phones are not always reliable. Rangers will follow the on-site agenda. If an unexpected problem occurs, rangers do carry park radios to make contact with the park dispatch office. For non-emergencies, call the Park Ranger dispatch at 865-436-1230 or contact a park employee.

## Animals and Plants of Concern in the park

- All animals in the park are wild and their behaviors are unpredictable. Treat all animals with caution.
- Venomous snakes - Two species of venomous snakes live in the Smokies, the copperhead and timber rattlesnake. Students should be cautious where they place their hands and feet.
- Insects - Yellow jacket wasps are the insects of greatest concern. They build nests in the ground along trails and streams and are aggressive when disturbed. Stings cause local swelling and can lead to severe allergic reactions in sensitive individuals. Such persons should carry epinephrine kits.
- Poison Ivy - Poison ivy is a three-leaved plant which can grow on the ground as well as on “hairy” vines up trees. To avoid chances of an allergic reaction wear long pants, stay on trails, and avoid direct contact with vegetation. If contact occurs or is a concern, wash affected parts in cold soapy water immediately.
- It is extremely helpful to rangers leading the program for students to wear clearly labeled name tags with first names only.
- Pets are not allowed on most park trails. Please do not bring them on the field trip.
- For more information about the park (Things to Know Before You Come) please visit the park’s website: <http://www.nps.gov/grsm/planyourvisit/things2know.htm>



# MAP TO METCALF BOTTOMS

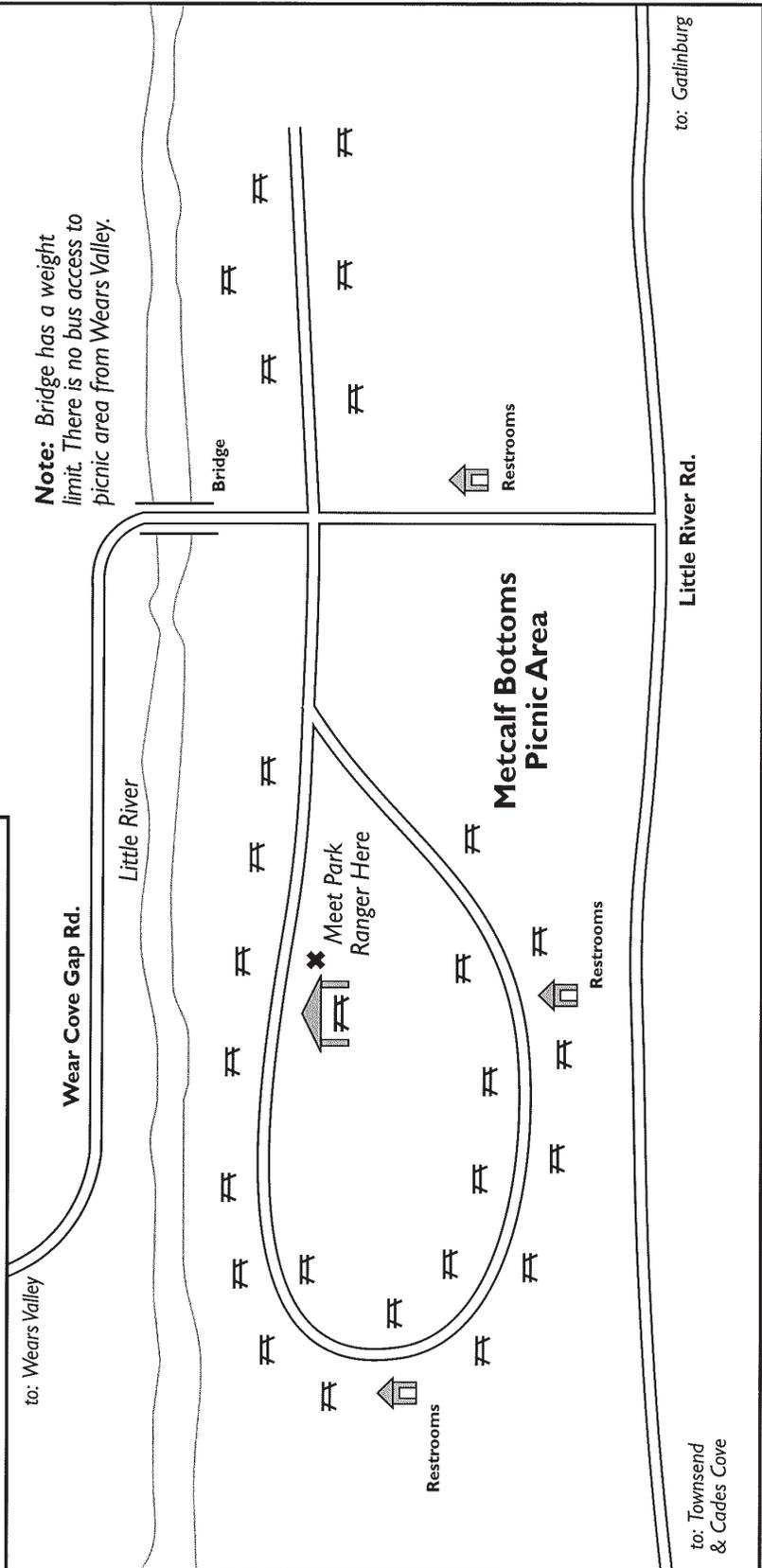
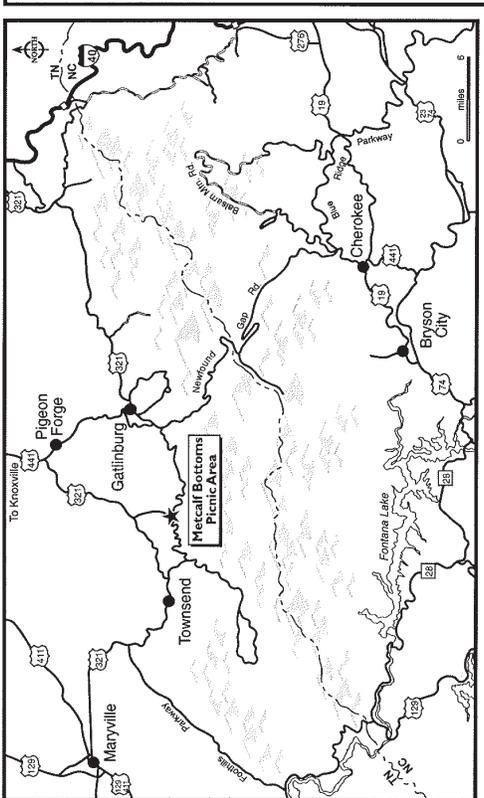


## Metcalf Bottoms Picnic Area

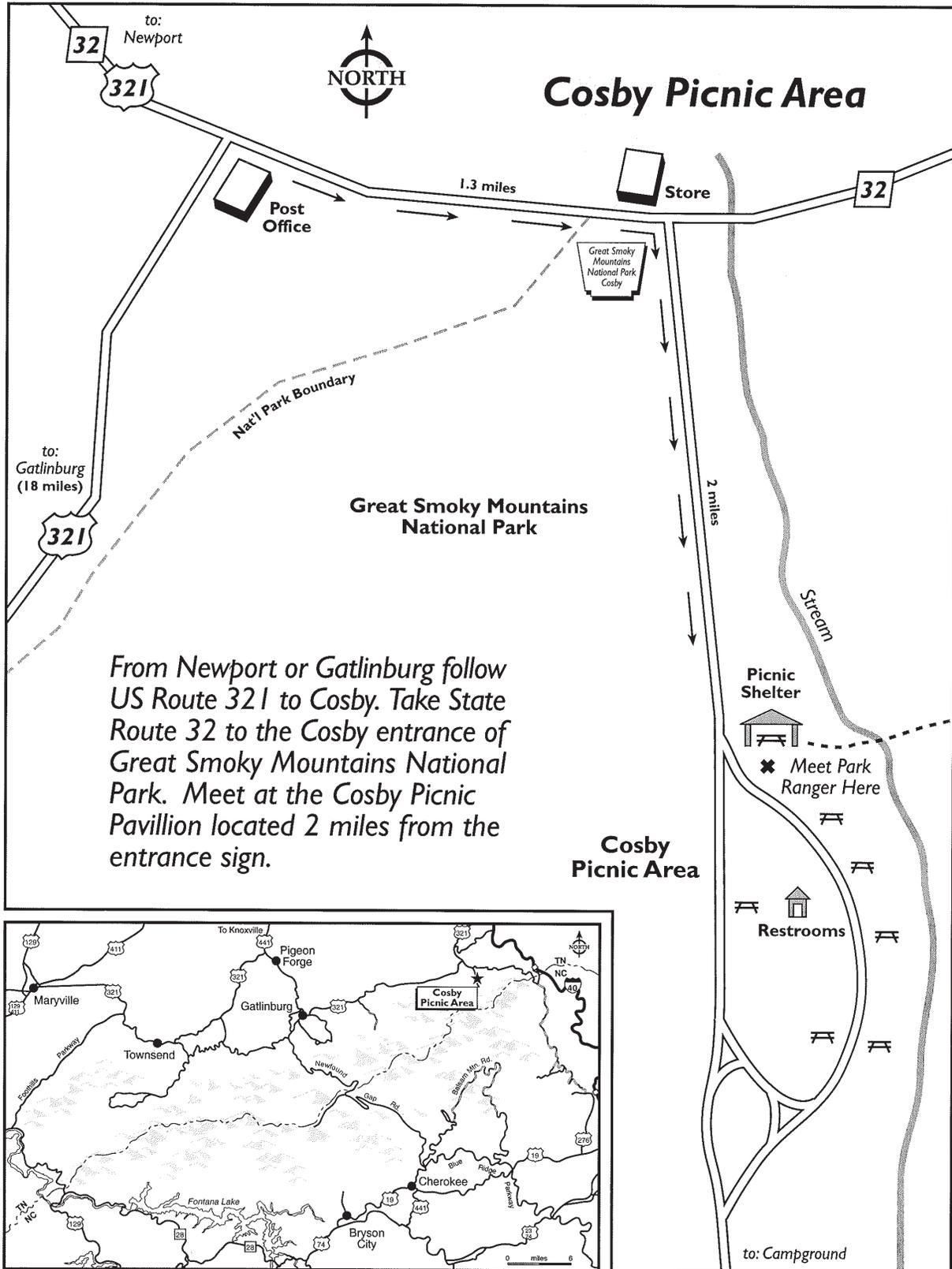
From Gatlinburg, enter the GSMNP on US Route 441. Take a right at the Sugarlands Visitor Center onto Little River Rd. Head towards Cades Cove. At about 8 miles turn right into the Metcalf Bottoms Picnic Area. Take the first left before the bridge to the picnic pavilion. Meet the Park Ranger there.

From Townsend, enter the Park and turn left on Little River Rd. towards Gatlinburg. Go about 8 miles and turn left into picnic area.

**Note:** Bridge has a weight limit. There is no bus access to picnic area from Wears Valley.



# MAP TO COSBY



# PRE AND POST SITE TEST



Pre Score: \_\_\_\_\_

Post Score: \_\_\_\_\_

Name \_\_\_\_\_

## Habitat Diversity

Circle the correct answer:

1. A person who studies soil is called an ____.	Agronomist	Ornithologist	Entomologist
2. Soil is created by both decomposition and weathering.	True	False	
3. In a food chain, people are considered ____.	Producers	Consumers	Decomposers
4. Animals that are active at night are ____.	Diurnal	Nocturnal	Periodic
5. An animal that feeds upon other living animals is a ____.	Decomposer	Producer	Carnivore
6. The ability of a plant or animal to adjust to its surroundings so that it can survive is ____.	Adaptation	Not possible	Habitation
7. The path energy takes when one living thing eats another is a ____.	Food Chain	Niche	Consumer
8. A habitat includes the animal's food, water, shelter, and space.	True	False	
9. Water pollution can damage a habitat.	True	False	
10. There are many different habitats in the Great Smoky Mountains.	True	False	
11. The source of almost all energy on earth is the moon.	True	False	
12. The ability for an animal to blend in with its environment is called ____.	Carnivore	Niche	Camouflage
13. A plant or animal from another country that causes harm in the Great Smoky Mountains is ____.	Native	Invasive Exotic	Nocturnal
14. Living things that break down matter so that it can be used by plants are ____.	Decomposers	Consumers	Producers
15. Animals can be both prey and predator.	True	False	
16. An organism that could be found in soil is a ____.	Lady bug	Centipede	Monarch Butterfly
17. Examples of traces left by animals in the soil are ____.	Tracks and tunnels	Decomposing Leaves	Arrowheads



# PRE AND POST SITE TEST

## ANSWER KEY

(Teachers: Administer this test once before teaching the pre-visit activities and once after the post site activities for comparable results of comprehension and retention.)



1. A person who studies soil is called an ____.	<b><i>Agronomist</i></b>	Ornithologist	Entomologist
2. Soil is created by both decomposition and weathering.	<b><i>True</i></b>	False	
3. In a food chain, people are considered ____.	Producers	<b><i>Consumers</i></b>	Decomposers
4. Animals that are active at night are ____.	Diurnal	<b><i>Nocturnal</i></b>	Periodic
5. An animal that feeds upon other living animals is a ____.	Decomposer	Producer	<b><i>Carnivore</i></b>
6. The ability of a plant or animal to adjust to its surroundings so that it can survive is ____.	<b><i>Adaptation</i></b>	Not possible	Habitation
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# PRE-SITE ACTIVITY

## FOOD CHAINS



**Grade Level:** Third

**Subject Area:** Science

**Activity time:** 30 minutes

**Setting:** In the classroom

**Skills:** Classifying; Constructing; Demonstrating; Evaluating; Sequencing

**Vocabulary:** carnivore; consumer; energy web; food web; herbivore; omnivore; predator; prey; producer

**Objectives:** To teach students about the food chain and how energy moves through a habitat.

**Materials:**

\* Food Chain Cards (on following pages)

\* Ball of yarn

**Background:**

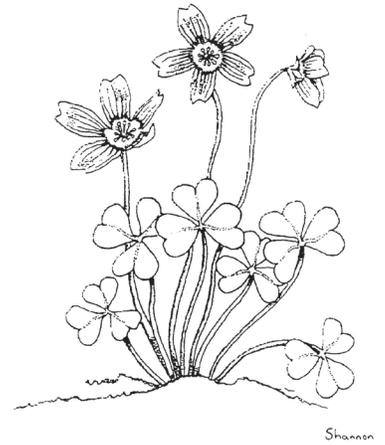
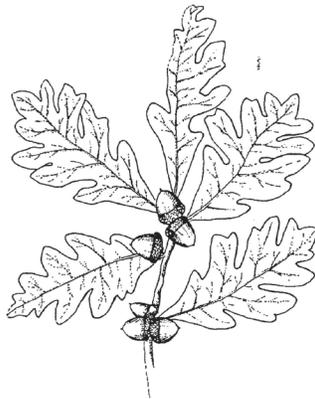
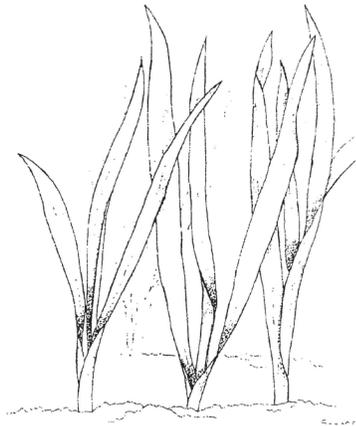
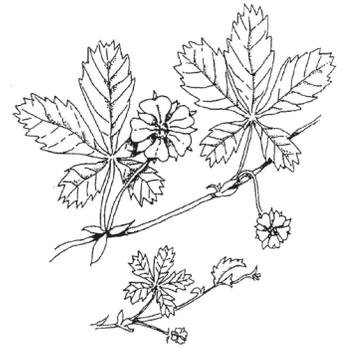
The park's fundamental significance is that it is a sanctuary for a remarkably diverse array of native plants and animals. Today a large part of Great Smoky Mountains National Park is a relatively undisturbed ecosystem, in sharp contrast to nearly every other land area of the Eastern United States. The undisturbed ecosystem values include natural communities with endemic gene pools providing opportunities for scientific research and education. These natural systems can be used as an indicator of change occurring locally, regionally, nationally, and internationally.

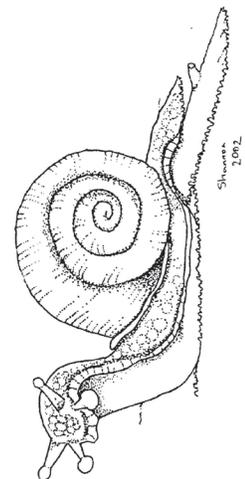
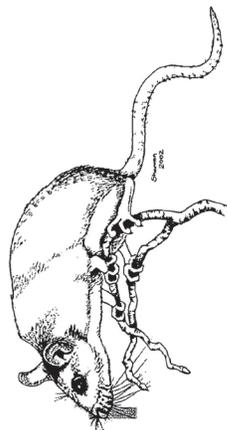
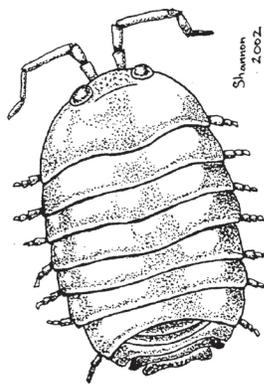
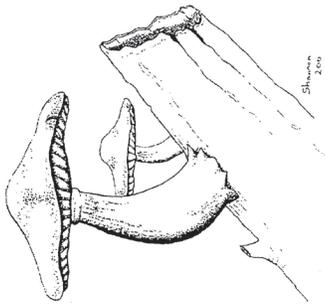
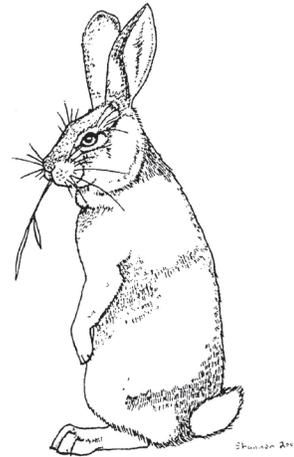
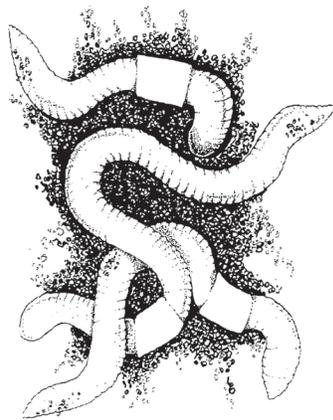
Understanding food webs and monitoring their elements is one way to assess the health of a habitat. In this activity, students will connect components of a food web, while understanding that a food chain is the flow of energy from plants (producers) to other animals (consumers).

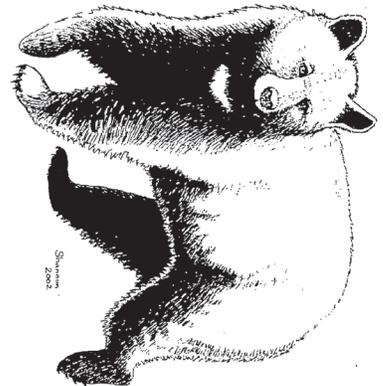
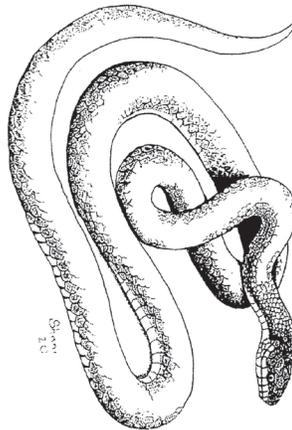
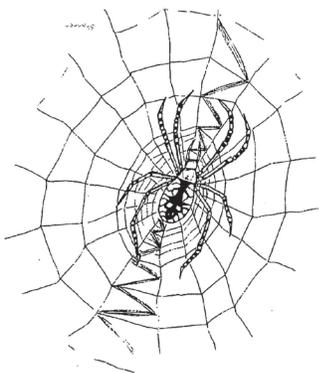
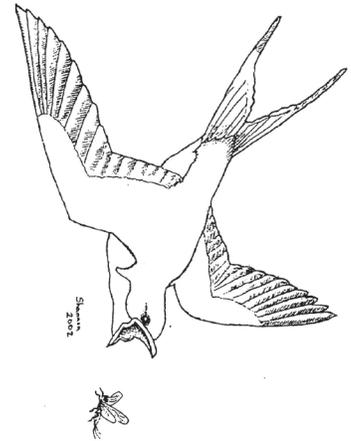
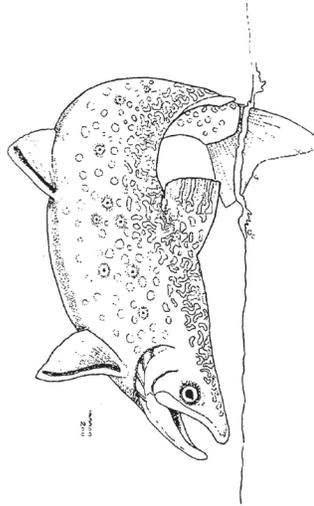
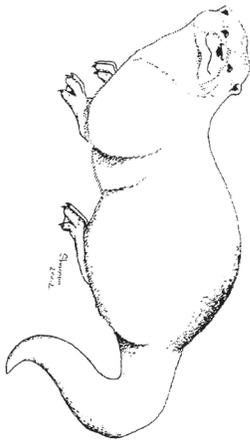
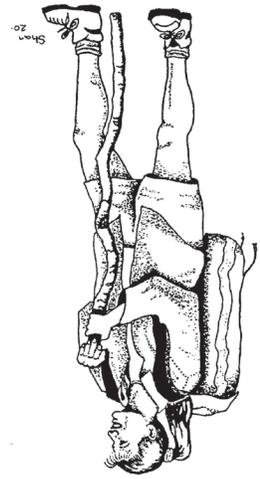
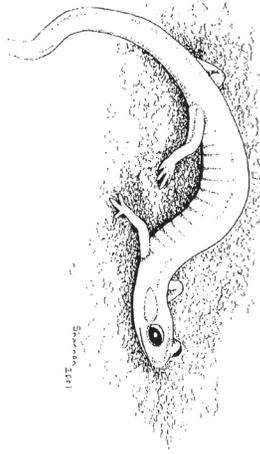
**Procedure:**

Arrange students in a circle. Pass out the food chain cards (one per student). Select one student to be the "soil". Give the end of the ball of yarn to this student. With the student holding the end, ask them to toss the yarn to the next food chain components which depend on the soil (vegetation and mushrooms). The final student in the vegetation and mushroom group should toss the yarn to the consumers of vegetation and mushrooms (herbivores). These students will then toss the ball to the next level of consumers (carnivores), and then the to the omnivores. The yarn will be crisscrossed across the circle to show the complexity of a food web.









# ON-SITE ACTIVITY

## PARK RANGER DIRECTED LESSONS AT METCALF BOTTOMS



**Grade Level:** Third

**Subject Area:** Science

**Activity time:** 3 hours  
(including a lunch break)

**Class Size:** Maximum of 50

**Setting:** Outdoors in the park

**Skills:** Analyzing; Classifying; Constructing; Demonstrating; Evaluating; Interpreting; Observing; Recording Data

**Vocabulary:** agronomist; biodiversity; carnivore; conservation; consumer; decomposers; energy web; food web; habitat; herbivore; invasive species; native species; omnivore; predator; prey; producer

**Objectives:** Teach students about the diversity of habitats that exist in Great Smoky Mountains National Park through various hands-on activities.

**Materials:** provided by park staff

### **Background:**

The following is a brief description of your on-site activities. These activities will be led by park staff, but please be familiar with them, as the classroom teacher may be asked to assist on-site.

### **Soil Inventory (45 minutes)**

The park rangers will introduce soils as a habitat. Students will be asked to explore and then “cook” up soil using selected ingredients. Students will then be divided into several small teams of 5 or 6 and asked to inventory a small plot of soil, while keeping a written record of what they discover.

### **Habitat Exploration (45 minutes)**

In 2 sub-groups, students will be led to a forest or stream habitat. Students will be given cards with clues about an animal. As small groups they must decide what animal the cards describe. Students will then search the habitat for their clues and mark them with a flag. Park rangers will ask students questions to help the students understand the science they are conducting.

### **Build a Habitat (45 minutes)**

In teams of four, students will be given the opportunity to build a habitat using a variety of materials. Students will be asked to work as a team, share materials, and discuss answers to questions regarding cause and effect of habitat impacts.



# ON-SITE ACTIVITY

## PARK RANGER DIRECTED LESSONS AT COSBY



**Grade Level:** Third

**Subject Area:** Science

**Activity time:** 3 hours  
(including a lunch break)

**Class Size:** Maximum of  
50

**Setting:** Outdoors in the  
park

**Skills:** : Analyzing; Classifying; Constructing; Demonstrating; Evaluating; Interpreting; Observing; Recording Data

**Vocabulary:** agronomist; biodiversity; carnivore; conservation; consumer; decomposers; energy web; food web; habitat; herbivore; invasive species; native species; omnivore; predator; prey; producer

**Objectives:** Teach students about the diversity of habitats that exist in Great Smoky Mountains National Park through various hands-on activities.

**Materials:** provided by park staff

### **Background:**

The following is a brief description of your on-site activities. These activities will be led by park staff, but please be familiar with them, as the classroom teacher may be asked to assist on-site.

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### **Build a Habitat (45 minutes)**

In teams of four, students will be given the opportunity to build a habitat using a variety of materials. Students will be asked to work as a team, share materials, and discuss answers to questions regarding cause and effect of habitat impacts.



# POST-SITE ACTIVITY

## HABITATS AT HOME



**Grade Level:** Third

**Subject Area:** Science

**Activity time:** On-going

**Setting:** Schoolyard and Classroom

**Skills:** Analyzing; Evaluating; Observing

**Vocabulary:** habitat; invasive species; native species

**Objectives:** Students will evaluate schoolyard for different habitats.

### Materials:

- landscaping materials

### Background:

Great Smoky Mountains National Park is the largest federally protected land mass in the eastern United States. Despite its size of 500,000 acres (nearly 800 square miles), it faces many threats to its habitats. Trees and plants are affixed to the ground by their roots. When polluted air or rainfall comes in contact with them, they have no ability to run and hide. Animals, who do have the ability to move within an habitat are sometimes limited by food sources due to natural factors such as competition, but also non-natural factors such as exotic pests, diseases, and poaching.

An animal who leaves the National Park to forage for food, reproduce, find new territory, or even to migrate are essentially leaving an “island” of protected habitat. Immediately adjacent to much of the park boarder are human-populated communities with development, exotic plants, and lack of appropriate habitat. Schools, neighborhoods, cities, and towns can improve their natural habitats by understanding how their actions can affect animal and plant populations.

### Procedure:

Teachers can elaborate on this activity in a variety of ways. Encourage students to examine their school yard and ask them for ideas on how to improve it in a way to invite native animals to share their schoolyard habitat. See the following examples:

#### •Invertebrate Habitat:

Worms are an essential part of a healthy soil habitat. They also become food for other animals. Begin a compost pile with grass clippings and fallen leaves. Cut a 5 foot long x 2 foot tall piece of chicken wire (or other sturdy material with good ventilation). Roll up the piece of chicken wire to form a cylindrical shape. Find a spot on the school yard where the compost pile will not be disturbed by lawn mowers or sport activities. Place torn pieces of corrugated cardboard in the bottom of the container and soak with water. Add grass clippings, leaves, and even vegetable waste like apples, carrots, celery etc (no meats or fats). Continue to keep the pile moist and add more ingredients. Stir the pile with a rake or a garden

hoe every few weeks and over time (several months) insects and worms will be attracted to this pile and will eat your ingredients. Add more ingredients to the pile. This produces healthy soil to add to a garden or for a tree planting project.

#### •Bird/Bee/Butterfly Habitat:

Planting a simple flower garden is the easiest way to invite many animals into your habitat. Brightly colored flowers are attractants to hummingbirds, bees, and butterflies. The most important tip for this plan: only plant flowers which are natural to your habitat. Check with a local home improvement store to be certain of this. Planting non-native species can create problems when seeds are scattered. The seeds can grow into invasive problems which suffocate native varieties. Quite often, these exotic varieties are not healthy food sources for the animals they attract.

#### •Bat Habitat:

Bats are natural bug control. Bats can eat thousands of bothersome bugs (such as mosquitoes). Bats require specific natural roosting sites such as caves and hollow trees. In an urban setting, these habitats are rare to nonexistent. Building a bat box for your school yard is one method of providing proper habitats for these helpful creatures. Bat boxes may be purchased through science supply catalogs, and plans to build your own can be found on the internet.



# POST-SITE ACTIVITY

## EXPLORE YOUR NATIONAL PARKS



**Grade Level:** Third

**Subject Area:** Science

**Activity time:** 30 minutes

**Setting:** Indoors

**Skills:** Varying skills depending on activities selected

**Vocabulary:** Varying vocabulary depending on activities selected

**Objectives:** To teach students about the various aspects of the National Park Service.

**Materials:** Internet access

### Background:

The Great Smoky Mountains are world renowned for their diversity of plant and animal species. This great variety makes the park an exemplary outdoor laboratory for the study of relatively undisturbed native flora, fauna, physical environs, and processes of the Southern Appalachians. The park is the largest federally preserved and protected upland area east of the Mississippi River offering park visitors a refuge from the stresses of everyday life.

You and your students can learn more about this special place as well as participate in on-line activities to further your knowledge of the National Park Service and

other federally protected lands. Please check out the following web addresses:

### Especially for Kids

To learn how to become a web ranger for the National Park Service, go to:

[www.nps.gov/webrangers](http://www.nps.gov/webrangers)

To learn how to become a Junior Park Ranger at Great Smoky Mountains National Park or other parks, go to:

[www.nps.gov/learn/juniorranger.htm](http://www.nps.gov/learn/juniorranger.htm)

### Especially for Teachers

For a comprehensive understanding of the background and development of the National Park Service, that is perfect for teachers and others those who need the maximum amount of accurate information in the minimum amount of time, go to: <http://www.ParkTraining.org> The U.S. Department of Education is pleased to announce the newly remodeled and updated Federal Resources for Education Excellence (FREE) website. It now provides richer, more expansive resources to teachers and students alike. There are over 1,500 resources to take advantage of at FREE ranging from primary historical documents, lesson plans, science visualizations, math simulations and online challenges, paintings, photos, mapping tools, and more. This easily accessible information is provided by federal organizations and agencies such as the Library of Congress, National Archives, National Endowment for the Humanities (NEH), National Gallery of Art, National Park Service, Smithsonian, National

Science Foundation (NSF), and National Aeronautics and Space Administration (NASA). Go to: <http://www.free.ed.gov/>



# PARENT/CHAPERONE LETTER



Greetings Parents/Chaperones:

Park rangers are pleased to be presenting an educational program to the students in Great Smoky Mountains National Park. In order to achieve the goals for a successful program, the park rangers will need your assistance in the following ways:

(These points will help to ensure that park rangers and teachers will be able effectively conduct the lessons and activities throughout the trip.)

- The program will be conducted outside and there will be some hiking throughout the trip. Prepare your student with appropriate footwear, long pants, layers, and rain gear.
- If your child is bringing a lunch from home, we recommend that students bring water to drink and a lunch with minimal packaging. Soft drinks are usually left unfinished by students, and remaining sugary drinks cannot be poured out on the ground. (Minimally packaged lunches lead to less trash being left behind or scattered by the wind. Additionally, this reduces the accumulated trash to be disposed).

If you are a chaperone attending the field trip:

- Please be an active part of the lessons. Keep up with the group and listen to the information being given in the case that you may be called upon to assist (handing out materials, sub-dividing groups etc.).
- Please do not hold conversations with other chaperones or use a cellular phone while the rangers are teaching the students.
- Refrain from smoking during the trip. If you must smoke, please alert a ranger or teacher and remove yourself from the group.
- Please be aware that the program will be conducted outside and that there will be some hiking throughout the trip. Prepare yourself with appropriate footwear, long pants, layers, and rain gear.
- We recommend that parents and students bring a small towel in their backpacks to sit on at lunch (there are no picnic tables at the program site).

Thank you for your needed assistance. We look forward to meeting you on the program!

Sincerely,

The Education Staff at Great Smoky Mountains National Park



# RESOURCES AND REFERENCES

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