

JONES GAP

STATE PARK

Mountain Bridge Wilderness Area Headquarters
Caesars Head State Park
8155 Geer Highway, Cleveland, SC 29635
(864) 836-6115



The Mountain Bridge Wilderness Area is a Project Green area. As part of "Leave No Trace", all park visitors are asked to pack out whatever they bring in. Visiting schools are asked to bring trash bags to take back all of the trash produced from lunch and snacks.

Option: To allow students to participate in a real "Leave No Trace" experience, have students pack their lunches in their backpacks (book bags) and carry their own lunch and their own trash out!

Directions

Jones Gap State Park is located northwest of Greenville, South Carolina off U.S. Highway 276. From Greenville take Highway 276 north to Cleveland. Take River Falls Road; the road ends in the park.

Park personnel will meet you at the parking lot entrance. Please keep all students on the bus until further instructions are given.

Facilities

The Learning Center for the Mountain Bridge Wilderness Area is located at Jones Gap State Park. The Learning Center includes a large classroom room and a separate laboratory.

Restroom facilities and water fountain are located between the parking area and the Learning Center.

Picnic tables are available in the park for students to have lunch or enjoy a snack.

Reservations and Program Information

For reservations, contact:

Tim Lee

Park Interpreter

Phone: (864) 836-6115

Fax: (864) 836-3081

tlee@scprt.com

Program Info:

Program offered September - mid November and March - May

1 - 25 students.....\$40

26 - 40 students.....\$80

41 - 60 students.....\$120

What to Bring

Students:

- rain gear (raincoat, pants, etc.)
- one pair dry socks
- change of dry clothes
- jacket

Jones Gap



Teachers:

- first aid kit
- name tags
- trash bags for garbage

Program Description

The Mountain Bridge Wilderness Area contains more than 10,000 acres in north-western South Carolina. This area of the Blue Ridge Escarpment ends in an abrupt drop of 2,000 feet to the foothills below, where the state’s Piedmont Region begins. This escarpment creates spectacular waterfalls, and provides a protective environment for rare and endangered plant and animal species.

The Middle Saluda River provides a habitat for a diversity of cold-water organisms including native brook trout, salamanders, crayfish and other cold-water animals. Students discover how these organisms interact as they explore the river, turning over rocks in their study of a cold-water habitat.

Students also hike and learn about different plant and animal species of the forest. Through hands-on activities, students learn how interactions among these organisms define a mountain forest community.

Goals

Foster an understanding and appreciation of the natural resources found in the mountains of South Carolina.

Make connections between the natural world and themselves.

Encourage creative thinking using a problem-solving approach.

Encourage stewardship of South Carolina’s natural resources.

Typical Discover Carolina Program Schedule

9:30 AM

Arrival at park (unload lunches and use the rest rooms)

10:00 AM

Introduction

10:30 AM – 12:00 Noon

Morning Classes

12:00 Noon – 12:30 PM

Lunch

12:30 PM – 2:00 PM

Afternoon Classes

2:00 PM

Depart

Discover Carolina Checklist -- Things to Consider Before Your Visit

Prior to Visit:

- ___ Send out chaperone agreements
- ___ Complete pre-visit site activities
- ___ Create student name tags
- ___ Collect signed chaperone agreements
- ___ Confirm bus
- ___ Discuss park etiquette and safety
- ___ Contact interpreter if you have any special needs

Day of Visit:

- ___ First aid kit
- ___ Contained lunches
- ___ Name tags
- ___ Water bottles
- ___ Ample # of chaperones
- ___ Students are dressed for the weather
- ___ Evaluation needs



Jones Gap State Park: *River Ecology Pre-Site*

Content Area:
Science

Grade Level:
6

Time to Complete:
1 hour

Title of Program:
River Ecology
Who Lives In A Mountain Stream

South Carolina State Standards Addressed
6-1.3 – Classify organisms, objects and materials according to their physical characteristics by using a dichotomous key.

Program Description

Students will develop a classification system for the organisms that live in coldwater habitats of South Carolina based on five similar characteristics. (e.g. lives in water, Have 4 legs, 2 eyes, and a tail and is one color.)

Focus Questions For Students

1. How do scientists classify objects found in our world?
2. What is a dichotomous key and how do we use them?

Culminating Assessment

Students will identify and classify organisms based on the dichotomous keys they develop.

Material/Equipment/Resources

- Pictures of organisms that live in a cold-water habitat.
- Pencil and Paper

Teacher Preparation

1. Read background information and be prepared to introduce students to dichotomous keys and how they are used to classify objects.
2. Provide each group with a packet of pictures provided with the kit.

Background Information

Scientists have discovered and named millions of living and nonliving things in the world. How do we organize all of these things? Classification is the process of grouping things together according to similar characteristics. Classification systems organize and name things in a logical, meaningful way.

Procedures

1. Introduce or review with students how scientists classify objects based on common attributes (eg. plants, animals, fungus, rocks, etc.) and how they use dichotomous keys as a tool to identify objects.
2. Divide class into groups and give each group a set of pictures.
3. Ask groups to place the organisms into two separate categories based on one attribute. For example, with legs or without legs
4. Working only with those organisms in one pile, divide that group into two groups based on a new characteristic. The organisms that have legs, for example, may be divided into those with 4 legs those with more than 4 legs.
5. Continue to divide the organisms by



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choosing new characteristics until you have only one organism left in each group. Identify that organism.

6. Repeat steps 3 –5 with the other group of organisms.
7. Each group will write out a dichotomous key based on their classification scheme, see example key in kit.



Vocabulary List: Coldwater River Ecology



Adaptation - A characteristic or behavior that helps an organism survive in its environment.

Aquatic - Having to do with water.

Diversity - The variety of species present in an ecosystem.

Ecology - The study of relationships between living organisms and their environment.

Environment - The external conditions and influences affecting living organisms.

Habitat - The place where an organism live.

Invertebrate - An animal without a backbone.

Larvae - An immature insect that experiences complete metamorphosis.

Metamorphosis - To change during growth or formation.

Nymph - An immature insect that experiences incomplete metamorphosis.

pH - The amount of acid in a solution.

Pollution - Substances in water, air, or soil that are harmful to living organisms.

Riparian Area - The green ribbon of life found on the edges of water courses.

Species - A population of related individuals that resemble one another and that are able to breed among themselves.

Vertebrate - An animal with a backbone.

Jones Gap: Pre-Site



Coldwater River Ecology References



Informational Books for Teachers

Pond and Brook; Michael J. Caduto

Eyewitness: Pond and Stream

How To Know The Aquatic Insects; Dennis M. Lehmkuhl

Activity Guides

Aquatic Project Wild
Riparian Retreat
Fishy Who's Who

SC MAPS

Activity 1-2

Performance Task 1, Trace The Santee drainage basin

Performance Task 4, Write a story about salamanders river journey

Project WET

Macroinvertebrate Mayhem

Children' Books

Webs of Life: Mountain Stream; Paul Fleisher

Water Insects; Johnson

Websites (May 2010)

Insects: <http://entweb.clemson.edu/museum/misc/aqua/index.htm>

Salamanders: <http://www.uga.edu/~srelherp/salamanders>



Jones Gap State Park: *River Ecology On-Site*

Content Area:
Science

Grade Level:
6

Time to Complete:
1.5 hours

Title of Program:
River Ecology
Cold River Ecology

South Carolina State Standards Addressed

6-1.3 – Classify organisms, objects and materials according to their physical characteristics by using a dichotomous key.

6-3.1 – Compare the characteristics of invertebrates animals (including sponges, segmented worms, echinoderms, mollusks and arthropods) and vertebrate animals (fish, amphibians, reptiles, birds and mammals).

6-3.2 – Summarize the basic functions of the structures of animals that allow them to defend themselves, to move and to obtain resources.

Program Description

Students will conduct a survey of the Middle Saluda River to determine the animals that live in a coldwater habitat and the relationships among these animals and their aquatic environment. Organisms will be collected and identified using dichotomous keys to classify the organisms that live

there. Water temperature and pH will also be used along with bioassessment to determine water quality in the river.

Focus Questions For Students

1. What types of plants and animals would you expect to find in the river?
2. What is an invertebrate?
3. How are animals, plants, fungi identified?
4. How are plants and animals adapted for life in a mountain river?

Culminating Assessment

Post-visit activities

Material/Equipment/Resources

At Jones Gap State Park:

- Rubber Boots
- Video Microscope
- pH Kit
- Dichotomous Keys
- Collecting Net
- Thermometer
- Forceps
- Stream Survey Form
- Collecting Pans
- Petri Dishes
- Pipette

At school:

- Pre-visit activities

Teacher Preparation

1. Call for reservation.
2. Complete all pre-visit procedures.
3. Read Background Information and be prepared to discuss ecology of cold water streams.

Background Information

In South Carolina, mountain river commu-



nities are limited to the Blue Ridge geologic region, which comprises less than 1% of the state. By studying these unique ecosystems, students can gain a better understanding of how to protect and preserve these areas. A good way to explore the mountain river ecosystem is through collecting, observing and identifying the aquatic insects that make up an important portion of the river community. These insects live in or on the water for all or part of their lives. They have various morphological structures that make them well adapted to occupy particular river habitats, as well as camouflage coloration and behaviors that enable them to elude consumers. They are an important member of the food webs that allow larger predators, such as trout, to survive. The aquatic insects, along with several other invertebrates, are used as biological indicators of the quality of rivers.

It is also necessary to understand the physical aspects of this environment, such as water temperature, water pH, amount of dissolved oxygen, and substrate of the river bottom. Some of the fish and aquatic insects have a very narrow tolerance for changes in abiotic conditions. A rise in temperature or a decrease in dissolved oxygen can stress these organisms to the point of death. Additions of sediment or changes in river velocity can adversely affect the organisms within this ecosystem. Therefore, it is necessary to examine the river's watershed for possible changes that could affect the river community. Though natural occurrences within the watershed can result in changes, it is often man's actions that have catastrophic influences. Practices such as logging or construction within the watershed can result in higher water temperatures and increased runoff and the sediments that accompany it. Recreational activities can even influence the conditions necessary for sensitive organisms. These conditions can be investigated by measurements of biotic and abiotic factors made at intervals along the river and by topographic

maps and aerial photographs of the watershed.

Procedures

1. Provide students with boots and collecting nets.
2. Select adults to help in the river and brief them on boundaries and rules.
3. Explain safety rules and boundaries to students.
4. Demonstrate how to safely and gently collect organisms. Explain to students that organisms will be returned to river after observations are made.
5. Students will collect organisms from the river and place them in collecting pans.
6. Collect and record quantitative data including river pH and temperature following test kit procedures.
7. Collect and record qualitative data describing the river and its watershed (e.g., water clarity, water color, river bed composition, shaded or sunny, etc.)
8. Return to laboratory or group area to identify and classify organisms using dichotomous keys and discuss adaptations.
9. Complete a bioassessment based on organisms identified to determine water quality.
10. Discuss pH and temperature data collected from river and how these factors affect organisms that live in the river.



Jones Gap State Park: *River Ecology Post-Site*

Content Area:

Science

Grade Level:

6

Time to Complete:

1.5 hours

Title of Program:

River Ecology
Rivers of South Carolina

the different types of rivers in our state and the organisms found in each. Students will compare and contrast physical characteristics and the organisms which utilize the different types of rivers.

Focus Questions For Students

1. What types of plants and animals would you expect to find in the river?
2. What is an invertebrate?
3. How are animals, plants, fungi identified?
4. How are plants and animals adapted for life in a mountain river?

Culminating Assessment

Students will present finding orally and or in written report.

Material/Equipment/Resources

- Computer with internet access.
- Computer monitor(s) and/or audiovisual equipment for viewing program.

Procedures

1. Discuss with students the results of their Coldwater River Ecology field study at Jones Gap Stat Park including findings and conclusions about this environment.
2. Students will use A Tour of SC's Rivers on web site provided to take a journey across SC observing the different types of rivers in our state.
3. Students will describe in writing the different types of rivers and where they are located throughout SC.
4. Students will compare and contrast physical characteristics and the organisms which utilize the different types of rivers.
5. Students will present finding orally and or in written report.

South Carolina State Standards Addressed

6-1.3 – Classify organisms, objects and materials according to their physical characteristics by using a dichotomous key.

6-3.1 – Compare the characteristics of invertebrates animals (including sponges, segmented worms, echinoderms, mollusks and arthropods) and vertebrate animals (fish, amphibians, reptiles, birds and mammals).

6-3.2 – Summarize the basic functions of the structures of animals that allow them to defend themselves, to move and to obtain resources.

Program Description

Discuss with students the results of their Coldwater River Ecology field study at Jones Gap Stat Park including findings and conclusions about this environment. After completing discussions, students will use A Tour of SC's Rivers on web site provided to take a journey across South Carolina observing

