

**FUN ACTIVITIES & EXPERIMENTS THAT GET KIDS OUTDOORS**



**BACKYARD**

**SCIENCE &**

**DISCOVERY**

**WORKBOOK**

**SOUTH**



**ERIKA ZAMBELLO**

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**BACKYARD**

**SCIENCE &**

**DISCOVERY**

**WORKBOOK**



**SOUTH**



**ADVENTURE PUBLICATIONS**

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# ABOUT THIS BOOK

From the soaring Blue Ridge, Smoky, and Appalachian Mountain ranges and the sugar-sand beaches of the Florida and Alabama coastlines to the swamps, wetlands, and cypress forests of Louisiana and Texas, the South is home to many different ecosystems and supports thousands of fantastic and rare species. Covering 14 states, the region includes two distinct coastlines and ranges in elevation from more than 6,000 feet to beneath the waves, where you'll find the country's only hard coral reefs.

As a National Geographic Young Explorer and writer, I have traveled across the South visiting research sites, state and national parks, and wildlife refuges, always keeping a special eye on the biodiversity of each location.

Yet I experience the most joy when identifying species from my own home in North Florida. With a warm climate, distinct seasons, and plenty of rain, the South is an exceptional place to learn about backyard species. By turning your gaze to the yard behind your house or your local park, both you and your parents will be surprised at the intricate communities that share our landscapes with us.

This book features **19 hands-on science projects**, including raising native caterpillars, making mushroom spore prints, and attracting moths and other insects with an ultraviolet light; **more than 20 simple, fun introductions** to the region's habitats, birds, seasons, and rocks and minerals; and **11 fun activities** to help you make hypotheses, observe nature, and learn about the world around you.

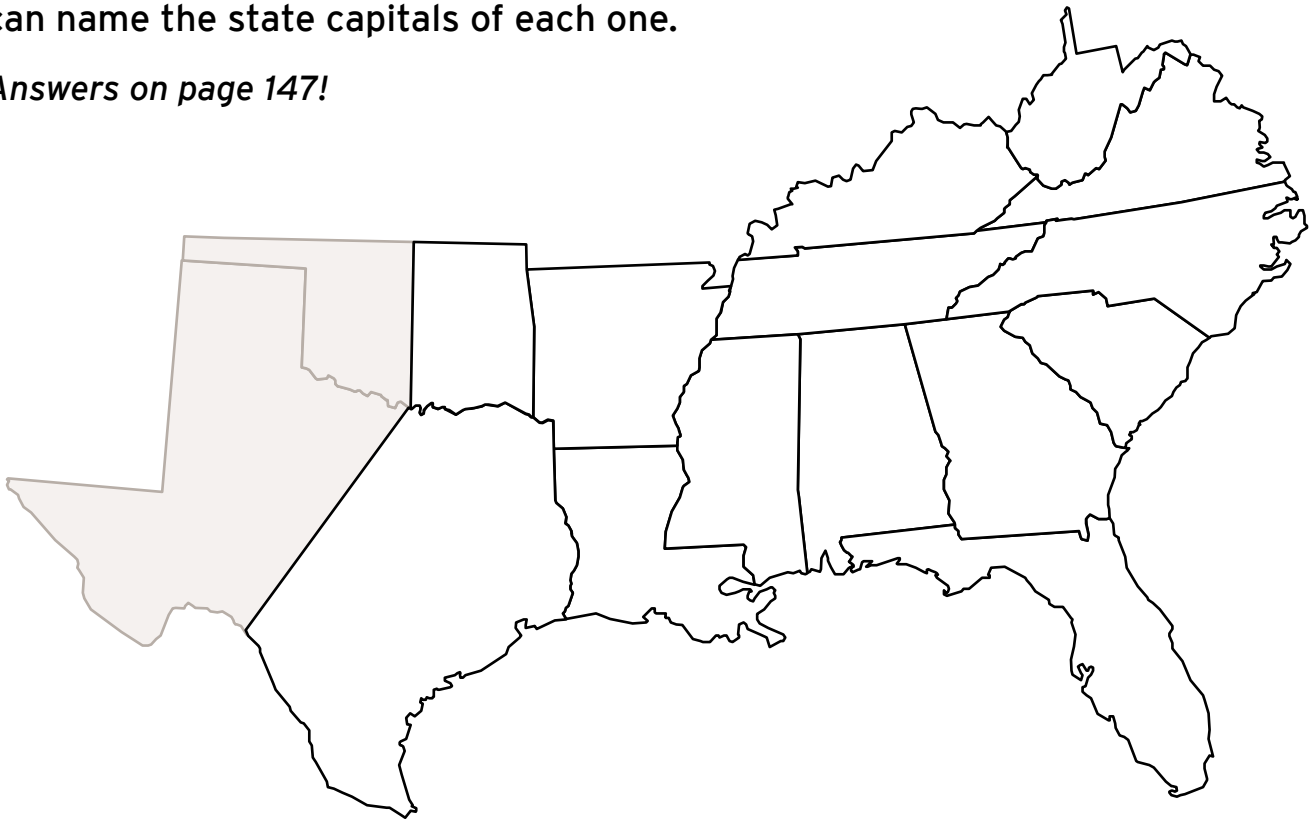
Discover, explore, and share your remarkable observations as a family. You're going to be amazed at what you find!

**Erika Zambello**

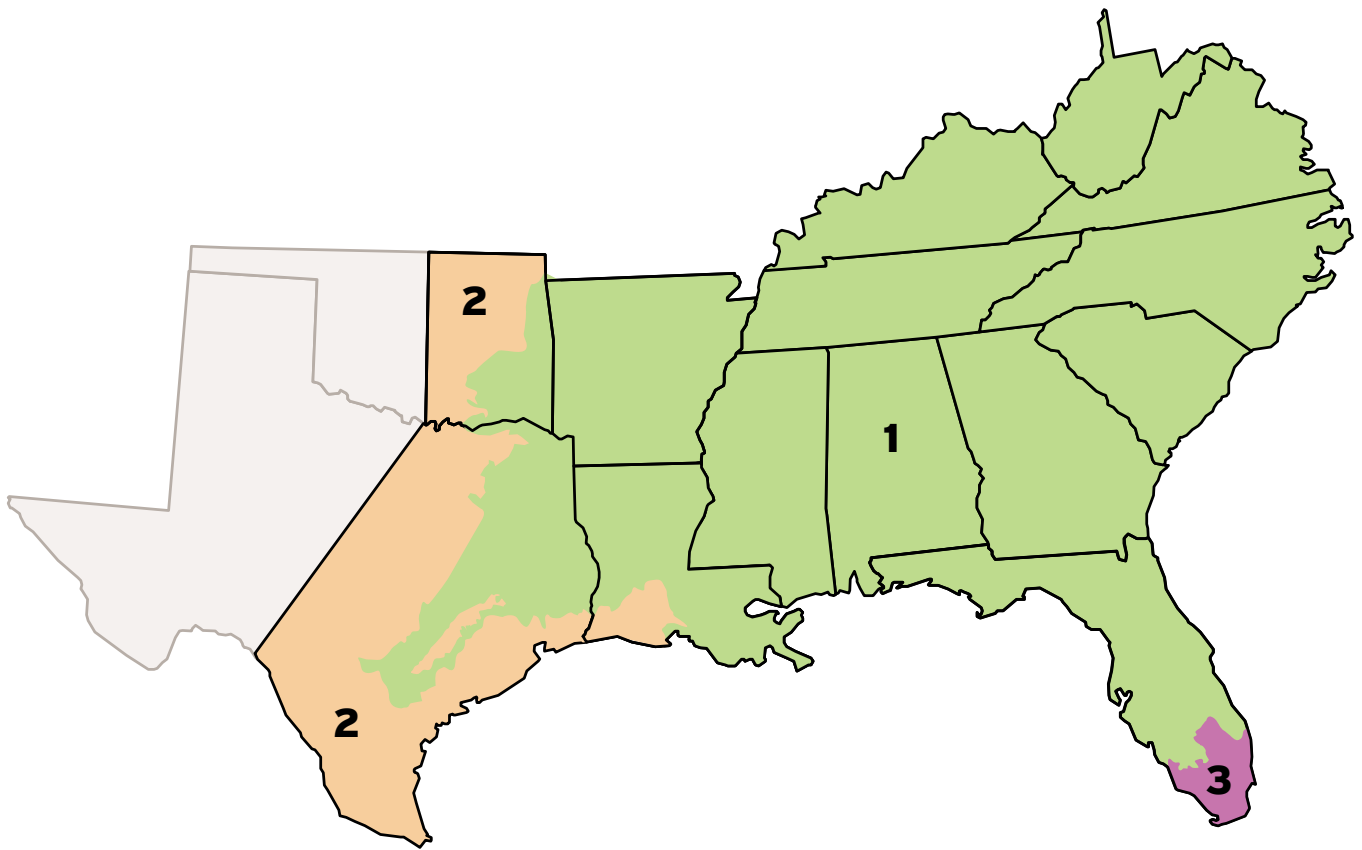
# GEOGRAPHY OF THE SOUTH

The South covers 14 states in all and stretches from the eastern parts of Texas and Oklahoma to the shores of the Atlantic Ocean and the Gulf of Mexico. Practice your geography and label the states above. Bonus points if you can name the state capitals of each one.

*Answers on page 147!*



AL	_____	NC	_____
AR	_____	OK	_____
FL	_____	SC	_____
GA	_____	TN	_____
KY	_____	TX	_____
LA	_____	VA	_____
MS	_____	WV	_____





# GET TO KNOW THE SOUTH'S BIOMES

The best way to get to know your Southern state and backyard is by understanding your natural neighborhood: its **biome**. A biome is a community of animals and plants that live in a specific kind of climate and environment.

You've probably heard of some biomes before: grasslands, forests, and so on.

The South is home to several different biomes:



1. Eastern  
Temperate  
Forest



2. Great Plains



3. Tropical Wet  
Forest

## QUICK QUESTION

Which biome do you live in?

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## GREAT PLAINS

Grasslands make up America's Great Plains. Stretching from the southern tip of Texas and well into Canada, the plains support some of the country's iconic species, including bison, elk, and more. European settlers initially viewed the prairies as "wastelands" and immediately set about converting the land, and its valuable soil, to farmland. Today, only a tiny fraction of these grasslands remains, and many of the animals and plants that depended on them have been **extirpated**, or are no longer present in this area.

In the South, the plains are limited to Texas and western Louisiana, flowing until they reach the Gulf of Mexico. These grasslands provide critical habitat for wintering **waterfowl**, which is another name for ducks, geese, and other birds that live on or near water.

## QUICK QUIZ

Which of the following birds is a waterfowl species?



A. Fulvous Whistling-Duck



B. Northern Mockingbird



C. American Crow



D. Red-Tailed Hawk

*Answer on page 147!*

1. Grasslands are made up of different species of grasses.  
How many species of grasses can you find near your house?

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2. Look up, do you see birds flying overhead? Write down the family groups of the birds you see: waterfowl, songbirds, wading birds, or raptors (birds like eagles, hawks, and owls).

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## TEMPERATE FORESTS

The word **temperate** means mild or moderate; in temperate forests, there are long periods (summer!) where the weather is warm. These forests primarily have deciduous trees (trees that lose their leaves), such as maples, hickories, and oaks, though **conifers** can grow there (sometimes in huge numbers) as well. Temperate forests are home to familiar creatures such as raccoons, woodpeckers, and White-Tailed Deer, but they also have thousands of species of insects, fungi, and plants.

Farmers once cut huge sections of Southern forests to make way for both livestock and crops. However, since then much of this biome has been allowed to grow back; that means these are **second-growth forests**.



## QUICK QUIZ

There are many different kinds of trees in the South's deciduous forests, but tulip trees, oaks, and sweetgum are very common.

Can you identify each tree's leaves?



1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

*Answers on page 147!*

1. How many different deciduous trees (trees that lose their leaves) can you find near you?

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2. Which one is your favorite? Why?

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## TROPICAL WET FOREST

With average year-round temperatures well above freezing, the plant and animal communities within the tropical wet forest don't have to worry about frost. High temperatures, combined with plenty of rain, mean these forests are some of the most **biodiverse** on the planet. (That means the forests have many different kinds of plant and animal species.)

In the South, only the southern tip of Florida is part of this biome. On the coasts, mangrove forests—complete with three species of mangrove trees—protect the land from erosion while providing habitat for some of the most unique species in the United States. Roseate Spoonbills, for example, are bright-pink wading birds with a spatula-like bill, and they are common in this region.

As climate change causes stronger storms to impact South Florida, mangroves protect both the shoreline as well as coastal towns and cities.

## QUICK QUIZ

What pink bird species lives in Florida's Tropical Wet Forest? (**Note:** Only one of the birds below lives in our region; the rest live in other countries.)



A. Scarlet Ibis



B. Pink Robin



C. Roseate  
Spoonbill



D. Rose-Breasted  
Cockatoo

*Answer on page 147!*

1. Tropical wet forests can grow near salt, fresh, or brackish water (which is a mix of fresh and salt water). What kind of water can you find near your backyard?

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2. Tropical wet forests are known for the biodiversity of their plant life. Can you sketch a plant from your backyard?



## THEN VS. NOW

The South was once largely covered with forests that stretched to the wetland meadows of the coastal plains. Indigenous peoples burned certain areas of the forests to create additional hunting territory, and lightning strikes naturally burned other sections of forests every few years. In fact, many of the pine woodlands of Florida, Georgia, and Alabama need to be periodically burned in order to maintain healthy ecosystems. This burning creates what is known as a **prescribed fire**.

However, European-descended settlers cut much of these forests for farms, **turpentine** (an oily liquid with many uses) and development, and forest managers of the nineteenth and twentieth centuries largely stopped the fires these forests need. Only in the late twentieth and the current twenty-first centuries have foresters, landowners, and scientists teamed up to restore Longleaf Pine ecosystems. These open pinelands provide habitat for rare species, including Red-Cockaded Woodpeckers and Flatwoods Salamanders.

Farther north, the American Chestnut tree once grew across 200 million acres of eastern forests, from the South all the way up to Maine. American Chestnuts can





grow to nearly 100 feet tall, and its nuts acted as critical food sources for approximately 60 species of wildlife. Unfortunately, in the early 1900s an imported bark fungus took hold among the trees, and within 50 years had killed nearly every American Chestnut in the United States.

Imported insects and other pathogens continue to decimate our **native** trees. In the more recent past, for example, the Woolly Adelgid Beetle has nearly wiped out Hemlock trees.

## QUICK QUIZ

How many species depended on the American Chestnut tree for food?

- A. 12
- B. 30
- C. 60
- D. 100
- E. 1000



*Answer on page 147!*

# STATE SYMBOLS

Another good way to get to know the region is by learning your state's official symbols. From the state bird and flower, which you might know already, to lesser-known categories, such as state amphibian, gemstone, or fossil, these iconic plants, animals, and materials have a long history with their states. Of course, not every state has symbols for the same categories—some states even have a state soil!—and some have many while others recognize only a handful. How many can you identify?



Why are state symbols important? Because they tell a story! By voting on symbols, elected officials and citizens are highlighting what makes their states—and their homes—special.



# ALABAMA



**Northern Flicker  
(Yellowhammer)**

*Bird*



**Oak-Leaf  
Hydrangea**

*Wildflower*



**Camellia**

*Flower*



**Marble**

*Rock*



**Tarpon**

*Saltwater Fish*



**Largemouth Bass**

*Freshwater Fish*



**Monarch Butterfly**

*Insect*



**Southern  
Longleaf Pine**

*Tree*



**Black Bear**

*Mammal*

# STATE SYMBOLS

## MISSISSIPPI



**Mockingbird**

*Bird*



**Petrified Wood**

*Stone*



**Southern Magnolia**

*Tree and Flower*



**Spicebush Swallowtail**

*Butterfly*



**Largemouth Bass**

*Fish*



**White-Tailed Deer**

*Land Mammal*



**Honeybee**

*Insect*



**American Alligator**

*Reptile*



# LOUISIANA



**Brown Pelican**

*Bird*



**Magnolia**

*Flower*



**Alligator**

*Reptile*



**Bald Cypress**

*Tree*



**Louisiana  
Black Bear**

*Mammal*



**Honeybee**

*Insect*



**Petrified  
Palmwood**

*Fossil*



**Cabochon-Cut  
Oyster Shell  
(LaPearlite)**

*Gemstone*



**Agate**

*Mineral*

# STATE SYMBOLS

## TEXAS



**Mockingbird**

*Bird*



**Bluebonnet**

*Flower*



**Petrified  
Palmwood**

*Stone*



**Pecan**

*Tree*



**Monarch Butterfly**

*Insect*



**Texas Horned  
Lizard**

*Reptile*

# ARKANSAS



**Mockingbird**  
*Bird*



**Diamond**  
*Gem/Stone*



**Quartz**  
*Mineral*



**Loblolly Pine**  
*Tree*



**Diana Fritillary**  
*Butterfly*



**Honeybee**  
*Insect*



**Apple Blossom**  
*Flower*



# STATE SYMBOLS

## OKLAHOMA



**Scissor-Tailed Flycatcher**

*Bird*



**Collared Lizard**

*Reptile*



**Oklahoma Rose**

*Flower*



**Black Swallowtail**

*Butterfly*



**Honeybee**

*Insect*



**Indian Blanket**

*Wildflower*



**Eastern Redbud**

*Tree*



**Barite Rose**

*Rock*

# FLORIDA



**Northern Mockingbird**

*Bird*



**Orange Blossom**

*Flower*



**Sabal Palm**

*Tree*



**Agatized Coral**

*Stone*



**Manatee**

*Marine Mammal*



**Florida Panther**

*Animal*



**American Alligator**

*Reptile*



**Zebra Longwing**

*Butterfly*

# STATE SYMBOLS

## SOUTH CAROLINA



**Carolina Wren**

*Bird*



**Yellow Jessamine**

*Flower*



**Cabbage Palmetto**

*Tree*



**Blue Granite**

*Stone*



**Tiger Swallowtail**

*Butterfly*



**Carolina Mantis**

*Insect*



**White-Tailed Deer**

*Mammal*

# GEORGIA



**Brown Thrasher**

*Bird*



**Gopher Tortoise**

*Reptile*



**Tiger Swallowtail**

*Butterfly*



**Cherokee Rose**

*Flower*



**Largemouth Bass**

*Freshwater Fish*



**Honeybee**

*Insect*



**Staurolite**

*Mineral*



**Live Oak**

*Tree*



**Azalea**

*Wildflower*



# STATE SYMBOLS

## NORTH CAROLINA



**Cardinal**

*Bird*



**Dogwood**

*Flower*



**Honeybee**

*Insect*



**Gray Squirrel**

*Mammal*



**Granite**

*Rock*



**Pine**

*Tree*



**Eastern Tiger Swallowtail**

*Butterfly*



**Carolina Lily**

*Wildflower*



**Eastern Box Turtle**

*Reptile*

# VIRGINIA



**Northern Cardinal**  
*Bird*



**American Dogwood**  
*Flower*



**Tiger Swallowtail**  
*Butterfly*



**American Dogwood**  
*Tree*



**Brook Trout**  
*Freshwater Fish*



**Striped Bass**  
*Saltwater Fish*



**Nelsonite**  
*Rock*

# STATE SYMBOLS

## WEST VIRGINIA



**Cardinal**

*Bird*



**Sugar Maple**

*Tree*



**Black Bear**

*Animal*



**Rhododendron**

*Flower*



**Honeybee**

*Insect*



**Monarch**

*Butterfly*



***Lithostrotionella***

*Fossil*



# TENNESSEE



**Mockingbird**  
*Bird*



**Zebra Swallowtail**  
*Butterfly*



**Iris**  
*State Cultivated Flower*



**Passionflower**  
*Wildflower*



**Tennessee Coneflower**  
*Wildflower*



**Tennessee Pearl**  
*Gem*



**Firefly**  
*Insect\**



**Eastern Box Turtle**  
*Reptile*



**Limestone**  
*Rock*



**Tulip Poplar**  
*Tree*



**Raccoon**  
*Wild Animal*

\*Tennessee actually has three state insects: the firefly; the ladybug; and the honeybee, the state agricultural insect.

# STATE SYMBOLS

## KENTUCKY



**Cardinal**

*Bird*



**Brachiopod**

*Fossil*



**Butterfly**

*Butterfly*



**Goldenrod**

*Flower*



**Coal**

*Mineral*



**Tulip Poplar**

*Tree*



**Kentucky Agate**

*Rock*

## QUICK QUIZ

Many Southern states share their state birds. Which state below has not chosen the cardinal as its state bird?

- A. Kentucky
- B. Virginia
- C. Georgia
- D. West Virginia

*Answer on page 147!*

1. Many states identify official state trees. Do you have one (or more) state trees in your yard? If you do, list them below!

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2. Many states choose birds that are easy to find and identify as their state symbol. Have you ever seen your state (or another state's bird) in your neighborhood? If you have, list them below.

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# INTRODUCED VS. INVASIVE

Because of its warmer temperatures, the South hosts many plants and animals that were **introduced** to the region. Some of these, such as agricultural crops or livestock, were introduced on purpose; they are **nonnative**, but they haven't been a problem. Others were introduced on purpose or by accident, but once they arrived they spread quickly, often finding an environment with few predators or natural checks on their population. These species then became **invasive**, spreading uncontrollably and either eating native animals and plants or taking over their food sources and habitat.

Invasive species are a special problem for Florida, where temperatures often do not dip below freezing, even in the winter.

How can you prevent the spread of invasive species? Never release pets of any kind outside if you can no longer take care of them. Also, please choose native plants for your garden. (Plants can "escape" from gardens too!)

Pictured here are a few familiar but invasive plants and animals.



Kudzu



Lionfish



Pythons



Japanese Climbing Fern



House Sparrow



Feral Hog



Iguanas



## QUICK QUIZ

Which of the following animals is an introduced species in the South?



A. Texas Horned Lizard



B. American Alligator



C. Iguana



D. Green Anole

*Answer on page 147!*

Can you think of other introduced species in your area?

**Hint:** Most farm animals aren't from here! The same is true for many weeds.

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**RECORD YOUR ACTIVITIES,**

**DISCOVERIES & FINDS HERE**

If you find something neat, make a sketch to the right to help you remember details so you can compare your drawing with a field guide or another reference later.

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## RECOMMENDED READING

**Daniels, Jaret C.** *Backyard Bugs: An Identification Guide to Common Insects, Spiders, and More.* Cambridge, Minnesota: Adventure Publications, 2017.

**Daniels, Jaret C.** *Wildflowers of the Southeast Field Guide.* Cambridge, Minnesota: Adventure Publications, 2012.

**Lynch, Dan R.** *Fossils for Kids: An Introduction to Paleontology.* Cambridge, Minnesota: Adventure Publications, 2020.

**Lynch, Dan R.** *Rock Collecting for Kids: An Introduction to Geology.* Cambridge, Minnesota: Adventure Publications, 2018.

**Lynch, Mike.** *Stars: A Month-by-Month Tour of the Constellations.* Cambridge, Minnesota: Adventure Publications, 2012.

**Poppele, Jonathan.** *Night Sky: A Field Guide to the Constellations.* Cambridge, Minnesota: Adventure Publications, 2009.

**Sibley, David.** *The Sibley Field Guide to Birds of Eastern North America.* New York: Knopf, 2016.

**Tekiela, Stan.** *Birds of Prey of the South Field Guide.* Cambridge, Minnesota: Adventure, 2013.

# GLOSSARY

**Adapted** Changed in response to the environment or conditions.

**Agricultural Products** Farm products such as wheat, soybeans, or livestock.

**Biodiverse** An ecosystem that is biodiverse has a large number of plant and animal species.

**Biome** A community of animals and plants that live in a specific kind of climate and environment.

**Chalcedony** A banded form of quartz that is popular as a collectible.

**Chemical Element** One of the 92 naturally occurring chemicals, such as oxygen and carbon, that make up all matter on Earth.

**Commodities** Agricultural products (see above) that are sold worldwide.

**Conifer** A tree that produces seeds by cones; most conifers, but not all, are **evergreen**—that is, they stay green all winter.

**Extirpated** Refers to an animal or plant being eliminated from its native range.

**Genus Name** Because there are so many different plants and animals and other lifeforms, scientists give every organism one name, usually derived from Latin or Greek. This scientific name has two parts: a **genus name**, which is like an organism's last name and which it shares with others, and a **species name**, which is like its first name.

So if you want to talk to a scientist about the American Robin, *Turdus migratorius* is the name that scientists would recognize all around the world. (And yes, that really is its scientific name.)

**Introduced** Brought to an area instead of occurring there naturally (example: cows in the U.S.) (Also see **Nonnative**, page 146).

**Invasive** Describes introduced species (see above) that outcompete native animals, harming the ecosystem.

**Latitude** How far north or south a person or place is from the equator; the equator is at a latitude of 0; the North Pole is 90 degrees North.

**Legislature** The lawmaking body (for example, the State Senate and State House of Representatives) in each Southern state; legislators are the officials who make laws pertaining to the environment.

**Limestone** A sedimentary rock made out of marine animals, such as coral and others; it often preserves fossils within it.

# GLOSSARY

**Mineral** A chemical combination of two or more elements. Individual elements (such as copper and gold) are considered minerals as well.

**Mohs Hardness Scale** The relative scale of mineral hardness, from the softest (talc, 1) to the hardest (diamond, 10).

**Mutualistic** Refers to a relationship between two organisms where each one gets something of value or benefit.

**Native** Refers to an animal, plant, or other organism that is found naturally in an area.

**Nonnative** Refers to an animal, plant, or other organism that is *not* found naturally in an area. (Also see **Introduced**, page 145). **Note:** Not all nonnative plants and animals are invasive (see page 145).

**Phenology** The study of the seasons and other natural cycles over time.

**Prescribed Fire** A fire that is intentionally burned by land managers. This allows new species to thrive after the fire. Also called a **controlled fire**.

**Rock** A combination of two or more minerals (see above).

**Saprobies** Mushrooms that feed on dead or dying material (often wood or plant parts).

**Second-Growth Forests** Forests that grow back after old-growth forests are harvested.

**Species Name** See **Genus Name** (page 145).

**Summer Solstice** The longest day of the year, when the earth is pointed most directly at the sun; in the northern hemisphere, the summer solstice occurs in late June.

**Temperate** An environment where there are long periods (summer!) where the weather is warm.

**Turpentine** A sticky resin that comes from trees, used to make a variety of products.

**Toxic** Poisonous.

**Waterfowl** Ducks, geese, swans, and other aquatic birds.

**Winter solstice** The shortest day of the year, when the earth is tilted away from the sun the most; in the northern hemisphere, the summer solstice occurs in late December.

# QUICK QUIZ ANSWERS

**Page 5:** Montgomery, Alabama; Little Rock, Arkansas; Tallahassee, Florida; Atlanta, Georgia; Frankfort, Kentucky; Baton Rouge, Louisiana; Jackson, Mississippi; Raleigh, North Carolina; Oklahoma City, Oklahoma; Columbia, South Carolina; Nashville, Tennessee; Austin, Texas; Richmond, Virginia; Charleston, West Virginia

**Page 9:** Fulvous Whistling-Duck

**Page 11:** 1. Tulip Tree 2. Sweetgum 3. Southern Red Oak

**Page 13:** Roseate Spoonbill

**Page 15:** 60

**Page 31:** Georgia

**Page 33:** Iguana

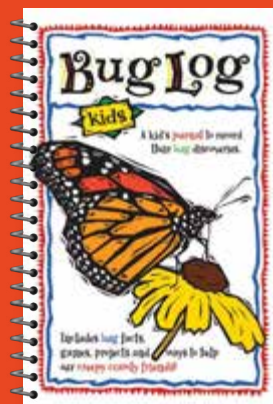
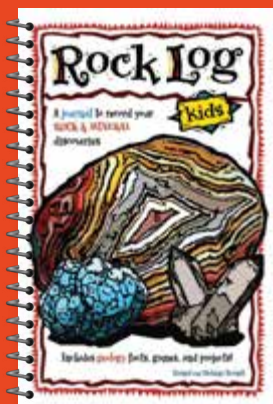
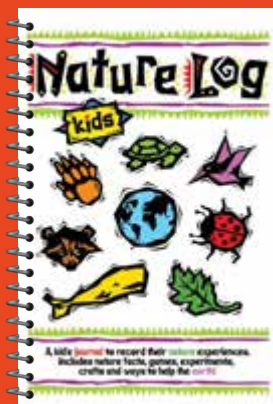
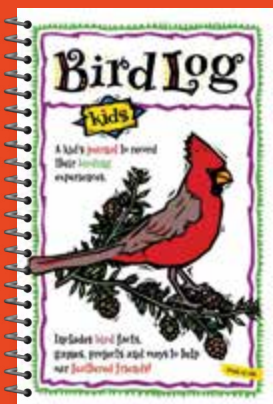
**Page 55:** 1. Soybeans 2. Corn 3. Sugarcane 4. Cotton

**Page 91:** A rock is made up of multiple minerals. This can be really confusing, because some official state rocks are actually minerals and some official minerals are actually rocks!

**Page 108:** 1. Eastern Calligrapher Fly 2. Yellowjacket 3. Honeybee

## NATURE JOURNALS FOR KIDS from ADVENTURE PUBLICATIONS

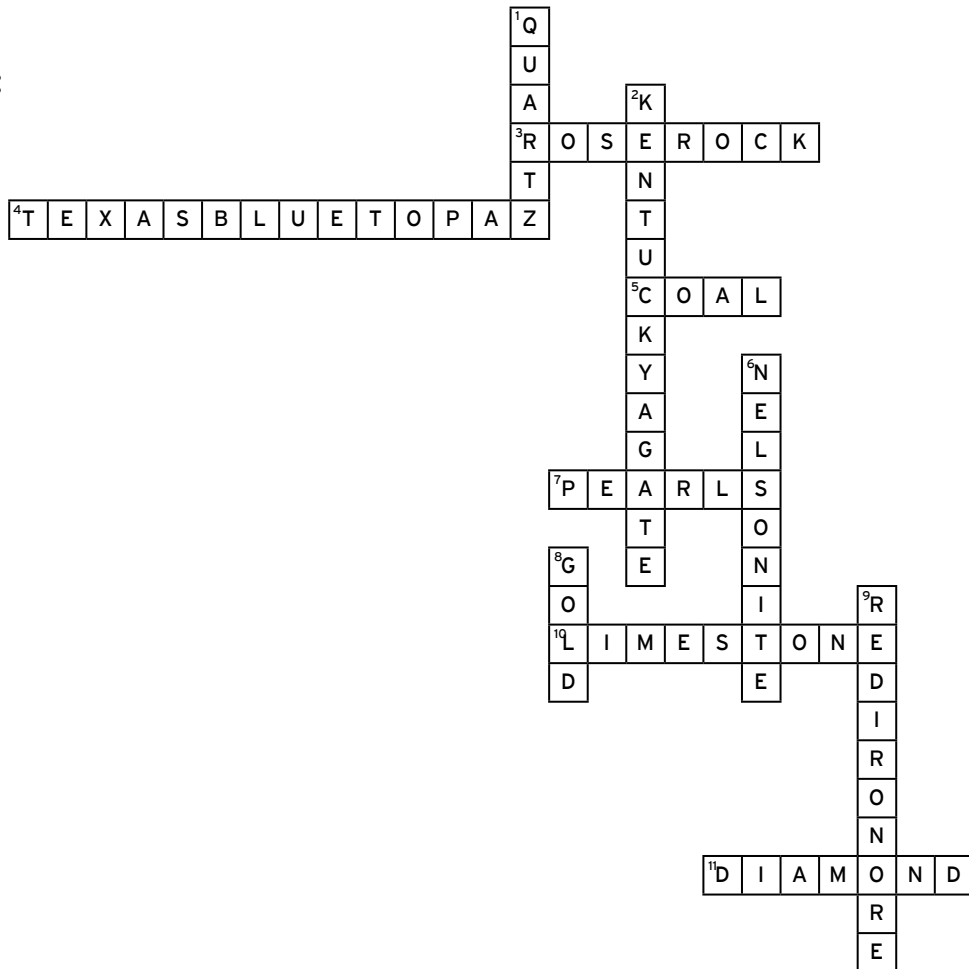
- Guided journaling pages
- Fascinating information
- Fun activities for the family
- Photo and art pages



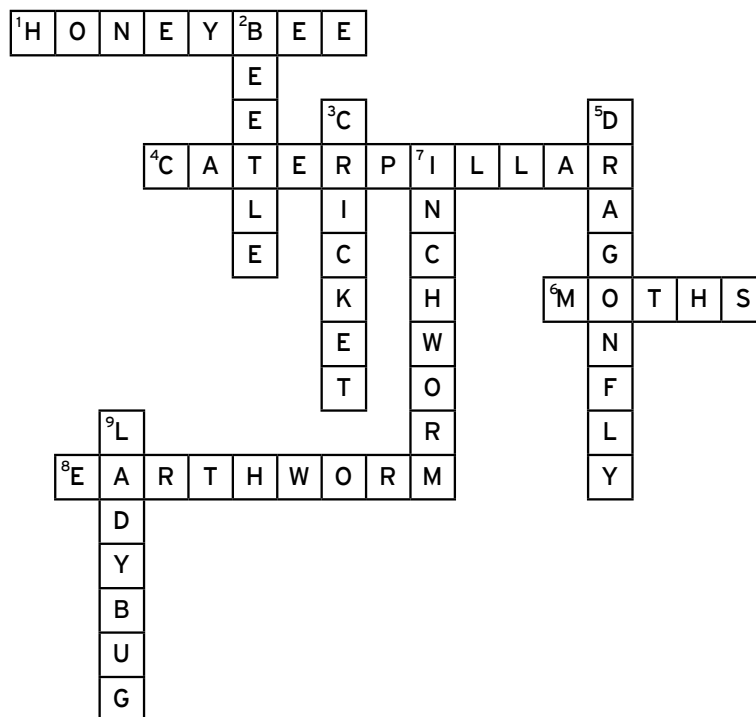


# CROSSWORD ANSWERS

Page 98:



Page 115:



# ABOUT THE AUTHOR



**Erika Zambello** is a writer, naturalist, and communications specialist. After earning a master's degree in environmental management from Duke University, where she specialized in ecosystem science and conservation, she traveled across the United States visiting important science and naturalist sites for the Florida Park Service, the Long Term Ecological Research Network, National Parks Traveler, NOAA, and more. Her work has appeared in *BirdWatching Daily*, *Backpacker*, *National Geographic Adventure*, *National Parks Traveler*, *Guy Harvey Magazine*, *Florida Sportsman*, and *Coastal Angler*. When she isn't working, she is exploring near her home in North Florida, looking for native bird species. She lives in Tallahassee with her husband, kid, and two cats.

## **ACKNOWLEDGMENTS**

Thank you to my parents, who instilled in me a love of nature, and to my husband, who is always up for a new adventure.

## **DEDICATION**

To Noah, my new favorite adventure partner.

# PHOTO CREDITS

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# SAFETY NOTE

Nature is wonderful and amazing, and it's certainly nothing to be afraid of, especially if you take common-sense precautions.

This is a guide intended for backyards and green spaces in the South; such places should be pretty safe, by definition, but have an adult accompany you when outside and to supervise the activities in this book. And when you're outside, don't reach where you can't see, and be aware of potentially dangerous animals like bees, wasps, venomous spiders or snakes, and bothersome plants such as poison ivy or poison sumac/oak. While you can avoid them by paying careful attention, be especially aware if they are found in your area, or if you're allergic (to bees, for instance).

The best way to stay safe is to keep your distance from wild animals, avoid handling wildlife, and take photos or make sketches instead. Also, wear gloves, appropriate clothing for the weather, long pants in areas where ticks are present, and sunscreen (as needed). Pay attention to the weather and any potentially unsafe surroundings. You are responsible for your safety.

**An important note:** This book is **not** intended to help you identify which wild plants, berries, fruits, or mushrooms are safe to eat. Please leave the berries, fruits, and mushrooms you find for the birds, critters, and the bugs; instead, get your snacks from the fridge!

Edited by Brett Ortler

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Fun Activities and Experiments That Get Kids Outdoors**

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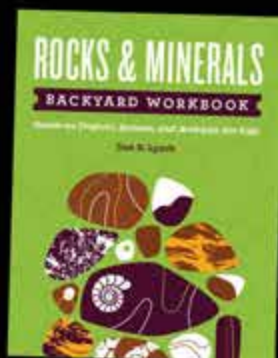
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