

Bat Count

A Citizen Science Story



by Anna Forrester

illustrated by Susan Detwiler

Bat Count

A Citizen Science Story

Jojo is prepping for an exciting night; it's time for the bat count! Bats have always been a welcome presence during the summers in the family barn. But over the years, the numbers have dwindled as many bats in the area caught white-nose syndrome. Jojo and her family count the bats and send the numbers to scientists who study bats, to see if the bat population can recover. On a summer evening, the family quietly makes their way to the lawn to watch the sky and count the visitors to their farm.



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Thanks to Katie Gillies, Director of the Imperiled Species Program at Bat Conservation International (www.batcon.org), and Catherine J. Hibbard, White-nose Syndrome Communications Leader with the U.S. Fish and Wildlife Service, for verifying the accuracy of the information in this book.

The *For Creative Minds* includes

- Bat Facts
- Bat Bodies
- White-Nose Syndrome
- Citizen Science

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Anna Forrester is an amateur naturalist who finds inspiration for her writing in the quirks and curiosities she encounters in the natural world. When she isn't writing or reading or messing around outdoors, she creates gardens and other green play spaces for city kids. *Bat Count: A Citizen Science Story* is Anna's debut picture book, and was inspired by counts she does with family and friends every summer at a farm in Pennsylvania. She loves biking, paddling, and making things—from soups to bug hotels to giant paper snowflakes. Visit Anna's website at www.annaforrester.com.

Susan Detwiler is an award-winning children's book illustrator. Her books include *On the Move* (NSTA-CBC Outstanding Trade Book); *Big Cat, Little Kitty* (Mom's Choice Awards Gold); *Pandas' Earthquake Escape* (Mom's Choice Awards Gold); and *One Wolf Howls* (Silver Nautilus Book Award) for Arbordale. She is the author/illustrator of *Fine Life For A Country Mouse*. Susan is a member of the Society of Children's Book Writers & Illustrators. Books have always been a source of joy in her life, and as a child she particularly loved books with beautiful illustrations. Susan was educated at the Maryland Institute College of Art and lives with her artist husband in Baltimore. Visit her website at www.susandetwiler.com.



Anna Forrester



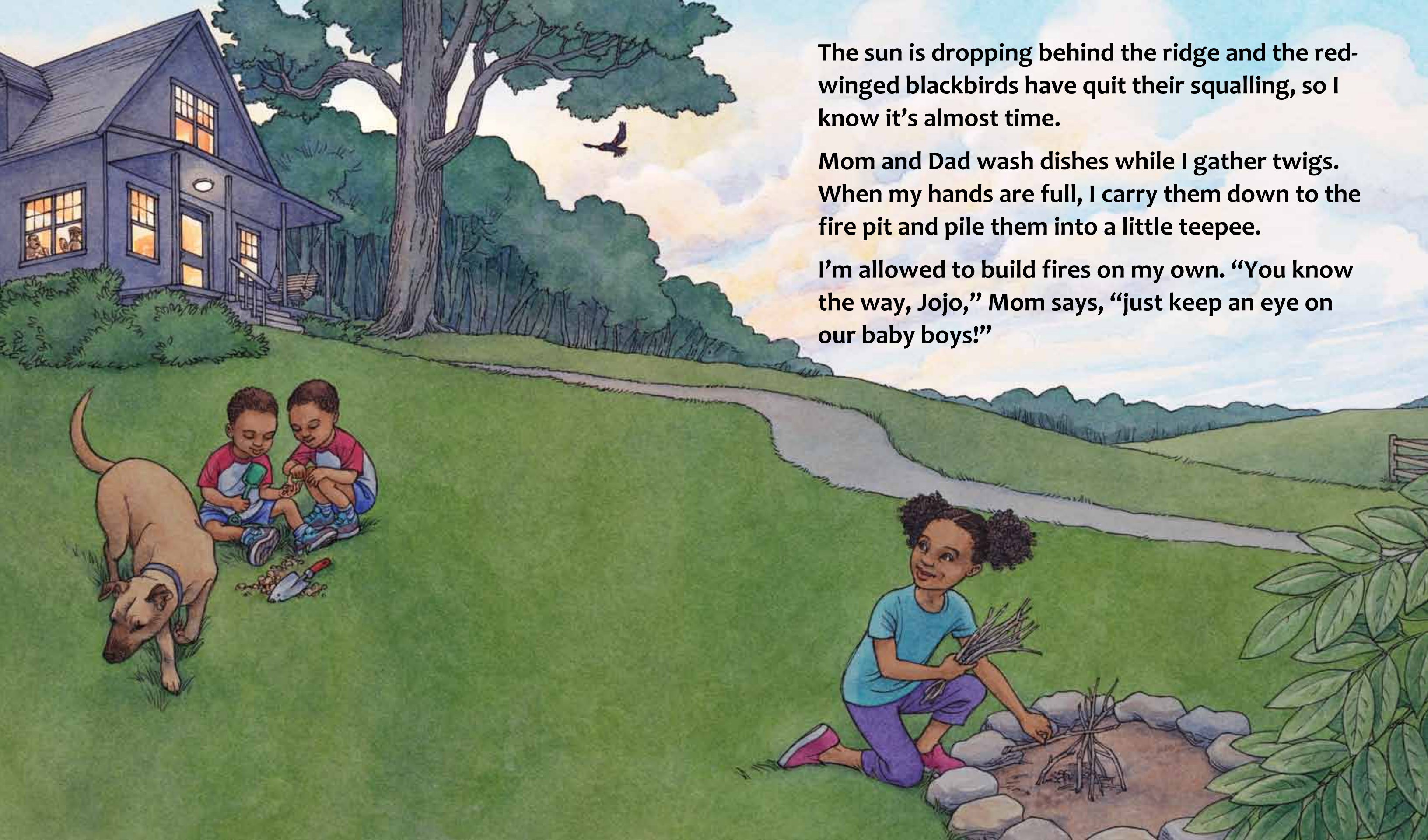
Susan Detwiler

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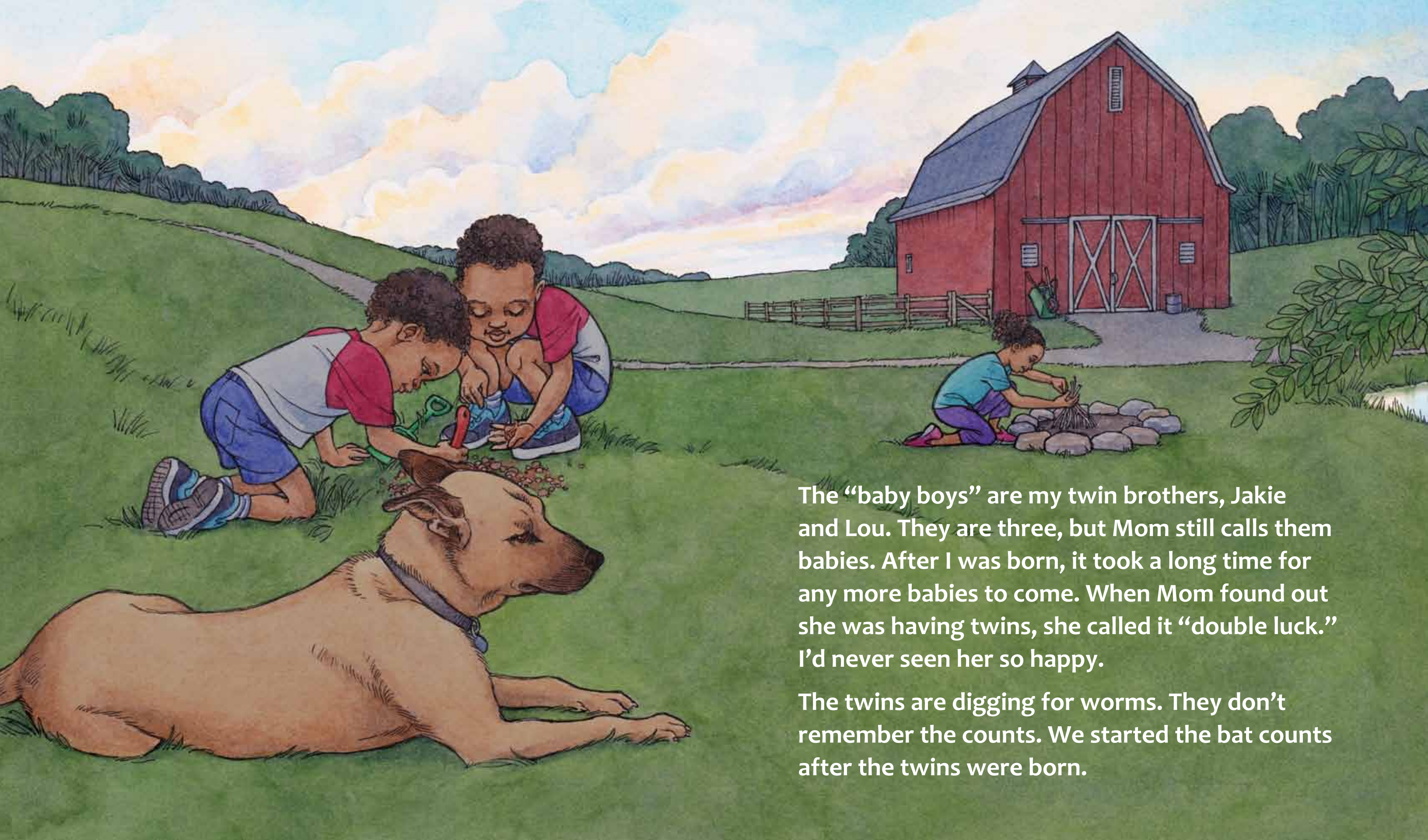
by Anna Forrester
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The sun is dropping behind the ridge and the red-winged blackbirds have quit their squalling, so I know it's almost time.

Mom and Dad wash dishes while I gather twigs. When my hands are full, I carry them down to the fire pit and pile them into a little teepee.

I'm allowed to build fires on my own. "You know the way, Jojo," Mom says, "just keep an eye on our baby boys!"

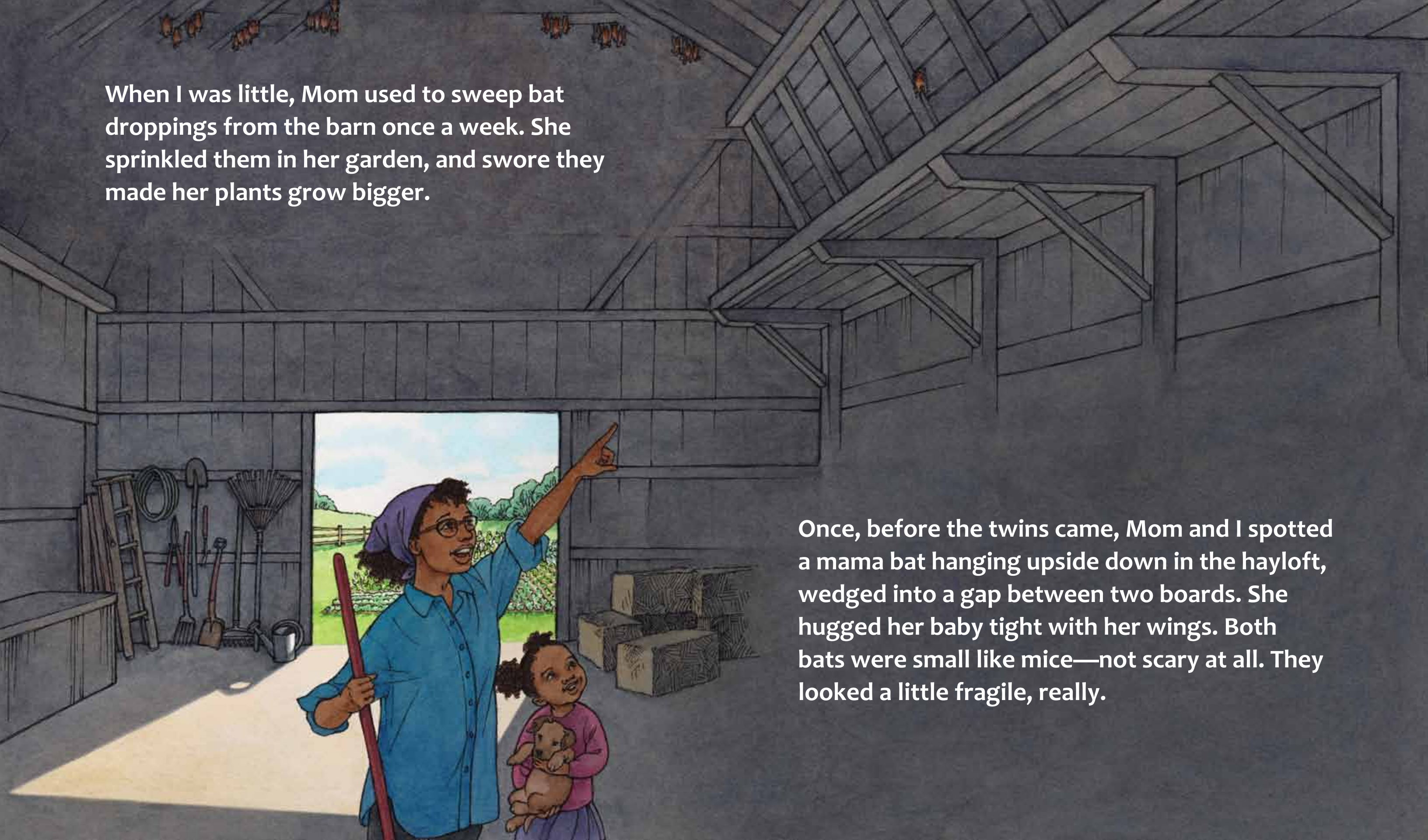


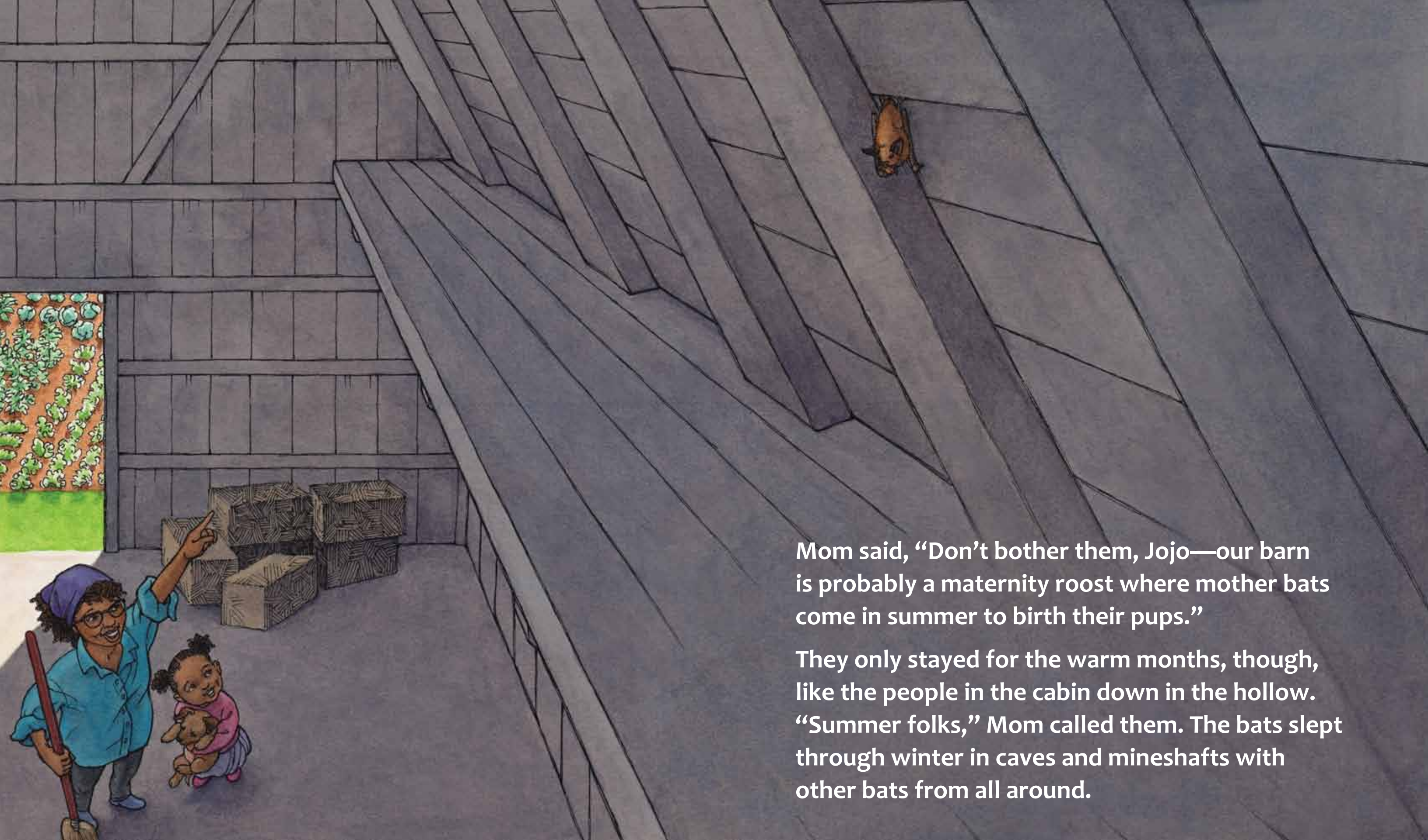
The “baby boys” are my twin brothers, Jakie and Lou. They are three, but Mom still calls them babies. After I was born, it took a long time for any more babies to come. When Mom found out she was having twins, she called it “double luck.” I’d never seen her so happy.

The twins are digging for worms. They don’t remember the counts. We started the bat counts after the twins were born.

When I was little, Mom used to sweep bat droppings from the barn once a week. She sprinkled them in her garden, and swore they made her plants grow bigger.

Once, before the twins came, Mom and I spotted a mama bat hanging upside down in the hayloft, wedged into a gap between two boards. She hugged her baby tight with her wings. Both bats were small like mice—not scary at all. They looked a little fragile, really.





Mom said, “Don’t bother them, Jojo—our barn is probably a maternity roost where mother bats come in summer to birth their pups.”

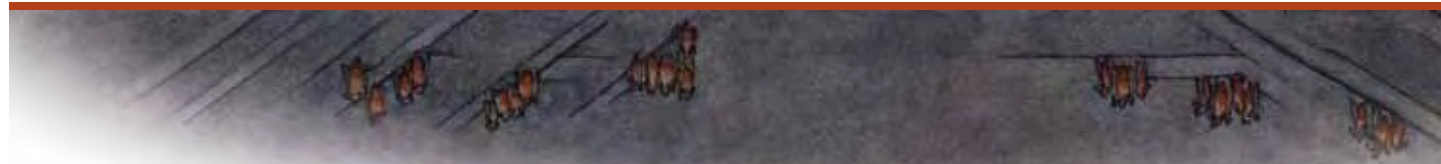
They only stayed for the warm months, though, like the people in the cabin down in the hollow. “Summer folks,” Mom called them. The bats slept through winter in caves and mineshafts with other bats from all around.

For Creative Minds

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Bat Facts



Bats are a type of mammal. Like other mammals, bats are vertebrate animals (have a spine or spinal column), they breathe oxygen from the air, they are warm-blooded, they have fur or hair, give birth to live young, and their young drink milk from their mothers. But bats are a special type of mammal: they are the only mammal that can fly.

Most bats, like humans, have one pup at a time. But, also like humans, they can sometimes have more.

There are 1,200 to 1,300 different species of bats. Bats make up about 20% of all the mammals in the world. There are two main types of bats.

Megabats are also called fruit bats. They live in warm, tropical climates, and usually roost in trees. They use their large eyes to find food in the dark. Megabats usually eat fruit or drink nectar from plants.

Microbats are usually smaller than megabats. They use their ears to find food. They make a high-pitched squeak as they fly. This sound bounces off objects and the bats listen to the echo to learn about their surroundings. This is called **echolocation**. Microbats live in warm and cold climates all around the world. They roost in caves, crevices, buildings, and trees. Many microbats eat insects (insectivores). They can also eat fruit, nectar, blood, and fish.

Many people think that bats are blind. Have you ever heard the phrase, “blind as a bat”? But bats can actually see very well. They just can’t see color. But that doesn’t slow them down at all. Since bats are active at night (nocturnal), they don’t miss seeing a lot of color.

There are 40 to 50 different species of bats in the United States. Before the bats were affected by white-nose syndrome, little brown bats were the most common bat in the United States. A little brown bat eats half its body-weight in insects every night!

Bat Bodies

Match the body part to its location on this little brown bat. Do you have any body parts similar to a bat’s? Does a bat have any body parts that you do not?



Answers: A-wings, B-feet, C-tail, D-elbow, E-thumb, F-ear, G-shoulder, H-nose, I-forearm

White-Nose Syndrome



Healthy bat

White-nose syndrome, or WNS, is a disease that affects hibernating bats. It is caused by a fungus that grows in cold, wet environments like caves, mineshafts, and rock crevices. Many bats hibernate in these places through the winter. The fungus grows on bats' noses, wings, and ears.

Bats squeeze together to stay warm when they hibernate. If one bat is sick with WNS, the fungus can spread to other bats hibernating in the same space.

When bats have WNS, they act strangely. They wake up and move around a lot, even when they should be sleeping. They move closer to the entrance of the cave or mineshaft. Sometimes bats with WNS even fly out into the cold, winter air.



Bat with WNS

Hibernating bats usually sleep through the winter. When they wake up and move around, they burn through the body fat that they had stored. This body fat was supposed to sustain them through the winter. There is nothing for the bats to eat until spring, so their bodies grow weak. This makes the bats vulnerable to other kinds of sickness as well.

When WNS is introduced to a place where bats are hibernating, it can kill as many as 90-100% of the bats. WNS has killed millions of bats since it was first discovered in New York in 2006. Since then, WNS has spread across eastern and central United States and Canada, and even to the west coast in Washington State.

You can help bats!

- Build a bat house. Look up directions online or at your library. Your bat house will provide a safe place for bats to roost or have pups in the summer.
- Participate in a Bat Count. Help scientists track the bat population in your area.
- Do not explore caves or mines where bats are hibernating. If you see bats hibernating, leave them alone.
- If you see a bat in the wild, do not try to touch it. If the bat looks sick or injured, contact a local wildlife rescue organization. Wild animals don't know that you are trying to help them, and can be dangerous if they are scared. If a bat accidentally touches you, tell your doctor.



Bats affected by WNS in 2016

Citizen Science

Scientists are studying WNS, but they cannot do it all alone. They rely on **citizen scientists** to help. Citizen scientists, like Jojo and her family, are volunteers who make observations and gather data. They can help professional scientists in their research. There are many different projects, all around the world and online, where citizen scientists can help with research. *Would you like to be a citizen scientist?*



Bat counts, like other citizen science activities, are carefully planned by the scientists conducting the research. These scientists need to make sure that the data they get is usable and reliable. Often the scientists create simple forms or worksheets for citizen scientists to fill in. This makes sure that the scientists get all the information they need about the bats and where they were counted.

Many different organizations participate in bat counts. If you want to get involved in a bat count, contact your local Department of Natural Resources, Fish and Wildlife Department, Game Commission, nature center, or bat conservation organization. They can tell you more about the bats in your area and train you to participate in bat counts.

Bat Count Form

Site Name: _____

Name of Bat Count: _____

Address: _____ Email: _____

Phone: _____

Roost Site Property Owner:

Name: _____ Email: _____

Address: _____ Phone: _____

Roost Information

Structure Type (circle one) _____

Barn _____ Church _____

Moore (unoccupied) _____ valley building _____

Bridge _____ Tree _____

Is "Other" described? _____ Yes _____ No _____

Is the structure regularly used by people? _____ Yes _____ No _____

Is the structure scheduled for renovation or demolition? _____ Yes _____ No _____

Is bat excretion planned? _____

Comments: _____

Genus sample enclosed? _____ Yes _____ No _____

Photographs enclosed? _____ Yes _____ No _____

Have you observed bats at this site before? If so, please describe the history of this bat colony and note the number of bats in previous years: _____

Surveyor's Signature: _____

| Site Conditions | Wind Speed | Start Temp (°F) | Start Time | End Time | Total Bats Counted | Technician (Initials or Name) |
|-----------------|------------|-----------------|------------|----------|--------------------|-------------------------------|
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After counting the bats in their barn, Jojo fills out a form and mails it to the scientists who are studying WNS. Soon these researchers will know that Jojo's bat had twins!

To Mira, Adrie, Mitch . . . and our bats.—AF

For Felix, with love.—SD

The author donates a portion of her royalties to Bat Conservation International.

Thanks to Katie Gillies, Director of the Imperiled Species Program at Bat Conservation International (www.batcon.org), and Catherine J. Hibbard, White-nose Syndrome Communications Leader with the U.S. Fish and Wildlife Service, for verifying the accuracy of the information in this book.

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