### By LARRY WEBER Illustrations by TAINA LITWAK



Biking to a park on a hot July day, you hear clicking and buzzing coming from roadside grasses. Returning at dusk, you tune into chirping and creaking too. In the days and weeks that follow, more buzzing and whining calls resound from treetops. Welcome to the hot sounds of the singing bugs of summer.

Crickets, katydids, and cicadas perform in this warm-weather chorus. The males call for mates.

Instead of using throats and lungs to sing, these insects make sounds using other specialized parts on the skeleton on the outside of the body.

Because they are cold blooded, insects need hot days to warm up their instruments. You won't hear them on a cool morning. But if you listen, you will notice them around midday. By late afternoon or early evening, more insects will have joined the chorus.

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# **Crickets and Katydids**

Crickets and katydids belong to the insect order Orthoptera, which means "straight wings." Though many do have straight wings, some have rounded or curved wings.

Crickets and katydids make sounds with their wings. The insect rubs a sharp ridge on one wing against a rough part of the

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other. As it rubs, its wings vibrate. The vibration amplifies the sound. This singing style, known as *stridulation*, sounds like buzzes, chips, chirps, or clicks.

**Crickets.** Crickets hold their wings flat on the back. Their long, slender antennae extend beyond the body. The female has a single long tube, called an *ovipositor*, for laying her eggs in soil or plants.

female

Two common kinds of **field crickets** sing chirping songs in Minnesota. Listen for spring field crickets from May to July. Their cousins, the fall field crickets, sing from July to October.

> We've been kept as pets in Greece, China, and other places for 2,500 years, mostly for the male's sweet singing and

male

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brrreeet-brreet-brreet brrreeet-brreet-brreet brrreeet-brreet brrreeet-brreet-brreet **Ground crickets** make a series of soft, high-pitched trills or buzzes. Their pulsating call often seems like background noise, resounding day and night from late summer into October. Ground crickets are dark brown and often striped. You might see these tiny crickets scatter

tough fighting.

in front of a Íawn mower.





Tree crickets are pale green with broad wings. Some species live in trees and bushes, especially raspberry and blackberry, and tend to sing at night. Some tree crickets live in grasses and

Use me, the snowy tree cricket, to tell the temperature: Count the number of chirps in 13 seconds, then add 40 to estimate the degrees Fahrenheit.

weeds, and call both day and night. Though some chirp, most make a very long trill: treettreet-treet. When they synchronize their calls into one loud sound, it seems to come from everywhere at once.

Katydids. Katydids look like large green grasshoppers with super-long antennae. Indeed, another name for these insects is long-horned grasshoppers.

Minnesota is home to four kinds of native katydids: bush katydids, meadow katydids (also called meadow grasshoppers), conehead katydids, and shieldback katydids (also called shieldback grasshoppers). They live in the vegetation and feed on leaves. A few will eat other insects. Katydids start calling in mid-July and keep going until October.



Meadow katydids are the next to call. All afternoon and into the evening on hot days, you can hear their click, click, click followed by louder buzzes.

JULY-AUGUST 2004

Shieldback katydids, the first to call in summer, buzz softly for two to five seconds at a time.

tch-tch tchtchtchtchrrrtch tch-tch tchtchtchtrrrrtch

PHOTOGRAPHS BY LARRY WEBER

### More katydids

tsip-tsiptsip-tsiptsip-tsiptsip-tsiptsip-tsip

### Conehead katydids

call from fields and roadsides of grasses and sedges on warm summer nights. Males repeat a loud, quick tsip-tsiptsip or a loud, steady buzz.

### The name *katydid*

comes from a large species found in the southern and northeastern United States. Pioneers thought the katydid call sounded like "Katy-did" or "Katy-she-did," and so they dubbed the noisemaker the katydid. This species is not native to Minnesota, but it was accidentally transported here years ago and can now be found in the Twin Cities area.

> Katydids and crickets have ears on their front legs. Now put me down!

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Bush katydids, camouflaged on leaves of shrubs and meadow grasses, call in late afternoon. Their sharp zick call sounds like crunching a potato chip. After dark, the males make a creaking zeep-zeep-zeep song that females sometimes answer with a little chip.



# Big sound, little size

e male crickets have very special wings. Not only do we use our wings to fly, but we also use them to make sounds.

Our secret? Close to the place where our wings meet, we have a file and scraper. The tiny row of teeth called a file hides beneath the top wing. The bottom wing has the scraper. The scraper edge curves to fit between the teeth.

When we close our wings, the scraper trips across each tooth and makes a tiny pulse of sound. Back and



forth the cricket's scraper moves, a little bit like the way you might scrape your fingernail across the teeth of a comb, only much, much faster. (Common field crickets play 4,000 teeth

per second.) The male katydid uses only one wing as a scraper and one as a file, and he makes sounds only when closing his wings.

This little sound grows louder as it bounces through the broadcasting parts of our wings, called the harp and mirror in crickets, and into the air.

Future mates can find us easily by just following our songs. Unfortunately, predators can hear us too.

Susan Binkley



## Cicadas

Cicadas belong to the insect order Hemiptera. A cicada is 1 to 2 inches long, with a blunt head and clear wings. Similar to true bugs, it has a mouthpart for sucking. Like a drinking straw with a sharp end, the cicada's mouthpart can pierce a woody plant and suck up sap.

The female cicada has an ovipositor folded under her abdomen. She uses it to slice into the tip of a branch and deposit eggs inside.

After the eggs hatch, the young cicadas (called *nymphs*) drop to the ground and use special front legs to tunnel into the soil. Underground, they feed on root sap and grow in dark burrows for many years.

Each cicada crawls out of the ground and up onto a tree or other woody plant. Then the cicada nymph inflates itself with air, mois-

The **dog-day cicada** calls from early July into September, the hottest part of summer, known as the dog days. Its highpitched, whining song lasts a minute and resembles the sound of a distant buzz saw. The male usually sings around midday and again in late afternoon. Though widespread in the state, dogday cicadas are most common in hardwood forests, where they call from high in the trees.



EMERGING CICADA BY SKIP MOODY, DEMBINSKY PHOTO ASSOCIATES

ture, and blood, splitting open its exoskeleton. Eventually, the grownup cicada emerges and leaves its exoskeleton on the bark.

Males begin to call for a mate, and females listen for their courting call. After mating and laying eggs, the adults die.



LARRY WEBER

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The Say's pruinose cicada also lives in hardwood forests. It pulsates its loud, memorable zee-oozee-oo for 15 to 30 seconds at a time. It calls during the brightest sunlit time of day and does an evening encore. Pruinose cicadas are common residents of woodlots, roadsides, and towns in much of the country.









The Canadian cicada, found in northern Minnesota pine and aspen woods, starts calling by the end of May and continues for two months. Its rapid, highpitched lisps last about a minute.

The **prairie cicada** is smaller than other cicadas in Minnesota. Rare, it is disappearing along with its prairie habitat. Nymphs rely on the roots of compass-plant for food.

Periodic cicadas don't live in Minnesota, but they are famous because they emerge in huge swarms in the central and eastern United States. They live 13 or 17 years (depending on the species) underground.

The largest of all broods began emerging in May 2004 and will not emerge again until May 2021. It filled forests, parks, and yards in numbers exceeding the trillions!

Some people call cicadas *locusts*, but they are not. The confusion happens because locusts, which are a kind of large grasshopper, sometimes show up in tremendous swarms. However, locust swarms are very destructive. They devour entire crops, while cicadas feed only on plant juices and do minor damage to trees.

### Male cicada sound systems Loudest of all

#### cicada cross section



RELAXED

e male cicadas are loud! One of us is the

loudest insect in the world. He's an African cicada recorded at 106.7 decibels (as loud as a chain saw) at 1 meter.

Our noisy song starts in stiff but flexible ribs found in parts called timbals. Only males have a pair of timbals: one on each side, under our wings.

When we want to attract a female, we lower our abdomen and puff it out. Then we use our timbal muscles to pull in our timbals. The timbals buckle like a squeezed pop can. One at a



time, each little rib on the timbal makes a quick sound. When we relax these muscles, the timbals pop back out. Our timbals pop out and in many times very fast. Sounds from each rib run together and make a buzz.

Scientists think our expanded abdomen changes the pitch and makes the sound louder. but we haven't given up this secret vet.

On the underside, we have two tympana. We use them like amplifiers to make our sound go far. To do this, we have to open our opercula, flaps that cover and protect our tympana.

Females don't have timbals, but they do have tympana. They use them to hear our mating calls.

We may be small, but we have a really cool way to make awesome, loud sounds.

**Susan Binkley** 

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