Illinois is 'kind of the place to be with periodical cicadas,' researchers say as 17-year brood expected

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Annual cicada. Credit: Bruce Marlin/Wikipedia.

For nearly two decades, they've hung out underground, preparing for the day they'll writhe up into our world, make a lot of noise, have sex and die.

It's not a nightmare. It's a summer preview for a sliver of eastern Illinois and swaths of Indiana. And you can think of it as a warmup for what's coming to Chicago in 2024.

Sometime in May, maybe after a light rain around Memorial Day, one of the largest groups of periodical cicadas will head above ground in Illinois for the first time in 17 years. They're called Brood X—the cohorts are numbered by Roman numerals—and they're expected in more than a dozen states in the Midwest and eastern United States.

Some of the foremost cicada experts have been based in Illinois, and the state is essential when it comes to understanding the insects, researchers say. Illinois houses several broods, both life cycles and all seven periodical species, so mapping the bugs can help answer questions about how they might be responding to climate change.

One person who has devoted much of his life to looking for cicadas is John Cooley, a University of Connecticut at Hartford professor. Cooley has studied cicadas for years, traveling the state to stop and listen and record coordinates. Illinois is "kind of the place to be with periodical cicadas," Cooley said.

Unlike the many species of annual cicadas all over the country, periodical cicadas are on a prime timeline—they appear in 13- or 17-year increments. This year it's Brood X's turn to emerge for a few weeks and create another round of 17-year-old progeny.

Katie Dana, a scientific specialist in entomology at the Illinois Natural History Survey, studies Illinois cicadas and, generally, is "interested in everything cicada." She remembers when she moved to the Midwest for graduate school and heard something new.

"We stepped out of the car and it was like stepping into another world," Dana said.

When Brood X last appeared, George W. Bush was president, "Yeah!" by Usher was on the radio and TikTok was still the sound of time passing by.

Now there's an app to track cicada emergences.

"As you travel across the state, you encounter different species of cicadas, different species of birds, different species of other insects, and it makes your town kind of unique," Dana said. "I like to think of it as the soundtrack of summer."

Brood X includes three species—Magicicada septendecim, Magicicada cassini and Magicicada septendecula—which can be differentiated by their calls. The insects only have a few weeks to mate and lay eggs before they're goners.

Egg laying can occasionally cause "flagging" of trees which results in browning and wilting branches, but cicadas are largely harmless, despite being historically and incorrectly confused with plague-harbinger locusts.

"They will stare out at the world with fiery red eyes, emanating stolid arrogance, that, it must be said, serves to mask a profound stupidity," former Tribune reporter Peter Gorner wrote in an extensive 1990 story on the Chicago brood.

Some of the earliest to emerge will be snapped up by predators. Others may be afflicted by a fungus: one notorious pathogen eats away at their butts. Infected males have exhibited behavior that, politely, might be described as libidinous, and some have been found to harbor a cocktail of illegal substances equivalent to what one might take at a weird party.

But the survivors will build up their band. And then the males call, and call.

Septendecim is known for its singsong "phaaaaraoh" call, with a drop in pitch at the phrase's end. Cassini comes on strong and then shifts to something more staccato, like a lawn sprinkler. For septendecula, it's a straightforward metronome tick.

The calls are created by vibrating ribbed membranes inside the males' abdomen, called tymbals, amplified by the bugs' bodies. Individually, these cicadas aren't exceptionally loud, but there's a lot of them.

"You'll have these huge emergences where cicadas will form chorus centers, where the males will just scream waiting for the females to fly in," Dana said.

Reciprocating females from the same species flick their wings. Eggs laid by females in branches and twigs hatch in a month or two and orphan nymphs fall to the ground, burrowing down.

"A lot of them don't make it very far," Dana said. "But the ones that do set up a little tiny chamber in the soil around a root. And they have a strawlike mouth that they stick into the roots to drink."

The cicadas grow and feed off xylem which provides a steady, if moderate, diet.

"As far as we know they don't do much damage below ground, which is sort of cool because they're taking all this really low-nutrient food and then bringing it above ground," Dana said. "And then there's this massive feast for every animal out."

The mass emergences make for a good survival strategy—overwhelm predators to the point where they've eaten all they possibly can at the bug bacchanal. Dana said she's seen photos of cut-open, cicada-stuffed snakes—copperheads are reportedly fond of the bugs. Some insectivorous birds can be brutal. Even dragonflies have plucked cicadas out of Dana's net.

Many of Illinois' cicadas are associated with prairies—now fragmented habitat. Broods come and go. Part of the work is just trying to figure out, where are the cicadas?

"I really hope for the conservation of these species," Dana said. "You'd think for an animal that screams at you that you'd know it's there. But people haven't really been looking."

Mapping looks different now than it did more than a century ago when the Bureau of Entomology sent postcards out to schools and science teachers to ask for cicada reports. But it still takes time—and reliable reports.

In Illinois, there's interest in the boundaries between 13- and 17-year cicada broods, which runs near the middle of the state. The 17-year broods roughly stick to the northern half of the state and 13-year broods cover the southern half. Brood X is an exception.

"One hypothesis is that if the climate is warming, it will make areas in the north more attractive for 13-year cicadas, and they'll move north," said Cooley, the Connecticut researcher. "Anything that messes with the

forest and the trees is going to mess with them."

Sometimes, cicadas make mistakes, usually in increments of one or four years. Last summer in Chicago, some members of Brood XIII, expected in 2024, arrived early—and not for the first time.

"So these early emergences are really interesting because the question that we have is—are they indications of the cicadas' cycle breaking down in response to something like climate change?" Cooley said.

The last time Brood X emerged in Illinois, they were spotted around Vermilion, Edgar, Clark and Crawford counties.

"I was getting some pretty heavy duty chorusing activity the first week of June," Cooley said. "Some of the populations in that area in eastern Illinois in 2004 were among the densest populations I've ever seen. It's just great habitat for them."

Cooley hopes to remap and see if there are any changes.

"The fact that you have them indicates something is going right with the forest," Cooley said. "You might find them annoying. But in fact what they're telling you is the forest is still working like it's supposed to"—a good reminder if you happen to find yourself at Kickapoo State Park around Memorial Day.

Even if you miss out on Brood X this summer, 2024 is coming.

"We go downstairs for breakfast, and right away we can hear them," one Lincolnshire resident told the Tribune during the 2007 emergence. "Then we go outside to our backyard, and it's like the concert begins."

In 2024, broods of 13- and 17-year-olds will cover the north and south of

the state in the event of a lifetime for entomologists—and for the bugs. There's not much overlap between the northern Brood XIII, a 17-year group, and Brood XIX, 13-year cicadas. But if they encounter each other, they can hybridize.

"That will be among the last chances I have in my professional life to get into the questions of the mating behavior of these species, and of the species belonging to different life cycles," Cooley said.

He's prepared to be surprised.

"I think that's part and parcel of studying nature, is that you may gloss over it or ignore it or think it's simple on the outside, but it really isn't. What's going on is very subtle and very complicated."

Marianne Alleyne, an assistant professor in the department of entomology at the University of Illinois at Urbana-Champaign, grew up in the Netherlands, moved to California for college and ended up studying some of those complications in a cicada epicenter.

"What was really new to me after living in all these places was cicadas," Alleyne said.

Alleyne has studied the wings of annual cicadas, which are superhydrophobic. Meaning, Alleyne said, "that when water lands on it, it just stays in a bubble and then it kind of rolls away and then it maybe can clean any dust particles or even microbes off." Engineers are looking to these properties to create water repellent and antimicrobial surfaces.

As for where to see some of her favorite creatures in Illinois, Alleyne offered a tip based on a cicada trip her kids still talk about: "I highly recommend cemeteries."