

FOCUS BEETLES

Ladybug patrol spreads its wings

Citizen scientists snap at chance to help project shed light on why some species are fading

By **TINA SUSMAN**
Tribune Newspapers

NEW YORK — Leah Tyrrell wants to make something clear: She does not wear ladybug sweat shirts. She does not carry her belongings in ladybug bags, shelter from the rain beneath a ladybug-shaped umbrella or take notes with pens decorated with little ladybugs.

True, someone did give her earrings in the shape of ladybugs, and another admirer gave her a rock painted like a ladybug. A woman once saw her in the supermarket and said loudly, "Oh! The ladybug lady!"

For the most part, the Buffalo, N.Y.-based student and mother of two says she is no different from thousands of other people across North America who have become absorbed in the Lost Ladybug Project, which Cornell University entomologist John Losey started 12 years ago to document the insects and determine why some species are declining.

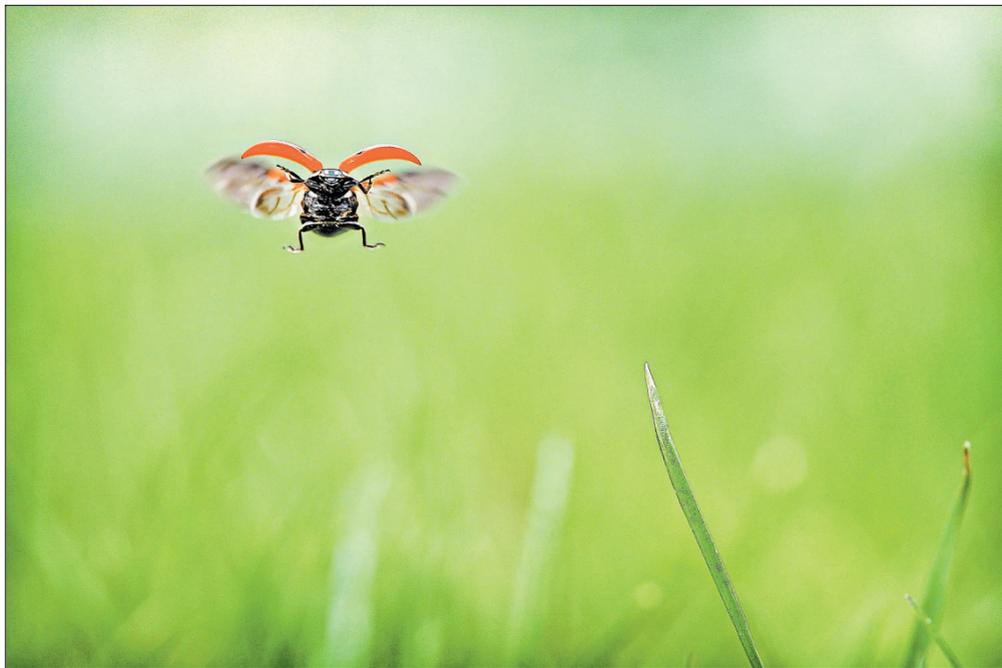
In the beginning, ladybug collectors worked with sticky cards — trapping the bugs on gluey bits of paper and sending them to Cornell. It was good for the science but not for the ladybugs.

By 2004 the program had gone digital, with participants uploading photographs of ladybugs and volunteers pulling together a database of the discoveries. Now, the Lost Ladybug Project is a popular "citizen scientist" project, with about 15,000 sightings reported by spotters.

"People just love ladybugs," said Losey, who has funding from the National Science Foundation to keep the project going at least through 2015. "It's a very sort of charismatic, approachable insect."

With prime ladybug-spotting season approaching — ladybugs tend to hibernate in fall and winter — people like Tyrrell once again are heading outside in search of the little beetles. Many are buoyed by last summer's discovery of some rare nine-spotted ladybugs on Long Island.

"It's ridiculous how much I know about them now," Tyrrell said as she headed into her garden for a peek at her plum tree, ticking off trivia about ladybug mating and eating habits. "They eat every-



A ladybug flutters across a field in Walla Walla, Wash. The Lost Ladybug Project, which began 12 years ago to determine why some species are declining, has amassed about 15,000 sightings across North America.

thing from aphids to mold."

Like most of those who submit ladybug photos to Cornell, Tyrrell, 33, is not a bug expert and has no special science training. She is a self-described nature lover who dotes on the native plants in her organic garden in central Buffalo. Tyrrell credits her study of art and photography in high school with enabling her to spot the tiny bugs that others might never notice.

"A lot of people are looking for something specific. They're not necessarily looking for something the ladybug project wants them to search for," she said.

In July 2009, Tyrrell and her toddler son, Jack, discovered an *Adalia bipunctata* — a two-spotted ladybug — in their plum tree. Of all the ladybug sightings reported to Cornell, only 222 have been this species, and most have turned up in Canada and the western U.S.

The famous beetle

But no sighting has generated as much excitement as the one last July at the Quail Hill organic farm on Long Island. There, Peter Priolo found a nine-spotted ladybug, the first documented in New York state in 29 years.

The species had become so rare in New York that lawmakers considered replacing the nine-spotted ladybug — formally known as *Coccinella novemnotata* — as the official state insect. Just over 100 of the once-common nine-spotted brand, valued for

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— John Losey, Cornell University entomologist

devouring pests, have been reported to the Lost Ladybug Project from anywhere in North America.

"That's the celebrity beetle of the group. It's like the golden ticket," said Priolo, 27, an organic gardener and agricultural expert who was working with Cornell and with the Peconic Land Trust, which runs Quail Hill, when he found the bug.

By comparison, spottings of *Harmonia axyridis* — the Asian ladybug, introduced to the United States in the 1980s in a pest-control effort — number in the thousands, leading scientists to speculate that introduced species are pushing out natives.

"It was incredible, like goose bumps," Cornell entomologist Leslie Allee said of Priolo's discovery. "The two-spot was really cool; the nine-spot was like, 'Wow!' "They used to be just every-

where, and now they're not," Allee said of many native ladybug species, which account for about 500 of the world's approximately 5,000 types. "We want to try to understand why, and if we can bring those species back."

Losey said he has noticed the native bugs found are generally smaller than they once were, a sign that nonnative species are beating them to the aphids and other pests ladybugs feed on. But he's encouraged by the numbers of bugs being reported, something that would not be possible without thousands of citizen scientists.

Submitting photos

Spotters have submitted photos of bugs on the pavement at Walt Disney World in Florida, on the grassy plains of Wyoming and on a tattered green dishrag in California. There are photos of ladybugs with their tiny wings spread; ladybugs perched atop coins, beside rulers and on fingertips to reflect their size; ladybugs in glass containers; ladybugs on arms, leaves and at the centers of daisies; and ladybugs clustered in thousands on tree trunks and rocks.

On the Lost Ladybug Project's Facebook page, followers post updates on sightings. "YAHOO! I thought it would be too early to see ladybugs here, but I just submitted my first photos of the season!" one wrote.

The ladybug project is one of dozens that invite nonscientists to

document everything from bobcats to butterflies, eels to frogs. But unlike most, the ladybug project is not confined to a specific region, and participation requires little more than a digital camera and perhaps a sweep net and a jar.

During his visit last year to the Quail Hill farm, Priolo corralled a group of hunters, including his grandmother, to fan out in search of ladybugs.

At the end of the day, the bugs were inventoried and photographed, and most set free. But Priolo took his own jar home with one bug inside. He sent a photo to Losey, who confirmed the good news: The state insect was alive and living on Long Island.

"I was kind of jumping up and down in my living room. It was like a chance of a lifetime — an accomplishment, really," said Priolo, who released the bug into his organic garden. Subsequent searches turned up more of the species at Quail Hill.

Some rare ladybugs are caught and sent to Cornell for mating in a ladybug lab. A separate colony of aphids is maintained to feed them.

Tyrrell has sent five ladybugs. She became involved in the project about three years ago, when she and Jack, then 2, attended an event at a nature reserve and happened upon the Lost Ladybug Project booth.

"A woman kept pointing to a two-spotted ladybug and insisting she had one in her front yard," entomologist Allee recalls of her first encounter with Tyrrell. "I kept saying, 'Oh sure, it's possible but probably you're seeing something else.' "

No two-spotted ladybugs had been seen in the state for years. Tyrrell, though, was certain.

When Tyrrell got home that day, a ladybug flew off the plum tree, landed on her mother's arm, and Jack caught it. A closer look confirmed it was a two-spotted ladybug. They photographed it, gave it a name — Jack dubbed it Marty Stouffer, in honor of the "Wild America" television show host — and sent it to Cornell.

All those digital images prompt a question: How do Losey and Allee know that people aren't altering photographs, perhaps adding or removing a spot or two?

"I don't think it's possible," Losey said, noting that there are countless characteristics that make each beetle special. "You would really have to be a good forger at a very high level to fool our ID people. You could add the spots, but we'd know something was fishy."

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Spotting ladybugs

Cornell University's Lost Ladybug Project relies upon the participation of thousands of citizen ladybug spotters spanning North America to photograph or send in examples they spot. The project was started in 2000 because of rapidly changing ladybug distribution patterns both in populations and range.

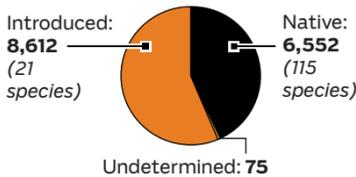
PROJECT GOALS

- Understand and help prevent native species from becoming scarce.
- Create maps to study habitat patterns, distribution numbers and climate characteristics of a specific area.
- Create the largest database from every state, Canada and Mexico to confirm shifts from native to invasive species.
- Document range shifts through spotters.
- Create new colonies from acquired ladybugs, where controlled lab studies can search for patterns that may hold clues to their disappearances.

SOME FINDINGS

- Located more rare ladybugs, some in new locations, than any other survey in decades.
- Lab study showed the development of pathogens that may have contributed to population declines in the wild.
- Rare ladybugs were smaller in the wild than in the lab where they were fed regularly. This demonstrated the theory that invasive species were depleting food supply.

Specimens as of May 2
Total identified: **15,239**



About ladybugs

Ladybugs or lady beetles are flying insects in the *Coccinellidae* family of the beetle order, *Coleoptera*. There are more than 500 species in the U.S. and more than 4,500 worldwide. Non-native species may have been introduced to the U.S. by scientists as an attempt to control crop-damaging aphids, or entered with vegetation from Europe, Africa or Asia.

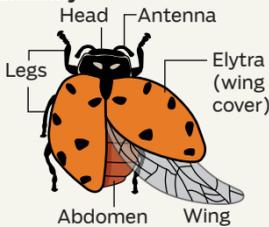
Identification: Small, brightly colored with spots.

Diet: Aphids, soft-bodied insects, insect eggs, plant and pollen mildews.

Life span: About one year.

Predators: Assassin bugs, stink bugs, spiders and toads.

Anatomy



A COMMON LADYBUG

Multicolored Asian ladybug
Harmonia axyridis (invasive)
Size: 5-8 millimeters



PHOTO COURTESY STEVE SPITZER

Total identified through project as of May 2: **4,919**



About: Native to Asia, introduced to the U.S. as a biological control agent where it is now widespread. Has a wider range of colors and spot numbers than other species.

A RARE LADYBUG

Nine-spotted ladybug
Coccinella novemnotata (native)
Size: 5-7 millimeters



PHOTO COURTESY GAIL STARR

Total identified through project as of May 2: **108**

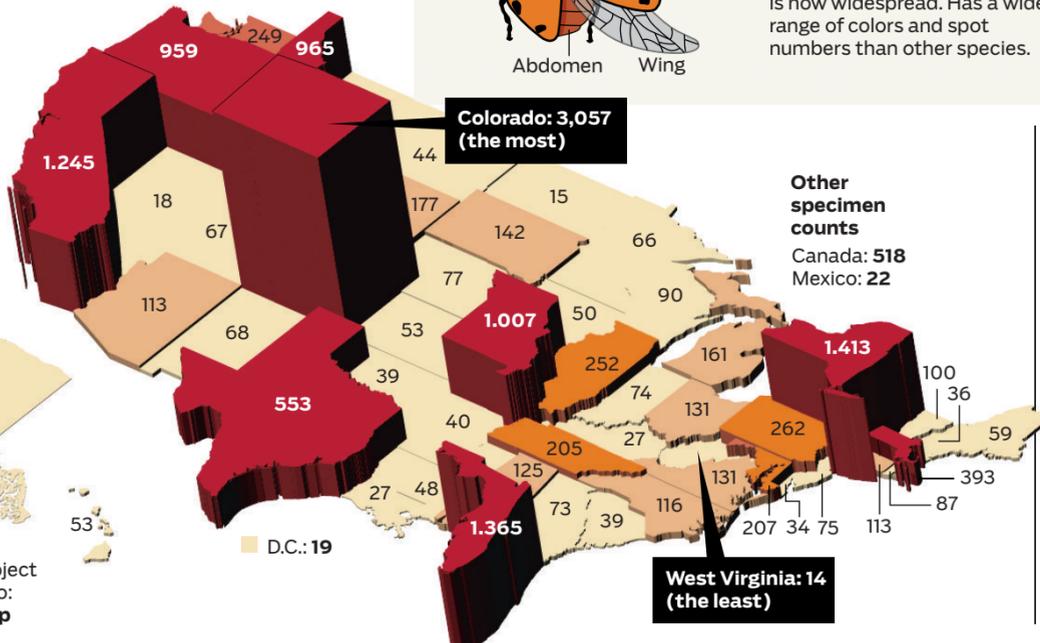


About: New York's official state insect. Widespread and revered for suppressing pests until the mid-1980s, when populations declined and it was feared extinct. Small populations were recently discovered along the East Coast.

Project specimens by state

As of May 2

- 100 or fewer
- 101-200
- 201-300
- More than 300



COLLECTING LADYBUGS

When to look: Early summer when it's not too dry.

Where to look: Lush plant growth, agricultural fields, wildflowers, weeds and trees. They are also attracted to outdoor lights.

Tools: Sweep net (tough cloth bag) and a jar.

Photographing: Because they are active, you can slow them down by putting them in a freezer or cooler safely for about five minutes. Six minutes may kill them.

Identifying: Field guide or posters. Collected online journals.

