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NEWS ANALYSIS

The Year the Monarch Didn't Appear



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Published: November 22, 2013

ON the first of November, when Mexicans celebrate a holiday called the Day of the Dead, some also celebrate the millions of monarch butterflies that, without fail, fly to the mountainous fir forests of central Mexico on that day. They are believed to be souls of the dead, returned.

This year, for or the first time in memory, the monarch butterflies didn't come, at least not on the Day of the Dead. They began to straggle in a week later than usual, in record-low numbers. Last year's

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low of 60 million now seems great compared with the fewer than three million that have shown up so far this year. Some experts fear that the spectacular migration could be near collapse.

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"It does not look good," said Lincoln P. Brower, a monarch expert at Sweet Briar College.

It is only the latest bad news about the dramatic decline of insect populations.

Another insect in serious trouble is the wild bee, which has thousands of species. Nicotine-based pesticides called neonicotinoids are implicated in their decline, but even if they were no longer used, experts say, bees, monarchs and many other species of insect would still be in serious trouble.

That's because of another major factor that has not been widely recognized: the precipitous loss of native vegetation across the United States.

"There's no question that the loss of habitat is huge," said Douglas Tallamy, a professor of entomology at the University of Delaware, who has long warned of the perils of disappearing insects. "We notice the monarch and bees because they are iconic insects," he said. "But what do you think is happening to everything else?"

A big part of it is the way the United States farms. As the price of corn has soared in recent years, driven by federal subsidies for biofuels, farmers have expanded their fields. That has meant plowing every scrap of earth that can grow a corn plant, including millions of acres of land once reserved in a federal program for conservation purposes.

Another major cause is farming with Roundup, a herbicide that kills virtually all plants except crops that are genetically modified to survive it.

As a result, millions of acres of native plants, especially milkweed, an important source of nectar for many species, and vital for monarch butterfly larvae, have been wiped out. One [study](#) showed that Iowa has lost almost 60 percent of its milkweed, and [another](#) found 90 percent was gone. "The agricultural landscape has been sterilized," said Dr. Brower.

The loss of bugs is no small matter. Insects help stitch together the web of life with essential services, breaking plants down into organic matter, for example, and dispersing seeds. They are a prime source of food for birds. Critically, some 80 percent of our food crops are pollinated by insects, primarily the 4,000 or so species of the flying dust mops called bees. "All of them are in trouble," said Marla Spivak, a professor of apiculture at the University of Minnesota.

Farm fields are not the only problem. Around the world people have replaced diverse natural habitat with the biological deserts that are roads, parking lots and bluegrass lawns.

Meanwhile, the plants people choose for their yards are appealing for showy colors or shapes, not for their ecological role. Studies show that native oak trees in the mid-Atlantic states host as many as 537 species of caterpillars, which are important food for birds and other insects. Willows come in second with 456 species. Ginkgo, on the other hand, which is not native, supports three species, and zelkova, an exotic plant used to replace elm trees that died from disease, supports none. So the shelves are nearly bare for bugs and birds.

Native trees are not only grocery stores, but insect pharmacies as well. Trees and other plants have beneficial chemicals essential to the health of bugs. Some monarchs, when afflicted with parasites, seek out more toxic types of milkweed because they kill the parasites. Bees use medicinal resins from aspen and willow trees that are antifungal, antimicrobial and antiviral, to line their nests and to fight infection and diseases. "Bees scrape off the resins from the leaves, which is kind of awesome, stick them on their back legs and take them home," said Dr. Spivak.

Besides pesticides and lack of habitat, the other big problem bees face is disease. But these problems are not separate. "Say you have a bee with viruses," and they are run-down, Dr. Spivak said. "And they are in a food desert and have to fly a long distance, and when you find food it has complicated neurotoxins and the immune system just goes 'uh-uh.' Or they become disoriented and can't find their way home. It's too many stressors all at once."

There are numerous organizations and individuals dedicated to rebuilding native plant communities one sterile lawn and farm field at a time. Dr. Tallamy, a longtime evangelizer for native plants, and the author of one of the movement's manuals, "Bringing Nature Home," says it's a cause everyone with a garden or yard can serve. And he says support for it needs to develop quickly to slow down the worsening crisis in biodiversity.

When the Florida Department of Transportation last year mowed down roadside wildflowers where monarch butterflies fed on their epic migratory journey, "there was a huge outcry," said Eleanor Dietrich, a wildflower activist in Florida. So much so, transportation officials created a new policy that left critical insect habitat un-mowed.

That means reversing the hegemony of chemically green lawns. "If you've got just lawn grass, you've got nothing," said Mace Vaughan of the Xerces Society, a leading organization in insect conservation. "But as soon as you create a front yard wildflower meadow you go from an occasional honeybee to a lawn that might be full of 20 or 30 species of bees and butterflies and monarchs."

First and foremost, said Dr. Tallamy, a home for bugs is a matter of food security. "If the bees were to truly disappear, we would lose 80 percent of the plants," he said. "That is not an option. That's a huge problem for mankind."

Jim Robbins is a frequent contributor to The New York Times and the author of "The Man Who Planted Trees."

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A version of this news analysis appears in print on November 24, 2013, on page SR9 of the New York edition with the headline: The Year The Monarch Didn't Appear.

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