

SCIENCE

What All the Affection for Monarch Butterflies Misses

For all the attention the butterflies receive, there's little appreciation for how people have shaped their environment.

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DARIO LOPEZ-MILLS / AP

Here in Maryland, where I live, monarch butterflies were everywhere last summer. Some days I saw several black-and-orange visitors wafting past or opportunistically sucking nectar from nearby flowers. It was a dramatic—and welcome—contrast to recent years, when I would have counted myself lucky to notch that many encounters in a season.

Monarch butterflies are in trouble, and when scientists report each new drop in overwintering monarch-butterfly populations, the alarmed headlines emerge as predictably as monarchs used to in summer. This season, the population that congregates in Mexico and breeds in the eastern and midwestern U.S. is doing

relatively well, but the one that migrates up and down the West Coast appears to be on the brink of collapse. The attention these migrations receive, and the desire it reveals for a connection to ever-dwindling nature, mark a growing, collective sense that humanity's impact is reaching a breaking point. The monarch, the polar bear: Like the whales that inspired 1970s conservation, they have become our bellwethers.

But choosing one insect to represent a huge swath of nature is both reductive and potentially dangerous. Scientists, environmentalists, and the public have vested the butterfly's fortunes with such symbolic weight that the disappearance of its migration could be interpreted as an irreparable catastrophe. Yet the monarch is actually an outlier among insects—one whose abundance humans have unwittingly enhanced.

[Read: Is the insect apocalypse really upon us?]

The end of the monarch migration would be a huge loss. But it need not take away our faith in nature's resilience. Millions of other insects and ecological relationships all around us—literally in our backyards—represent nature just as fully as the monarch. We need to get to know them too.

Since it was first definitively reported, in 1857, the monarch butterfly's annual migration has become a potent symbol of what we in North America mean when we say "nature." Millions of monarchs alight northward from Mexican and Californian forests every spring. They find milkweed plants and mate; females lay eggs. Caterpillars hatch, feast, chrysalize, and metamorphose into new butterflies, which set off northward toward yet new breeding grounds. Come fall, the great-grandchildren and great-great-grandchildren of the original migrants head south, returning to trees that neither their parents nor even their grandparents ever knew.

But the bounty we have come to expect exists in part because earlier generations altered our landscape to make it possible. Monarch-butterfly caterpillars eat only leaves of plants in the milkweed genus, and the most important milkweed species for monarchs—common milkweed—grows best in open, recently disturbed areas. Nature, of course, creates disturbances such as wildfire and grazing bison. But few forces restructure landscapes as efficiently and on such large scales as humans—

especially technologically advanced ones.

Since the first people walked across an icy land bridge onto this continent, we humans have profoundly altered it, wiping out dominant animal species, setting fires to keep land open, and farming. Native Americans used common milkweed for food and likely increased its abundance. Then European settlers cleared forests and native prairies, and reworked the landscape into a patchwork quilt of small farms where “weeds” such as common milkweed readily grew in margins, along fences, and between crop rows—where they benefited from fertilizers added to aid crops. Could a better monarch-butterfly habitat have been designed?

Before 1492, most of the eastern U.S. was forested. In Maryland, for example, forest cover was about 95 percent; milkweeds—and monarchs—would have at most occupied small clearings. More than half of that forest has since been replaced by farms and other land cover. “There is little doubt that land-use changes over the last 200 years have greatly aided the expansion of milkweeds,” a Canadian biologist wrote in 1996, adding that this expansion led to a “demonstrable increase in the abundance and distribution of Monarchs in Ontario over the last 5 decades.”

In the West, where the butterfly has lately generated headlines, humans also helped monarchs, starting around the time of the Gold Rush, by planting Australian eucalyptus trees along the California coast. Groves of eucalyptus are now among the butterflies’ favorite roosting spots; they also seem to enjoy Russian olive. This has put conservationists in the odd position of championing non-native trees to try to save a native insect.

Farming and land clearing did reduce the abundance of some milkweeds, such as those that live in prairies. But only in recent decades have human activities become a clear threat to monarch butterflies. During that period, American farms consolidated, and farmers began planting from fencerow to fencerow, applying powerful insecticides and adopting genetically engineered crops that allow for mass herbicide spraying, which has reduced monarchs’ breeding habitat. Logging in the Mexican forests has cut into monarchs’ winter habitat. Warming weather, a parasite that infects monarchs that overwinter in the U.S. South, and collisions with cars on highways are also taking a toll. Choose almost any large-scale

environmental concern—climate change, agricultural chemicals, GMOs, deforestation, suburban development—and the beleaguered monarch seems to embody it.

Nothing, perhaps, is more natural than wanting to save nature. Nearly everyone, in one way or another, cherishes and wants to preserve a remembered or mythologized environment that seems less impacted and more whole.

But most of us—and I want to be clear that I include myself—are confused about what the actual nature is that we want to protect. Humanity's environmental footprint has been so heavy for so long, and we know so little about the life around us—much less about the myriad complex interactions that sustain this life—that we may have little sense of what was here before us, and what is here because we are here. Often we seek to preserve a version of nature that is already profoundly altered and simplified.

Many of us have grown so used to the tiger-colored insects casually flitting through our fields and gardens that the thought of their absence is almost too much to bear. So rather than reforest places that were once forested, conversation-minded people plant yards and parks with milkweed and nectar-producing plants, seeking to attract monarchs.

That in itself is surely harmless, and plants that attract monarchs also benefit many others. (More than 450 insects are known to eat common milkweed.) There is danger, however, in pinning so many hopes on one charismatic species. This is obviously not how nature operates. It goes instead for strength in numbers and diversity; it hedges its evolutionary bets with a profusion of forms.

The sheer numbers can defy belief. According to the Biota of North America Program, Prince George's County, where I live, is a national hot spot for plant biodiversity. Somehow, even in this highly populated and developed suburban jurisdiction, with a several-century history of deforestation and farming, more than 1,200 native plants have been documented. Every one of those plants harbors its own retinue of native insects, which feed everything else.

The closer you look, the more astounding it can get. The entomologist Douglas

Tallamy has found 879 species of moths alone on his property. And there are probably many more out there. “I can still go out in my backyard and find an undescribed species without a whole lot of trouble,” he told an audience at the Audubon Naturalist Society in Chevy Chase, Maryland, in December. Tallamy does not live in a remote nature preserve; he lives on a fairly modest 10-acre lot in the Pennsylvania exurbs, where he has judiciously cultivated insect-harboring native plants.

The rest of the insect world might be subtler than the gaudy monarch; more time and work are required to get to know it. But that knowledge can open up a richer and more empowering conception of nature than one gets from hanging everything on the success or failure of a single species of butterfly. This work starts with recognizing the hidden biodiversity that lurks everywhere—under the leaves in our gardens and the bark of our trees, in the soil, and even inside shivering dried-out flower and grass stalks that provide homes for native bees in winter.

“If you want the zebra swallowtail, you have to have pawpaw,” says Tallamy. “If you want the oak-leaf skeletonizer, you need oaks.” Few of us can effortlessly rattle off plant-insect mutualisms like this. But we can learn which plants host the most insect species—oak, cherry, and willow top the list in my neck of the woods—and choose them over conventional landscaping fare.

“Our life is frittered away by detail,” Thoreau wrote. “Simplify, simplify.” In nature, life is not frittered away by detail; it is detail. Complexify, complexify.

So where does that leave us with the monarch? Compared with most of the species Tallamy has found in his yard, the monarch butterfly was probably an occasional visitor to this part of the world back when forests dominated. Seeking to preserve the monarch migration means holding on to something that we have, to a large extent, helped create. There’s nothing wrong with that. I view it as the same impulse that drives us to protect farmland from suburban sprawl, or antiquities from decay and destruction. I believe the great (and, sadly, recently deceased) monarch expert Lincoln Brower might even have been hinting at this with his favorite answer to a persistent question: What difference would it make if the monarch migration ended?

“What difference would it make if we lost the *Mona Lisa*?” he countered. The modern, continental-scale monarch migration could indeed be one of humanity’s greatest works.

However, I would argue that, with its endlessly superfluous and stunning and, frankly, often absurd life forms—from speckled and polka-dotted and eyespotted moths to apocalyptically armored beetles to the hundreds of thousands of wasp species that lay eggs inside caterpillars and other insects so that hatching larvae can eat their hosts from the inside—nature has produced a strange and wonderful body of work that outshines even the monarch migration.

[*Read: The butterflies’ great migration*]

And here I think the *Mona Lisa* analogy suggests a second point: We care about the monarch and its migration not because it is useful to us, but because it is something far more important than useful—it is meaningful, and beautiful, to us.

The same is true for nature’s riotous, unruly, unreasonable abundance. Utility will never provide a compelling rationale for preserving biodiversity. We’ve grown wealthy even as we’ve driven species to extinction. The authors of a major recent UN report warn that if we continue to pummel the biosphere, we will pay the price at some point, in the form of food insecurity, polluted water, and other lost ecosystem services. In the long term, they are right, of course. But I suspect we can probably continue on our current exploitative path for some time before the toll becomes obvious.

This wealth may look good on a balance sheet. But if it comes at the expense of nature, it is an impoverished kind of wealth.

Think about how your heart might lift upon seeing a monarch butterfly. Now imagine that moment multiplied by thousands. That’s what awaits those who open their eyes to the full bounty of nature around them. It’s what happens when the dormant plants you put in the ground last fall open up in April, and previously unseen bees and butterflies and flies show up from who knows where to feed, so numerous and so busy that at times the Earth itself seems to vibrate. I myself have experienced only the first fleeting glimpses of this, but I’m already hooked.

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