

# Meddling With Monarchs



By Margaret Renkl

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Nashville — Back in July, as I sat before the butterfly enclosure in my family room, waiting to see if maggots would emerge from a twitching monarch caterpillar clinging to the screen at the top of the cage, two thoughts occurred to me: Is the caterpillar suffering? And is this what obsession looks like?

Here in Middle Tennessee, the monarch migration hit its official midpoint on Oct. 2, but I have not seen a single monarch in my pollinator garden this year. God knows it's not for lack of trying. In spring I planted two additional varieties of milkweed, the monarch's host plant, to supplement the milkweed already nestled among coneflowers and liatris and coreopsis and beebalm. The monarchs never arrived.

Milkweed is the only plant that a monarch will lay her eggs on and the only plant a monarch caterpillar will eat, so when the milkweed bloomed, I gathered their seeds and replanted, in case the butterflies turned up late this year. They did not turn up late. Deciding to jump-start the whole process, I finally ordered a dozen caterpillars from a teacher-supply catalog and jury-rigged an enclosure over the milkweed bed. It was full dark by the time I finished anchoring the mosquito netting to the ground.

In the morning I found a hole in the net and three caterpillars missing. Over the next two weeks, most of the others disappeared or died. The last two actually got so far as to form a chrysalis, but a storm knocked one of them to the ground before it had fully hardened. The other I brought inside according to recommendations from the monarch groups I'd joined on Facebook. That last chrysalis seemed healthy, but the butterfly couldn't break free despite painstaking assistance from a pair of tweezers I was wielding on advice from the online chorus. Hours later, when I reported that the half-emerged butterfly had died, my computer erupted with crying-face emojis. I felt like crying myself.

A pollinator garden never goes to waste, and this year I've had a bumper crop of gulf fritillaries, swallowtails, clouded sulfurs and one hackberry emperor — as well as a tiny gray hairstreak butterfly, smaller than my pinkie fingernail. The honeybees and wasps and bumblebees have been in heaven here, too, and hummingbirds kept trying to guard the flowers from seed-hunting goldfinches, who cling to the stems and rip the petals apart in a paroxysm that looks exactly like joy. But there has been no sign of monarchs, and I planted this garden for them.

The life cycle of the monarch hinges on the availability of milkweed, but the prevalence of the herbicide Roundup has made milkweed very hard to find: Crops genetically modified to withstand herbicides can be carpet-sprayed, poisoning every wildflower in its wake. Milkweed, which once grew in great stands along the nation's roadsides and in the margins of farms, essentially disappeared from the American landscape overnight. In 1996, the year before Roundup-resistant soybeans and corn were first planted in the Midwest, the butterflies' primary migration corridor, there were a billion migrating monarchs in North America. This year there are roughly 109 million, and that number is down 27 percent from just last year.

The monarch is the only butterfly that migrates thousands of miles the way birds do, wintering in Mexico and traveling — through successive generations in a single season — as far north as Canada before heading south again. Their travels make them vulnerable to more than just the loss of milkweed. Two other causes of population decline are deforestation in their Mexican wintering grounds and, you guessed it, climate change.

Of all the assaults on the monarch population, climate change may prove the most pernicious. In summer, excessive heat stresses developing caterpillars already vulnerable to diseases and predators. In fall, unseasonable warmth can prevent them from heading south in time to reach their wintering grounds, and extreme weather events like hurricanes can destroy an entire wave of the migration before it reaches Mexico. Worst of all, climate change threatens the monarchs' wintering grounds, where very specific environmental conditions keep them in a hibernation-like state. In winter, unstable temperatures in Mexico can wake the butterflies too early from hibernation, sending them north before the nectar flowers they feed on have bloomed. And by some estimates, that microclimate high in the mountains of Mexico will all but disappear by 2030.

Not all monarchs in North America migrate. In South Florida, they live and breed year-round, though virtually all of those butterflies are heavily infected with protozoans that weaken the population. Monarchs west of the Rockies travel much shorter distances, overwintering on the California coast, but that population is in even worse shape, down 97 percent from its pre-Roundup norm. A new study this year suggests that it's on the verge of extinction.

In the wild, less than 10 percent of monarch caterpillars survive to adulthood, even when environmental conditions are ideal. Monarch enthusiasts bring in the eggs they find outside to rear indoors, hoping to improve those odds. When something goes wrong for someone in an online butterfly group, the refrain of consolation is always a reminder of how poorly the monarch fares in nature, of how even one success will help to "raise the migration."

Since I had no eggs to collect from my own milkweed, I decided to order another set of caterpillars from a different supplier and try again indoors. I put them in a professionally manufactured butterfly enclosure and fed them milkweed leaves I'd sterilized and rinsed. The monarch stewards in my online groups were having glorious success with this method, releasing hundreds of monarchs they'd collected as eggs earlier in the summer. They kept posting videos of the newly emerged butterflies walking delicately over their hands, and I was going a little mad with jealousy. I typed in my credit-card number one more time.

O.K., two more times. Still, not a single caterpillar survived.

There are many possible causes, both natural and chemical, for my failure. At the top of the list: user error. And my plan was flawed from the beginning, it turns out. Releasing monarchs raised from commercial butterfly farms can create additional risks for the native population, spreading disease, limiting genetic diversity and interrupting scientific efforts to understand the migration.

I haven't decided whether I'll go on a quest for wild monarch eggs when these lovely creatures return to Middle Tennessee next spring, but I think it's time to admit that the pollinator garden I've planted here in sterile suburbia is just not big enough to attract a migrating butterfly high in the sky. Still, it's possible, and if there's any sight more heart-lifting than a monarch butterfly glowing in the sunshine, I don't know what it might be. When I finally saw one the other day, it was flying straight down the middle of my street, heading south.

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