

MONARCH BUTTERFLIES, EACH SMALLER THAN THE PALM OF YOUR HAND, MIGRATE THOUSANDS OF MILES EVERY YEAR, THUS ENSURING THE SURVIVAL OF THE SPECIES.

FROM NOVEMBER TO MARCH, BLACK-AND-ORANGE FLECKS fill the sky in central Mexico's mountains and along the California coast. These airborne dots are monarch butterflies (*Danaus plexippus*) flitting about in their winter habitat. They flutter and float by day; before the sun disappears, they glide to the trees and gather in clusters, creating a forest of tangerine-tinted trunks as they huddle together for warmth. Anyone lucky enough to witness this display is privy to a mysterious phenomenon. Though these animals, part of the Lepidoptera insect order, weigh only as much as a paper clip, they migrate up to 3,000 miles annually, using the sun's position in the sky to stay on course. Their Mexican wintering sites were unknown until 1975, when Kenneth Brugger, working with monarch researchers Fred and Norah Urquhart, discovered a colony on Sierra Pelon, an 11,483-foot mountain.

THE FLIGHT CYCLE

The monarch migration is unlike that of any other Lepidoptera. As August days grow shorter and cooler, the butterflies emerge across the northern United States and southern Canada. They gorge on nectar in preparation for their long journey. Scientists don't fully understand which cues trigger monarchs to move to warmer climes, but some surmise it's based on the sun's angle in the sky. Monarchs west of the Colorado Rockies—a tiny percentage of the world's population—head toward the Pacific Ocean, taking up residence in Monterey pines and eucalyptus trees along California's coast. The millions-strong eastern population migrates to oyamel fir forests high atop 12 mountains in central Mexico. The trees, which grow only at altitudes of roughly 7,900 to 11,800 feet, offer a cool, protected, moisture-filled environment where the butterflies live out the winter. All migrating swarms reach their destinations by mid-November. In March, as the days lengthen, the overwintering butterflies start to produce the hormones their bodies need to create the next generation. The insects fly north, each female laying hundreds of eggs on milkweed plants in the southern United States. Finally, after fulfilling their reproductive responsibilities, these nine-month-old

monarchs die. Their offspring, which live just three to five weeks, take over, like a relay team with a twofold mission: to move north and to procreate as they go. One generation after the next—up to four—pushes toward Canada, mating and laying eggs before dying. Likely spurred by late summer's shorter days, the last generation, which will live for up to nine months, turns around and heads south, starting the process again.

AN ENDANGERED HABITAT

North America's monarchs may number in the hundreds of millions, but both their breeding and wintering grounds are at risk. Between the thousands of acres lost daily to development and the widespread, indiscriminate use of herbicides, good monarch habitat—particularly that containing milkweed, which is absolutely key to these butterflies—is disappearing fast. Meanwhile, development along California's valuable coast, and demand for Mexico's oyamel fir trees, used to build furniture and houses, mean potentially fewer places for the insects to settle during cold months. What's more, as the firs are cut down—both legally and illegally—the loss of trees and the resulting drop in temperature make the Mexican forests inadequate habitat for the butterflies.

WHAT YOU CAN DO

The easiest way to help monarchs is to plant milkweed, which is essential to their larval and pupal stages, and other nectar sources. You can create supporting habitat in home

gardens, parks, almost anywhere. Perennials such as black-eyed Susans and annuals such as zinnias are good nectar sources, but dozens of other flower species will do the trick as well. You can also track monarch arrivals and departures in your area, and report your findings to Monarch Watch (monarchwatch.org), Journey North (learner.org/jnorth), or other similar organizations.

WEB EXCLUSIVE: For a video on the monarch's amazing life story, go to audubonmagazine.org/web/monarch.



WILDLIFE
SPECTACLE

The Butterfly Effect

BY MICHELE WILSON



Egg Females lay hundreds of eggs but don't play favorites, usually depositing each egg on a different milkweed plant.



Caterpillar In the two-week larval stage, the caterpillar feeds on milkweed and molts five times before entering chrysalis.



Chrysalis The cocoon-like pod looks green but is actually clear. It turns brown, yellow, and orange before the monarch emerges.



Butterfly It's easy to tell males and females apart. Females, like this one, lack a black spot on the back of each wing.