

# Female monarch butterflies on 30-year decline in eastern North America

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(PhysOrg.com) -- Female monarch butterflies in eastern North America have significantly declined over the past 30 years, a new study by a University of Georgia researcher reveals.

Andy Davis, a Ph.D. candidate in the Warnell School of Forestry and Natural Resources, analyzed published overwintering and migratory data for the insect from 1976 to the present, discovering that the female to male ratio for the [butterflies](#) east of the Rockies has gradually been changing. In the late 1970s, Davis said, females made up around 53 percent of the monarch butterfly population that migrated to [Mexico](#) for the winter. Today, that number has dropped to about 43 percent which paints a dire picture for population recruitment. Davis outlines his findings in a new paper co-authored with Eduardo Rendón-Salinas of World Wildlife Fund-Mexico. The paper appears in *Biology Letters*.

"I nearly fell over when I saw the trend," said Davis. It was an unintentional but extremely

important finding."

The monarch butterfly, one of the most well-known and widely-recognized [insects](#) in the world, is a flagship species for conservation. North American Monarchs can migrate more than 2,000 miles as they fly to Mexico from Canada and the U.S. for the winter. "The implications of this decline are huge," Davis said. "Female monarchs can lay as many as 400 eggs over their lifetime, which is why the species is so resilient."

But Davis said that as the monarch population continues to struggle because of breeding habitat loss, widespread pesticide use, and deforestation of the overwintering sites, losing a significant number of females could seriously hinder the population's ability to rebound after periodic crashes. Davis, who studies monarchs in addition to his doctoral work, said that news of the decline has gone unnoticed until now "because no one's ever looked at the data like this. For years, scientists have been collecting male and female monarchs at the overwintering sites and during the fall migration. When we compiled the numbers from these collections, along with the year they were made, the trend was obvious."

At their wintering sites, monarchs cluster on trees and form massive colonies that can number in the millions. Illegal logging of these trees is a serious threat to their wintering stage, but the threats they face in their breeding range in the United States and Canada are just as important. Further, because the decline in females is also present in the fall migration, Davis says, it means that whatever is causing this decrease is happening during the breeding season in the U.S. and Canada.

"That tells us we need to look here to see what the cause is," he said. Whatever it is, Davis explained, "it must be something that affects females more so than males. This will be the challenge for future studies to sort out. We'll also need to monitor the

numbers of females in the population closely over the next few years, at all stages of their life cycle.

This discovery just goes to show how new insights can be gained from critical re-examination of published studies, and more generally, how much we still need to learn about this amazing insect before it is too late.”

Provided by University of Georgia ([news](#) : [web](#))

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