

Study reveals how monarch butterflies recolonize northern breeding range

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Each year, millions of monarch butterflies (*Danaus plexippus*) migrate from overwintering grounds in central Mexico to colonize eastern North America, but just how these delicate creatures manage to reach the northern part of their breeding range in spring has largely remained a mystery.

Monarch Butterfly New research from the University of Guelph led by Prof. Ryan Norris, Department of [Integrative Biology](#), former graduate student Nathan Miller and Environment Canada, reveals how monarchs recolonize the northern reaches of their [breeding grounds](#) — information that will help preserve this migratory species threatened by loss of critical food and habitat.

Every year, adult monarchs head north to lay eggs on milkweed plants in the United States. Subsequent generations continue north to reproduce, some eventually reaching southern Canada.

But this amazing migration has been declared "threatened" by the International Union for the Conservation of Nature. Because of milkweed destruction, the monarch butterfly has remained on Canada's list of species of "special concern" since 1997.

Norris said scientists need to learn more about the butterfly's migration to forecast how it will respond to environmental change such as habitat loss.

"It wasn't clear where these individuals were born and how long they lived," he said. "One possibility was that some monarchs that reach places like southern Ontario could have migrated all the way from Mexico."

Miller sampled monarchs from 44 sites across Ontario and the northern states. By analyzing chemical markers called stable isotopes and examining wing wear, the researchers found that about 10 per cent reaching the northern breeding range in the spring come directly from Mexico.

"This is an incredible journey from an animal this size, especially if you consider that these butterflies are little more than eight months old and have travelled thousands of kilometres over their lifetime," Miller said.

Ninety per cent of monarchs sampled by the researchers in the spring were first-generation individuals born en route that year. Surprisingly, most of these monarchs were born in the highly productive region of the central United States, not in the southern states as previously thought.

"Linking these periods of the breeding cycle provides us key information for conservation and identifies highly productive regions that fuel the migration further north," said Norris.

The study appears in the journal *PLoS One*.

Provided by University of Guelph

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