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Climate Conditions, Herbicide Use Resulted in Sharp Drop in Number of Monarch Butterflies Wintering in Mexico this Past Season

by Carlos Navarro

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Climate conditions in the US and Mexico and the prevalent use of herbicides in the US and Canada contributed to a 28% decline in the population of monarch butterflies wintering in Mexico during the 2011-2012 season. A study commissioned by The World Wildlife Fund (WWF), the Comisión de Áreas Naturales Protegidas (CONANP), and private donors said monarch butterflies were found in only 2.89 hectares of forest this winter, compared with about 4 ha last winter and 4.7 ha in 2009-2010.

CONANP said the nucleus of the Monarch Butterfly Reserve Biosphere in Michoacán and México states had only about 80% coverage this year. Scientists located 10 separate colonies in the biosphere where the butterflies typically gather during each season, which runs from November through March. Five additional colonies were found outside the biosphere, accounting for another 0.5 ha. The UN Educational, Cultural and Scientific Organization (UNESCO) designated the biosphere as a World Heritage site in 2008 ([SourceMex, July 9, 2008](#)).

Scientists now use the forest surface occupied by monarch butterflies as a more accurate indicator of numbers than a simple count, which can often result in errors.

Drought in Texas last year a major factor

CONANP director Luis Fueyo McDonald pointed to adverse climate conditions, particularly drought and irregular rainfall, as the main reason for the reduced numbers in 2011. "We suffered an atypical drought in the US and Mexico, which reduced rainfall," said Fueyo.

The drought was especially severe in Texas, in the middle of the migration route that begins in Manitoba and Maine and ends in central Mexico. The US Drought Monitor reported that nearly 97% of Texas was experiencing extreme drought conditions as of the beginning of October.

"Monarch butterflies migrating south to Mexico have reached Texas and will have difficulty finding the water and flowers needed to complete their journey to their winter roosting site," Accuweather.com said on Oct. 10, 2011.

Fueyo pointed out that the population of monarch butterflies wintering in Mexico has varied greatly during the past 19 years, ranging from a low coverage of 1.92 ha in 2009 to a high of 18.9 ha in 1996. The extreme drop in 2009 was caused by severe winter weather in the biosphere ([SourceMex, Sept. 1, 2010](#)).

Still, an online study published in *Insect Conservation and Diversity* showed a general decrease in monarch butterflies between 1994 and 2011. The loss of habitat in Mexico as a result of uncontrolled logging was cited as a major reason for the long-term decline in butterflies in the 1990s and 2000s ([SourceMex, March 16, 2005](#), and [May 31, 2006](#)).

Mexican officials recently pointed to the effectiveness of state and federal authorities in greatly reducing the prevalence of illegal logging in the monarch butterfly biosphere. Mexico launched a major anti-logging initiative in the area in 2007 ([SourceMex, Dec. 12, 2007](#)). "The deforestation levels in the biosphere occurred on only 0.48 ha in 2011," said Adriana Rivera Cerecero, deputy director for natural resources at the Procuraduría Federal de Protección al Medio Ambiente (PROFEPA). "This means that this area is now basically under control."

Environmental advocates point to other factors in the US and Canada that have reduced the numbers of monarch butterflies, such as the use of harmful herbicides in soybean, corn, and cotton fields. The herbicides not only kill weeds, but also destroy milkweed, which provides food for migrating butterflies.

Scientists and environmental advocates said glyphosate-based pesticides are sprayed heavily in fields where genetically modified corn and soybeans are grown. The corn and soybeans are resistant to the herbicide, but not the weeds, including milkweed, which serves as food for the larvae of monarch butterflies.

"This milkweed has disappeared from at least 100 million acres of these row crops," said Chip Taylor, an insect ecologist at the University of Kansas and director of the research and conservation program Monarch Watch. "Your milkweed is virtually gone...this [glyphosate use] is the one main factor that has happened...you look at parts of the Midwest where there is a tremendous use of these crops and you see monarch populations dropping. It's hard to deny the conclusion."

The WWF urged the Canadian and the US governments to take action to regulate the use of herbicides, which would in the end help monarch butterflies. "The governments of Canada and the US have much more to do to protect the areas [where the monarch butterfly reproduces]," said Omar Vidal, Mexico director of the WWF.

Deforestation reduced in butterfly habitat in Mexico

While Mexico has made strides in controlling logging in the biosphere, WWF urged authorities to remain vigilant and continue a campaign of reforestation in the monarch butterfly wintering grounds. He pointed out that nearly 6.7 million trees have been planted in the biosphere in the past decade, with the government offering local communities economic-development options that are alternatives to logging. "These communities are now convinced that a live tree is more valuable than a cut tree," said Vidal.

Biologist Lincoln Brower of Sweet Briar College in Virginia, who has studied monarch butterflies for 56 years, said the removal of a single tree is comparable to cutting a hole in a blanket. "The forest serves as an umbrella, a blanket and a hot water bottle for the butterfly," Brower said in a recent interview with [mongabay.com](#).

The federal government and the governments of Michoacán and México states have a strong incentive to protect the monarch butterfly biosphere, since the reserve has become a major tourist attraction during the winter months. By some estimates about 90,000 tourists visited the area this season, primarily from other parts of Mexico, the US, and Canada.

Federal, state and municipal governments have allocated more than 100 million pesos (US \$7.8 million) for the "País de la Monarca" campaign for promotion and tourism-infrastructure

improvements in the communities near the biosphere, particularly El Rosario, La Sierra Chincua, and Senguio in Michoacán state.

"The investments that have been made seek to generate a great impact on tourism, which would bring strong economic benefits to the area," said Roberto Monroy García, tourism secretary for Michoacán state. [Peso-dollar conversions in this article are based on the Interbank rate in effect on March 21, 2012 reported at 12.70 pesos per US\$1.00.]

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