

A Change In The Air?



PHOTO: MATT MORLOCK

Listing Monarch Butterfly As Threatened Could Cause Changes To Midwest Agriculture

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Monarch butterflies are one of America's most iconic insect species, known for its 3,000-plus annual migration from Mexico to Canada and back. But with a more than 90 percent decrease in population since 1995, it may soon be listed among the nation's threatened species.

"We're at risk of losing a symbolic backyard beauty that has been part of the childhood of every generation of Americans," said Tierra Curry, senior scientist at the Center for Biological Diversity in Washington, D.C. "The drop in the monarch's population is a loss so staggering that in human-population terms, it would be like losing every living person in the United States except those in Florida and Ohio."

But since the cause for its decline in the United States is largely due to the loss of milkweed, the monarch caterpillar's sole source of food, along the butterfly's migratory corridor, an endangered listing could have big repercussions for Midwest agriculture, particularly pesticide use.

Results of U.S. Department of Agriculture agricultural experiments located in South Dakota, published on April 3 in the journal Science of Nature, further confirm agriculture's impact on monarch dwindling numbers, identifying the neonicotinoid insecticide, clothianidin, as a contributor to monarch deaths. Neonicotinoids have been implicated in the declines in other pollinator species as well, including honey and native bees.

"These results are very worrisome, but it is also crucial not to get lost in the specifics of chemical toxicology and individual species declines," said Allison Wilson, science director at the Bioscience Resource Project in Ithaca, N.Y. "Industrial agriculture is a lethal combination of methods that is causing the extinction of thousands of species worldwide. It is affecting birds, amphibians, bats and other pollinators besides butterflies. Many ecosystems are staring down the barrel."

The U.S. Fish and Wildlife Services (FWS) is expected to issue a decision on a pending petition to list the monarch butterfly as threatened in December of 2015.

"We are extremely pleased that the federal agency in charge of protecting our nation's wildlife has recognized the dire situation of the monarch," said Sarina Jepsen, director of the Endangered Species program of the Xerces Society for Invertebrate Conservation of Portland, Ore. "Protection as a threatened species will enable extensive monarch habitat recovery on both public and private lands."

According to the FWS, the agency has received substantial scientific evidence supporting the listing. The FWS had originally received the petition for federal protection of the monarch butterfly in August of 2014 from the Center for Biological Diversity (CBD), the Center for Food Safety (CFS), the Xerces Society and longtime monarch biologist Dr. Lincoln Brower.

"The Endangered Species Act is the most powerful tool available to save America's monarchs, so I'm really happy these amazing butterflies are a step closer to the protection they so desperately need," said Curry said.

Within the actual document to the FWS, the petitioners specifically name pesticide use in genetically engineered cropping systems — specifically Monsanto's Roundup Ready soybeans and corn, introduced in 1996 and 1998 respectively — as a primary contributor to the monarch butterfly's population decline in that pesticide use kills milkweed, thereby eliminating the only source of habitat for monarch reproduction, as well as decreasing nectar sources for adult monarchs to feed. The petition details that the most severe milkweed loss has occurred in the U.S. Corn Belt — more than 165 million acres, an area about the size

of Texas, accounting for one-third of the butterfly's summer breeding grounds. The Corn Belt is the migratory corridor for the majority of the world's monarchs.

"The widespread decline of monarchs is driven by the massive spraying of herbicides on genetically engineered crops, which has virtually eliminated monarch habitat in cropland that dominates the Midwest landscape," said Bill Freese, science policy analyst of the Washington, D.C.-based CFS. "Doing what is needed to protect monarchs will also benefit pollinators and other valuable insects, and thus safeguard our food supply."

Additional monarch habitat loss is occurring in the rapid conversion of grasslands to corn and soybean fields. Land involved in the Conservation Reserve Program (CRP) was specifically named as the last milkweed reserve. However, nationally, CRP acreage has shrunk by 30 percent since 2007, more than half of this loss happening in the Midwest where landowners opted not to renew CRP acres in favor of corn and soybean production.

The last of the milkweed populations are being squeezed out due to pesticide drift, insecticide use in crops, aggressive roadside management, urban development and long-term drought.

Overall, according to the petition, it's estimated that milkweed has declined by 64 percent in the Midwest from 1999 to 2012, which has resulted in an 88 percent decrease in monarchs since 1999 in the Midwest.

"The monarch is the canary in the cornfield, a harbinger of environmental change that we've brought about on such a broad scale that many species of pollinators are now at risk if we don't take action to protect them," said Brower who lives in Virginia, has been studying monarchs since 1954 and has been involved in monarch conservation since 1977.

Combine this with the pressures the monarch population is experiencing in its overwintering ranges — urban development in California and logging in Mexico — as well as the effects of climate change in both winter and summer habitats, and the monarch butterfly is not doing well at all.

"Our petition is a scientific and legal blueprint for creating the protection that the monarch so direly needs, and we are gratified that the agency has now taken this vital first step in a timely fashion," said George Kimbrell, CFS executive director. "We will continue to do everything we can to ensure monarchs are protected."

So how would listing of the monarch affect Midwest agriculture?

Wilson advocates for low-input agricultural systems, like organic production.

"The saddest irony is that, though industrial agriculture experts call their methods 'scientific,' using toxins to kill pests runs contrary to all biological understanding, including the sciences of ecology, of evolution and of complex systems," she said. "The proof of this is that the very best results in all of agriculture come from farming methods that reject all industrial inputs. Agribusiness would very much like that not to be known."

The likelihood would be increased conservation efforts and partnerships with agribusinesses to find production methods that are more sustainable for monarch populations. Monsanto announced a partnership at the end of March with the National Fish and Wildlife Foundation (NFWF) in support of the NFWF's Monarch Butterfly Conservation Fund. Monsanto will contribute \$3.6 million over the next three years to support habitat restoration, youth education and outreach, and milkweed seed production and distribution.

In addition, Monsanto plans to donate \$400,000 in grants to other organizations working to protect biodiversity.

"As the number of people on our planet increases, agriculture is working to sustain-

ably grow more and more food," said Brett Begemann, Monsanto's president and chief operating officer. "Because of the important role agriculture plays in the environment, Monsanto is committed to working with others to protect natural habitats and species that share our planet."

While the potential change to the agricultural industry is largely speculative, already efforts are being put forth by conservationists to work with landowners particularly in improving overwintering habitat in California and the monarch butterfly population west of the Rockies that typically overwinters there. According to the Monarch Joint Venture based in St. Paul, Minn.:

- A habitat assessment, and ongoing monitoring, has been conducted in California's monarch overwintering sites. More than 140 priority sites have been identified.

- Local citizens near California's monarch overwintering sites have been trained in advocacy to protect the habitat from urban

development as well as monitoring of the numbers of western monarchs.

- Last year, the Natural Resources Conservation Service had partnered with farmers to plant more than 120,000 acres of pollinator habitat, including milkweed plots, across the nation. Additional milkweed plantings were placed in key areas of the monarch breeding range where severe milkweed shortages had been seen due to drought, including California, Arizona, New Mexico, Texas, Florida and the Great Basin of Utah and Nevada.

- A database was created, which lists more than 7,000 milkweed locations in the Western United States.

- Educational and outreach activities to individual landowners, schools, resource conservation districts and the general public are helping to promote the planting and protection of monarch habitat, including milkweeds.



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