

Conservation Matters: Contributions from the Conservation Committee

The committee's thoughts on the "Petition to protect the Monarch Butterfly (*Danaus plexippus plexippus*) under the Endangered Species Act"

In August, four parties (The Center for Biological Diversity, The Center for Food Safety, The Xerces Society, and Dr. Lincoln Brower) petitioned "the Secretary of the Interior, through the United States Fish and Wildlife Service (USFWS), to protect the Monarch butterfly (*Danaus plexippus plexippus*) as a threatened species" (<http://www.xerces.org/wp-content/uploads/2014/08/monarchesa-petition.pdf>). News of the petition traveled quickly throughout our community of lepidopterists, as well as state and federal governments, conservation groups, and all forms of social media. Reactions and opinions regarding the petition were diverse, spanning the gamut from full acceptance to full rejection. Given the disparity in opinions across the spectrum of members in our Society, the Conservation Committee has yet to come to a consensus regarding the petition. However, there is much within the petition regarding the Monarch's plight and need for conservation measures that the Committee and our Society can endorse enthusiastically. It is our wish to use the column in this issue to initiate a discussion among our membership regarding this subject/concern as well as others linked to the conservation of Lepidoptera.

There is strong evidence that the Monarch is currently in decline in North America. Annual monitoring of

overwintering adults in both California and Mexico has documented significant population decreases since 1997. Most telling are data for overwintering sites in Mexico: eastern Monarchs occupied less than two hectares in each of the last two winters—these numbers are down more than 75% from their average overwintering acreage over the past two decades (see Figure 12 from petition). This downward trend is threatening one of nature's most heralded and familiar biological phenomena. National and international actions on the Monarch's behalf are warranted.

The petition identifies an array of factors that could be causing the decline, including North American agricultural practices and policies, national energy policy, landuse changes in North America, release of mass-reared Monarchs, the continued degradation of overwintering habitat in both California and Mexico, climate change, and others. The evidential cases for these stressors range from generally well accepted to those that remain unsubstantiated. The relative weights of these stressors are of central importance, given that some these factors, such as climate change, are difficult targets for conservation efforts. While much of the petition is focused on genetically modified crops (GMOs) and current agricultural practices in the Midwest—and much could and

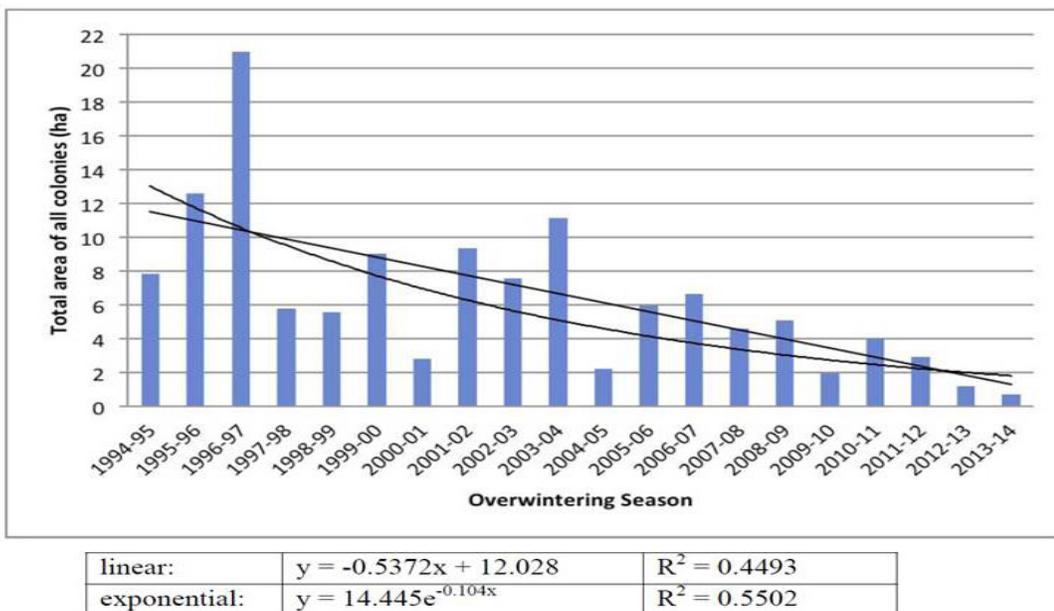


Figure 12 from the petition to list the Monarch as a Threatened species. The blue bars in the histogram show acreages of forest occupied by overwintering adults from 1994 to 2013. The black lines are the fitted regressions assuming linear ($y = -0.54 + 12.03$, $R^2 = 0.45$) and exponential decline ($y = 14.44e^{-0.104x}$, $R^2 = 0.55$)

Figure 12. Total annual area occupied by overwintering butterflies in Mexico from 1994 through 2013, with linear (upper line) and exponential (lower line) regression analyses. The significant decline charted by Brower et al. (2012a, Fig. 1) through 2010-11 continues through 2013-14.



Monarch, in Connecticut (male; photo by Michael Thomas)

should be changed in such practices that would be more favorable to native biodiversity—evidence that GMOs and concomitant agricultural practices are the primary factors in Monarch decline is circumstantial and in need of study and corroboration. The population declines since 2011 have been so dramatic, and have occurred over such broad geographical areas, that many would argue that the region-wide droughts in northern Mexico and Texas, and not the sum of gradual changes in agricultural practices in the Midwest, are at the root of this collapse.

Danaus plexippus is not in danger of extinction; non-migratory populations of Monarchs occur in Florida and throughout much of northern Central America, and no one is saying that these populations are in danger. California overwintering populations, much smaller than those in Mexico, may be more secure than those overwintering in Mexico. But the migratory populations that exchange between Mexico and the eastern U.S. and Canada, are in a worrisome state of decline. The eastern migration phenomenon, which has brought global fame to this winged beauty and a greater appreciation for invertebrates in general, is threatened. This singular iconic insect of North America could become an ecological ghost, and, without sustainable migratory populations of Monarchs, what would we lose? The waxing and waning waves of butterflies moving in mass northward and southward across much of our continent may cease. The chance to witness trees draped with many thousands, perhaps millions of individual butterflies at the winter roost sites may be come to an end. The opportunity to see one of America's most familiar, beautiful, and beloved insects sailing through our gardens may become rare. For children, the chance to find and rear its striking caterpillar and to watch it change into its stunning chrysalis might be lost. The formative entomological and, perhaps more importantly, developmental experience of tens of thousands of school children watching this caterpillar metamorphose may become a memory of past generations. Most worrisome, we could lose one of the world's most magnificent biological phenomena. Perhaps more than any other wild insect on the continent, Monarchs enrich the quality of life across political, cultural, and socioeconomic boundaries.

While there is a wide diversity of opinions relative to specifics within the petition, there is much agreement that actions to stem the decline of the Monarch would be beneficial. Members of the Society are encouraged to plant milkweeds, control black swallowwort, bring about changes in mowing and spraying regimes that would favor milkweeds and the availability of late-season nectar sources, and endorse U.S. and Mexican efforts to protect overwintering sites. Certainly, much should be done to promote more environmentally friendly practices in the nation's farmlands. We should support efforts to conduct controlled scientific studies on the consequences of mega-agriculture to local and regional biodiversity and redouble efforts to determine if genetically modified crops have ecological impacts beyond their rows. All levels of increased engagement by our membership, through effort or dollar, can improve chances for the Monarch. Local actions are the stepping stones toward global solutions.

Regardless of whether the petition is successful or denied, considerable national and international attention has been drawn to the Monarch's plight. The U.S. Fish and Wildlife Service recently formed a "High-Level Federal Monarch Working Group" with representation from the heads of the U.S. Forest Service, National Park Service, Bureau of Land Management, Federal Highway Administration, Natural Resource Conservation Service, and others. The group is working to revise the North American Monarch Conservation Plan before President Obama meets with the leaders of Mexico and Canada in February 2015. Mexico and the World Wildlife Fund are also working on parallel conservation plans. The USFWS is taking actions to promote the welfare of this species on its refuges. Similar efforts are underway for the Monarch on National Forest lands by the U.S. Forest Service. The U.S. Department of Agriculture is looking to provide incentives for Monarch restoration on farms and exploring other ways to make farming friendlier to biodiversity. The Xerces Society has been exceptionally active and successful in their campaign to marshal interest and the financial commitments mentioned above. Certainly, the welfare of the Monarch and other invertebrates has been greatly elevated by the collective actions of the Xerces Society, Lincoln Brower, and other petitioners.

We, as a Society, are committed to preserving the Monarch for generations to come. We have enlisted in the Monarch Joint Venture project, offered our expertise to advise on pollinator conservation at the local, state, and federal levels, and many of our members are at the forefront of Monarch conservation efforts. We urge our membership to read the petition, ponder the issues, and share your views with policy makers, conservation groups, town leaders, and other partners. And more importantly, engage in actions that will benefit the Monarch as well as other wildlife.

Dave Wagner, Todd Gilligan and John Shuey – for the Conservation Committee