

A large, dense cluster of monarch butterflies is shown against a background of green foliage. The butterflies are in various stages of flight and resting, their orange and black wings creating a vibrant, textured pattern. The lighting is soft, highlighting the intricate details of the wings and the surrounding leaves.

THE XERCES SOCIETY'S

# Partnerships for Monarchs

Fall 2014

Monarch butterflies are among North America's most iconic native species. They are familiar and beloved among people throughout Canada, the United States, and Mexico. As recently as the 1990s, hundreds of millions of monarchs made the epic flight each fall from the northern plains of the U.S. and southern Canada to sites in the oyamel fir forests in the mountains north of Mexico City. In western North America, more than a million monarchs made a shorter flight to the California coast.

The size of these dramatic migrations has been shrinking. The overall population of monarchs has declined by 90% in the last two decades.

The Xerces Society for Invertebrate Conservation has a long history working to protect monarchs and their habitat. Robert Michael Pyle, Xerces founder, worked to get the monarch migration listed by the International Union for Conservation of Nature (IUCN) as an endangered phenomenon in 1983. During the 1980s, Xerces ran the Monarch Project, a statewide effort to protect Californian overwintering sites. This work was reinvigorated in the late 1990s. Since that time, Xerces has worked with partners to engage citizen scientists to better understand and protect western monarch overwintering sites in California. In fact, data from these citizen scientists helped us understand the severity of recent monarch declines in the western U.S.

To conserve this animal and its habitat, Xerces works with multiple partners across North America. Scott Black, Xerces Executive Director, is vice-chair of the Monarch Joint Venture (MJV), a coalition of academic scientists, nonprofits, and government agencies. MJV acts as the main coordinating body for monarch conservation, research, and education in the U.S. Xerces also works directly with many other partners. We work with the USDA Natural Resources Conservation Service to incorporate high-quality habitat for monarchs and other pollinators on farms. We collaborate with native seed companies to ensure that native milkweed seeds (monarchs' only host plants) are available for habitat restoration activities. We partner with the U.S. Forest Service to protect and manage habitat on federal land, and with state and federal agencies to conserve, restore, and enhance habitat along roadways and in natural areas. We believe that by working broadly with multiple stakeholders, we are well-positioned to truly recover these butterflies.

Monarchs at a California overwintering site. Photo by The Xerces Society/Carly Voight.

# The Scope of Our Work

With our partners, we aim to create diverse, resilient monarch habitats for breeding and overwintering. Our recent accomplishments and ongoing efforts (highlighted here and discussed in detail below) include the following:

- We have worked with farmers to restore tens of thousands of acres of habitat for monarchs and educated thousands of farmers about the importance of this type of habitat.
- We are increasing the availability of native milkweed seed for restoration efforts in multiple regions of the monarch's breeding range. To date we have helped produce seed for 11 native milkweed species—35 million seeds have been produced so far.
- We are increasing the supply of high-value monarch nectar plants for use in restoration.
- We are identifying key conservation areas for protection and restoration. These include key overwintering sites in California and breeding habitat areas through the West.
- We are working with multiple federal and state agencies on monarch protection and monarch habitat restoration.
- We provide technical resources to help land managers, farmers, and others protect, enhance, and restore monarch habitat (both breeding and overwintering).
- We are engaging decision makers and government agencies in making monarch conservation a priority.
- We are working to better understand the monarch's status and the current threats it faces.
- We continue to enlist citizen scientists to monitor the species' status and recovery.

## Restoring Habitat for the Monarch Butterfly

### Involving Farmers in Restoring Milkweed Breeding Habitat

*Partners: Natural Resources Conservation Service, farmers, and other landowners*

To conserve the monarch butterfly, we need to protect, enhance, and restore high-quality habitat in breeding areas and overwintering sites. Xerces works with farmers across the U.S. to provide pesticide-free habitat on farms. These plantings come in the form of hedgerows and wildflower meadows and include both native milkweeds and nectar sources to fuel migration.

To date we have trained over 38,500 farmers, agricultural professionals, and others to understand why habitat for pollinators, including monarchs, is essential. Our work has led to the restoration of over 169,000 acres of habitat for pollinators, including tens of thousands of acres of high-quality monarch breeding habitat.

Milkweed (foreground) established in a pollinator habitat planting. Photo by Jessa Kay Cruz, the Xerces Society.





The number of monarchs gathering in California overwintering sites has fallen in the last decade. Photo by The Xerces Society/Carly Voight.

## Increasing Breeding Habitat on Non-Agricultural Lands

*Partners: Monarch Joint Venture, U.S. Forest Service, U.S. Fish and Wildlife Service, state agencies, homeowners, and gardeners*

Xerces regularly works with a variety of landowners and managers to encourage habitat protection and creation. We have provided information on management to the U.S. Forest Service, U.S. Fish and Wildlife Service, and state agencies. We also engage a broad cross section of gardeners, homeowners, and others through our Bring Back the Pollinators campaign in which more than two thousand people have taken a pledge to provide habitat and use less (or no) insecticides. Monarchs are a major focus of these efforts.

## Protecting Overwintering Sites in California

*Partners: Monarch Joint Venture, Monarch Alert, Los Padres National Forest, California Natural Diversity Database, Citizen Scientist Mia Monroe, and Dr. Stuart Weiss*

Overwintering sites are vital for the conservation of this species. As such, Xerces has focused efforts to identify, protect, and manage overwintering sites in California—the only place in the U.S. with large aggregations of overwintering monarchs. We have completed a review of all laws and regulations that apply to the management and conservation of monarchs and their habitat at California overwintering sites. This review allows municipalities and citizens to understand what activities are allowed in monarch overwintering habitat—the first step in ensuring these sites are protected. This work has helped local citizens stop destructive development at monarch overwintering sites.

We have also developed guidance for state and federal agencies on how to manage overwintering habitat effectively, developed a protocol to assess site quality, and developed site-specific management plans for the Los Padres National Forest, which is the only national forest in the U.S. that hosts monarch overwintering sites.

In addition, we have created a habitat assessment protocol, now in use by citizen scientists, to evaluate the quality of monarch overwintering habitat in California. This protocol is generating information needed to inform land management guidelines.

## Coordinating to Preserve Overwintering Sites in Mexico

*Partners: World Wildlife Fund Mexico and Monarch Joint Venture*

Xerces' early work on behalf of monarchs reached across the border to partner with World Wildlife Fund in Mexico, and we recently reconnected with our neighbors to the south. In September 2014 at a meeting organized by World Wildlife Fund Mexico, Xerces' Executive Director Scott Black provided an overview of conservation efforts in the U.S. by MJV and others. He also provided input on the Mexico action plan for the monarch butterfly being developed by World Wildlife Fund Mexico.

## Identifying Key Conservation Areas

The loss of monarch habitat—breeding habitat and overwintering habitat—is likely a leading cause of their decline throughout North America. Compared to the eastern population of monarchs, much less is known about the western monarch and its habitat needs. Our work to better understand the status of monarchs and their habitat has focused on the western population to address this data gap.

### Western U.S. Breeding Habitat Database

*Partners: Monarch Joint Venture, U.S. Forest Service, U.S. Fish and Wildlife Service, state agencies, and herbaria*

Breeding habitat for monarchs is synonymous with milkweeds. Monarch caterpillars need this key group of plants to survive, and increased herbicide application, drought, and other activities have led to dramatic declines in these plants' availability. To identify important western monarch breeding areas and target conservation efforts appropriately, the Xerces Society compiled a database of more than 7,000 milkweed locations in western states. This database incorporates herbaria records, records from the scientific literature, and results from a survey that was distributed to citizens, scientists, and resource agency personnel. This database has multiple uses; for example, we are engaged in a research project to evaluate whether or not there has been a loss of milkweed in western states. We are also using this database to identify key conservation opportunities and additional partners. Recently, this database was used to help the U.S. Fish and Wildlife Service prioritize monarch conservation on national wildlife refuges in Oregon, Washington, and Idaho.



Monarch caterpillars need milkweed to eat. Photo by Karan A. Rawlins, University of Georgia, Bugwood.org.

### California Overwintering Habitat

*Partners: Monarch Alert, Monarch Joint Venture, U.S. Forest Service International Programs, Los Padres National Forest, Citizen Scientist Mia Monroe, and Dr. Stuart Weiss*

Most western monarchs aggregate in forested groves on the California coast in the fall and winter; then, in the spring, these animals fly inland to breed throughout the state and into neighboring western states. California is the only place in the U.S. with large aggregations of monarchs. Overwintering habitat in California has been lost

due to development or severely reduced in quality due to aging trees. The Xerces Society seeks to better understand the status of overwintering monarchs, identify knowledge gaps, prioritize protection, and evaluate how specific management activities and development projects will affect monarchs. To that end, we developed a comprehensive geographic and informational database of the more than 450 documented California overwintering sites, and we have surveyed and monitored more than 140 monarch overwintering sites from 2011 to 2014 in order to fill gaps in that database. Our survey work resulted in the discovery of six new sites and the rediscovery of an overwintering site that hosts more than 20,000 monarchs—the third largest overwintering site in California.

## Increasing the Supply of Milkweed and Nectar Sources for Monarchs

### Project Milkweed: Advancing Native Milkweed Seed Production

*Partners: USDA Natural Resources Conservation Service's Plant Materials Program, Monarch Joint Venture, Hedgerow Farms, Inc., Ernst Conservation Seeds, Native American Seed, Gunnell Farms, Arizona Western College, Painted Lady Vineyard, and Terroir Seeds*

The restoration of native milkweeds is critical to reversing the downward population trends in monarchs, but a scarcity of milkweed seed in many regions of the United States has limited opportunities to include the plants in habitat restoration efforts. To address this seed shortage, the Xerces Society launched Project Milkweed, a collaboration with the native seed industry, the USDA Natural Resources Conservation Service's Plant Materials Program, MJV, and community partners to produce new sources of milkweed seed in key areas of the U.S. where native milkweed seed had not been reliably available.

To date we have launched seed production for eleven milkweed species in California, Arizona, New Mexico, the Great Basin, Texas, and Florida, key areas of the monarch's breeding range where native seeds had not been available. Over 3 million seeds were sustainably collected to start this effort, and so far, our work has resulted in the production of more than 35 million seeds.



Seedlings of spider milkweed (*Asclepias asperula*) in greenhouse. Photo by Rodney Thurman, Greenheart Farms.

In the spring of 2014, we launched the Milkweed Seed Finder, a comprehensive online directory of milkweed seed vendors throughout the country. This valuable resource connects interested customers, including monarch enthusiasts, private landowners, restoration practitioners, and natural resource agencies, with regionally appropriate seed sources. To date, the Seed Finder webpage has received nearly 25,000 visits.

To help the U.S. native seed industry increase their knowledge of milkweed seed production and their capacity to scale up production accordingly, we produced *Milkweeds: A Conservation Practitioner's Guide*, a first-of-its-kind manual on large-scale milkweed seed production, nursery propagation, and field restoration of the plants. This tool provides seed producers, native plant nurseries, conservation agencies, community groups, and non-governmental organizations with the latest and most comprehensive science-based milkweed propagation and restoration methods ever compiled in a single publication.



## Increasing the Supply of a High-Value Monarch Nectar Plant

*Partners: Minnesota Native Landscapes and Natural Resources Conservation Service*

With the support of a Conservation Innovation Grant from the USDA Natural Resources Conservation Service, we have partnered with Minnesota Native Landscapes, a native seed nursery based in Otsego, Minnesota, to improve the seed yields of meadow blazingstar (*Liatris ligulistylis*) for monarch butterfly habitat restoration. While most *Liatris* species are attractive to monarchs, Xerces staff recognized after multi-year field observations that this particular plant is a special monarch magnet. Though small amounts of meadow blazingstar seed are routinely available from the native seed industry, the bulk quantities necessary for large-scale revegetation projects are not. We have worked with Minnesota Native Landscapes to establish a ¾-acre field of meadow blazing star for research and development of seed production. We are studying how to diagnose and develop solutions to plant health issues, and we are finding ways to optimize seed harvesting and cleaning techniques. Through this work, we are gaining a thorough understanding of what it takes to successfully grow the plant on a large scale.

Meadow blazingstar is a preferred nectar source for adult monarchs. Photo by Keith Fredrick, Minnesota Native Landscapes.

## Providing Outreach and Education

*Partners: Natural Resources Conservation Service, Make Way for Monarchs, Monarch Joint Venture, Pacific Grove Museum of Natural History, and McGuire Center for Lepidoptera & Biodiversity*

Through our national series of Pollinator Conservation Short Courses and talks at universities, botanic gardens, and conferences, Xerces reaches thousands of people each year. Monarchs are a featured topic at all Pollinator Conservation Short Courses, and we give talks to lay audiences across the U.S. to engage them in monarch conservation. We use our e-newsletter network, Facebook, and Twitter to reach tens of thousands of additional people annually. Also, in the last year, Xerces has helped generate over 200 media stories on monarchs, which have reached millions of readers. In addition, we have partnered with the Pacific Grove Museum of Natural History and the McGuire Center for Lepidoptera & Biodiversity to produce brochures about monarchs and their conservation needs.

## Focusing National Attention on Monarchs

### Monarch Coalition Letter

*Partners: Make Way for Monarchs*

In April 2014, the Xerces Society worked with Make Way for Monarchs to draft a letter from a coalition of monarch butterfly scientists, farmers, conservation groups, writers, and artists to President Obama and the

Secretaries of Agriculture and Interior. The letter highlighted monarch declines and urged the president and these agencies to take broad action to mitigate the loss of milkweed breeding habitat.

## White House Stakeholder Meeting

*Partners: Monarch Joint Venture*

In April 2014, Scott Black, Xerces' executive director and MJV vice-chair, met with White House staff in a multi-stakeholder meeting on the current state of pollinator conservation. Xerces also provided written comments. On June 20, 2014 (during National Pollinator Week), the White House released a presidential memorandum regarding a federal strategy to address the decline of pollinators. This memorandum included many of the key recommendations that Xerces presented, including acknowledgement that monarch butterflies need protection.



Official White House photo by Pete Souza.

## Monarch Listing Petition

*Partners: Dr. Lincoln Brower, Center for Food Safety, and Center for Biological Diversity*

On August 26, 2014, Dr. Lincoln Brower and the Xerces Society joined the Center for Biological Diversity and the Center for Food Safety in a petition to the U.S. Fish and Wildlife Service seeking protection for the monarch butterfly under the Endangered Species Act. This science-based petition provides robust, detailed information on threats to this butterfly. Xerces ensured that the science was clearly presented in the petition and also worked with monarch scientists and others to ensure that the petition recognized the important role that research by scientists, citizen scientists, and the seed industry has played—and will continue to play—in understanding and conserving the monarch butterfly and its habitat. To this end, the petition requested that the Service streamline the permitting process, so that research, citizen science, educational activities, and milkweed production are encouraged rather than deterred by a listing.

# Developing a Conservation Status Assessment and Conservation Plans

## NatureServe Assessment

*Partners: U.S. Forest Service and NatureServe*

In early 2015, NatureServe will release an updated assessment of the North American monarch butterfly population. The Xerces Society is working with NatureServe to provide data and content for the assessment of the western North American population and will also provide review of the overall assessment. Government agencies, academic researchers, and conservationists rely on these assessments to understand which species face the greatest dangers and in what locations they are especially at risk.

## State Wildlife Action Plans

*Partners: Monarch Joint Venture*

State Wildlife Action Plans are the key documents that guide state conservation priorities. They are updated

once every decade, and most states will finalize their updated plans in the fall of 2015. Xerces Society staff has reached out to states to include monarchs as a Species of Greatest Conservation Need (SGCN) in their updated Wildlife Action Plans. Should the monarch be listed as an SGCN, states will become more engaged in its conservation, and funds for population monitoring and habitat restoration will become available through the federally administered State Wildlife Grant program.

## Enlisting Citizen Scientists

*Partners: Monarch Alert, Monarch Joint Venture, and Citizen Scientist Mia Monroe*

The Xerces Society has managed the annual Western Monarch Thanksgiving Count since 1997. Each year, volunteers monitor monarchs at more than 100 overwintering sites in California to determine the status of the population and quality of the habitat. We provide trainings and other resources to these volunteers, and we compile and manage the data that they collect. This effort provides valuable data on the status of overwintering sites, and it has also engaged citizens to be stewards and advocates for local monarch overwintering sites.

## Looking Ahead

Recent attention on monarchs at the national and international levels makes the time right for practical solutions that leverage policy gains. Together with our partners in government, the private sector, academia, and nonprofit organizations, we seek to ensure that these butterflies don't become a tragic example of a widespread species being erased because we falsely assumed it was too common to become extinct.



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Meadow blazingstar with monarch butterflies. Photo by Keith Fredrick, Minnesota Native Landscapes.