MONARCH JOINT VENTURE

Partnering across the U.S. to conserve the monarch migration

www.monarchjointventure.org

Monarch Joint Venture

The Monarch Joint Venture (MJV) is a partnership of federal and state agencies, non-governmental organizations, businesses and academic programs working together to protect the monarch migration across the United States.

Our mission is to protect monarchs and their migration by collaborating with partners to deliver habitat conservation, education, and science across the United States.

Our vision is thriving monarch populations that sustain the monarch migration into perpetuity and serve as a flagship for the conservation of other plants and animals.

Contact us

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Saint Paul, MN 55114

Find additional contact information on our website.

Background photo credit: Wendy Caldwell

Plant Milkweed for Monarchs

Monarchs cannot survive without milkweed. Monarch caterpillars need milkweed plants (*Asclepias* spp.) to grow and develop, and female monarch butterflies only lay their eggs on milkweed. With shifting land management practices, we have lost much milkweed from the landscape. Please plant milkweed to support monarch populations, and their incredible migration! Planting milkweed is a great way to help other pollinators too, as milkweed provides nectar resources to a diverse suite of bees and butterflies.

Northeast Region Milkweed Species

Common Milkweed
Asclepias syriaca
Well drained soils.
Photo by Louis-M. Landry

Swamp Milkweed
Asclepias incarnata
Damp, marshy areas.
Photo by Janet Allen

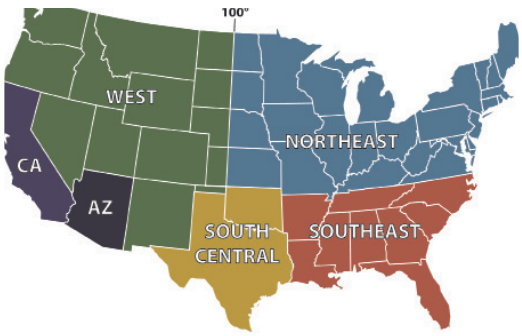
Butterfly Weed
Asclepias tuberosa
Well drained soils.
Photo by Thomas Muller, Lady Bird Johnson Wildflower Center

Whorled Milkweed
Asclepias verticillata
Prairies and open areas.
Photo © Kim Davis & Mike Stangeland

Poke Milkweed
Asclepias exaltata
Woodland areas (except in NE, KS, MO, ND & SD).
Photo by David Smith

Milkweed Regions

There are many native milkweed species in each of the six "Milkweed Regions" shown on this map. The species highlighted are known to be used by monarchs, and are easy to establish. Please try to find plants grown as close as possible to where you'll be planting them, and from the closest possible seed source.



Note: Although commercial availability is limited, *A. purpurascens* and *A. sullivantii* are also recommended in the Northeast region.

South Central Region Milkweed Species

Green Antelopehorn Milkweed
Asclepias viridis
Dry areas and prairies. Also known as green milkweed.
Photo by Harlen Aschen

Antelopehorns Milkweed
Asclepias asperula
Desert and sandy areas.
Photo by Kip Kiphart

Zizotes Milkweed
Asclepias oenotheroides
Sandy/rocky prairies and fields.
Photo by Jennifer Kleinrichert

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Content contributed and approved by Sonia Altizer, Dara Satterfield, Karen Oberhauser, Lincoln Brower, Wendy Caldwell, and Kelly Nail.

Potential risks of growing exotic (non-native) milkweeds for monarchs

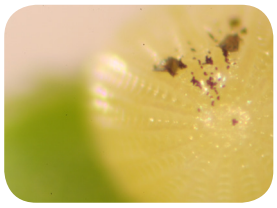
Each fall, monarchs in eastern and western North America migrate to overwintering sites, where they form clusters in trees and stay in a semi-dormant state until the spring. However, some monarchs skip the traditional long-distance migration. In parts of the southern U.S. and California, the year-round persistence of tropical milkweed allows monarchs to breed throughout the winter. These year-round tropical milkweed patches foster greater transmission of the protozoan *Ophryocystis elektroscirrha* (OE), increasing the likelihood that monarchs become infected with the debilitating parasite. Therefore, we recommend that tropical milkweed (*Asclepias curassavica*) should be cut back in the winter and fall months in the southern U.S. and California, and should be gradually replaced with native milkweeds as they become available.

Tropical milkweed

Tropical milkweed (*Asclepias curassavica*) has a natural range that extends as far north as Mexico, but this plant is not native to the United States or Canada. Tropical milkweed is attractive and easy to grow, so it tends to be the most widely available milkweed at commercial nurseries. Because tropical milkweed historically occurred in the New World tropics, it is adapted to grow year-round in mild climates, whereas most native North American milkweeds die back seasonally and are absent during the winter months. When tropical milkweed is planted in the coastal southern U.S. and California, these plants continue to flower and produce new leaves throughout the fall and winter, except during rare freeze events.

What is OE?

Ophryocystis elektroscirrha (OE) is a debilitating protozoan parasite that infects monarchs. Infected adult monarchs harbor thousands or millions of microscopic OE spores on the outside of their bodies. When dormant spores are scattered onto eggs or milkweed leaves by infected adults, monarch larvae consume the spores, and these parasites then replicate inside the larvae and pupae. Monarchs with severe OE infections can fail to emerge successfully from their pupal stage, either because they become stuck or they are too weak to fully expand their wings. Monarchs with mild OE infections can appear normal but live shorter lives and cannot fly was well as healthy monarchs. Although recent research shows that tropical milkweed can lower OE replication within infected monarchs (due to high levels of cardenolide toxins), this might not benefit the monarch population. In fact, this could actually promote disease spread by allowing moderately infected monarchs that otherwise would have died quickly following eclosion to live longer and spread more parasite spores.



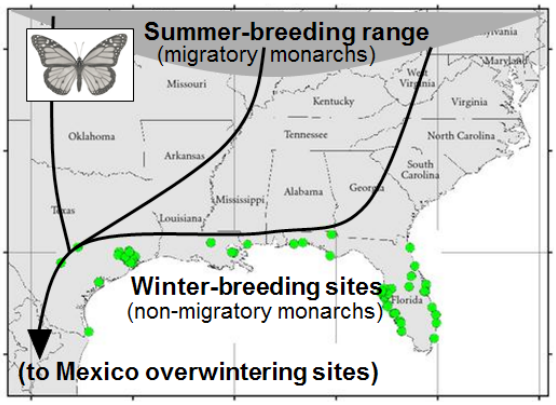
PROJECT MONARCH HEALTH

Project Monarch Health - www.monarchparasites.org

Project Monarch Health is a citizen science program focused on understanding the monarch parasite, OE. Learn more about this program and how to get involved by visiting the project website.

Year-round monarch breeding

If milkweed is present year-round, then monarchs can breed year-round. In recent years, Journey North (www.learner.org/jnorth) and Monarch Larva Monitoring Project (www.mlmp.org) volunteers have reported many monarch larval sightings during the winter in the southern U.S., ranging from coastal Texas to the Carolinas. Almost exclusively, these caterpillars are feeding on tropical milkweed – often in very high densities. In mild climates, a single garden of tropical milkweed can harbor tens or hundreds of monarch eggs and larvae with multiple monarchs per plant, during December, January, and February. Scientists have reasons to think that winter-breeding is more common now than in the past, although data needed to test this trend are limited. It is not clear whether the eggs and larvae on tropical milkweed come primarily from resident monarchs or from migratory monarchs that halt their journeys once they encounter tropical milkweed. Regardless, winter larvae feeding on tropical milkweed face multiple threats, including a higher chance of becoming infected with OE parasites.



Risks of year-round breeding

Monarchs that reproduce year-round on tropical milkweed face several challenges. Research in this area is ongoing, but recent work suggests that winter-breeding monarchs suffer higher risks of mortality and lower ability to reproduce due to:

1. **Infectious disease.** Winter larvae are more likely than migratory monarchs to become infected with the OE parasite. Citizen scientists in the program Monarch Health showed that 49% of winter-breeding monarchs were infected with this parasite, compared to 9% of migratory monarchs sampled in Mexico and 15% of migratory monarchs sampled in the northern U.S. and Canada. This effect is probably the result of monarchs using the same plants generation after generation, allowing the parasite to accumulate both in the local monarch population and on milkweed plants.
2. **Food shortages.** Because tropical milkweed plants often harbor high densities of monarch larvae during the winter, larvae sometimes eat plants to the ground and run out of food. Thus, compared to summer-breeding larvae, winter-breeding larvae face a higher risk of food limitation, leading to starvation or cannibalism.
3. **Freezing temperatures.** While winters in the southern U.S. and California are mild in most years, rare freeze events can kill tropical milkweed plants, leaving monarch larvae without food and adult monarchs with less nectar. This happened in many locations in early 2014.

Photos
Larva on A. curassavica - S. Altizer
Oviposition - P. Davis
Spores on egg - J. de Roode
Deformed/Infected adult - S. Altizer
Aging milkweed - D. Satterfield
Adult on A. curassavica - P. Davis
Winter-breeding map - Modified from Howard, Aschen and Davis (2010)
Larvae defoliating milkweed - D. Satterfield

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What can you do?

- Plant only species of milkweed that are native to your region, whenever possible. The MJV Milkweed Information Sheet (monarchjointventure.org) provides more information on a few priority species for each region of the U.S.
- If you already have tropical milkweed in your garden, prune the milkweed stalks to about 6 inches in height during the fall and winter months to discourage monarchs from establishing winter-breeding colonies*. Cutting back the milkweed will also help to eliminate OE spores that may be present on the plant. Re-cut the milkweed every few weeks as leaves re-sprout. Tropical milkweed might pose fewer problems in the northern monarch breeding range because it dies back naturally when it freezes.
  **These recommendations are not applicable in south Florida (south of Orlando), where a distinctive, non-migratory population of monarchs has long been established. However, native milkweed planting is still encouraged in this area.*
- Contribute to scientific knowledge about winter-breeding monarchs by participating in citizen science projects.
  Project Monarch Health involves volunteers in collecting parasite samples from wild monarchs (monarchparasites.org). Observers receive a report on the infection status of all monarchs they sample. Volunteers can also report observations about winter monarch sightings on **Journey North** (journeynorth.org/monarchs), and collect detailed information on monarch use of milkweed plants in any season for the **Monarch Larva Monitoring Project** (mlmp.org).

Southeast Region Milkweed Species

Butterfly Weed
Asclepias tuberosa
Well drained soils.
Photo by Thomas Muller, Lady Bird Johnson Wildflower Center

Whorled Milkweed
Asclepias verticillata
Prairies and open areas.
Photo © Kim Davis & Mike Stangeland

White Milkweed
Asclepias variegata
Thickets and Woodlands.
Photo by Melton Wiggins

Aquatic Milkweed
Asclepias perennis
Hydrated soils.
Photo © Kim Davis & Mike Stangeland

Sandhill/Pinewoods Milkweed
Asclepias humistrata
For use in some regions of FL.
Dry sandy areas and soils.
Photo © Kim Davis and Mike Stangeland

Note: *Asclepias syriaca* and *Asclepias incarnata* are native to parts of this region and may also be suitable species to plant. More details on the native range of each species can be found at: http://bonap.net/NAPA/TaxonMaps/Genus/County/Asclepias

Western Region Milkweed Species

NOTE: Excludes Arizona; see below for Arizona milkweed.

Narrow-Leaf Milkweed
Asclepias fascicularis
Dry climates and plains, except in CO, UT, NM & AZ.
Photo by Christopher Christie

Showy Milkweed
Asclepias speciosa
Savannahs and prairies.
Photo by Robert Potts © California Academy of Sciences

Selecting and Finding Milkweed Plants

While any of the species listed here can be grown in garden settings, please use species that are native to your county for larger restoration projects. You can find more information about milkweed, together with a directory of native plant vendors that sell milkweed plants and seeds, on our website:

www.plantmilkweed.org

Arizona Milkweed Species

Butterfly Weed
Asclepias tuberosa
Well drained soils.
Photo by Gail Morris

Antelopehorns Milkweed
Asclepias asperula
Desert and sandy areas.
Photo by Kip Kiphart

Rush Milkweed
Asclepias subulata
Desert areas.
Photo by Gail Morris

Arizona Milkweed
Asclepias angustifolia
Riparian areas and canyons.
Photo by Morris Family

California Milkweed Species

Narrow-Leaf Milkweed
Asclepias fascicularis
Dry climates and plains.
Photo by Christopher Christie

Showy Milkweed
Asclepias speciosa
Savannahs and prairies.
Photo by Robert Potts © California Academy of Sciences

Desert Milkweed
Asclepias erosa
Desert regions.
Photo by Christopher Christie

California Milkweed
Asclepias californica
Grassy areas.
Photo by Christopher Christie

Heartleaf Milkweed
Asclepias cordifolia
Rocky slopes.
Photo by Dee E. Warenycia

Woolly Milkweed
Asclepias vestita
Dry deserts and plains.
Photo © 2010 Neal Kramer

Woolly Pod Milkweed
Asclepias eriocarpa
Clay soils and dry areas.
Photo by Br. Alfred Brousseau, St. Mary's College

*Common names vary from place to place, so we have used the USDA names for consistency.

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MONARCH JOINT VENTURE PARTNERS (SELECTION)

December, 2024

State and National Agencies

US Fish and Wildlife Service

US Forest Service

US Geological Survey

National Park Service

Association of Fish and Wildlife Agencies

Northeast Association of Fish and Wildlife Agencies

Western Association of Fish and Wildlife Agencies

Midwest Association of Fish and Wildlife Agencies

Southeast Association of Fish and Wildlife Agencies

California Association of Resource Conservation Districts

Central Coast State Parks Association

Iowa Department of Natural Resources

Minnesota Department of Natural Resources

Pennsylvania Department of Conservation and Natural Resources

Nevada Division of Natural Heritage

Texas Parks and Wildlife Department

Wisconsin Department of Natural Resources

Santa Clara Valley Habitat Agency

National and International Conservation Organizations

The Nature Conservancy

Environmental Defense Fund

Xerces Society

Audubon International

Butterfly/pollinator-specific Conservation Organizations

North American Butterfly Association

Iowa Monarch Conservation Consortium

Malibu Monarch Project

Arkansas Monarch Conservation Partnership

Bee and Butterfly Habitat Fund

Missourians for Monarchs

Monarch Butterfly Fund

Project Monarch Health

Nebraska Monarch and Pollinator Initiative

Sustainable Monarch

Pollinator Partnership

Pollinator Protection Fund

Western Monarch Trail

Other Conservation Organizations

Deep Roots

Earth Discovery Institute (San Diego)

Houston Wilderness

Lady Bird Johnson Wildflower Center

Mississippi Valley Conservancy

Botanical Gardens, Zoos, Nature Centers and Museums

San Diego Zoo Wildlife Alliance

San Antonio Zoo

Cincinnati Nature Center

Cincinnati Zoo and Botanical Garden

Coastal Virginia Wildlife Observatory

Butterfly Pavilion

Desert Botanical Garden

Fort Worth Botanic Garden

Hallberg Butterfly Gardens

Houston Arboretum and Nature Center

The Field Museum

Pacific Grove Museum of Natural History