



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.

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Photo credits: Wendy Caldwell

Monarch Community Science

Volunteer contributions to understanding an iconic insect

Community Science

Public participation in science has a long history. Prior to the late 1800s, most scientific research was conducted by untrained, yet passionate, members of the public. Today, we use the term community scientist to describe volunteers who collect data for research but who are not professional scientists. The term community science is becoming more common, although it is still interchanged with citizen science, a popular alternative over the past two decades.

Community science and monarch monitoring have been closely tied for years. Starting in the 1950s, Dr. Fred Urquhart's "Insect Migration Association" involved hundreds of volunteers in search of the then unknown overwintering grounds of eastern North American monarchs. This tagging project tracked the flights of individual butterflies, and ultimately led to the 1975 discovery that monarchs from the northern U.S. and southern Canada were overwintering in central Mexico.

Public involvement in monarch community science has been growing since 1990. Several community science programs focus on different aspects of monarch biology, including migration, population dispersal, parasitism, and overwintering. Countless hours spent by thousands of dedicated volunteers have allowed scientists to answer questions about how and when monarchs use available habitat, how their numbers change within and among years, how environmental perturbations affect these variations, and how monarchs are responding to contemporary global change and conservation efforts.

Community Science Contributions

Community scientists make large-scale studies possible by providing data, time, and other resources at continental scales. The importance of their contributions is reflected in many ways:

- 17% of peer-reviewed publications that focused on monarchs since 1940 have used data from community science projects¹. Many project websites provide summaries of findings and publications, raw data, and other information.



- Since 2000, two-thirds of papers on field-based research outside of the Mexican Reserve (where scientific permits are required) used community science data¹.
- Community science volunteers engage in many actions that have important conservation outcomes², from teaching others to improving and creating habitat.
- Data generated by community scientists allow researchers to answer questions that could never be considered using traditional academic research methods.

Links and Resources

Monarch Community Science:

www.monarchjointventure.org/get-involved/study-monarchs-community-science-opportunities

Citizen Science Central:

www.birds.cornell.edu/citscitoolkit/projects/find

Resources:

1. Ries, L. and K. S. Oberhauser. A Citizen Army for Science: Quantifying the Contributions of Citizen Scientists to our Understanding of Monarch Butterfly Biology. *BioScience* (April 2015) 65 (4): 419-430
2. Lewandowski, E J and Oberhauser, K S 2016 Butterfly Citizen Science Projects Support Conservation Activities among their Volunteers. *Citizen Science: Theory and Practice*, 1(1): 6, pp. 1-8, DOI: <http://dx.doi.org/10.5334/cstp.10>
3. Oberhauser, K.S. et al. 2015. Contributions to Monarch Biology and Conservation through Citizen Science: 70 Years and Counting. pp 13-30 in K.S. Oberhauser, K. Nail, and S. Altizer, eds., *Monarchs in a Changing World: Biology and Conservation of an Iconic Butterfly*, Cornell University Press, Ithaca, NY.

Tracking the Migration

Track monarchs on their migration routes to understand timing, habitat use and other factors that influence migratory success.

Journey North has a strong educational component and provides opportunities to track and view a variety of migrations across North America.



- Report sightings of monarchs (adults, eggs, and larvae) and milkweed during the spring and fall migrations as well as throughout the year. View real-time maps of sightings.
- Online or app data submission.

journeynorth.org/monarchs

Monarch Watch has enabled participants to tag over 1 million monarchs, providing information about migration dynamics as monarchs are recovered at overwintering sites and other areas along the migratory pathway.



- Order small, lightweight stickers with unique identifying numbers.
- Place the stickers carefully as instructed on the wings of monarchs that are captured in the wild or reared and released.
- If you find a monarch that is already tagged, submit the tag number to the program.
- Online or mail data submission.

monarchwatch.org

Overwintering (Western)

Track the movement and health of the western overwintering population along the coast of California.

Western Monarch Count provides estimates of the western monarch population size and evaluates habitat in overwintering grounds.



- Connect with a Regional Coordinator to become trained and assigned a monitoring site.
- Survey your site, especially during a focal period around Thanksgiving.
- Online, mail, or app data submission.

westernmonarchcount.org

Monarch Alert studies the movement and connections between western overwintering sites, and uses ecological information to predict the overwintering population size.

- Follow instructions to become permitted to apply tags to monarchs in California.
- Apply tags to monarchs that are captured in the wild or reared and released.
- Online or mail data submission.



monarchalert.calpoly.org

More Than Monarchs!

In addition to monarch monitoring programs, other community science programs collect data on all butterfly species, and even moths.

Check out the North American Butterfly Association, Butterfly Monitoring Networks, Butterflies and Moths of North America, and eButterfly to learn more.

Monitoring Eggs, Larvae, and Natural Enemies

Monitor the health and reproduction of monarchs across their breeding grounds.

Monarch Larva Monitoring Project helps researchers study factors that affect monarchs during the breeding season, determining how populations vary in time and space.



- Inspect milkweed plants for monarch eggs and larvae weekly or as single observations.
- Conduct additional activities as time and interest allow, such as rainfall tracking or estimating survival of monarchs through rearing.
- Online and mail data submission.

mlmp.org

Project Monarch Health tracks the spread of a protozoan parasite of monarch butterflies, *Ophryocystis elektroscirrha* (OE).



- Request a parasite sampling kit from Monarch Health, or follow their instructions to use materials from home.
- Sample butterflies that are captured in the wild or reared indoors for parasites.
- Submit the samples to the program for diagnosis and receive your results.
- Mail data submission.

monarchparasites.org

Integrated Monitoring

Monitoring for monarchs as an integrated part of their habitats.

Integrated Monarch Monitoring Program tracks monarchs *and* their habitat across the breeding range to better understand habitat availability, quality, and use by monarchs in different land-use types, including conservation lands.



- Attend in-person training or complete training online.
- Use online tools to select a high priority randomly-selected site near you, or select your own site.
- Conduct any of the following *optional* activities: Record blooming plants; count milkweed stems; survey for monarch eggs, larvae, or adults; or estimate survival rates.
- App or online data submission.

monarchjointventure.org/immp

Local Monitoring

Many local community science programs have been implemented throughout the country as well, including:

Southwest Monarch Study tags and monitor monarchs and their habitats in the desert southwest. Data provide greater understanding of the migration, breeding, and overwintering strategies of monarchs in the area. swmonarchs.org

Cape May Migration Monitoring Project (NJ) and **Peninsula Point Migration Monitoring Project (MI)** count all monarchs seen during a fixed period of time and in a fixed location well-known for migratory activity. monarchnet.org

Western Monarch Milkweed Mapper maps monarchs and milkweed distribution across the western U.S. monarchmilkweedmapper.org

See [Links and Resources](#) section (pg 1) for more information.