



MLMP Updates

An e-newsletter of the Monarch Larva Monitoring Project



Winter 2025

*This winter's newsletter includes a recap of our first-ever virtual **2024 end of season gathering** in October 2024 along with dates for our **2025 virtual MLMP training workshops**. Please join us and/or share with others who might be interested in being part of the MLMP.*

*We also provide information about the recent determination by the U.S. Fish and Wildlife Service (USFWS) to **give monarchs protection** under the **Endangered Species Act** and the **public comment period** from **December 12, 2024 - March 12, 2025**.*

Read on!

2024 Monitoring Season Wrap-Up

At the end of October 2024, coinciding with the first monarchs making their way to the overwintering sites in Mexico, the MLMP Team led the first-ever virtual wrap-up session about the 2024 season. We shared monitoring results and gave general updates about monarch conservation, highlighted some of the great work being done by all of you in the MLMP community, shared recent research using MLMP data, reviewed data collection reminders, and shared monarch monitoring stories and impressions of the year with fellow MLMP volunteers from across the continent. Highlights of the wrap-up session are found in this update, and the full recording can be watched on our website [at this link](#).

By the Numbers

2024 Monitoring Season

- 214 sites monitored
- 147 individuals/teams
- 2131 monitoring events in 30 states
- 150 larvae reared for Activity 3

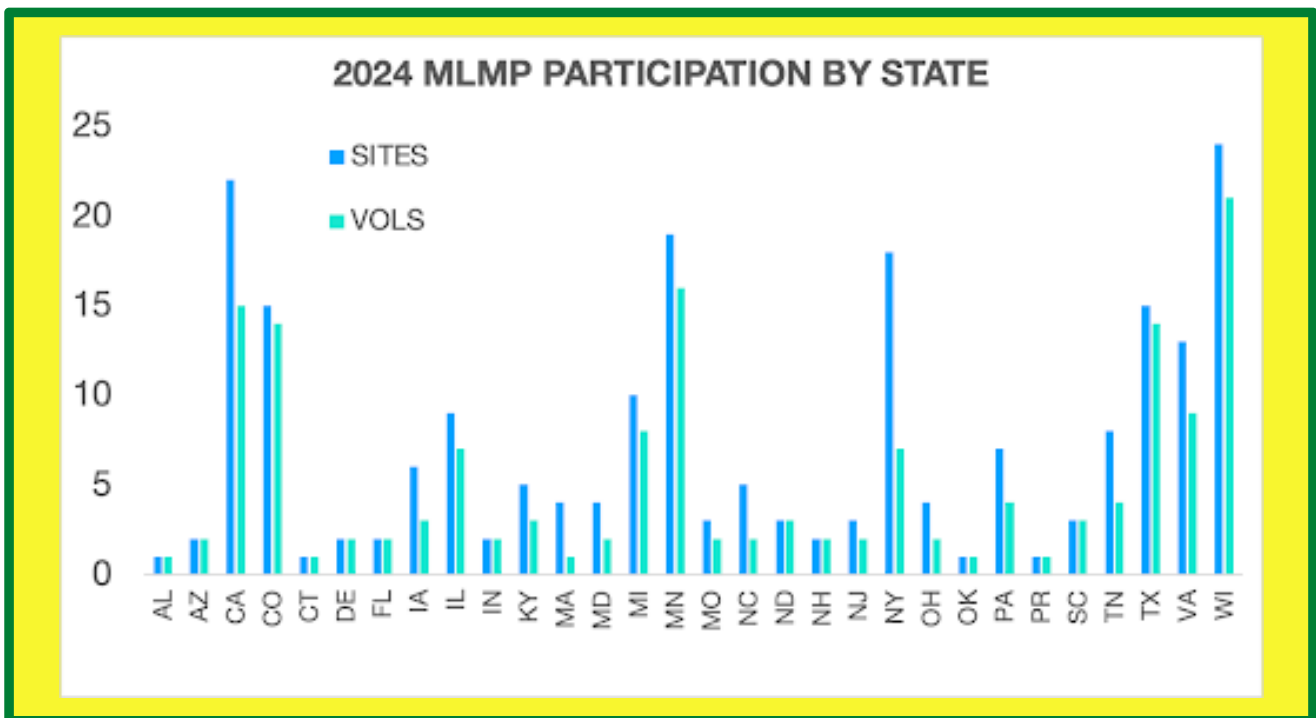
The **Monarch Larva Monitoring Project** is a partnership of the **Monarch Joint Venture** and the **University of Wisconsin-Madison Arboretum**.



Volunteer Recognition

As we near our 30 year mark, we send gratitude to all volunteers. In this newsletter, we'd like to give a special shout-out to 2024 volunteers who have monitored for over 15 years with the MLMP! You've seen a lot and contributed incredibly valuable long-term data.

Karen Oberhauser	1996	Tim Vargo and EEC Team	2003
Susan Jamison	1997	Sondra Cabell	2004
Gayle Steffy	1997	Maureen Clark	2004
John Weber	1998	Sharon Duerkop	2004
Susan Payant	1999	Five Rivers EEC Staff	2004
John Pleasants	2000	Karl Pauli	2005
Brian Bockham	2002	Virginia de Wolf	2007
Susan Bogle	2002	Albert Eurs	2007
Ilse Gebhard	2002	Debi Nitka	2007
Laura Molenaar	2003	Shana McMillan	2008
Sharon Duerkop	2000	Cindy Petersen	1999

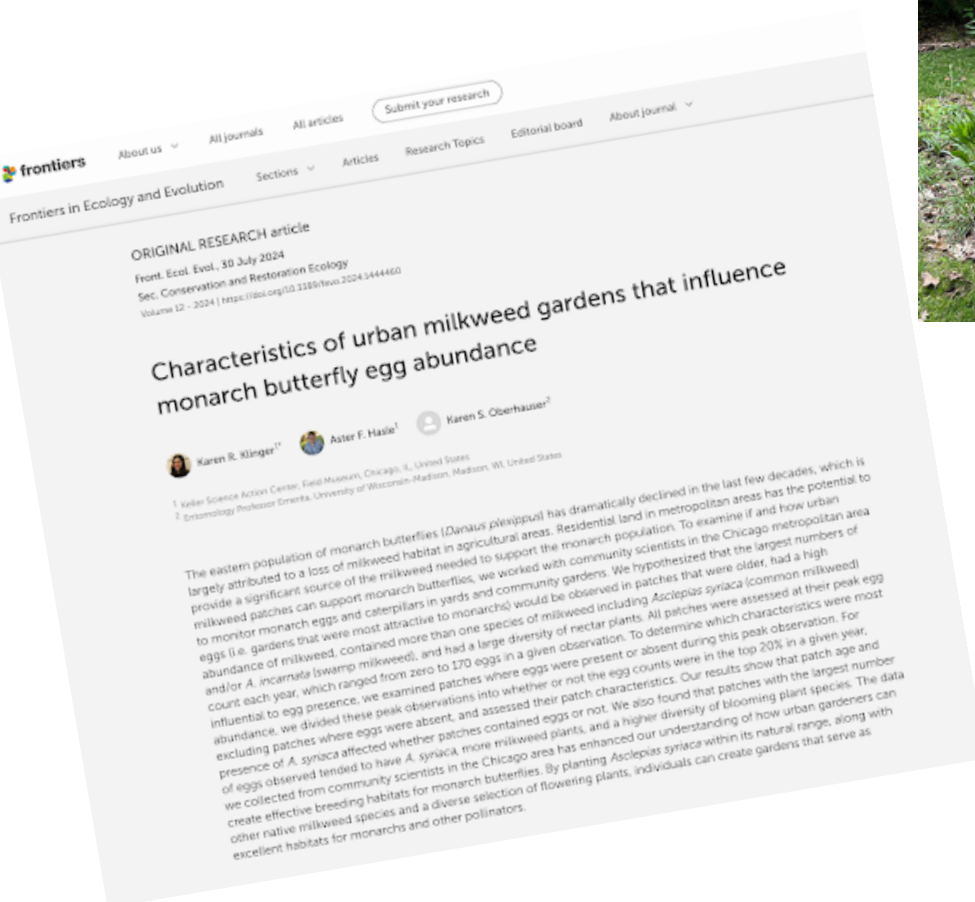


Other Ways to Help

Please let us know if you'd like more information on becoming an **MLMP trainer** or if you'd like to be **a resource for other MLMP volunteers** in your area. We may have **other volunteer opportunities** apart from monitoring as well, such as helping with the newsletter, spot-checking data, etc. If you're interested in helping with these, please reach out to info@mlmp.org!

MLMP Data in Recent Research

The data MLMP volunteers collect has been used in many research projects and analyses over the years, reinforcing the importance of your monitoring efforts for monarch conservation. You can see [publications](#) that have used MLMP data on our website, and all [MLMP results can be viewed](#) on the data portal of mlmp.org as well. Read on to learn about recent research using MLMP data! Each of these recent publications is summarized along with the full article linked in the title.



- Collaborative research with Chicago Field Museum
- Residential land in urban areas can provide significant monarch habitat
- Chicagoans used MLMP to monitor yards and gardens
- Older patches and patches with common milkweed were more likely to contain eggs
- Patches with common milkweed, more milkweed, and higher diversity of blooming plants had more eggs



[Characteristics of Urban Milkweed Gardens that Influence Monarch Butterfly Egg Abundance](#)

Klinger, K.R., Hasle, A.F., Oberhauser, K.S. (2024)

Frontiers in Ecology and Evolution, 12, DOI:

10.3389/fevo.2024.1444460

The potential of roadside verges as insect habitat: Road salt has few effects on monarch butterfly performance and migration

Amanda K. Hund^{1,2} | Timothy S. Mitchell² | M. Isabel Ramírez³ |
Amod Zambre² | Lili Hagg² | Anne Stene^{2,4} | Karilyn Porter² |
Adrian Carper⁵ | Lauren Agnew² | Alexander M. Shephard^{2,6} |
Megan E. Kobiela^{2,7} | Karen S. Oberhauser⁸ | Orley R. Taylor⁹ |
Emilie C. Snell-Rood²

- Ongoing studies of roadsides as monarch habitats
- In a massive study that involved feeding larvae three different amounts of salt and tagging over 2500 adults, adults from all three salt levels were recovered in Mexico (seven recoveries)
- Larvae on high salt diets excreted sodium but there were no effects on fitness
- This research was based on studies that use MLMP protocols, and provides information about the value of roadside habitat to monarchs



Click to read the full
publication.


Dietary road salt and monarch butterflies: minimal effects on larval growth, immunity, wing coloration, and migration to Mexico.

Hund, A., Mitchell, T., Ramirez, I., Zambre, A., Hagg, L., Stene, A., Porter, K., Carper, A., Agnew, L., Shephard, A., Kobiela, M., Oberhauser, K., Taylor, O., Snell-Rood, E. (2023)

10.1101/2023.09.04.554310.

ORIGINAL ARTICLE

Host plants and landscape predict use of roadside habitat by breeding monarchs

Alison J. Banks Cariveau¹  | Grace A. Haynes¹  | Patrick Perish¹  |
Karen Tuerk¹ | Chris Nootenboom²  | Timothy Mitchell³  | Eric Lonsdorf⁴  |
Karen Oberhauser⁵ | Emilie C. Snell-Rood³ 



- Used MLMP protocols to survey over 250 roadside sites in MN
- Milkweeds more likely to be present in roadsides adjacent to crops and grasslands, and in S and W of state
- Likelihood of monarch presence higher as milkweed density increased
- Monarchs per plant higher with lower milkweed densities (concentrate eggs where fewer plants are present)
- Monarch density per plant increased in areas farther from core grasslands and on narrower roadsides

 Click to read the full publication.

Host plants and landscape predict use of roadside habitat by breeding monarchs.

Cariveau, A.J.B., Haynes, G.A., Perish, P., Tuerk, K., Nootenboom, C., Mitchell, T. et al. (2024)

Insect Conservation and Diversity, 17(5), 894-909. Also available from: <https://doi.org/10.1111/icad.12758>.

*Using MLMP and **Integrated Monarch Monitoring Program** protocols.*


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Journal for Nature Conservation
Volume 82, December 2024, 126723

ELSEVIER

Projected distribution shifts of resident monarch butterflies and consequences for migratory monarchs

Iman Momeni-Dehaghi^a, Lenore Fahrig^a, Joseph R. Bennett^a, Trina Rytwinski^a,
Karen S. Oberhauser^b, Nancy A. Sheehan^c, Greg W. Mitchell^{a, d}



- Winter breeding populations are prone to high OE burdens
- Models predict an increase and northern shift in areas suitable for winter breeding
- This could increase disease spread from resident to migratory monarchs
- Research supports calls for controlling the spread of non-native tropical milkweed

 Click to read the full publication.

Projected distribution shifts of resident monarch butterflies and consequences for migratory monarchs.

Momeni-Dehaghi, I., et al. (2024)
Journal for Nature Conservation, Volume 82, 2024, 126723, ISSN 1617-1381.





- Enhancing monarch conservation using artificial intelligence (AI) in citizen science photographs
- AI can identify larval instars from iNaturalist photos
- This means we can track larval phenology using the thousands of date and location stamped photos submitted to iNaturalist
- Training AI tools was based on MLMP protocols, and findings will augment our ability to track monarch phenology more broadly. This will add to the more detailed information provided by MLMP surveys.



Click to read the full publication.

Artificial intelligence correctly classifies developmental stages of monarch caterpillars enabling better conservation through the use of community science photographs.

Neupane, N., Goswami, R., Harrison, K. et al.

Sci Rep 14, 27039 (2024).

<https://doi.org/10.1038/s41598...>

Data Collection Reminders

As we gear up for another season of monitoring, here are a few data collection reminders to assist you!



- Zero is still a number – and an important one! **Keep collecting data even if you aren't seeing monarchs.**
- **Monarch density data collection is for monarchs outside, not ones you are rearing indoors.** Once you bring a monarch inside, do not report it for Activity 1 (monarch density) again. Consider it “graduated” to Activity 3 (monarch survival).
- **Avoid subdividing sites.** If multiple people monitor the same biologically similar site or you monitor multiple areas within a site, collate the data before entering.
- **Pupae are only counted if they are on milkweed.** If you see a pupa not on milkweed, please add it to your notes for the day, but not in the Activity 1 (monarch density) record.
- Keep monarchs you are rearing for **Activity 3 (monarch survival)** in **their own, individual containers.**
- We encourage you to **submit your data right away if possible.** It's less work and easier to catch/fix any mistakes you find. And it allows us to track monarch numbers in real time.
- If you have questions, **please contact us!** We're happy to help!

Public Input Sought by USFWS on Monarch Butterfly ESA Listing

On 12/10/2024, the U.S. Fish and Wildlife Service (USFWS) announced its decision on whether to give monarchs protection under the Endangered Species Act (ESA). After careful consideration, they have determined that monarchs are threatened, accompanied by a 4(d) rule and critical habitat designation. The **USFWS** currently **is seeking public input** during a **90-day comment period**, open **from December 12, 2024 to March 12, 2025**. Dr. Karen Oberhauser shared a letter with the MLMP community in December about this decision.



December 10, 2024

Dear Monarch Larva Monitoring Project Volunteers,

Today, the U.S. Fish and Wildlife Service (USFWS) announced its decision on whether to give monarchs protection under the Endangered Species Act (ESA). After careful consideration, they have determined that monarchs are threatened; that is, they are likely to become endangered in the foreseeable future through a significant portion of their range.

This follows a decade-long process that is summarized by [Monarch Joint Venture](#). The original petition that started this process was submitted by the Xerces Society for Invertebrate Conservation, the Center for Biological Diversity, the Center for Food Safety and the late Dr. Lincoln Brower, a long-time monarch researcher.

It is important to note the process is not complete; as with any ESA decision, there will be a [public comment period](#) of about 90 days, opening Dec. 12 and closing on March 12, 2025, followed by a review of the 4(d) rule by the USFWS. The 4(d) rule will lay out protective regulations that should be followed to conserve monarchs. We will provide future updates on the proposed 4(d) regulations.

Following a significant decline in monarch numbers across their migratory cycle, multiple scientific analyses have shown that populations are not at a safe level that buffers them against the kind of catastrophic events that have occurred in the past. These events include extreme weather conditions that result in the mortality of a large portion of the population.

(continued on next page)

Letter from Karen Oberhauser (continued)

The ESA is a powerful tool for preventing extinction. It results in legal protection and resources to support conservation work in the United States that wouldn't otherwise happen, and the ESA has been credited with preventing extinction for 99% of the species that have been listed. For monarchs, this decision will protect monarch wintering habitat in coastal California, allow federal agencies to consider monarchs when making land management decisions, and support monarch habitat nationwide.

The voluntary efforts that we are collectively carrying out are important, and are probably the reason that monarchs are not doing worse than they are. Despite ongoing habitat loss and threats from weather and pesticides, monarch numbers have been relatively stable for the past decade. While there is a great deal of year-to-year variation, the downward trend seen earlier in this century has not continued.

The ESA gives the USFWS flexibility to create a 4(d) rule that will work for the public, including farmers and landowners, and for monarchs. It could include incentives for conservation practices as well as exceptions for activities that lead to habitat loss as long as they are balanced with conservation actions. As the rule is currently proposed, people will still be able to handle, study, and raise monarchs on a small scale, such as the numbers reared by some Monarch Larva Monitoring Project volunteers in our survival study, although it is likely that large-scale and commercial rearing will be prevented since this level of rearing raises risks for monarchs.

While the ESA applies only to conservation in the US, our actions have a direct impact on the number of monarchs that migrate to Mexico each year, and is in line with protections that have been enacted or proposed in Mexico and Canada.

Thank you for your efforts to help us better understand monarchs!

Karen Oberhauser

Monarch biologist

Retired UW–Madison Arboretum director

To read more about this decision:

- [USFWS Press Release](#)
- [Monarch Joint Venture](#) calls for [increased collaboration](#) and shares information about how to participate in the [USFWS 90-day public input period](#) (from December 12, 2024 – March 12, 2025)



2025 MLMP TRAININGS

JOIN US

FOR THE FIRST TIME, OR AS A REFRESHER!



January 29 – western region

9 am – 2 pm PT (1 hour break at 11 am for lunch)



February 26 – southern region

10 am – 3 pm CT (1 hour break at 12 pm for lunch)



May 7 – northern region

10 am – 3 pm CT (1 hour break at 12 pm for lunch)

- The MLMP team from the **Monarch Joint Venture** and the **UW-Madison Arboretum** co-lead these virtual one-day trainings on **how to collect data that contributes to our knowledge about the monarch population.**
- Participants learn about **monarch biology, monitoring procedures, and data entry protocols** and are able to **ask monarch biologists their questions** about monarchs and monitoring.
- Workshops are relevant for both **newcomers** and individuals who are **already participating** in MLMP or another monarch citizen science project.

Register online and learn more at mlmp.org

You can support MLMP in many ways!

Please consider supporting our collective conservation efforts with a donation that supports training, materials, and maintenance of the data you collect.

You can make a financial contribution today [here](https://mlmp.org).

Have a story from your site or art to share? We'd love to hear from you!

info@mlmp.org | mlmp.org

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