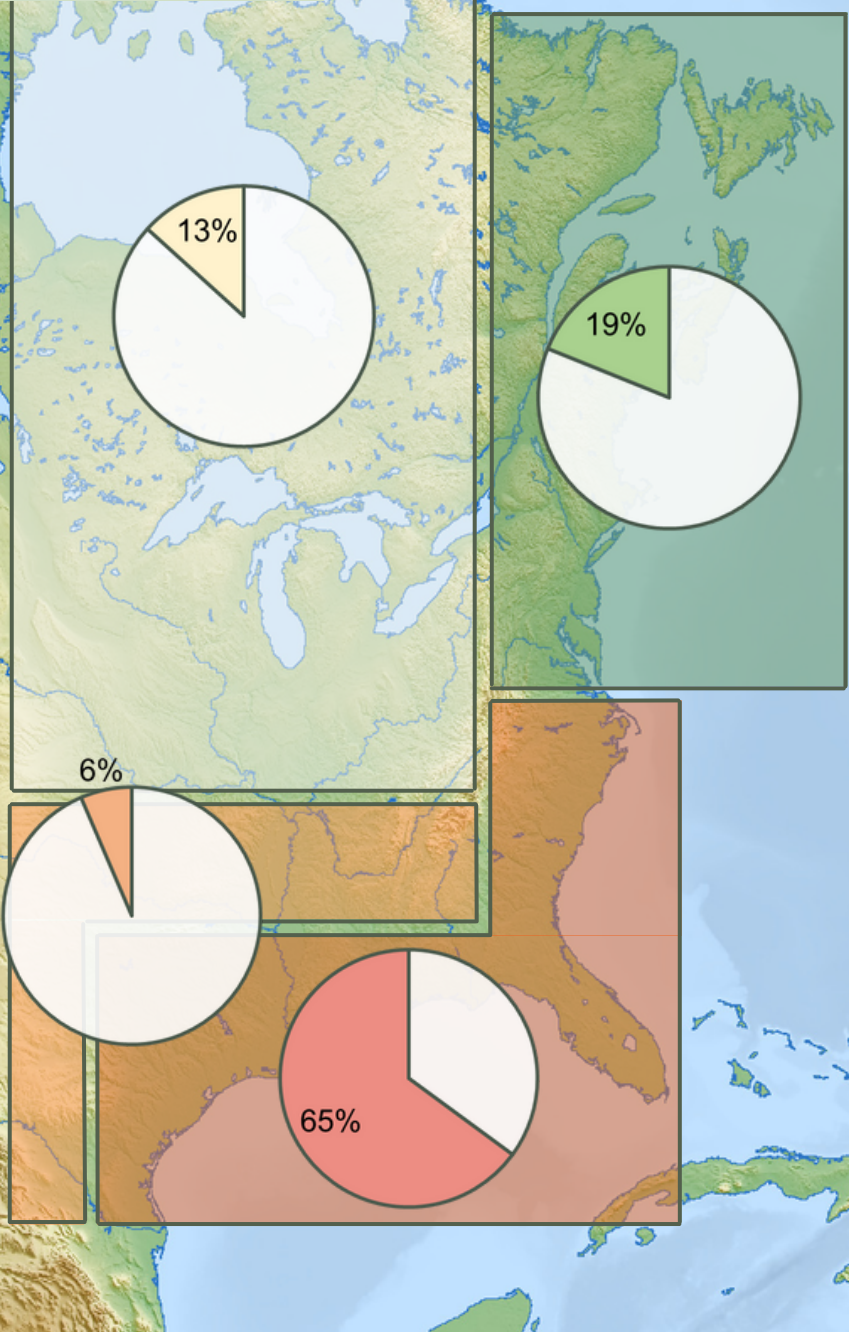
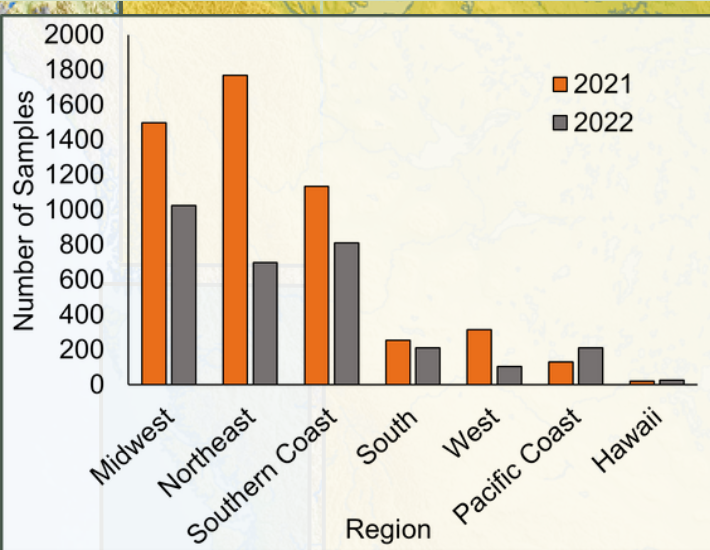


# PROJECT MONARCH HEALTH NEWS

## 2021-22 MONITORING SUMMARY

In 2021-22, 204 volunteers submitted a total of 8206 samples. Across North America and Hawaii, **the average infection rate was 28.4%. Infection prevalence by the protozoan parasite OE was highest along the Southern and Pacific coasts**, where longer growing seasons allow milkweed to persist all year and support non-migratory populations of monarchs. **Pie charts for each region show the percentage of infected samples** in the color corresponding to that region.



The spring migration is underway!  
 Want to be ready to contribute to this coming season's dataset?  
**Email us at [monarchhealth@gmail.com](mailto:monarchhealth@gmail.com) to request an OE sampling kit!**





Project Monarch Health is built on collaboration. Let's recognize some of the amazing people working to protect monarch butterflies!

**We have new ball caps and T-shirts!**

**Donate \$35 or more to Project Monarch Health, and we will send you a baseball cap or a T-shirt as a thank you gift!**



**[CLICK HERE TO DONATE](#)**

**Thank you to our top donors!**

- Ms. Karoun Bagamian
- Mr. James T. Altizer
- Dr. Rosemary Plank
- Mr. Matthew Grant
- Ms. Margaret Kettlitz
- Transylvania Garden Club
- Ms. Becky Harrison
- Ms. Betty Cerar
- Ms. Jackie Salas
- Ms. Debora Evans
- Ms. Hayley A. Schroeder
- Ms. Emily Gene Carr
- Mr. Dale Lyon Hoyt
- Mr. Mark Barton
- Ms. Patricia Pasztor
- Mr. Greg Pearson

**Welcome our new Research Professional, Julia Berliner!**

Julia recently graduated with her Master's in Entomology at UGA, where she studied insect food web ecology. Julia is elated to continue to explore her interest in insect ecology as part of such a collaborative team of colleagues and community scientists. What a lucky opportunity to hone her skills in research and outreach!

**Congratulations and farewell, Kade!**

Kade Donaldson has been offered a position at the USDA. We are proud to have worked with Kade for several years as both an undergraduate intern and as our previous research professional. We are excited to see his career in environmental health at government agencies flourish! Good luck, Kade! We will miss you.

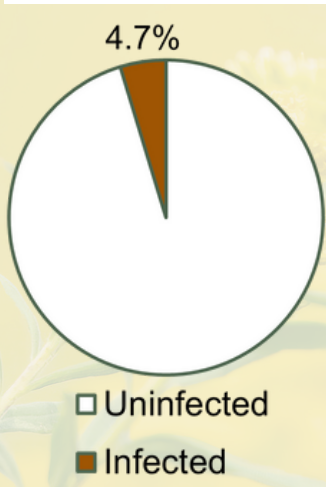


**Collaboration in the Uinta Basin for Monarch Conservation!**

We were so excited to receive 85 samples this year from Dinosaur National Monument in Utah, one of several sites where federal and state agencies, private landowners, and volunteers collaborate to conserve monarchs and other pollinators under a partnership known as Uinta Basin Birds and Butterflies. In addition collecting data on milkweed and other pollinator habitat, this group tags monarchs and samples them for OE (their results are shown below). We are thankful for their involvement in our project, and even more grateful for their efforts in improving and restoring pollinator habitat!



Thank you to Emily Spencer for the photos!





## Congratulations, Caroline!



Caroline Aikins, a former Master's student who graduated from the Altizer Lab in 2022, recently published her graduate work in the Journal of Insect Behavior! Titled "**Neither Copy nor Avoid: No Evidence for Social Cue Use in Monarch Butterfly Oviposition Site Selection,**" Caroline's paper discusses her surprising finding that, when monarch butterflies are choosing where to lay their eggs, they do not seem to take into account how many eggs have already been laid on a plant. This was an unexpected result, because other insects are known to either "**copy**" other females of their species, laying eggs on the plants that already seem to have been deemed high quality, or to "**avoid**" laying eggs on plants that already have lots of eggs on them in order to minimize competition with other caterpillars when their eggs hatch. Whereas some insects use the social cue of how many eggs have already been laid on a plant, it seems monarch butterflies stick to other cues of plant health, such as water availability, herbivore damage, and plant chemistry.

Read Caroline's paper here: <https://rdcu.be/c4LHP>

## OE Infection in Monarch Relatives

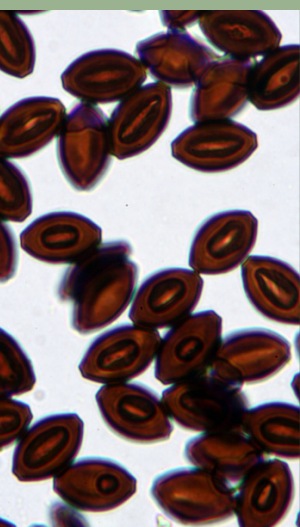


**How many other butterflies are infected with OE-like parasites?** Current PhD student in the Altizer Lab **Maria Luisa Müller** is working towards answering this question. OE was described in monarch and queen butterflies in 1970 and similar parasites (termed OE-like) have been recently documented in other milkweed butterflies (subfamily Danainae). Graduate student Maria Luisa Müller, in collaboration with current and former lab members, is analyzing **samples collected from 2,726 museum specimens** housed at the American (NY), FL and GA Natural History Museums as well as at Del Valle University in Guatemala. **Samples span 85 countries from all five**



**continents and 57 species of milkweed butterflies, and date as early as 1921.** Results will allow us to learn if there are any other milkweed butterflies in which parasite infection is as frequent and geographically widespread as it has been documented in monarchs.

## What should you do if you think you have a sick monarch?



If you think a captive monarch butterfly may have OE, ask yourself these questions before releasing into the wild:

1. Did you use responsible rearing techniques (i.e. no overcrowding, no adults emerging over larvae, all rearing supplies bleached between caterpillars)?
2. Does your monarch have fully formed wings and is able to fly?

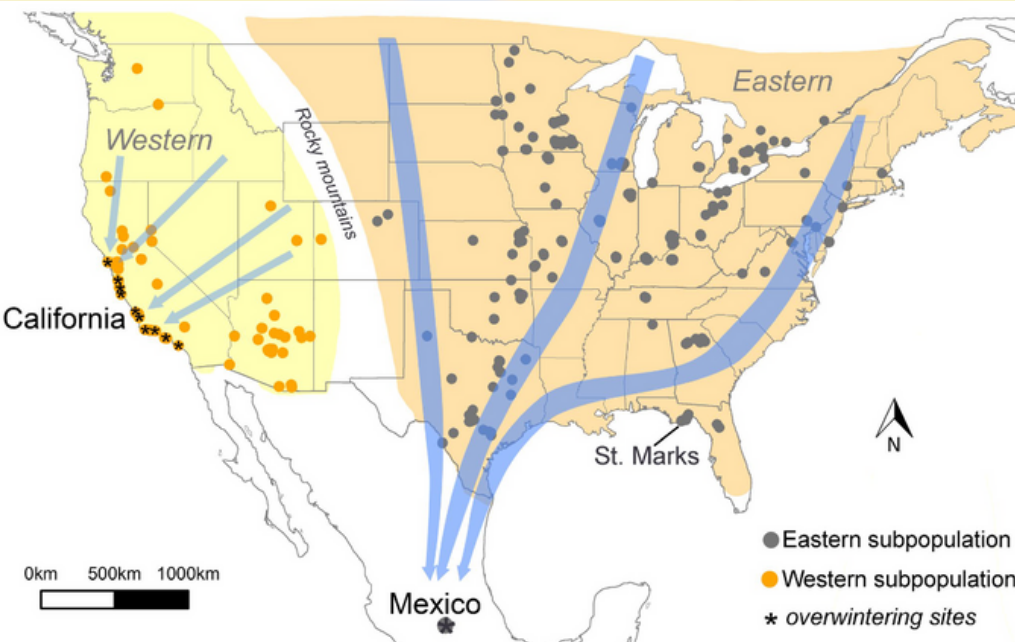
If you answered **YES** to these questions, it's fine to release your monarch.

If you answered **NO** to either of these questions, visit this page on our website <https://www.monarchparasites.org/infection-signs> for more information and a detailed explanation of how to proceed.



# 50 years of data on monarchs and their parasites: what trends emerge?

Ania Majewska, a professor at the University of Georgia College of Veterinary Medicine who graduated from the Altizer Lab with her PhD in 2019, published a paper titled "Parasite dynamics in North American monarchs predicted by host density and seasonal migratory culling." With data spanning 50 years from across North America, she found that **parasite prevalence in the eastern North American subpopulation of migratory monarchs has increased 3-fold since 2002**. The western subpopulation, which has its own unique, shorter migration routes, exhibits a higher average parasite prevalence overall. Despite the different trends between the eastern and western populations, the best predictor of infection rates across both populations was the abundance of adult butterflies, affirming previous understanding that **parasite transmission is enhanced in high densities of butterflies**. The study also found evidence to support existing understanding of why migration might be so important in maintaining healthy monarch populations; because monarchs infected with OE are often weak flyers, many infected monarchs don't make it to their overwintering sites. Through this process known as **migratory culling**, migration naturally reduces monarchs' infection rate each year. Majewska's study supported migratory culling by showing that **the proportion of infected adults was lower in the overwintering season than during the breeding season**. Because the western subpopulation of monarchs migrates much shorter distances, migratory culling may not impact on their infection rate as strongly. Dr. Majewska argues that **future studies should examine whether the rise monarch conservation efforts since the 2000s might have contributed to the rise in parasite prevalence** observed in this study.



**Want to make sure your conservation efforts keep OE in mind? Here are some tips:**

**1) Be mindful of OE and other parasites when tagging, sampling, and rearing monarch butterflies, even if they appear healthy.**

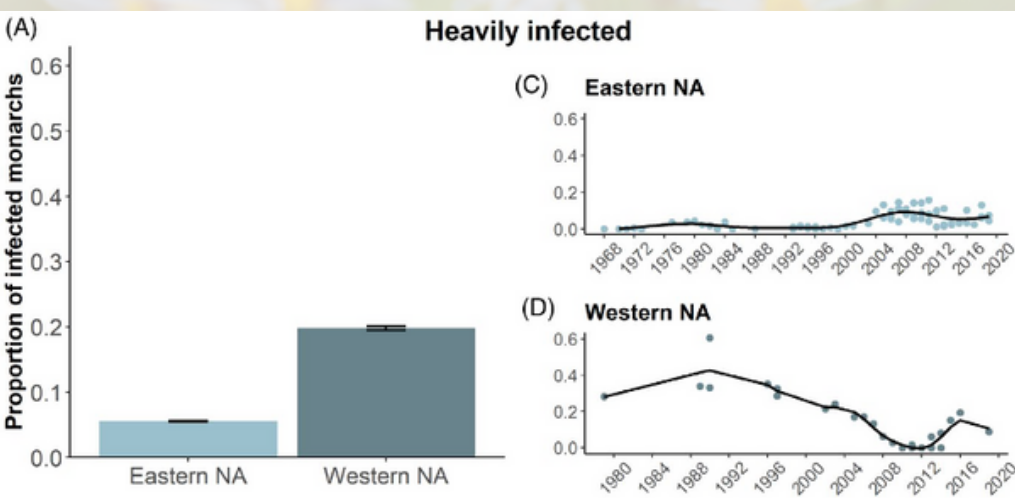
Change gloves and sanitize tools between tagging or sampling wild butterflies. Sanitize rearing containers with 20% bleach between uses, and don't keep monarchs in crowded conditions. Without taking necessary precautions, well-intentioned monarch conservationists might accidentally facilitate the spread of OE.

[Click here](#) for information on how to rear monarchs responsibly

**2) Plant native milkweed and nectar flowers.**

Because of a rise in planting Tropical Milkweed (*A. curassavica*), monarchs in some parts of North America no longer migrate, instead breeding year-round on this non-native milkweed. Unfortunately, this means that OE infection can persist year-round, rather than being culled during the fall migration.

[Click here](#) for our milkweed identification guide



Majewska et al., 2022