

## **Resident Monarch Populations on the Rise in California: What Does this Mean for the Western Migratory Population?**

Home (/) - Xerces Blog (/Blog) -

Resident Monarch Populations On The Rise In California: What Does This Mean For The Western Migratory Population?

# **RESIDENT MONARCH POPULATIONS ON THE RISE IN CALIFORNIA: WHAT DOES THIS MEAN FOR THE WESTERN MIGRATORY POPULATION?**

By Stephanie McKnight on 1 March 2021

Stephanie McKnight

Many people have been seeing and reporting fairly large numbers of monarchs, both adults and caterpillars, all winter long in gardens on the California Coast this year. Since there haven't been any formal studies of the number of monarchs breeding during the winter in California in prior years, it is difficult to know if there is in fact an increase this year, or if people are paying more attention and reporting them more often. Some researchers have unpublished data to suggest that winter breeding is on the rise in California, but more data is needed. It may also be that as more people have amped up efforts to help monarchs, there is now more milkweed in gardens and urban areas for monarchs to use—especially in large urban centers.

Elizabeth Crone, a professor at Tufts University in Massachusetts, conducted surveys of monarchs in Berkeley, California, this winter. Based on her assessment (<https://www.authorea.com/users/317860/articles/510405-resilience-or-catastrophe-a-possible-state-change-for-monarch-butterflies-in-the-west>), there may be up to 12,000 resident monarchs in the Bay Area alone this winter. While that may sound like a large number, it pales in comparison to the hundreds of thousands of migratory monarchs counted on the California coast just a few years ago, or the millions counted in the 1980s. It is also important to note that these winter breeding monarchs may not contribute to the migratory population that usually span out across the West in successive generations each spring and summer. So even if there are 12,000 monarchs in the Bay Area right now that weren't recorded as part of the Thanksgiving or New Year's counts of monarchs at overwintering sites, it is unknown whether these

Help support science-based conservation. Become a member or make a donation today!  
DONATE (<https://secure.aceptiva.com/?cst=633566>) JOIN (<https://secure.aceptiva.com/?cst=633566>)

monarchs will aid in the recovery of the western migratory population, will harm the recovery, or will be neutral. Some of these monarchs may migrate out of the urban areas, find wild milkweed and enter the migratory population, but the science we have available on this topic suggests they will likely stay put in gardens and urban areas where the milkweed and nectar are now in constant supply. And, there's a risk to having a large winter breeding population: when migratory monarchs interact with these resident, winter breeding monarchs, they may be exposed to high levels of pathogens. I'll delve deeper into this topic below.



**Connie Masotti, the Monterey County regional coordinator for the Western Monarch Thanksgiving Count didn't find a single monarch at the Pacific Grove Butterfly Sanctuary this winter. Connie did however find resident monarchs breeding on tropical milkweed nearby. (Photo: Connie Masotti.)**

A similar trend of winter monarch breeding was observed in Arizona this year as well. Gail Morris of the Southwest Monarch Study (<https://www.swmonarchs.org/>), has received consistent and unprecedented reports of monarchs breeding on the native evergreen milkweed (*Asclepias subulata*). This year had record high temperatures across North America, and this fall was especially dry and warm in both Arizona and California where western monarchs spend the winter months. Gail Morris noted: "this year the temperatures were so warm with record highs our deciduous trees are not even losing leaves and some that flower in the fall are still in bloom. A major phenology change in progress for sure."

Help support science-based conservation: become a member or make a donation today!

DONATE (<https://secure.acceptiva.com/?cst=b335b6>) JOIN (<https://secure.acceptiva.com/?cst=307561>)

The winter monarch activity in both coastal California and Arizona this year may very well be due to the abnormally warmer and dryer weather. Changing weather patterns is something that we can likely expect to continue, which for the western monarch population may mean less migratory monarchs and more resident monarchs. The warming trend is also allowing both native and non-native milkweed to grow year-round on the California coast. This may be very problematic for the migratory monarch population because it can lead to increased disease and a shift from their natural behavior to migrate to overwintering sites. Instead, they may continue breeding year-round.

## Migratory Versus Resident Monarchs

So what do we mean when we talk about migratory and resident monarch populations? When we talk about the eastern and western populations of the monarch, we are referring to the migratory populations that breed in successive generations throughout the U.S. and in southern Canada, and then migrate to overwintering sites in central Mexico and the Pacific Coast of California and Baja. When we discuss the western monarch population decline as reported by the Thanksgiving and New Year's Counts, we are referring to the migratory population, not the resident populations. These two migratory populations make up the vast majority of monarchs in North America.

Resident monarch populations do not migrate, and occur in areas where the weather is mild all winter long, and milkweed can grow year-round. In the continental U.S., resident populations occur in Florida, along the Gulf Coast, and in Southern California. We have known for many years that monarchs breed year-round in Southern California as a resident population, but more recently it appears that a resident population is forming in the Bay Area in California as well—possibly as a result of warmer drier winters. These year-round resident populations are primarily using non-native milkweed species such as tropical milkweed and balloon plant/jewel flower in the winter. These resident populations don't migrate and no longer contribute to the overwintering monarch congregations, where they are counted each winter to get a population estimate.

Help support science-based conservation: become a member or make a donation today!

DONATE (<https://secure.acceptiva.com/?cst=b335b6>) JOIN (<https://secure.acceptiva.com/?cst=307561>)





Help support science-based conservation: become a member or make a donation today!

DONATE (<https://secure.acceptiva.com/?est=655506>) JOIN (<https://secure.acceptiva.com/?est=307561>)  
A monarch butterfly infected with *Ophryocystis elektroscirrha* (OE) may not be able to eclose from its chrysalis, or may emerge with wings that cannot extend and flatten. (Photo: Dara Satterfield / Project Monarch Health.)



A growing body of research has found that resident monarch populations using year-round milkweed have a higher rate of the disease OE (*Ophryocystis elektroscirrha*). (<https://xerces.org/blog/tropical-milkweed-a-no-grow>) For this reason, Xerces recommends an approach guided by the precautionary principle: plant native milkweed species in their natural ranges to help monarchs. In general, native milkweed species in their natural ranges die back once per year, thus breaking the cycle of disease, whereas the non-native milkweed species that grow year-round serve as constant reservoirs of disease. We also suspect that both native and non-native milkweed near overwintering sites can disrupt the overwintering behavior, so planting milkweed near overwintering sites (within 5 miles) has generally been discouraged. Even native milkweed species are being reported growing year-round in coastal California, so in order to avoid disrupting their natural overwintering behavior, it is best to avoid planting milkweed near overwintering sites.

Resident monarch populations are especially problematic when wild migratory monarchs encounter diseased resident monarchs and become infected, thus spreading the disease even more, and reducing overall fitness of migratory monarchs. Diseased female monarchs produce fewer offspring than healthy monarchs. Resident populations also pose a major risk to recovery efforts, because research has found that monarchs that enter resident populations generally lose their inclination to migrate. So if any monarchs breed this coming year in the West, and then migrate to California overwintering sites, they may encounter these large resident monarch populations and enter the resident populations rather than continuing on to overwintering sites, thus breaking the natural migratory phenomenon. In this way the resident populations could act as population sinks for the migratory population of the monarch butterfly, but more research is needed to fully understand how resident and migratory populations interact.

We may be losing the spectacular migratory phenomenon to urban resident monarchs. If indeed we see a loss of the overwintering phenomenon most state across the west would rarely, if ever, see a monarch. The loss of monarchs in state like Idaho, Oregon, Washington, Nevada, and Utah would be a loss for those of us that live in these states but also may be an ecological loss. Additionally, places like Pacific Grove and Pismo Beach may no longer provide the incredible winter display that attracts people from far and wide. The West without migrating monarchs would be a very different place.

Help support science-based conservation: become a member or make a donation today!

DONATE (<https://secure.acceptiva.com/?cst=b335b6>) JOIN (<https://secure.acceptiva.com/?cst=307561>)





Monarchs —such as this larva on swamp milkweed (*Asclepias incarnata*) in Idaho —will be a rare sight in states like Idaho, Oregon, Washington, Nevada, and Utah. (Photo: Xerces Society / Stephanie McKnight.)

## Looking Ahead to the 2021 Breeding Season

The big question is, are there enough migratory monarchs left in California to maintain the population? Is the migratory phenomenon coming to an end, leaving us only with the resident populations in the large urban centers of California? Only time and more research will tell. It is unclear whether the resident populations will contribute to the migratory population this spring, or if they will stay put where there is ample milkweed and nectar in the urban and suburban gardens. If we look at how other resident monarch populations behave—such

Help support science-based conservation: become a member or make a donation today!  
DONATE (<https://secure.acceptiva.com/?cst=b35506>) JOIN (<https://secure.acceptiva.com/?cst=307561>)

as those in Florida and along the Gulf Coast—they tend to stay put. What is really hard to know, is whether the few remaining migratory monarchs that clustered at overwintering sites will join the resident populations as they disperse looking for milkweed, or if they will journey on to wild milkweed in areas further inland. If they join the resident populations in California, then we can expect to see very few monarchs in the West this year. To help researchers answer all of these questions, please report your observations of monarch butterflies, caterpillars, eggs, and chrysalises to the Western Monarch Milkweed Mapper (<https://www.monarchmilkweedmapper.org/>). Even though the monarch numbers are discouraging, there is some hope for the Western migratory population. As monarchs from Mexico migrate north into the United States from their overwintering grounds in Mexico, the successive migratory generations will move north as the spring and summer progresses, with some hopefully reaching inland parts of the West. We think that monarchs migrate up from the desert Southwest into Nevada and Utah each spring. If this does happen, and they have a successful breeding season, then some of those butterflies may make their way back to California overwintering sites next winter, to add a needed boost to the western population. Insects can be incredibly resilient, and monarchs are no exception. Local populations can grow exponentially if conditions are right (ample native milkweed and nectar plants, roost sites, and protection from disease, parasites, and pesticides). If you live in Arizona, Nevada, or Utah, or anywhere across the West be sure to report all monarch sightings to the Western Monarch Milkweed Mapper so that we can better understand this piece of the western monarch migration.

Help support science-based conservation: become a member or make a donation today!

DONATE (<https://secure.acceptiva.com/?cst=b335b6>) JOIN (<https://secure.acceptiva.com/?cst=307561>)







Monarch larva on the early emerging California milkweed (*Asclepias californica*) in April of 2020. (Photo: Beth Pratt.)

## How to Help Western Monarchs

*Plant native milkweed and wildflowers:* Now that monarchs have mostly left overwintering sites, it is time to focus primarily on the light blue area of the map by protecting and planting pesticide-free native milkweed and nectar plants, especially species that have resources for monarchs in February, March, and April (February resources won't help this year, but they will help next year and beyond). Based on available phenology data for native milkweed species in California, the earliest emerging milkweed species are California milkweed (*Asclepias californica*), heartleaf milkweed (*A. cordifolia*), woollypod milkweed (*A. eriocarpa*), and in southern California, desert milkweed (*A. erosa*). These early season milkweeds provide crucial breeding habitat for the first generation of monarchs born from eggs laid by the overwintering generation. Find local native milkweed

(<https://www.xerces.org/milkweed/milkweed-seed-finder>) and determine what nectar plants

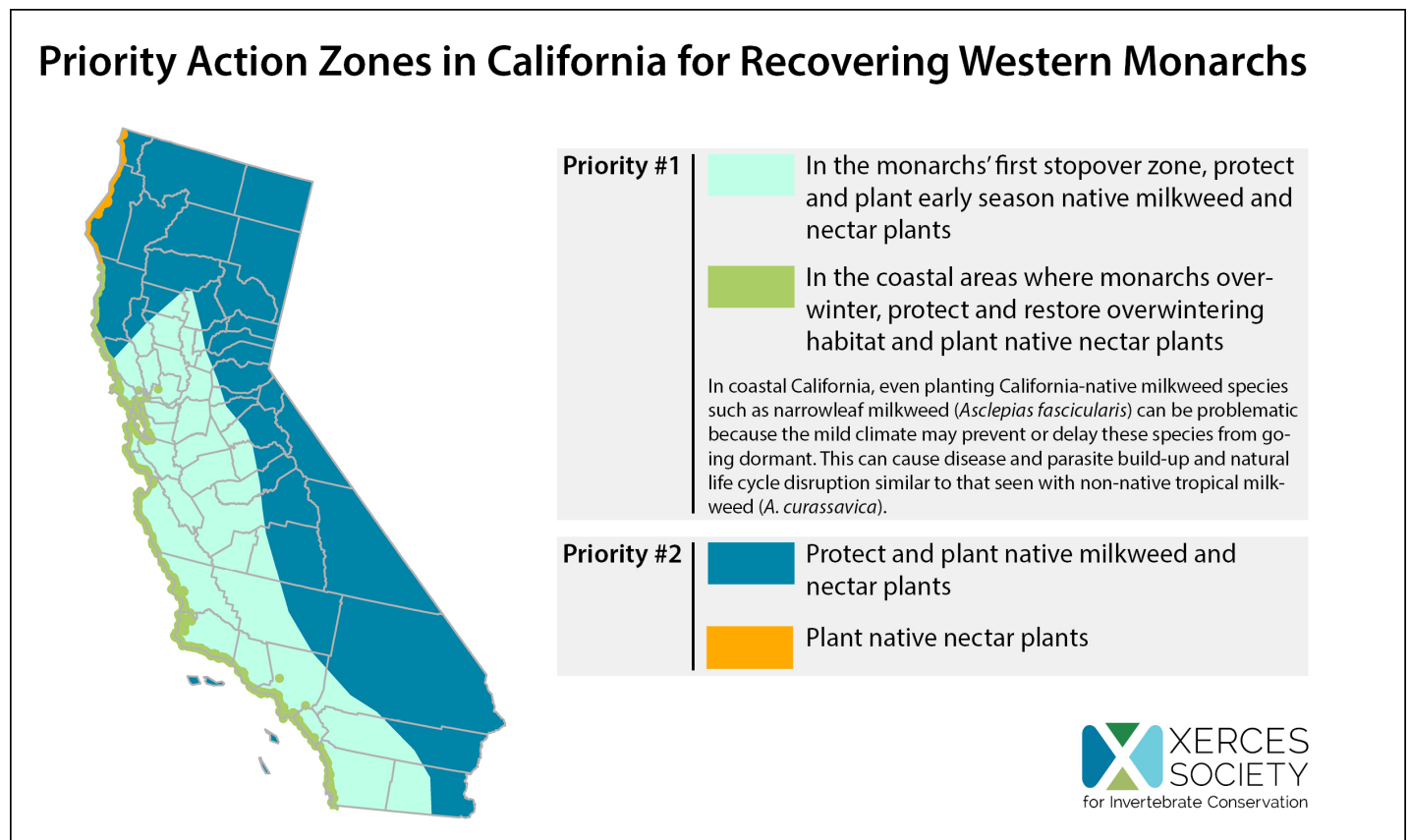
Help support science-based conservation: become a member or make a donation today!

(<https://www.xerces.org/milkweed/milkweed-seed-finder>) are appropriate for your region.

DONATE (<https://secure.acceptiva.com/?cst=b335b6>) JOIN (<https://secure.acceptiva.com/?cst=307561>)



You can also be planting native milkweeds and nectar plants in northern and eastern areas of the California—and in the surrounding states—in readiness for when migrating monarchs reach you.



**Priority Restoration Zones in California for recovering western monarchs. The state is divided into four zones, each with its own priority actions.**

*Community Science:* Please document and report all monarch activity so that researchers can get a better picture of what is happening with both the resident and migratory populations. Report all monarch sightings (adults, eggs, larvae, pupae) to the Western Monarch Milkweed Mapper (<https://www.monarchmilkweedmapper.org/>). One project in particular, the Western Monarch Mystery Challenge, is a campaign running from February 14 to April 22 to collect more records of where western monarchs spend the spring in California. We know monarchs spend the winter months (November to February) in groves along the California coast, and start breeding in central California as early as February. However, we know a lot less about where they are and what they're up to in the next couple of months. Solving the mystery of where western monarchs spend the spring is central to conserving and restoring the phenomenon of monarch migration in the West. To participate in the Western Monarch Mystery Challenge, report your monarch sightings to the Western Monarch Milkweed Mapper (<https://www.monarchmilkweedmapper.org/>).

*Western Monarch Call to Action:* Learn about actions you can take to help save western monarchs at [savewesternmonarchs.org](http://www.savewesternmonarchs.org) (<http://www.savewesternmonarchs.org>). Help support science-based conservation: become a member or make a donation today!

DONATE (<https://secure.acceptiva.com/?cst=b335b6>) JOIN (<https://secure.acceptiva.com/?cst=307561>)

*Why Captive Rearing Isn't the Way to Help Monarchs:* With the reports rolling in all winter of monarchs outside of overwintering sites in California, many of these butterflies were likely captive reared in homes. There are so many things that can help monarchs such as planting and improving habitat, but we do not recommend monarch rearing as a conservation strategy (<https://xerces.org/blog/keep-monarchs-wild>). Rearing a few butterflies for personal enjoyment or education is a great way to admire these impressive animals, but what monarchs really need is protected overwintering habitat and high quality flower- and milkweed-rich habitat free from pesticides and disease. Read more about rearing monarchs in *Keep Monarchs Wild: Why Captive Rearing Isn't the Way to Help Monarchs* (<https://xerces.org/blog/keep-monarchs-wild>) on the Xerces blog.

## Further Reading

Read the blog announcing the results from the 2020-21 Western Monarch New Year's Count (<https://xerces.org/blog/fifth-annual-western-monarch-new-years-count-confirms-continued-decline-in-western-monarch>).

Read the blog announcing (<https://xerces.org/blog/western-monarch-population-closer-to-extinction-as-wait-continues-for-monarchs-protection>) the results from the 2020 Western Monarch Thanksgiving Count and discussing the USFWS ESA listing decision.

Learn more about the Thanksgiving and New Year's Counts by exploring [westernmonarchcount.org](http://www.westernmonarchcount.org) (<http://www.westernmonarchcount.org/>)

Western Monarch Thanksgiving and New Year's Count data is available online at [westernmonarchcount.org/data](https://www.westernmonarchcount.org/data) (<https://www.westernmonarchcount.org/data/>).

Monarch Joint Venture's Annual Research Review: A Summary of the Latest Scientific Findings About Monarch Butterflies (<https://monarchjointventure.org/blog/annual-research-review>).

Report your monarch and milkweed sightings to the Western Monarch Milkweed Mapper (<https://www.monarchmilkweedmapper.org/>). This website also includes information on the biology and distribution of milkweed species as well as monarch butterfly biology in the West.

Authors

## Stephanie McKnight (/staff/stephanie-mcknight)



(/staff/stephanie-mcknight)

Help support science-based conservation. [Join our team](#), become a member or make a donation today!

[DONATE \(https://secure.acceptiva.com/?cst=633566\)](https://secure.acceptiva.com/?cst=633566) [JOIN \(https://secure.acceptiva.com/?cst=307561\)](https://secure.acceptiva.com/?cst=307561)



Endangered Species Conservation

Biologist (/staff/stephanie-mcknight)

Stephanie works on the western population of monarch butterflies including development of best management practices for monarchs and pollinators on public lands. Stephanie completed a bachelor's of science in botany at Oregon State University. Previously, Stephanie worked as a botanist with the U.S. Forest Service in California and the U.S. Army Corps of Engineers in Oregon.

## YOUR SUPPORT MAKES A DIFFERENCE!

Xerces' conservation work is powered by our donors. Your tax-deductible donation (<https://secure.acceptiva.com/?cst=b335b6>) will help us to protect the life that sustains us.

Join (/donate)    Donate (<https://secure.acceptiva.com/?cst=b335b6>)

## ARTICLE TAGS

western monarchs (/blog/tag/western-monarchs)

community science (/blog/tag/community-science)

how you can help (/blog/tag/how-you-can-help)

monarchs (/blog/tag/monarchs)

## SHARE THIS

## NEW ON THE BLOG



(/blog/resident-monarch-populations-on-rise-in-california-what-does-this-mean-for-western-

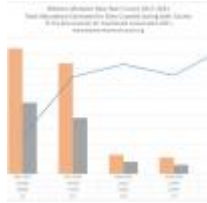
migratory)

Help support science-based conservation: become a member or make a donation today!

Resident Monarch Populations on the Rise in California: What Does this Mean for the Western Migratory  
DONATE (<https://secure.acceptiva.com/?cst=b335b6>) JOIN (<https://secure.acceptiva.com/?cst=307561>)

Population? (/blog/resident-monarch-populations-on-rise-in-california-what-does-this-mean-for-western-

migratory)



(/blog/fifth-annual-western-monarch-new-years-count-confirms-continued-decline-in-western-

monarch)

Fifth Annual Western Monarch New Year's Count Confirms Continued Decline in Western Monarch Population

(/blog/fifth-annual-western-monarch-new-years-count-confirms-continued-decline-in-western-monarch)



(/blog/monarch-numbers-from-mexico-point-to-declining-population)

Monarch Numbers from Mexico Point to Declining Population (/blog/monarch-numbers-from-mexico-point-to-declining-population)

[View More \(/blog\)](#)

## PROGRAMS

[Pollinator Conservation \(/pollinator-conservation\)](#)

[Endangered Species Conservation \(/endangered-species\)](#)

[Pesticide Reduction & Alternatives \(/pesticides\)](#)

## RESOURCES

[Press & Media \(/press\)](#)

[Xerces Blog \(/blog\)](#)

[Publications Library \(/publications-library\)](#)

Help support science-based conservation: become a member or make a donation today!

[Support the Xerces Society \(/donate\)](#)

DONATE (<https://secure.acceptiva.com/?cst=b335b6>) JOIN (<https://secure.acceptiva.com/?cst=307561>)

[Site Map \(/sitemap\)](#)



## CONNECT WITH US

Sign up for our enewsletter to receive up-to-date information about our programs & events.

Email	Submit
-------	--------

## FOLLOW US

@xercessociety



(<https://www.facebook.com/xercessociety/>)



(<https://twitter.com/xercessociety>)



(<https://www.instagram.com/xercessociety/>)



(<https://www.youtube.com/channel/UCAiPLPJuySOgn6CbjkOxqLQ>)



© 2006-2021 The Xerces Society

Tel: (855) 232-6639 • Fax: (503) 233-6794

Main Office: 628 NE Broadway, Ste. 200, Portland, OR 97232 USA • Mailing Address for Donations: P.O. Box

97387, Washington, D.C. 20090-7387

[Privacy Policy \(/privacy-policy\)](/privacy-policy/) • [Terms of Use \(/terms-of-use\)](/terms-of-use/)



(<https://www.greengeeks.com/about/>)

Help support science-based conservation: become a member or make a donation today!

DONATE (<https://secure.acceptiva.com/?cst=b335b6>) JOIN (<https://secure.acceptiva.com/?cst=307561>)

