



Western Monarch & Native Insect Pollinator Working Group

# Threats to Western Monarchs

*Advancing Collaborative, Proactive, Science-Based Fish and Wildlife  
Conservation and Management Across the West*



Credit: Xerces

## ***Multiple factors contribute to monarch decline***

*The WAFWA Western Monarch Conservation Plan outlines the multiple interacting factors that are thought to have caused the dramatic, recent fluctuations in the western monarch population.<sup>4</sup> These include habitat loss and degradation in both the monarch's overwintering and breeding ranges, pesticide exposure, climate change, and disease.<sup>1</sup> The Plan also presents actions that can be taken to address and minimize stressors associated with different land management practices.<sup>7</sup> Successful recovery will depend on reducing the impacts of these stressors to the western monarch population.*

## **Monarch recovery depends on reducing environmental stressors**

### **Overwintering habitat lacks protection**

Hundreds of groves of native and non-native trees along the coast of California and Baja California, Mexico serve as the winter home for monarchs of the western U.S., yet many of these sites are not formally protected. Since the 1980s, at least 60 overwintering sites have been destroyed by development, fire, and tree cutting, and another 50 are currently threatened. Though the California Coastal Commission designates monarch overwintering sites that occur within the Coastal Zone as Environmentally Sensitive Habitat Areas—thus requiring impacts be avoided or mitigated—there are few other protections in place for these important habitat areas, especially those that exist outside of the Coastal Zone.<sup>4</sup>

### **Climate change is negatively impacting monarchs**

Climate change is shifting habitat conditions in ways that are less favorable to monarchs. Higher summer and fall temperatures are linked to the monarch decline over the past four decades.<sup>2</sup> Warmer winter and spring weather may also be cueing monarchs to leave overwintering sites earlier than they have done historically, at a time when many milkweed species have not yet emerged. This potential mismatch between the monarch and its host plant could be stressing the first generation, whose success is critical to subsequent generations. Finally, the ongoing west-wide drought has degraded the quality and extent of breeding habitat. In overwintering habitat, drought-stress has accelerated rates of disease spread and grove senescence.



### **Steps that can help address these threats**

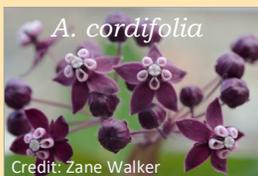
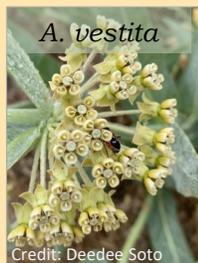
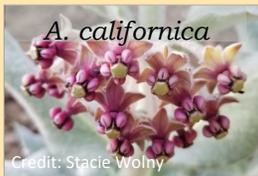
- **Protect, improve management of, and restore monarch overwintering habitat**
- **Protect, improve management of, and create fall migratory habitat**

# Unavailable or Unhealthy Habitat

## Lack of early-season milkweed limits monarchs

Western monarchs are most vulnerable during the late winter and early spring<sup>2</sup>, as they leave overwintering sites to mate and find milkweed upon which to lay their eggs. This time period has the potential for high monarch mortality because monarchs have left the protected microclimate of their winter roosts, and both nectar and milkweed resources are in short supply. Most species of milkweed have not yet emerged from winter dormancy during this time. In addition, anecdotal reports from volunteers participating in the Western Monarch Thanksgiving Count community science project suggest that monarchs are leaving overwintering sites earlier than historically noted. It has been hypothesized that this change may be due to a warming climate.

There are four species of native milkweeds that emerge relatively early in California's coast range and the western Central Valley (*Asclepias californica*, *A. cordifolia*, *A. erosa*, and *A. vestita*) that naturally occur in the monarch's early breeding range. These early-emerging milkweeds are likely critical to monarch survival, providing the first egg-laying resource of the year. There is a need for early-emerging species of California's native milkweed to be made commercially available, and planted widely throughout the Priority Restoration Zone for western monarchs.



## Pesticide exposure threatens monarchs

During their migration, monarchs traverse multiple habitats including agricultural and urban areas where they can be exposed to a variety of pesticides, including systemic, long-lived insecticides that are expressed in nectar. A recent study examined milkweed collected from farms, backyards, natural areas, and nurseries in California's Central Valley, and found that all the leaf samples were contaminated with insecticides toxic to monarchs, indicated that they are exposed across the landscape.<sup>3</sup>

## Introduced milkweed species increase disease

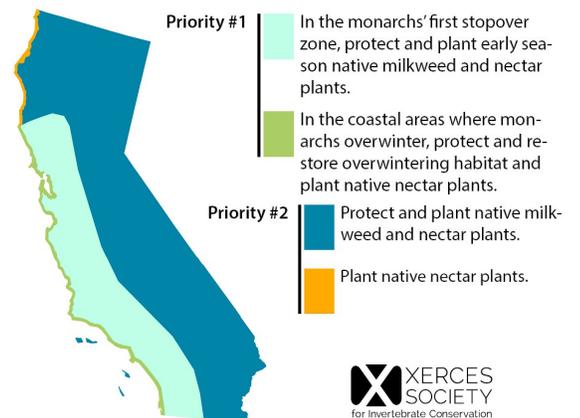
*Ophryocystis elektroscirra* (*Oe*) is a protozoan parasite that can kill or debilitate monarchs. Resident monarchs that feed on non-native, tropical milkweed in the winter have been found to have nine times the *Oe* pathogen load of wild, migratory monarchs<sup>5,6</sup>— they may also spread this deadly pathogen to the migratory monarchs, further contributing to their decline.



## Steps that can help address these threats

- Protect monarch habitat from insecticides
- Protect monarchs from disease by planting native milkweed, not tropical milkweed
- Restore early-season milkweed in priority areas where the first generation breeds:

### Priority Action Zones in California for Recovering Western Monarchs



## References

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