



Monarch and Pollinator Habitat Kit

Planting Guide

Thank you for your interest and work in conserving western monarchs and other pollinators. By planting this habitat kit, you are an essential partner in western monarch conservation! This handout includes instructions for planting and follow-up care for successful habitat establishment.

Background

Western monarchs, which generally breed west of the Rocky Mountains and overwinter along the California coast, have experienced a population decline of over 99% since the 1980s. The significant problems afflicting western monarchs and other imperiled pollinators include habitat loss, pesticide use, and climate change. In order to help address monarch declines and habitat loss, the Xerces Society partnered with local native plant and seed producers to create these kits and make them available to conservation partners.

What's in This Kit?

These kits contain climate-smart native plants, including milkweed, the larval host plant for monarchs, and a variety of nectar plants documented to be attractive to monarchs. Plant species in these kits also support many other native pollinators. Nectar plants that bloom early in spring and late in fall may be especially important for supporting monarchs during their migration in California, so there is an emphasis on these species in the kits. You can find more information on the plant species in your kit, including growth form, bloom time and size at maturity, at calscape.org.

Tips for Plant Establishment

The plants in your kit are ideally suited for your region of California, but they will need good care to get started.

- ⇒ **Weed management:** Before and after planting, manage weeds so they aren't outcompeting transplants. Providing a top layer of mulch may help protect against weed encroachment while potentially reducing irrigation requirements.
- ⇒ **Timing:** For best establishment success, plant the entire habitat kit within a week or two of receiving your plants. Milkweed transplants are best planted before they go

dormant, giving time for the roots to become established underground. If planting is delayed, kits can be planted as late as early winter (mid-December). Transplants will be fine kept in containers if they are watered regularly and rhizomes can be stored in buckets of water or in a moist, sterile medium in the refrigerator until they are planted. Seed should be stored in a cool, dry location.

Plant Spacing and Configuration

Generally speaking, we recommend spacing herbaceous plants and grasses on 3-4' centers and woody plants (shrubs) on 8-10' centers. For kits that contain both woody and herbaceous plants, consider alternating woody and herbaceous plants on 6' centers (this is our recommended spacing for linear hedgerows). Because survival rates can be lower with smaller transplants, we recommend planting small transplants such as plugs 2-3' apart. If planting in areas with minimal irrigation or moisture, consider planting everything closer together or clustering several plants together, particular for smaller transplants. Seed can be sprinkled in select areas at the rate of approximately 25 seeds/ft².

All kits can be planted in linear rows or any configuration that fits your planting site. However, monarchs seem to prefer small- and medium-sized milkweed patches to large patches or single plants, so we recommend planting milkweed in patches of 3 - 10 plants. If possible, vary the size and density of milkweed patches within the landscape. Over subsequent years, multiple stems may sprout, expanding outward.

Irrigation

Generally speaking, seed and rhizomes may be better able to establish with minimal moisture as compared to transplants, and smaller transplants will need more frequent irrigation than larger transplants. A thick layer of mulch is recommended to help plants retain moisture.

- ⇒ **Transplant irrigation:** Transplants will need supplemental irrigation or moisture during the first several years to get established. Irrigate transplants thoroughly immediately after planting, and keep the soil evenly moist prior to the start of winter rains. Resume irrigation in spring or whenever soil moisture starts depleting, and continue irrigating until fall rains begin.

During the first growing season, irrigate transplants approximately once a week based on the soil moisture present and the needs of the plant. Smaller transplants such as plugs may need more frequent irrigation, and larger transplants or plants near a source of moisture (eg. creek or pond) may need less frequent irrigation. Once plants are well established (usually after the first year), irrigation can be gradually decreased.. Generally, by the third year after planting, most native plants will need only monthly irrigation or no irrigation at all. Riparian plants have similar irrigation requirements to upland plants, but may need slightly more frequent irrigation and will be less tolerant of drying out. Drip irrigation is ideal for transplants.

- ⇒ **Rhizome and seed irrigation:** Rhizomes and seeds should be watered thoroughly after planting but may need minimal irrigation after that. We have had success establishing rhizomes by irrigating only twice per month, but they can also be watered as frequently as the other transplants. Seeds may not require additional irrigation after germination during normal rainfall years, but can benefit from occasional (once or twice a month) irrigation.

Planting

- ⇒ **Transplants:** Dibble sticks are ideal for plug planting, as they are easy to use and designed to make a correctly sized hole. Use a spade or shovel for larger transplants (or for plugs if dibble sticks are not available). The hole should be slightly deeper and wider than the plant container. Gently remove the plant from the container using a small blade (a plastic knife works well for plugs), being careful to keep the root ball intact, and place it in the hole. Gently pack soil around the base of the plant and pinch or compress field soil gently over the plant's root crown to minimize loss of soil moisture. It is important not to make the holes too deep; the base of the plant should be level to the surrounding soil.
- ⇒ **Rhizomes:** Plant rhizomes horizontally at two to six inches below the surface of the soil. Shallowly planted rhizomes may emerge more quickly in the spring, but more deeply planted rhizomes may need less supplemental irrigation. After planting, cover rhizomes with soil and lightly pack.
- ⇒ **Seed:** As a general rule of thumb seeds should be planted at a depth of two times the width of the seed. For example, if you have a seed that's about 1/16 inch thick, it should be planted about 1/8 inch deep.

Xerces is Here to Help!

We are excited to partner with you on creating monarch and pollinator habitat. Please feel free to contact us if you have any questions or need additional guidance (centralvalleypollinators@xerces.org). You will find publications about monarchs, pollinators, and habitat restoration work on our website (xerces.org) or by following the links provided.

The Xerces Society for Invertebrate Conservation is a nonprofit focused on protecting the natural world through the conservation of invertebrates and their habitats. We take our name from the now-extinct Xerces blue (*Glaucopsyche xerces*), the first butterfly known to go extinct in North America as a result of human activities.

Additional Resources

Monarchs and Milkweed

Xerces Society: *Western Monarch Call to Action*
xerces.org/save-western-monarchs

Xerces Society: *A Quick Guide to Monarch Habitat in California's Central Valley*

xerces.org/publications/guidelines/quick-guide-to-monarch-habitat-on-farms-in-californias-central-valley

Xerces Society: *Managing for Monarchs in the West*

xerces.org/publications/guidelines/managing-for-monarchs-in-west

Xerces Society: *Native Milkweed in California: Planting and Establishment*

xerces.org/publications/fact-sheets/native-milkweed-in-california-planting-and-establishment

Xerces Society: Regional milkweed guides

xerces.org/milkweed/milkweed-guides

Pollinators

Xerces Society: California-based resources, including plant lists and milkweed guides

xerces.org/pollinator-resource-center/california

Bee Better Certified

beebettercertified.org

Habitat Establishment and Management

Xerces Society: *Guidance to Protect Habitat from Pesticide Contamination*

xerces.org/publications/fact-sheets/guidance-to-protect-habitat-from-pesticide-contamination

Xerces Society: Pollinator habitat installation guides for hedgerows and wildflower meadows

xerces.org/pollinator-conservation/habitat-installation-guides

Community Science

Western Monarch Milkweed Mapper

monarchmilkweedmapper.org

Bumble Bee Watch

bumblebeewatch.org

California Bumble Bee Atlas

cabumblebeeatlas.org