



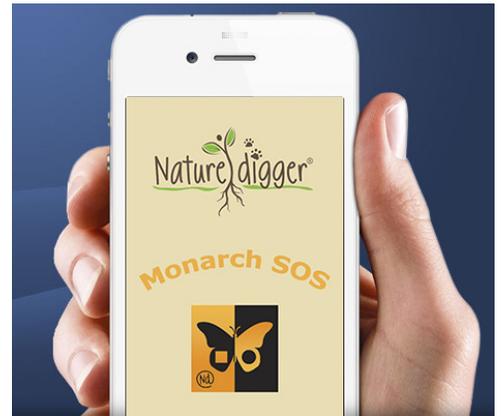
Southwest Monarch Study

The Southwest Monarch Study is a citizen-science research project studying the breeding, migration and conservation of monarch butterflies, *Danaus plexippus*, in the Southwest United States. Our area of study includes Arizona, Utah, Nevada, New Mexico, western Colorado and the deserts of California. Over 500 people of all ages have participated in the study. Over 15,000 monarchs have been tagged in the Southwest leading to sightings of tagged monarchs at overwintering sites in both Mexico and California as well as

monarchs that spend the winter in the lower deserts throughout the region.

In general, monarchs in the Southwest are breeding and live about 30 days from about March through August each year. Monarchs that eclose from a chrysalis in September onwards often delay reproduction to migrate. Since they are not breeding they are able to live a longer life, often up eight months. Our study is asking for reports of adult monarch butterflies flying through the region, any evidence of mating and laying eggs on milkweed, and presence of caterpillars on milkweed. In addition each fall we would like you to tag migrating monarchs through the region. You can also report a tagged monarch that you see – we will let you know where it was tagged and your name and sighting to its journey records.

Information about tagging monarchs can be found on our website www.swmonarchs.org by following the link, “Tagging Monarchs.” Easy to follow directions of how to tag a monarch are available on this page as well as how to record data. Data can be recorded on a paper datasheet then transferred to an Excel datasheet to easily email into the study or you can download the free Monarch SOS app by Nature Digger where you can record all the above data directly and then send it to us when you are back in an internet zone. Monarch SOS is currently only available for I-Phones and I-Pad but we hope it will be available in Android by August in time for the fall tagging season. The app has helpful information to help identify monarch caterpillars, the differences between male and female monarchs, identify milkweeds and even identify a monarch butterfly in comparison with other similar butterflies you may find.



Your help in reporting monarch butterflies, caterpillars and tagging monarchs will provide valuable information in an area of the southwest lacking information. For tags, please visit our website at www.swmonarchs.org and see the “Request Tags” link.

Questions? Contact us!
Southwest Monarch Study
www.swmonarchs.org
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**Monarch migration in the Grand Canyon:
September through November**



Status of *Danaus plexippus* in Arizona

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Top Ten Findings (including Grand Canyon)

1. Monarch butterflies are present throughout Arizona. Where they are found depends on the time of year and the elevation.

2. Monarchs favor several *Asclepias* spp. in Arizona to lay their eggs. While Arizona has the second largest number of milkweed species in the United States, we found monarch eggs and caterpillars primarily on Horsetail Milkweed, *Asclepias subverticillata* on the South Rim the Grand Canyon. In addition, the following native milkweeds are found along the Colorado River corridor in the Grand Canyon: *A. asperula*, *A. latifolia*, *A. speciosa*, *A. tuberosa* and vining *Funastrum* spp.

3. Monarchs will usually feed on milkweed in bloom, but they also favored the nectar of other flowers when they are breeding. Wild monarchs were frequently observed on the following flowers that varied by elevation as well as other nectar sources: Dogbane (Indian Hemp), Thistles, Seep Willow, Sunflowers, Threadleaf Groundsel, New Mexico Vervain, Button Bush.

4. The monarch breeding season in Arizona is complicated. In Arizona, when and where you will see breeding monarchs will depend on where you live. At the Grand Canyon the first monarchs of the season are usually seen on the South Rim in late June and more commonly in early July mating and laying eggs on Horsetail Milkweed, *Asclepias subverticillata*. Information regarding breeding in the inner Canyon is unknown but monarchs have been documented flying out of the Canyon on the South Rim in late July through September. Several milkweeds are found in the Canyon.

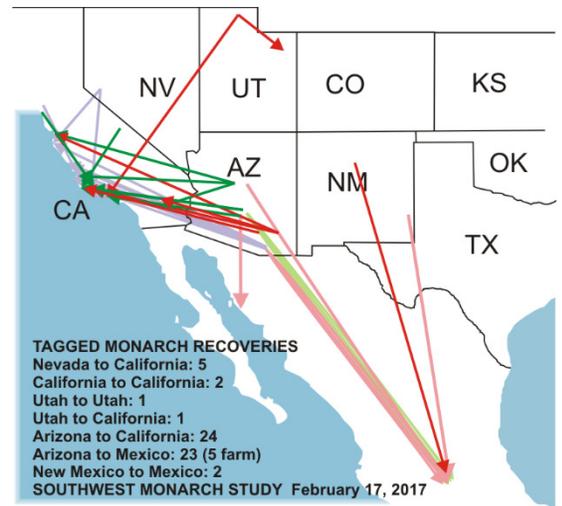


5. During the fall migration, monarchs in Arizona have favorite flowers for nectar to refuel for their long journey. When monarchs are migrating, they are not breeding, so milkweeds are not as critical. In the wild, monarchs favored the following nectar plants during their fall migration: Sunflowers, Rabbitbrush, Desert Broom, Sweetbush, Thistles, Golden Crownbeard, Smooth Beggartick (*Bidens laevis*), Seep Willow, as well as Milkweeds in bloom and others. Trixis along the river is a likely resource.

6. Peak fall monarch migration in Arizona ranges from September through mid-October, depending on latitude. The monarch migration window in Arizona is longer than anticipated. You may see both breeding and migrating monarchs at the same time in the fall. We learned that some monarchs migrate beginning about one month before the peak migration through the state. Late season monarchs were seen flying along the Colorado River in the Canyon in October and early November. The main migration should be in September in this range. Small, loose clusters of monarchs were found throughout Arizona during the peak migration, usually on the southeast side of trees.

7. Monarch butterflies in Arizona migrate to both Mexico and California. Wind direction is significant.

A total of 12,088 monarchs were tagged between 2003 and 2014 by 384 individuals in 276 locations. In addition to tagging sites, there were 134 unique locations where monarchs were reported around the state. During their fall migration, monarchs from Arizona fly both to Mexico and California. In early September our monsoon winds can affect the migration. Monarchs prefer to ride thermals to save their energy while migrating when possible. There is a statistically significant correlation between wind direction at 1,000 feet and migration—monarchs tagged when the wind is from the northeast or southwest are almost never recovered. Monarchs tagged on the same day almost always fly to the same destination, another statistically significant finding. (Updated map added)



8. Not all monarchs migrate in Arizona; small numbers of monarchs spend the winter in the lower deserts.

Small aggregations of monarch butterflies spend the winter in the greater Phoenix area, especially along the Salt River, Tucson, Yuma and along the Colorado River in Parker and Lake Havasu. From weekly monitoring some of the monarchs are breeding, others appear to be non-breeding populations. One monarch tagged at Rotary Park in Lake Havasu along the Colorado River in November was spotted in the town of Lake Havasu in February. When a hard-freeze occurs during winter the monarch sightings drop.

9. Monarch butterflies in Arizona have low levels of *Ophryocystis elektroscirrha* (Oe), a protozoan parasite.

463 samples were submitted over five years to Monarch Health at the University of Georgia for testing. Eastern monarchs have a 10 to 15% infection rate; Western monarchs, 25 to 30%; year round monarch populations, 85%. Arizona had an average rate of only 4% despite evergreen native milkweeds, limited irrigated Tropical Milkweed, *Asclepias curassavica*, and small overwintering monarch populations. At this time it is not a serious threat to the monarch population in Arizona.



10. Monarchs seek water in Arizona during high temperatures and low humidity.

Monarch butterflies are not well known for puddling with only limited reports in the Eastern population. During periods of drought, low humidity and high temperatures, Arizona monarchs could frequently be found in creeks and streams seeking water.

For the complete copy of “Status of *Danaus plexippus* in Arizona” see: <http://images.peabody.yale.edu/lepsoc/jls/2010s/2015/2015-69-2-091.pdf>

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