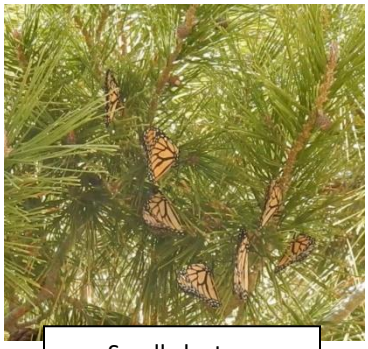
Monarch Migration and Breeding In The Southwest

Every fall millions of monarch butterflies across North America begin their long migration to overwintering sites deep in the mountains of Mexico and along scattered sites along the California coast. While much is known about the eastern portion of the monarch population and their migration to Mexico, much less is known about the west. Through over 600 Citizen Scientists' data the Southwest Monarch Study has learned extensive information about monarch behavior in the southwestern United States including Nevada, Utah, New Mexico, Arizona, western Colorado and the eastern deserts of California. Details will be provided in a peer-reviewed publication soon.

Fall Migration

By tagging during the fall migration we have learned some monarchs in the southwest fly to Mexico while others migrate to California for the winter. Most monarchs recovered in Mexico were at El Rosario, traditionally the largest overwintering site in the region. In California tagged monarchs have been found from Camp Pendleton (just north of San Diego) through Pacific Grove in the Monterey peninsula. The largest density of tagged sightings was from Ventura to Goleta to Pismo Beach. In addition small populations of monarchs remain in the lower Sonoran Desert regions surrounding and including Phoenix and Tucson, as well as along the Colorado River in Yuma, Parker and Lake Havasu in Arizona and in Rancho Mirage in California rather than migrating to traditional overwintering sites. To date one monarch tagged in Tucson in early November was seen in early February in Palm Desert, California with Citizen Science sightings reported in the Palm Springs area as well. Tagged monarchs in Arizona migrate to both California and Mexico during the same season and appear to be linked to wind direction and temperature.

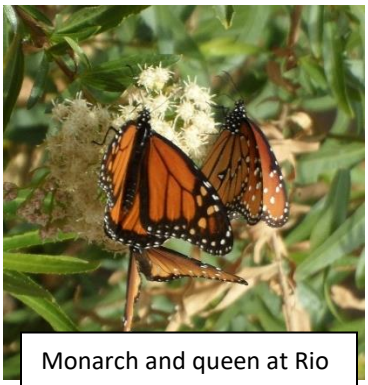


Small clusters
Lake Havasu, Arizona

Sightings and recoveries of tagged monarchs indicate the migration season in the southwest is long. Early recoveries of tagged monarchs showing directional flight begin from September 1 in both Utah and Arizona to as late as November 19 in Arizona. Most recovered monarchs are tagged mid-September through mid-October. One unusual exception to this pattern to date was a monarch tagged in Gardnerville, Nevada on July 28, 2017 found on Sept 17 in Volcano, California, a southwest flight of 59 miles in 53 days.

Small clusters of monarchs are found in trees during the fall migration in Arizona in Phoenix and Canelo with larger clusters of 100 to 500 monarchs reported along the Colorado River. In addition, Citizen Scientists reported southerly flight of monarch butterflies in western Colorado, eastern Utah and the eastern half of Arizona during the fall migration. We are hoping to learn of more fall clusters and directional flight in other southwest states.

Overwintering Monarchs



Monarch and queen at Rio Salado Habitat Restoration Area in Phoenix, Arizona

While most migrating monarchs fly to California coastal sites or to the Monarch Butterfly Biosphere Reserve in Mexico, in most years several hundred monarchs instead spend the winter in the lower deserts of California and Arizona at familiar sites and in city backyards. To date no overwintering monarchs have been observed in New Mexico. They may thrive throughout the season unless subjected to a hard freeze which decimates the population. Some of these monarchs are breeding while others appear to be non-breeding as suggested by their longevity and lack of observed mating or oviposition on nearby milkweed. By tagging overwintering monarchs we've also learned they tend to stay within a three mile radius and many stay where they were tagged. In most years, winter non-breeding monarchs in the desert areas of Arizona and California begin mating by early February. (In occasional warm winters breeding may begin earlier.) Monarchs then begin to expand their range in the region and disperse. Monarchs are not present in the lower deserts during the summer months.

Spring Migration

With the monarch population at its lowest seasonal ebb, sightings of remigrants from Mexico and California are limited in the spring but more are reported each year as Citizen Scientists continue to increase in number. Reports are complicated by the presence of overwintering monarchs already in the region in most years adding confusion as to their origin. Strong westerly winds in March, typical for the season in the region, likely discourage the number of monarchs returning from Mexico to the southwest although some do. Monarchs from California or Baja overwintering sites are more frequently observed heading north along the Colorado River or inland north of Ajo, Arizona.

Worn remigrant at Lake Havasu, Arizona. March 2017

Monarchs are reported in Parker and Lake Havasu, Arizona, along the Colorado River in early March and reports begin expanding north and northeastward with confirmed sightings in Prescott in late March and early April, in mid-April at Phantom Ranch along the Colorado River in the Grand Canyon and in Flagstaff in late April in some years. Monarchs also are reported in Las Vegas, Nevada in late March and April and the Reno area by late May and early June. First monarchs appear in southwestern Utah in West Jordan by June and the northern and eastern portions of Utah by July.

Monarchs have also been documented during the early spring migration in late March and early April in New Mexico and the eastern/central portion of Arizona. Monarchs arrive at Bosque Del Apache NWR in late March and south of Alamogordo in early April in New Mexico. Oviposition was noted at Bosque Del Apache NWR in April (see photo at left.) First sightings of monarchs in Albuquerque was in July, 2017. Monarchs were also reported along the San Pedro River, Tacna, Dateland, Phoenix, Tucson and Pinetop/Lakeside in Arizona in April.

Summer Breeding Monarchs

By July monarch butterflies are reported throughout the southwest range including the middle and higher elevations of Arizona and New Mexico, Utah and Nevada and the population continues to expand through August. Approximately 30 days before the peak migration predicted by latitude (see https://www.swmonarchs.org/peakmigration.php) breeding monarchs appear to move south throughout the range with increased sightings and abundant reports of eggs, larvae and pupae. As this phenomenon occurs monarchs begin to reappear in the lower deserts beginning with Lake Havasu and Phoenix in late August/early September, Tucson (early/mid September) and Yuma (mid/late September). The offspring of these monarchs usually join the migration through the region. However it appears that monarchs in the fields eclosing during this time-frame may also migrate indicated by the early recoveries in California and Mexico of monarchs tagged during this period.

Southwest As Part Of The Western Monarch Range

Tagged monarchs have been recovered as far north as Pacific Grove, California, but there is likely movement in the spring to the north and northeast to Oregon and beyond. While it is unknown if monarchs from New Mexico and Arizona migrate all the way to Canada, north/northeast movement has been documented in the spring locally. In the fall, eastern Utah, western Colorado and eastern Arizona all report southerly monarch flight. There is ample opportunity for genetic mixing of the east and west ranges of the monarch population at the overwintering sites in Mexico as well.

There is still much to learn but thanks to the keen observations and tagging of over 600 Citizen Scientists, together we will continue to unravel the intricacies of monarchs in the southwest.