All About Monarch Butterflies
and how to garden for Monarch Habitat

University of California
Cooperative Extension
Santa Clara County
Master Gardener Program
Master Gardeners of Santa Clara County

- E-mail questions using our website: mgsantaclara.ucanr.edu
- Call the Help Desk: (408) 282-3105 (9:30am - 12:30 pm Monday through Friday)
- Bring specimens to the Master Gardener Help Desk Office during Hotline hours: 1553 Berger Drive, Building 1, 2nd Floor, San Jose, CA 95112
- Call or bring specimens to the Master Gardeners at the Gamble Garden Library in Palo Alto: (650)329-1356 Fridays only, 1-4pm. In Winter, please call before going to Gamble.
Monarch Butterfly - *Danaus plexippus*

Male

Female

pouch
About Monarchs

• Life Cycle
  – Egg
  – Larvae (5 instars)
  – Pupa
  – Adult
• Migration
• Habitat
• Threats
• Conservation
Life Cycle

Life cycle (Photo: Dave Astin, Denny Brooks, Michelle Solensky, Mary Holland, Wendy Caldwell)
Caterpillar ready to emerge from egg. The dark tip at the anterior of the egg is actually the 1st instar head. (Photo: Siah St. Clair)
Larva

All 5 monarch larval instars (Photo: Monarch Lab)
“The most dramatic changes that occur in the pupa are the growth of the wings and the development of flight muscles. These things could not occur in an active larva.” Monarch Lab - University of Minnesota

Labeled diagram of monarch pupa (Photo: Siah St. Clair)
Adult
Migration

• East Coast
  – Southeastern Canada, Eastern USA & Central Mexico

• West Coast
  – Southwestern Canada, Western USA
Monarch Butterfly
Fall & Spring Migrations

- Fall migration
- Spring migration
- Unconfirmed
- Summer breeding areas
- Spring breeding areas
- Overwintering areas
- Corn belt high monarch production

MonarchWatch.org
Education • Conservation • Research
Breeding Season

Wintering in Mexico

Dec
Nov
Oct
Sep
Aug
Fall Migration

Fall Breeding
Some monarchs breed in the south beginning in August. Assuming they are 4th generation monarchs from the north, their offspring are the 5th generation, the great-great-great grandchildren of the monarchs from Mexico.

1st generation
Children of monarchs from Mexico
Born in south
Migrate to north to lay eggs

2nd generation
Grandchildren
Born in north
Lay eggs in north

3rd generation
Great-grandchildren
Born in north
Lay eggs in north

4th generation
Great-great grandchildren
Born in north
Migrate to Mexico

Breeding season begins...
Monarchs migrate north from Mexico
Lay eggs in south beginning in mid-March.

Spring Migration

Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
California Sites

- Ardenwood Historic Farm, Fremont, CA
- Natural Bridges State Park, Santa Cruz, CA
- Lighthouse Field State Beach Monarch Grove, Santa Cruz, CA
- Point Lobos State Park, Carmel, CA
- Morro Bay State Park, Morro Bay, CA
- Pismo Beach Monarch Butterfly Grove, Oceano, CA
- Ellwood Mesa Open Space, Goleta, CA
Habitat

• Food
  – Larvae = Milkweed
  – Adult = Nectar

• Shelter
  – Monterey Pine,
    Monterey Cypress &
    Eucalyptus
  – Moderate Weather
    Extremes

• Space
  – International
Pacific Wintering Habitat
Pinus radiata
Monterey Pine

- Fast growing, but short lived.
- Limited Range
- Pitch Canker Disease
- Drought Stress
- Habitat Destruction / Encroachment
Hesperocyparis macrocarpa
Monterey Cypress
Milkweed
Asclepias

- Native Larval food for Monarchs
- Goes Winter dormant
- Contains cardenolide
  - Monarch larvae can eat
  - Makes Monarchs distasteful to predators

R. Schoenenberger
Asclepias fascicularis
Narrowleaf Milkweed
Asclepias speciosa
Showy Milkweed
Asclepias cordifolia
Heartless Milkweed

Asclepias cryptoceras
Humboldt mountains milkweed
© 2013 Mary Winter

Asclepias californica
California Milkweed
© 2013 Mary Winter

Asclepias eriocarpa - Indian Milkweed
© 2003 Charles E. Jones

Asclepias subulata - Alamete
© 2008 Aaron Schusteff

Asclepias erosa
Desert Milkweed
© 2003 James M. Andre

Asclepias eriocarpa - Indian Milkweed
© 2003 Charles E. Jones
Gomphocarpus *(Asclepias)* physocarpus

- Balloon Plant
- Balloon Cotton-Bush
- Balloon Milkweed
- Bishop’s Balls
- Elephant Balls
- Hairy Balls
- Monkey Balls
- Swan Plant
- Family Jewels Tree
- .... and many others
Gomphocarpus (Asclepias) fruticosus

- Less common in commercial trade
- Smaller stature than G. physocarpus
- Also called Ballon Plant or Swan Plant
- Origin: South Africa
Oxypetalum caeruleum (Tweedia caerulea) 
Blue Flowered Milkweed

• Blue flowers
• Related to Milkweed
• Twining Perennial
• Origin: Brazil & Uruguay

NC Extension Plant Database

University of California
Agriculture and Natural Resources  Master Gardener Program
Creating Habitat - Nectar Plants

- Umbel = landing pad / resting area
- Long bloom season or repeated blooms
- Colorful
- Early & Late blooming is most important: Feb. - April & Sept. - Oct.
Ornamental (non-Native) Plants for Butterflies

- Salvia - Sage
- Foeniculum vulgare - Fennel
- Zinnia - Zinnia
- Scabiosa - Pincushion Flowers
- Tagetes - Marigolds
- Dahlia - Dahlia
- Callistemon - Bottlebrush
- Lantana - Lantana
- Buddleja - Butterfly Bush
- Cosmos - Cosmos
- Echinacea - Coneflowers
- Erysimum - Wallflowers
Achillea millefolium

Yarrow ‘Island Pink’

California native plant; colorful pink flowers in spring, summer, and fall make good cut flowers; ferny green foliage will spread; flowers attract butterflies and beneficial insects.
Arctostaphylos densiflora
Manzanita ‘Howard McMinn’
Ceanothus ‘Concha’
Wild Lilac Selection

California native plant; one of the best California lilacs for the garden with dark-green leaves all year; showy, deep blue flowers with reddish bracts bloom in spring; attracts beneficial insects.
Encelia californica
Coast Brittlebush

California native plant; golden daisies blossom from early spring until mid-fall among triangular-shaped green leaves; tolerates full sun or part shade and is low maintenance.
Ericameria sp.  
Rabbitbrush
Erigeron glaucus
‘W.R.’
‘Wayne Roderick’
Seaside Daisy

California native plant; flowers bloom through the spring, summer, and fall; long-blooming daisy for home gardens; attracts butterflies and beneficial insects.
Eriogonum sp.
Buckwheat
Peritoma (Isomeris) arboreus
Bladderpod

California native plant; one of the only native shrubs that blooms year round; yellow flowers attract beneficial insects and hummingbirds to the garden and then develop into attractive seed pods.
Ribes aureum
Golden Currant

California native plant; flowers have a light, spicy fragrance; good choice for planting under native oaks; attracts butterflies and beneficial insects.
Salvia clevelandii
‘Winefred Gilman’
Cleveland Sage

California native plant; evergreen shrub produces maroon-stemmed, blue-violet flowers; heat and drought tolerant; attracts hummingbirds, butterflies and beneficial insects.
Salvia Spathacea
Hummingbird Sage

California native plant; leaves have a pleasant, fruity fragrance; excellent drought-tolerant groundcover for sun or partial shade; attracts hummingbirds.

Photo by Marie Haka
Solidago californica ‘Cascade Creek’
California Goldenrod

California native plant; bears bright yellow flowers in summer and fall that attract butterflies and beneficial insects; ideal for native grass meadow.
Threats

• Habitat Loss & Degradation
  – Private Property
  – Pruning

• Pesticides
  – BT (a non-toxic, naturally occurring biological larvicide)
  – Neonicotinoids (a common class of insecticides derived from nicotine)

• Climate Change
  ➔ Milkweed too toxic
  ➔ Unknown ???
1980s monarch population in California = 4.5 million.
Current human population in Los Angeles = 4 million.

Current monarch population in California = 28,429.
Current human population in Monterey = 28,828.

To-scale version of 28,429 vs. 4.5 million (compare to leftmost photo).
Avoid Tropical Milkweed

*Asclepias curassavica* or *A. tuberosa*

- Can harbor OE - *Ophryocystis elektroscirrhra* a deadly parasite
- Does not go Winter dormant
  - IF you must have it cut to ground in Fall (Oct. - Nov.)
  - Many need to be cut back repeatedly in Winter
  - More of a problem in S. Cal
- Providing year round larval food sources may send mixed signals. This may have a negative effect on migration.
- Climate Change: With temperature rising Tropical Milkweed is becoming too toxic (cardenolides) for Monarchs.
OE - *Ophryocystis elektroscirrha*

- Decreased larval survival
- Smaller wing span & lower body mass
- Decreased male reproductive success & Shorter Adult lifespan
- Less activity & weight among females
- Diminished Condition & Activity: Wings tattered & Scale loss

Photo by Dara Satterfield, Project Monarch Health.
Conservation

THE BUTTERFLIES BEST FRIEND
RO VACCARO, FOR HER LABOR OF LOVE
FROM FRIENDS OF THE MONARCHS

R. Schoenenberger
Action Items:

- Protect CA Winter Sites
- Restore Breeding & Migratory Habitat in CA
  - Native Milkweeds
  - Pollinator Gardens
- Protect Habitat from Pesticides - Practice IPM
- Restore Breeding & Migratory Habitat outside of CA
  - Regional Milkweeds
  - Pollinator Gardens
- More Research on how to best aid Monarchs
Citizen Science

- The Monarch Larva Monitoring Project
- Tagging Monarchs
- Participate in Winter counts
- Raising Monarchs Responsibly
PROPER PLACEMENT OF MONARCH WATCH TAGS
monarchwatch.org/tagging
What you can do:

- Create diverse habitat.
  - Year round Nectar Sources
  - Colorful
- Pesticide-free
  - Use IPM
- Plant local Milkweed
- Do not plant [Tropical] Milkweed within 5 miles of Winter Sites (coast)
References


• Calflora https://www.calflora.org

• Monarch Watch http://www.monarchwatch.org

• Xerces Society http://xerces.org/monarch-nectar-plants/
  http://xerces.org/save-western-monarchs/?fbclid=IwAR29RpYlNi7tJxs116UeE9FPpkpxPexNkNCFF2NJV_ks-AaC3p0lR7gsaPo


• Cypress Disease. Author: Leonard Cicerello. https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=22724&fbclid=IwAR2gHufe7uWUoP4W9SlPkb-fBE1AJ0EfJng0J0P1vPiWBjioiMa4wXa835I

• Will Neonicotinoids on Milkweed Hurt Monarchs? Steven Frank. NC State Extension. https://entomology.ces.ncsu.edu/2017/05/will-neonicotinoids-on-milkweed-hurt-monarchs/

Thank you!