



Status of the Western Monarch Butterfly Population and Ellwood Mesa Monarchs

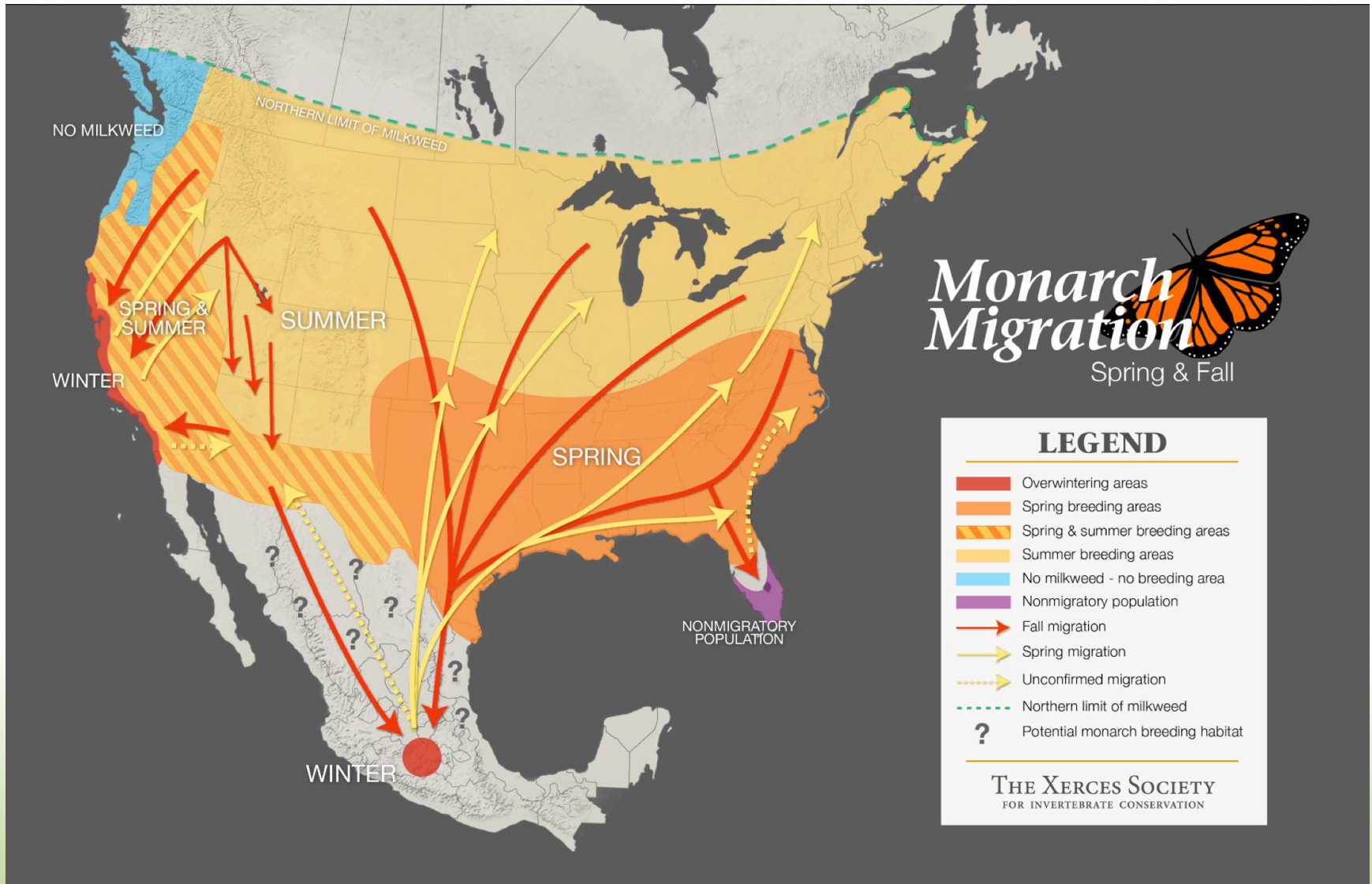
Daniel E. Meade, Ph.D.

February 29, 2020

Topics

- Monarch butterfly counts
- Reasons for the monarch population crash
- Aggregation site conditions
- What can we do?

Monarch Migration Pattern



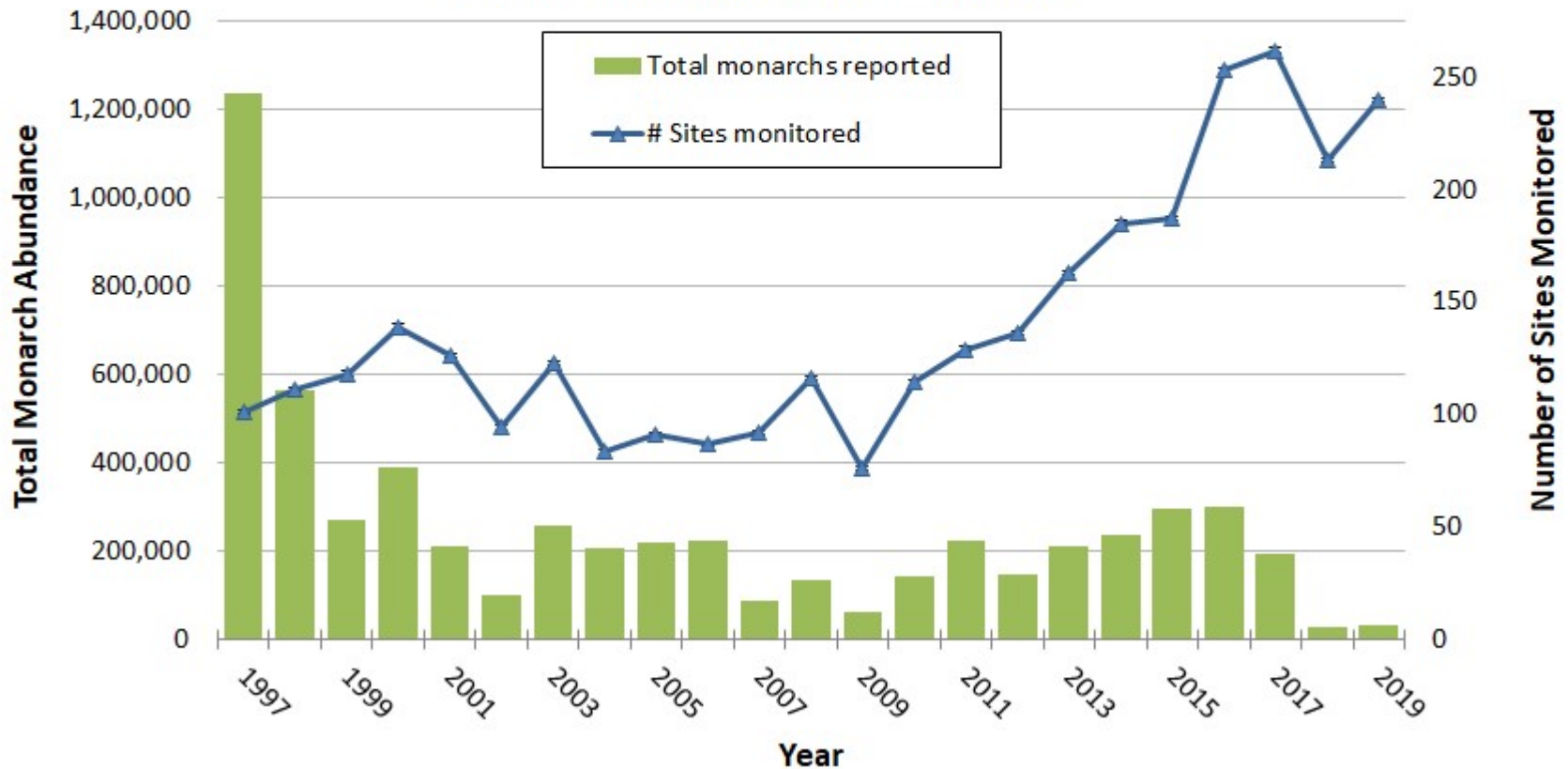
Western Population Trends

Western Monarch Thanksgiving Count

Total Abundance Estimates w/ Number of Sites Monitored
from 1997-2019

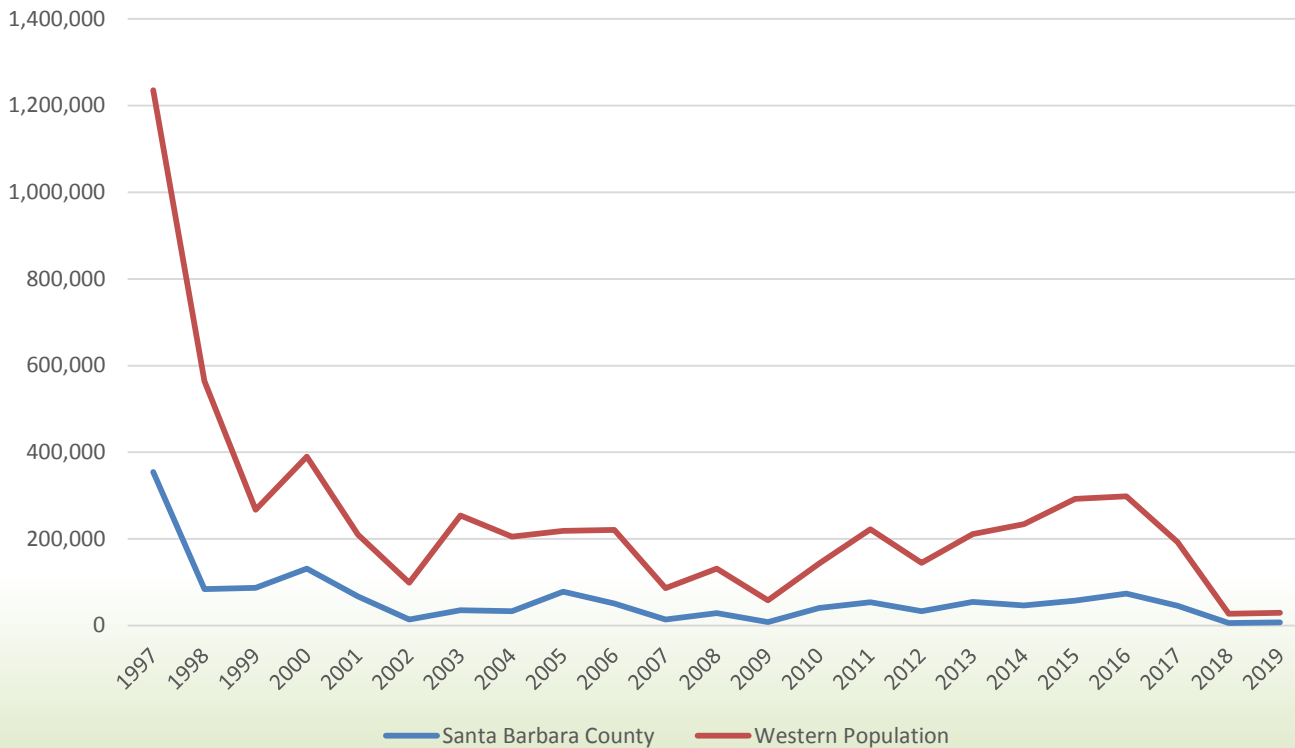
(Xerces Society Western Monarch Thanksgiving Count 2019)

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Santa Barbara County

Santa Barbara County and Western Population



2019 Results

WM pop 29,418
County 7,660
Ellwood Main 52
Ellwood Mesa 248

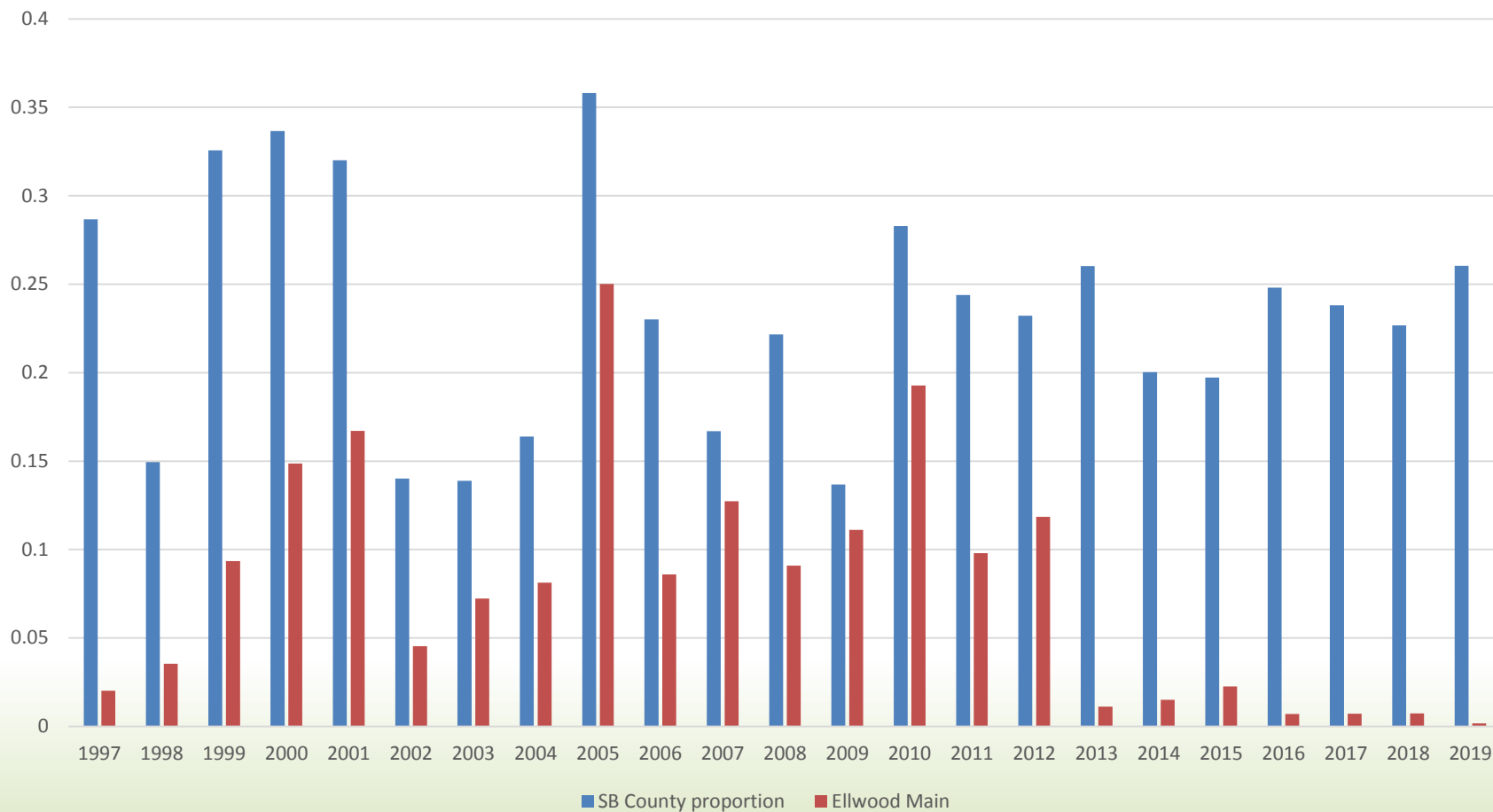
Ellwood Mesa Butterfly Habitat Areas



Ellwood Monarch Butterfly Aggregation Sites 2019-2020

Monarch Counts	10/10/2019	10/24/2019	11/7/2019	11/19/2019	12/5/2019	12/19/2019	1/2/2020	1/16/2020
Ellwood Main	0	8	66	52	2	1	1	0
Ellwood East	1	2	4	55	52	13	7	0
Ellwood West	0	5	2	44	15	2	1	0
Ellwood North	3	2	2	8	1	0	3	0
Sandpiper	9	22	18	89	40	0	2	0
Ellwood Ironbark				4	0	0	0	0
Ellwood Main Annex				19	1	0	0	0
Ocean Meadows					0	0	0	0
Total	13	39	92	248	110	16	14	0

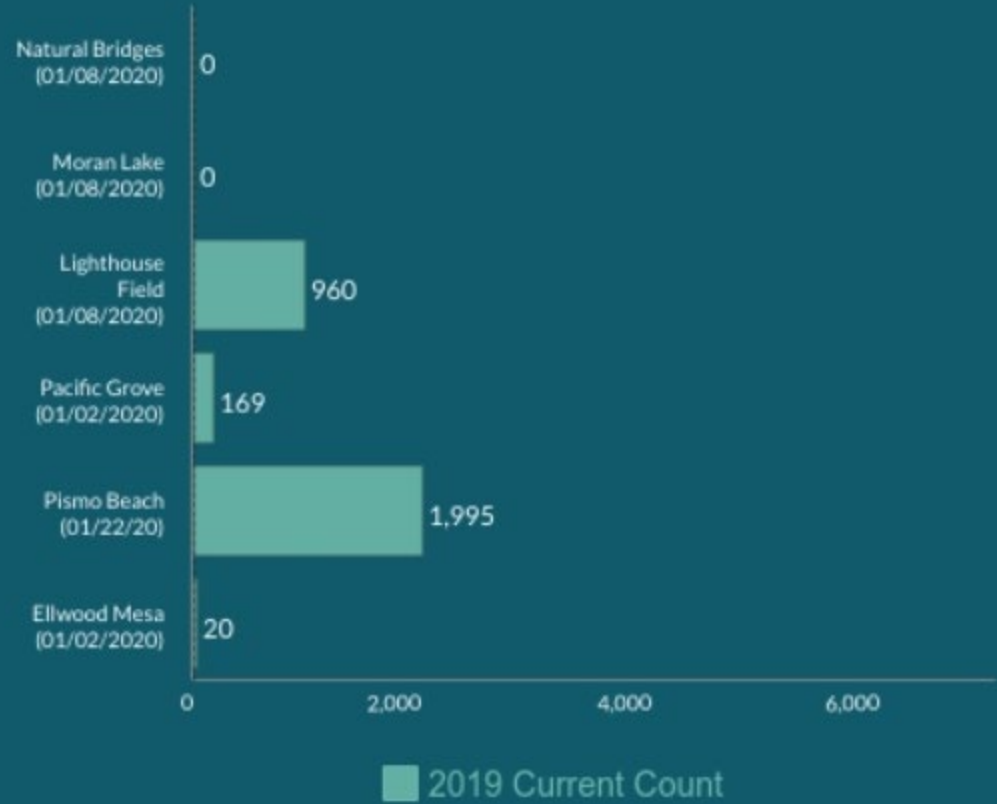
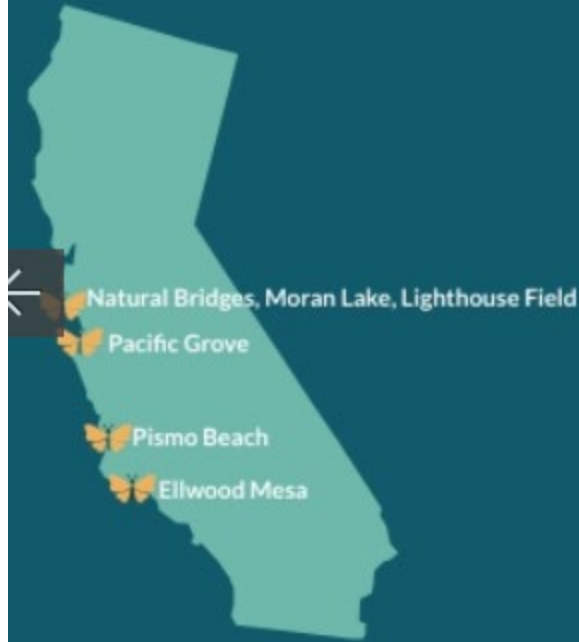
Proportion of Western Monarch Population Ellwood Main and Santa Barbara County



Thank you to the volunteers who are providing these regular counts!!

2019/2020 Real Time Western Monarch Count Data

Data will be updated as it is available. This graph shows the most current count available for these sites and is not the official count total for the site for the Thanksgiving or New Years Count.



Why has the population crashed?

- Loss of overwintering habitat
- Pesticides
- Disease – *Ophryocystis elektroscirrha* OE
- Climate change
- Loss of breeding habitat
 - Timing (Phenology)

Overwintering Habitat

- Over 400 sites identified in California, yet only 113 had any monarchs in 2019, and only 30 had more than 100 monarchs
- 21 sites damaged or destroyed since 2016
- 54 sites documented as damaged or destroyed before 2016
- Many sites degraded

Ellwood Habitat Conditions

What do Monarchs need during overwintering?

Stability – no disturbance

Temperature

Humidity range

Dappled light

Moisture – water

Protection from storms



Ellwood North

2011



2017



Ellwood North



Ellwood Main

2010



2020



Ellwood Main

2-5-2020



Population loss during overwintering

Thanksgiving count numbers are only included for sites repeated at New Year's.

Year	Thanksgiving Count	New Year's Count	Percent Loss
2016-2017	167,582	94,908	43%
2017-2018	147,343	74,728	49%
2018-2019	25,253	16,063	38%
2019-2020		Not available	

Pesticides

California use, 2017 – 205 million pounds
2007 – 172 million pounds

Neonicotinoids

Developed in the 1990's

Now the most widely used in the world

Targets insects

Persistent

Disease

- Disease of monarchs
 - *Ophryocystis elektroscirrha* OE



Tropical milkweed
Asclepias curassavica

Pests

Eucalyptus Longhorned Borer

Phoracantha semipunctata

1984 – Orange County



Pests

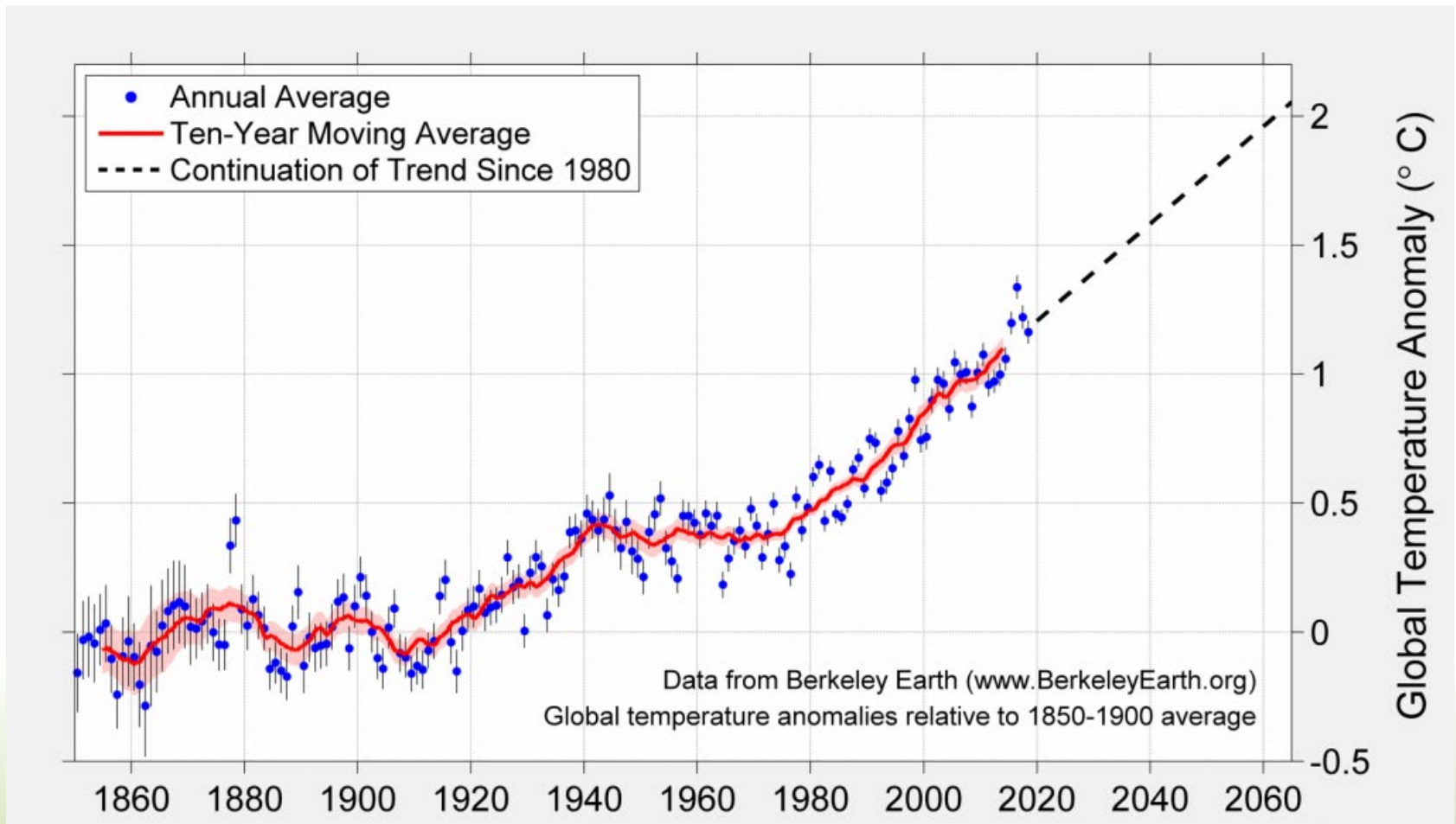
Tortoise beetle larvae



Tortoise beetle larva and adult

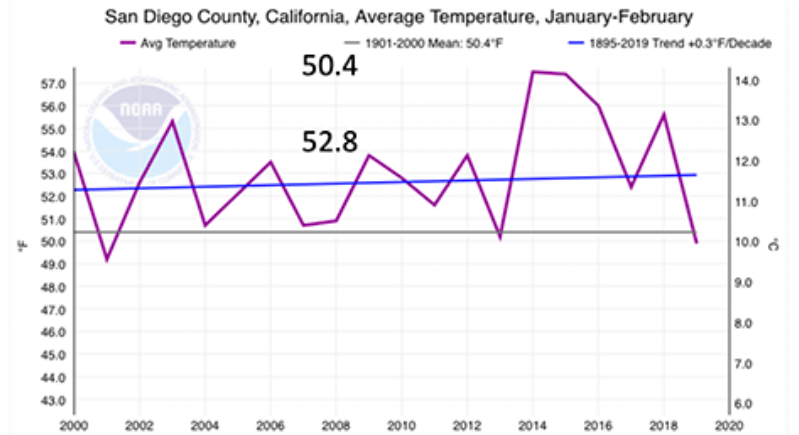
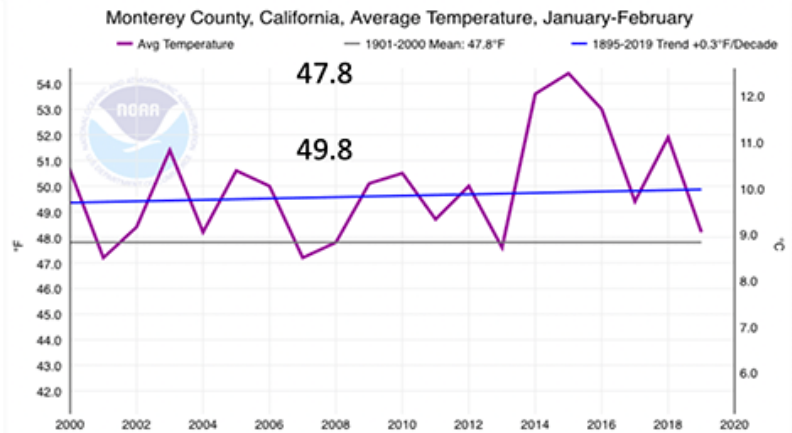
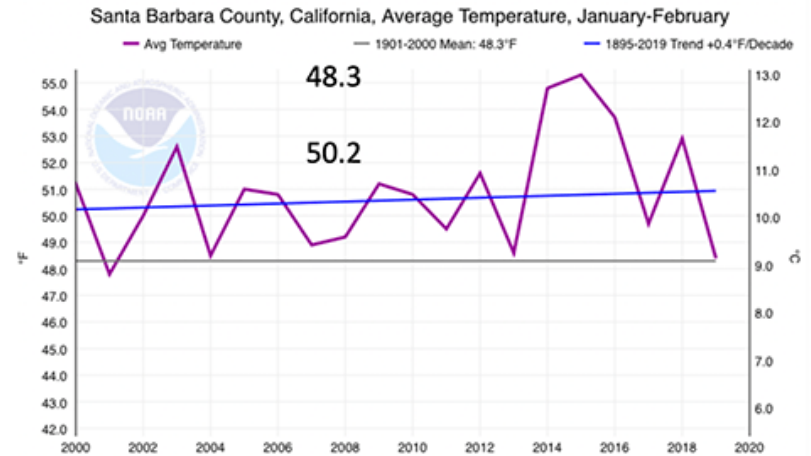
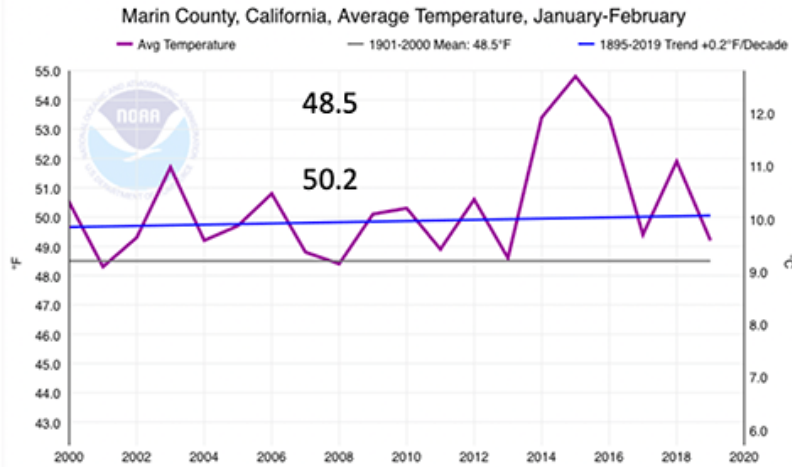


Climate



Monarchs and climate in the West

25 February 2020 | Author: Chip Taylor

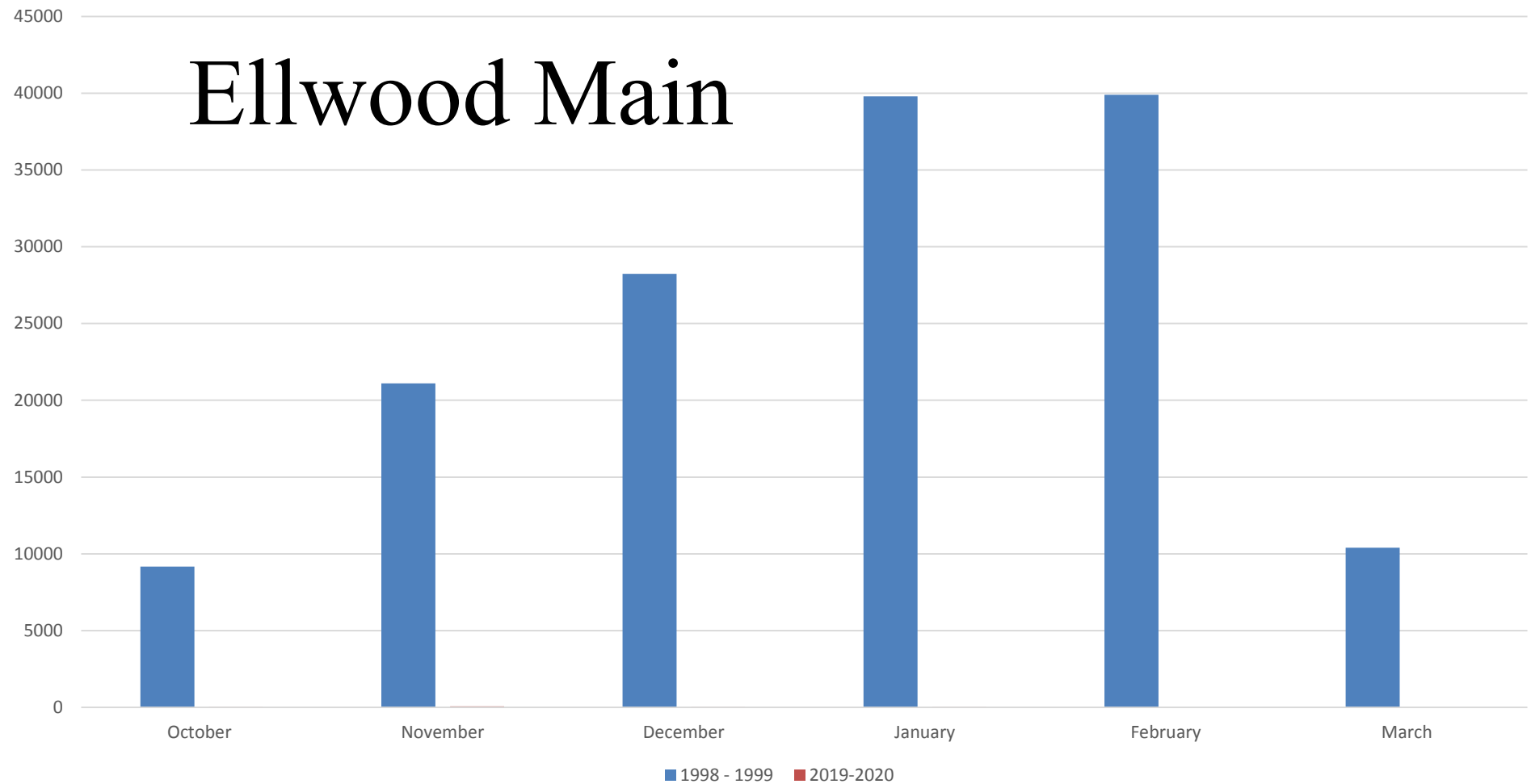


Breeding Habitat

- Timing of aggregation dispersal
- Availability of native milkweeds



Ellwood Main



	October	November	December	January	February	March
1998 - 1999	9,179	21,100	28,240	39,800	39,900	10,395
2019-2020	8	66	2	1	0	0

Actions to Help Save Western Monarchs

Xerces Society Call to Action

- Protect and manage California overwintering sites
- Restore breeding and migratory habitat in California
- Protect monarchs and their habitats from pesticides
- Protect, manage, and restore summer breeding and fall migration monarch habitat outside of California
- Answer key research questions about how to best aid monarch recovery

What can we do?



What You Can Do to Help Monarchs

1. Plant native milkweed.
2. Plant native flowers.
3. Support organic and GMO-free agriculture.
4. Avoid using insecticides and herbicides.
5. Get involved in another [community science project](#).
6. [Support](#) the Xerces Society's monarch conservation efforts.

Photo by Stephanie McKnight, The Xerces Society

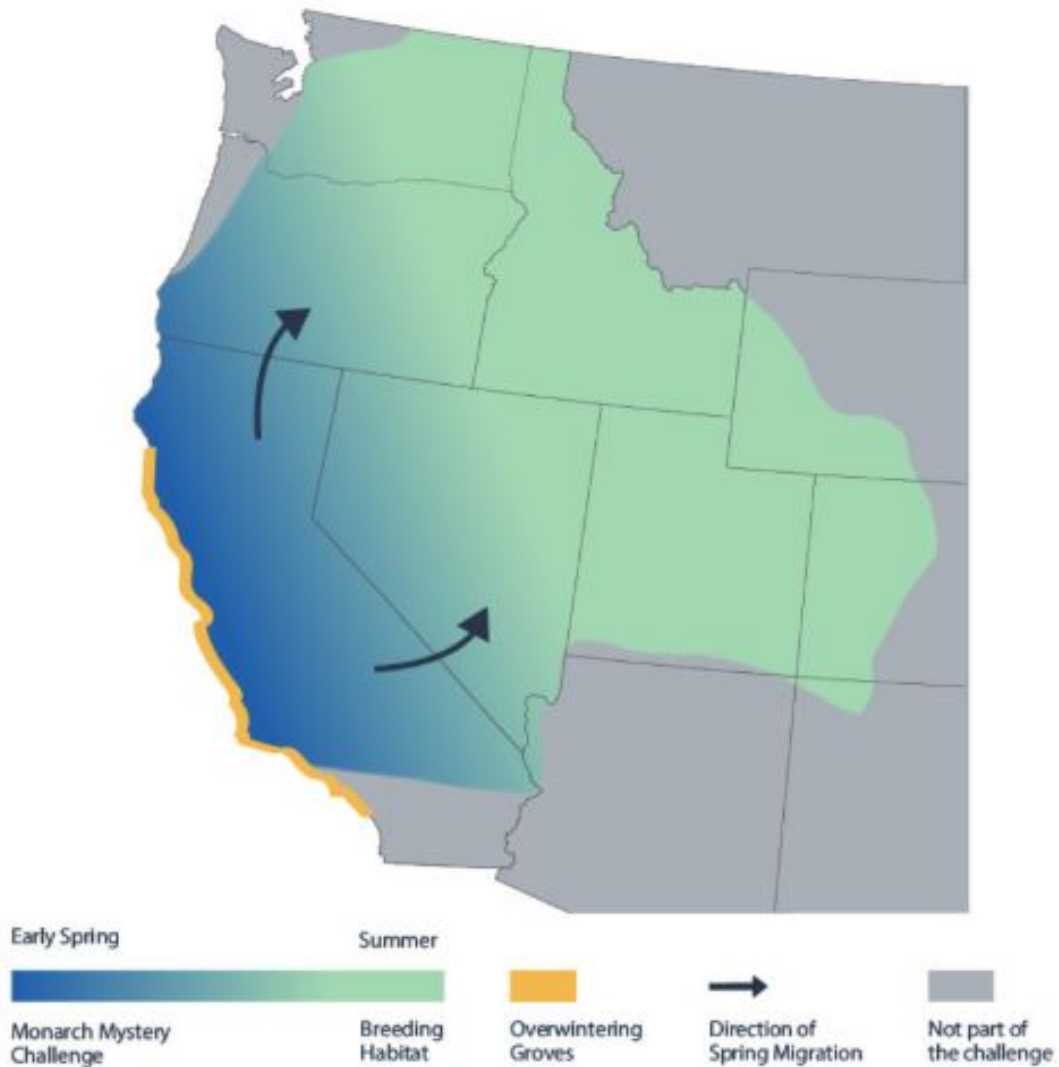
What can we do?

Key Research Question

Report monarch observations

- **The Western Monarch Mystery Challenge**
February 14 – April 22
 - <https://www.westernmonarchcount.org/the-western-monarch-mystery-challenge/>

Western Monarch Butterfly Population Breeding Range



What can we do?

Native milkweed planting 5 miles from aggregation



Asclepias fascicularis, Narrow leaf milkweed



Asclepias eriocarpa, Woollypod



Asclepias californica, California milkweed



Asclepias cordifolia, Heartleaf milkweed

"It is vital that we invest in increasing restoration of early emerging native milkweeds, especially in the coastal hills and the Central Valley of California, areas where the first monarchs that leave the overwintering sites breed."

Xerces Society

<https://xerces.org/milkweed/milkweed-seed-finder>

What can we do?

- Participate in restoration efforts
 - Ellwood North
 - Tree Planting
 - Pollinator garden
 - Ellwood Main in 2020



Ellwood Monarch Habitat Restoration

Planting trees and shrubs at Ellwood North

- Wind break and aggregation trees
- Pollinator garden, nectar and pollen

Forest condition information for entire grove

- Aerial photography
- LiDAR data acquisition
- Wind and light modeling for planting plans
- Tree census

Aggregation Site Restoration

- Tree restorations

Thank You for being here today!!



References

<https://pollinator.cals.cornell.edu/threats-wild-and-managed-bees/pesticides/neonicotinoids/>

https://www.cdpr.ca.gov/docs/pur/pur17rep/17sum.htm#year_summary

<https://www.frontiersin.org/articles/10.3389/fevo.2019.00223/full>

<https://xerces.org/blog/tropical-milkweed-a-no-grow>

<https://monarchjointventure.org/resources/downloads-and-links>

<https://xerces.org/western-monarch-call-to-action>



Narrow leaf milkweed



Heart leaf milkweed



Ellwood North
clusters 11-29-2012