

Information Summary for lectures at INTERNATIONAL MONARCH SCIENCE SYMPOSIUM

coordinated by Monarch Watch on the University of Kansas

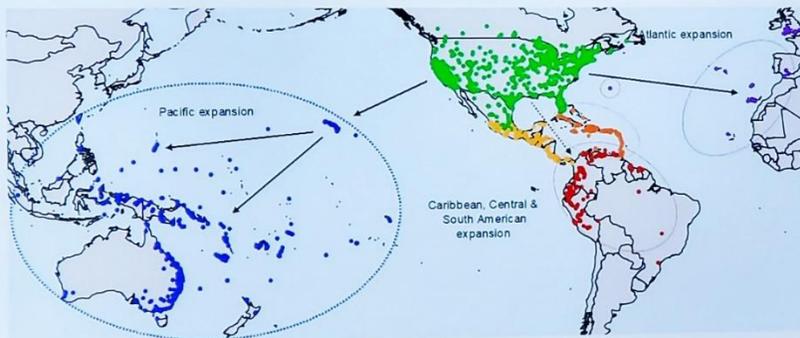
August 5-7, 2025

By Susie Vanderlip

Monarch Conservation Specialist in Southern California for Monarch Watch

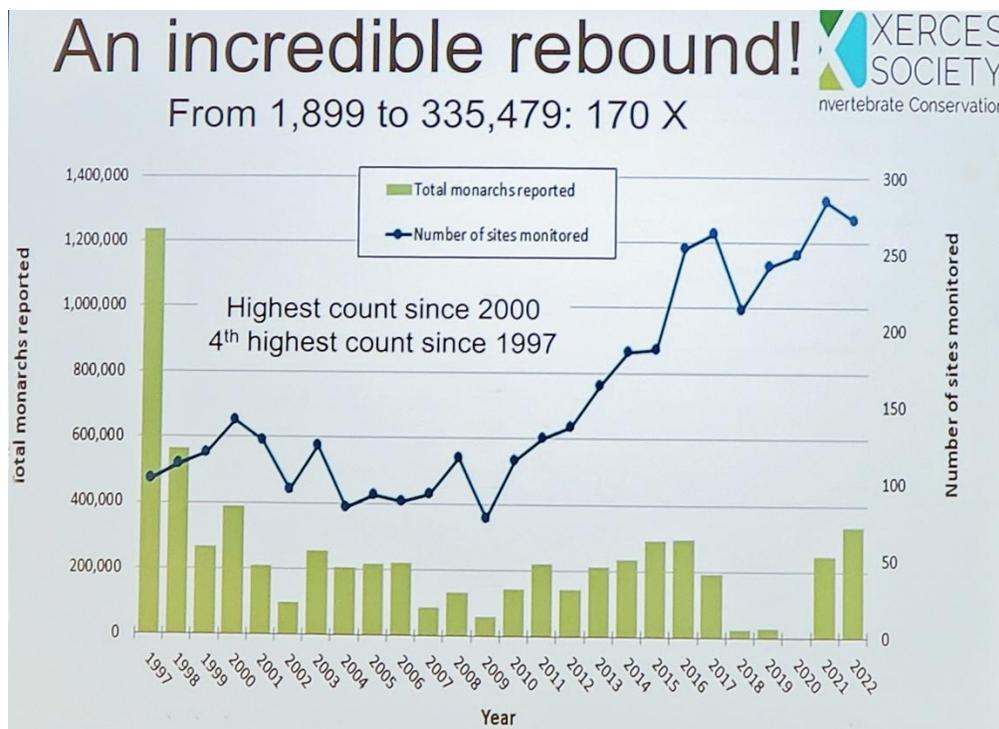
1. Worldwide Monarchs – found most abundantly in North America, but also in Central America, Caribbean, South America, Indonesia, Australia, New Zealand, Africa, Great Britain, Spain, and various Islands in the South Pacific and eastern Atlantic.

There is not only one monarch population in the world



(Freedman et al, 2020)

2. Western Monarch Population from 1997 thru 2022 – Dr. David James



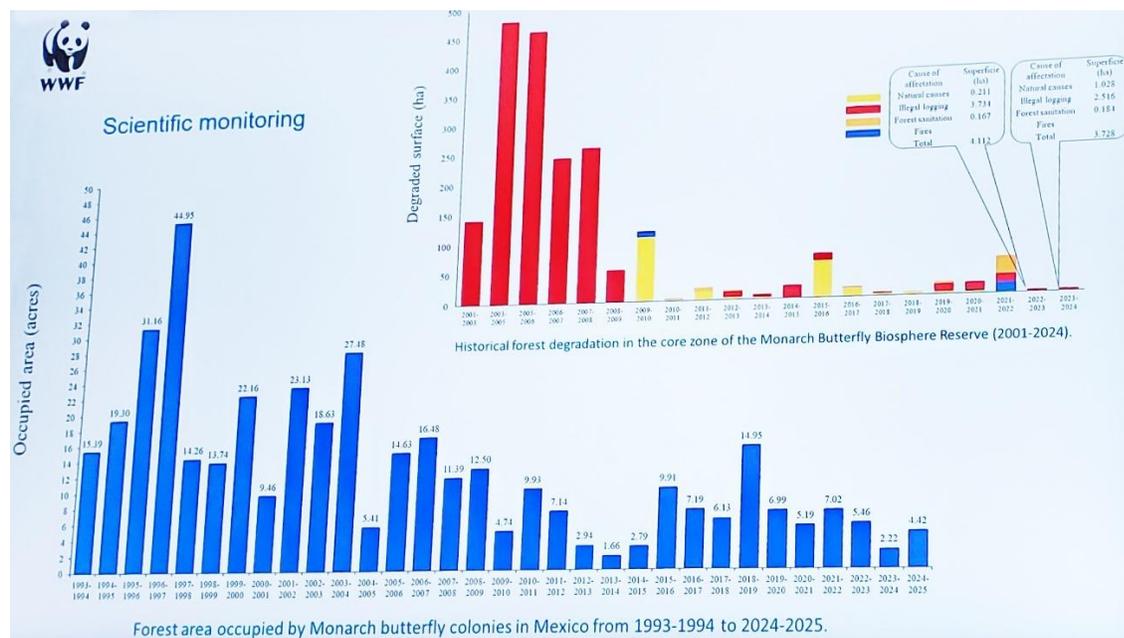
Significant Recent Overwintering Counts (account is done on Thanksgiving every year by dozens of volunteers trained by Xerces)

- In 2020, counted only 1,899 monarchs overwintering in central coast California.
- In 2021, counted 335,479 – remarkable and inexplicable rebound.
- The 2023 count was 234,000 (Initially 330,000 but ½ lost to impact of multiple atmospheric river storms that hit central coast as monarchs were overwintering).
- The 2024 count was only 9,000 – inexplicable as well.
- The count for this year, 2025, is going to be very interesting as we’ve had such an abundance of Monarchs this season, again, inexplicably so.

Conclusions by Dr. David James, Washington State University

- *Overwintering in California may alternate between reproductive and non-reproductive, depending on temperatures experienced by migrants September-October*
- *Smaller overwintering populations will be vulnerable to increasingly severe winter storms.*
- *Future overwintering populations will be a mix of non-reproductive and reproductive, following the Australian model. (what has occurred with the Australian monarch population)*
- *The ability of Monarchs to adapt to changing conditions will be an important driver of future population trends.*

3. Eastern Monarch Population over time – Dr. David James



Hectares Occupied by Overwintering Eastern Monarchs Occupy

Also significant decline – 98%

4. Australia Population Decline – Dr. David James

Monarch overwintering populations in Australia suffered a 90% decline from 1964-1978,

5. Crowding of Caterpillars Impact - Wajd Alaidrous

Crowding of caterpillars on a plant or on rearing has no significant impact on caterpillar survival and OE susceptibility, but does affect total development, wing morphology and spore load.

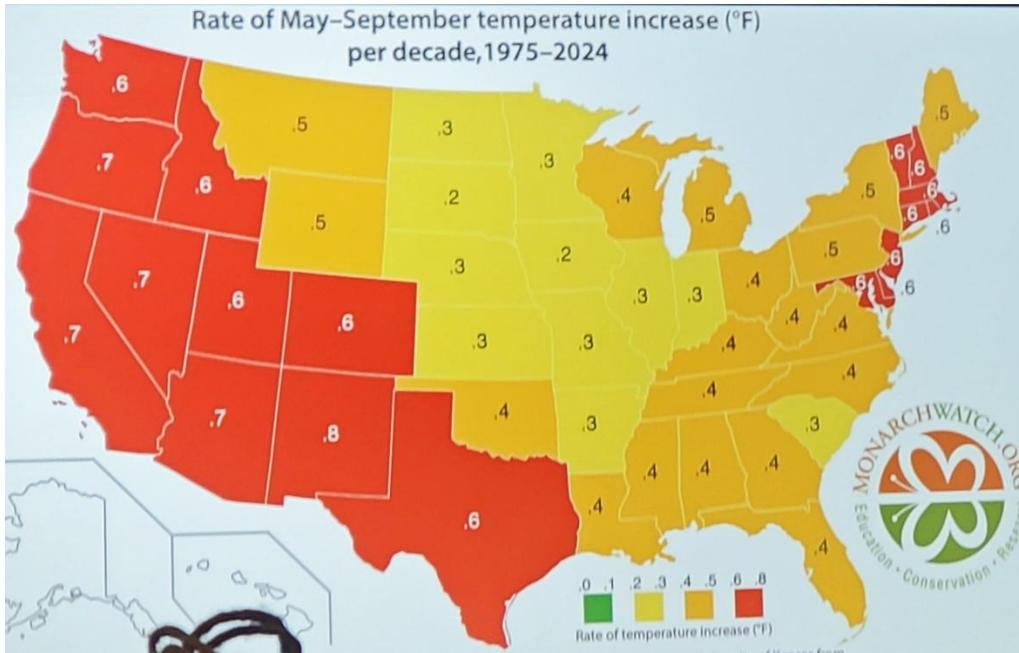
6. Is Monarch Rearing Harmful? - John Pleasants

- *Concerns about captive rearing*
 - *Less fit*
 - *Infected with OE*
 - *Lacking migration cues*
- *Several scientists and Monarch conservation organizations have discouraged rearing.*
- *Do reared monarchs have lower migration success*
- **CONCLUSIONS**
 - *Average survival from egg for wild monarchs 0.26*
Average survival from egg for reared monarchs 0.82
CONCLUDE: 4 x as many reared eggs make it to a butterfly
 - *Average probability of a wild eastern monarch making it to Mexico: 0.26*
Average probability of a reared eastern monarch making it to Mexico: 0.41
1.6 times higher for reared monarchs

Conclusion Part 3

- Although rearing has a positive impact on the monarch population, that impact is very small
- Concerns about rearing are overblown and raising these concerns puts people who like to rear monarchs for fun, or because they think it is helping, in conflict with the scientific community and conservation organizations

7. Global warming Concern – Dr. Chip Taylor



Western monarchs face significant global warming concerns since all the western monarch states are heating up the fastest in the US. Also critical is the warming of Texas, a key state for eastern monarch migration in both directions, also heating up fastest in the US.

(Dr. Chip Taylor)

8. Heat Impact on Caterpillars – Cheryl Schultz

Heat in the west deters success. Caterpillars need shade.

See more eggs and caterpillars in the shade vs sun.

Caterpillars start to die at and above 100 degrees. They get black and shriveled.

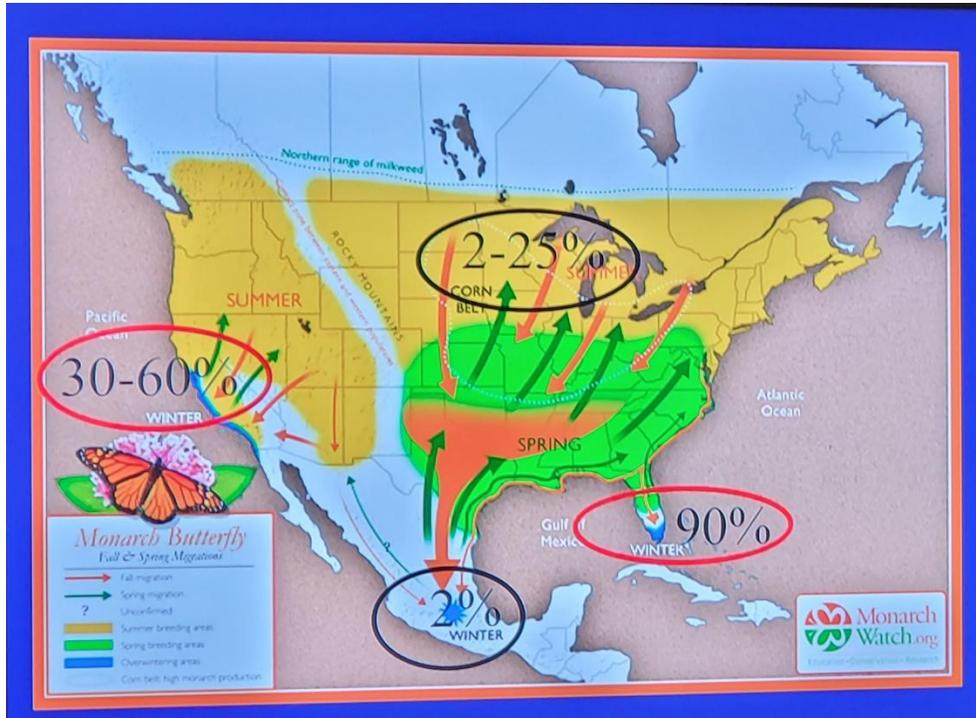
During the pilot round, a heatwave with temperatures greater than 100° F for 5 consecutive days caused substantial mortality on caterpillars in the sun treatment



Conclusions

- Enhance milkweed in/near shade structure
- Different milkweed species may offer different responses to environmental conditions
- Largest butterflies come from partial shade

9. O.e. Percentages around the Country – Monarch Watch



10. Predators – Sara Hermann

Clearly, there are innumerable insect (arthropod) predators of monarch eggs and baby caterpillars, many we never even see! Now you can understand why so many eggs never seem to produce a caterpillar later in the season when the predators have multiplied with the heat of summer. They get eaten! Likely less than 1% of eggs make it to a butterfly!

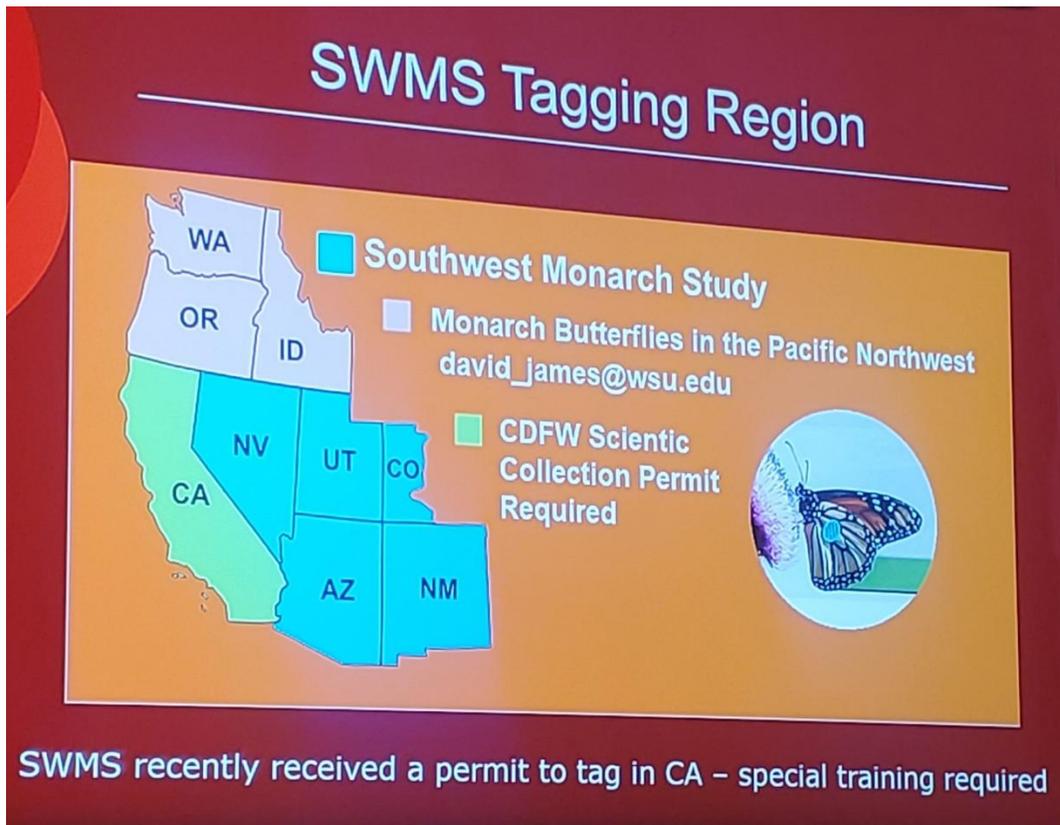


11. Transmitter Tracking – Gayle Steffy

Transmitters are now being tested on monarchs to follow their flight paths. Each one costs \$150 per butterfly, so it is not in use a lot yet, but they are being tested. Every butterfly has its own very different journey!



12. Southwest Monarch Study – Sign up – Gail Morris



SWMS Tagging Region

WA OR ID CA NV UT CO AZ NM

■ Southwest Monarch Study

■ Monarch Butterflies in the Pacific Northwest
david_james@wsu.edu

■ CDFW Scientific Collection Permit Required

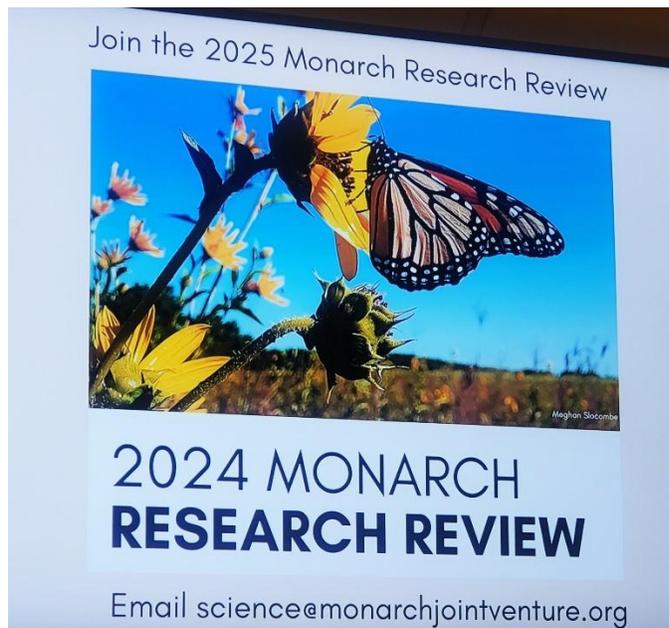
SWMS recently received a permit to tag in CA – special training required

If interested, read about the Study and how to participate at:

[Southwest Monarch Study](#)

13. Science Review - Sign-up

Want to participate in reviewing future scientific papers from monarch studies? Email science@monarchjointventure.org



14. Additional Presentations

- Migration Orientation

Several research studies were presented seeking to understand how eastern monarchs orient themselves south in the fall to migrate down to Michoacan, Mexico to overwinter. Despite attempts to orient them in other directions, something in their brains continues to reorient them south!

No one had any explanation as to how western monarchs go south from Washington/Oregon/northern California, west from Utah, and north from southern California to overwinter in central coast California!

- OE Transmission from Females to Egg

Females will have OE in their vagina and transmit it to the egg upon laying. When the caterpillar emerges, it eats its egg sack and ingests the OE. It is not a problem unless the OE has flourished on milkweed for 2+ years and become too much for a caterpillar to survive or a butterfly to be formed with disabled.