



THE MONARCH BUTTERFLY

North America's Amazing Migrant

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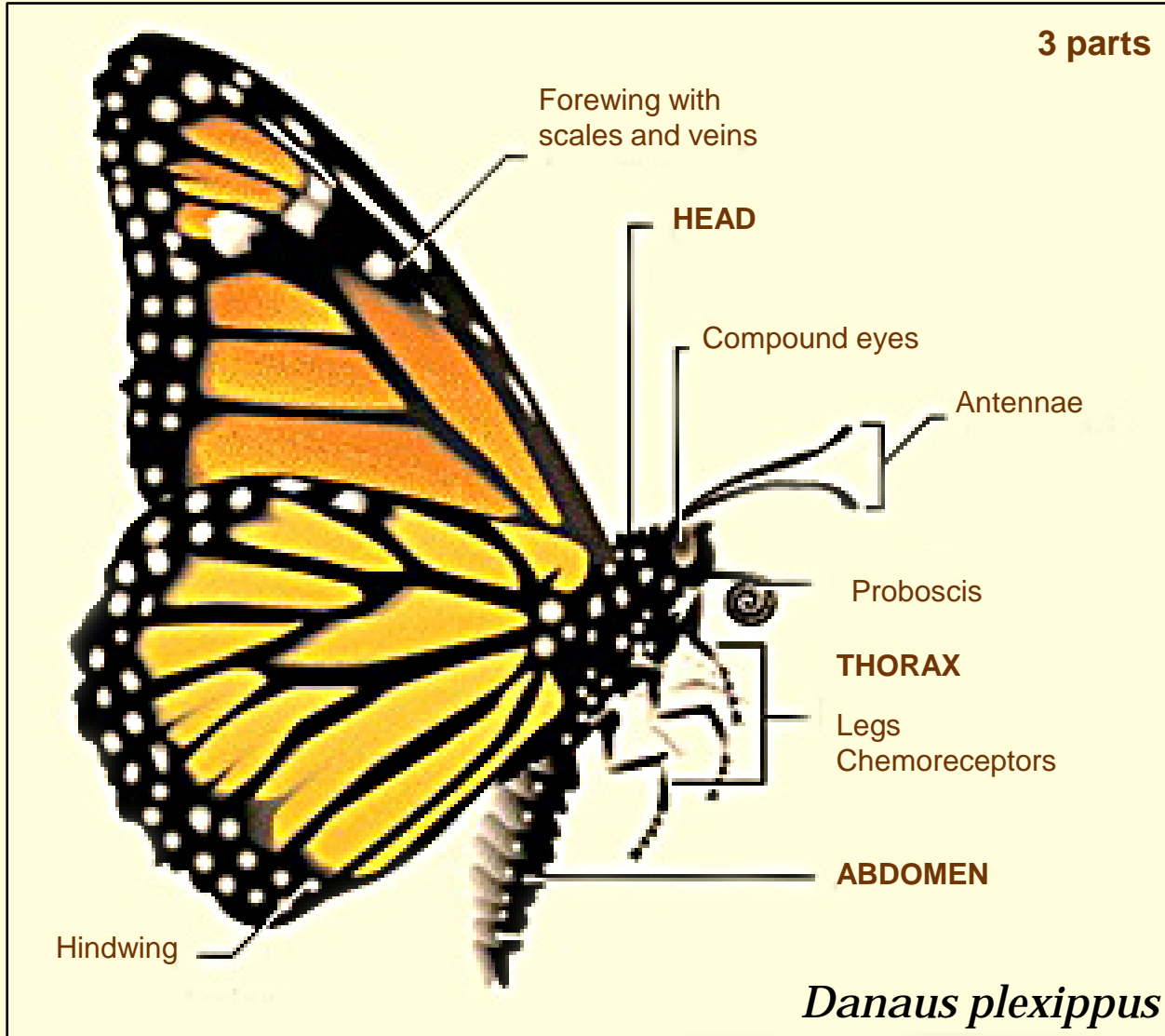
ISSI 2024

A vertical strip on the left side of the slide shows a close-up of monarch butterfly wings. The wings are orange with black veins and white spots along the edges.

Outline

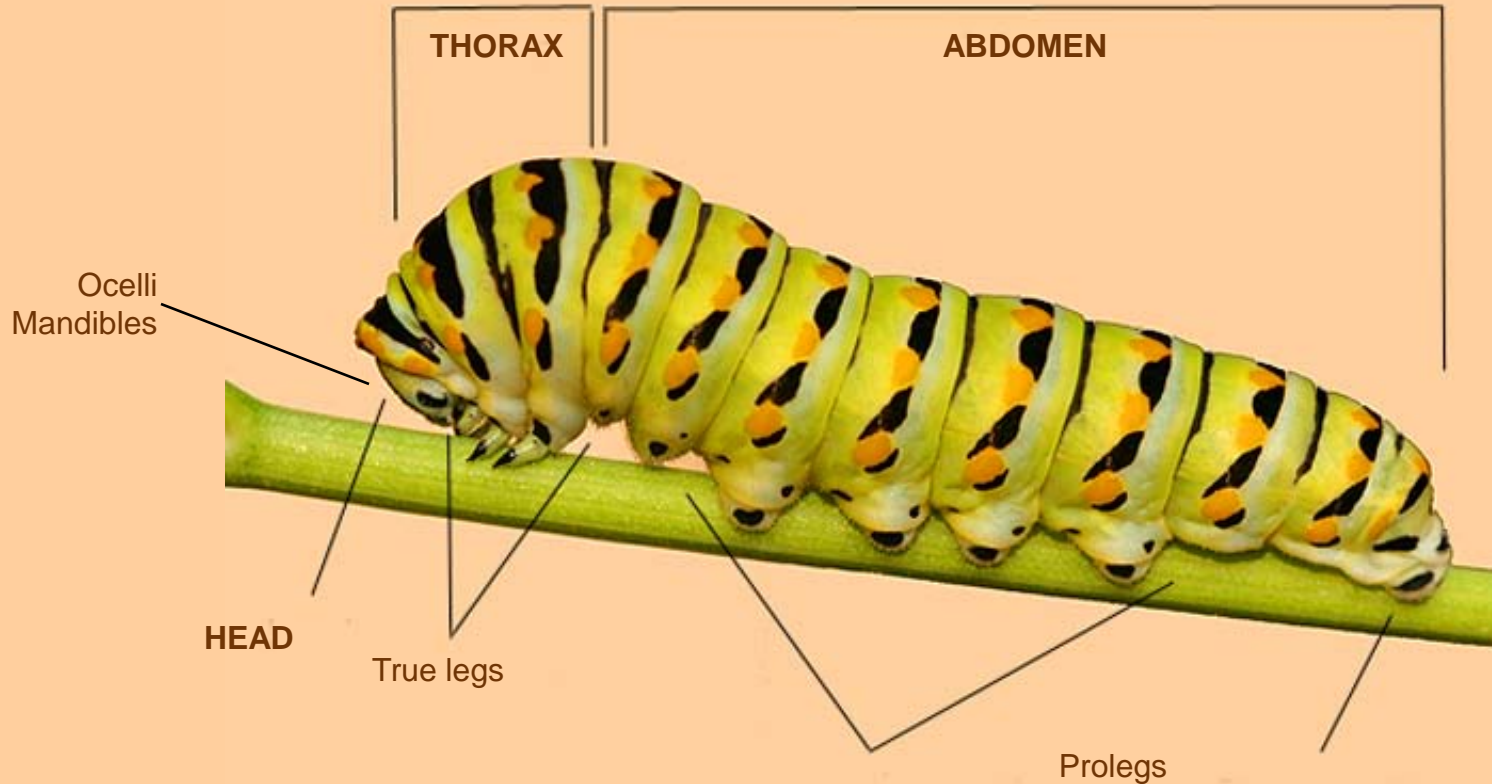
- **Biology**
- **Life Cycle**
- **Annual Cycle and Migration**
- **Conservation**
- **Cultural Significance**

Butterfly Morphology



Caterpillar Morphology

CHITINOUS EXOSKELETON



Dimorphism

- Female
 - Thicker veins
 - Slightly smaller
- Male:
 - A black spot on each hindwing
 - Appear paler



Function

Caterpillar



Feeding and Growth

Adult



Reproduction

Host Plants

Asclepias spp.

Milkweed *Algodoncillo/Venenillo*

Foliage *Follaje*

... plus a wide variety

Nectar
10% sugars

Milkweed / El Algodoncillo / El Venenillo



- Toxic chemical
- Milky latex
- Natural insecticide
- Monarchs





A. tuberosa
© Beautifulcataya (Flickr)



A. asperula
© Seth Anderson



A. purpurascens
© Christopher Benda



A. viridis
© Pinke (Flickr)



A. syriaca
© Anita Gould

Aposematic Colors

Caterpillar



Warning / Advertencia
Don't eat me! / ¡No me comas!

Adult



Camouflage / camuflage

LOS DOBLES



© Carlos Galindo Leal

Queen–*Danaus gilippus*



© Ken Thomas

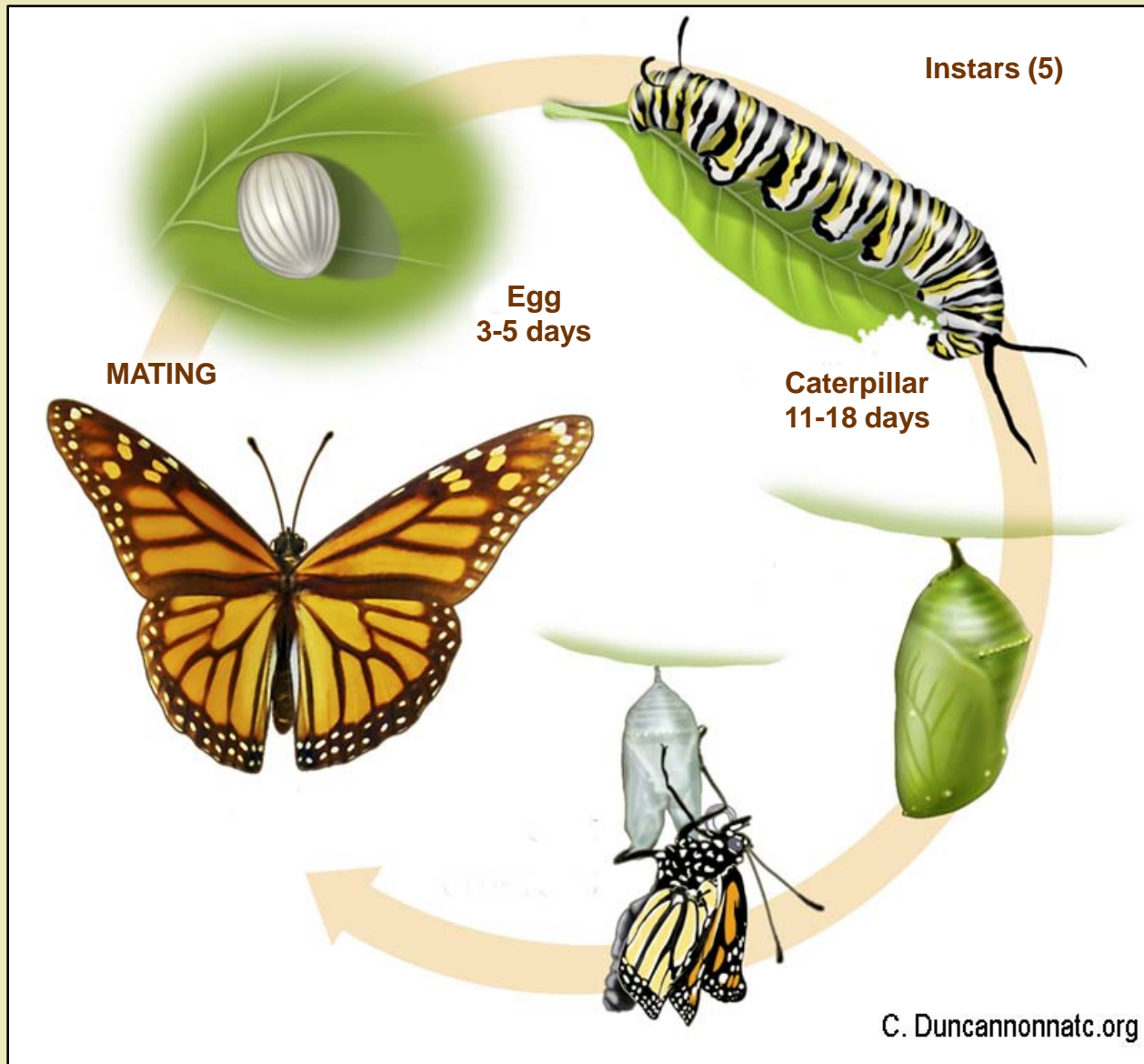
Soldier–*Danaus erisemus*



© Benny Mazur

Viceroy–*Limenitis archippus*

Life Cycle



Five Instars / Las 5 edades

1 - 2 mm L



6 - 9 mm L



10 - 14 mm L



13 - 25 mm L



25 - 45 mm L



Shed exoskeleton 4 times

Hay que mudar la piel (exoesqueleto) 4 veces

In 14 days, their body weight increases about 2700 times

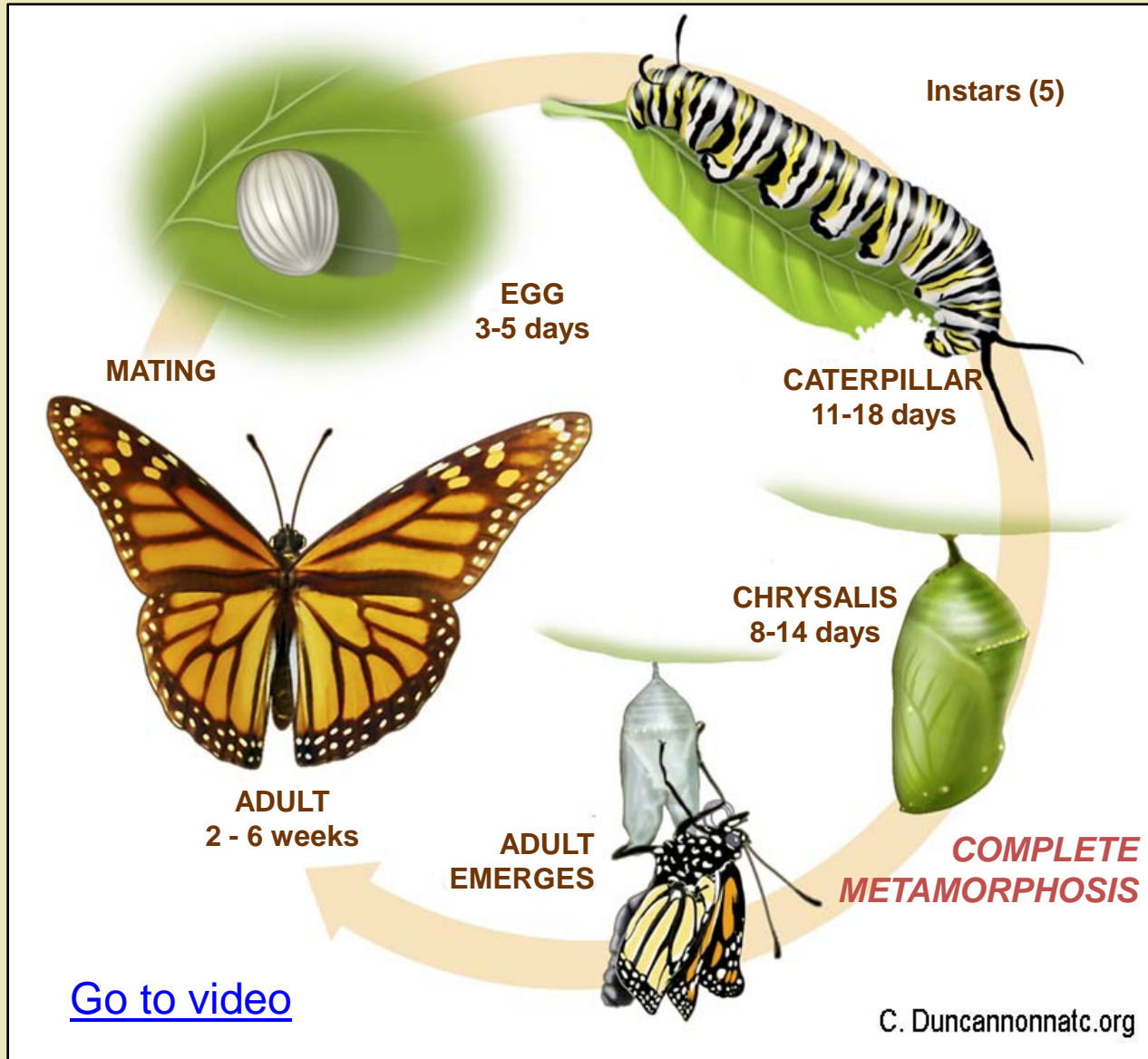


Human baby (8 lbs)



Orca (21,600 lbs or 10 tons)

Life Cycle

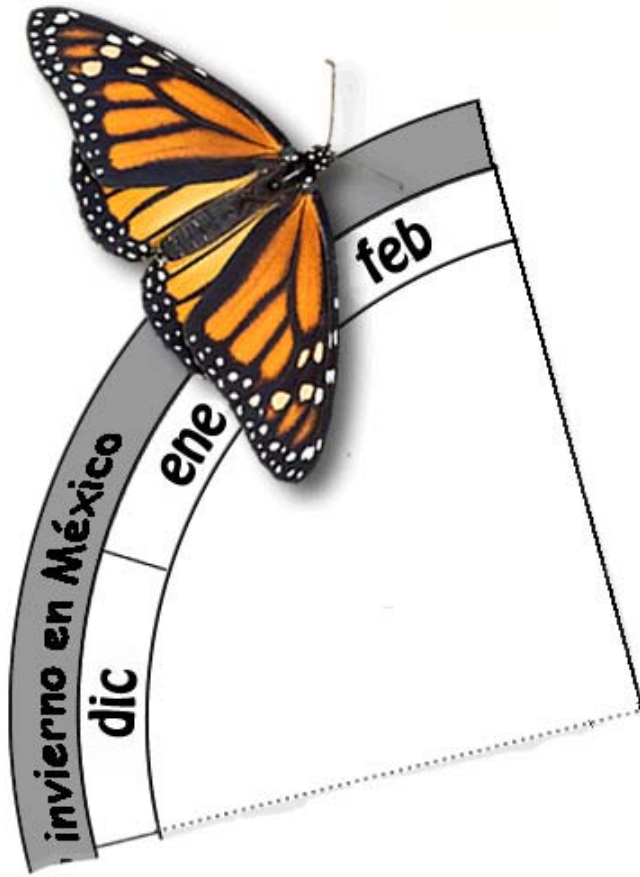




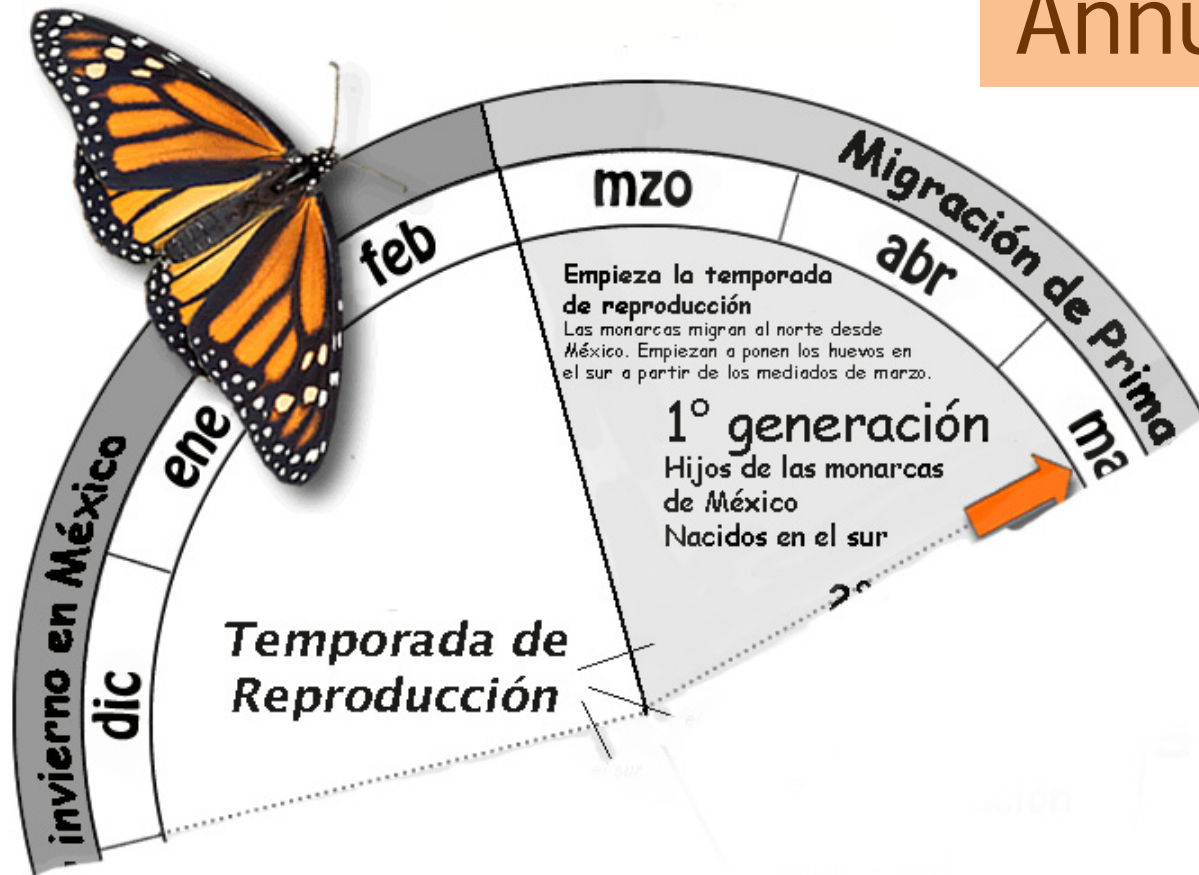
Migration and Their Annual Cycle

- **A long and unique migration in the animal kingdom.**
 - Trinational (3 countries, approx. 3,000 miles)
 - Multigenerational (4 or 5 generations)
- **Why do they migrate?**
 - Can't tolerate winter temperatures in the north (body temp. $\geq 55^{\circ}$ F)
- **How do they know when to reproduce or migrate?**
 - Reproduction: day length & temperature
 - Migration: day length
- **How do they know where to go?**
 - Angle of the sun
 - Earth's magnetic field (possible)

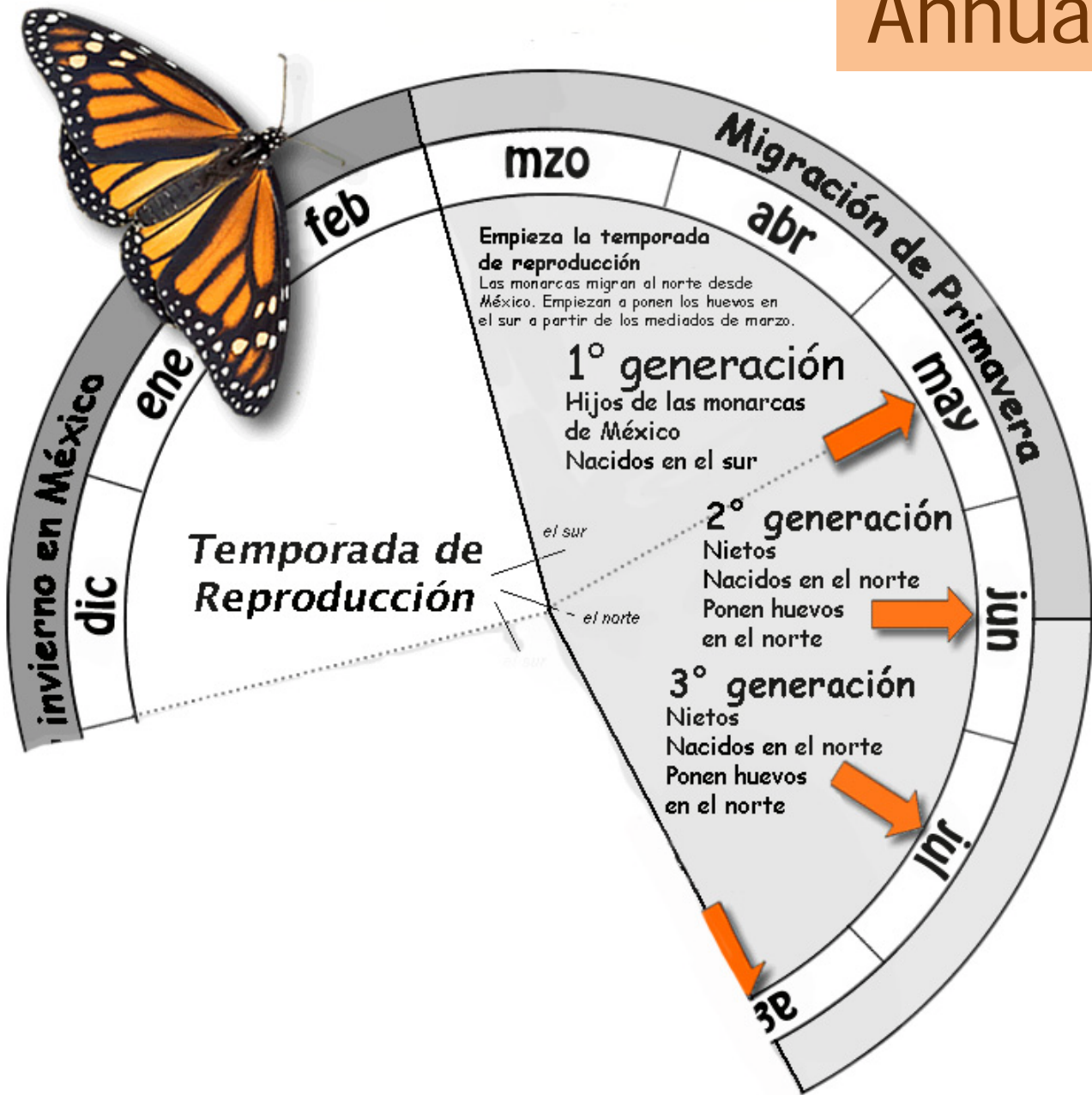
Annual Cycle



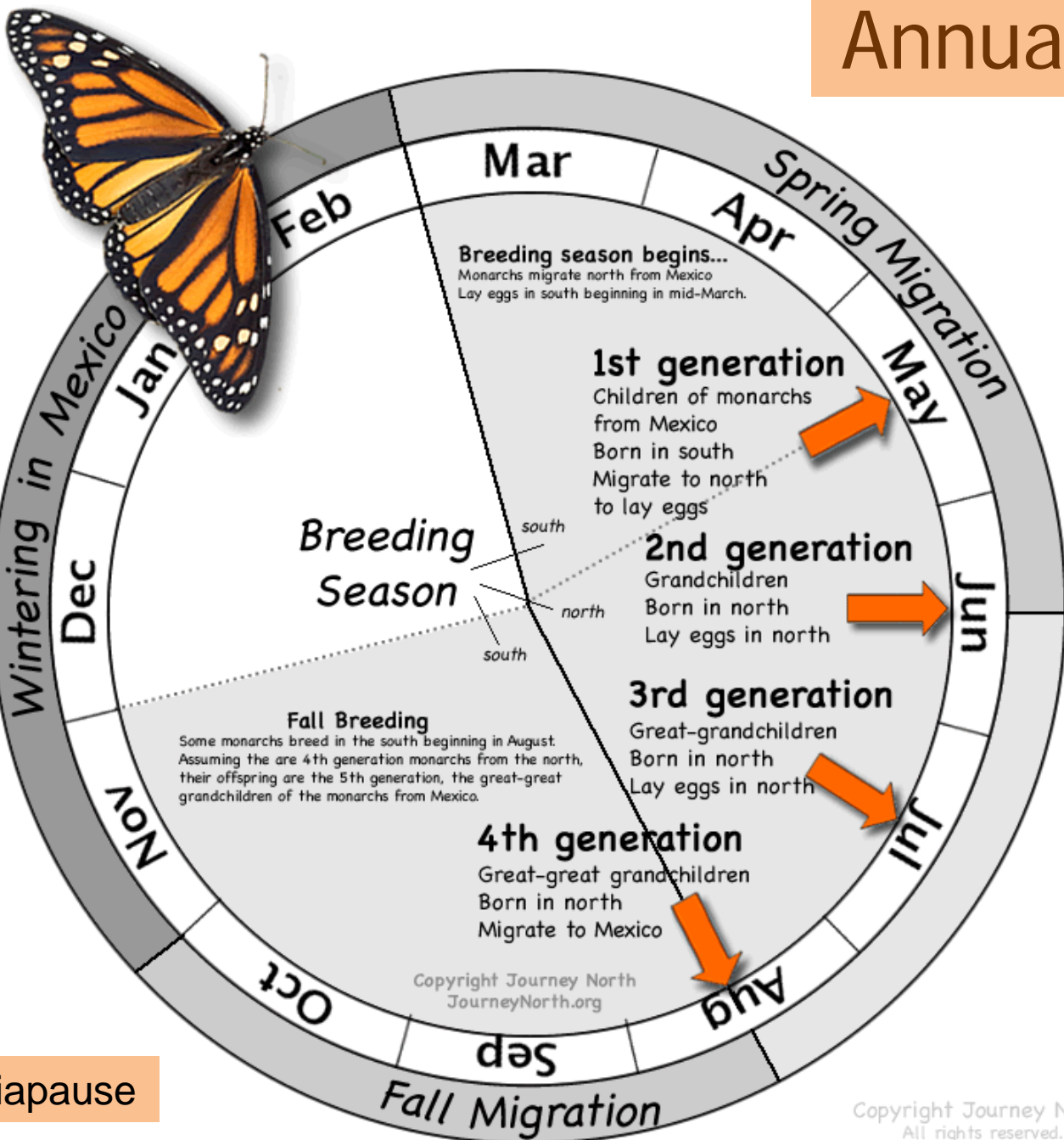
Annual Cycle



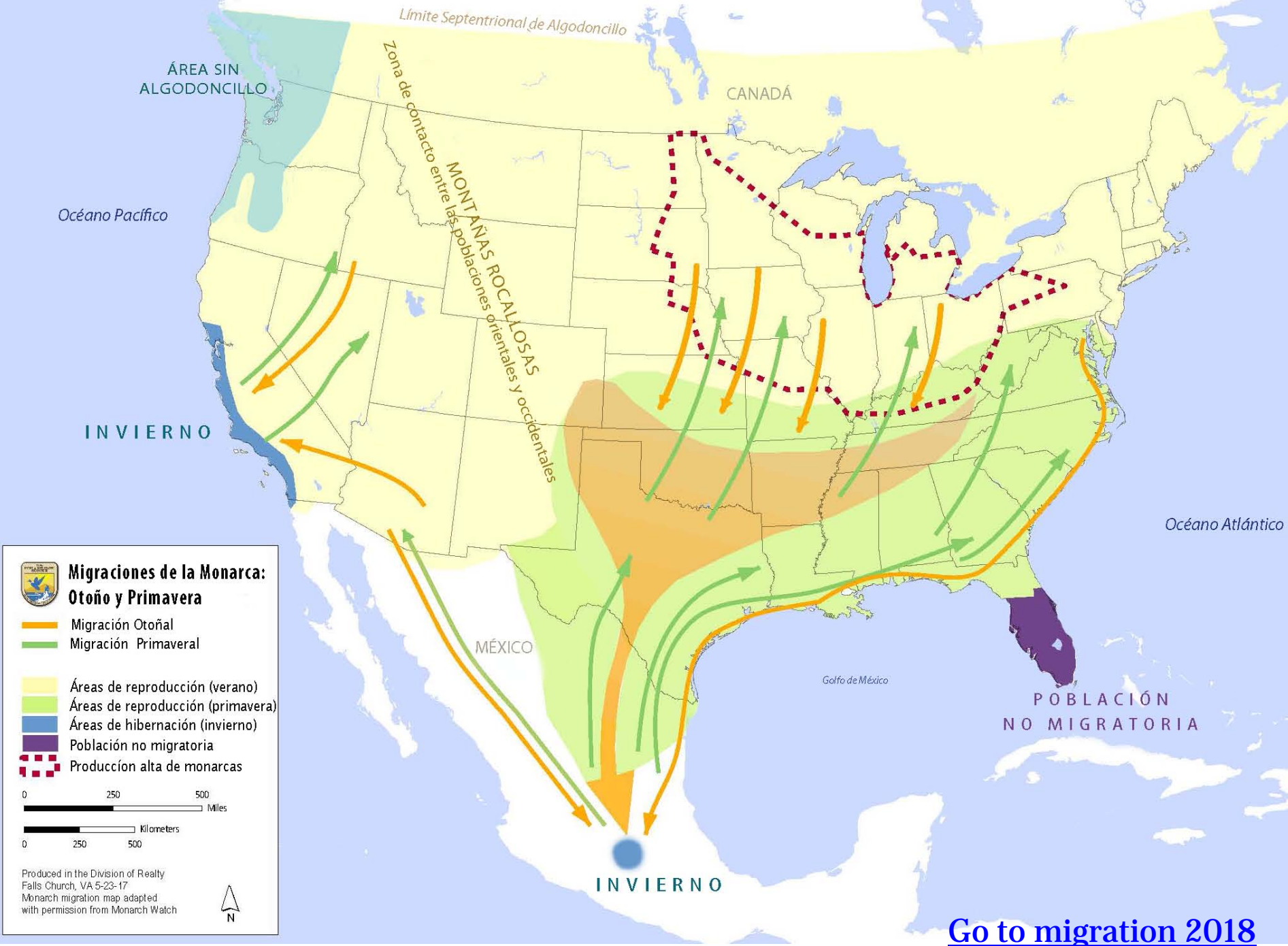
Annual Cycle



Annual Cycle

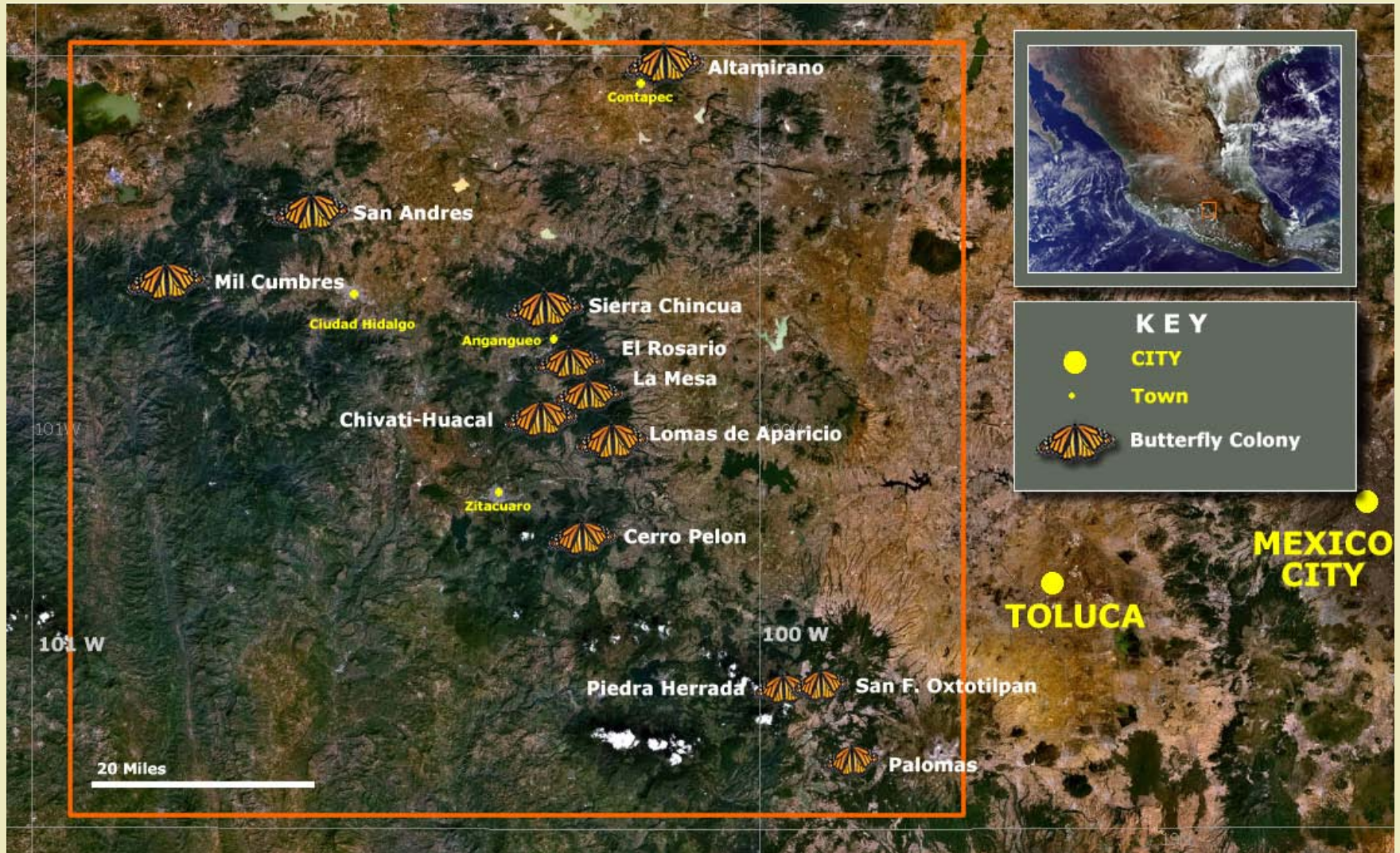


Diapause



[Go to migration 2018](#)

Arrival in Mexico



On the border of the states of Michoacán and México
between 7800 and 11,700 feet

The Monarch Butterfly Biosphere Reserve



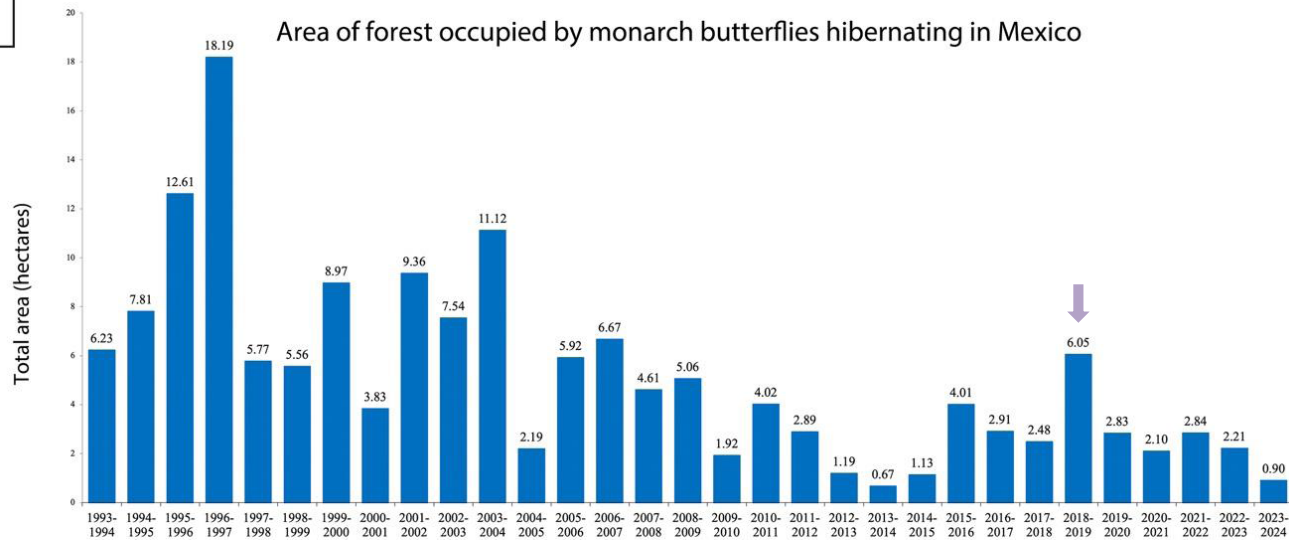
- Hibernation
- Oyamel Fir forest
- Microhábitat with mild temperaturas, high humidity & little wind
- 138,380 acres

- World Heritage Site (Un sitio del Patrimonio de la Humanidad) –UNESCO
- 4 tourist stations (Sierra Chincua, El Rosario, La Mesa, El Capulín)
- 2023-24: 21 million in 2.2 acres (\pm 1.6 football fields)

[Go to video](#)



Trends in the Overwintering Areas



Data collected from December to January every year





Their ancestors are returning

Arrival of monarchs
coincides with Day of the
Dead



Threats

Loss of milkweed habitat



Agriculture



Urbanization



Pesticides y herbicides

Climate change

Loss of forest refuges



Illegal clearcutting



Extreme weather



Unexpected changes



Conservation



Migration to Mexico discovered

1907



Official protection begins in Mexico

1980



Trinational workshops for "sister" protected areas begin

2006

Trinational Working Group to protect and conserve migration established

2014

1975
Hibernation areas located



2000
Declared a Biosphere Reserve



2008
Named World Heritage Site



2010
Network of organizations along the migratory route form



<p><i>Current population</i> 300 million</p>	<p><i>Longtime average</i> 300 million</p>	<p><i>Historic high</i> 1 billion</p>
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¡Gracias!

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www.lasecomujeres.org