

# Weeds, Bees, and Native Plants

## Native Pollinators and Plant Selection in the Northwest



**Eric Lee-Mäder**

Pollinator Conservation Program Co-Director

# What is the Xerces Society?



## Protecting the Life that Sustains Us

Since 1971, the Society has worked to protect wildlife through the conservation of invertebrates and their habitat.

### Major Programs:

- Endangered species
- Aquatic conservation
- Pesticide policy and regulation
- **Pollinator conservation and agricultural biodiversity**

\* Xerces blue butterfly (*Glaucopsyche xerces*), the first U.S. butterfly to go extinct due to human activities



# Part 1. The Status of Pollinators



Rusty patch bumble bee (*Bombus affinis*)

# Pollinators an Ecological Keystone

## The Role of Pollinators

- 85% of Plant species require pollinators
- One in three mouthfuls of food and drink
- Bee pollinated crops = \$200+ billion/year



Morse RA, Calderone NW. 2000. The value of honey bees as pollinators of U.S. crops in 2000. *Bee Culture* 128: 1–15.

Klein et al. 2007. Importance of pollinators in changing landscapes for world crops. *Proc. R. Soc. B* 274: 303-313.

## Fewer Honey Bees Available

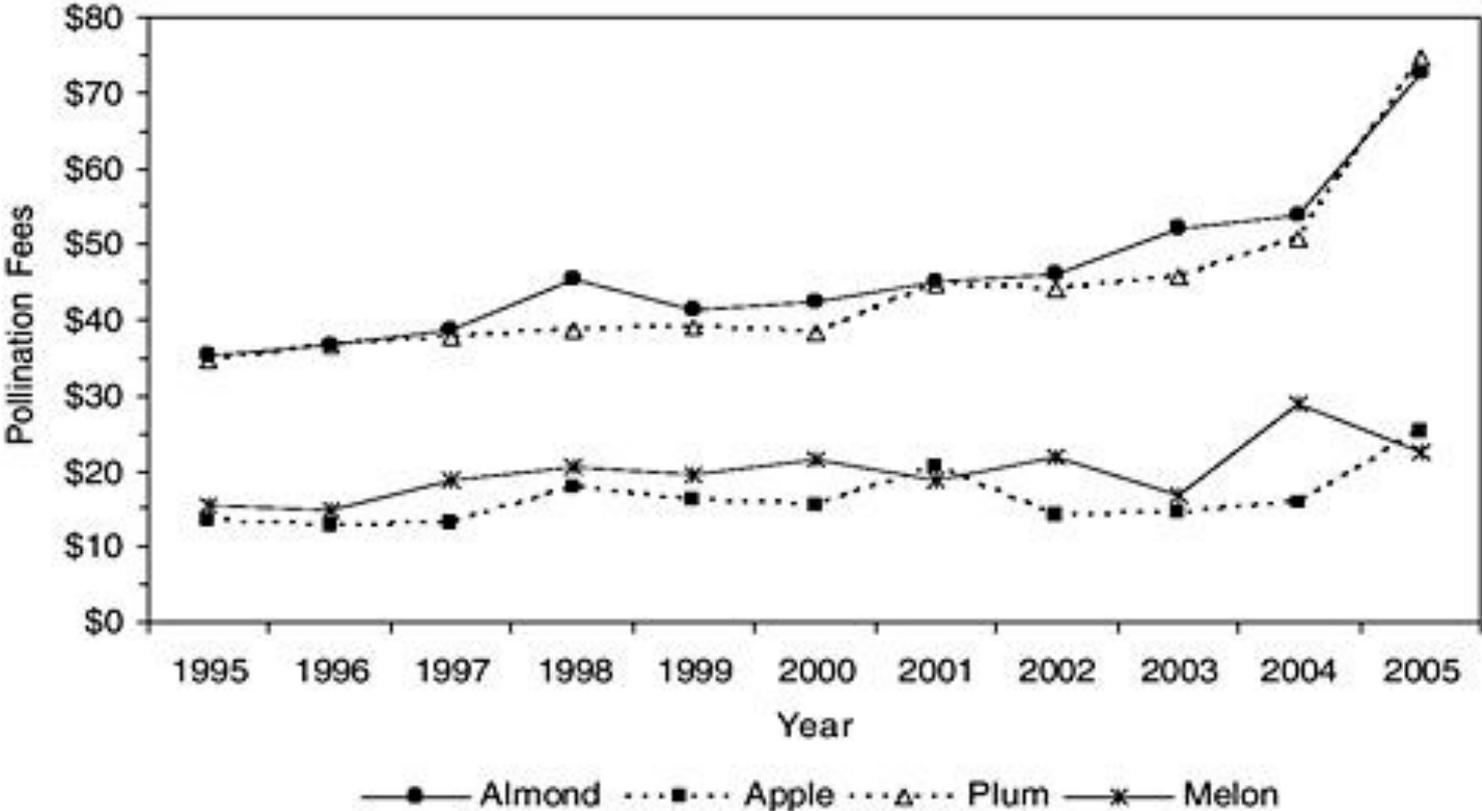
- 50% decline in managed hives since 1950

**Causes:** Disease, pests, honey prices, and...Colony Collapse Disorder

Varroa mite



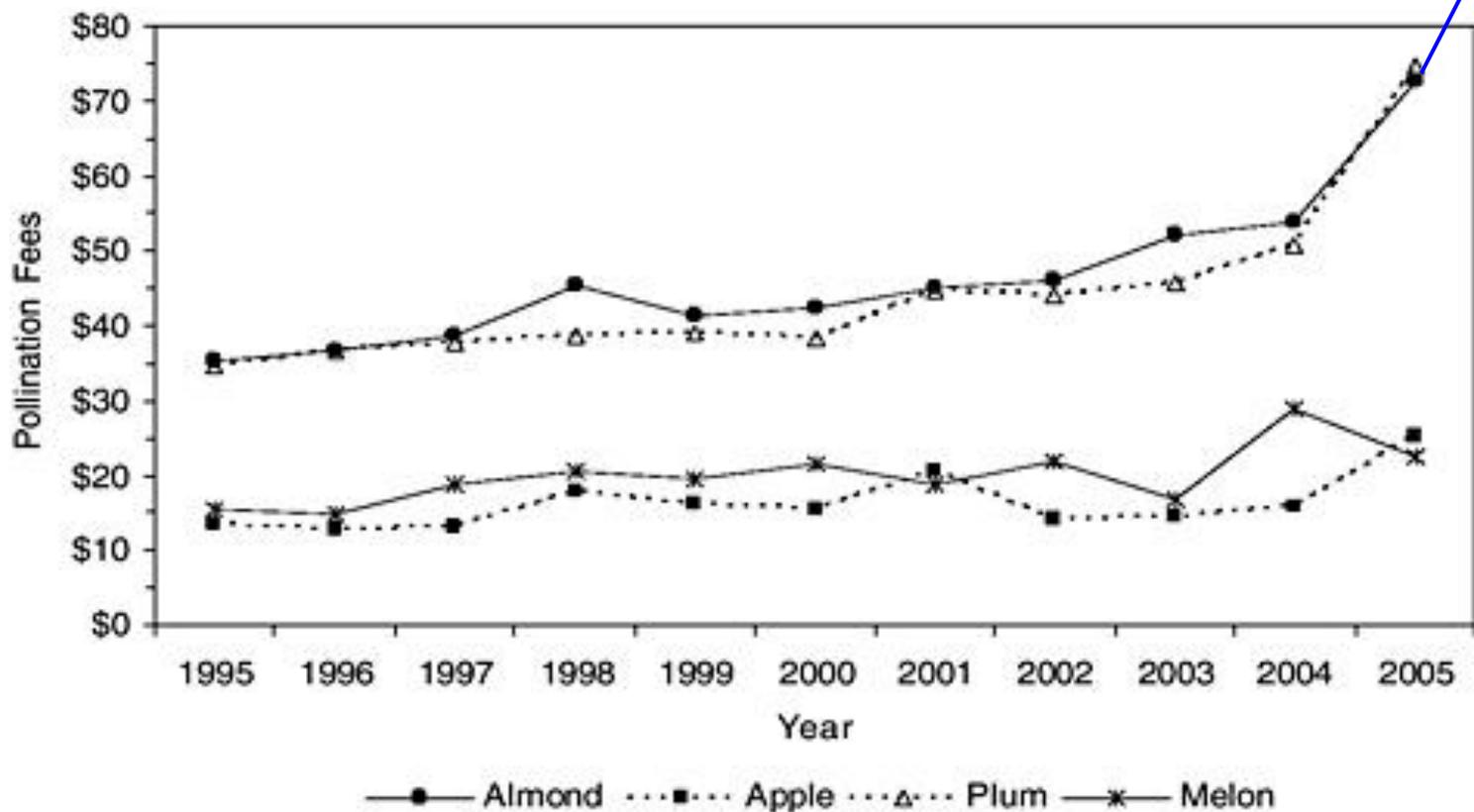
## Honey bee colony rental rates for selected California crops, 1995–2005.



# Honey Bees in Decline

## Honey bee colony rental rates for selected California crops, 1995–2005.

Plus almonds, 2006-2008



# Other Important Pollinators in Decline

## Native Bees also in Decline

25% of bumble bee species at risk of extinction



Yellow-banded

© Jodi DeLong



Franklin's

© Peter Schroeder



Rusty patched

© Johanna James-Heinz



Western

© Derrick Ditchburn

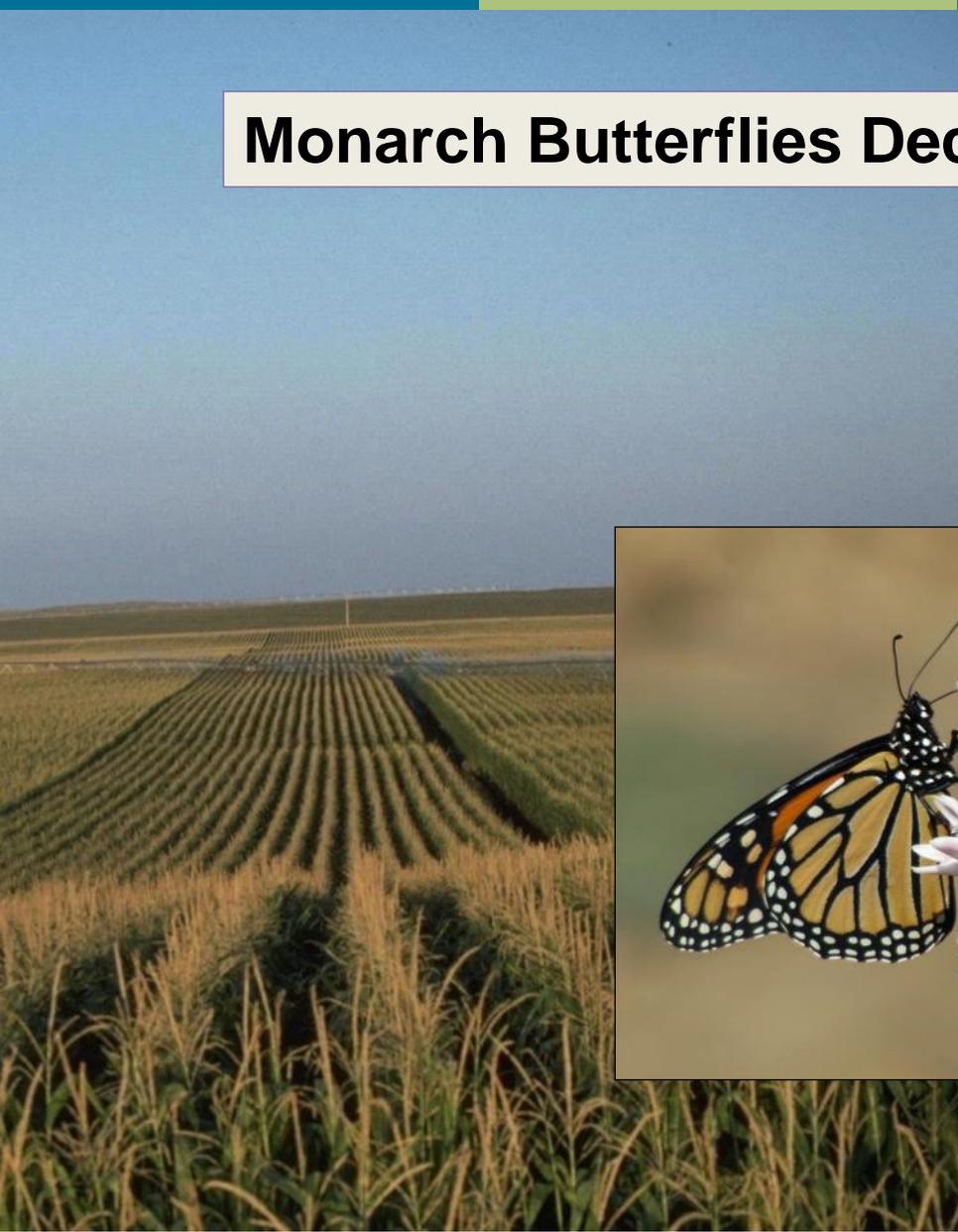
Evans, E.,R. Thorp, S. Jepsen, and S. Hoffman Black, 2009. Status Review of Three Formerly Common Species of Bumble Bee in the Subgenus *Bombus*. Xerces Society.

Cameron et al. 2011. Patterns of widespread decline in North American bumble bees. PNAS



# Other Important Pollinators in Decline

**Monarch Butterflies Decline 90% Since 1990s**

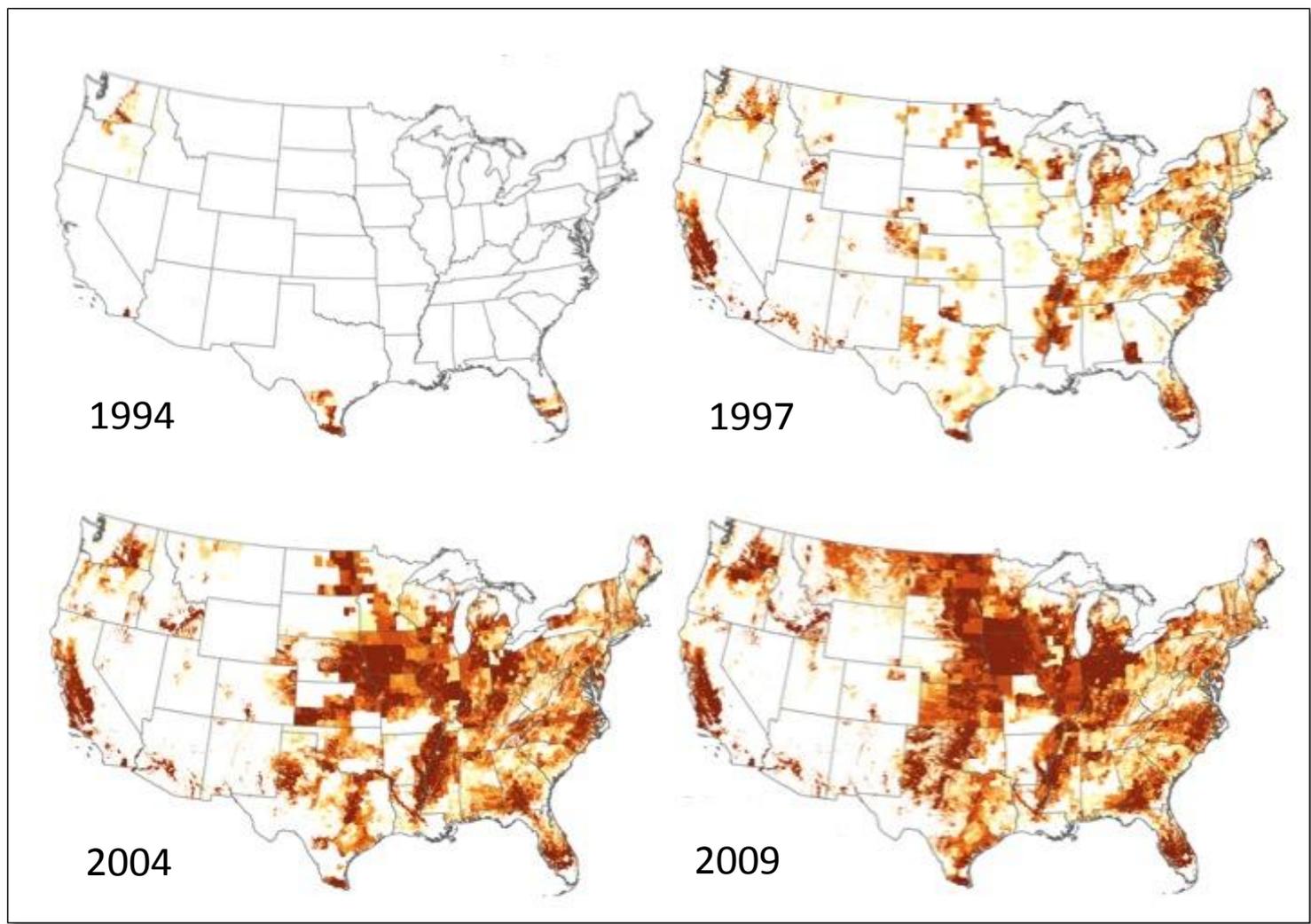


## Threats to Pollinators

**9+ Million Acres of Habitat Loss Since 2007**



## New Systemic Insecticides Now Widespread



## 2014 Report: Earth has lost half of its wildlife in the past 40 years

Analysis of 10,000 populations of more than 3,000 species (birds, mammals, fish, reptiles, etc.)



## NEWS SCIENCE & ENVIRONMENT

### World wildlife populations halved in 40 years - report

COMMENTS (657)

By Roger Harrabin  
BBC environment analyst

BBC



Habitat loss and hunting have reduced tigers from 100,000 a century ago to just 3,000

**The global loss of species is even worse than previously thought, the London Zoological Society (ZSL) says in its new Living Planet Index.**

The report suggests populations have halved in 40 years, as new methodology gives more alarming results than in a report two years ago.

The report says populations of mammals, birds, reptiles, amphibians and fish have declined by an average of 52%.

Populations of freshwater species have suffered an even worse fall of 76%.

#### Severe impact

Compiling a global average of species decline involves tricky statistics, often comparing disparate data sets - and some critics say the exercise is

## Part 2. Native Bee Ecology



Sweat bee (*Lasioglossom* spp.)

4000+ Native bee species in  
North America



Squash bee (*Peponapis pruinosa*)



Native sunflower bee (genus: *Svastra*)

# Three Functional Groups of Native Bees

## Bumble Bees

- Social animals
- Annual lifecycle
- Nests in abandoned rodent burrows or under thatch
- Active in cool weather



# Three Functional Groups of Native Bees

## Late Season:

Mated queens seek overwintering sites

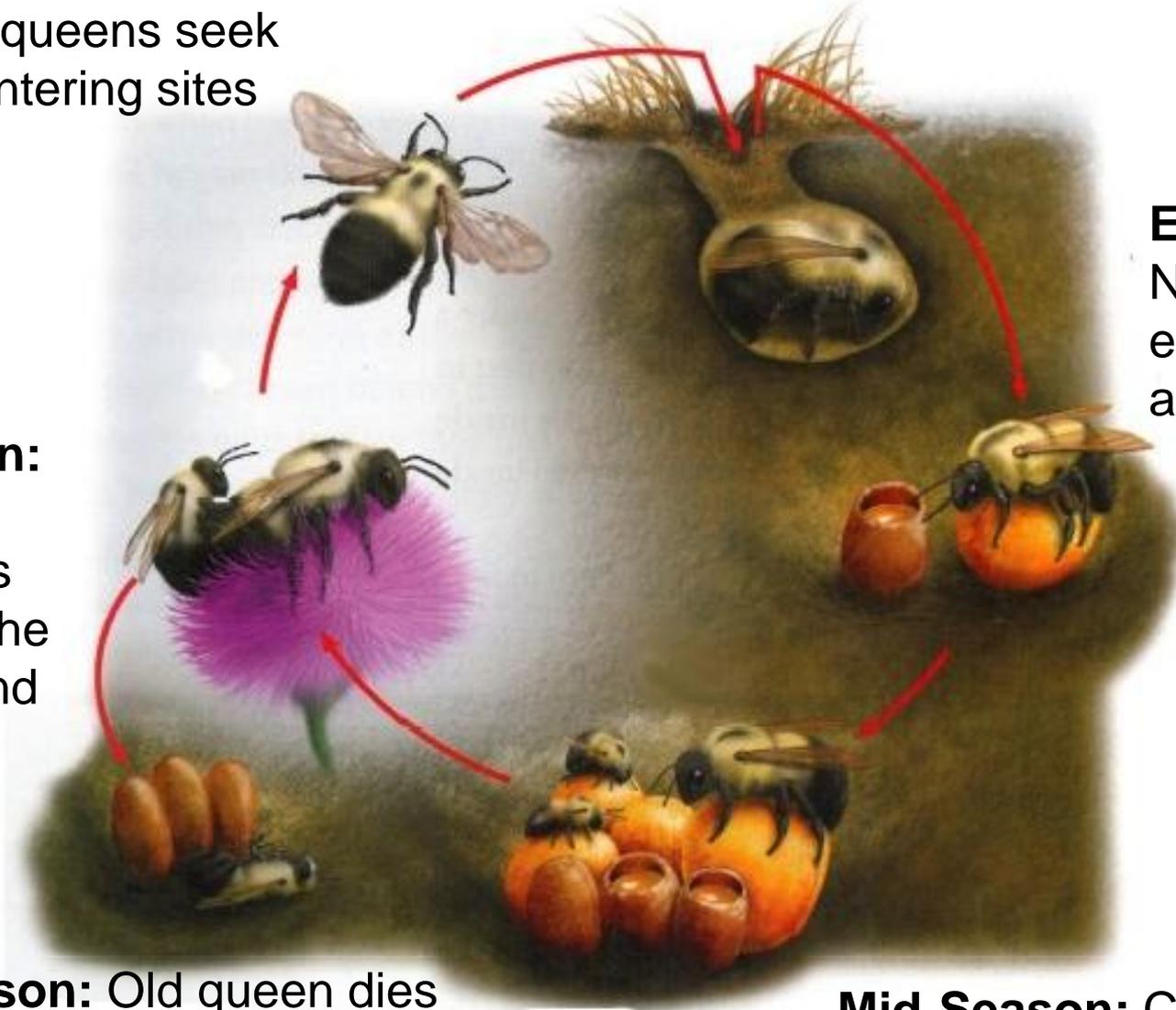
## Dormant Season: Hibernating queen

## Early Season:

Nest establishment and egg laying

## Late Season:

New queens leave the nest and mate



Late Season: Old queen dies

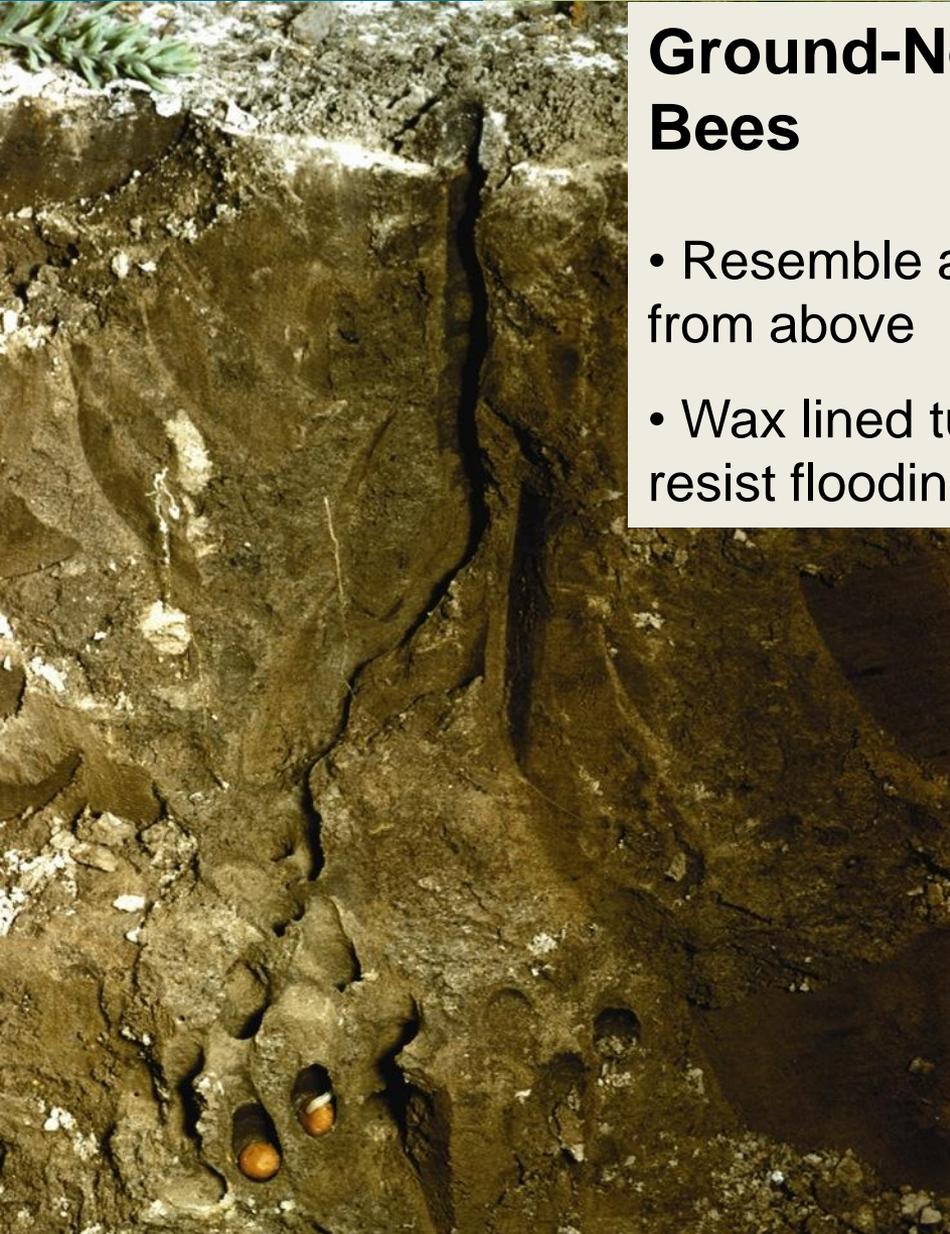
Mid-Season: Colony peak



# Three Functional Groups of Native Bees

## Ground-Nesting Bees

- Resemble ant-nests from above
- Wax lined tunnels can resist flooding



# Three Functional Groups of Native Bees

## Ground-Nesting Bees



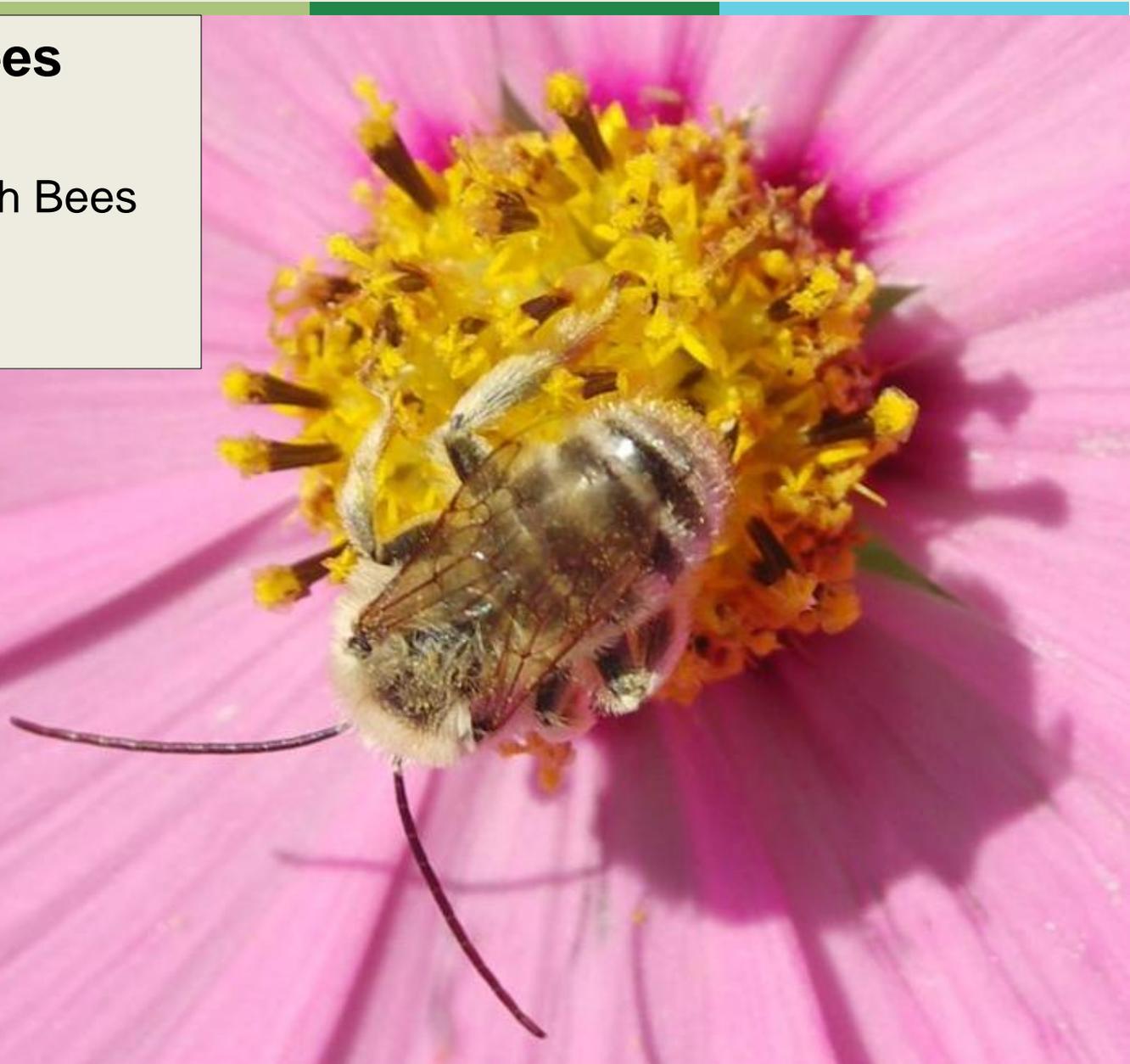
Mining bee (*Andrena* sp.): a year in its underground nest as egg, larva, and pupa before emerging to spend a few weeks as an adult.



# Three Functional Groups of Native Bees

## Ground-Nesting Bees

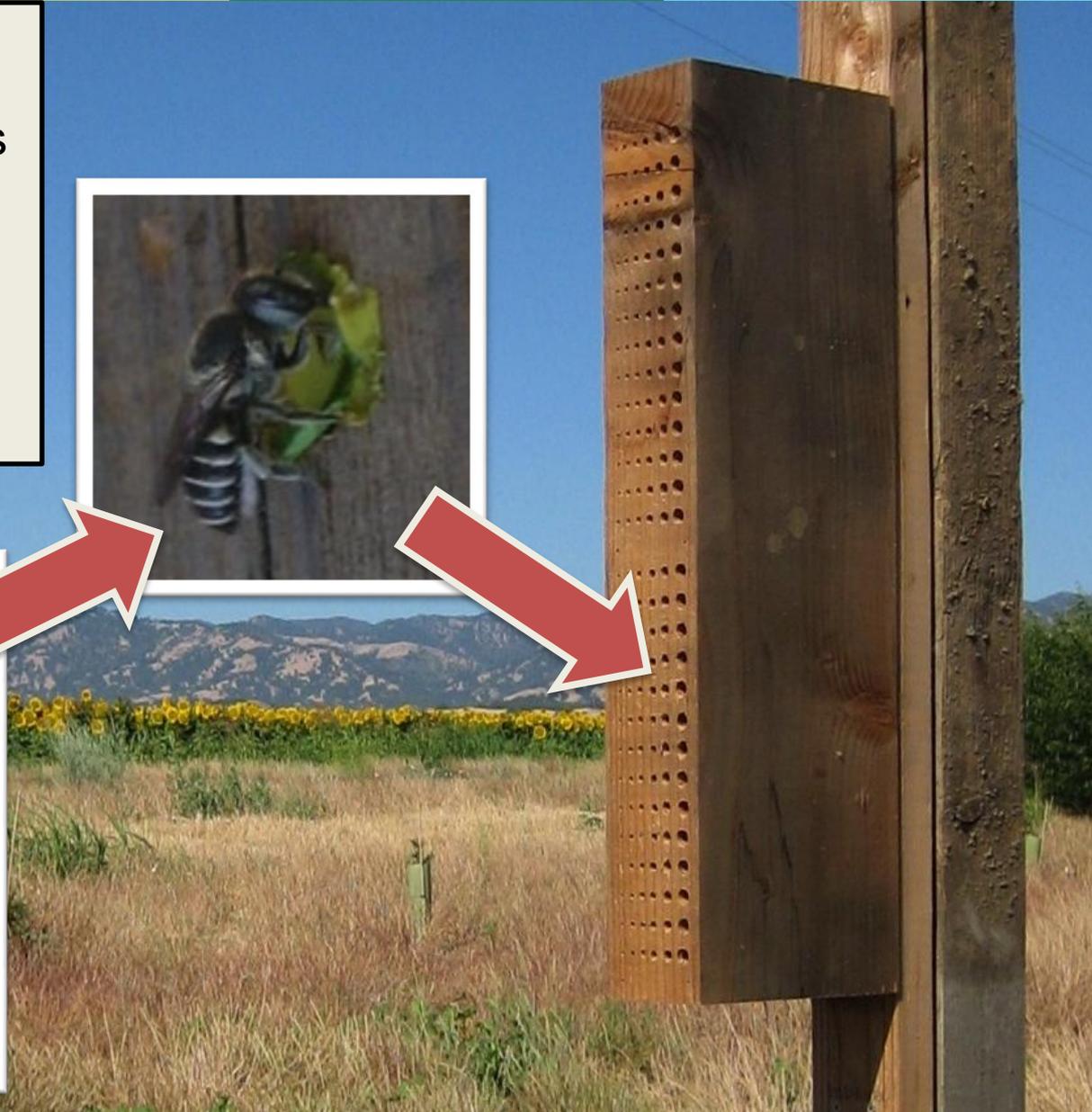
- Sweat Bees
- Sunflower and Squash Bees
- Mining Bees
- Long-Horned Bees



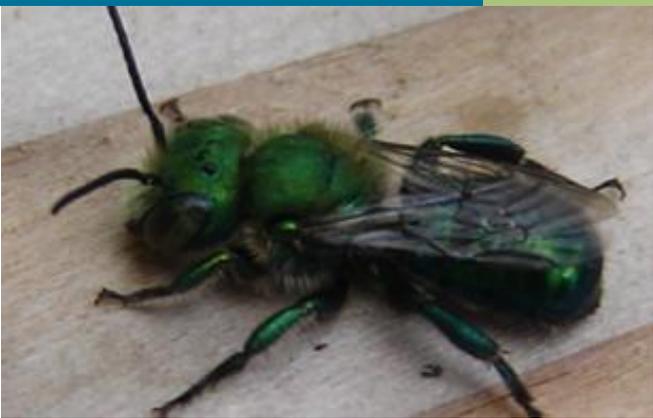
# Three Functional Groups of Native Bees

## Wood-Nesting Bees

- Hollow stems, borer holes
- Nests sealed with mud or leaf pieces
- Leafcutter and mason bees



# Three Functional Groups of Native Bees



## Wood-Nesting Bees

### Cross-section of silk cocoons



Larva

Pupa

Adult

Pollen mass

Egg

Mud wall



Silk cocoons with dormant bees inside

Mud cap closure



## Part 3. Rare and At-Risk Pollinators of NW Washington



Western bumble bee (*Bombus occidentalis*)

# Rare and At-Risk Pollinators of NW Washington

Island marble (*Euchloe ausoindes insulanus*)



Taylor's checkerspot (*Euphydryas editha taylori*)



Mardon skipper (*Polites mardon*)



Western bumble bee (*Bombus occidentalis*)



A vibrant field of pink and blue flowers, likely in a meadow or garden. The pink flowers are the dominant color, with some blue flowers scattered throughout. Several butterflies are visible, including a prominent blue butterfly in the center-left. The background is a soft-focus green, suggesting a wooded area or dense foliage.

## Part 4. Plant Selection for Pollinators

# Plant Selection for Pollinators

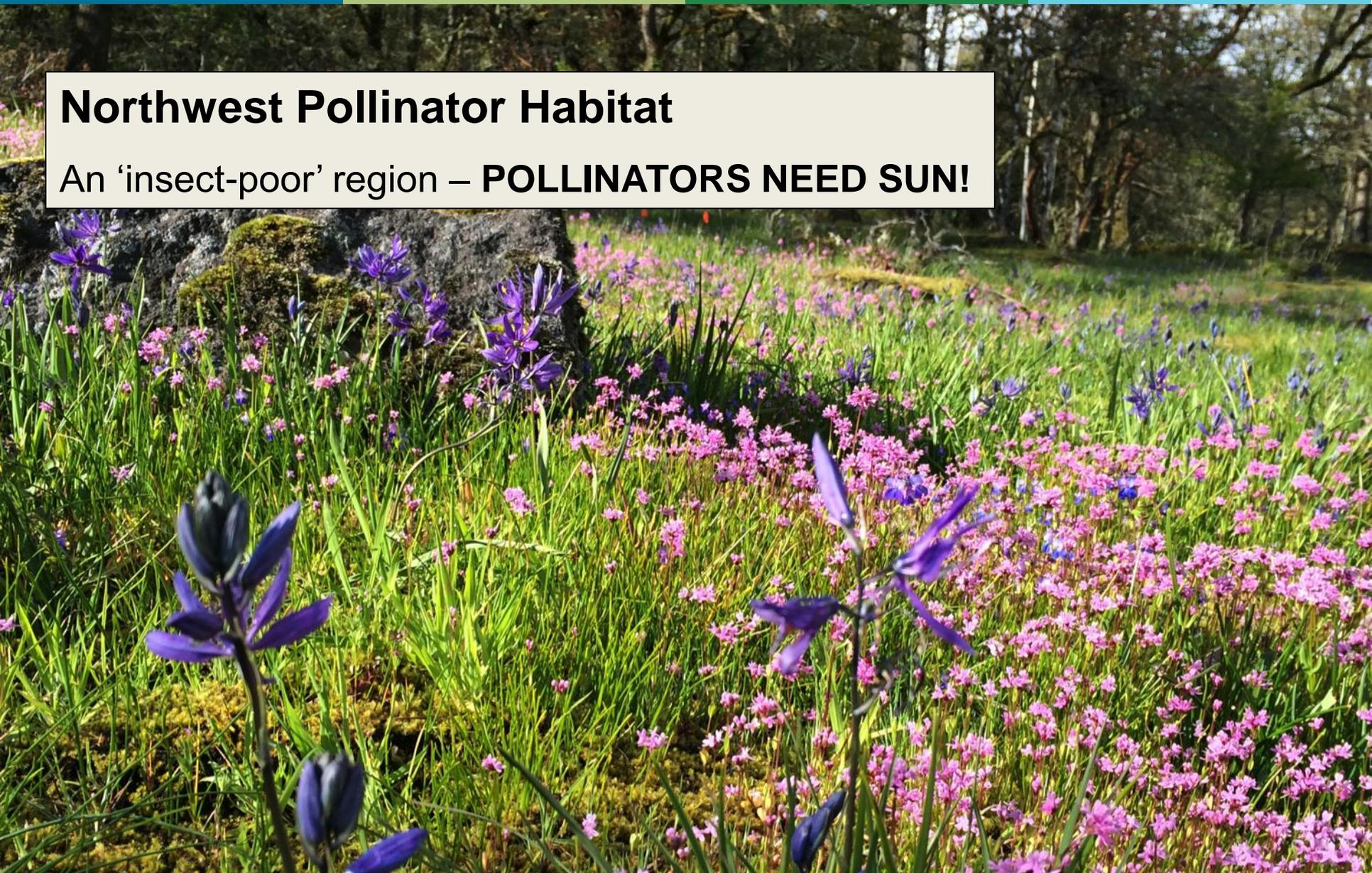


**Pollinators Need Bloom in Spring, Summer, and Fall**



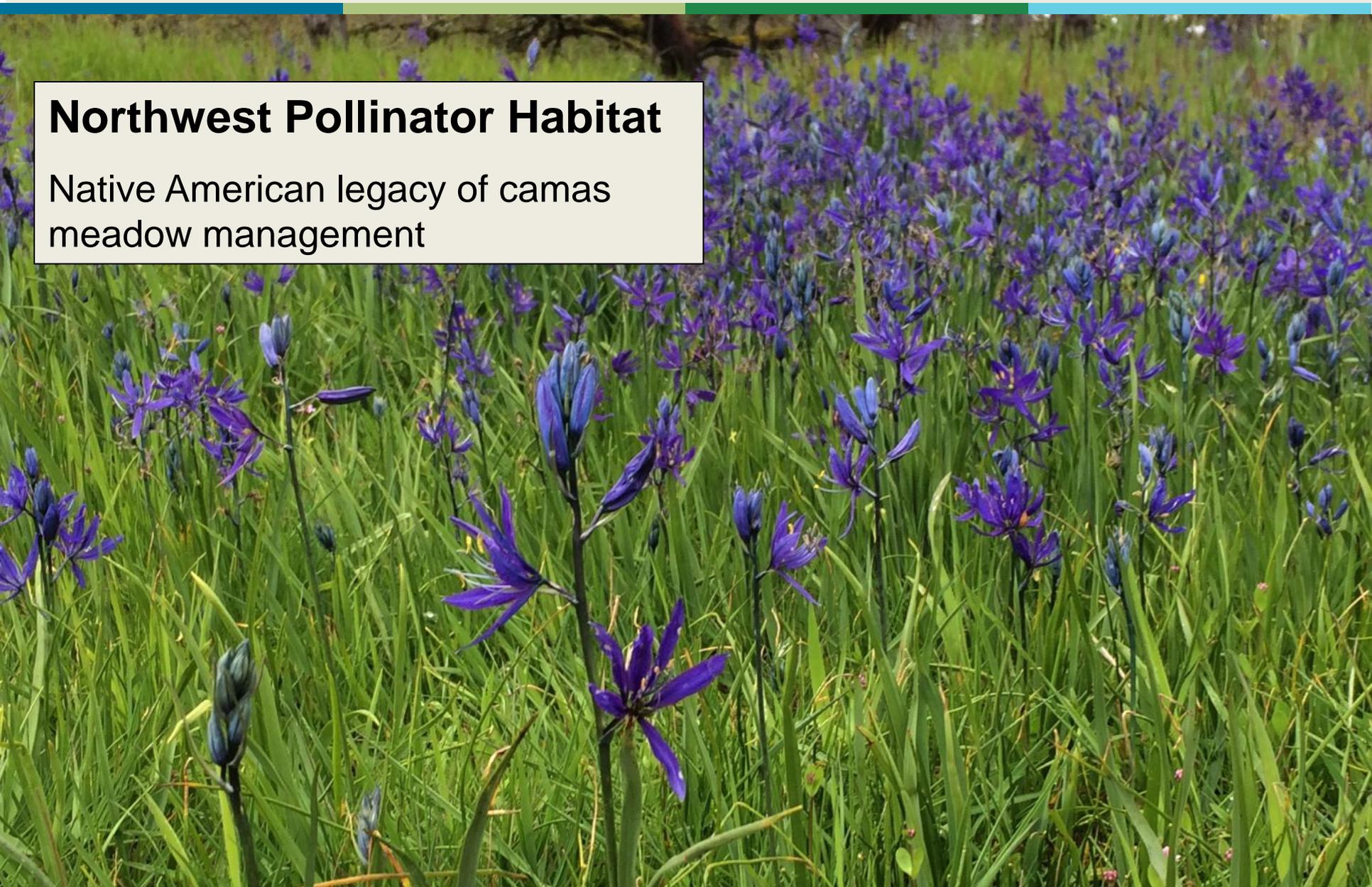
## Northwest Pollinator Habitat

An 'insect-poor' region – **POLLINATORS NEED SUN!**



## Northwest Pollinator Habitat

Native American legacy of camas  
meadow management



# Plant Selection for Pollinators

## Native Northwest Wildflowers

- Lupine
- Fireweed
- Goldenrod
- Native thistles



## Native Northwest Wildflowers

- Gumweed
- Springbank clover
- Tarweed
- Douglas aster



## Native Northwest Wildflowers

- Selfheal
- Camas
- Sea blush



**And don't forget native grasses!**



## Flowering Shrubs for Northwest Hedgerows and Gardens

Willows, Oregon grape, huckleberries, ocean spray, red currant, ninebark, wild rose, snowberry, Pacific crabapple, Douglas hawthorn



### **A Note About Weeds**

Exotic and invasive weeds tend to be associated with “generalist” and non-native pollinators, and...

Non-native pollinators may facilitate the spread of non-native plants.

**European honey bee on  
Himalayan blackberry**



## Part 5. Meadowscaping for Bees!

## Example: Headwaters Urban Farm, Portland Oregon



**May 2013: Newly Cultivated Meadow Area**





**June 2013: Solarization Plastic Installed**



## October 2013: Plastic Removed; Broadcast Seeded



# Meadowscaping for Bees



**May 2014: Initial Wildflower Germination**



## July 2014: Full Wildflower Establishment



# Part 6. Pollinator Conservation in Diverse Landscapes



# Home Pollinator Garden, Clark County, WA



# Pollinator Meadow - Oregon Blueberry Farm



**May 2014**

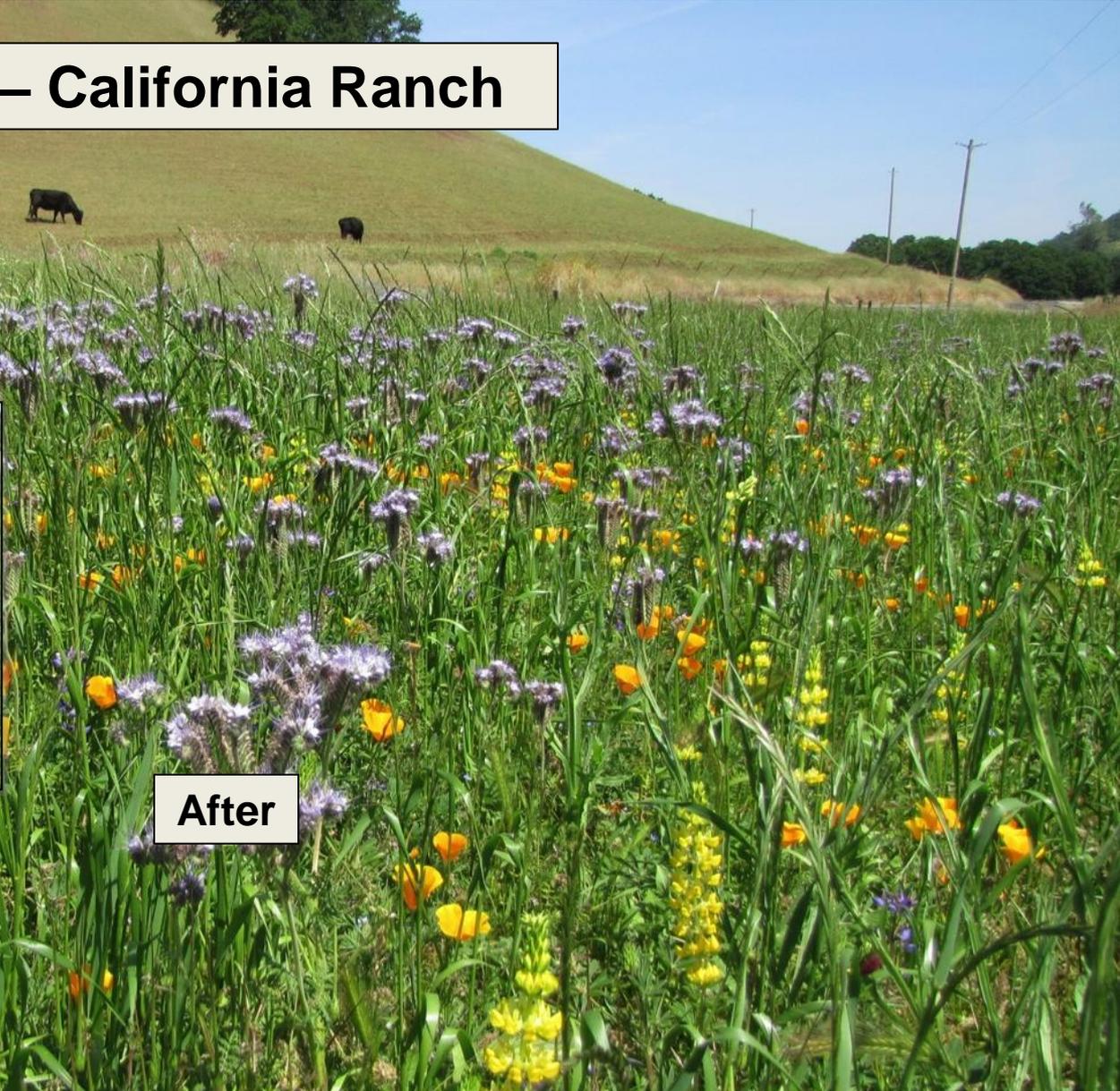
**July 2014**



# Pollinator Meadow – California Ranch



Before



After



## Portland, Oregon Street Bio-Swales

- Run-off filtration in parking medians



Showy Milkweed



**Pollinator Meadow - California**



# Rhode Island Land Trust Pollinator Meadow



## California Almond Orchard Strip Plantings



## Portland International Airport

- 50 acre wildflower meadow restoration



## Part 7. Additional Resources

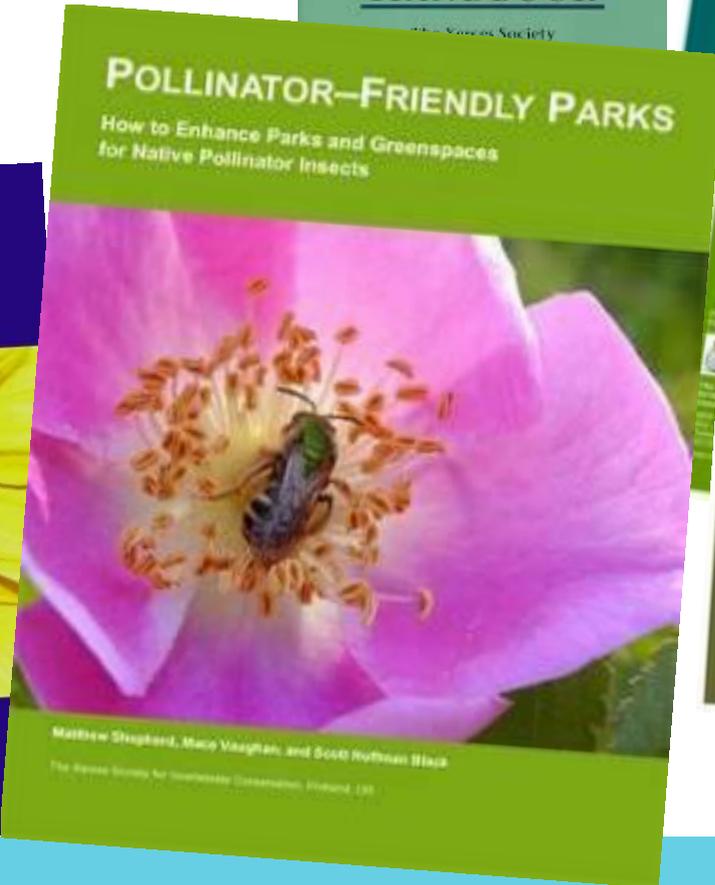
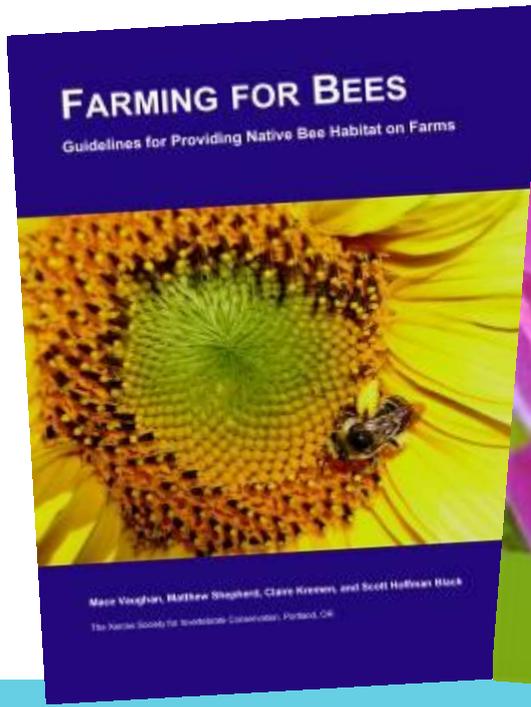
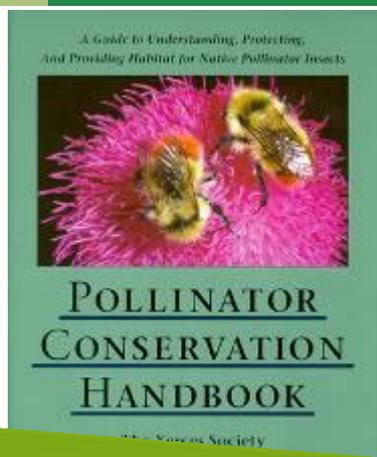


# Additional Resources

## The Xerces Society

- Free downloadable publications
- Conservation advocacy
- Workshops and short courses

[www.xerces.org](http://www.xerces.org)

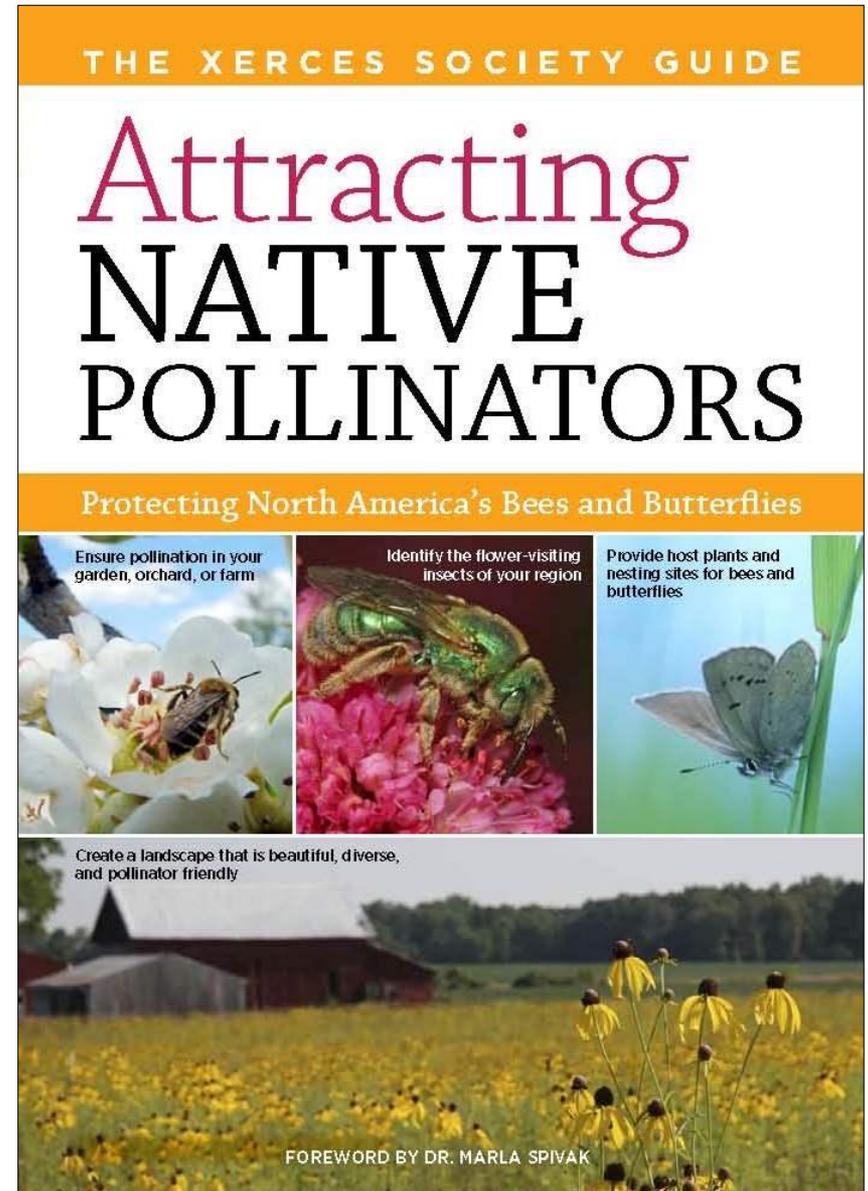


**“*Attracting Native Pollinators* belongs on the bookshelf of everyone who values the future of the natural world.”**

- Douglas W. Tallamy, researcher and author of *Bringing Nature Home*

**“Precise, elegant and thoughtful, the recommendations offered by the Xerces Society will become essential to advancing a healthy and diverse food production system.”**

- Gary Nabhan, author of *The Forgotten Pollinators* and *Renewing America's Food Traditions*



## Pollinator Conservation Resource Center

Information from Xerces and other sources, including:

- Wildflower lists
- Conservation guides
- Bee nest construction guides
- Links to identification guides
- Pesticide guidelines
- Native plant nursery directory

[www.xerces.org/pollinator-resource-center](http://www.xerces.org/pollinator-resource-center)

THE XERCES SOCIETY  
FOR INVERTEBRATE CONSERVATION

about programs publications news invertebrates our work support

### Pollinator Conservation Resource Center

Welcome to the Pollinator Conservation Resource Center, where you can find regional information about plant lists, habitat conservation guides, and more. Scroll over the map below and click on your region of the country. For questions or comments about the Resource Center, or to suggest additional content, please contact [Eric Medler](mailto:Eric.Medler@xerces.org), Xerces Assistant Pollinator Program Director.

[Click here to donate](#)

#### Program Features

- [main page](#)
- [pollinator resource center](#)
- [agriculture](#)
- [organic farming resources](#)
- [managing habitat for pollinators](#)
- [gardens](#)
- [native & self-sown](#)
- [bumble bees in decline](#)
- [red list of bees](#)
- [resources for teachers](#)
- [xerces pollinator publications](#)

#### Program Highlights

- [Online application](#) on pollinator conservation basics in farm landscapes
- The Xerces Society works with congressional staff to include [pollinators in the Farm Bill](#)
- Xerces organizes a [briefing to U.S. legislators](#) on Honeybees, Colony Collapse Disorder and native pollinators
- The National Research Council issues a [report](#) on the Status of Pollinators in North America
- Agriculturally important [bumble bees in decline](#)

This resource center is a collaboration of the Xerces Society and [Neal Williams at the University of California, Davis](#). Significant funding was provided by a grant from NESARE. Additional funding was provided by the USDA Natural Resources Conservation Service, the Columbia Foundation, Turner Foundation, Penix Rhee Foundation, Drancy Wildlife Conservation Fund, CS Fund, Wildwood Foundation, CERES/Greater Milwaukee Foundation, Bullitt Foundation, Organic Valley, Organic Farming Research Foundation, The White Pine Fund/The Hawkspire Foundation, and Xerces Society members.

NORTHEAST SARE UC DAVIS UNIVERSITY OF CALIFORNIA NRCS Natural Resources Conservation Service

The Xerces Society • 4828 SE Hawthorne Blvd., Portland, Oregon 97215 USA • tel 503.333.6639 • fax 503.333.6794 • [info@xerces.org](mailto:info@xerces.org)  
site map • contact • give • contact the webmaster

A vibrant meadow scene featuring a dense carpet of small, light pink flowers. Interspersed among them are several tall, slender green stalks topped with large, six-petaled blue flowers. The background shows a soft-focus expanse of similar pink flowers under bright, natural light.

# Northwest Meadowscares

- True native grass and wildflower seed
- Pollinator, beneficial insect, and wildlife seed mixes
- Specializing in Western WA/OR

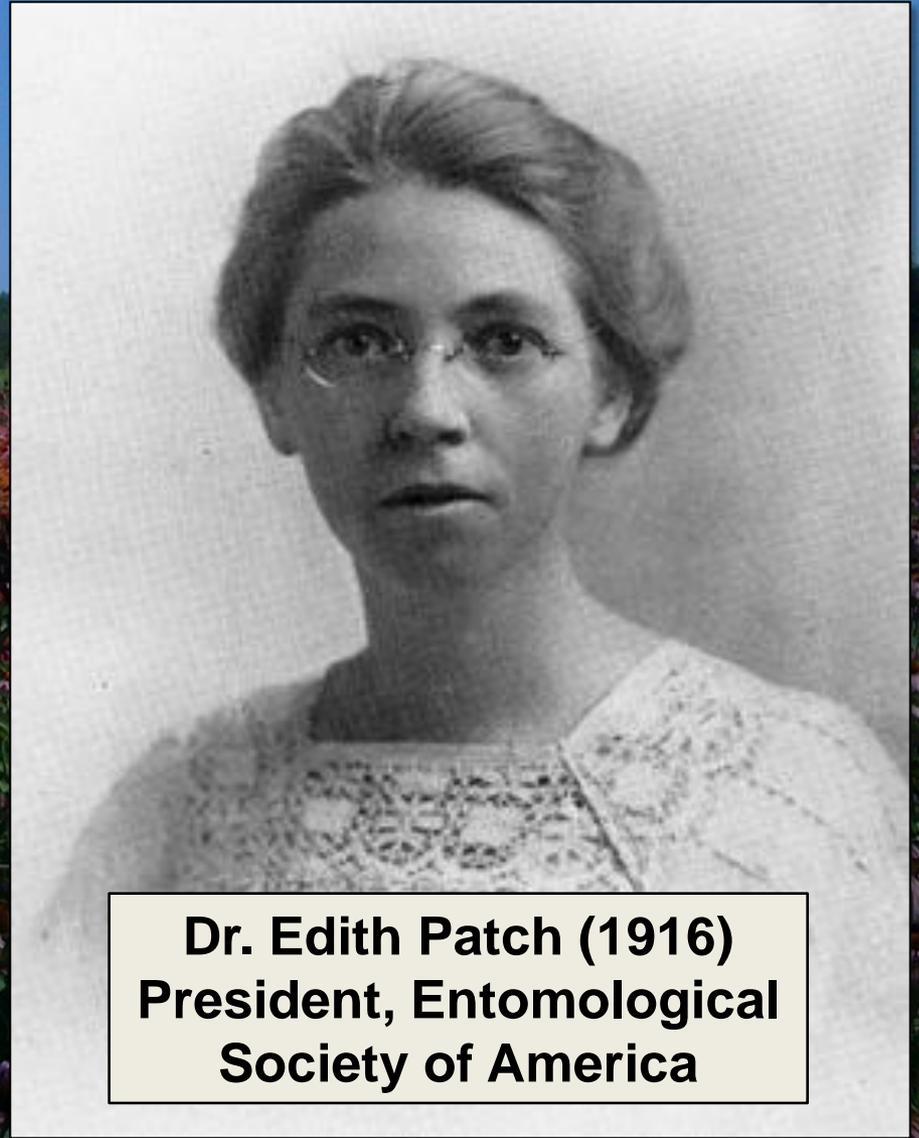
**[www.northwestmeadowscares.com](http://www.northwestmeadowscares.com)**

A photograph of a lush field of wildflowers, including purple coneflowers and white daisy-like flowers, with several monarch butterflies perched on them. The background shows a line of trees and wooden posts. A white rectangular box with black text is centered in the upper half of the image.

# Take Home Message

### **In 1938, Dr. Patch predicted that by the year 2000**

...the President of the United States would issue a proclamation claiming that land areas at regular intervals throughout the U.S. would be maintained as “Insect Gardens,” under the direction of government entomologists. These would be planted with milkweed, hawthorn, and other plants that could sustain populations of butterflies and bees. She predicted that some time in the future, “Entomologists will be as much or more concerned with the conservation and preservation of beneficial insect life as they are now with the destruction of injurious insects.”



**Dr. Edith Patch (1916)  
President, Entomological  
Society of America**

**Thank You!**

[eric@xerces.org](mailto:eric@xerces.org)

**BRING BACK  
— THE —  
POLLINATORS**

*A Xerces Society Conservation Campaign*