

Pollinators and Beneficial Insects in Working Lands

Who are they and what can they do for
me?

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Xerces Society for Invertebrate Conservation



Protecting the life that sustains us.

www.xerces.org
[@xercessociety](https://www.instagram.com/xercessociety)



What Do We Do?

Major Programs

- Pollinator conservation & agricultural biodiversity



Conservation planning, restoration, education, research, & advocacy to protect invertebrates and habitat



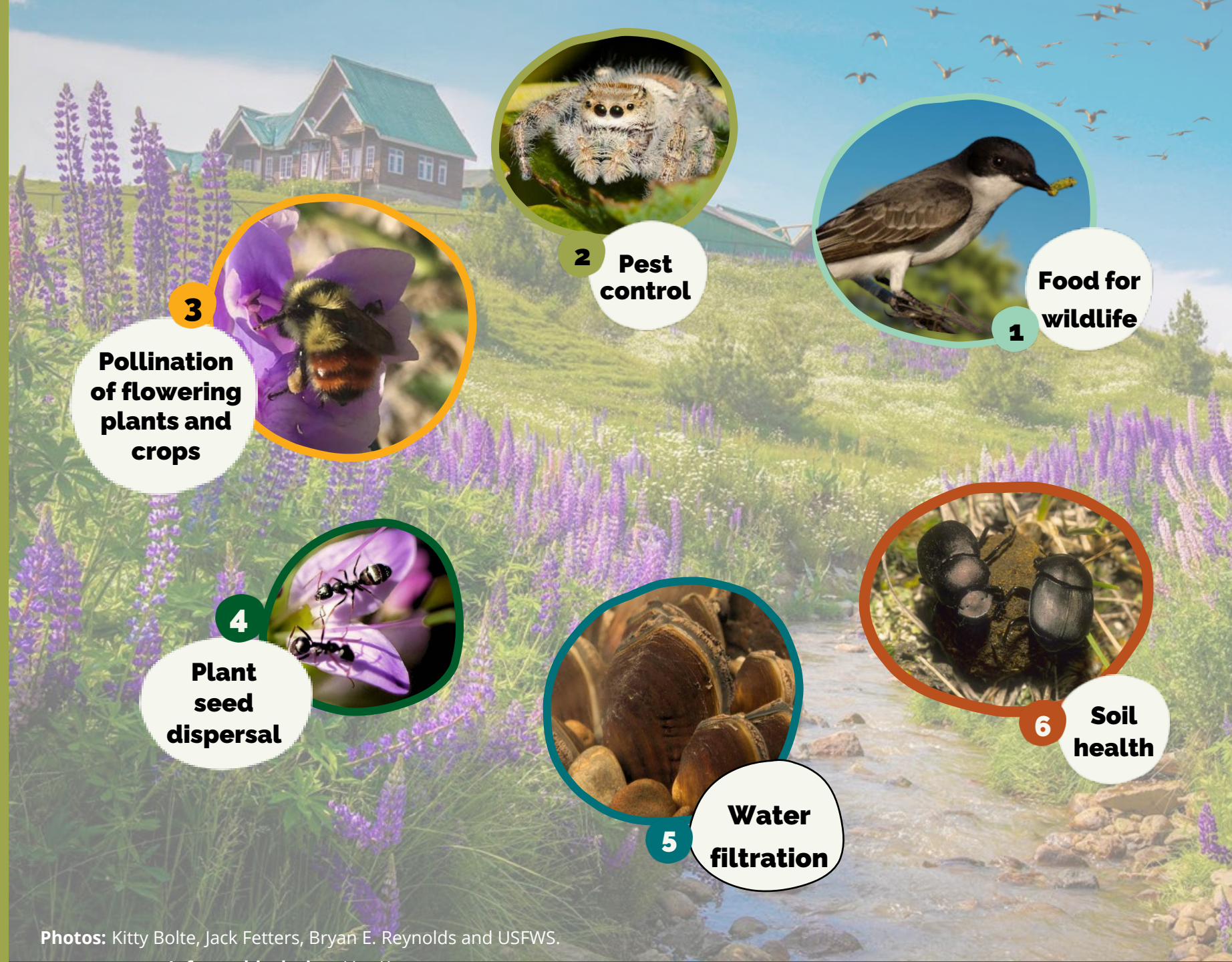
- Pesticide reduction
- Endangered species protection
- Aquatic conservation



Photos: Xerces Society / Sarah Foltz Jordan; Dana Ross; Justin Ross / NRCS

Invertebrates are the heart of a healthy landscape

These often-overlooked animals play crucial and multifaceted roles in maintaining all ecosystems across the globe. All around us, even beneath our feet, they are busy providing an array of ecological services such as:



Photos: Kitty Bolte, Jack Fетters, Bryan E. Reynolds and USFWS.

Pollinators Matter!

85%

of flowering
plants require a
pollinator to move
pollen and
fertilize the flower



Photo: Bryan E. Reynolds

Food Production

1 in 3

mouthfuls of food
and drink we
consume

>\$30
billion

value of crops in
North America



Photo: Pixabay

Conservation Biocontrol (CBC)

- Providing habitat for naturally occurring beneficial insects who help control pest populations.
- Only a small fraction of insects are pests (~2%)



Conservation Biocontrol (CBC)

Natural Enemy Groups

- ★ Insect predators
- ★ Insect parasitoids
- ★ Non-insect predators
- ★ Pathogens



Photos: Sarah Foltz Jordan, John Robertson, Sara Morris, Thelma Heidel-Baker, Katja Schulz, Mario Ambrosino, David Cappaert

Conservation Biocontrol (CBC)

The estimated value of pest control by wild beneficial insects is \$4.5–12 billion annually for U.S. crops, and \$100 billion worldwide.

Losey & Vaughan. 2006. BioScience:47 (11)



Photo: Parasitoid wasp attacking a mottled tortoise beetle, by © Margy Green / www.margygreen.com

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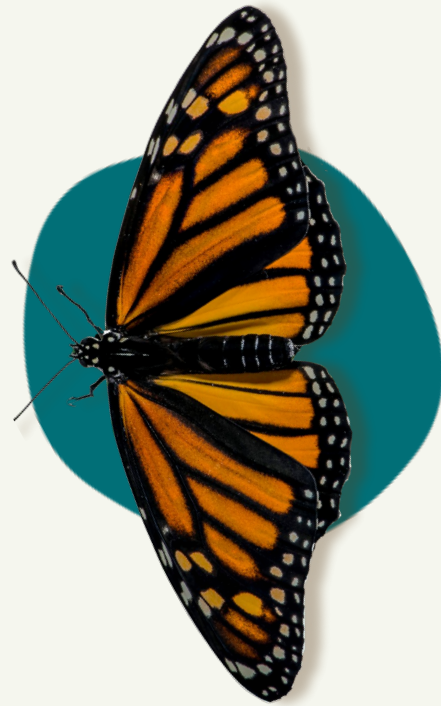


Photo: Parasitoid wasp attacking a mottled tortoise beetle, by © Margy Green / www.margygreen.com

The Decline of Insects

Butterflies and moths (Order Lepidoptera)

Populations of the iconic and culturally significant monarch butterfly have declined by **over 70%** since the 1980s.

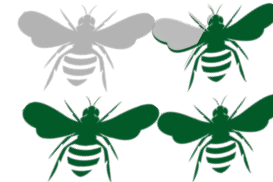


Bees (Order Hymenoptera)

Bumble bees' buzz pollination makes them better pollinators of some crops than honey bees.

Over 1 in 4 (28%)

North American bumble bee species face some degree of extinction risk.



Key Threats to Pollinators

Habitat degradation & fragmentation

- Development
- Invasive plant species
- Monoculture agriculture
- Biodiversity loss

Synergistic with other threats

- Pesticide toxicity
- Pathogens & diseases
- Climate change



Agricultural Management Can Make a Difference!

Photo: Alina (Harris) Cypher



Habitat for Conservation Biocontrol

If more than 20% of a farm is diverse habitat, pest control by beneficial insects is observed throughout fields.

(Tscharntke et al. 2002)



Habitat for Conservation Biocontrol

- **Food**
 - Pollen, nectar, alternate prey
- **Shelter**
 - Overwintering, egg-laying
- **Protection**
 - Pesticides, disturbance

Photo: Catherine Coverdale / Xerces Society



Habitat Provides Alternate Food Source

- Address gaps in diet when crop pests are absent
- Keeps beneficials in the crop area

Lady beetle larva eating oleander aphids (not a crop pest) on milkweed



Photo: Alex Wild

Habitat for Conservation Biocontrol

★ Native Trees and Shrubs



Habitat for Conservation Biocontrol

★ What are your favorite perennials (trees, shrubs, forbs) for beneficial insects?

Trees



Shrubs



Forbs



Habitat for Conservation Biocontrol

★ Insectary Strips and Blocks



Habitat for Conservation Biocontrol

**12% higher
blueberry
yields
adjacent to
wildflower
plantings.**

Dr. Rufus Isaacs and Brett Blauw,
Michigan State University

Photo: Brett Blauw



Habitat for Conservation Biocontrol

Native perennials

- ★ Season-long bloom
- ★ Three blooms per season
- ★ Ideally, at least one grass species

Spring



Lupine, Manzanita,
Ceanothus

Photo: Nancy Lee Adamson

Summer



Milkweed, Yarrow, Phacelia,
Sage, Penstemon

Photo: Kelly Gill

Fall



Asters, goldenrod

Photos: Catherine Covendale



Coyotebrush

Habitat for Conservation Biocontrol

★ Cover Crops/Intercropping



Habitat for Conservation Biocontrol

★ Bolting Crops



Xerces-NRCS Conservation Partnership

- Joint Staff Biologist positions with USDA NRCS
- Technical assistance for Farm Bill programs
- Developing / enhancing on-farm pollinator habitat
- Financial support for conservation
- Find out more at:
www.nrcs.usda.gov



Xerces-NRCS Partner Biologists (+ Support)

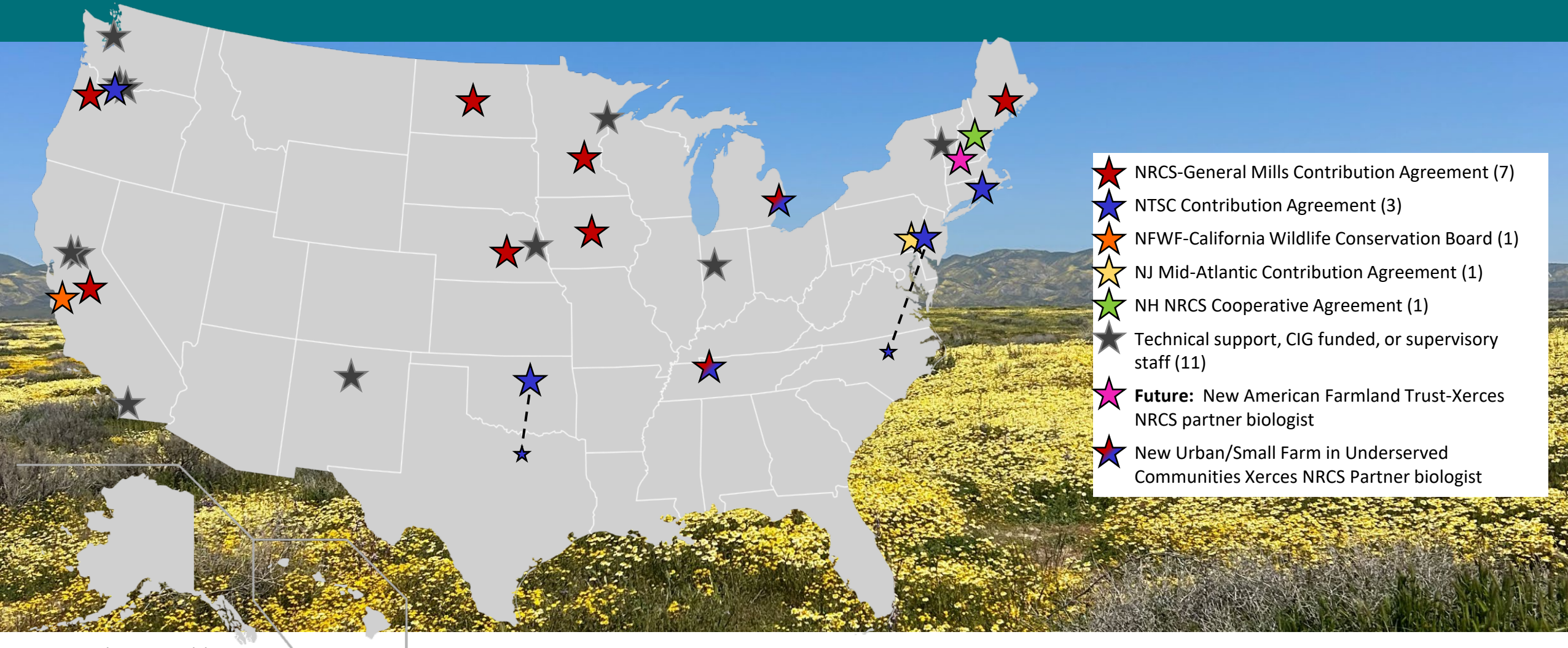


Photo: Maddy Kangas

Habitat Kit Program

- California
 - New overwintering site & Southern California residential kits
- Oregon
- Washington (new!)
- New Mexico
- Wisconsin
- Detroit, MI
- Mid-Atlantic

Learn more at
xerces.org/habitat-kits



Online Resources



Join the Movement

The work we do depends on everyone. Make a difference for the invertebrates that you love by becoming a Xerces member today!

xerces.org/donate

Xerces Society is a 501(c)(3) nonprofit and contributions are tax-deductible.



Photo by Bob Danziger

Thank You!

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Photo: Maddy Kangas

