How Your Yard Can Support Pollinators and Other Insects

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for Invertebrate Conservation

The Xerces Society

Major conservation programs:

- Habitat creation and preservation
- Pesticide reduction
- Endangered species study and protection
- Community science and outreach

Photo: Kitty Bolte

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Photos: Kitty Bolte, Jack Fetters, Bryan E. Reynolds and USFWS. **Infographic design:** Lisa Korpos

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:

1 Food for wildlife

Invertebrates form a crucial base of the food web, serving as food for other animals including birds, mammals, fish, and reptiles. Without this foundation, our world's food chains would collapse.

2 Biological pest control

Predatory insects like jumping spiders feed on harmful pests, and small wasps lay their egg in pest insects, controlling their populations.

3 Pollination

Bees, butterflies, moths and other insect pollinators are necessary for the reproduction of over 85% of wild plants. Agriculture also depends on insect pollinators. More than two-thirds of the world's crop species, from apples to strawberries, rely upon insect pollination.

4 Plant seed dispersal

Ants bury plant seeds in their nests, leaving them to germinate underground. This aids in plant reproduction and dispersal worldwide.

5 Water filtration

Hidden below the water's surface are mussels—the filter-feeding powerhouses that clean our rivers and lakes. These creatures remove sediment, impurities, bacteria, and heavy metals from water as they feed. A single mussel can filter between ten and twenty gallons of water per day!

6 Decomposition and soil health

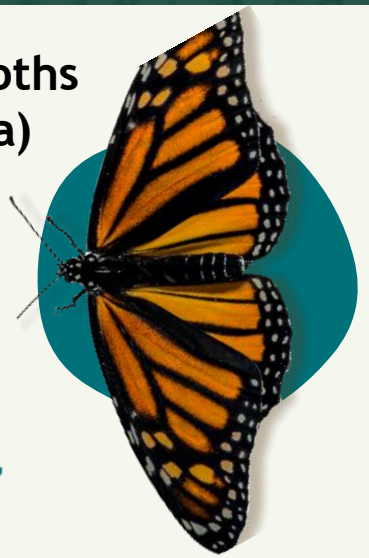
Invertebrates like dung beetles break down waste and dead organisms, releasing nutrients back into the soil. By consuming and processing organic matter, they facilitate the movement of nutrients through the ecosystem. Their tunneling also helps aerate the soil and improve water drainage.

The Decline of Insects

Insects, the vital animals at the base of our world's food webs and ecosystems, are experiencing a crisis. Studies show that insect populations are declining at an alarming rate, with annual decline at 1 to 2%. A 2% annual decline is approximately a 30% decline over 20 years.[1] Pollinators, especially, are in trouble. According to an assessment commissioned by the United Nations, over 40% of insect pollinator species like bees and butterflies may be facing extinction.[2] This rapid loss means we do not have much time to act to protect these animals.

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.[3]

Beetles (Order Coleoptera)

The glow of a cherished beetle, the firefly, is in danger of going out.

1 in 3 firefly species assessed in North American are at risk of extinction. Over 50% are still data deficient.

Dragonflies (Order Odonata)

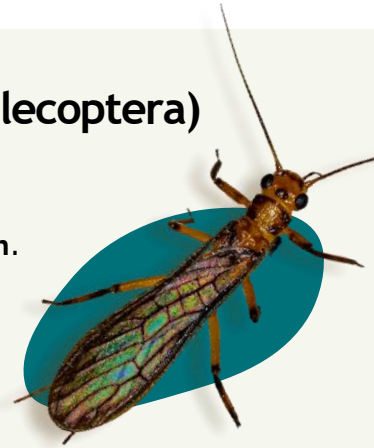
These guardians of our waterways consume mosquitoes and other insect pests.

1 in 6 (16%) dragonfly and damselfly species are threatened with extinction.[4]

Stoneflies (Order Plecoptera)

Stoneflies and other aquatic insects are a vital food source for fish.

Over 43% of stoneflies are at risk of extinction in the United States.[5]



Sources Cited:

1 Insect decline in the Anthropocene: Death by a thousand cuts. David L. Wagner, Eliza M. Grames, Matthew L. Forister, May Berenbaum, and David Stopak. 2021. *Proceedings of the Natural Academy of Sciences*. 118: 1-10.

2 Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). United Nations assessment. 2016.

3 Declines in insect abundance and diversity: We know enough to act now. Matthew L. Forister, Emma M. Pelton, Scott H. Black. *Conservation Science and Practice*. 2019.

4 "Dragonflies threatened as wetlands around the world disappear." IUCN Red List. Press Release. 2021.

5 *Precious Heritage: The Status of Biodiversity in the United States*. Bruce A. Stein, Lynn S. Kutner, and Jonathan S. Adams, editors. The Nature Conservancy, NatureServe. 2000.

Photo credit: US Forest Service, Kellie Hayden, Richard Joyce, Big Cypress National Preserve, Vinicius Rodrigues de Souza, and Candace Fallon.
Infographic design by Lisa Korpos.

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Living Farms

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Photos: Michael Trier and Kitty Bolte

What do pollinators and other insects need?

- Food
- Shelter
- Protection from Pesticides

Photo: Jennifer Hopwood

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Food

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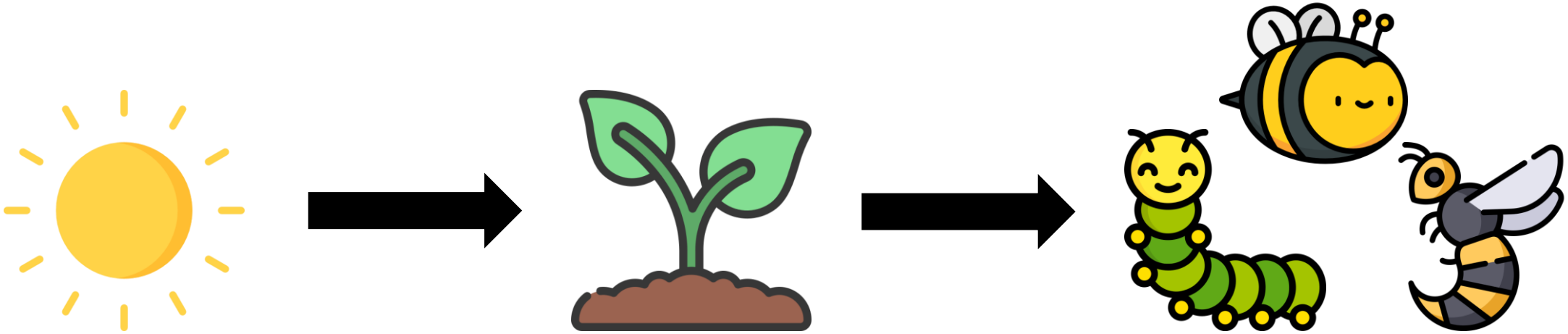

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The plants we choose matter

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Coevolution

millions of years...

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90% of moth and butterfly caterpillars can only feed on native plants

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Birds and ~~Bees~~ Caterpillars

6,000-9,000 caterpillars per chickadee brood from hatching to fledging.

About 500 caterpillars per day.

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Keystone Species

Learn more here

FLOWERS AND GRASSES

strawberry
Fragaria
Rosales

SAVE 64

lupine
Lupinus
Fabales

SAVE 59

goldenrod
Solidago
Asterales

sagebrush, wormwood
Artemisia
Asterales

sunflower
Helianthus
Asterales

SAVE 44

deer vetch, trefoil
Lotus
Fabales

SAVE 28

butterweed, ragwort
Senecio
Asterales

milkvetch
Astragalus
Fabales

TREES AND SHRUBS

SAVE 339

willow
Salix
Salicales

SAVE 269

beach plum, cherry, chokecherr ...
Prunus
Rosales

SAVE 242

aspen, cottonwood, poplar
Populus
Salicales

alder
Alnus
Fagales

birch
Betula
Fagales

SAVE 209

pine
Pinus
Pinales

SAVE 181

crabapple, apple
Malus
Rosales

cranberry, blueberry
Vaccinium
Ericales

How about the bees?

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Over 600 species in Washington

Polylectic (Generalist)

Oligolectic

Monolectic

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Other insects

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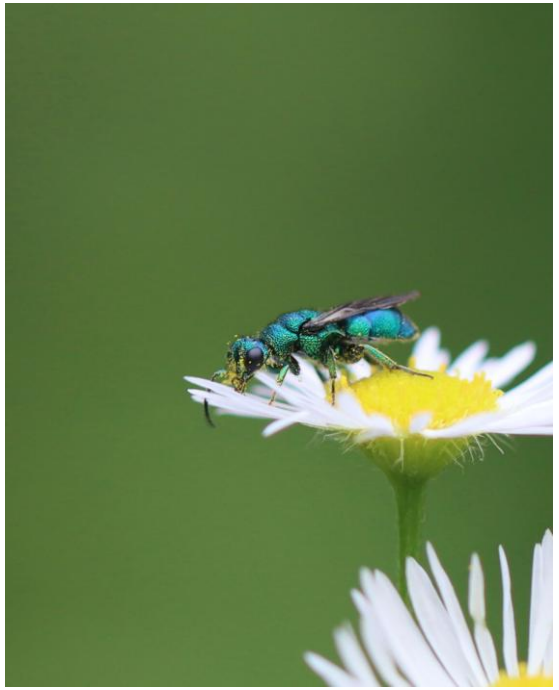

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What should you do?

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#1: Plant Native Plants

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Best pollinator/insect plants

Inland NW Native Plant List

- **Willows** (*Salix* species)
  - Coyote Willow (*Salix exigua*)
  - Scouler's Willow (*Salix scouleriana*)
- **Chokecherry** (*Prunus virginiana*)
- **Lupines** (*Lupinus* species)
  - Bigleaf Lupine (*Lupinus polyphyllus*)
  - Silky Lupine (*Lupinus sericeus*)
- **Goldenrods** (*Solidago* species)
  - Cascade Canada Goldenrod (*Solidago elongate*)
  - Western Canada Goldenrod (*Solidago lepida*)
  - Missouri Goldenrod (*Solidago missouriensis*)
- **Sagebrush** (*Artemisia tridentata*)
- **GRASSES!**
  - Idaho Fescue (*Festuca idahoensis*)
  - Basin Wildrye (*Leymus cinereus*)
  - Bluebunch Wheatgrass (*Pseudoroegneria spicata*)

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#2: Reduce or Eliminate Pesticides

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#3: Provide nesting sites and other habitat

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Leave the Leaves

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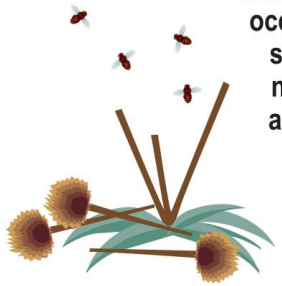
How to Create Habitat for Stem-nesting Bees

WINTER

Leave dead flower stalks in-tact over the winter.

SPRING

Cut back dead flower stalks leaving stem stubble of varying height, 8 to 24 inches, to provide nest cavities.

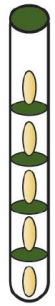


Female bees find cut or naturally-occurring open stems, start a nest, then lay an egg on the pollen balls. Larvae eat the pollen.

SUMMER

New growth of the perennial hides the stem stubble.

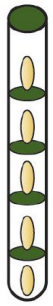
Bee larvae develop in cut dead stems during the growing season.



FALL

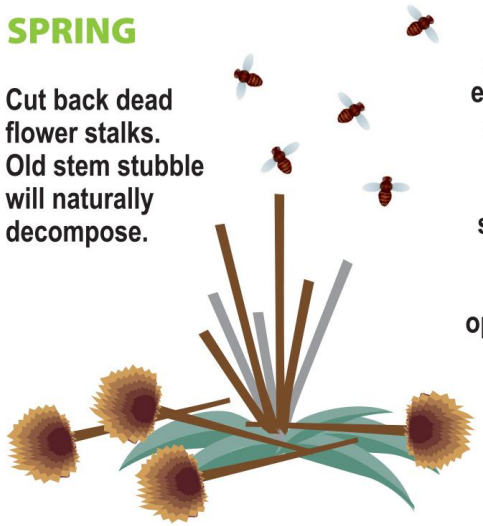
WINTER

Bees hibernate in stems during the winter.



SPRING

Cut back dead flower stalks. Old stem stubble will naturally decompose.



Adult bees emerge and start nests in newly cut dead stems or in naturally-occurring open stems.

Graphics and content: Colleen Satyshur, Elaine Evans, Heather Holm, Sarah Foltz-Jordan

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Bare Ground

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Washington Habitat Kit Program

Supporting Pollinator Habitat Projects

- Provides native pollinator plants, technical guidance, & resources
- Partners provide site, labor, and stewardship
- **Location:** Eastern Cascades foothills of WA
- **Special kit features**: Supports at-risk bumble bees and other native pollinators

Interested in participating?

Proposal period: Feb-April

xerces.org/pollinator-conservation/habitat-kits

Photo: Molly Martin

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/join

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

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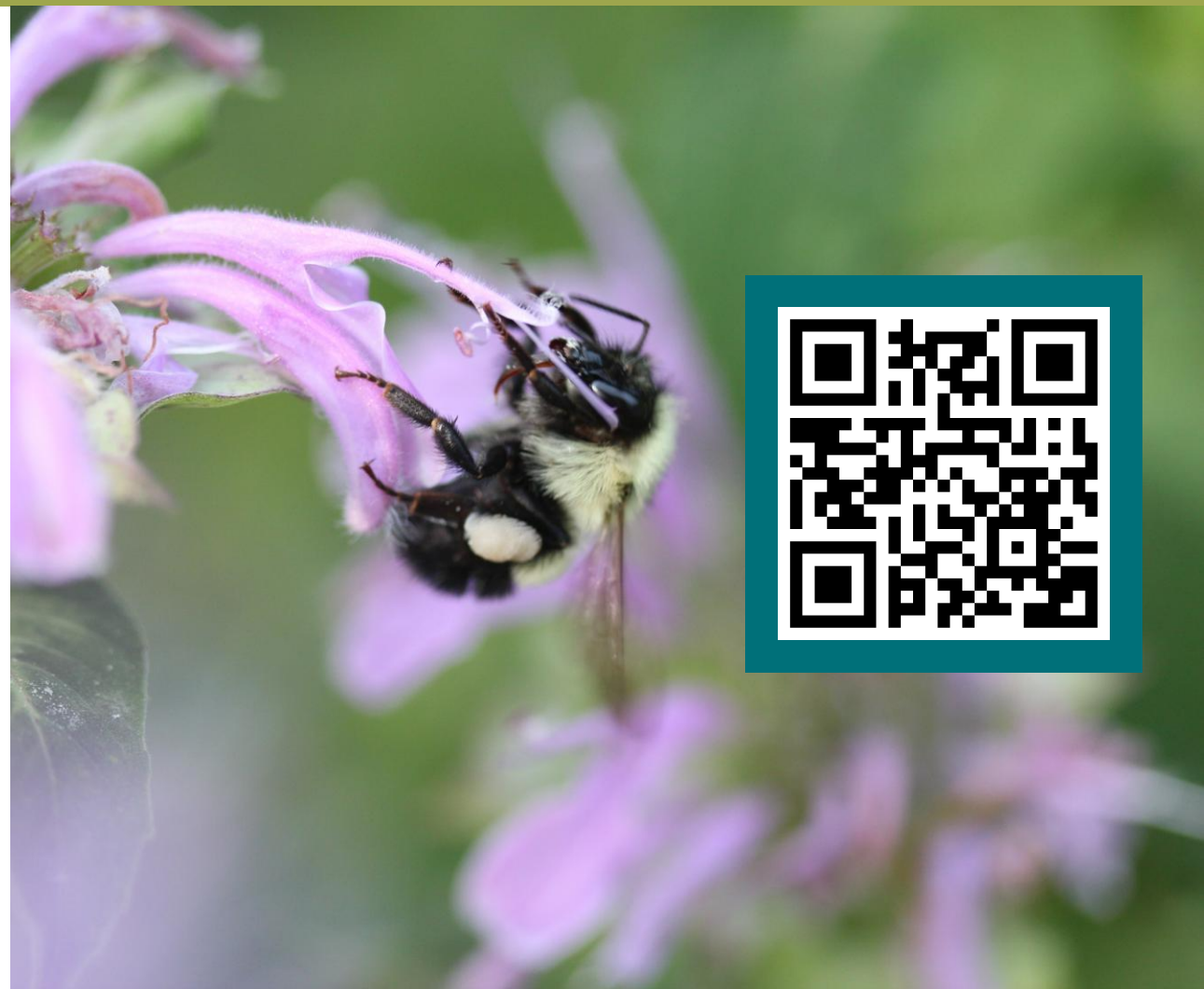

Half-black bumble bee (*Bombus vagans*) foraging from wild bergamot (*Monarda fistulosa*) flower. (Photo: Genevieve Pugesek / Xerces Society.)