Bring Back the Pollinators

Jennifer Flitton Adams

Xerces Ambassador
The Xerces Society for Invertebrate Conservation

Photo Credit: Sarah Hamilton Buxton/Xerces Society

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The Xerces Society

Named for the Xerces blue butterfly

Last seen flying in 1943

The Xerces Society for Invertebrate Conservation is an international nonprofit organization that protects the natural world through the conservation of invertebrates and their habitats

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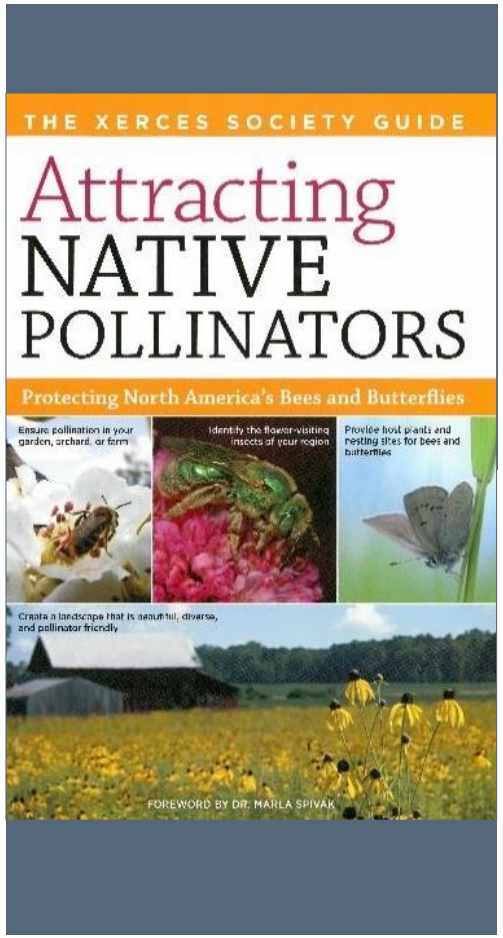
Protecting the Life That Sustains Us

- Conservation
- Advocacy
- Research
- Education



Photos: Paul Jepson; Dick Dewey; Xerces Society/Brianna Borders

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Thank You to Xerces' Partners

We don't work in isolation—the Xerces family is large and diverse

- Over 17,000 Xerces Society members in 15+ countries.
- Scores of private foundations that provide funding.
- More than 100 scientists at universities around the world.
- Dozens of federal, state, and local agencies.
- Hundreds of farmers and land managers that have worked with us on habitat projects.
- Over 50 companies supporting us.
- Thousands of people who act to protect invertebrates in their neighborhoods.

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Why Care About Pollinators?

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Photo: Clay Bolt

Pollination 101

Photo: Sarah Greenleaf

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Plant Reproduction

85%

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

Photo: Obscure skipper (Bryan E. Reynolds)

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Food Production

1 in 3

mouthfuls of food and drink we consume

>$30 billion

value of crops in North America

Photo: Pixabay

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Importance of Pollinators

Photo: Whole Foods Market

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Photo: Whole Foods Market

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Support Other Wildlife

Pollinators are at the center of complex food webs.

They enable the fruits and seeds that make up a major part of the diet of many animals.

And sometimes they are the food themselves.

Photos: Wildreturn, Flickr; Colleen Prieto, Flickr; U.S. Forest Service; kansasphoto, Flickr.

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Enrich our Lives, Define our Seasons

Springtime flowers

Summer berry picking

Halloween scares

Thanksgiving pie

Photo: Matthew Shepherd

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Pollinator Diversity

Photo: Mace Vaughan

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Main Groups of Pollinators

Photos: Bryan E. Reynolds (3); Matthew Shepherd; Xerces Society/Sarah Foltz Jordan; Xerces Society/Mace Vaughan

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Bees are the Most Important

Three distinct behaviors:

- Collect and transport pollen
- Forage in area around nest
- Exhibit flower constancy

Photo: Mace Vaughan

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Pollen Transport

Moist as a lump in a pollen basket (“corbicula”) on the rear legs

Dry between hairs of a pollen brush (“scopa”) on the rear legs, underside of abdomen, or rear of thorax

Photos: Rollin Coville

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Honey Bees are Not Typical Bees

Photo: Robert W. Matthews, University of Georgia; Bugwood.org

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Honey bees

European honey bee is hugely important for crop pollination

Beekeeping industry is afflicted by diseases, pests, insecticides, nutrition, and low honey prices

Honey bees are not endangered

- 2.9 million hives in US in 2022

Photo: Xerces Society / Matthew Shepherd

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Bee vs. Wasp

Bees: hairier; pollen carrying structure.

Wasps: few hairs; no pollen carrying structure; wings may fold lengthways

Photos: Bryan E. Reynolds; Whitney Cranshaw, CSU, Bugwood.org

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Bee vs. Fly

Bee: long, elbowed antenna; eyes on side of head; pollen carrying structure; two pairs of wings

Fly: tiny antenna; large eyes; no pollen carrying structure; one pair of wings

Photos: Bryan E. Reynolds

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Native Bees

- Most are solitary
- Gentle
- Unlikely to sting

Photo: Rollin Coville

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Bee Diversity

Number of species

USA & Canada	Oregon	Portland	In a single garden
3,600	600–800?	80–100?	20–30

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Native Bee Diversity

Photo: Stephen Buchmann

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Native Bee Diversity

Photo: Metallic green sweat bee (*Agapostemon* sp.), by Clay Bolt

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Native Bee Diversity

Photo: Cuckoo bee (*Holcopasites calliopsidis*), by Clay Bolt

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Native Bee Diversity

Photo: Long-horned bee (*Svastra aegis*), by Clay Bolt

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Native Bee Diversity

Photo: Fuzzy-legged leafcutter bee (*Megachile melanophaea*) male, by Clay Bolt

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Native Bee Diversity

Photo: Nocturnal bee (*Megalopta genalis*), by Ajay Nanendra

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Native Bee Diversity

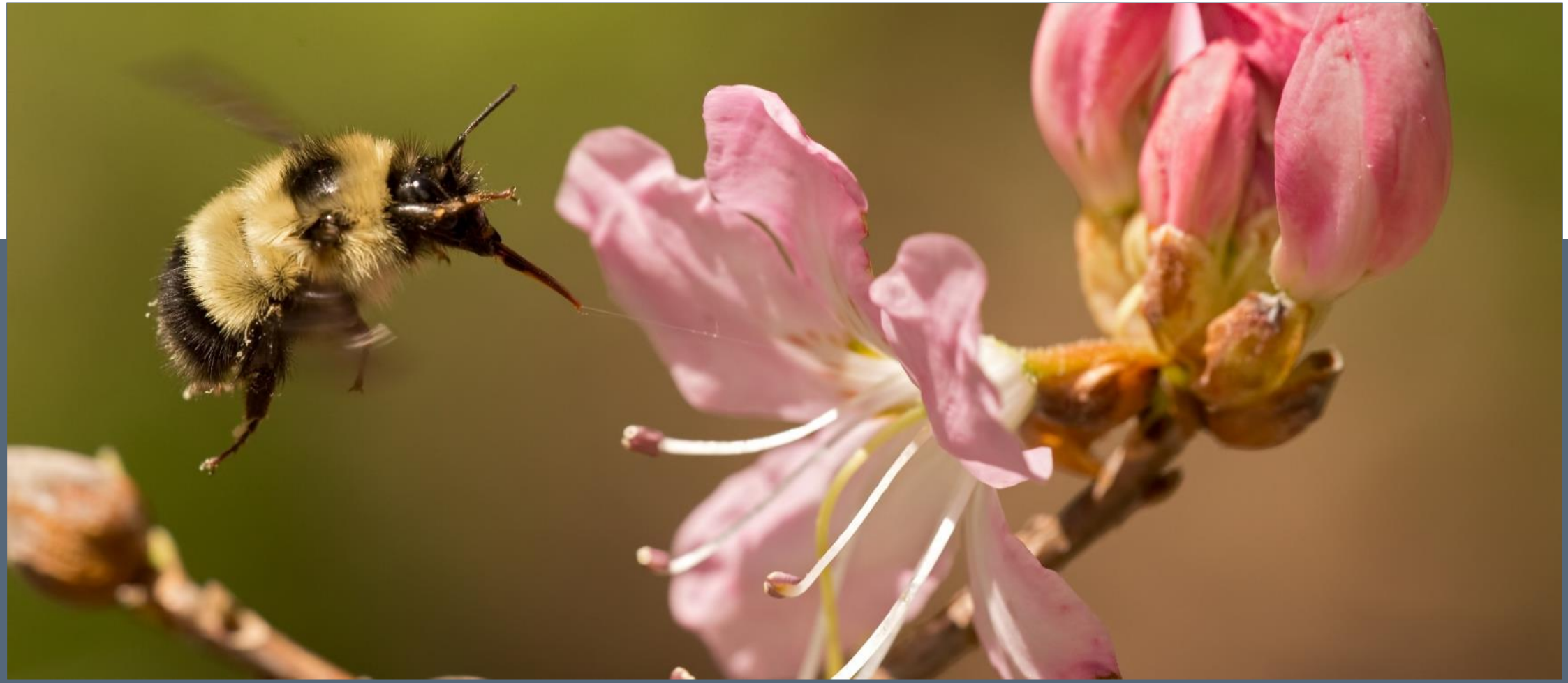

Photo: Sanderson's bumble bee (*Bombus sandersoni*), by Clay Bolt

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Natural History

Photo: Rollin Coville

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Solitary Bee Life Cycle

Up to a year to develop before emerging to spend a few weeks as an adult.

Mining bee

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Photos: Xerces Society/Mace Vaughan; Dennis Briggs (3); Robbin Thorp.

Bee Needs: Access to Soil

Roughly 70% of native bee species are ground-nesting

- Resemble ant-nests from above ground
- Conserve sandy soil, bare ground

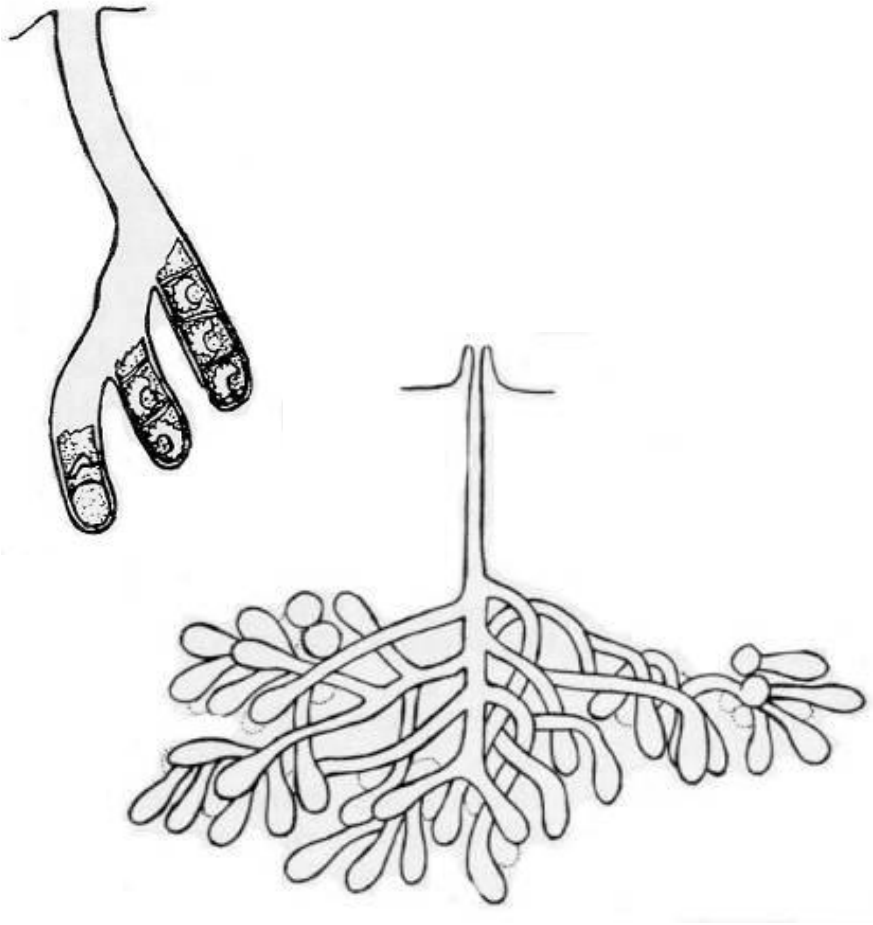

Photo: Xerces Society/Matthew Shepherd.
Drawings from Stephen, Bohart, and Torchio, 1967

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Bee Needs: Dead Trees and Branches

Roughly 30% of native bee species are tunnel-nesting

- Keep dead trees
- Don’t trim all dead twigs and branches

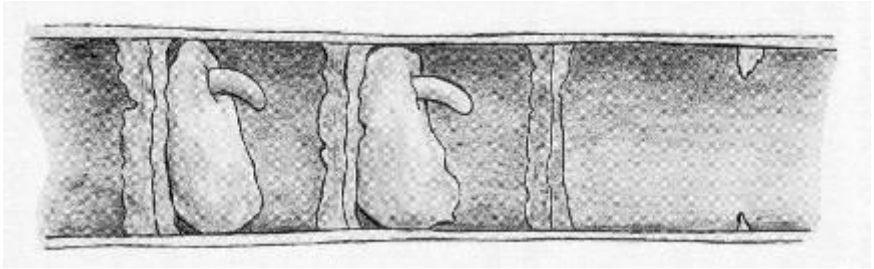

Photo: Xerces Society/Matthew Shepherd.
Drawings from Stephen, Bohart, and Torchio, 1967

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Bee Needs: Nest Materials

Some species collect leaf pieces, resin, soil, etc. for constructing nest cells

Photo: Clay Bolt

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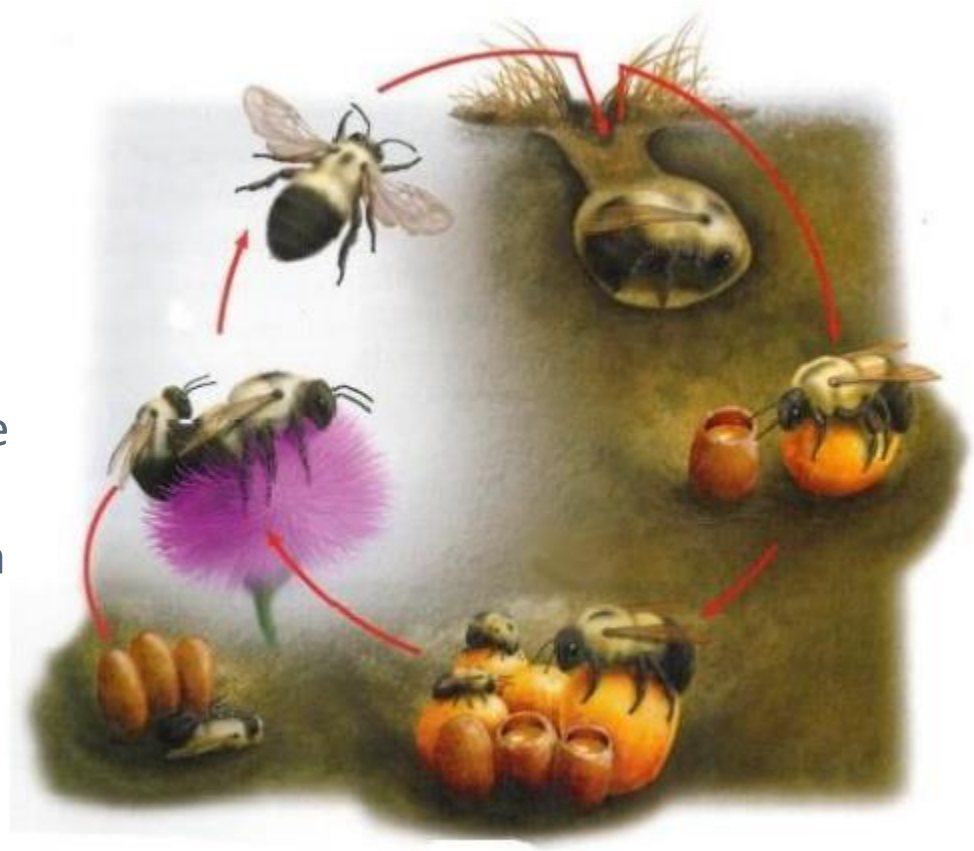
Bumble Bee Life Cycle

Winter: Hibernating queen

Fall: Mated queens seek overwintering sites, founding queen dies

Spring: Queen establishes nest and lays eggs



Early Fall: Males leave nest, then new queens leave to find a mate

Early Summer: Worker females help grow the colony

After mating, males die

Summer: Colony peak

Illustration: David Wysotski

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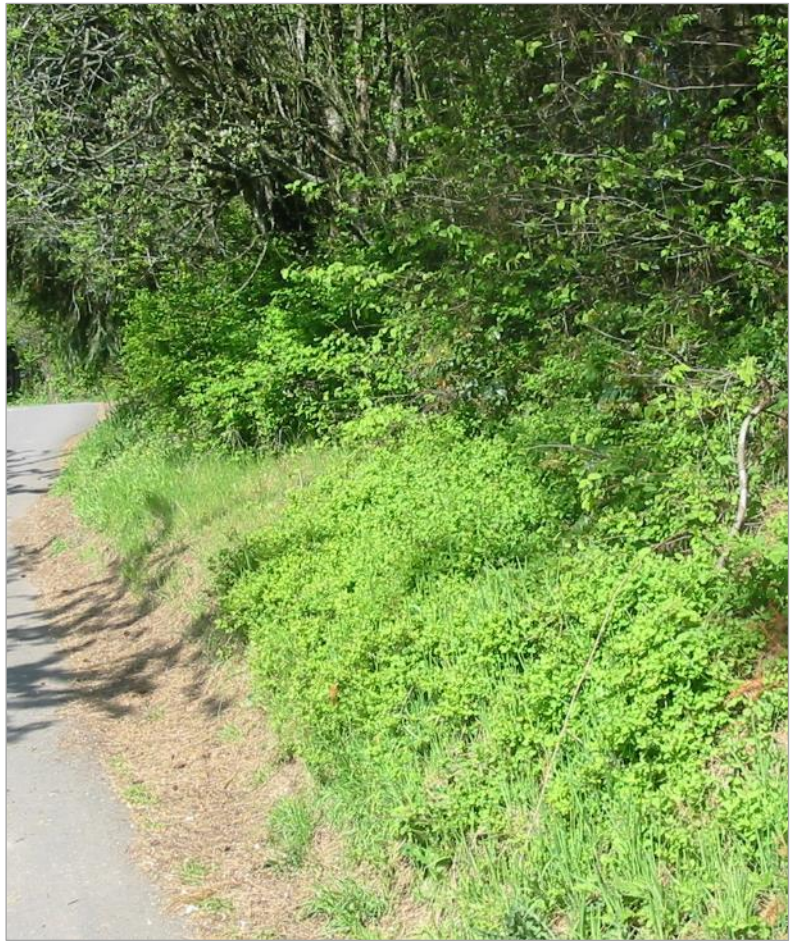
Habitat Needs: Untidy Areas

Bumble bees nest in existing cavities such as old rodent holes

- Don’t tidy all areas
- Have long grass and overgrown places

These places can also provide winter shelter for butterflies



Photos: Matthew Shepherd; Bonnie Carruthers

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Habitat Needs: Flowers

Drink nectar from any accessible flower

May be more particular about where they collect pollen

Photo: Matthew Shepherd

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Threats

Photo: Matthew Shepherd

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Habitat Loss

Photo: Matthew Shepherd

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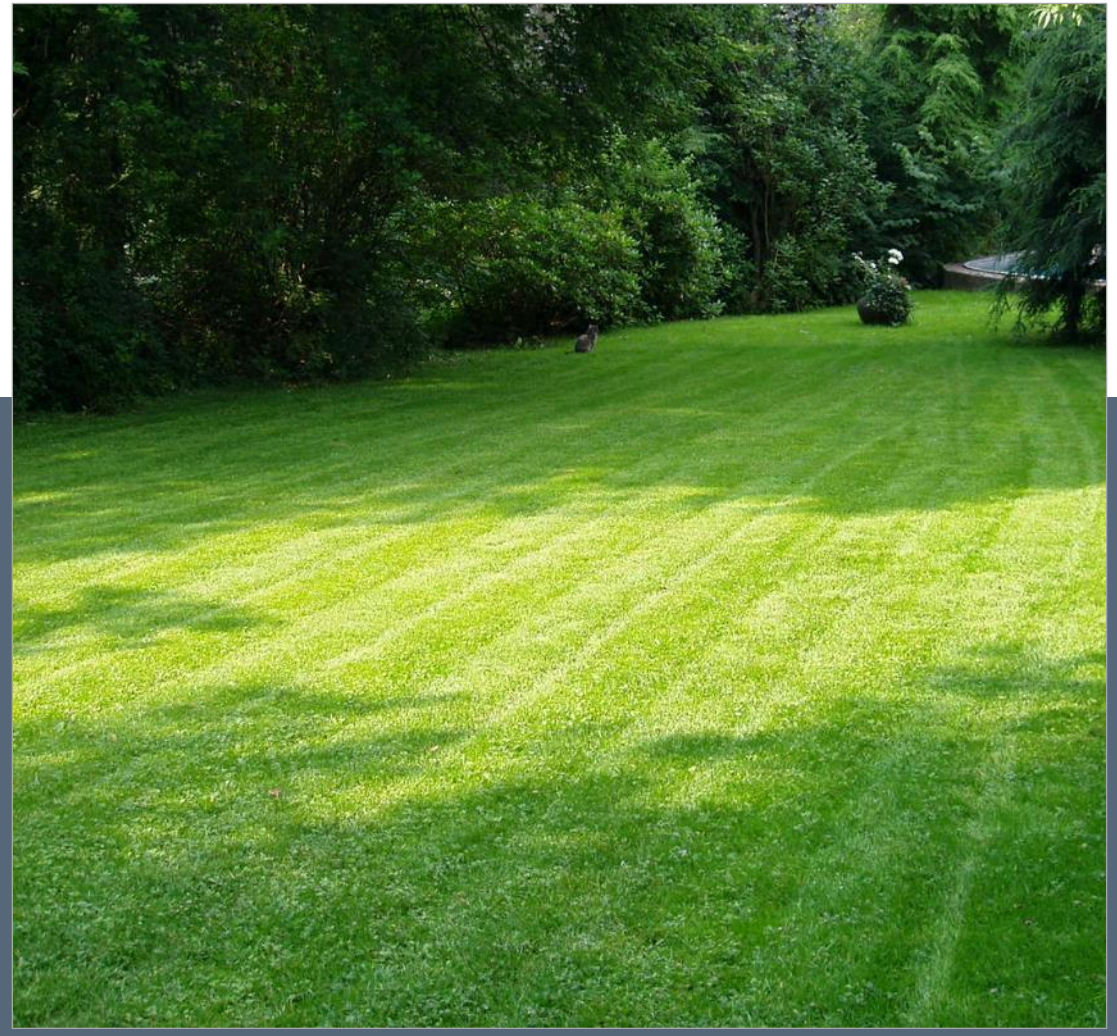
Habitat Loss



Photos: Matthew Shepherd; heipei, Flickr

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Pesticides

Photo: Xerces Society/Matthew Shepherd

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Pesticides

Photo: Matthew Shepherd

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Climate Change

Photo: John Weiss, Flickr

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Conservation

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Photo: Eric Lee-Mäder

Beekeeping ≠ Bee Conservation

There are lots of reasons for keeping honey bees

But bee conservation is not one of them

Photo: Thien Gretchen, Flickr

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Photo: Matthew Shepherd

Provide Habitat

Support the entire life cycle

Bees need:

Secure nest sites

Flowers for foraging

Pesticide-free environment

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Natural Areas

The glue that holds all other habitat together.

Photos: Rod Gilbert; Matthew Shepherd

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Unnatural Areas

Partial habitats in urban and suburban areas

Photos: Matthew Shepherd (7); Rebecca Tonietto

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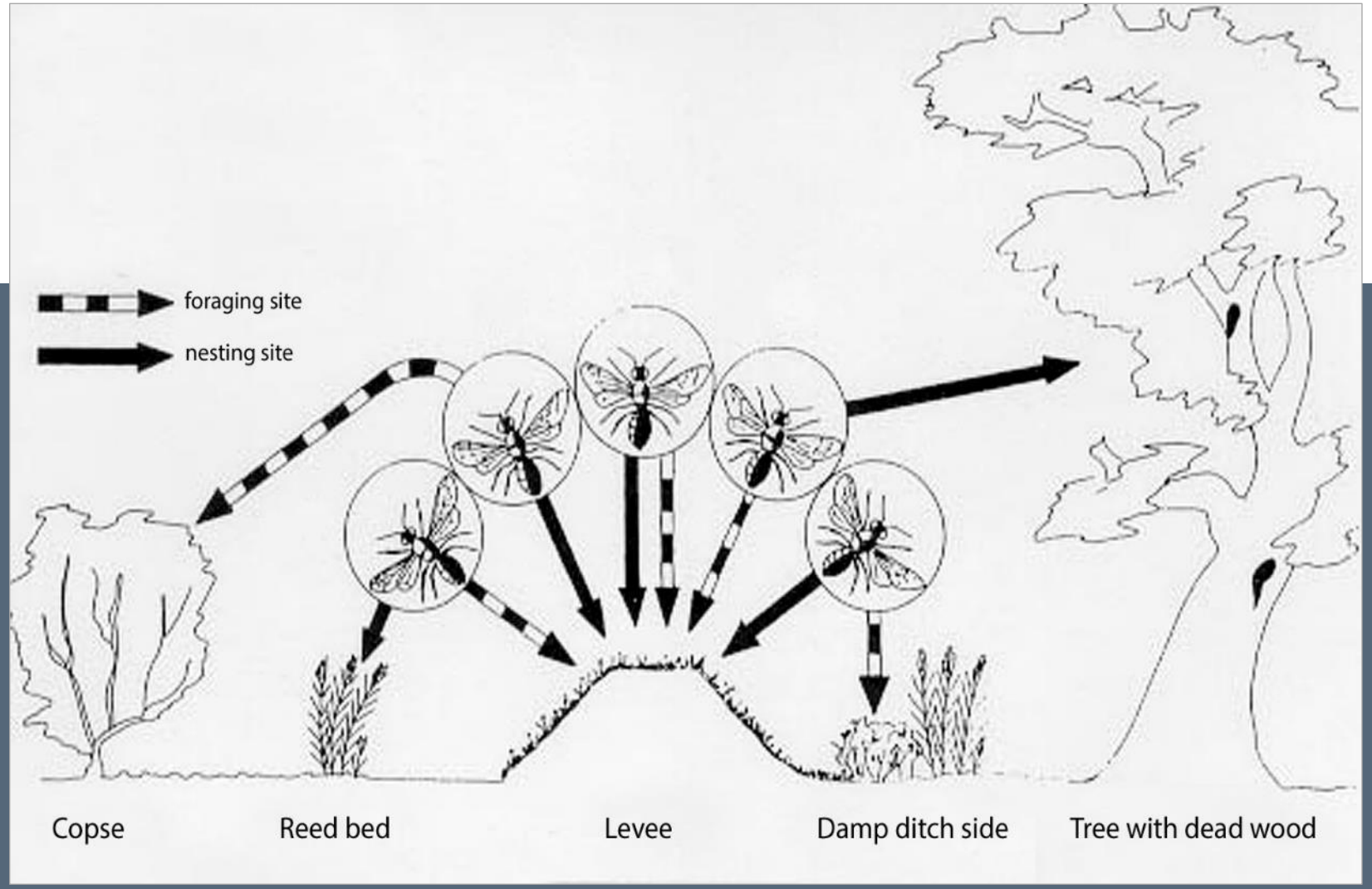
Partial Habitats



Source: Westrich 1996

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Bee’s-eye View of a Neighborhood

Graphic: Xerces Society / Sara Morris

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Photos: Xerces Society/Matthew Shepherd

Bee Nest Sites

Retain Natural or Existing

Snags

Shrubs with hollow stems

Bare ground

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Photo: Matthew Shepherd

Ground Nests

Bare ground doesn’t need to be a large area

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Nest Blocks

Make your own artificial snags

Drill holes

3/16” to 3/8” diameter

4” to 6” deep

Hollow stems

Bamboo

Common reed

Photos: Matthew Shepherd

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Nest Blocks

Tunnel nests work!

Photos: Mace Vaughan; Matthew Shepherd

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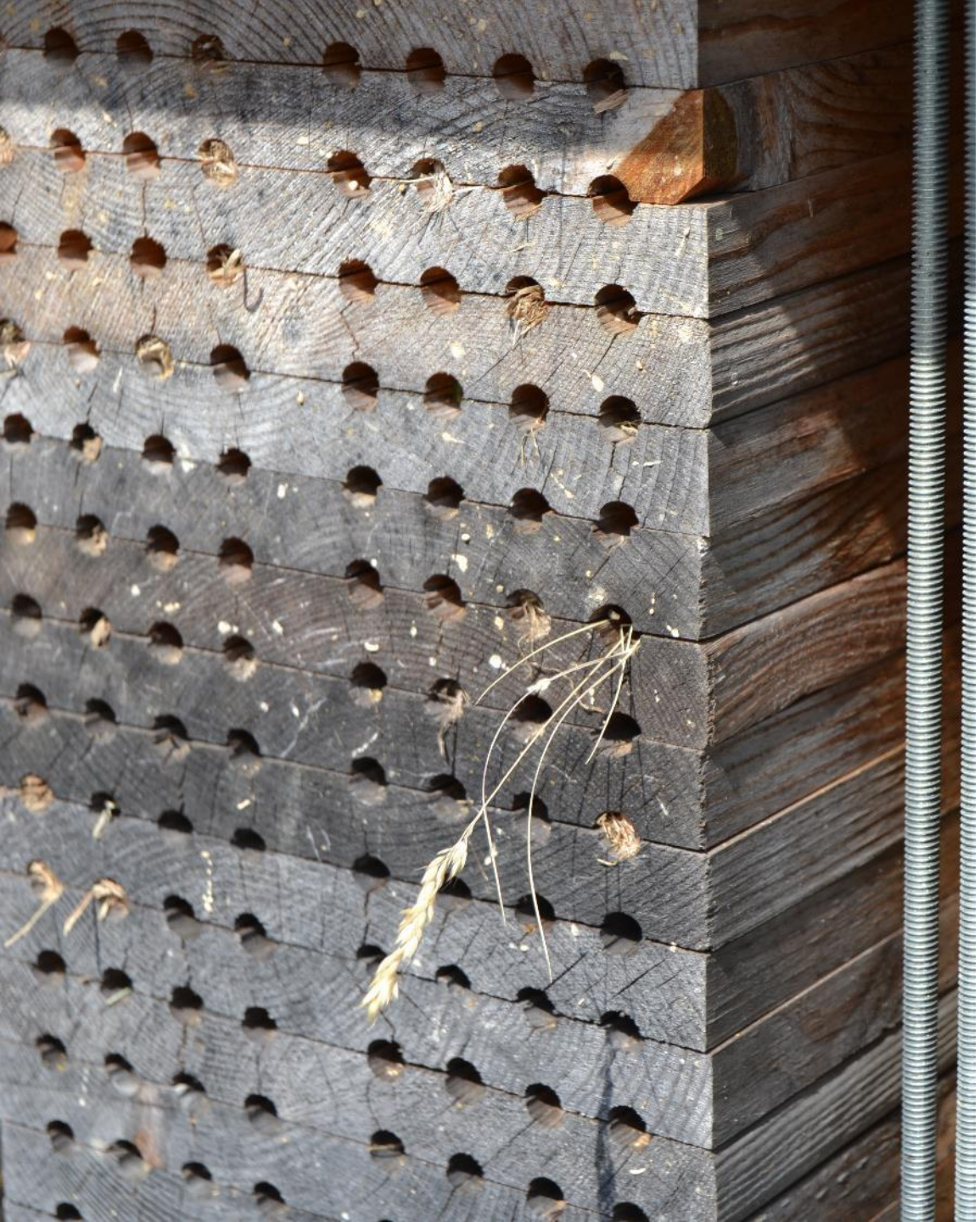

Nest Blocks

Help more than just bees

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Bumble Bee Nests

Nice project, but of limited value

Better to ensure adequate untidy areas!

Photos: Xerces Society/Matthew Shepherd

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Leave the Leaves

Overwintering for butterflies, moths, beetles, flies, and more

Can leave a thin layer of leaves on grassy areas

Spread on vegetable or flower beds for soil building & weed protection

Pile around trees, shrubs, and perennials for mulch

Avoid shredding leaves

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Photos: Sara Morris; Sarah Foltz Jordan

Save the Stems

Plants with pithy or hollow stems:

Cane berries, sumacs, joe-pye weed, coneflowers, hyssop, sunflowers, roses

Management:

Leave flower stalks intact over the winter

Prune to create nest sites in the early spring

Cut at a variety of heights ~8 to 24 in.

Watch for activity!

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Photos: Matthew Shepherd

Build a Stick Pile

Can be big or small

Size depends on space and materials you have

Stack up branches leaving gaps and spaces

Insects will occupy cut ends of hollow sticks and cavities in between

Chipmunks, etc. will nest, creating future bumble bee homes

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Photos: Matthew Shepherd; Jennifer Hopwood

Build a Rock Pile

Include a diversity of rock types and sizes, and assemble with a "messy" configuration

Can be part of your hardscaping

Incorporate bunchgrasses, shrubs, or flowers around the pile to increase wildlife value

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Photo: Phil Roeder, Flickr

No Mow May

Manicured lawns offer little or no habitat value

Lawns in USA = 40.5 million acres

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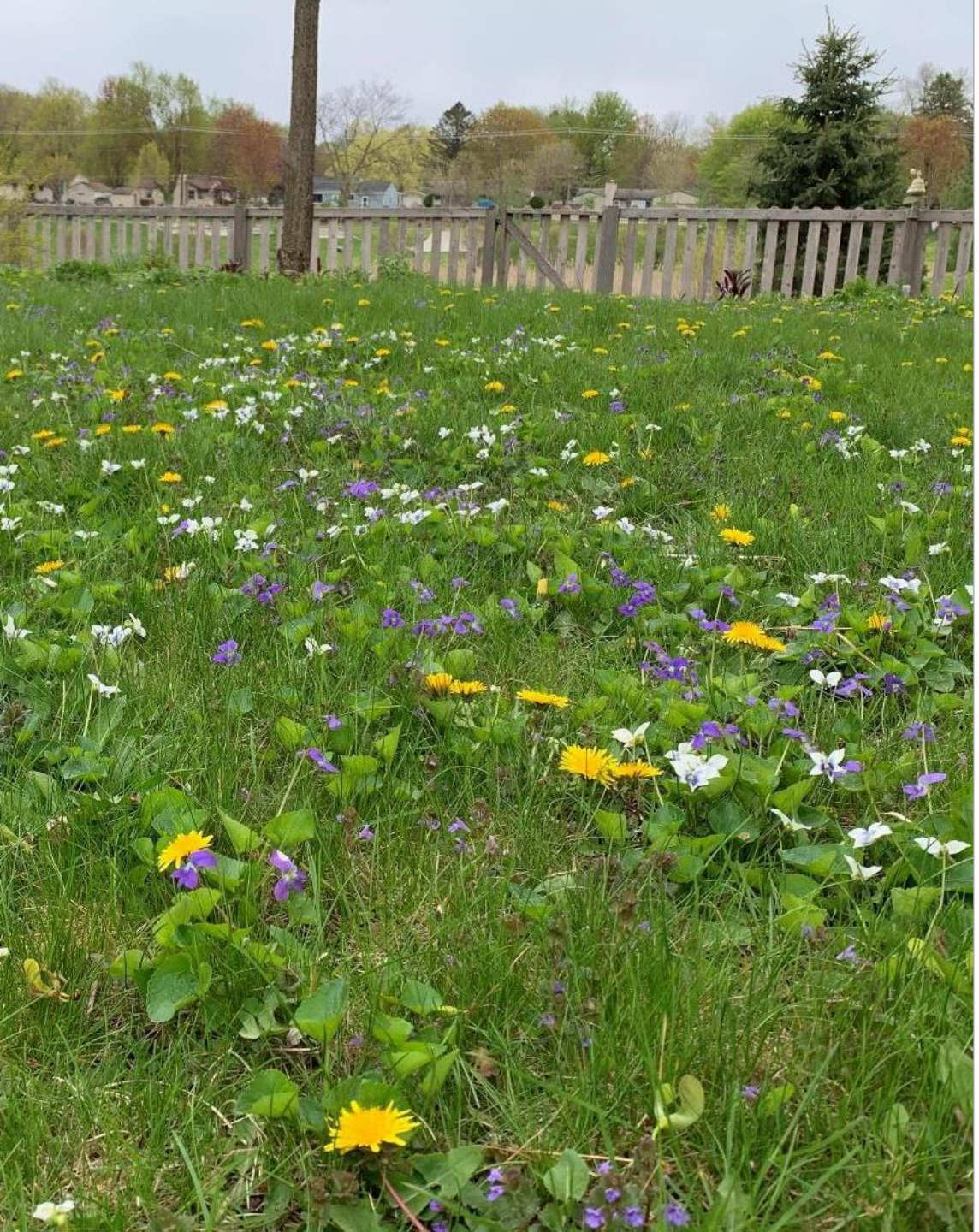

Photo: Karin Jokela

No Mow May

Initiative first promoted by Plantlife in Britain

By not mowing in the spring, flowers can bloom and provide forage to bees

Most discussions are about dandelions and honey bees—but No Mow May is about so much more

beecityusa.org/no-mow-may

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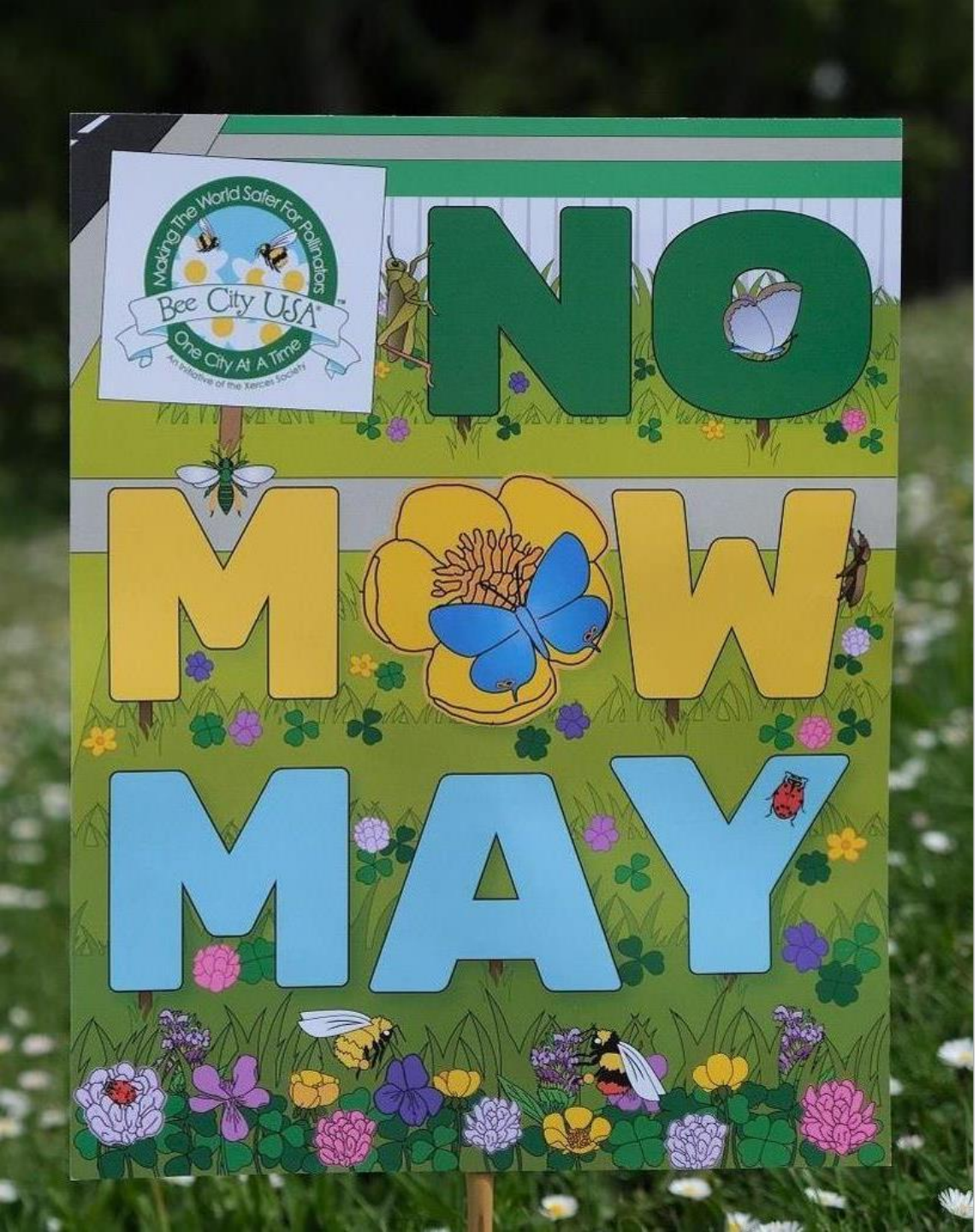

Photo: Xerces Society / Molly Martin

Add a Sign

Shows that your longer-than-typical grass is on purpose

Might recruit some more gardeners

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Photo: Susan Sharpless Smith, Flickr

No Mow May

Unmowed lawns are better for bees—but aren't great

We can't pat ourselves on the back and say "yay, we saved the bees!"

Not mowing is not the end point

Bee conservation is not about dandelions and clover

No Mow May is just a starting point for making neighborhoods less inhospitable for bees

Incremental change will bring long-term benefits

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Photo: Mace Vaughan

Forage Patches

Plants bloom everywhere, but not all flowers will help bees and butterflies

Retain existing flower patches

Create new patches

Locally native plants are better

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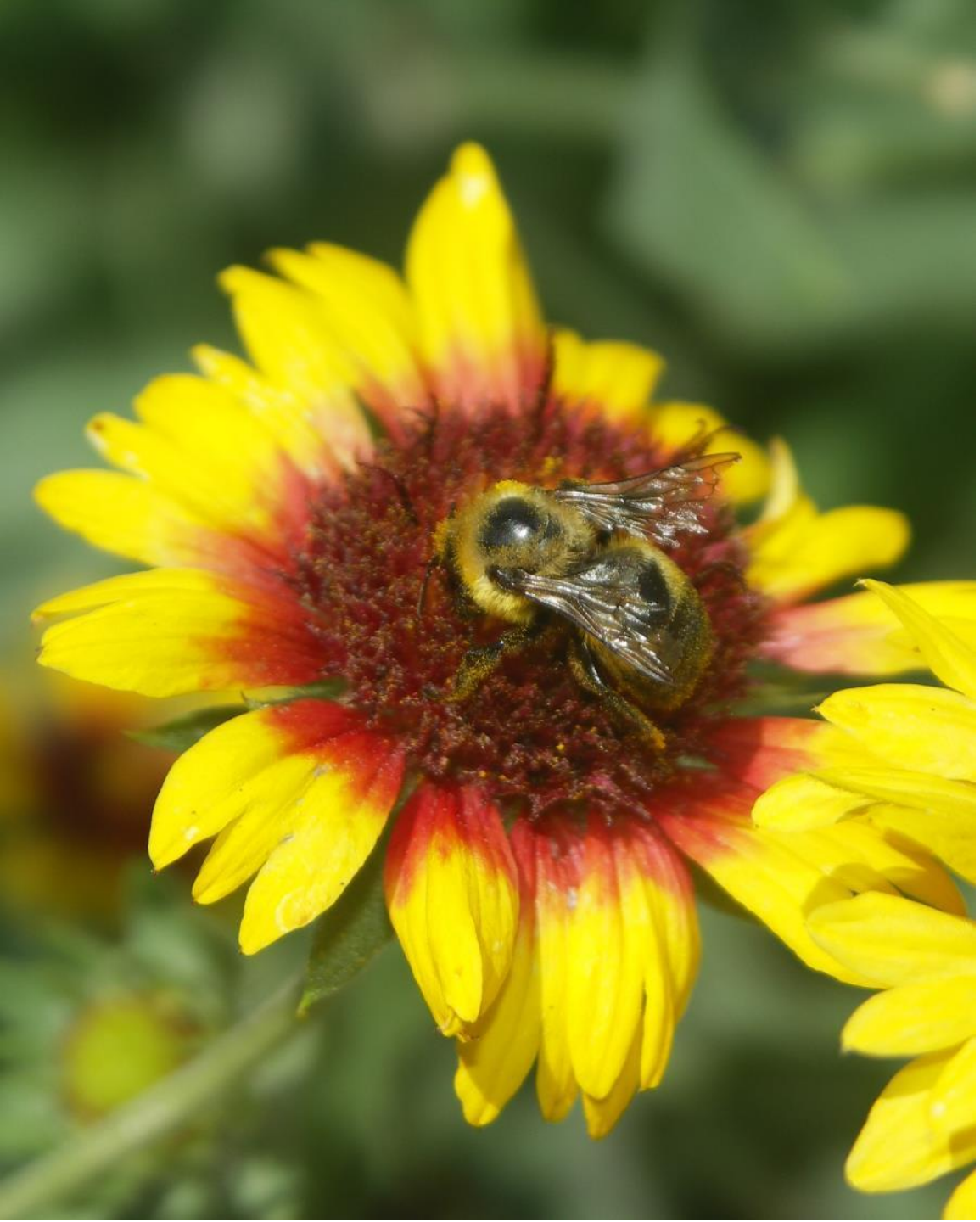

Photo: Xerces Society/Mace Vaughan

Choice of Plants

Color

Diversity

Bloom period

Native species

Drought tolerance

Landscape context

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Landscape context

Graphic: Xerces Society / Sara Morris

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Native is Best

Provide bloom from late-winter to late-fall

Photos: Matthew Shepherd

xerces.org

Garden Plants

Garden plants are OK in a formal landscape, when chosen carefully

Photos: Matthew Shepherd

xerces.org

Photo: Matthew Shepherd

“Cultivar Conundrum”

Some modern varieties and cultivars have lost their ability to produce pollen and/or nectar

Avoid double-flowered varieties

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Photo: Matthew Shepherd

Lawns

Sow an ecolawn

Apply benign neglect

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Photo: Xerces Society/Matthew Shepherd

Pesticides

Avoid using pesticides

If you must use them:

Minimize their use

Read guidance carefully

But be warned:

Even when label instructions are followed, there is limited protection for native bees.

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Photo: Matthew Shepherd

Displaced Problem

Plants treated at the nursery with systemic insecticides such as neonicotinoids will carry those with them.

Some neonicotinoids will remain in the plant for months or years.

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Photo: Adam Varenhorst

Use Alternatives

Beneficial predators and parasitoids

Pollinator habitat will also support many other helpful insects

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Bring Back the Pollinators

BringBackThePollinators.org

Sign the Pollinator Protection Pledge and follow the four principles:

Grow pollinator-friendly flowers

Provide nests & egg-laying sites

Avoid using pesticides

Share the word

Photo: Xerces Society / Suzanne Granahan

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BEE CITY USA®

AN INITIATIVE OF THE XERCES SOCIETY

BEE CAMPUS USA™

AN INITIATIVE OF THE XERCES SOCIETY

Bee City USA

Bee City USA & Bee Campus USA bring people together to make their communities better places for pollinators—native bees, in particular—by increasing the abundance of native plants, providing nest sites, and reducing pesticides.

Affiliates commit to create habitat, reduce pesticide use, and host outreach activities.

Driven by local desire to help pollinators.

beecityusa.org

xerces.org

X Kids Program

Activity booklet with badge upon completion

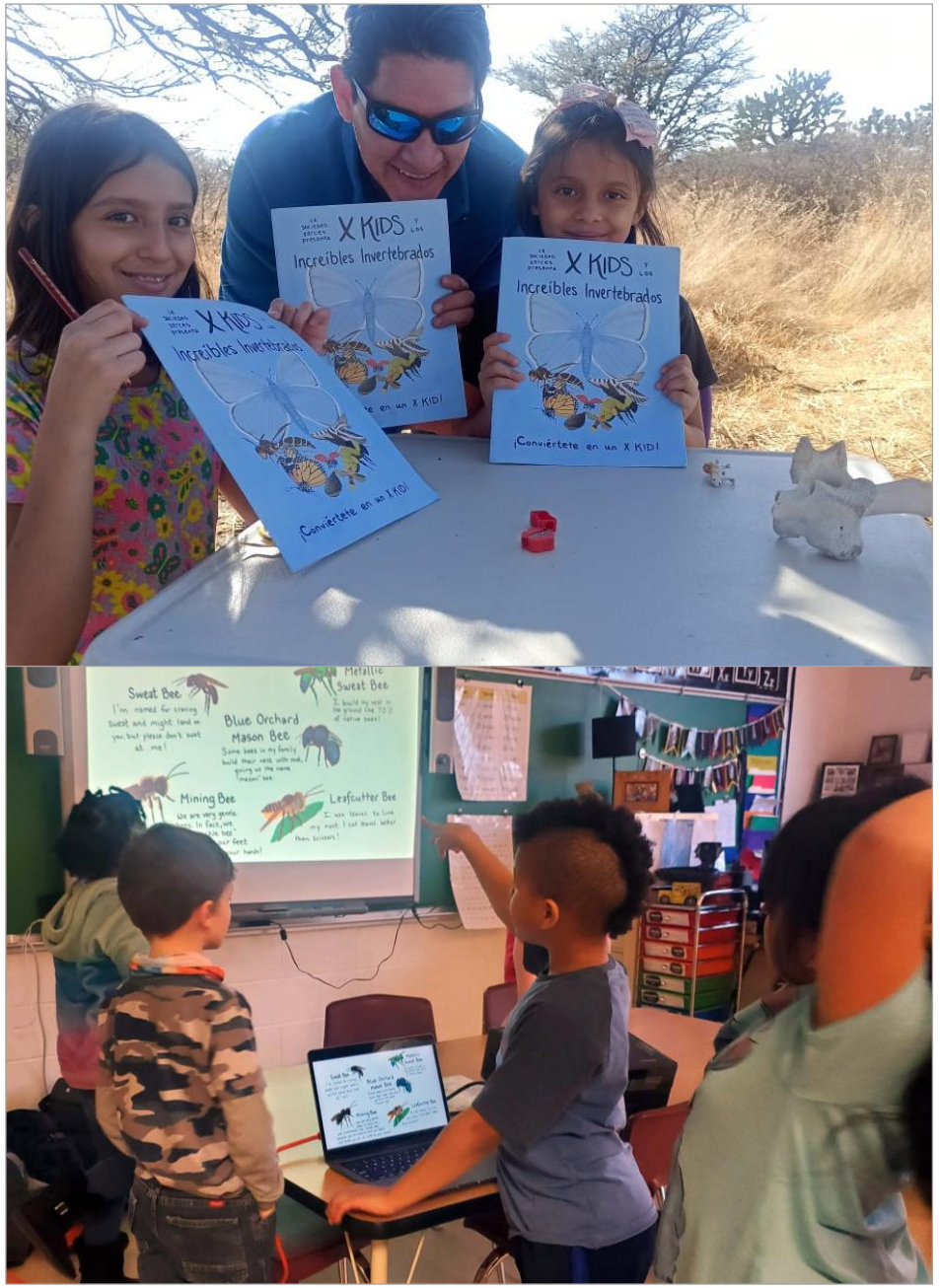
Target grades 3 – 5

Individuals and groups

Available in English and Spanish

Xerces.org/xkids

Questions? xkids@xerces.org



Credit: top, Héctor Avila; bottom, Leah Zerbe

Photo: Xerces Society / Matthew Shepherd

Community Science

Xerces Society

Bumble Bee Watch

PNW Bumble Bee Atlas

Western Monarch Milkweed Mapper

Other organizations

Journey North

Project Monarch Health

Monarch Larva Monitoring Project

Great Sunflower Project

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Books by the Xerces Society

xerces.org

Download from xerces.org

Fact sheets & brochures

Guidelines & reports

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xerces.org/bug-banter

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Clay Bolt

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Thank you!

Any questions?

Photo: Matthew Shepherd

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