the POLLINATOR
EXPERIENCE
MEET the UNSUNG HEROES of GREAT SMOKY MOUNTAINS NATIONAL PARK
TODD AMACKER

"Let me say a word on behalf of these little things that run the world…"

-E.O. Wilson

Why do pollinators matter?

Honey bees alone contribute over $14 billion to the value of U.S. crop production.

*Princeton University

European honey bee
(*Apis mellifera*)

Many of the country's food crops would not exist without the presence of honey bees at bloom time.

But how exactly does it work? It turns out that bees need to collect both pollen and nectar in order to stay alive. To do this, they frequently visit a wide variety of crops that can include peas, beans, melons, berries, and various other fruits. By visiting these crops (and spreading pollen in the process), it allows for plants to reproduce. In turn, the honey bees use pollen to help develop their growing larvae and nectar to turn it into honey.

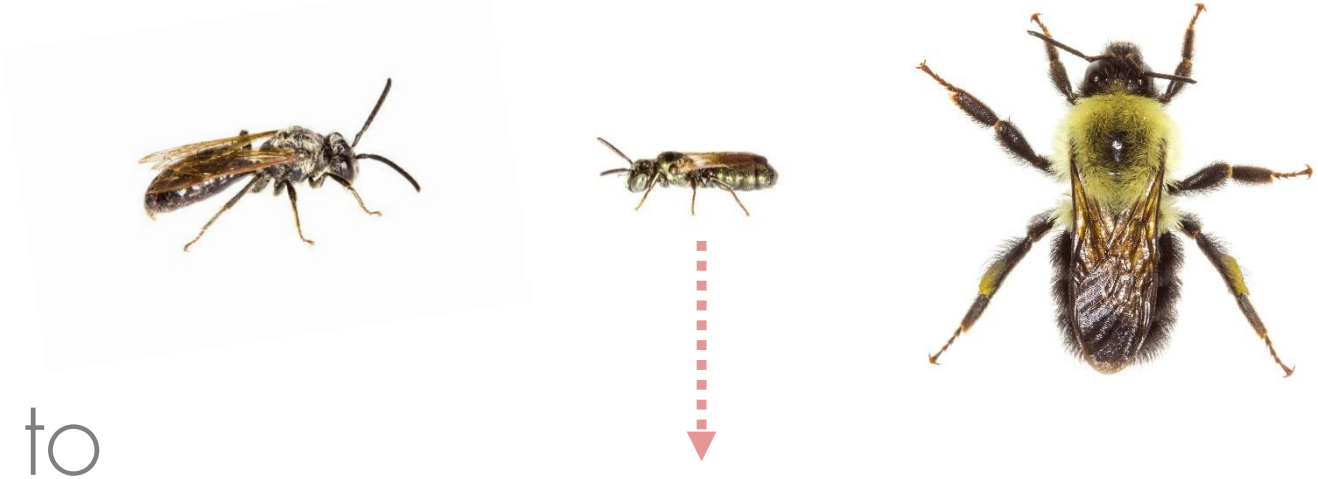
But there are *many* other species of bees found in your own backyard…

In fact, there are

more than

4,000

species of bees native to North America!

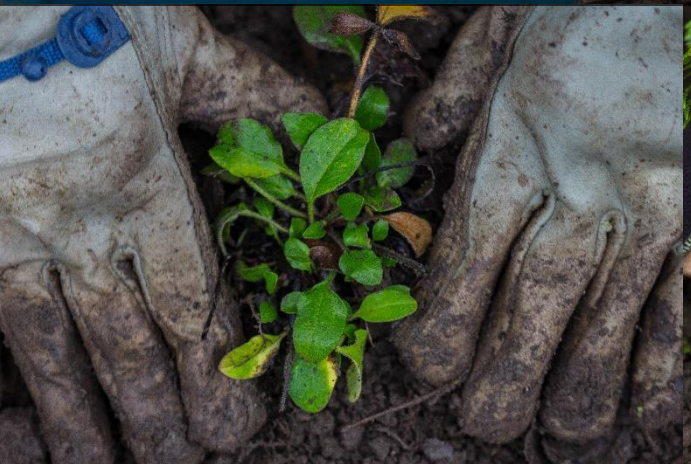


Some of them are barely larger than a grain of rice!

Great Smoky Mountains National Park welcomed more than 10,000,000 visitors in 2015. Many of them visit Sugarlands Visitor Center, one of the most visited areas in the park.

After several years of disuse, the flower beds at Sugarlands Visitor Center were shabby, and a host of less desirable plant species were taking over.

A group of master gardeners, park biologists, a non-profit organization, and other dedicated volunteers braved the cold and rain to clear out unwanted plants and plant new, pollinator-friendly native species.



The result is a flourishing, more diverse habitat that is more pleasing to the eye for droves of daily visitors. But who else is drawn to the beautiful flower beds?

The proboscis is a long, hairy tongue that acts as a straw to transport liquids to the mouth. When in use, the tongue moves rapidly back and forth while the flexible tip performs a lapping motion. After feeding, the proboscis is drawn up and folded behind the head.

Notice the falling pollen? Scientists have discovered that bees create resonating vibrations to loosen the pollen grains inside flowers!

The term *scopa* refers to modifications on the body of a bee that form a pollen-carrying apparatus. In honey bees, the scopa is simply a particularly dense mass of elongated, often branched, hairs (or setae) on the hind leg.

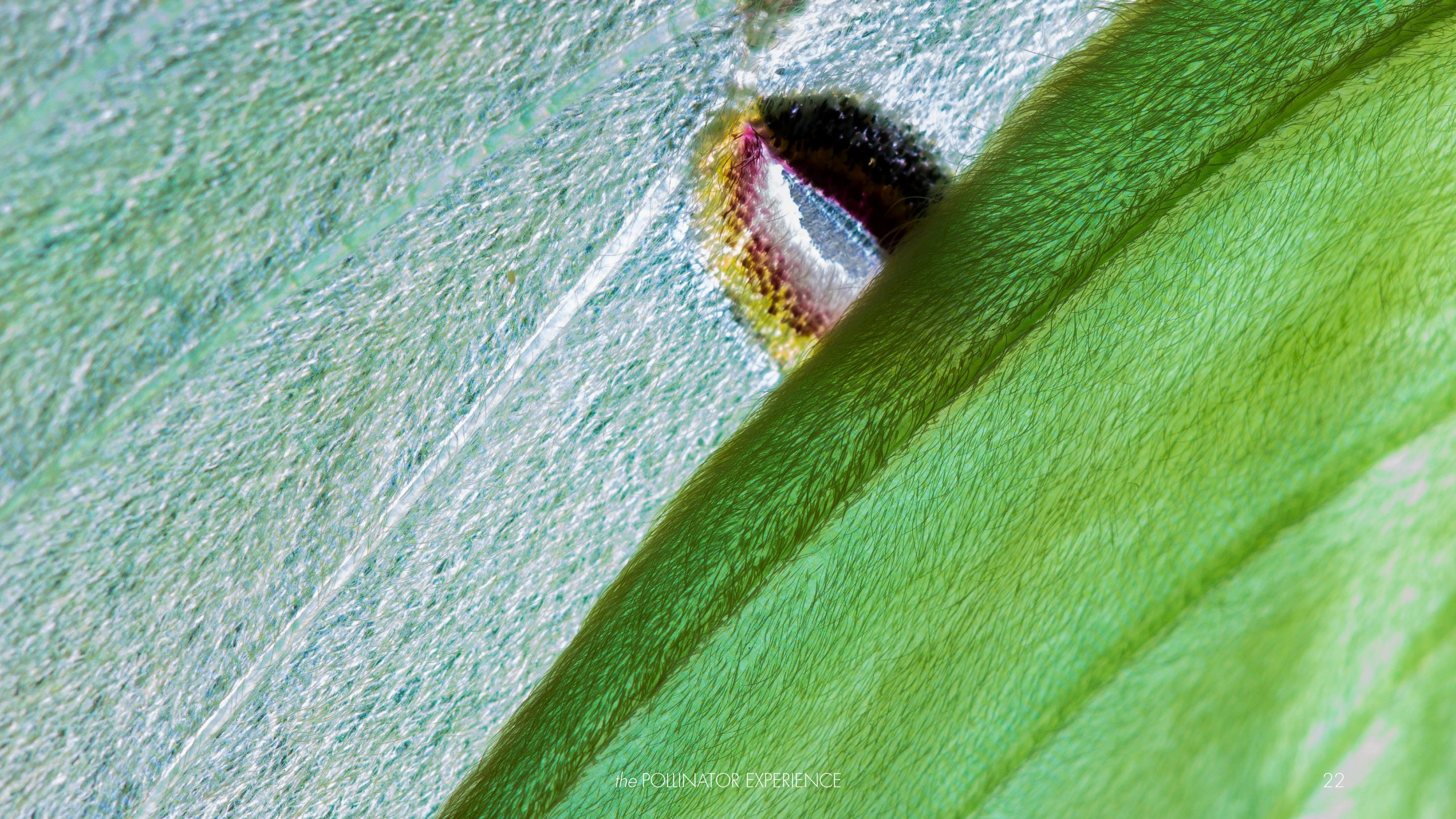
Bees are one of the main reasons that so many flowers are brightly colored. That's because the brighter the flower, the more bees are attracted to them!

An easy way to distinguish a wasp (left) from a bee (right) is that wasps don't have hair on their legs; there's no need for wasps to carry pollen.

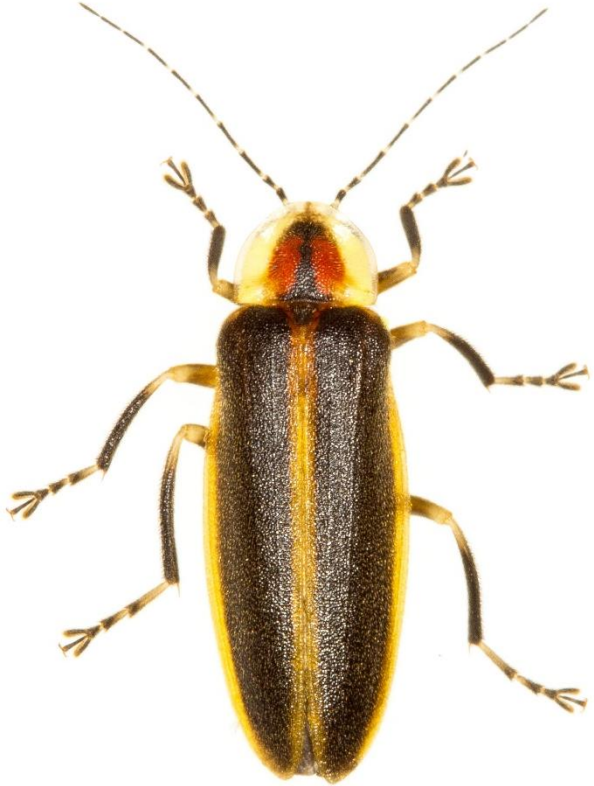
Hummingbird clearwing moths like the ones pictured have transparent wings. How might this benefit them? Scientists think that they use this trait to make themselves less visible to predators like birds, mantids, and spiders.

The scientific group that includes butterflies and moths is known as *Lepidoptera*. The name is derived from Ancient Greek **λεπίδος** (scale) and **πτερόν** (wing).

Some moths have eye spots that mimic the eyes of larger predators such as owls. This in turn discourages smaller predators like songbirds from attacking moths.



BEETLES



Flowers pollinated by beetles tend to be bowl-shaped, with a strong fruity aroma, and open during the day.

Citizen scientists from east Tennessee (and visitors from all over the country) are joining to help conserve monarch butterflies, which are declining globally. Participants catch and tag individuals for *Monarch Watch*, a program started by the University of Kansas.

Black Swallowtail
Eastern Tiger Swallowtail
Spicebush Swallowtail
TEAM

TAG@KU.EDU
MONARCH WATCH
1-888-TAGGING
SMX 296

CALL TO ACTION

CREATE AND PROTECT POLLINATOR HABITAT IN YOUR OWN BACK YARD!

Whether you have rural acreage, a suburban yard, or a small city lot, you can do your part to provide pollinator habitat on your own property. For example, native plants have formed symbiotic relationships with native wildlife over thousands of years, and therefore offer the most suitable habitat. Follow the links below to learn more about native plants in your region and other forms of backyard conservation.

www.nrcs.usda.gov/pollinators
www.fws.gov/pollinators
www.fs.fed.us/wildflowers/pollinators
www.nps.gov/subjects/pollinators

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