



The Buzz About Bees

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What do bees, bats, butterflies, wasps hummingbirds, beetles, moths and flies have in common?

Hint: they keep our world - and us - alive with an abundant mix of fruits, vegetables, flowers, fragrances, fuel, flavors, drinks, drugs, spices, greenery and natural beauty.

Answer...

They are all pollinators - the renewers of life - ferrying pollen from one flower to another as they search for food, mates or shelter. In doing this, pollinators fertilize female plants so they can produce seeds and fruits that grow into so many of the things that we eat, drink and use every day.

Globally, at least 1,000 different species of plants grown for food, beverages, fibers, spices and medicines need to be pollinated by one or more of these critters. Without this giant, humble work force, you could say 'goodbye' forever to apples, blueberries, strawberries, cranberries, chocolate, coffee, melons, peaches, potatoes, greenhouse tomatoes, pumpkins, vanilla and almonds, just for starters. Not to mention most fibers (cotton, flax), edible oils, alcoholic beverages, medicines, dietary supplements and herbal products.

About 75 percent of the world's flowering plants depend on live pollinators to reproduce (versus wind pollination). This includes more than two-thirds of the world's food crops. Basically, every third bite of food you take exists thanks to insect pollinators. Bees are the main pollinator for most commercial crops and wildflowers in the U.S. and Canada.



One-fifth of Bee Species Live in North America

Currently there are at least 400,000 pollinator species in the world, half of which are insects. Approximately 20,000 species of bees (yes, just bees!) live on the planet; one-fifth of them (4,000) are native to North America (Canada, Mexico and the U.S.)

While the act of pollination is not intentional by any animal, most bees do intentionally collect pollen for their use and have specific structures on their bodies to contain it. Many butterflies and birds move pollen around only because it sticks to their bodies as they collect nectar from flowers.

In the United States alone, pollination by (managed) European honey bees produces roughly \$15 billion worth of products every year. The U.S. Fish and Wildlife Service estimates that the value of pollination services provided by native bees and other native wildlife is even greater. For some commercial food crops, researchers have learned that bumblebees and other native bees are more efficient pollinators than the European honey bee. The total value

of all pollination services annually in the U.S. could easily top \$40 billion.

History of the Honey Bee

The most actively managed pollinator (and honey and wax producer) used worldwide is the non-native European or Western honey bee (native to Africa, Asia and Europe). The earliest known domestication of this bee is from ancient Egypt. It arrived on U.S. soil in the 1600s with European immigrants.



A better understanding of how pollination worked and how to manage pollinators led to the commercialization and world-wide expansion of many crops. For example, growing figs didn't become commercially viable in California until the 1890's, when fig growers determined that a tiny wasp was the pollinator and imported them. But growers also had to provide the wasp with its proper habitat and conditions to synchronize wasp life cycles with the fig crop. By 1998, California's fig production was worth nearly \$10 million, second only to Turkey's.

Of the estimated 135,000 beekeepers in the U.S., only about one percent of them own a commercial operation. These beekeepers travel extensively with their hundreds to thousands of honey bee colonies, providing most of the country's pollination services.

Pollinators in Peril

In many parts of the world, pollinators are in decline; almost half of the insect extinctions documented worldwide have been pollinators. In the last 25 years, local ecosystem disruptions and declines in certain insect pollinator populations have been reported on every continent except Antarctica.

The number of managed honey bees is half of what it was in the 1950s. The decline began in the 1980s, when a non-native parasitic mite was accidentally introduced. The honey bee continues to decline due to diseases, pests, the low price of honey and most recently, Colony Collapse Disorder. This created a shortage of bee colonies in the U.S. and led to imports from Australia. It was the first time that honey bees had to be imported since 1922, when the federal Honeybee Act banned imports for fear they would spread non-native pests (still a vital concern).

The U.S. has lost more than 50 percent of its managed honey bee colonies in the past ten years. While colonies have been declining, crop acreage needing to be pollinated continues to increase. Luckily, recent research has shown that native bees make a significant contribution to crop pollination when enough nearby native habitat is available.

While the loss of the non-native honey bee is alarming, many of our wild native bees are also disappearing. For example, from about 1995 to 2005, the yellow-banded bumblebee went from being the most abundant bee in northern Wisconsin to one of the least abundant. In Oregon, the Franklin's bumblebee likely went extinct during the same time frame.

Other native bumblebee populations have also declined, although more field research is needed to determine the causes and extent. In addition to the reduction in bee numbers, some butterflies, bats and hummingbirds are also showing declines in their populations.

Pollinators are what scientists call a 'keystone' species, meaning that a lot of other species (small to large, plant to animal to human) depend on them for their lives, directly or indirectly. As pollinators around the globe disappear, the effect on native plants and wildlife, the global food web and human health can be disastrous.

"The little things that run the world, including bees, butterflies, bats and hummingbirds, go unnoticed and unprotected until it is sometimes too late."

*-entomologist Stephen Buchmann,
co-author of The Lost Pollinators*

Causes of Decline

The possible causes for declines in wild pollinator populations are:

- ❖ Fragmented, degraded and destroyed habitats
- ❖ Exposure to agricultural pesticides
- ❖ Air pollution
- ❖ Competition from invasive plants and animals
- ❖ Introduced diseases and parasites from non-native insects (*infection from latest threat, the varroa mite, is fatal to most honey bee colonies*)

In addition, in some areas of the U.S. insect pollinators are either not able to find 'their' plants at all (due to land clearing), or not at the right time of year (before or past flowering time due to fluctuating weather patterns). In other places, migratory routes have been disrupted due to development and urbanization and may be affecting hummingbirds, nectar-feeding bats and some butterflies and moths.

Awakening to the Crisis

Because public support is vital to get funding for research and monitoring (which may in turn lead to species protection) we know far more about a few big, breathtaking animals like tigers, bears and wolves than we do about the hundreds of thousands of insects that exist. But as far as which animals are essential for life to continue on this planet, insects (and many other backbone-less creatures called invertebrates) win hands down.

Pollination starts a chain reaction where a tiny insect fertilizes a flower that produces seeds or fruit that a larger animal eats, that in turn might get eaten by an even larger animal, or by us. The trouble is that most people simply do not know how supremely important insect pollinators are to the survival of ALL life on earth.

The study of plants and their animal pollinators is rather recent. Interest was sparked in the 1990s due in part to the 1996 book, *The Forgotten Pollinators*, by Buchmann and Nablan. It called for a national policy on pollination and pollinators.

Since 1998, declines in managed bee colonies (Colony Collapse Disorder) have taken place in China, Egypt, Europe, Latin America, North America and Japan, potentially becoming a global issue. At the same time, declines in some threatened and endangered native insect pollinators led to fears of a pollinator crisis. As a result, things started happening internationally and in the U.S.

The North American Pollinator Protection Campaign began in 1999, and has held an annual conference since 2001. The number of pollinator-related publications has risen steadily since 2000. A ten-day Bee Course on the bees of North and Central America has been offered once a year since 2003. The website '[Butterflies and Moths of North America](#)' launched in 2006. The federally-sanctioned Pollinator Week began in June 2007, and the [Journal of Pollination Ecology](#) came online in 2010.

For the first time in history, the 2008 Federal Farm Bill specifically mentioned pollinators, and officially recognized the vital role that pollinators play in the United States' agricultural industry. The bill proposed that funding be increased for research on honey bees and native bees, and mandated that conservation programs support habitat restoration and management for pollinators.



However, very few pollinator species are monitored in North America. Lack of research in the U.S. has critically hindered our knowledge about the status of most pollinators.

The European Union, on the other hand, has been so concerned that they have invested more than \$20 million investigating the status of their native pollinators. Unfortunately, researchers there have scientifically documented pollinating insect declines and extinctions.

Plants That Will Attract Pollinators

Trees

Big-leaf Maple
Cascara
Pacific Crabapple
Pacific Madrone
Serviceberry
Vine Maple

Shrubs

Blue Elderberry
Evergreen Huckleberry
Indian Plum
Kinnikinnick
Low Oregon grape

More Shrubs

Nootka Rose
Ocean Spray
Orange Honeysuckle
Pacific Ninebark
Pacific Rhododendron
Purple Coneflower
Red-flowering Currant
Red Huckleberry
Red-osier Dogwood
Salal
Snowberry
Yarrow