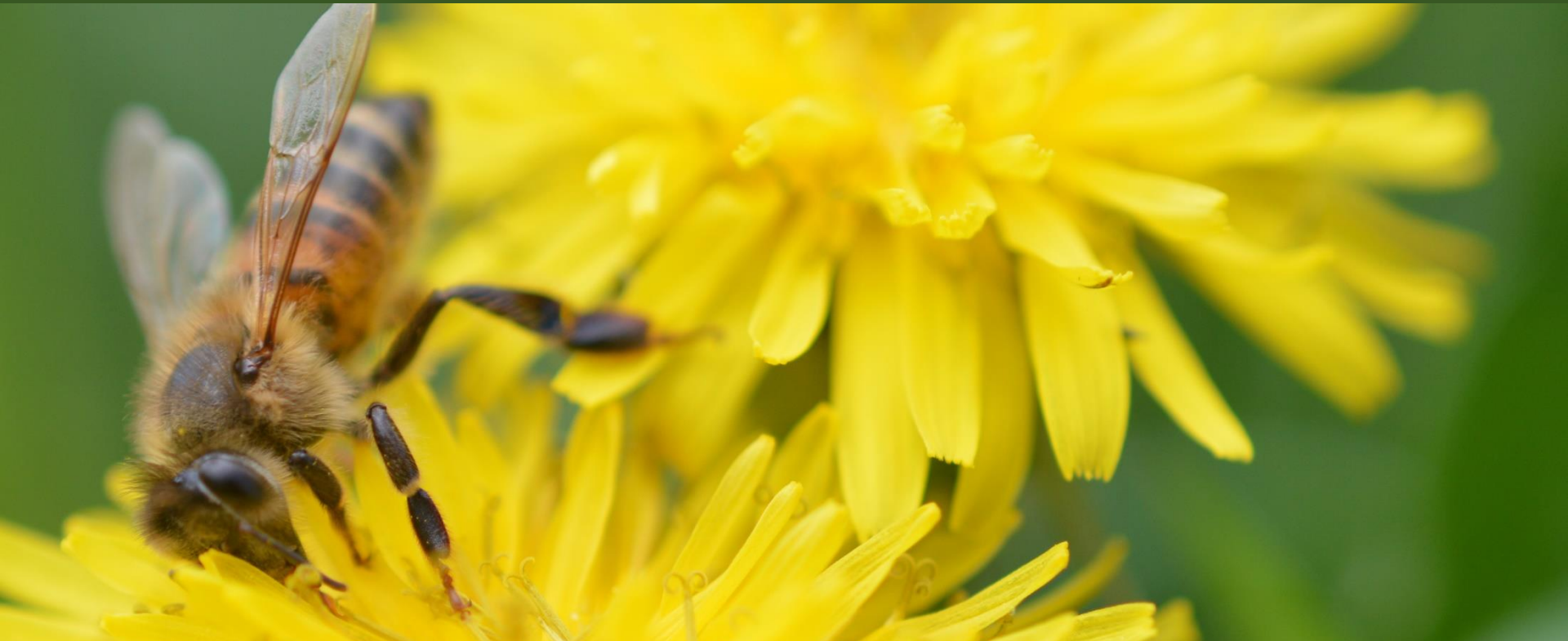


What's the buzz?

Pollinator decline and what you can do to help



Rachael E. Bonoan ❁ Melrose Public Library ❁ May 17, 2017

Flight Path

1. Introduction

- Importance of pollination
- What is pollination?
- Who are the pollinators?

2. Honey Bee Biology

- To bee or not to bee
- Comb sweet comb
- Secret life of bees
- You are what you eat

3. Pollinator Decline

- Declining populations
- Why the decline?
- How can we help?



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Introduction

Importance of pollination



Without pollinators...



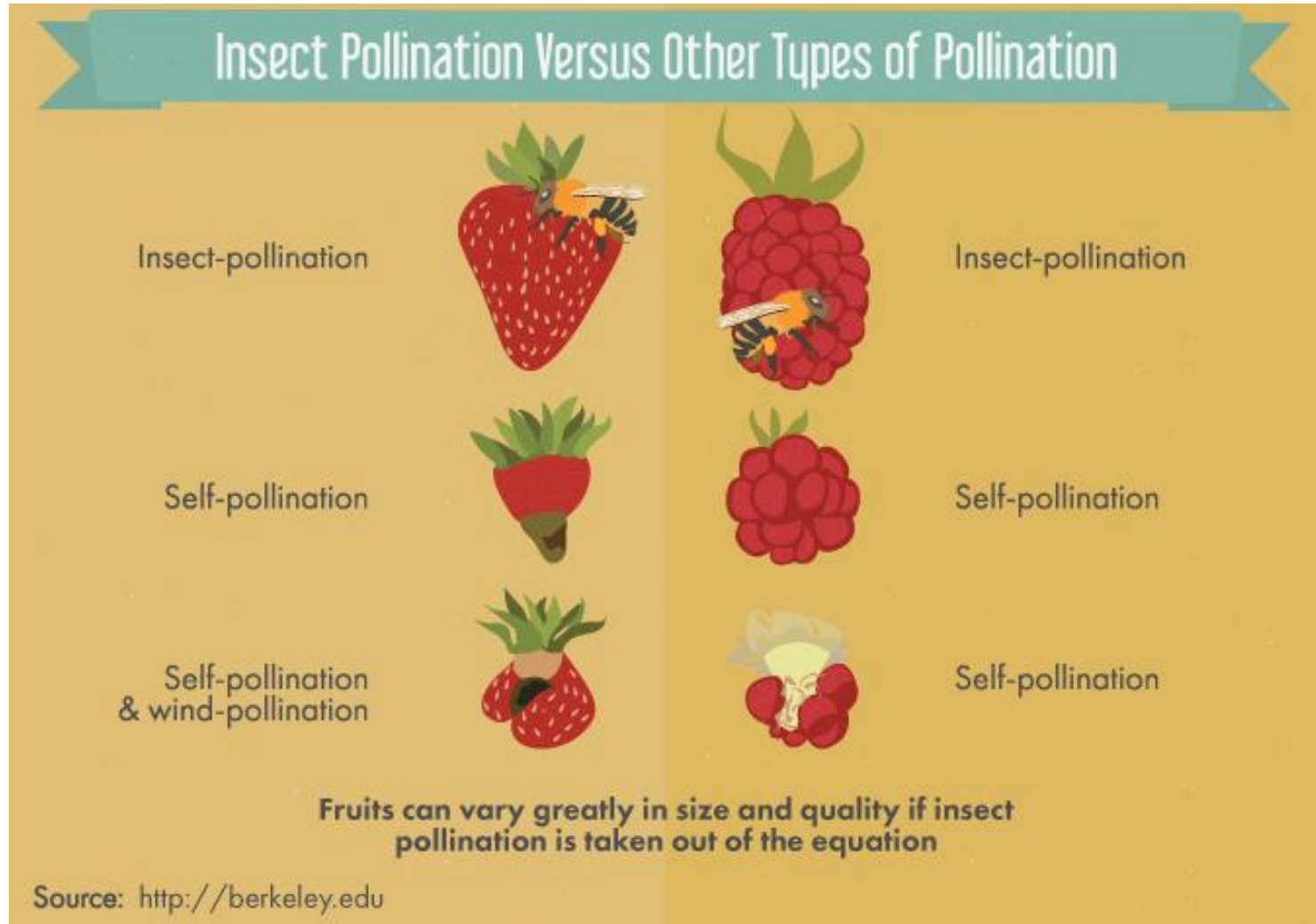
Pollination is important to...



Human Health & Nutrition

- Insect pollinators are necessary for 70% of the crops we eat!
- Crops that depend on insect pollinators are the richest in vitamins and minerals.

Pollination & crop quality



Pollination is important to...



Human Health & Nutrition

- Insect pollinators are necessary for 70% of the crops we eat!
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Flowering Plants

- Pollinators are responsible for the dispersal of seeds and propagation of plants.
- It is predicted that 20,000 flowering plant species will disappear in next few decades.

Honey Bees by the Numbers



It takes a lot of honey bees to make a hive.
Here's why.

bees  matter
beesmatter.ca


225,000

The approximate number of flowers visited by a hive each day.


80,000

How many kilometres a hive of honey bees travels for one pound of honey.

**60,000+**

The number of honey bees in an average hive.

 $\frac{1}{12}$

The number of teaspoons of honey every honey bee will collect in her lifetime.


24

The km/h flight speed of an average honey bee.


12,000


The beats per minute of each honey bee's four wings.

Pollination is important to...



Human Health & Nutrition

- Insect pollinators are necessary for **70%** of the crops we eat!
- Crops that depend on insect pollinators are the richest in vitamins and minerals.



Flowering Plants

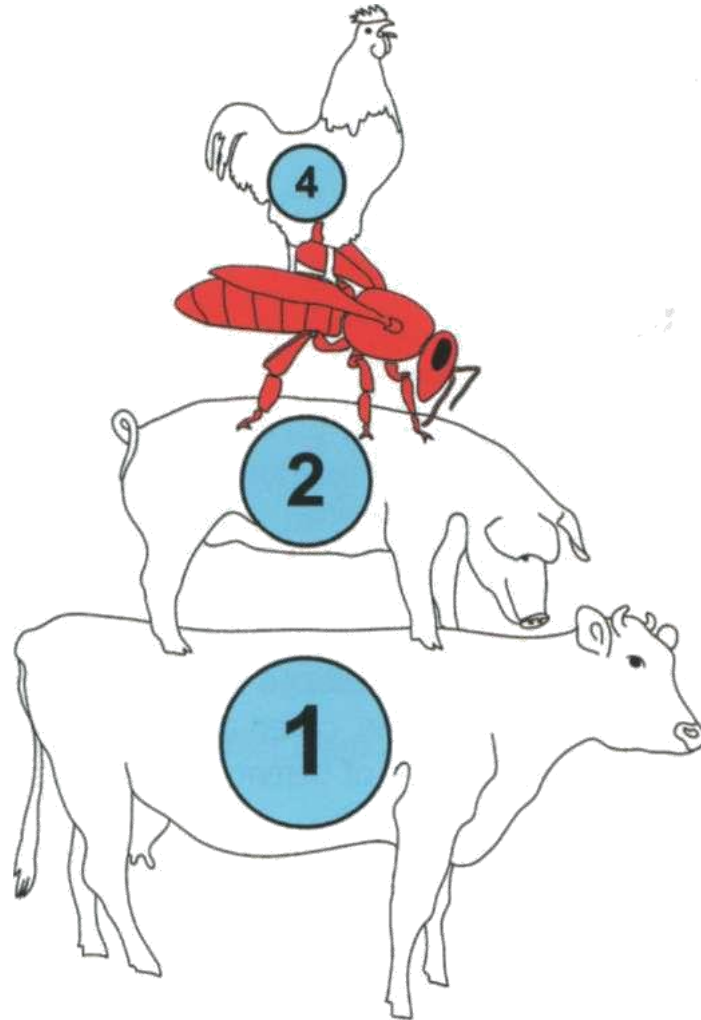
- Pollinators are responsible for the dispersal of seeds and propagation of plants.
- It is predicted that **20,000** flowering plant species will disappear in next few decades.



The Economy

- Insect pollinators contribute to more than **\$24 billion** to the U.S. economy.
- Honey bees alone account for **\$15 billion**.

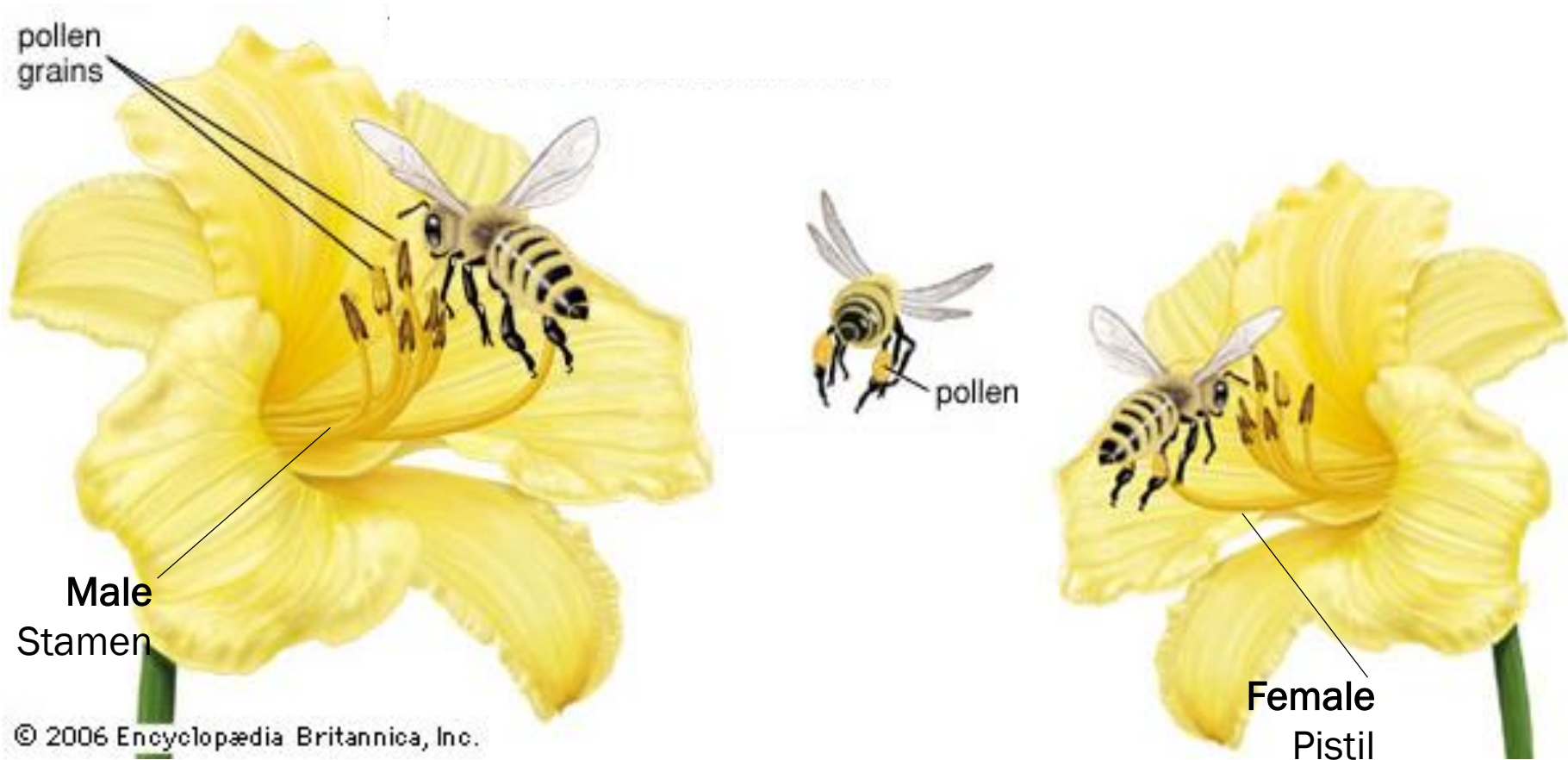
Honey bees are an important domesticated animal!



Introduction

What is pollination?





Good pollinators are **consistent pollinators**.

Pollination & bee behaviors

[Video](#): Study of Bees
Pollen-Foraging Habits
Could Create a Buzz

Introduction

Who are the pollinators?









© Alex Wild
alexanderwild.com





Foto. M. Tschapka



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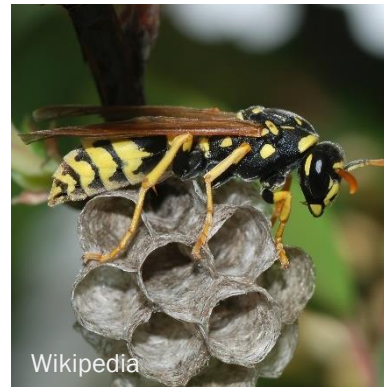


Honey Bee Biology

To bee or not to bee



Which are bees?



Which are bees?



Which is the honey bee?

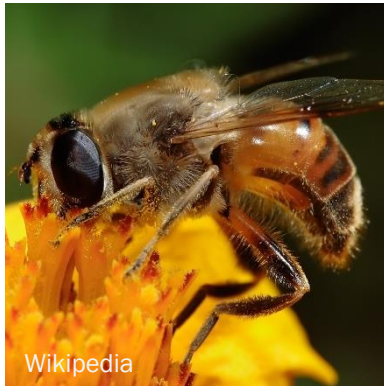


Which is the honey bee?



What looks different?

Drone Fly



Syrphid Fly



Sweat Bee



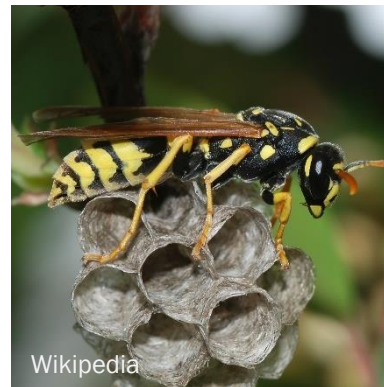
Yellow Jacket



Mining Bee



Bumble Bee



Paper Wasp



Honey Bee

Common Species of Bees and Wasps in the Northeastern U.S.



More pictures and information at www.facebook.com/4wasps

By Alex Surcică

BEEs ≠ WASPS

(they're cousins)



Bald-faced Hornet *Dolichovespula maculata*



European Hornet *Vespa crabro*



German Yellowjacket - *Vespula germanica*



European Paper Wasp
Polistes dominula



Honey Bee
Apis mellifera

0.5 inch
1.25 cm

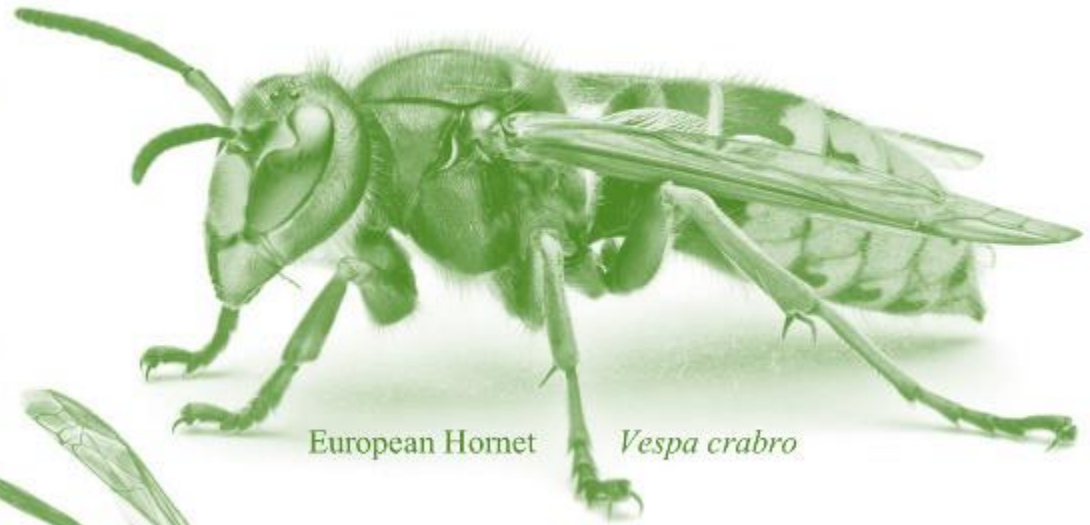


Common Eastern Bumblebee *Bombus impatiens*

Bees, Wasps, and Other Beneficials



Bald-faced Hornet *Dolichovespula maculata*



European Hornet *Vespa crabro*



German Yellowjacket - *Vespula germanica*



European Paper Wasp
Polistes dominula



Honey Bee
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Bees, Wasps, and Other Beneficials

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Honey Bee Biology

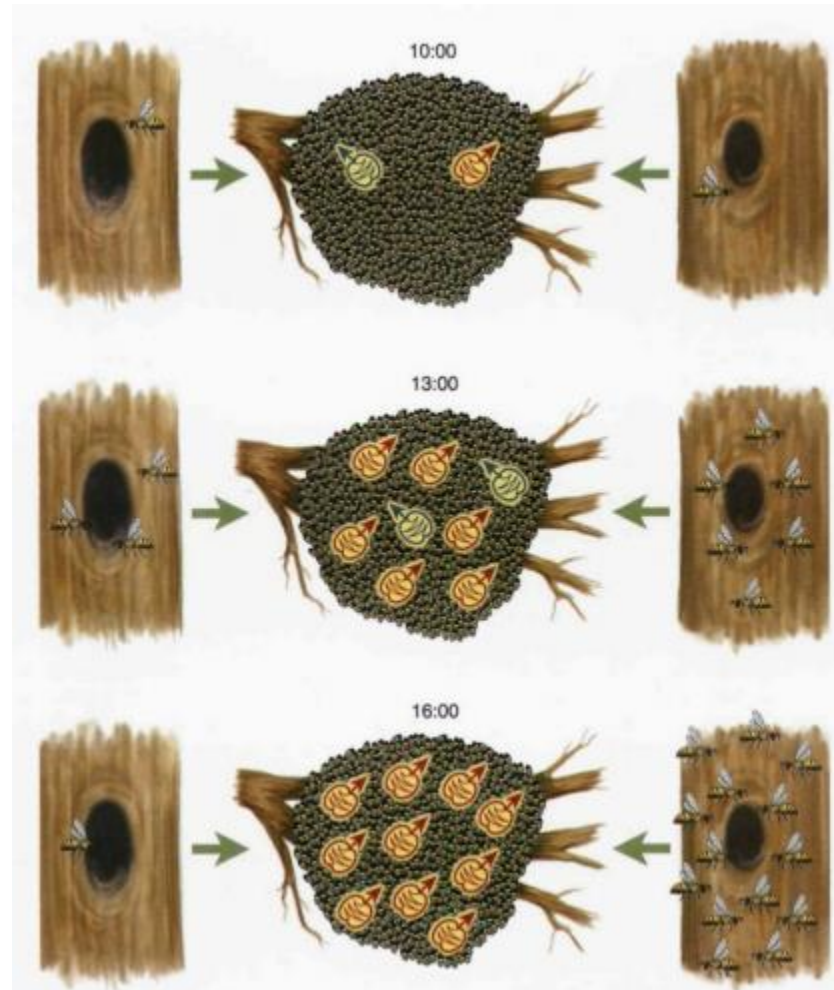
Comb sweet comb

Where do honey bees live?





Honey bees “vote” on a nest site







HCN.org



Chron.com



Ute Herzel-Harding



Queenbrishoney.com



Hightlandbees.com



Rachael E. Bonoan

Honey Bee Biology

Secret life of bees

How do honey bees interact?



Honey bees are social



Three “castes” of bees

Worker



Queen

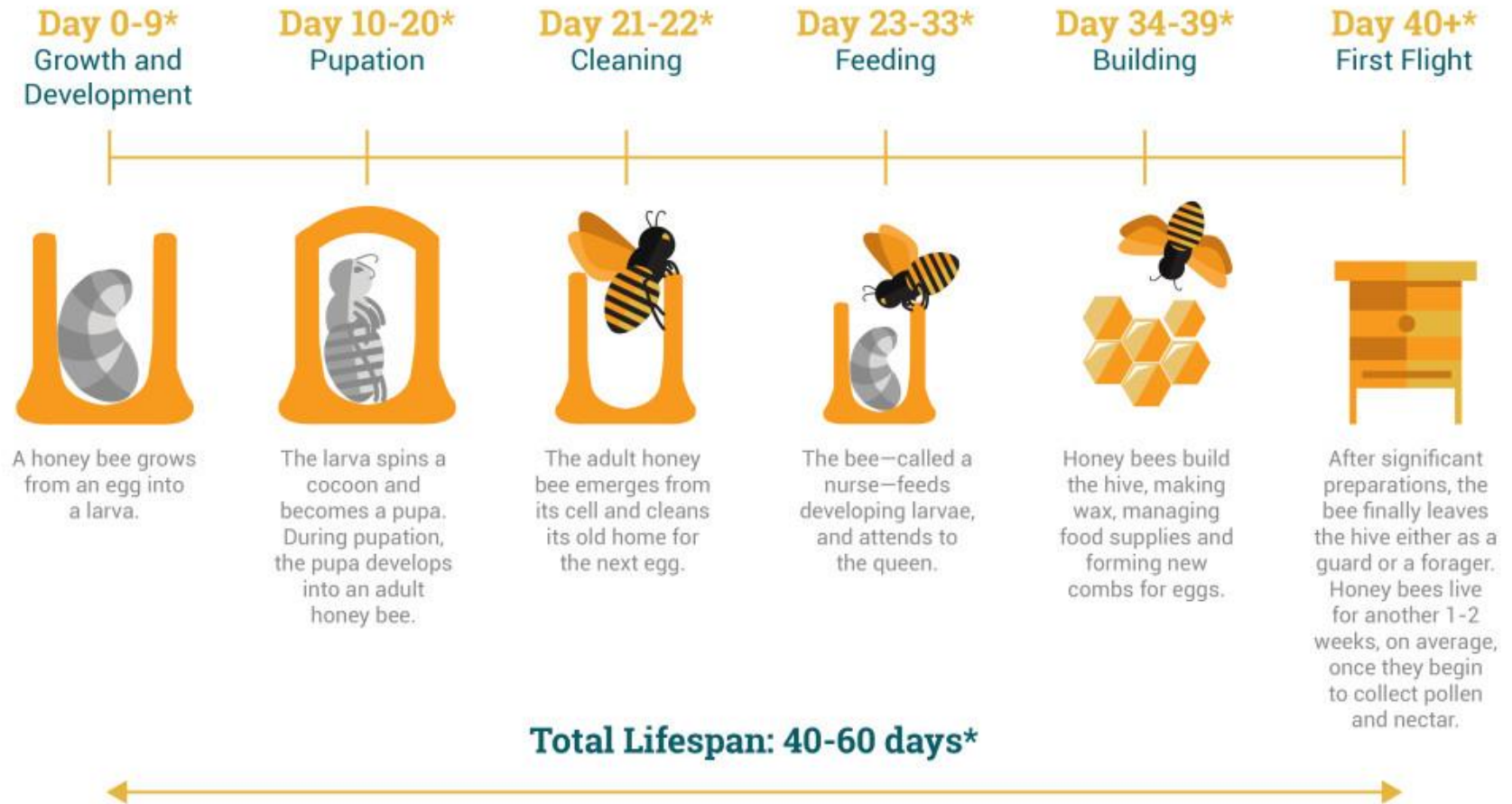


Drone



The Life of a Worker Bee

Worker bees—which make up the majority of the hive—have different tasks depending on their age.



*Average timespan, which can vary depending on environment.





Honey Bee Biology

You are what you eat

What do honey bees eat?



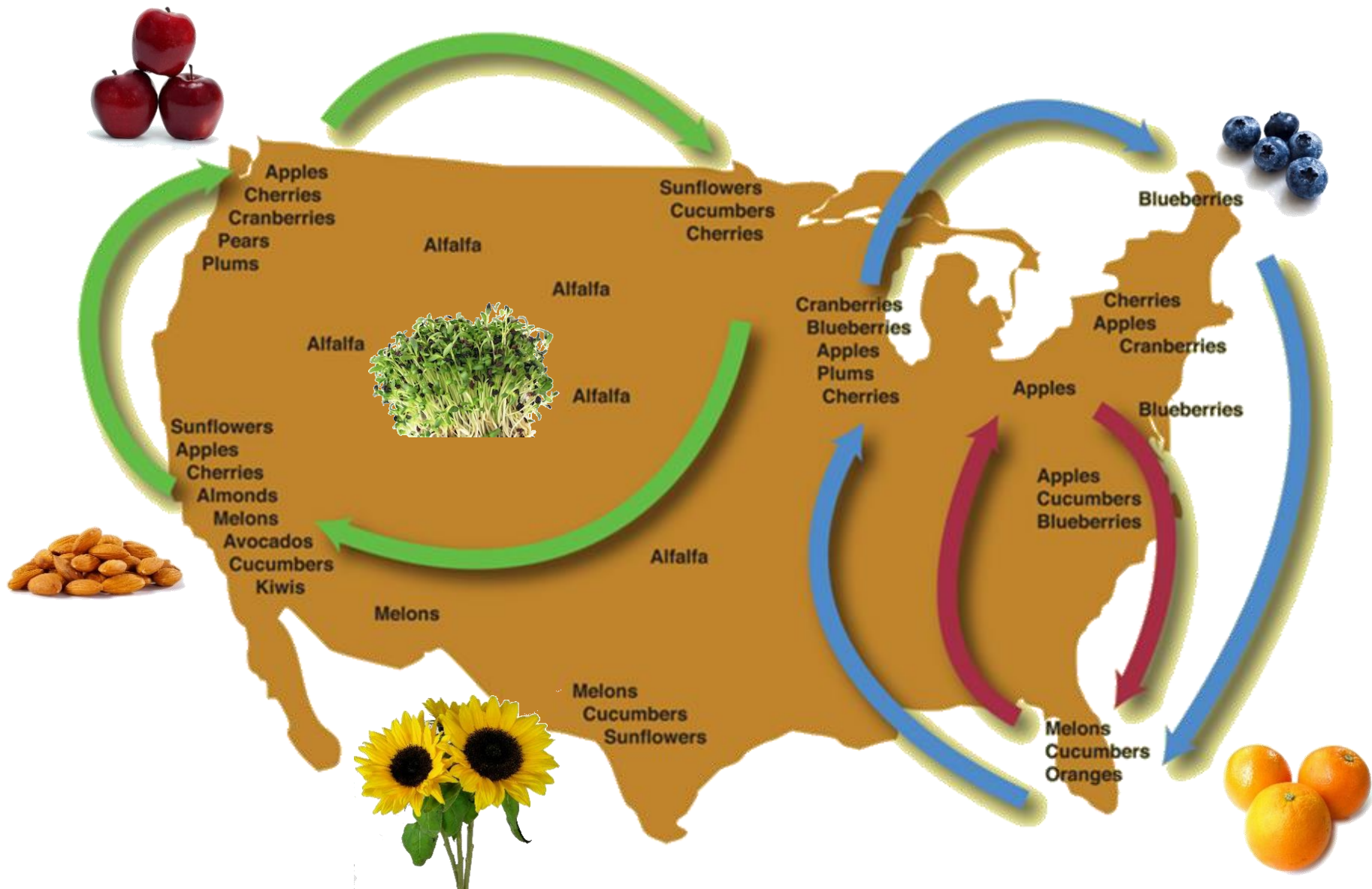




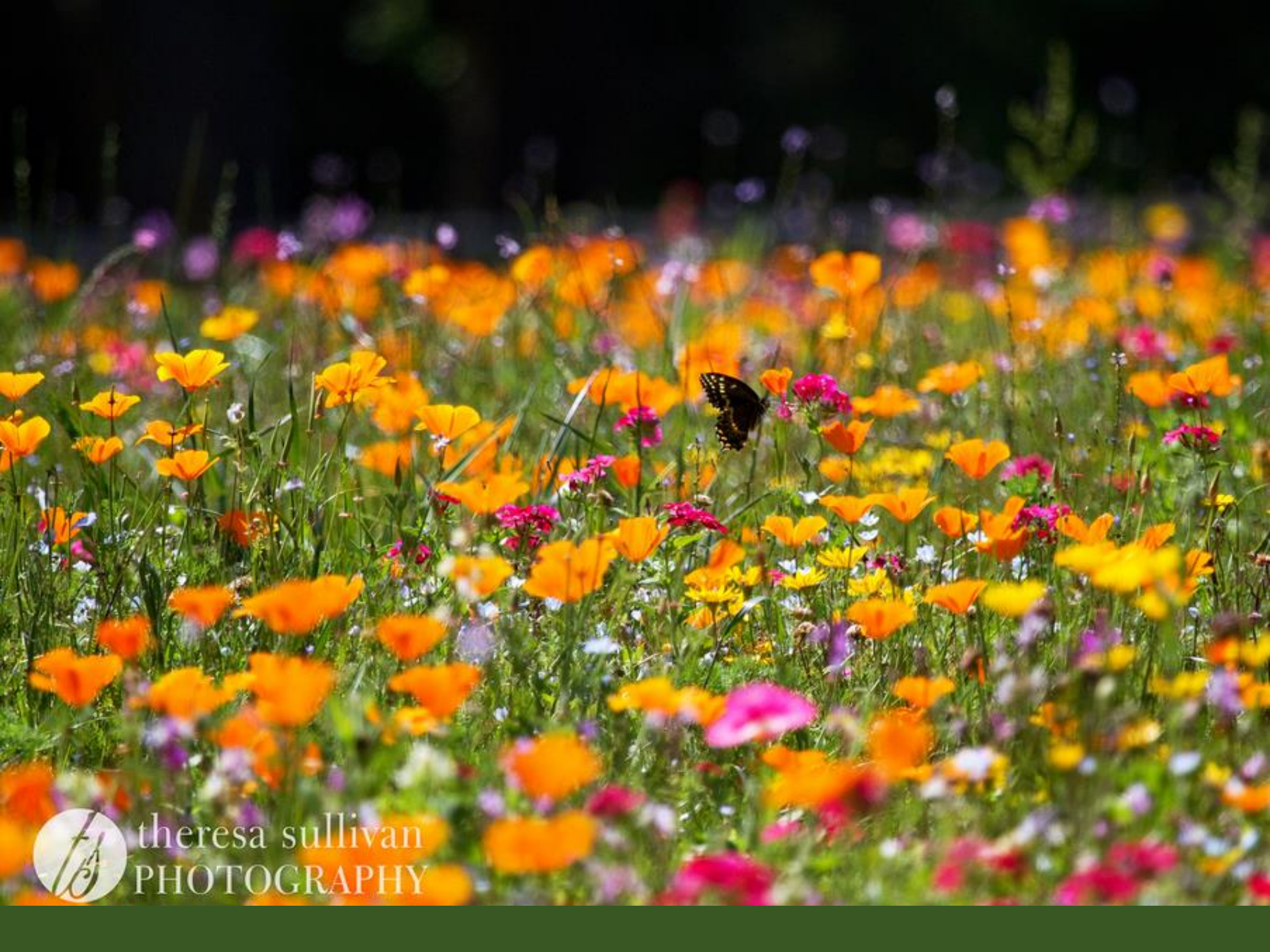


Picture your favorite food...









theresa sullivan
PHOTOGRAPHY

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Pollinator Decline

Declining populations



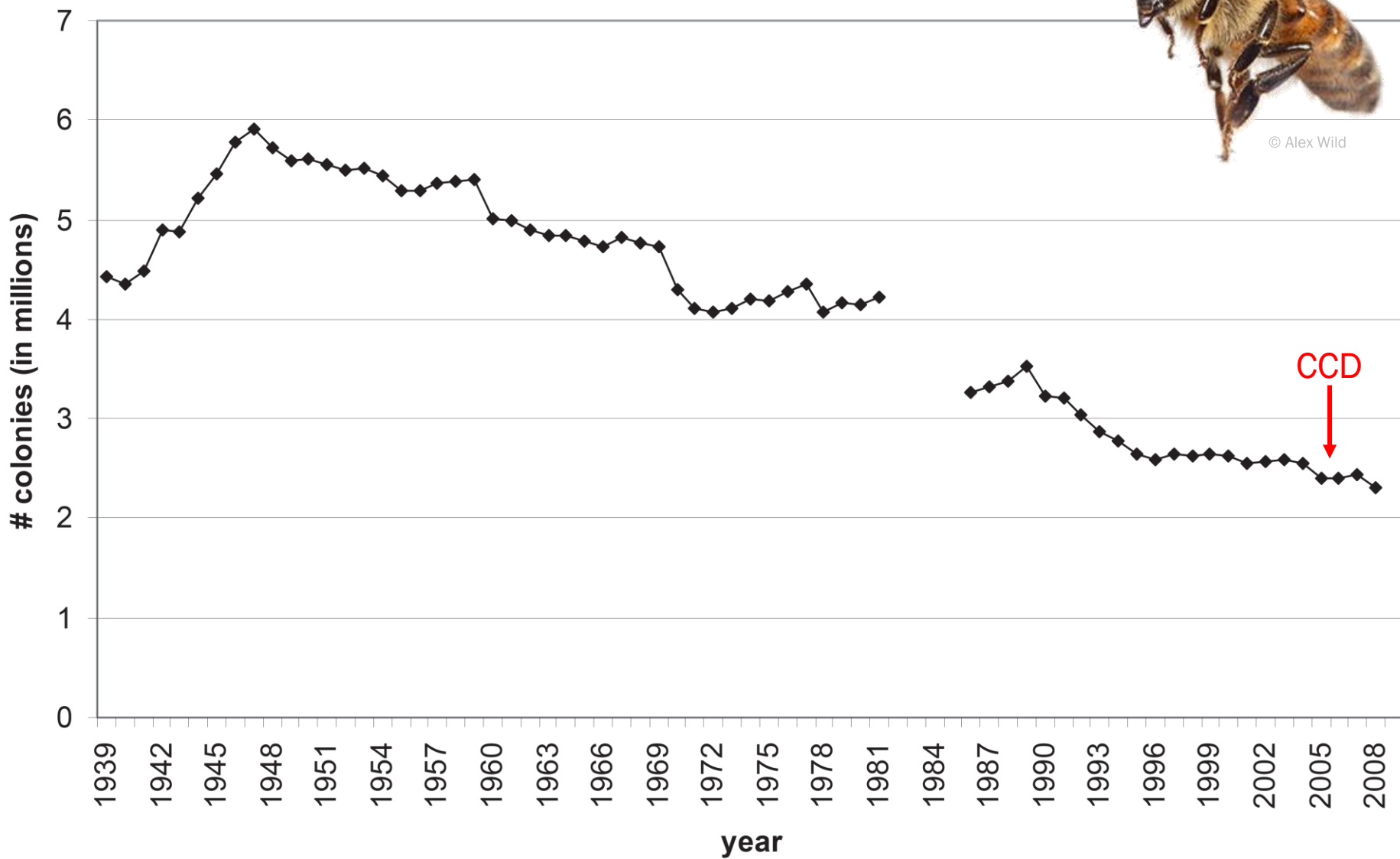
Who's in trouble?

- Honey bees
 - Steady decline since 1940s
 - 2006 → colony collapse disorder (CCD)





© Alex Wild

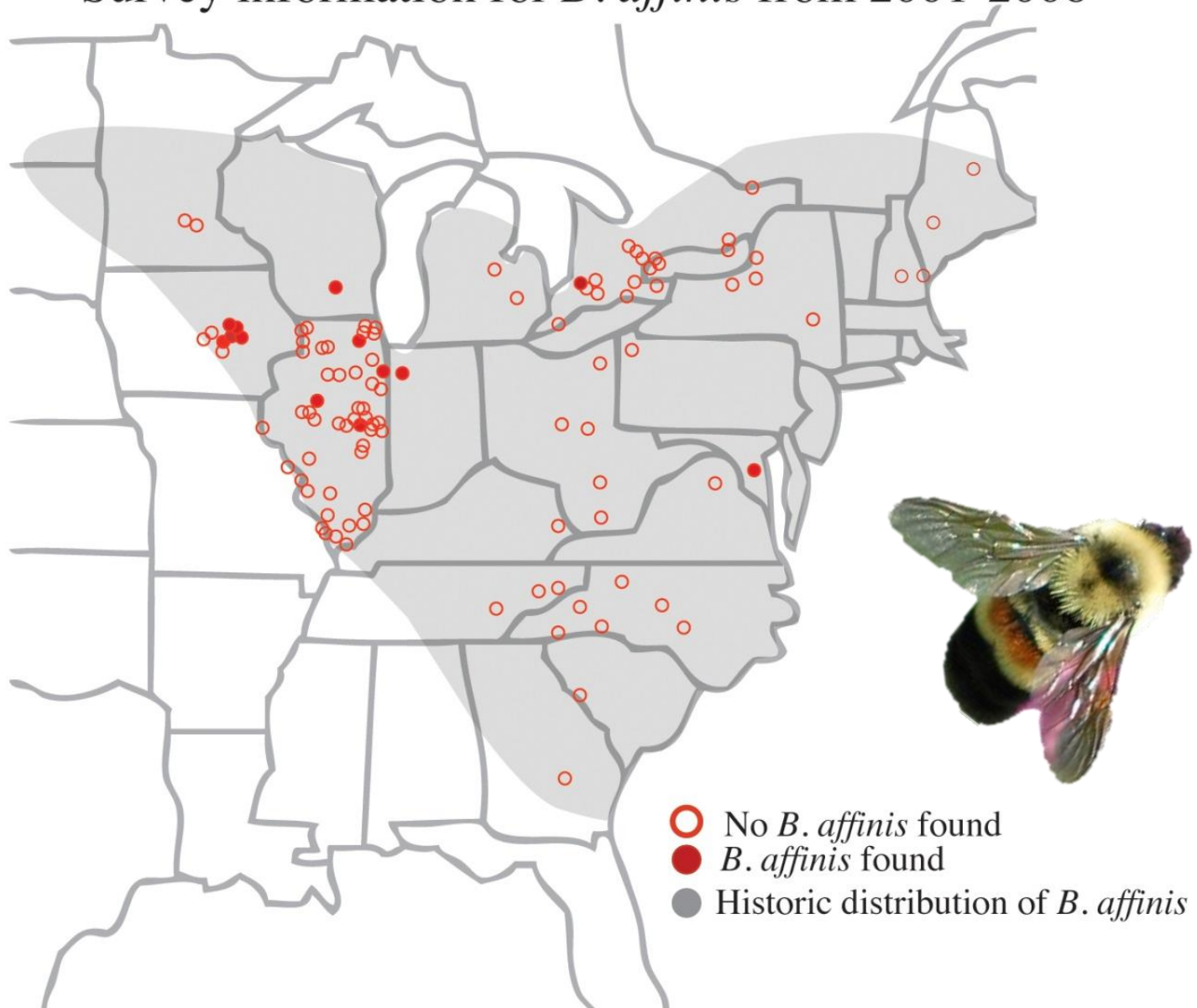


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- Bumble bees
 - 30% decline since the 1870s
 - 2012 → bumble bee scarcity syndrome



Survey information for *B. affinis* from 2001-2008



Who's in trouble?



- Honey bees
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- Solitary bees
 - 15% decline since the 1870s



Who's in trouble?

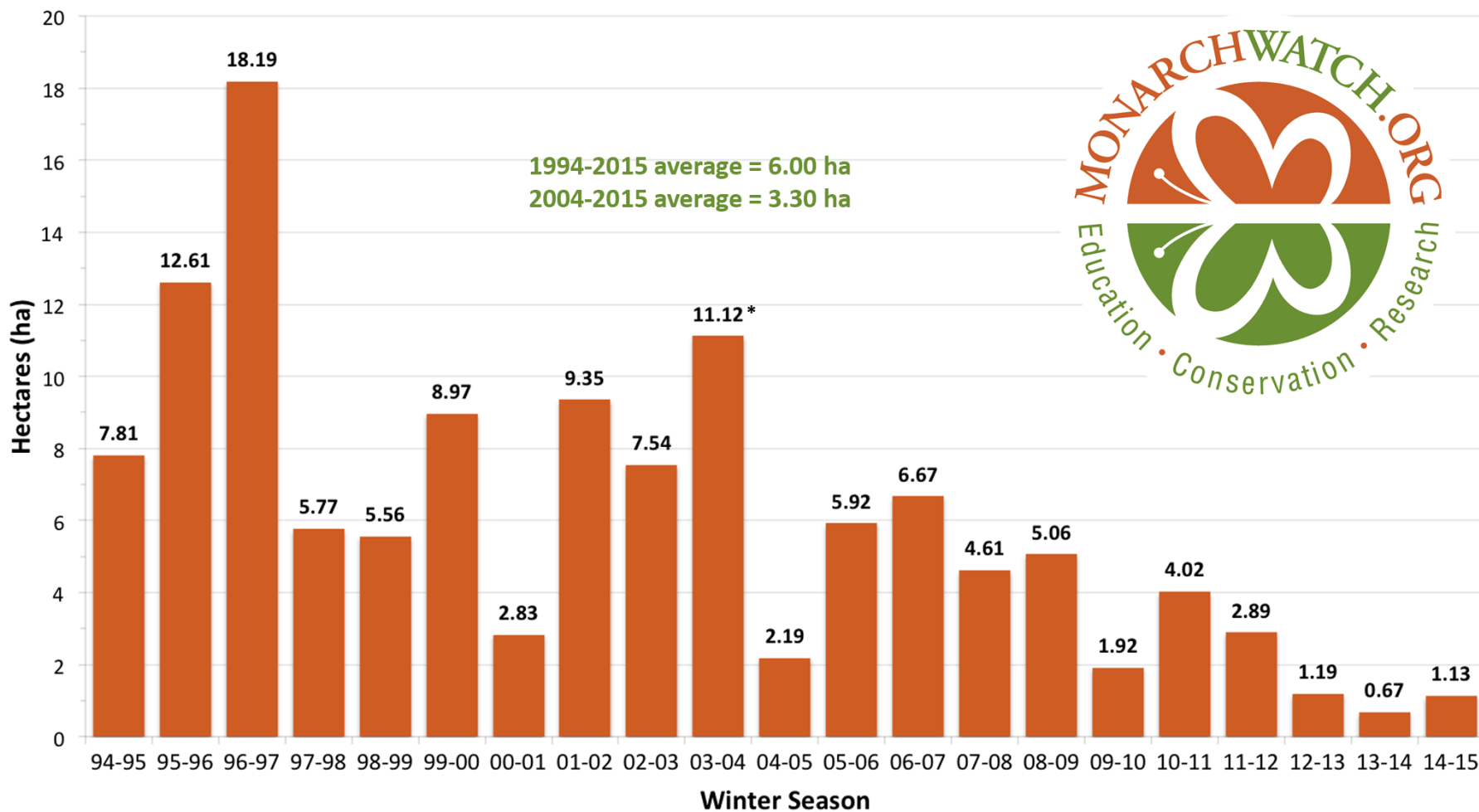


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- Solitary bees
 - 15% decline since the 1870s
- Butterflies
 - Monarchs → 80% decline since 1990s





Total Area Occupied by Monarch Colonies at Overwintering Sites in Mexico



Pollinator Decline

Why the decline?



Reasons for pollinator decline

Habitat Loss



Reasons for pollinator decline

Habitat Loss

Agricultural &
Grazing
Practices



Reasons for pollinator decline

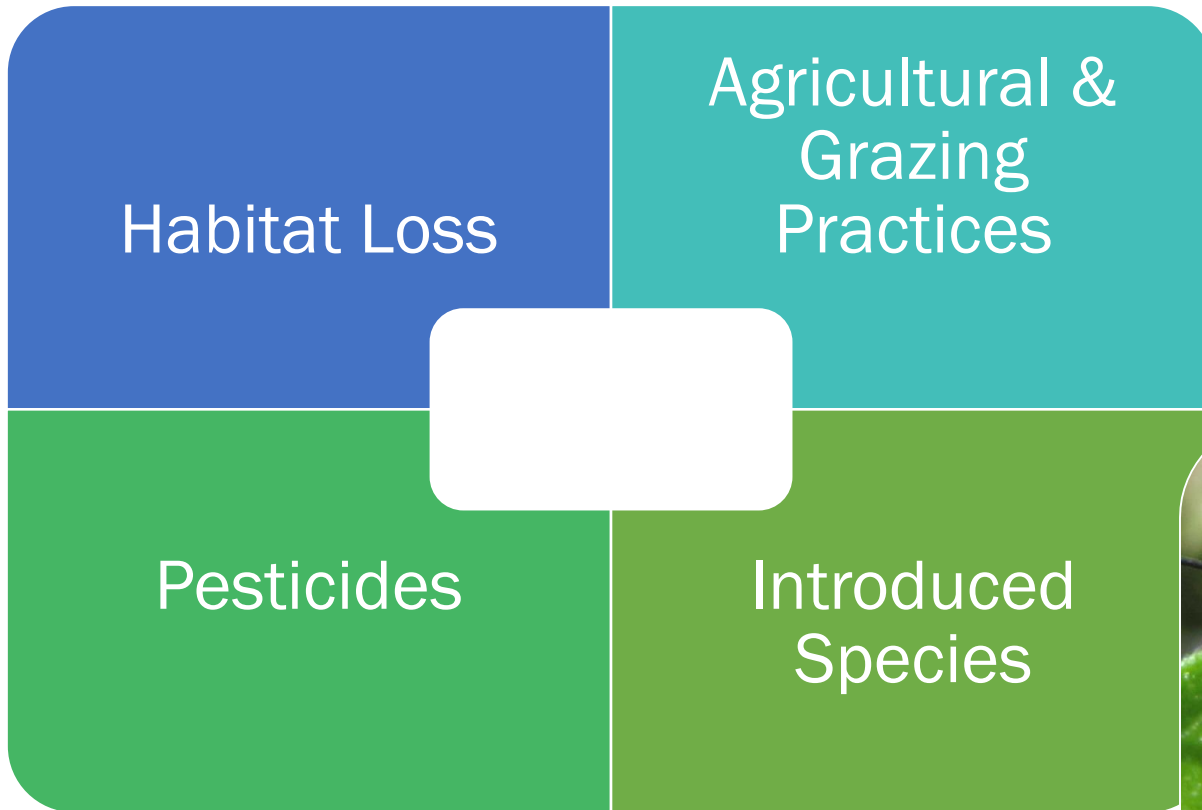
Habitat Loss

Agricultural &
Grazing
Practices

Pesticides



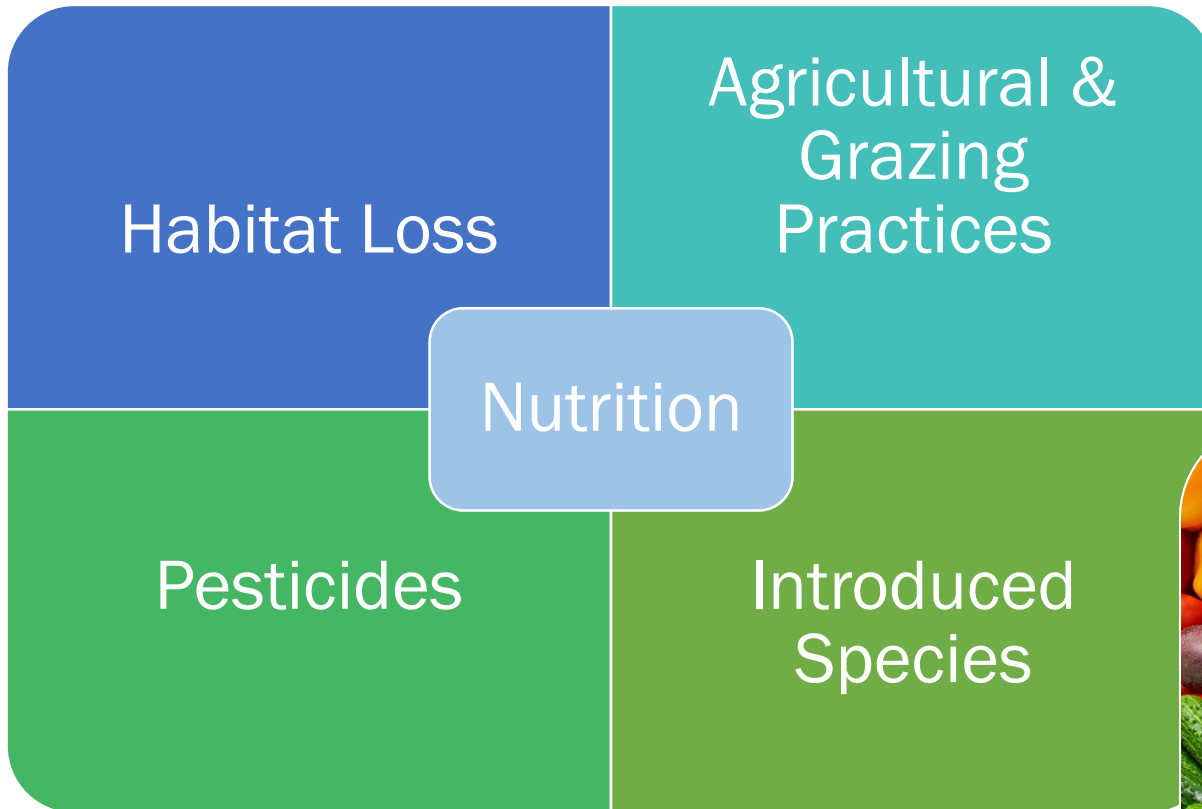
Reasons for pollinator decline



A bee battle

[Video](#): Bee Uses Deadly Force to Protect Flowers

Reasons for pollinator decline



Pollinator Decline

How can *we* help?





Bee
Lawns



Bee
Lawns



Bee
Lawns

Bee
Hotels





Bee
Lawns

Bee
Hotels



Bee
Lawns

Bee
Hotels

Bee
Smart





Bee
Lawns

Bee
Hotels

Bee
Smart

Buy
Local

Teach kids about bees!



Classroom Hives

www.classroomhives.org

Learn about and/or keep bees!



Boston Area Beekeepers Association

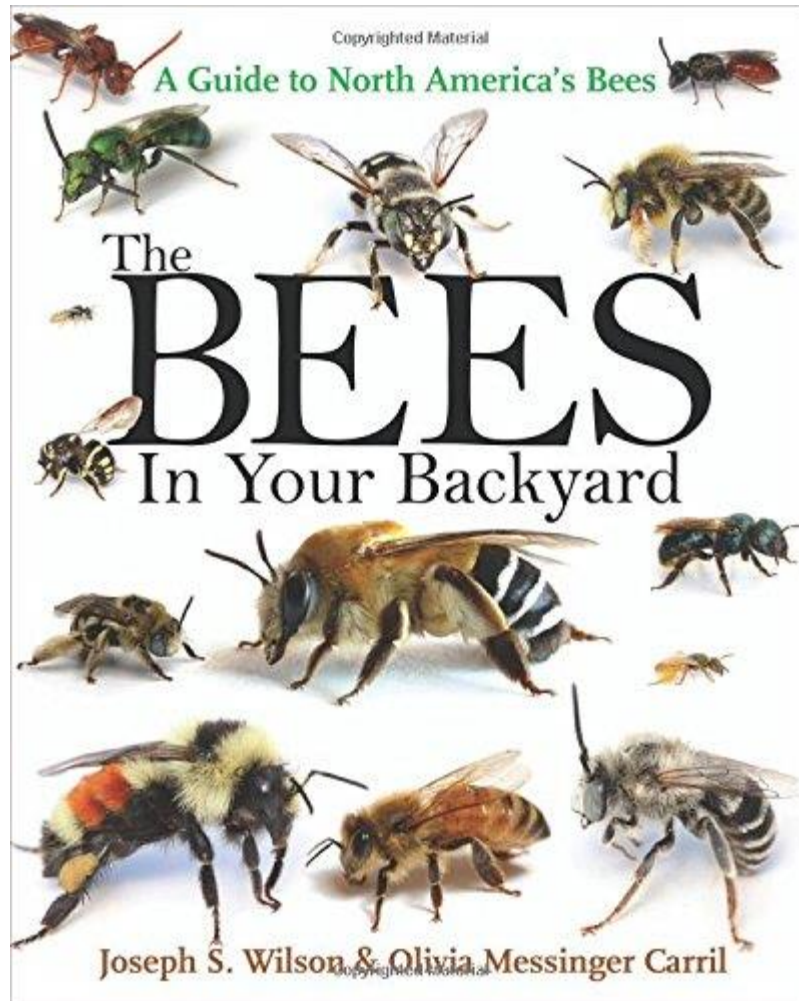
www.bostonbeekeepers.org

Where to look for more info

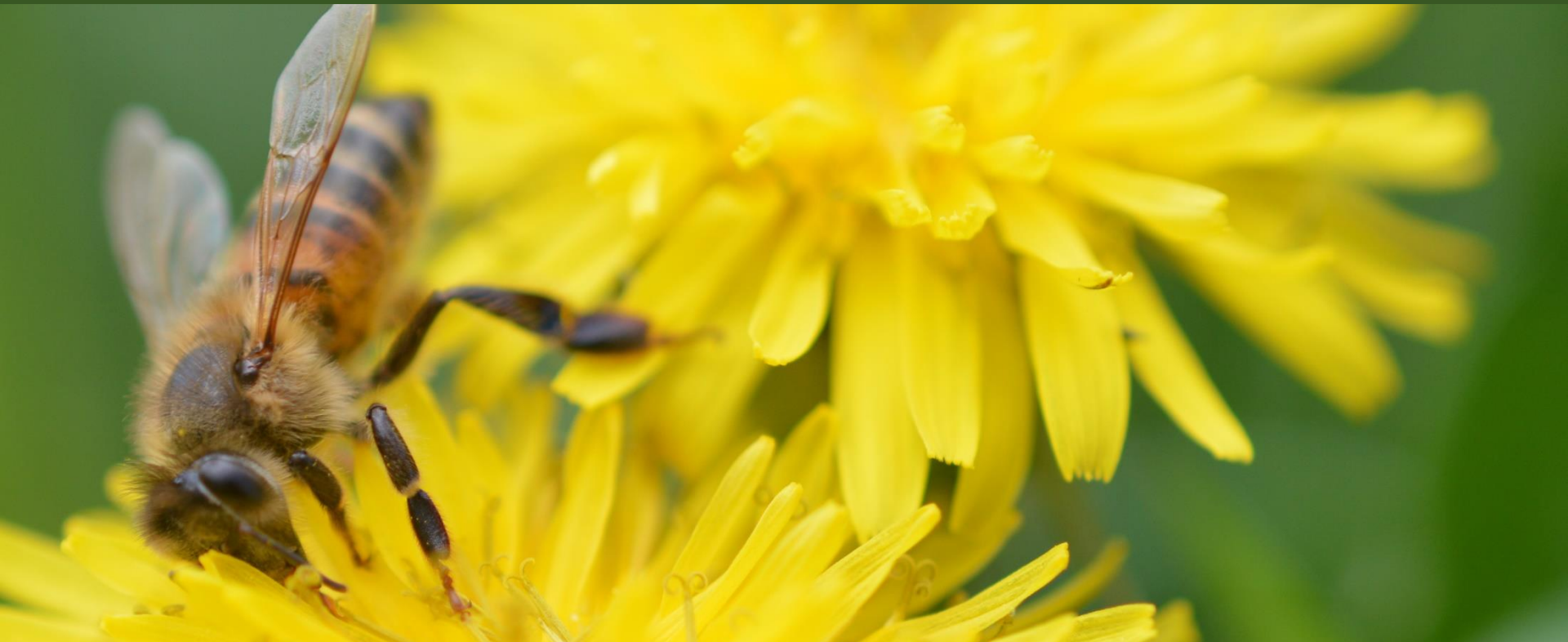
- U.S. Environmental Protection Agency
www.epa.gov/pollinator-protection
- Xerces Society for Invertebrate Conservation
www.xerces.org/pollinators-northeast-region
- Pollinator Partnership
www.pollinator.org



Where to look for more info



Thank you!
www.rachaelebonoan.com
[@RachaelEBee](https://twitter.com/RachaelEBee)



Rachael E. Bonoan ❁ Melrose Public Library ❁ May 17, 2017