

A BEGINNERS GUIDE TO POLLINATORS

Honey Bees vs. Native Pollinators

Presented by Jessie Collison

Presentaton Overview

TOPICS WE WILL COVER

Definition of Pollination

Honey Bees vs. Native Pollinators

Main 7 Pollinator Categories

Pollinator Preferences

Identification Basics

Colony Collapse Disorder

Native Pollinator Decline

What you can do!



What is Pollination?

THE BASICS

What is pollination?

- The movement of pollen between flowers, thus enabling their fertilization.
- Any organism that visits flowers for pollen or nectar is a pollinator

Pollinator Preferences

Different species visiting frequency varies depending on their preferences

- a. Flower odor/color/shape
- b. Foraging practices
- c. Physical Characteristics

Pollinator Syndrome: the association of floral characteristics and pollination method



POLLINATORS RESPONSIBLE FOR MUCH OF OUR FOOD

90% of flowering plants require an animal
pollinator to reproduce

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In British Columbia, about 1/3 of our birds and
mammals have pollinator-dependent fruits and
seeds as a major part of their diet

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World-wide, the volume of agricultural production
dependent on animal (ie.not wind) pollination has
increased by 300 per cent during the past 50 years

Bees Most Efficient Pollinators

WHY?

Flowers and Bees evolved together

Body parts used for the specific purpose of carrying pollen; hairy bodies assist in carrying pollen as well

Anything that visits a flower can pollinate

BUT

Southern BC Bees make 75-90% pollination visits



Honey Bees

MOST POPULAR POLLINATOR

EASY TO MANAGE

Live in tight knit colonies
Survive overwinter
Able to transport

HARDEST WORKER IN AGRICULTURE

Transported all across
country for seasonal
blooms

PRODUCTION OF BI PRODUCTS

Honey
Bees wax
Bee Pollen
Propolis

Native Pollinators

HIGH DIVERSITY

20 000 species worldwide; 900 in Canada
450 different species of Bees in BC, over 380
of these native to Canada
Okanagan supports highest pollinator density



NOT JUST BEES!

Other categories include

1. Wasps
2. Flies
3. Beetles
4. Birds
5. Butterflies
6. Bats.

Seven Categories

HONEY BEES
Apis Mellifera



BUMBLE BEES
Bombus



HAIRY BELLY BEES
Megachilidae



MINING BEES
Andrenidae, Halictidae,
Colletidae



HOVER FLIES
Syrphidae



WASPS
Vespidae



BUTTERFLIES
Lepodoptera



Identification Confusion

5 DISTINGUISHING CHARACTERISTICS



NUMBER OF
WINGS

Four vs. Two

ANTENNA
LENGTH

Long or short?

BODY SHAPE

Round, narrow
bodies, narrow
waist?

PRESENCE OF
A SCOPA

Hair present on
body for carrying
pollen

WHERE IS
THE POLLEN?

Lots of pollen on
belly or legs?

Body Morphology



NUMBER OF WINGS

hover flies (2 wings)
bees and wasps (4 wings)



ANTENNA LENGTH

hover flies (short antenna)



BODY SHAPE

narrow bodied vs. round
compare bumble bee to wasp

Presence of a Scopa

WHAT IS A SCOPA?

Visible feather like hairs found on abdomen or inside legs of female bees

- Aid in pollination

FOUND ON ALL BEE SPECIES NOT ON HOVER FLIES AND WASPS



Where does it carry pollen?

TAKE A CLOSER LOOK



POLLEN BASKETS
Honey bees and Bumble
bees



POLLEN ON BELLY
Hairy Belly Bees



POLLEN PANTS
Mining Bees

Category 1 - Honey Bees

Apis mellifera

Not Native; need bee keepers in BC to survive
Honey stores for food overwinter
Complex colonies composed of tens of thousand

MAIN CHARACTERISTICS

- a. Four wings
- b. Pollen Baskets
- c. Long Bodied and Fuzzy
- d. Black and Yellow Stripes



Queen Bee In Action

Three Roles In The Hive

LADIES RUN THE SHOW

QUEEN BEE

One and only
Egg layer
Fertilized egg, fed royal
jelly

WORKERS

Name says it all
Collect pollen, nectar,
maintain hive health
Fertilized egg

DRONES

Sole purpose is to mate
with queen
Mate with different
colonies queens
Unfertilized egg

Category 1 - Bumble Bee

Bombus

35 species in British Columbia

Generalists

Form small colonies; similar to honey bees

MAIN CHARACTERISTICS

- a. Four wings
- b. Pollen Baskets
- c. Robust, Round Bodies
- d. Fuzzy
- e. Loud Buzzing
- f. Variety of colors: yellow black and orange



Photo by Robert
Lalonde



Sub Species of Bombus



BOMBUS
VOSNESENSKII



BOMBUS NEVADENSIS



BOMBUS
OCCIDENTALIS

Category 3 - Hairy Belly Bees

Megachilidae

Named based on location of scopa

Solitary lives

Utilize bee homes

MAIN CHARACTERISTICS

- a. Four Wings
- b. Small, round bodied
- c. Hairy bellies
- d. Dark colored or metallic blue or green



SUB SPECIES OF HAIRY BELLY BEES

- a. Mason Bees
 - plug tunnels with mud
- b. Leafcutter Bees
 - plug tunnels with leaves and petals



BEE HOMES

Provides ideal nesting for hairy belly bees
Boxes stuffed with bamboo, moss pinecones
etc.

Can clean out each fall but need to replace
materials



Category 4 - Mining Bees

Andrenidae, Halictidae, Colletidae

Category composed of multiple families

Solitary bees

Wear pollen pants

MAIN CHARACTERISTICS

- a. Four Wings
- b. Small, narrow bodied
- c. Minimal hair
- d. Dark colored or metallic green

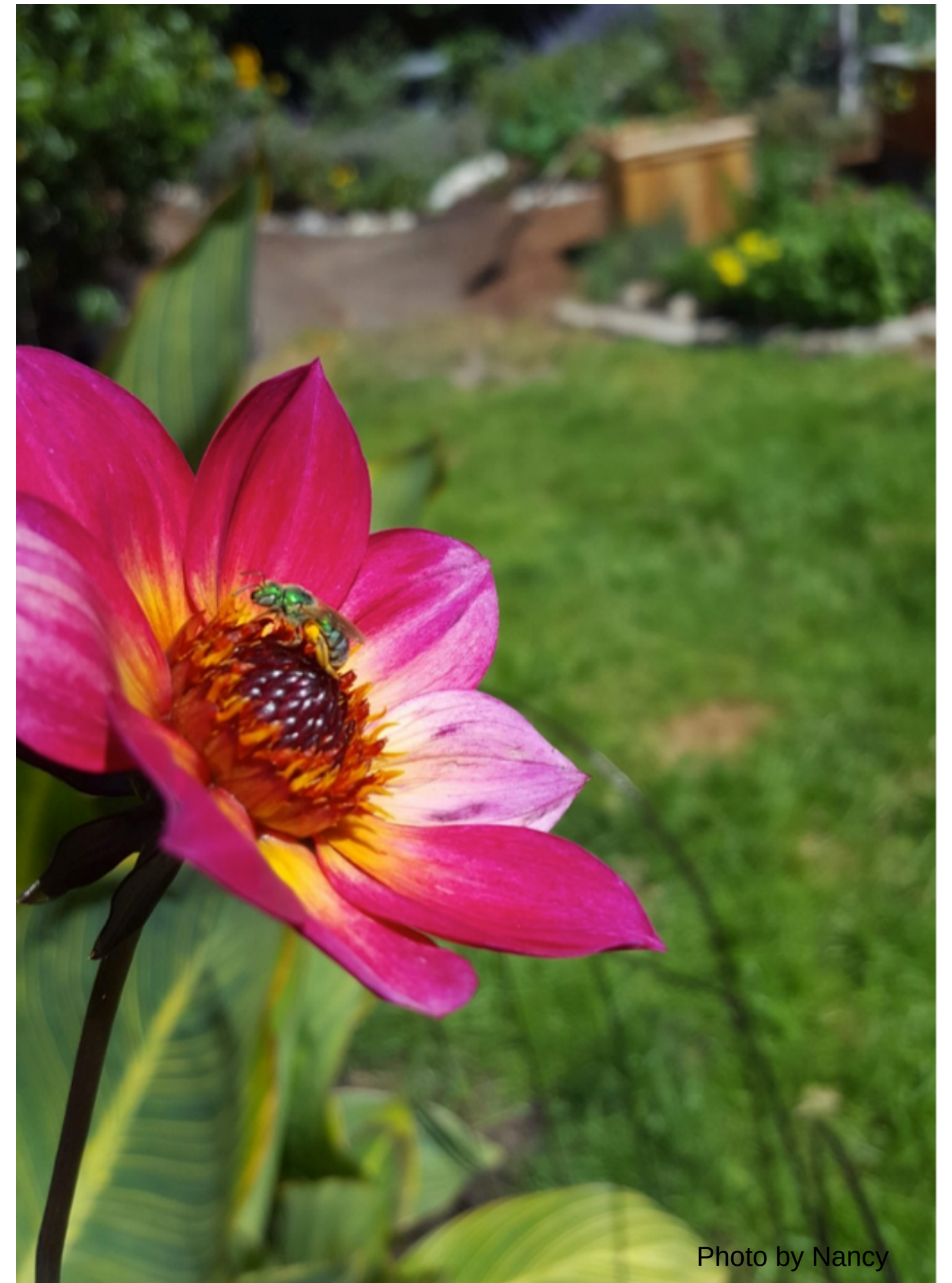


Photo by Nancy

Category 5 - Hover

Flies

Syrphidae

Similar coloring to bees

Dominate high elevation habitats

- Prefer open faced flowers

MAIN CHARACTERISTICS

- a. Large bulging eyes, take up face
- b. Two wings
- c. Short Antenna
- d. Black and yellow stripes
- e. Hover and stop abruptly



Category 6 - Wasps

Vespidae

Omnivores

Diverse, belong to multiple taxonomic families

Vespidae; most common in BC

Form colonies, similar to honey bees

MAIN CHARACTERISTICS

- a. Four Wings
- b. Long, narrow body
- c. Lack a scopa
- d. Shiny
- e. Yellow and black stripes, come all black



Category 7 - Butterflies

High diversity; vary in size and color

187 species in BC

Commonly found in meadow areas

Pollinate during the day vs. moths at night

MAIN CHARACTERISTICS

- a. Four large wings
- b. Colorful
- c. Patterns





BUT

Pollinators are at Risk!

MULTIPLE FACTORS LEADING TO THEIR DECILINE

Habitat Loss - Pesticide Use - Climate Change - Poor Diet

COLONY COLLAPSE DISORDER

What is it?

Characterized by large scale die off of bee colonies

2006 31% hives lost (USA)

2007 35% hives were lost (USA)



NATIVE POLLINATOR DECLINE

Not just honey bees on the decline

Other bee populations including solitary and social bumblebees on the decline

- Due to increase spread of disease
- Habitat loss
- Exposure to pesticides
- Potential synergistic effects

What's going
on?

**NATIVE BEES ARE EXPERIENCING
SIMILAR THREATS AS HONEY BEES
WITH ADDITIONAL STRESSORS....**

- Habitat loss (from 2002 to 2010, over 8.3 million acres of farmland and natural habitat succumbed to the bulldozer's blade)

- Climate Change

- Invasive Species Competition for resources (and sadly, one of those invasive species is the honey bee.)

All of the above PLUS the insecticides, diseases, mites, etc. that are killing off honey bees in huge numbers.

Effects Of Synergy

WHAT IS SYNERGY?

The interaction of two or more substances that produce a combined effect greater than the sum of their separate effects

Aka. One plus one vastly exceeds two

Research looking for lethal combinations of stressors

- Mark Winston discusses what we can learn from honey bees
- Frontline research subjects
- Warning system that other pollinators and even humans may be susceptible to synergy

What We Can Do!

GET INVOLVED

Many resources!

Build bee friendly gardens and habitats

Plant native plants

Build bee homes

SUPPORT LOCAL FARMS

Organic, little to no pesticide use

Small time farms = no green desert

HABITAT AND RESTORATION

Working in community

Creating a bee meadow, public pollinator garden

etc.



Photo by David
Murray

