



# Afternoon Workshop, Track A: **Pollinator Conservation Strategies**

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## **Topics**

- Identifying Pollinators
- Surveying Pollinators
- Creating Pollinator Habitat
- Monitoring & Retaining Pollinators

Photo: Matthew Shepherd, Xerxes

# Identifying Pollinators

- Important mainly at the technical level, i.e. for verifying success
- Challenging at first to make meaningful lists
- Pollinators are often small, difficult to distinguish, work intermittently, and are fast, i.e. hard to see!
- Clues as you learn:

## Behavior

Watch how the insect moves, how it feeds from the flower, what it does away from the flower

## Morphology

Size, color, wings, antennae, pollen-carrying areas, hairiness

## Flower Associations

Some flowers attract particular pollinators, e.g. moth & hummingbird flowers.

Color: bees prefer blue and yellow (but honey bees will visit almost any flower that has available nectar.)

Shape: long nectar tubes for large bees and humming birds.

Odor: stinky flowers may attract primarily flies &/or beetles (sometimes yellow jacket wasps)



Most common, most effective pollinators, best indicate a healthy landscape

- **Honey bees:** common, numerous, very good pollinators, may or may not be good indicators
- **Bumble bees:** sensitive to disturbance, require particular nesting habitat, very effective pollinators, excellent indicators
- **Mason bees:** require particular nesting habitat, specialist pollinators, good indicators
- **Misc. Solitary bees:** a diversity indicates a pollinator-healthy landscape
- **Butterflies:** certain species can be common, good indicators if numerous, diverse.



# Identifying Bees



## THE COMMON BEES OF CALIFORNIA

GRETCHEN LEBURN ILLUSTRATIONS BY NOEL B. PUGH



- *With experience*, you should be able to identify most bees to family.
- Species- or genus-level surveys must be assisted by a professional.
- Take close-up photos if possible; some i.d. can be made from those by bee specialists.
- Most easily identified are generally the most valuable in gauging success.
- Check local resources [e.g. Urban Pollination Project: [nwpollination.org](http://nwpollination.org)]

Most easily identifiable bees for beginners in Puget Sound area, chief characters, and likely taxonomic level of i.d.

**Honey bees**, moderate size, sparse hair, pollen on hind legs in pellets, species

**Bumble bees**, very hairy, medium to large (size varies), distinct color stripes, pollen on hind legs in pellets, species (out of 6-8 species or at least to genus)

**Mason bees** (Blue Orchard Bee and others in genus), small to medium, metallic color, pollen carried on underside of abdomen, genus (maybe species for BOB)

**Leafcutting bees**, small to medium, grayish, pollen carried on underside of abdomen, family

**Other solitary bees** (from 5 families), minute to medium size, color and form varies, pollen carried at base of hind &/or middle legs if visible, superfamily, i.e. "bee"

## Pollinator identification issues

- Bumble bees vary in size throughout the season with early spring workers being very small and late season workers being nearly queen-size.
- “Buzz” pollination can only be done by bumble bees and a few other species; honey bees don’t do it.
- Some parasitic bees (“cuckoo bees”) look very wasp-like. They do not collect pollen and are less hairy and less numerous than other bees but still visit flowers for nectar.
- Male bees, somewhat like parasitic bees, are often less hairy than females, often differently colored, and never collect pollen (although they may still spread it and pollinate.)
- Some very small solitary bees are hard to see except with a magnifying lens; they are still important!
- Flies, beetles, and moths are often discounted as pollinators but are still important!

Photo: Matthew Shepherd, Xeno's



*Bombus lapidarius* queen and male mating



Bumblebee.org



# Difficult Identification Cases

- Butterfly or Moth?

Butterflies: daytime flight, colorful, slower wingbeat

Moths: evening/morning or night, generally more drab, fast-flying

Exceptions: day-flying hawk moths, skippers

- Fly or Bee?

Flies: two wings + halteres (but can be hard to see), very short antennae, generally less hairy, do not purposely collect pollen, spend more time away from flower

Bees: two pair of clear wings (but can be hard to see), distinct antennae, very hairy, amass pollen on their legs or lower abdomen, almost always busy at the flower

Exceptions: bumble bee mimicking hover flies (hairy), many parasitic bees (not very hairy)

- Bee or Beetle?

Beetles always have hard front wing covers (elytra), although they may display very bee-like colors. Beetles are relatively slow-moving.

## Complex Relationships:

- Many pollinators as adults are garden, ornamental, or structural pests as larvae, e.g. Cabbage Butterfly, Carpenter Bee (south of our area).

- Some pollinators may also be beneficial predators and/or nuisance pests, e.g. Bald Face Hornet

# Difficult Identification Cases



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Photo: Matthew Shepherd, Kenes



## Surveying Pollinators – Ideas

- Pollinator surveys are the best proof of success but are not easy to do.
- Specialists will probably be part of the team in order to make a meaningful list.
- Work should be spread across all flower seasons, i.e. several surveys.
- Preliminary (“before”) data should be collected first.
- A multiple-year survey is best.
- Each survey should take several hours and may require several people.
- Traps and nesting materials can help if used appropriately.
- The most accurate information comes from a specimen collection; lesser but still useful results can come from visual checklists.
- It will require hundreds or thousands of records and/or specimens to make a meaningful survey. A small reference collection can help guide identification efforts.
- Short of surveys, maintaining a diverse, protected flowering landscape with pollinator requirements discussed earlier will probably increase the pollinator diversity and density.

# Surveying Pollinators – Ideas

## CHECKLIST: What I have seen

Picture	Name	Date	✓
	Common Black Ant		
	Southern Red Fire Ant		
	Bumble Bee		
	Honey Bee		
	Click Beetle		
	Firefly (Lightning Bug)		
	Japanese Beetle		
	June Bug		
	Ladybug		
	Box Elder (True Bug)		
	Cabbage Butterfly		



# Tools for surveying pollinators and/or augmenting pollinator habitat

## Natural materials

Pithy stems (yard waste, elderberry stems), leafcutting and small carpenter bees

Hollow reeds, cavity nesting bees and wasps

Holes drilled in stumps or waste wood, cavity nesting bees and wasps

## Constructed materials

Leafcutting and mason bee nest boxes, various designs

Bumble bee boxes, some species more amenable than others

Butterfly shelters, various species (used for pupal shelter)

## Traps

Colored bowls, bees, wasps, flies

Malaise traps, technical and expensive, many flying insects

Pipe traps

# Tools for surveying pollinators and augmenting habitat



# Creating Pollinator-friendly Landscapes

*Brief summary:*

Resources

Food

Basic nutrition: nectar + pollen

Butterfly/Bee garden plant lists: many

Local expertise, academic, nurseries

Nesting Resources

Bare ground

Dead stems, downed wood

Protection

Limit or eliminate toxins

Arrange for carefully managed applications on adjacent land

Reduce traffic in potential nesting areas

Photo: Matthew Shepherd, Xerxes

# Creating Pollinator-friendly Landscapes

## Special landscape features

Hedgerows, fallow fields, rock piles, ponds

## Considerations

Attracting pollinators may take a long time, possibly several years; be patient.

Noting increase in fruit set of certain pollinator-dependent plants may be a good indicator of success.

Creating vibrant pollinator habitat will make the landscape more healthy and diverse for many other life forms.

## Education & Engagement

Involve the local community: teachers, naturalists, beekeepers

Seek Advice/Resources

Cooperate with specialists if possible

- Horticulturists
- Beekeepers
- Extension Agents
- University students

Photo: Matthew Shepherd, Xerxes

# Creating Pollinator-friendly Landscapes

What we are learning about how to conserve pollinators is informed by agriculture, although the knowledge and techniques can apply to landscaping.

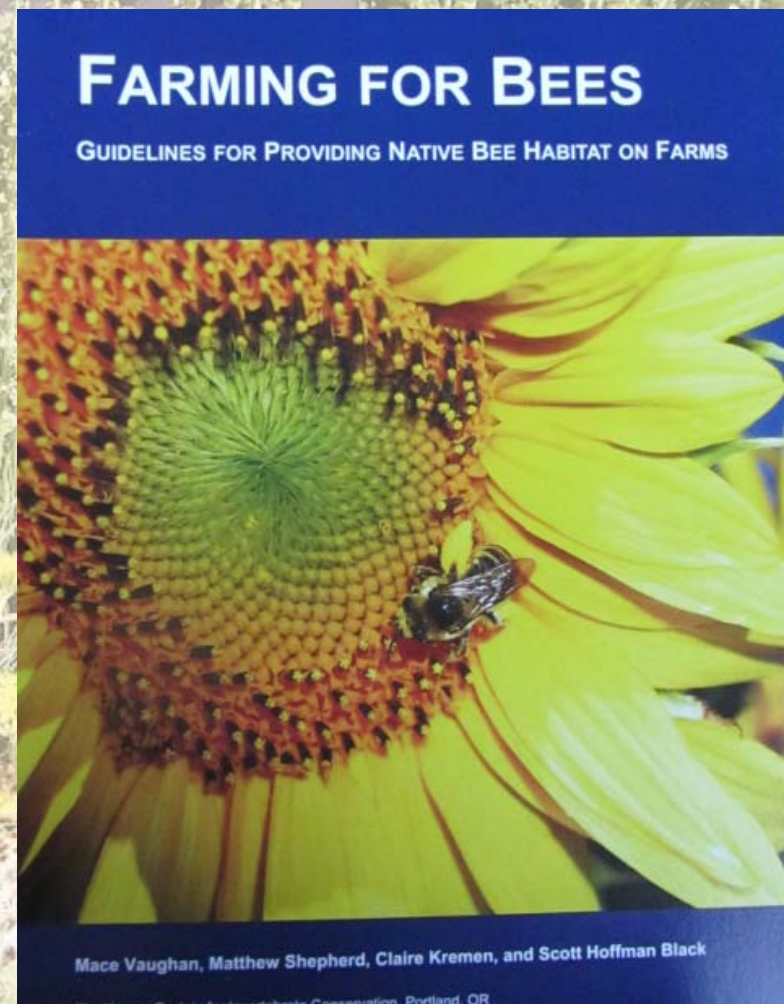
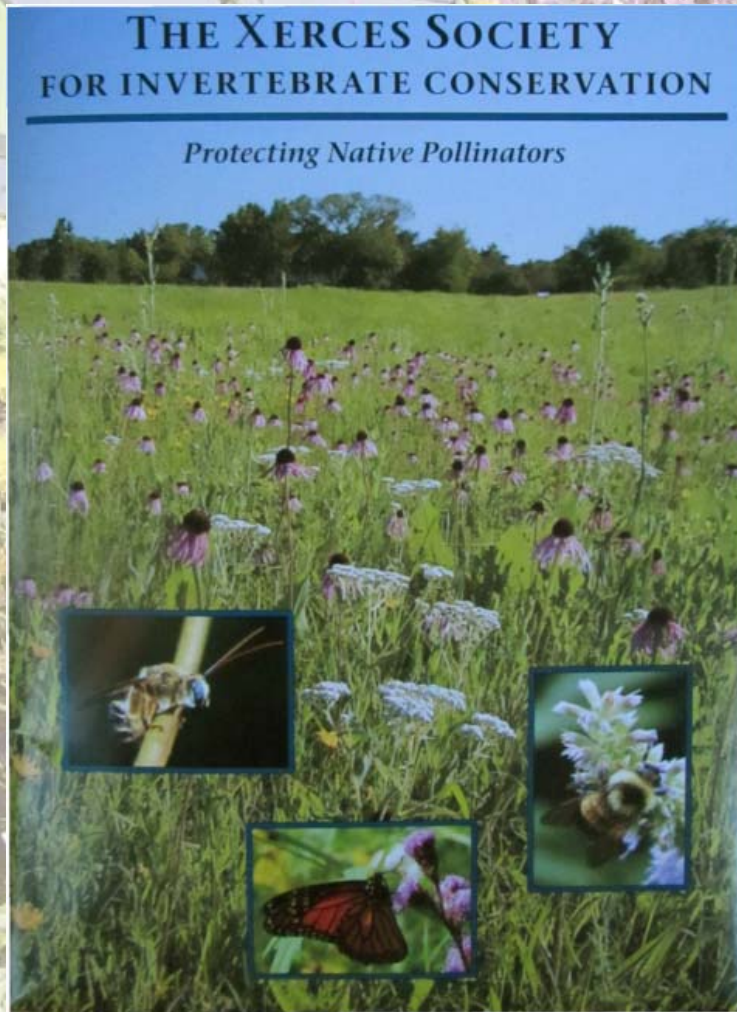
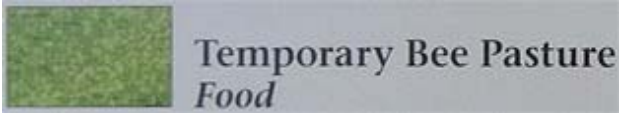
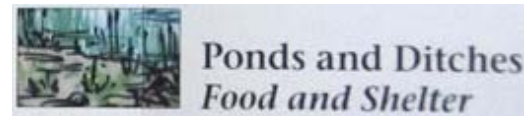


Photo: Matthew Shepherd, Xerces Society



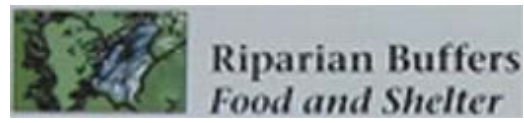
Temporary Bee Pasture  
*Food*



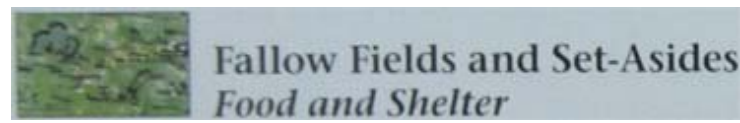
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*Food and Shelter*



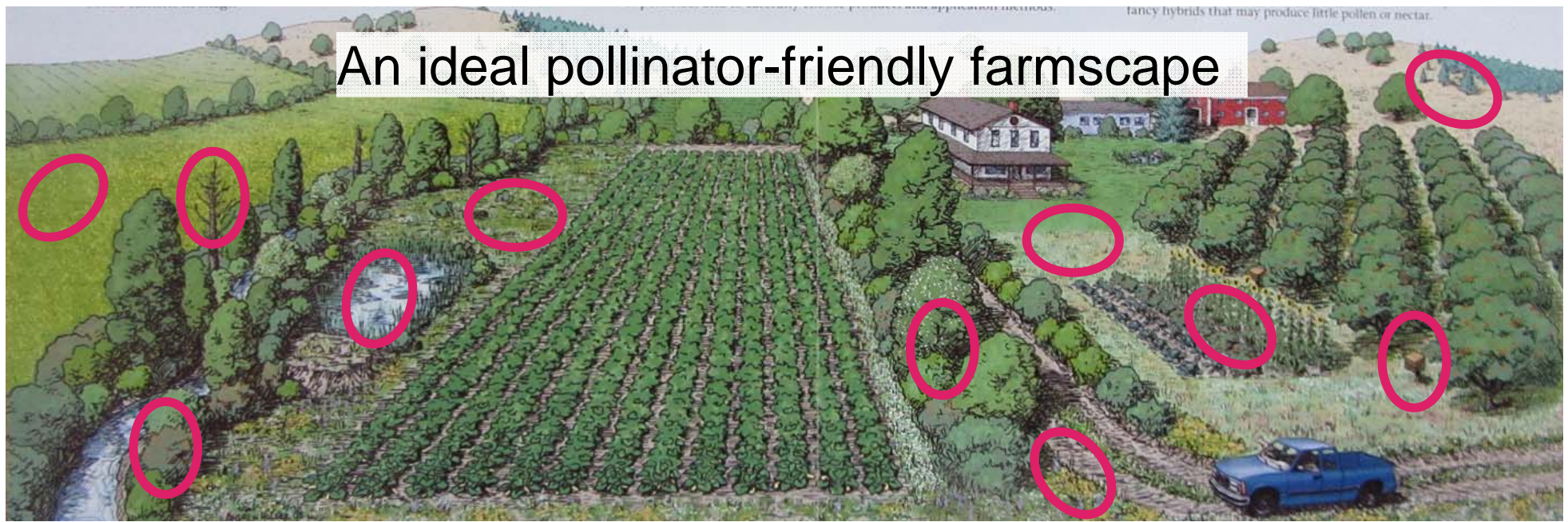
Snags  
*Shelter*



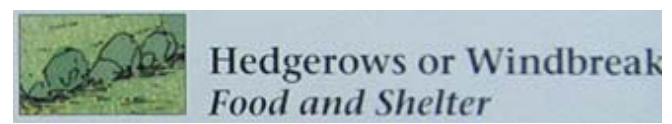
Riparian Buffers  
*Food and Shelter*



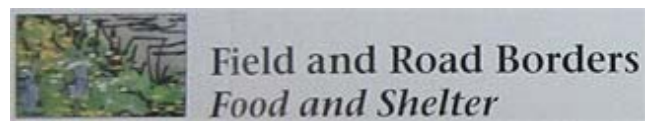
Fallow Fields and Set-Asides  
*Food and Shelter*



# An ideal pollinator-friendly farmscape



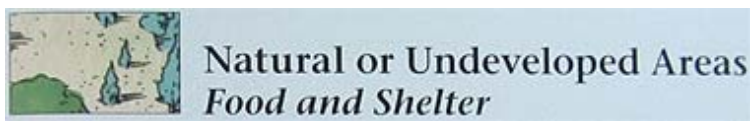
Hedgerows or Windbreak  
*Food and Shelter*



Field and Road Borders  
*Food and Shelter*



Gardens  
*Food*



Natural or Undeveloped Areas  
*Food and Shelter*



Cover Crops  
*Food*



Artificial Nests  
*Shelter*



# Pollinator forage/nesting areas on berry farms



# Pollinator-friendly habitat in a Seattle garden/backyard.

(Also supports honey bee hives.)





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Photo: Matthew Shepherd, Xerces Society