

## CENTRAL TEXAS KEY POLLINATORS



Nectaring housefly 1

**ORDER DIPTERA - Flies**  
two wings (one pair),  
bristles don't carry pollen,  
have short thick antennae,  
eat nectar, pollen, detritus



Syrphid or hover flies 2

### ORDER HYMENOPTERA

#### Wasps, Bees, and Ants

**Wasps** - four wings (two pairs),  
not hairy or few hairs don't carry pollen,  
short elbowed antennae, pinched abdomen,  
carnivorous diet plus nectar, some feed pollen to young



Yellow jacket (top)  
Fig wasp (left)  
Paper wasp (right)



Oil-collecting bee 7

**Bees** - four wings (two pairs),  
pollen carried on branched hair or in baskets  
(patches are *scopa*, baskets are *corbicula*),  
long elbowed antennae,  
like wasps: distinct head, thorax & abdomen,  
herbivorous diet of pollen & nectar  
**Oligolectic**: collect pollen of few plant groups  
**Polylectic**: collect pollen of many groups

## BEEES OF CENTRAL TEXAS – GENERAL GUIDE

### Honey Bees (non-native)

*Apis mellifera*, *Apidae* Family

**Size**: medium, **Shape**: robust (worker bees are *apiform*)  
**Color**: amber to black, stripes on abdomen  
**Hair**: fuzz on thorax, under abdomen, on head & eyes  
**Other**: ♀ has flat plate on hind legs to carry moist pollen clump  
**Behavior**: fly & buzz methodically among flowers, polylectic  
**Nesting**: highly social, females build wax honeycombs to nest in large colonies of thousands, with an egg-laying queen



Honeybees 8

Each cell has a larva (left).  
Four wings are visible below.



9



10



11

Head, thorax & segmented abdomen    Corbicula carry moist pollen clumps

[This guide uses descriptive common names based on morphology & behavior]

## Bumble Bees

*Bombus* spp. *Apidae*

**Size:** medium to very large, **Shape:** robust, bombiform  
**Color:** black with yellow bands, **Hair:** covers entire body  
**Hair:** baskets on hind legs carry moist pollen  
**Behavior:** make low buzzing sound when flying, polylectic  
**Nesting:** social, largely ground nesters



## Hairy-legged (digger, miner, chimney, longhorn) *Apidae*

**Size:** small-medium-large, **Shape:** robust, rounded, euceriform  
**Color:** striped abdomen. **Other:** males may have long antennae  
**Hair:** short, dense, velvety, brush of hair on leg or whole body.  
**Behavior:** fly quickly and smoothly, oligolectic to polylectic  
**Nesting:** solitary to communal ground nesters



## Large Carpenter Bees

*Xylocopa* spp. *Apidae*

**Size:** very large. **Shape:** robust, bombiform  
**Color:** shiny black/dark blue abdomen  
**Hair:** brush of hair on thorax, hind legs carry pollen  
**Behavior:** territorial males may buzz by you, polylectic  
**Nesting:** solitary cavity nesters, nest in soft wood



## Striped Hairy Belly Bee (leafcutter, carders) *Megachilidae*

**Size:** small to medium, **Shape:** slender to robust, megachiliform  
**Color:** black with silvery hairs, white stripes on abdomen  
**Hair:** brushes on abdomen underside may transport pollen  
**Behavior:** may raise abdomen while visiting flowers, polylectic  
**Nesting:** solitary cavity nesters, may line nest with leaves/hair



## Small Carpenter Bees (tiny dark)

*Ceratina* spp. *Apidae*

**Size:** tiny. **Shape:** slender, hyaleiform  
**Color:** dark blue-green, metallic, some have white face marks  
**Hair:** hairless except brushes of hair on hind leg carry pollen  
**Behavior:** move fast & jaggedly, polylectic  
**Nesting:** solitary to semi-social, cavity nesters



## Metallic Hairy Belly Bee (masons) *Osmia* spp. *Megachilidae*

**Size:** small to medium, **Shape:** stout, rounded, megachiliform  
**Color:** metallic green, blue, or blue-black  
**Hair:** brushes beneath abdomen carry pollen  
**Behavior:** observed in spring-early summer, polylectic  
**Nesting:** solitary gregarious cavity nesters



### Green Sweat Bees (metallic green)

*Halictidae*

**Size:** medium, **Shape:** slender, andreniform

**Color:** metallic green, males often with striped abdomen

**Hair:** females - brush of hair on hind legs carries pollen

**Behavior:** fast flying, often attracted to sweat, polylectic

**Nesting:** solitary to social-semi, ground nesters, some in wood



### Striped Abdomen (mining) Bees

*Andrenidae*

**Size:** tiny to large, **Shape:** medium, andreniform

**Color:** dark body, gray-striped abdomen

**Hair:** sparse, concentrated on hind legs

**Behavior:** oligolectic (Asteraceae, Rosaceae)

**Nesting:** solitary, ground nesters



### Striped Sweat Bees & Tiny Dark Bees

*Halictidae*

**Size:** tiny, small, medium, **Shape:** slender, andreniform

**Color:** dark, shiny metallic, some have abdominal stripes

**Hair:** brush of hair on hind legs carries pollen

**Behavior:** crawl in flowers, fast jagged movements, polylectic

**Nesting:** solitary to semi-social, ground nesters



### Striped Abdomen (plasterer) Bees

*Colletidae*

**Size:** small to large, **Shape:** medium, andreniform

**Color:** silver-white-striped, may have pointy abdomen

**Hair:** may have flattened hair on abdomen

**Behavior:** oligolectic (Asteraceae, Rosaceae, Solanaceae)

**Nesting:** solitary, ground or cavity nesters



### Cuckoo Bees (cleptoparasites)

*Coelioxys sp. Megachilidae*

**Size:** small, **Shape:** slender, epeoliform

**Color:** dark with white abdominal stripes

**Hair:** sparse thoracic, bare abdomen, lack pollen baskets

**Behavior:** sip nectar at flowers, don't collect pollen for brood

**Nesting:** nest in other bees cavities, don't tend to their young



### Striped Abdomen (oil-collecting) Bees

*Melittidae*

**Size:** small to medium, **Shape:** medium, andreniform

**Color:** yellow and black striped abdomen

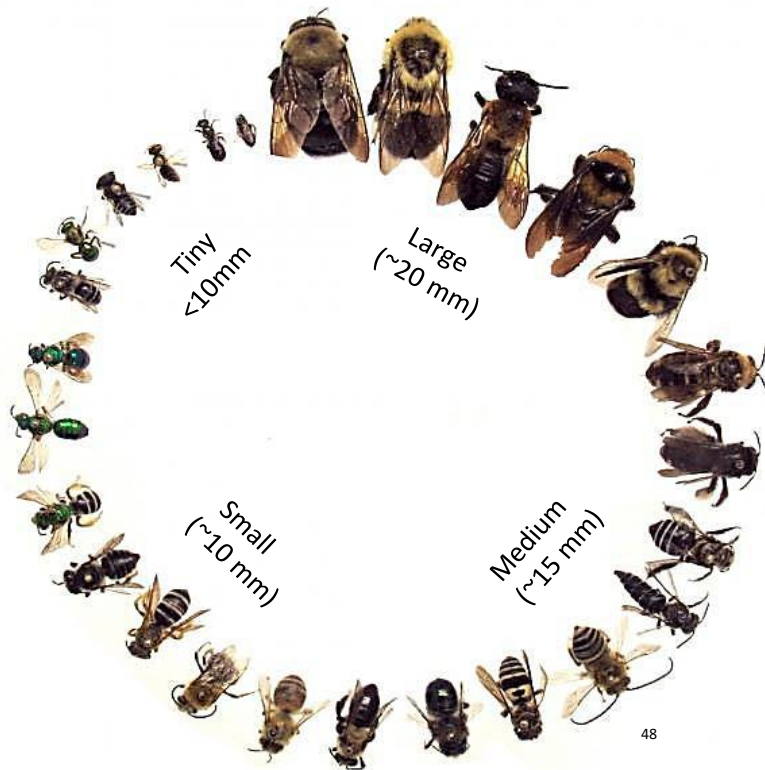
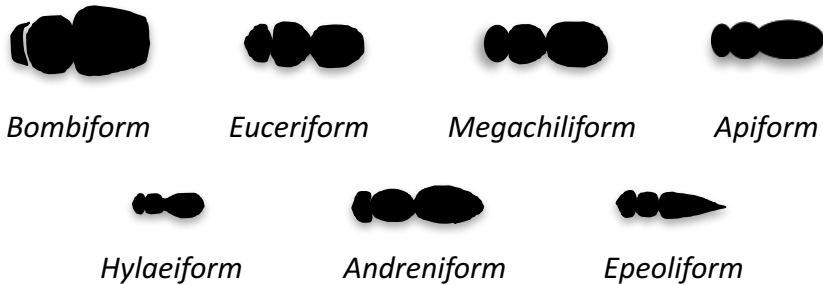
**Hair:** hairy body carries pollen

**Behavior:** polylectic, nectar, pollen, and plant oils

**Nesting:** semi-social, ground or cavity nesters



## APPROXIMATE SIZES & SHAPES OF BEES



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## BRIEF GUIDELINES FOR BEE SURVEYING

A **census** consists of periodic counts and checklists used to determine the status of bees, and potentially identify valuable plant species or management practices for their conservation. One way to census bees without collecting them is to conduct a standardized observation using Fixed Route Surveys (the preferred method) or Timed Random Walk Surveys. One identifies bees to broad morphological groups (e.g., bumble bee) and counts bees that are actively visiting flowers (hovering or crawling). The observer records the flower species and number of inflorescences, time, and weather. Observations should be done at least twice each season; spring (Mar-May), summer (Jun-Aug) and fall (Sep-Oct); on warm sunny days with little wind, approaching flowers slowly without casting shadows that disturb the bees.

**Fixed Route Surveys** require a standardized area (e.g., 50m X 2m) observed for a standardized time (e.g., 30 minutes). Within this area, five 1m X 1m plots are additionally surveyed for plant species and inflorescence number. **Timed Random Walk Surveys** require walking randomly with a steady pace and stopping periodically to observe and record the bees visiting flowers.

The *Xerces Society for Invertebrate Conservation* Bee Monitoring Protocol can be used for a more systematic observation of bee communities. Please refer to our website for details.

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Texas Parks & Wildlife Department

[https://tpwd.texas.gov/publications/pwdpubs/media/pwd\\_bk\\_w7000\\_1813.pdf](https://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_w7000_1813.pdf)  
[https://tpwd.texas.gov/huntwild/wild/wildlife\\_diversity/nongame/native-pollinators/native-bee-needs.html](https://tpwd.texas.gov/huntwild/wild/wildlife_diversity/nongame/native-pollinators/native-bee-needs.html)

The Xerces Society <http://www.xerces.org/pollinator-conservation>  
USFS/USDA [http://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb5306468.pdf](http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5306468.pdf)

