

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

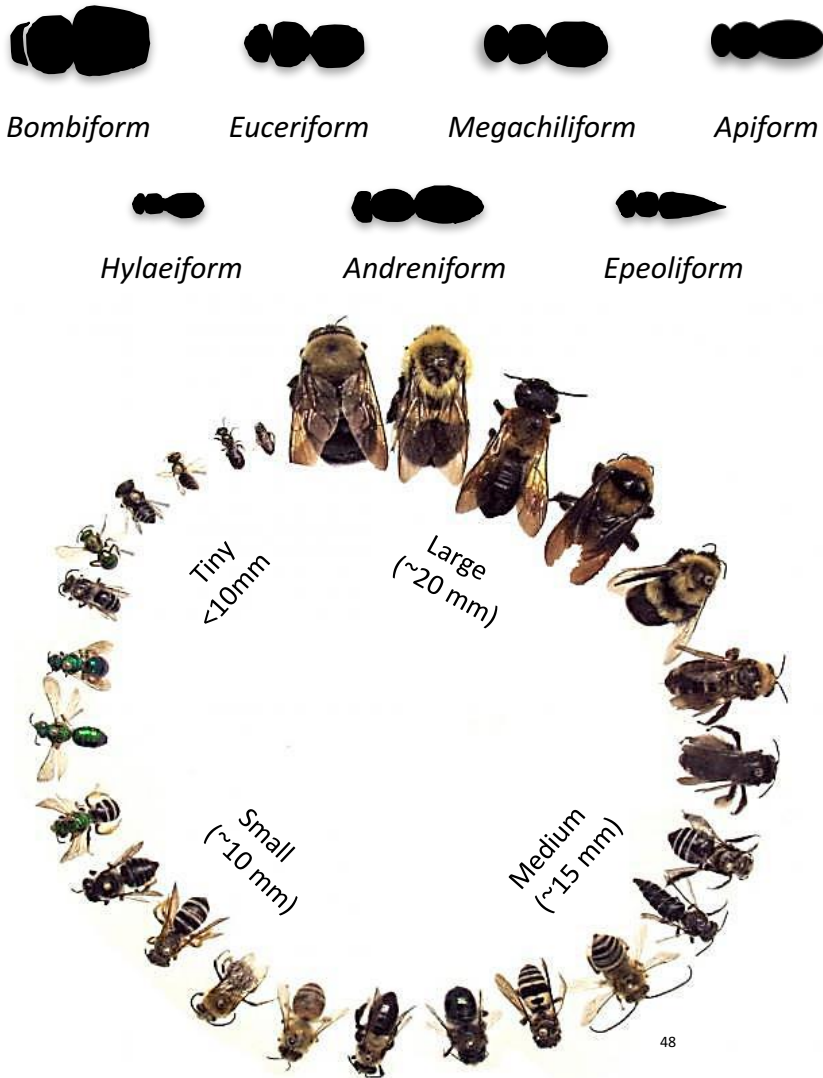
Hair: hairy body carries pollen

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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The University of Texas at Austin

Texas Parks & Wildlife Department

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

The Xerces Society <http://www.xerces.org/pollinator-conservation>

USFS/USDA http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5306468.pdf

Winkler
Family
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