CENTRAL TEXAS KEY POLLINATORS

Nectaring housefly

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

Syrphid or hover flies

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)

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

BEES 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

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

Head, thorax & segmented abdomen

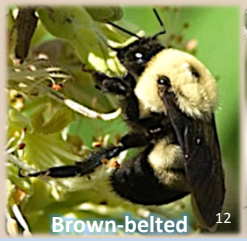
Corbicula carry moist pollen clumps

[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
Other: baskets on hind legs carry moist pollen
Behavior: make low buzzing sound when flying, polylectic
Nesting: social, largely ground nesters



Large Carpenter Bees

Xylocopa spp. *Apidae*

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

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

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

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

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

Metallic Hairy Belly Bee (masons) *Osmia sp. 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 but 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*

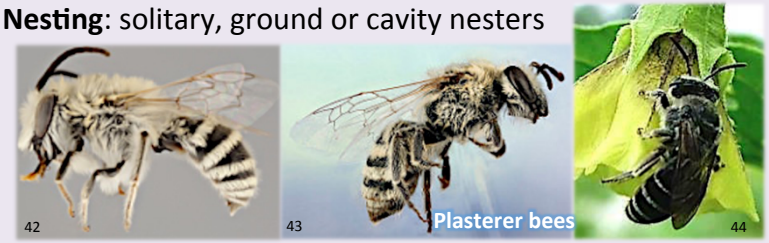
Size: tiny to large, **Shape:** medium, andreniform
Color: dark body, gray-striped abdomen
Hair: sparse, concentrated on hind legs
Behavior: oligolectic (Asteraceae, Rosaceae)
Nesting: solitary, ground nesters

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



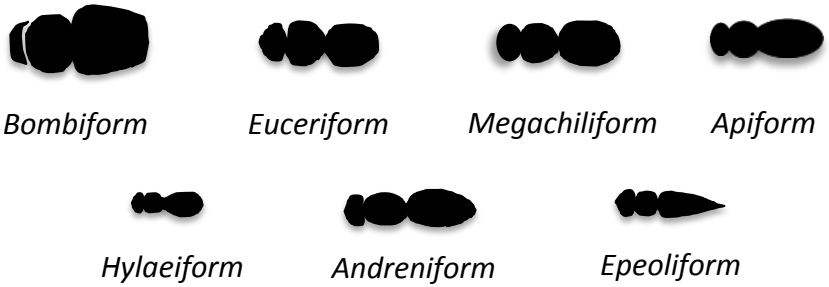
Cuckoo Bees (cleptoparasites) *Coelioxys sp. Megachilidae*

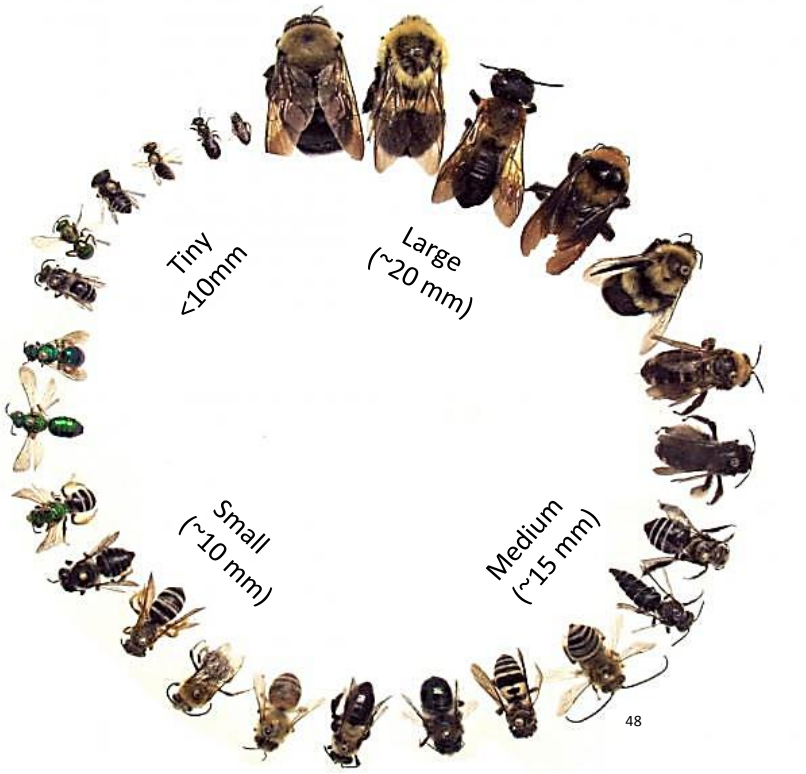
Size: small, **Shape**: slender, epeoliform
Color: dark with white abdominal stripes
Hair: sparse thoracic, bare abdomen, lack pollen baskets
Behavior: sip nectar at flowers, don't collect pollen for brood
Nesting: nest in other bees cavities, don't tend to their young

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
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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

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