

Native Pollinator Habitat Management for Tax Valuations

Tax Reductions for Landowners!

The Texas Parks and Wildlife Department [Nongame and Rare Species Program](#) has guidelines for pollinator habitat conservation to help landowners qualify for agriculture-wildlife tax valuation through a county appraisal district. These differ from bee-keeping guidelines for honeybees.

We encourage landowners to contact TPWD biologists or USDA-NRCS providers regarding [wildlife management plans](#) for native pollinators and call their county Central Appraisal District office regarding tax valuations.

Property owners may qualify for agricultural tax appraisal based on [wildlife management](#) if they implement 3 of 7 practices described in the [1-D-1](#) (Open-Space) form to help sustain populations of wild animals, such as pollinators:

- Provide shelter, water, or food
- Control habitat, erosion, or predators
- Do population censuses



Landowners who choose to do **population censuses** are encouraged to adopt the standardized guidelines that the Jha lab created to facilitate these surveys.

We supply:

1. Pollinator survey instructions (last 2 pp.)
2. Survey Data Sheets
3. Texas Bee ID Guide

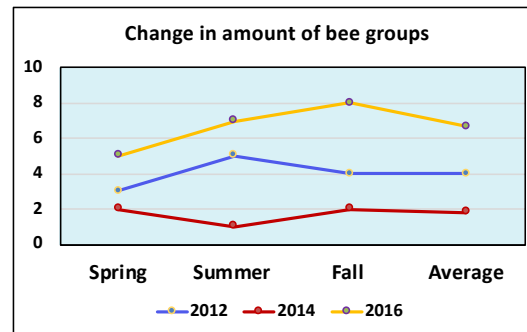
Survey Datasheets

<http://w3.biosci.utexas.edu/jha/wp-content/uploads/Survey-Data-Sheets.pdf>

Texas Bee ID Guide

<http://w3.biosci.utexas.edu/jha/wp-content/uploads/Texas-Bee-ID-Guide.pdf>

We can analyze your data to visualize trends that gauge management success, which can be a valuable component of annual reports required by tax appraisers. You can send survey results by mail or email or upload them to our online [Pollinator Survey](#).



Visit these websites for more information:

Native Pollinators and Private Lands

https://tpwd.texas.gov/huntwild/wild/wildlife_diversity/nongame/native-pollinators

/Bee Needs

https://tpwd.texas.gov/huntwild/wild/wildlife_diversity/nongame/native-pollinators/identify-protect.phtml

Using Wildlife Management as Qualifying Agricultural Use

https://tpwd.texas.gov/publications/pwdpubs/media/pwd_br_w7000_1121.pdf

Texas Comptroller

<https://comptroller.texas.gov/taxes/property-tax/ag-timber/index.php>

How Farmers Can Help Pollinators

<https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/plantsanimals/pollinate/farmers/>

Mail survey results to:

Laurel Treviño

Outreach Program Coordinator

The University of Texas at Austin, College of Natural Sciences, 1 University Station G2500, Austin, TX 78712

ltrevino@austin.utexas.edu

Jha Lab Webpage for Landowners and Naturalists:

<https://w3.biosci.utexas.edu/jha/landowners-naturalists>



The University of Texas at Austin

Department of Integrative Biology

College of Natural Sciences

Pollinator Survey Data Upload - https://docs.google.com/forms/d/e/1FAIpQLSfi1Y_9JaTf-y1ZnRxd6CJFK2CiWRq9TbZHWq_s2J7uSENKMw/viewform

Native Plants and Native Bees



~ 87% of flowering species rely on animal pollinators to an extent. 20,000 bee species exist worldwide; 4,000 in North America; ~800 in Texas. Native bees originated in and are adapted to local climate and soils. The western honeybee was

introduced to the Americas and naturalized.

Bee-pollinated Crop Species

Almonds, apples and blueberries depend on bee pollination. Watermelons, melons and squash are often pollinated by native squash bees. Bumble bees buzz-pollinate peppers and tomatoes. Leafcutters pollinate alfalfa well.



Pollination Services give us 1 in 3 food morsels!

~ 3/4 global crop types rely to an extent on pollinators. Pollinator-dependent crops contribute ~ 35% of global crop production volume. Bees boost US crop production by ~\$15 billion/year. Cross-pollination boosts cotton yield by 17% in Texas.

Native Bee Nesting Habitat

~ 75% of native bees are **ground-nesters**, like digger bees and bumble bees. If soil is deeply tilled, eroded or compacted their nests are destroyed. Leave bare ground for bee nests!



Tom Murray

~ 25% of native bees are **cavity-nesters**.

Carpenter bees, mason bees and leafcutter bees make nests in soft wood, plant stems or rock crevices. Leave snags, fallen logs, and thatch!



Alain C.

Scott Famous

~ 90% of native bees are **solitary**. A female bee lays eggs on the pollen balls she makes; larvae consume this bee bread developing into pupae.



Egg and Larva on Pollen Balls, Pupa in Brood Cell, Adult Miner Bee (*Andrena*)

© Dennis Briggs

© Robbin Thorp

© John Ascher

Threats to Pollinators

- Habitat loss
- Pesticides
- Diseases and invasive species
- Climate change

Most pollinators are insects, mostly bees. Bees depend entirely on flowers for nectar and pollen and native bees prefer to feed their larvae native plant pollen, which their larvae can digest. Loss of native landscapes and soil affects bees.

How You Can Help

- Provide: abundant native plants, spring to fall
- Provide: nest sites (bare ground & cavities)
- Control: soil erosion and compaction
- Reduce: pesticide use



Pollinator Habitat Management

Pollinator habitat conservation practices can help landowners qualify for agriculture-wildlife use. One of the habitat management practices are **pollinator habitat surveys**. We explain how to do surveys in the following pages.

Pollinator Habitat Surveying



Pollinator Habitat Surveys
How do you assess pollinator habitat quality?



Survey **pollinators** and their **associated vegetation** twice a year to establish baseline species lists.



Survey & photograph the habitat **before & after enhancement** for comparison, if applicable.

Follow your protocol consistently if monitoring.

Data obtained from surveys help assess pollinator habitat quality. You can compare habitat at different sites or periods. An improved habitat shows an upward trend in abundance or richness of pollinator and plant groups over time.

Two indices are measured:

- **Abundance** (# individuals/species)
- **Richness** (# species/community)

The Jha lab can help analyze survey data to provide landowners with graphic results of habitat health.



Sarah Cusser

Where to Survey:

Survey at least 1% of pollinator plot or 1 acre
Parallel to linear habitats (hedges, streams)
Ideally in a uniform habitat (vegetation class):

- open woodland
- shrub land
- grassland/prairie/meadow
- altered vegetation: crops or gardens

When to Survey:

- Ideally twice a year,
- during bee foraging season spring to fall
- at least 3 years if monitoring long-term

Establish a protocol & repeat surveys in the same area, season, date and weather.

How to Survey:

Bees don't like cold, windy or overcast weather.

Good survey conditions are:

- 8 a.m. to 3 p.m.
- > 70°F (21°C), warm to hot
- clear sky, part cloudy, slightly overcast
- calm wind to light breeze

- choose a pollinator/plant survey method
 - walk slowly & avoid casting shadows that spook pollinators
 - identify, count insects feeding on/in flowers, photograph bees if possible
 - go back to ID, count plants
 - record data on our data-sheets
 - upload data to Survey Response (below)
 - you can post bee photos on *iNaturalist*
- Observer-recorder teams help maintain the same effort throughout the survey.

Pollinator Surveys (choose a method):

A) Stationary Count: For 15 minutes, ID/count pollinators & plant inflorescences in an area with a diameter of your out-stretched arms.



B) Random Walk: 15 minutes without crossing your path, ID pollinators in area of your out-stretched arms, estimate distance.



C) Fixed Route: Walk a 160x6-ft transect in 15 minutes; ID & count pollinators in this area.



Vegetation Surveys

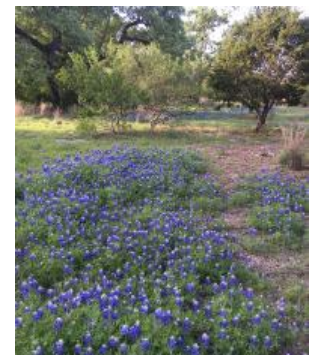
(choose a method & its data-sheet):

A) Simplified: Choose the vegetation class, list the dominant species, estimate # inflorescences/species (any pollinator survey).

B) Formal: Retrace your random walk path or return on the fixed route transect and count # inflorescences/species in the area.

Materials

- Map
- Pollinator Guides/Keys
- Plant list/ID key
- Measuring tape
- Wood stakes
- Watch
- Clipboard
- Data sheets
- Pencil



Pollinator Survey Response, Data Upload - https://docs.google.com/forms/d/e/1FAIpQLSfi1Y_9JaTf-y1ZnRxd6CJFK2CiWRq9TbZHWg_s2J7uSENMW/viewform

Example of a Survey Method (Fixed Route for Monitoring)

1. Pollinator Survey:

Mark the start point, measure a 160-foot line, and mark the end-point. Survey a 6-foot width along this transect, walking at an even pace for 15 minutes from beginning to end. ID & count insects feeding on flower reproductive parts and record observations on data sheets. You can post your bee photos on [iNaturalist: Texas Native Bees & Other Pollinators](#).

2. Vegetation Survey:

Return on the same transect. ID plants within the same 160x6-foot area. Count or estimate the inflorescences of the identified plants. Record all data on our data sheets. For feedback, upload pollinator & vegetation data from data sheets to [Pollinator Survey \(Google Forms\)](#).

For practical purposes, flowers & inflorescences are considered the same for these vegetation surveys, as shown on the next panel.



Look for small bees inside deep flower corollas



Native Pollinator ID Guides

<https://w3.biosci.utexas.edu/jha/texas-pollinator-guides>

<http://www.bugguide.net/node/view/8267>

<https://www.butterfliesandmoths.org/identify>

<http://www.inaturalist.org/projects/bees-and-wasps-of-texas>

http://tpwd.texas.gov/huntwild/wild/wildlife_diversity/non-game/native-pollinators/native-bee-id.phtml

Waterproof pocket field guides

Butterflies of Central Texas, Guide to Common & Notable Species, Valerie Bugh

Butterflies & Moths, Familiar North American Species, Pocket Naturalist, Kavanagh/Leung

Native Plant ID Guides

<http://aggie-horticulture.tamu.edu/texasnativetrees/http://texnat.tamu.edu/about/plant-identif>

<http://identifythatplant.com/plant-id-resources/plant-id-websites>

<http://www.npot.org>

<http://npsot.org/wp>

<http://www.wildflower.org/plants-main>

