

# Five-Year Study Examines Health of Bees in East Texas

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A five-year study is aiming to assess the health of bee populations in East Texas. The project, which started in 2022, is a collaboration between Stephen F. Austin State University, Sam Houston State University and Texas A&M Forest Service.



The American bumblebee population is alive and well in East Texas, according to early indications from a five-year research project.

The project, which started in 2022, is a collaboration between Stephen F. Austin State University, Sam Houston State University and Texas A&M Forest Service to assess the health of bee communities in 74 East Texas counties. The survey is funded through a \$500,000 state grant.

Dan Bennett, an associate professor of biology at Stephen F. Austin State University, said the results from samples collected in the study's first year are positive.

"We're catching lots of bumblebees of multiple species, and we're capturing quite a few of the American bumblebee," said Bennett, the lead entomologist for the project. "We're finding them most places we look, and that's a very good sign."

It's a good sign, Bennett said, because the American bumblebee is not doing well in other parts of its range and is being considered for protection under the Endangered Species Act.

"It's very early to say, and maybe we'll get different results this year, but the early indications are that the American bumblebee is doing well here," he said. "And that's very important because it has almost disappeared from places like Pennsylvania and Massachusetts."

## **Attracting bees**

Samples were collected from traps in each of the 74 surveyed counties for two weeks each in July, August and September, timed to avoid interfering with major pollination cycles and to minimize the risk of capturing queens during hive-building activities in the spring.

Texas A&M Forest Service staff members set the majority of the traps and retrieve the samples.



*Bee trap*

Allen Smith, Texas A&M Forest Service Regional Forest Health Coordinator, said the bees are attracted to the bright color of the traps, which are set across both urban and rural areas.

“Traps are placed anywhere from fence lines around airports to the edge of rights of way to open forest canopy where we would have flowering plants nearby,” he said.

Photos are taken of the area where the traps are set “so we can look at the vegetation and see what’s growing there,” Smith said.

Smith said the agency’s involvement streamlined the project, allowing an established network of statewide personnel to cover a lot of ground in setting and collecting the traps so researchers could focus on analyzing the data.

Smith developed a computer application for the collection teams to log data related to the traps, allowing the university teams to see when and where the traps were placed and when they were collected.

It makes sense for Texas A&M Forest Service to play a role in the study, Smith said, because of the agency’s access to the land throughout the region where the study is being conducted as well as the agency’s experience surveying insects in forests of East Texas.

“Everyone that’s working on this project for us deserves credit. We even have fire personnel out there helping out,” Smith said.

### **Early questions**

Questions have already emerged from the study’s early findings, Bennett said.

“Are they going to decline soon? Is there a disease coming? What’s the difference between here and where the populations have already declined?” he said.

The samples will give researchers an idea of how the bumblebee population is doing, Bennett said, and possibly shed light on where they might be in the future.

“We want to know where the bees are, why they are there, and how that relates to human activities,” Bennett said. “We’re looking at the entire landscape and the correlates of habitat diversity.”

## Counting pollen

Along with American bumblebees, the researchers are focusing on populations of long-horned bees, which are important pollinators of agricultural crops. As the project progresses, the pollen from the bee samples will be used to determine floral relationships.

“We’ll try to figure out which types of plants are represented on the bees based on the pollen that they carry,” Bennett said. “Maybe there are certain flowers that they need that we don’t quite know just yet.”

Justin Williams, a biological sciences professor at Sam Houston State University, serves as the botanist for the research project.

Using scanning electron microscopes, Williams and his students identify the pollen grains collected from the bees. Williams said his team has identified about 80% of the pollen from the bees trapped during the study’s first year.

“We are trying to find the diet of these bees,” Williams said, with the goal of introducing more of the flowers that the bees prefer.

Williams said sampling locations and methods will be refined through the study’s third year.

“That’s when we’re going to start bringing all of our data together,” Williams said. “Then we’ll start working on a modern inventory of the bees that we have.”

Williams said he’s hoping to find species of bees that haven’t been seen in decades.

“It’s not that they’ve gone extinct or disappeared, it’s just that people haven’t looked for them,” he said.

“Natural history just isn’t as appreciated today as it should be, and that’s why this project is so important.”



*American bumblebee*

## A teaching tool

In addition to the bee survey and pollen analysis, researchers are planning to incorporate an educational outreach component.

“We’ll be visiting Master Gardeners and botanical gardens and giving talks, and it’s our aim to make a poster that we can give out that has general information on identification of the bees of East Texas along with photos of the more common bees,” Williams said.

Part of that educational message, Williams said, is that we need more natural areas for bees and other species to thrive.

“Let those wildflowers be out there, because they are food for the bees,” he said. “Part of the reason bees might be struggling is our insistence on mowing all the time. You can mow, but let’s do that after the flowers have finished blooming.”

Bennett said he hopes the research highlights the significance of bees and the role they play in the ecosystem.

“Without them, we would be left with fewer things to eat, or the things we have to eat would be much more expensive,” he said. “I want people to appreciate what bees are doing for us and understand that if they decline, in a way, so do we.”

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