

# Undergraduate and Secondary Students' Knowledge of the Importance of Pollinators and Pollinator Conservation

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## Introduction

Worldwide, there is growing interest in research, education, and discourse around pollinators and pollinator conservation. Recent research reports a 75% decrease in insect biomass and diversity and dramatic pollinator declines. As a result, governmental agencies such as the Obama Administration's National Strategy to Promote the Health of Honey Bees and Other Pollinators, and non-profit organizations, such as Xerces Society's "Bring Back the Pollinators" Campaign, offer aid and support to help combat this crisis. This presentation focuses on the knowledge and understanding of 12 undergraduate students and 15 secondary students involved in a pollinator conservation program on a University campus. Students' knowledge of pollinators, pollinator conservation, and conservation practices were assessed using a survey instrument (see Table 1) and the bee/no bee quiz (see Figure 1). We compared our results to other pollinator conservation programs at other Universities. We discuss our findings and the implications they have for out-of-school programs and science teacher preparation.

## Goals

### Introduce students to:

- Plants
- Insects
- Pollinators
- Parasites
- Pollinator habitats
- Conservation practices
- Research
- Technology
- Flying drones
- Wild flower gardening
- Companion planting
- Honey bee behavior
- Types of pollen
- Sustainability

## Participants

Twelve undergraduate students, who were interns at the Garden and Apiary, along with fifteen secondary students that attended the Kids in the Garden Summer Bee Camp in 2021 at the University of North Carolina at Pembroke. Data from a similar study conducted at the University of Kentucky, Ohio State University, and Louisiana State University with undergraduate students were compared.

## Data Collection

Surveys and questionnaires were given on-line through Qualtrics. Qualtrics is a software system that allows researchers prepare, distribute, collect, and share surveys and questionnaires as well as analyze the data.

## Bee/No Bee Quiz

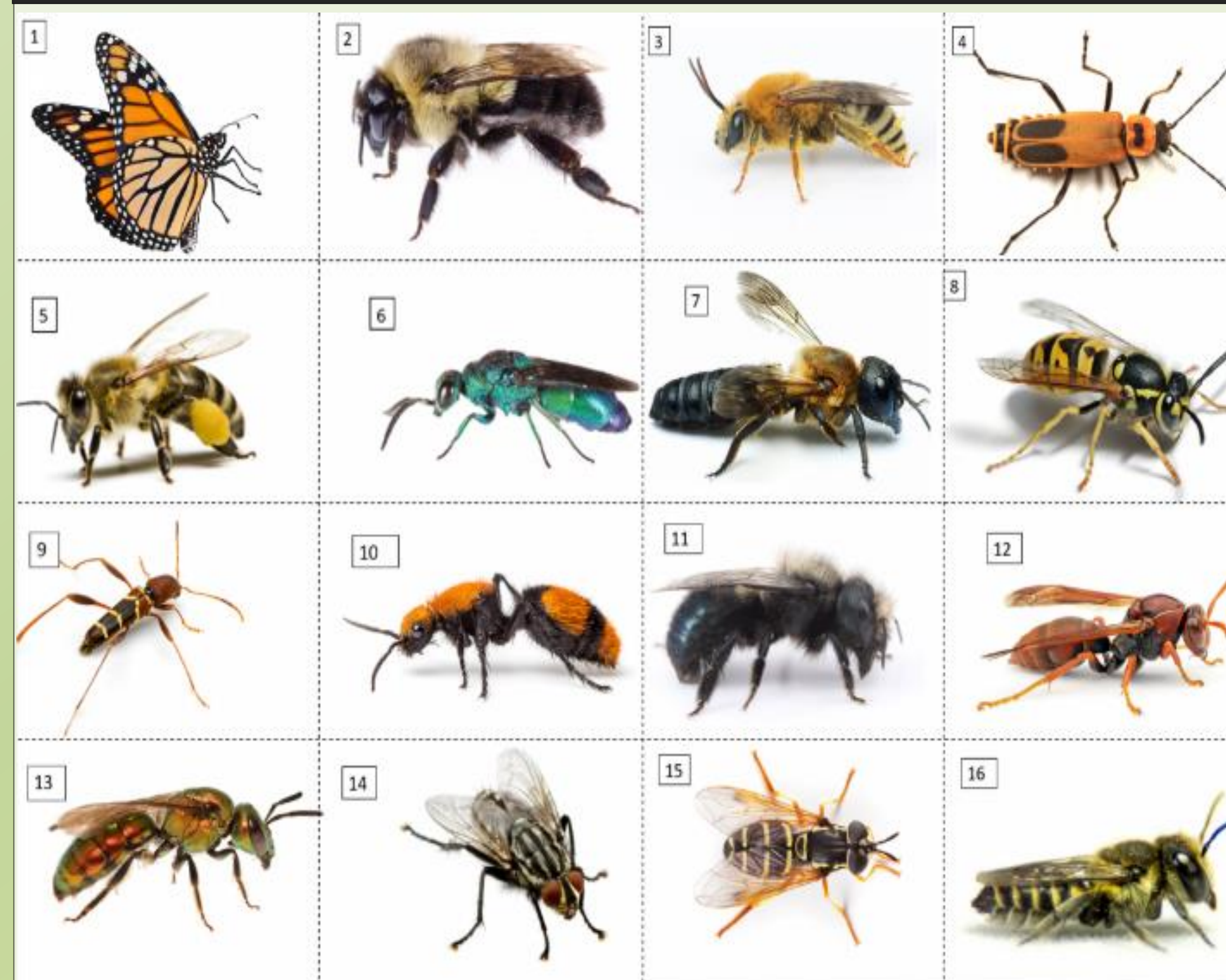


Figure 1. Students identified bees and specifically a honey bee (Campbell, K. & Hagevik, R., 2019)

## Interview Questions

1. Did you know that pollinators were declining?
2. Do you know which insects are pollinators?
3. Do you know of any conservation programs or initiatives?
4. Would you support incentives to become a pollinator campus? (fundraisers/courses/programs)
5. Would you pay a small fee if your school campus was a pollinator campus? (example: \$3.00 every semester which would be added to school fees)

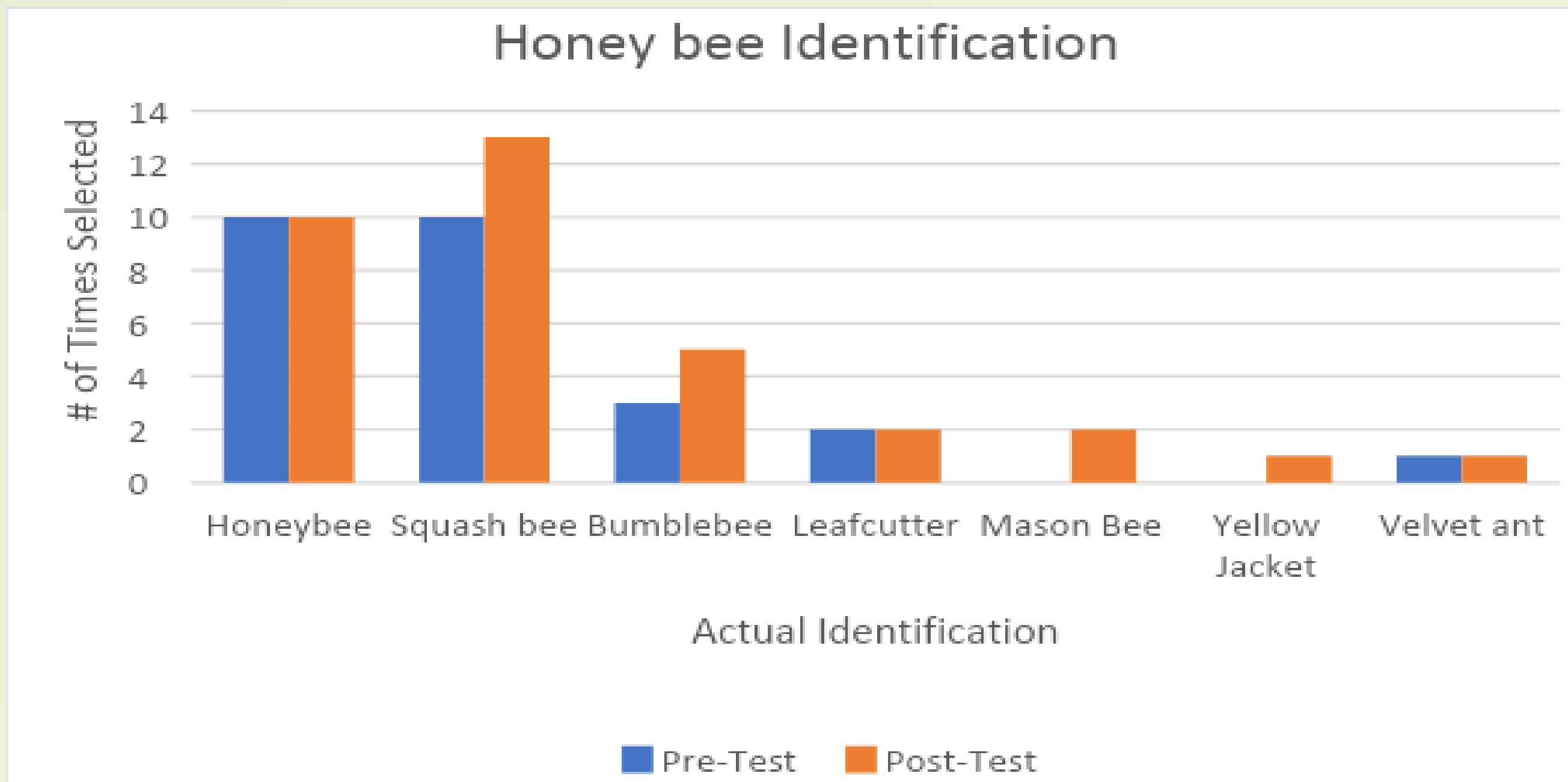
## Results

Table 1. Percent of students' knowledge of honey bees and interest in conservation

School	UK	LSU	OSU	UNCP
Honey bee identification	47.70%	55.70%	44.01%	50.00%
Would support implementing bee campus	95.10%	96.10%	96.20%	87%
Honey bee declines due to lack of habitat	46.90%	34.50%	37.60%	
Honey bee declines due to pesticides	29.70%	44.80%	42.90%	
Are honey bees declining	0.90%	0.80%	0.00%	

## Conclusion

Figure 2. Students responses when asked to identify honey bees- pre/post comparison



## Implications



Figure 3. Four elementary schools in Robeson County received a green house (with all accessories), shed, at least six raised beds, plants, soil, mulch, a native bee home, rain barrels, compost bins, tools, journals, and insect & plant guides from a grant from the Duke Energy Foundation.

## Future Research

Using research as an extra curricular activity outside of the classroom or introducing research into classrooms, especially with elementary to high school students, helps students gain an in-depth understanding of the scientific world around them. Pollinator Conservation programs offer students a distinct advantage of getting involved with research, gaining knowledge of pollinators, understanding of insect and plant habitats, gaining knowledge of correlations between insects and plants, dissecting plants, using radar tracking and drones, improving literacy skills, enhancing technology skills, learning to ask scientific questions, adding prevalent information to national databases, learning weather patterns, and learning the impacts of weather on plants and insects. Through a USDA-NIFA grant on foodscapes and islands of biodiversity this research will continue with curriculum development and teacher professional development in elementary, middle, and high schools.

## References

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