

NATIVE BEE WATCH COMMUNITY SCIENCE – ADULT EDUCATION IN LARIMER & ARAPAHOE COUNTY

Sam Palmer
Graduate Student
School of Education

Jill Zarestky Assistant Professor, School of Education
Lauren Vilen Doctoral Student, School of Education
Lisa Mason Horticulture Agent, Arapahoe County

NATIVE BEE WATCH INTRODUCTION

Pollinator populations are declining worldwide, partly due to urbanization and habitat loss. Bees, specifically, are crucial for sustainable ecosystems, necessitating the need to strengthen efforts in public awareness and engagement to mitigate continued declines. Native Bee Watch (NBW) is a community science program offered through CSU Extension that trains and supports volunteers to identify and monitor bees. As a multi-disciplinary collaboration, NBW's overarching goal is to create a ripple effect of engagement and education based on ecological and social science research.



INTERNSHIP GOALS

Participate in Research Projects

- Collected data weekly in the CSU Trial Gardens and CSU Pollinator Gardens to contribute to citizen science.
- Gained experience with analyzing qualitative data in order to make recommendations and changes to the NBW program for this summer.

Understand Citizen Science Experiences

- Created materials to assist volunteers in a virtual setting and created engaging materials to enhance overall learning.
- Provided opportunities for volunteers to meet in person in Fort Collins and Denver to strengthen volunteer confidence in bee monitoring.

HOW DOES THIS APPLY TO MY EDUCATION

I am a graduate student in the Adult Education and Training program, where I am learning how to build educational programs and engage with adult learners. This experience provided real-world knowledge in program assessment, research methods, learning transfer, and engagement with adult learners. I will apply this to my future courses in instructional design and my final research project. This opportunity allowed me to work with a new population and acquire knowledge about different ways of learning and engagement with citizen scientists.

WHAT I DID

Volunteer Materials

- Created a Buzz Through the Field Guide Mini Quiz for volunteers to use for studying purposes. The quiz consisted of 12 questions that summarized the Field Guide and included comprehensive answers to assist learning from mistakes.
- Created an Observation Cheat Sheet that outlined how to successfully observe and collect bee data in any location. The 2-page sheet uses photographs, colorful symbols, descriptions of actions, and helpful tips to assist with learning.

Data Collection

- Created transcripts of 23 interviews from 2020 to then be unitized and coded for data analysis.
- Organized and implemented a tracking system within Excel to collect volunteer feedback on the Pre and Post Season survey. The tracking system allowed me to identify which volunteers completed the survey and intentionally reach out to volunteers who did not complete the survey.
- Created a Pre-Season Survey report that includes significant findings from the data collected on volunteer feedback this summer.
- Monitored bees at the CSU Trial Gardens and CSU Pollinator Garden located on campus throughout the summer.

Figure 1. Graphic from Observation Cheat Sheet



The area defined by the yellow dashed lines is your transect, the area you will move around during your observations. The pink dotted boxes are how you will break your transects into groups, also known as your Field Of View.

WHAT I LEARNED

I gained skills and understanding in technological data applications such as Qualtrics and ArcGIS. This has given me experience in collecting data online that can benefit remote work environments. This form of data collection has helped me understand how adults navigate online surveys and what processes to implement in order to increase accessibility.

I immersed myself in the process of collecting qualitative data in preparation for analysis. Accurate qualitative data is important for analysis when generating a report or preparing a scientific paper for publication.

I learned A LOT about the different types of bees in Colorado and how to identify them based on visual characteristics.

Figure 2. Page 2 of the Observation Cheat Sheet

The Observation Cheat Sheet provides numbered actions for volunteers when monitoring bees within their home garden. The gray text boxes with numbers use language from the volunteer training in order to have consistent messaging. The pictures help volunteers visualize how to collect data.

2 **Begin taking 2 minute observations of your Field Of View box**

- Record the amount and type of bees visiting flowers
- Record plant species and number of flowers within your Field Of View
- If you have a large number of the same species of plant, you can do several 2-minute observations and then move to a new plant. You can choose the number of observations you do, just try to be consistent every week.

General tips

- Create a map of your yard with plant labels to stay organized
- Only observe and record flowering plants. If your plant has stopped blooming, you do not need to continue observing it.
- Bees prefer warm, sunny days and are most active in the early morning or early afternoon. Do not monitor when it is below 60 degrees.
- For trees - choose a square in an area which is easily observable and has blooms

3 **End Monitoring session**

- Report your data online on the Native Bee Watch Volunteer Portal (nativebeewatch.org) or you can go directly to the [Survey123 App](https://survey123.app).
- Please make observations of the same transect once a week at maximum

NATIVE BEE WATCH
COLORADO STATE UNIVERSITY
EXTENSION