Department of Horticulture, College of Agricultural Sciences

# BEE RICHNESS AND ABUNDANCE

## A Survey of Portland-area Gardens

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## INTRODUCTION

Gardeners make many decisions that affect pollinators. These decisions are critical, because gardeners and landscapers manage and maintain a significant amount of land area in the United States. Lawns and gardens cover approximately 2% of the land are in the continental U.S. In cities, residential yards can comprise 25-35% of total land area and more than 50% of urban greenspace.

Previous research has shown that urban greenspace, and in particular, urban gardens, can support diverse, abundant, and intact bee communities. In fact, the abundance and diversity of garden bees have been observed to approach, and even exceed, numbers in nearby natural areas and agricultural systems.

Currently, we have species-level lists of bees collected from gardens in NY, CA, AZ, IL, and OH. No such list currently exists for Oregon. In order to understand how Oregon's gardeners can act as stewards for native bee conservation, we need to:

- **Document the bee species that can be found in Oregon gardens**
- **Identify garden characteristics that might promote or inhibit bees from foraging and nesting in Oregon gardens.**

## METHODS

We sampled bee from 24 Portland-area gardens in June, July, and August of 2017. Gardens were spread across the metropolitan region, but largely hugged major roadways to facilitate efficient travel when sampling (Figure 1).

We used a modification of the standardized method for monitoring bee populations. UV blue, UV yellow, and white water pan traps (Figure 2) were used to passively sample bees from home gardens. We also hand-collected bees for 10 minutes (Figure 3), within each garden. Bees were brought back to the lab, where they were pinned, and are being identified.

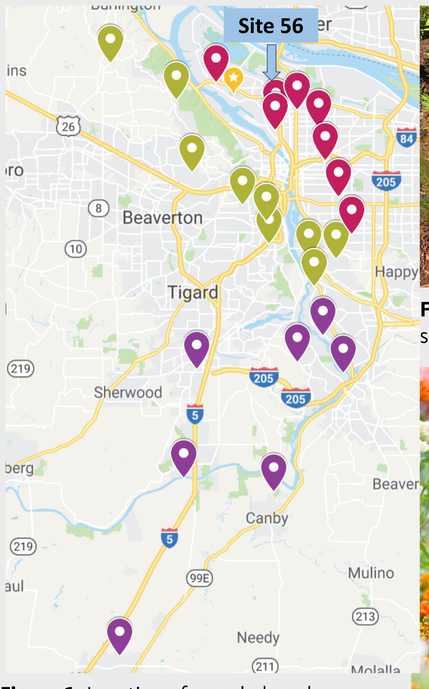



**Figure 1.** Location of sampled gardens

**Figure 2.** Water pan traps used to sample bees.

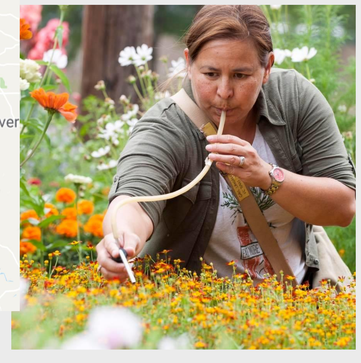


**Figure 3.** Using an aspirator to collect bees off of flowers.

## GARDEN BEE BIODIVERSITY: SEVERAL 'LITTLE BLACK BEES' AWAIT IDENTIFICATION

*Halictus sp.*

*Unidentified* *Unidentified*

*Unidentified* *Unidentified*

*Unidentified*

*Agopostemon sp.*

*Augochlorella sp.*

*Dianthidium sp.*

*Anthidium manicatum*

*Anthophora sp.*

*Ceratina sp.*

## PRELIMINARY RESULTS

- Dominant species include: *Apis mellifera*, *Halictus ligatus*, *Bombus vosnesenskii*
- We noticed a trend towards fewer bees with overhead irrigation, and in shadier sites.
- **We also caught a high number of bees (42 bees) via pan trapping (across all dates) from one of the smallest properties we sampled (site 56). This property is located in the Portland city center, but the gardener makes deliberate decisions in their plant list and practices, to be pollinator friendly. This suggests that intentionality matters, and that 'if you plant it, they will come'.**

**Figure 4**. There was a slight relationship between lot size and bee abundance ($R^2$ = 0.52). However, one of our smallest gardens (0.11 acres), located in an urban neighborhood (Figure 5), had the second highest bee abundance (42 bees). This garden was focused on attracting and conserving pollinators (Figures 6a and 6b).

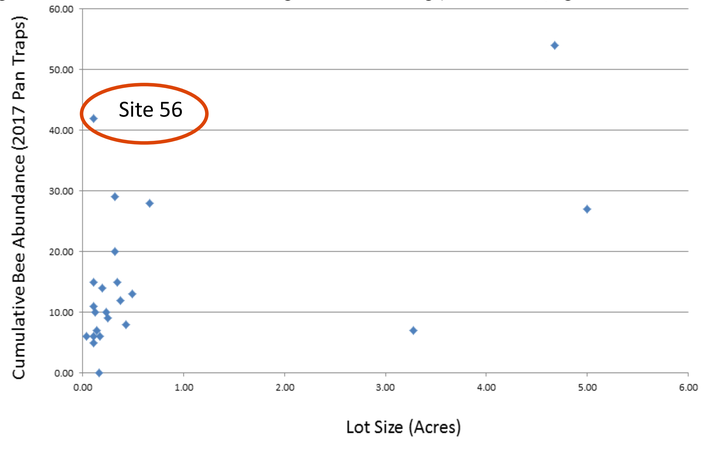
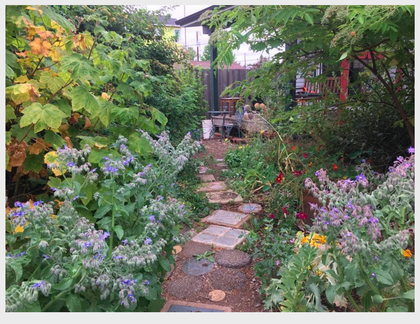




**Figure 4:** The location of site 56 (obscured to protect privacy) in East Portland. Note proximity to major highways and other development. This site had the second highest bee abundance (Figure 3), likely due to intentional plant choices (Figures 5a and 5b).



**Figures 5a (left) and 5b (right).** This garden, located in East Portland, was a pollinator haven. Plant choices such as borage, big leaf maple, and California poppy (5a), as well as hyssop (5b) gave this garden an unusually high number of pollinators, despite its relatively small size (0.11 acre) and location.

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