

# Distinguishing Beneficial Pollinator Garden Locations in Urban Landscape Using Geospatial Information Systems

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## Abstract

Research in Cleveland, Ohio utilizes geospatial information systems to classify abandoned parcel data by size, density and distribution. Vegetated areas and location data from beekeeping permits are overlaid on six inch resolution imagery of land cover and soil maps, applying distance algorithms, classification selection, and normalized difference and vegetation indices (NVDI) within a multilayer analysis.

## Methodology

NDVI was used to show the amount of vegetation (foraging material). Auditor parcel data of Cuyahoga County was used to access the land use of the region. Vegetated areas including conservation lands and parks were distinguished to show where gardens are likely not needed. Abandoned parcels, churches and schools were distinguished to highlight areas for easy garden placement. Areas of concern are indicated based high impervious surface percentage (scarce foraging material). Bee hive locations were plotted and a 1 mile buffer was placed around each to represent foraging habitat. Based on clusters of bee hives and land use, recommendations where gardens should be placed to best benefit honey bee communities were determined.

## Conclusion

Based on land use and bee hive locations, a map was produced that distinguished sites as highly beneficial and feasible locations for pollinator gardens to be installed. This data is beneficial to groups that desire to plant pollinator gardens and is intended to improve the effectiveness of such endeavors. The map has 6 inch resolution and can be zoomed in on to focus on a given area of the county, showing more detail than this poster does.

## Introduction

Insect pollinators (honey bees) are considered keystone species because they have a large impact on floral communities. However, their reduction or extirpation can have far reaching, negative effects on the whole ecosystem. Based on beekeeping data, the number of western honeybees (*Apis mellifera*) has decreased to half since the 1950s, while the demand for their ecosystem services has continued to increase. Numerous non-profit groups, such as Wild Ones, have set out to establish pollinator gardens and encourage native plant landscaping to support insect communities. Greater plant diversity and reduced pesticide use are thought to increase opportunities for colony survival, even in urban areas. One problem is deciding where garden patches may best benefit pollinators. This research may be of interest to the Ohio Department of Transportation for roadside pollinator habitat

## References/Software

Thank you to the Cuyahoga County Auditor for collecting and providing the necessary data. ArcMaps®

