**INTRODUCTION**

Pollinators are a key component for ensuring proper ecosystem health, linking natural environments with man-made and managed lands, such as parks, agricultural landscapes, and suburban and urban gardens. Although their primary objective is to feed themselves and their offspring, the work of bees, flies, beetles, butterflies and a host of other pollinators ensure that there is adequate pollination for a constant supply of fruits, vegetables, nuts and seeds. Of these, bees are generally considered to be the most important group of pollinators in North America.

We still have much to learn about the diversity and abundance of species on a local, or even regional, scale, about their nesting and foraging preferences, or about the diseases, pests and parasites that affect their health. To date, nearly 400 species of bees have been identified in Pennsylvania.



Through our monitoring effort, we hope to continue to expand our knowledge of how best to preserve, restore and protect these valuable ecological resources. The goal of the Penn State Extension Master Gardener 2013 monitoring program is to gather data on the attractiveness of various floral resources to our native bees and honeybees. We will note whether the condition of the plant material impacts the number of visits and whether the ‘straight species’ or cultivars are more attractive to pollinators. Our goal is to use the data to inform the public.  At a minimum we are considering using the resultant data for:

* ~~i~~ncorporating educational opportunities at events such as garden open-houses, pollinator education events, etc.
* selling the 'hottest' pollinator plants at events
* including signage at gardens to identify the 'hottest' pollinator plants
* writing articles for publications about the pollinator monitoring process and results

**MONITORING INSTRUCTIONS**

To be able to accurately compare the information from the different Commonwealth locations, please take the time to accurately record all the information listed on the form. Additionally, because of the difference in the blooming cycle across the state, the monitoring cycle is approximately May through October; gauge your monitoring by when the plants are in bloom – begin with the earliest bloom and monitor until the end of blooming for our selected species.

**SITE SURVEY**

For the first observational week of the year, and using the supplied form, describe the age of the site and provide a general habitat description (i.e., trees, distance to water, setting/landscape, floral and nesting resources available, etc.). Drawing a crude map of the site and immediate surroundings would also be helpful.

For the remaining observational weeks, describe any major modifications to the landscape/habitat since the initial observation visit.

****Before beginning your monitoring season, conduct a team meeting and review the data collection sheet and the monitoring instructions. A hands-on instructional session at the beginning of the season, with all volunteers, is suggested to ensure that everyone is on the same page (i.e., convene the first on-site monitoring with the entire pollinator monitoring team to walk through the monitoring procedures to ensure consistency).

**FIELD MATERIALS REQUIRED**

* Identification guides
* Watch or other timing device
* Tape measure
* Camera (Optional)
* Clipboards
* Pencils
* Observational Datasheet(s)
* First aid kit

Introduction

**DURATION:** (Roughly) from early-May through late-October depending upon when plants are in bloom.

**TEAM SIZE**: Assign teams of at least two individuals; team composition is at the discretion of the individuals monitoring site.

**FREQUENCY OF OBSERVATIONS**

You should plan on recording observational data for your field site once a week throughout the monitoring period. Observations should occur between 11:30 AM and 4:00 PM. The assigned team may have autonomy to determine both the day-of-week and relative time-of-day to monitor. Be aware of the weather conditions before trying to make your observations. Bees do not like cool temperatures (below 55°F) or wind (average wind speed over 5 miles per hour). Avoid rainy conditions. Establish and distribute a schedule of which team will be assigned to monitor which week.

Included on the data sheets are places to record, date, arrival and departure time, weather conditions, pollinator counts, and observations about the plants.

**MONITOR THE 10 PLANTS**

Monitor the 3 plant species and their cultivars planted in 2012.The monitoring sheet lists the floral species:

* *Agastache foeniculum*
  + Cultivars*: Agastache ‘Blue Fortune’; Agastache ‘Golden Jubilee’; Agastache ‘Black Adder’;*
* *Helenium autumnale*
  + Cultivars*: Helenium ‘Moerheim Beauty’; Helenium ‘Mardi Gras’;*
* *Physostegia virginiana*
  + Cultivars*: Physostegia ‘Miss Manners’; Physostegia ‘Vivid’*
* **RECORD YOUR OBSERVATIONS FOR EACH PLANTGROUP** 
  + height – inches tall (measure from the ground to top of tallest plant)
  + spread – inches wide (measure at a point half way up the plant group)
  + bloom status – indicate flower bloom of the plant group (none; pre-peak; peak, or fading)
  + plant vigor – indicate the general health of the plant group (healthy; in decline; or dead)

**HOW TO MONITOR AND OBSERVE POLLINATORS**

~~~~Before you begin monitoring your site it is important to know how to make observations. Keep the following points in mind when collecting observational data on floral visitors:

* Only collect data on floral visitors – i.e., no fly-by’s…the bee must stop on the flower to collect nectar or pollen to be counted
* Be careful not to disturb insects visiting flowers before you get a chance to observe them well
* Avoid sudden movements and do not stand too close to the flower you are observing
* Insects respond to shadows passing overhead by moving away; walk so that your shadow trails you, rather than advances in front of you

**MONITOR PLANTS FOR POLLINATORS**

* Monitor for these 4 bees - Carpenter bee, Honeybee, Bumblebee, Green metallic bee - and butterflies/moths. The monitoring sheet already lists the pollinator species A color guidesheet to the 4 bees has been provided and is on Sharepoint. We recommend laminating the sheet for field use.
* Be sure to spend 10 minutes per blooming plant grouping – NOT individual plants in the group but the entire group (straight species or cultivar identified in the column name)
* Monitor any visitations of butterflies or moths as well as the four bee species
* Record the number of bees/butterflies/moths visiting each group of flowers by making stroke counts in the block that intersects the plant species column with the pollinator species row – BE SURE TO TOTAL AND RECORD YOUR STROKE COUNTS IN THE TOTAL BLOCK BEFORE SUBMITTING THE FORM.

At the end of the observational period, record the names of the Master Gardener observation team on the form.

**REPORT SUBMISSION:** Submit your reports to your local coordinator. The coordinator with mail the reportson a monthly basis (by the 5th of the following month) to:

Penn State Extension Office

112 Pleasant Acres Road

York Pa 17401

Attn: Veronica Chavez

OR will scan the data observation sheets and e-mail them to [verowhaley@gmail.com](mailto:verowhaley@gmail.com). Remember to keep a copy in case there are questions.

**PLEASE CONSIDER TAKING AND SUBMITTING PICTURES WHICH WE WOULD LOVE TO INCLUDE IN OUR FINAL REPORT!!!!!!!!**