

Summer 2019 Native Bee Diversity and Collection Comparisons at the Huston-Brumbaugh Nature Center (Stark Co., OH)

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INTRODUCTION

- The Huston-Brumbaugh Nature Center (HBNC) includes 230 acres of forest and field habitats managed by the University of Mount Union.
- Due to concerns over pollinator decline, a systematic effort was begun in Fall 2018 to document the diversity of native bees found on the property along 3 transects (Figure 1).
- This effort was continued during the Summer of 2019, with the following objectives:
 - Document native bee genera during the summer months
 - Determine the best collection method for summer bees
 - Compare summer results with fall results



Figure 1. An aerial view of the three transects used in this study.

MATERIALS and METHODS

- Handnetting** was conducted with two researchers slowly walking a 100-m transect over a 20-min period and netting any bee within arm's reach of the lead person. A netted bee was passed back to the second person to be placed in a kill jar with ethyl acetate. Three transects were sampled every other week.
- Pan traps (blue and yellow)** were placed as a pair on the ground at the end of each 100-m transect and filled with soapy water. Traps were left in place for approximately 48 hours every other week (opposite of hand netting weeks), then specimens were strained out for identification.
- Vane traps (blue and yellow)** were hung as a pair from shepherd's hooks with fishing line at vegetation height in the middle of each transect and filled with soapy water. Traps were left in place for ca. 48 hours during the same weeks as the pan traps, with specimens strained out for identification.



Figure 2. A Yellow Pan trap placed on the ground. Each transect had one Yellow Pan and one Blue Pan set at the end of a transect.



Figure 3. A pair of vane traps being strained by Carson along the Meadow West transect.

RESULTS

Table 1: Total number of bee specimens collected Summer 2019 and Fall 2018 sorted by Family and Genus.

Bee Groups	Common Name	Summer 2019	Fall 2018
Family Andrenidae			
<i>Andrena</i>	Mining bee	YES (16)	NO
Family Apidae			
<i>Apis</i>	Honey bees	YES (6)	YES (12)
<i>Bombus</i>	Bumble bees	YES (17)	YES (50)
<i>Ceratina</i>	Small carpenter bees	YES (47)	YES (3)
<i>Eucerini</i>	Long-horned bees	NO	YES (2)
<i>Melissodes</i>	Long-horned bees	YES (14)	NO
<i>Peponapis</i>	Squash Bees	YES (3)	NO
<i>Xylocopa</i>	Carpenter bees	YES (1)	NO
Family Collectidae			
<i>Colleinae</i>	Plasterer bees	NO	YES (2)
<i>Hylaeus</i>	Yellow-faced bees	YES (3)	NO
Family Halictidae			
<i>Agapostemon</i>	Metallic green sweat bees	YES (2)	NO
<i>Augochlorini</i>	Sweat bees	YES (16)	YES (7)
<i>Halictus</i>	Furrow bees	YES (14)	YES (3)
<i>Lassioglossum</i>	Sweat bees	YES (28)	YES (6)
Family Megachilidae			
<i>Chelostoma</i>	Leafcutter bees	YES (1)	NO
<i>Hoplitis</i>	Leafcutter bees	YES (1)	NO
<i>Megachile</i>	Leafcutter bees	YES (1)	NO
<i>Osmia</i>	Mason bees	YES (1)	YES (1)
TOTALS		171	86

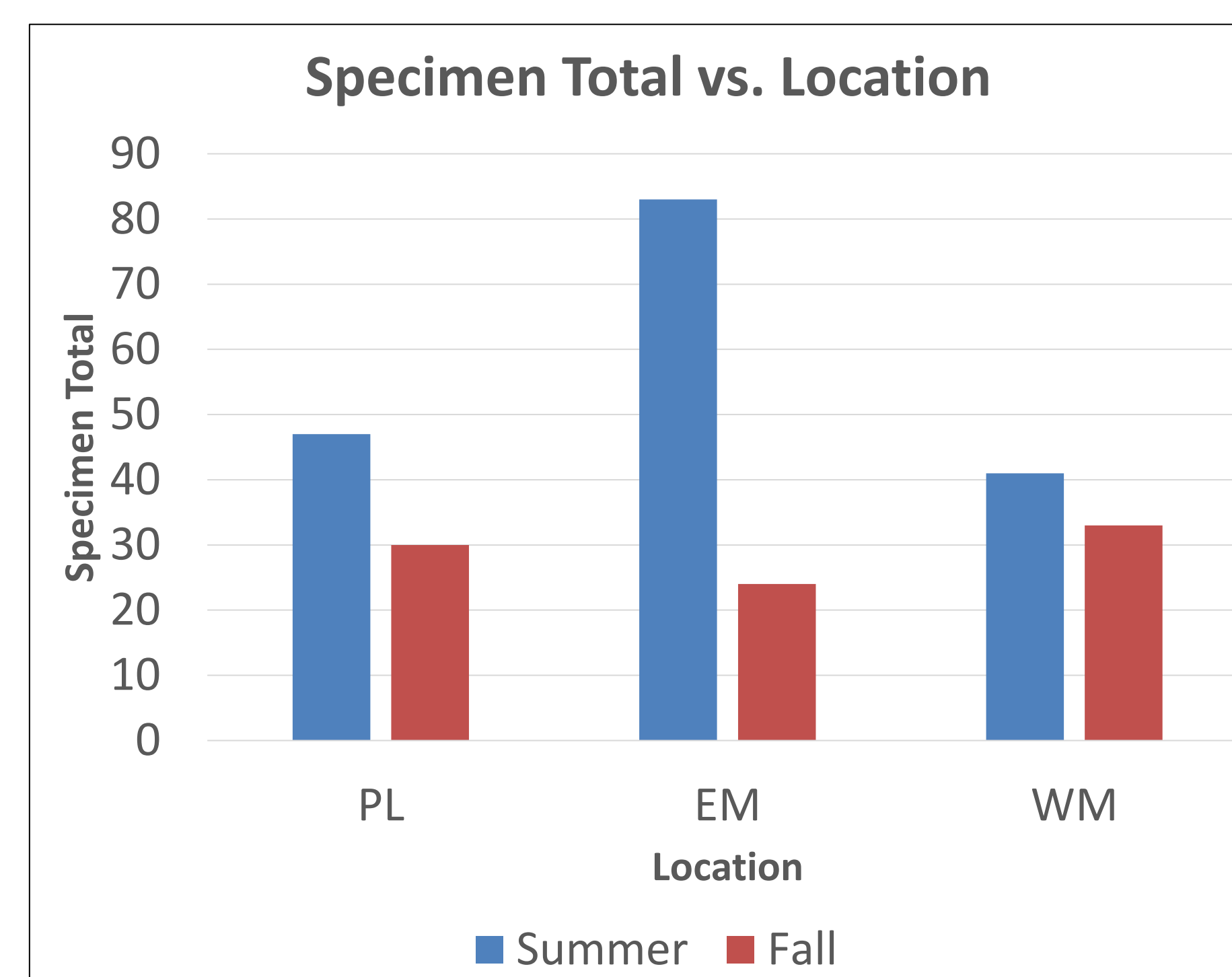


Figure 4. Specimen totals of each location on the Nature Center property. PL = Powerline, EM= East side of meadow, WM = West side of meadow.

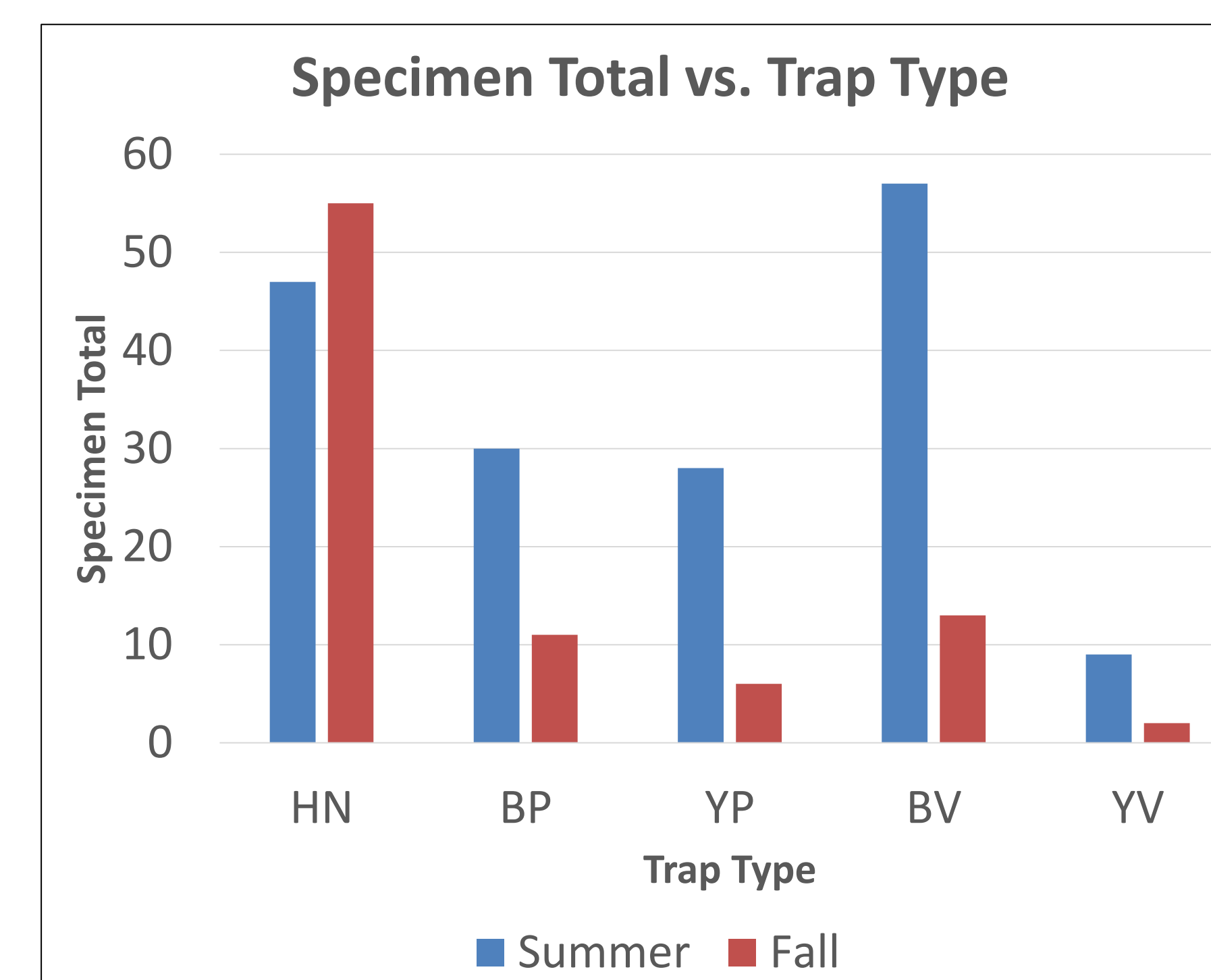


Figure 5. Specimen totals for each trap type. HN = hand net, BP = Blue pan, YP = Yellow pan, BV = Blue vane, YV = Yellow vane.

CONCLUSIONS

- During the summer months (Jun, Jul, Aug), 171 bee specimens were collected in 5 Families and 16 Genera vs. 86 specimens in 4 Families and 9 Genera during the fall months (Sep, Oct, Nov).
- Of the 18 Genera collected overall, only 7 Genera were present during both summer and fall seasons (Table 1).
- During the summer, the Meadow East transect clearly had the most bee specimens, but during the fall specimens were more evenly distributed among transects (Figure 4). Differences are likely due to multiple bees collected from one hollow twig.
- During the summer, *Ceratina* was the common native bee Genus collected but during the fall, *Bombus* was the most common (Figures 6 and 7). Honey bees were not counted in this study.



Figure 6. *Ceratina* specimen



Figure 7. *Bombus* specimen

- The Families Megachilidae and Collectidae are present at HBNC but they were not collected in high numbers.
- During the summer, Blue Vane traps captured the most specimens, but during the fall most specimens were collected by Hand Netting (Figure 5).
- In both seasons, Yellow Vane traps captured the fewest bee specimens (Figure 5).
- Three types of bees that are common in Ohio but were not found on the nature center property were Resin bees (Megachilidae), Wood-Carder bees (Megachilidae) and Cuckoo bees (Nomada).
- Overall, the native bee community at the HBNC is not very diverse, bee abundance is low, and there are major differences between the bees present during the summer months vs. the fall months.

ACKNOWLEDGMENTS

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