

2017 Annual Report: Bees of the Big Thicket National Preserve (Insecta: Hymenoptera: Apoidea)

Daniel J. Bennett¹ & John Pascarella²

¹ Assistant Professor, Department of Biology, Stephen F. Austin State University, P.O. Box 13003, SFA Station, Nacogdoches, TX 75962-3003, (936) 468-5163, bennett dj@sfasu.edu

² Dean, College of Sciences & Professor, Department of Biological Sciences, Sam Houston State University, 200 Lee Drain Building, Box 2209, Huntsville, TX 77341-2209, (936) 294-1401, jbpascarella@shsu.edu

Summary

Due to funding provided by the Big Thicket Association and Texas Commission on Environmental Quality, bees and other insects were sampled from late February through September 2017 within areas of Big Thicket National Preserve, Texas. Partial collections were made in late August and September due to impacts of hurricane Harvey. Samples are currently being processed and a voucher collection of identified bees is being assembled. To date, 2705 specimens have been mounted and 73 species of bees have been documented. Due to a budget surplus and the weather-related loss of data for late August and September 2017, we herein propose extending the time frame for fieldwork and associated expenditures to include sampling events in 2018.

Methods

Two localities were selected as permanent sampling sites for a standard array of traps: (1) a wet savannah near National Park Preserve headquarters complex on FM 420, 30.4596° -94.38316° (“HQ”); and (2) a longleaf pine sandyland near Sand Loop, Kirby Nature Trail, 30.47388° -94.33773° (“SL”). At each of these sites, one Malaise trap (Fig. 1) and four vane traps (two blue, two yellow) (Fig. 2) were in continuous operation from late February to late August 2017 for SL and through September for HQ. These traps were serviced every other week, at which time pan traps were deployed for a 24-hour period. A Malaise trap and four vane traps were also deployed at Turkey Creek Unit, near Pitcher Plant Trail, 30.58636° -94.33606° (“PT”), and were serviced as outlined above. Limited sampling with various methods also occurred at a wet savanna clearing within the Hickory Creek Savanna Unit, 30.54571° - 94.41125°, and a longleaf pine restoration area at the northern part of Turkey Creek Unit, 30.61413° - 94.34719°.

Where deployed at the HQ and SL sites, pan traps were set along two, ca. 150m transects. Each transect contained 36 alternating blue, yellow, and white pans separated by ca. 5m. Three pans of each color were placed on the ground, elevated 0.5m on pvc poles, elevated 1.5m on pvc poles, and hung about 2.0m above ground in trees. Additionally, about 10 bowls of each color were typically placed on the ground along a nearby trail.

Sweep netting was occasionally employed at all sites but this was largely abandoned as a routine method due to poor results and time constraints. Hand collecting was somewhat productive but was limited by the time constraints involved in reaching all sites.

Results

Bees were sorted from bulk trap samples in the Biology Department of Stephen F. Austin State University (SFA) and transferred to Sam Houston State University (SH) for pinning and labeling. As of this writing, February through mid-July samples have been processed, and most of the bees (2705 specimens) from these samples have been pinned, labeled and identified. To date, 73 species have been recognized from this work, 64 identified to species, and nine identified to morpho-species (Table 1). Specimen processing and species identification has progressed somewhat faster than outlined in the original proposal.

Student Training

Three SFA) biology majors, Ryan Pingenot, Archie Sauls, and Chris Strong, have received training in fieldwork and curatorial methods. One biology graduate student from Sam Houston State University, Cindy Botero has received training in curatorial and identification methods. As conceived in the original proposal, one SFA graduate student, Meghan Alkins, was expected to be involved. However, due to health issues, Ms. Alkins has taken a different degree path that does not require fieldwork. In her absence, additional involvement by SFA undergraduates has been utilized.

Budget Considerations

Of the \$13056 allotted to this project, \$5178.42 have been encumbered as of 15 September 2017. The project is roughly \$3000 under budget due to several factors. First, hurricane Harvey and its aftermath sharply curtailed late summer and fall fieldwork. Due to closures on Kirby Nature Trail, site SL has been inaccessible since 25 August. Other sites have remained accessible, but these have been sampled in a limited fashion. Secondly, the original budget provided for the added expense associated with 4WD vehicles. In the end, these were not needed, and vehicle rentals were about 60% of the anticipated amount.

Proposed Modification to Expenditure of Funds

As conceived in the original proposal, all funds earmarked for fieldwork were to be encumbered by the end of 2017. However, due to a budget surplus and the weather-related absence of sufficient data for August and September, we here request that the Thicket of Diversity Executive Council, Big Thicket Board of Directors, and Texas Commission on Environmental Quality allow excess funds to be spent on additional collecting to be carried out in 2018, with an emphasis on late summer and fall months. Under this scenario, the end date of the project (September 2019) will remain the same, but the remaining timeline and benchmarks will be modified as follows:

- 2018: September annual report indicating ongoing fieldwork and specimen processing, about 60% completion of species-level identification work, a preliminary checklist of taxa, and continued student training in fieldwork and curatorial methods.
- 2019: September final report indicating completion of species-level identification and checklist, sharing of data with Big Thicket Association, NPS, other agencies as appropriate, and indication of plans for data dissemination in a peer-reviewed journal and scientific conference.



Fig. 1. Malaise trap.



Fig. 2. Blue vane trap.

Table 1. Bee species recorded at three sites in Big Thicket National Preserve resulting from collections made February through July 2017.

Family	Genus	species	Turkey Creek Unit,	Near Preserve	Turkey Creek Unit,
			near Pitcher Plant Trail (PT)	Headquarters (HQ)	Sand Loop (SL)
Andrenidae	Andrena	cressoni	1	0	0
Andrenidae	Andrena	imitatrix	0	0	1
Andrenidae	Andrena	species	0	1	0
Andrenidae	Perdita	obscurata	0	0	1
Andrenidae	Perdita	species	2	1	58
Apidae	Anthophora	abrupta	1	0	1
Apidae	Apis	mellifera	13	6	9
Apidae	Bombus	griseocollis	1	0	1
Apidae	Bombus	impatiens	2	2	1
Apidae	Bombus	pennsylvanicus	4	13	3
Apidae	Ceratina	calcarata	16	0	0
Apidae	Ceratina	cockerelli	4	3	3
Apidae	Ceratina	species	0	0	2
Apidae	Ceratina	strenua	1	0	0
Apidae	Epeolus	species	1	0	2
Apidae	Habropoda	laboriosa	40	24	30
Apidae	Holcopasites	illinoisensis	0	0	1
Apidae	Melissodes	bimaculata	10	0	1
Apidae	Melissodes	species	111	20	453
Apidae	Melitoma	taurea	8	1	8
Apidae	Ptilothrix	bombiformis	73	51	29
Apidae	Svastra	atripes	0	1	0
Apidae	Svastra	species	0	1	4
Apidae	Triepeolus	species	0	0	1
Apidae	Xylocopa	micans	1	1	0
Apidae	Xylocopa	virginica	8	9	2
Colletidae	Colletes	thoracicus	1	0	0
Colletidae	Hylaeus	affinis	1	1	0
Colletidae	Hylaeus	confluens	0	3	0
Halictidae	Agapostemon	angelicus or texanus female	0	5	1
Halictidae	Agapostemon	texanus male	0	0	1
Halictidae	Agapostemon	splendens	7	0	7
Halictidae	Augochlorella	karankawa	6	0	185
Halictidae	Augochloropsis	metallica	2	7	5
Halictidae	Halictus	ligatus	4	1	0
Halictidae	Lasioglossum	apokkensis	16	3	122
Halictidae	Lasioglossum	batya	0	0	9

Halictidae	Lasioglossum	birkmanni	0	1	0
Halictidae	Lasioglossum	bruneri	36	10	26
Halictidae	Lasioglossum	callidum	0	1	0
Halictidae	Lasioglossum	cinctipes	0	0	6
Halictidae	Lasioglossum	coactum	0	0	1
Halictidae	Lasioglossum	coreopsis	30	20	5
Halictidae	Lasioglossum	creberrimum	19	10	0
Halictidae	Lasioglossum	disparile	0	5	1
Halictidae	Lasioglossum	fedorense	1	0	12
Halictidae	Lasioglossum	floridanum	20	1	164
Halictidae	Lasioglossum	illinoensis	4	0	11
Halictidae	Lasioglossum	imitatum	73	0	0
Halictidae	Lasioglossum	lustrans	0	0	1
Halictidae	Lasioglossum	species	105	71	48
Halictidae	Lasioglossum	tarponensis	8	0	1
Halictidae	Lasioglossum	tegularis	35	11	137
Halictidae	Lasioglossum	trigeminum	2	4	1
Halictidae	Lasioglossum	vierecki	47	0	190
Halictidae	Sphecodes	brachycephalus	0	0	39
Halictidae	Sphecodes	species	2	0	7
Megachilidae	Anthidiellum	notatum	2	0	1
Megachilidae	Coelioxys	immaculata	0	0	1
Megachilidae	Dianthidium	curvatum	0	1	0
Megachilidae	Hoplitis	truncata	0	0	2
Megachilidae	Megachile	albitarsis	0	1	0
Megachilidae	Megachile	brevis	0	0	1
Megachilidae	Megachile	campanulae	0	2	1
Megachilidae	Megachile	deflexa	0	0	1
Megachilidae	Megachile	frugalis	0	0	1
Megachilidae	Megachile	georgica	5	13	21
Megachilidae	Megachile	mendica	4	2	5
Megachilidae	Megachile	mucida	0	0	3
Megachilidae	Megachile	psuedobrevis	0	0	1
Megachilidae	Megachile	texana	1	0	31
Megachilidae	Megachile	xylocopoides	0	0	2
Megachilidae	Osmia	chalybea	0	1	1
Megachilidae	Osmia	sandhousae	3	1	2
# Specimens			731	309	1665
# Species			43	37	58