A conundrum of conservation: Measuring the impact of European Honey Bee (*Apis mellifera*) presence on wild bee populations and foraging patterns within the Balcones Canyonlands Preserve

Report to The Nature Conservancy, March 2025

Our team (Dr. Kaysee Arrowsmith and undergraduate mentee Willa Pabst) collected preliminary data describing the pollinating insect community at two locations in the Barton Creek Habitat Preserve during June of 2024. At each location, we surveyed insects for two weeks along four 1x20-m transects that were set up in June and removed in October. We also returned to these sites in mid-October in preparation to collect insects during the fall bloom, but found that too few flowers were in bloom to justify continued collection at these sites in the fall. During this collection, we recorded 59 insects visiting flowers within our transects. These insects can be further categorized as follows: beetle (n = 16), hemiptera (n = 16), wild bee (n = 12), honey bee (n = 6), fly (n = 6), wasp (n = 2), and moth (n = 1). With the exception of the honey bees, all other insects were collected and are currently in a lab at the University of Texas awaiting identification with the help of collaborators. These insects were all caught on only five plants: *Gaillardia pulchella*, *Linum berlandieri*, *Monarda citriodora*, *Stenaria nigricans*, and *Thelesperma filifolium*, all of which are native to the Edwards Plateau ecoregion.

Willa is conducting preliminary analyses of the limited data that we were able to collect in 2024, and has found positive, though non-significant, relationships between the density of honey bees that were present in a community and (1) the different types of insects present (richness) and (2) the overall abundance of insects visiting flowers. These findings are suggestive of honey bees in the Balcones Canyonlands Preserve acting not as competitors for floral resources but rather, as indicators of beneficial habitat. We hope to confirm this preliminary assessment with an additional surveys in 2025. Additionally, in 2025 we hope to collect sufficient insects to compare the plant-pollinator networks found in our region with networks collected from the Colorado Rocky Mountains and Mount Rainier National Park in Washington. We look forward to updating TNC with the findings from that additional project in the following year.