

The house of a thousand species: The untapped potential of comprehensive biodiversity censuses of urban properties

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Formal biodiversity surveys and citizen science programs have contributed greatly to our understanding of urban biodiversity (Mesaglio & Callaghan, 2021). The collection and interpretation of such data are usually predicated on understanding ecological communities on large spatial scales (e.g., Shochat et al., 2010), yet to understand urban ecosystems, it is equally important to understand communities at smaller scales. In urban environments, the private domestic property is a convenient, small unit of land upon which surveys can easily be performed. The question of how many species are in a small, urban lot/house is one of the simplest, most fundamental questions an ecologist could ask. Yet, surprisingly few studies have been structured around answering this question.

While the rise in popularity of citizen science data-gathering platforms such as eBird and iNaturalist have provided considerable amounts of valuable biodiversity data (DiBattista et al., 2021; Tng et al., 2021), these data, paired with traditional peer-reviewed studies, are insufficient for answering how many species are typically on an urban property. This is because, (1) there is considerable taxonomic bias and undersampling in both citizen science and traditional biodiversity data

sets (Binley & Bennett, 2023; Di Cecco et al., 2021); and (2) even if the data were unbiased, records rarely come from consistent daily observations, from a single urban property, over a continuous and extended period of time.

With little previous published information on expected species richness in an urban house, we aimed to determine this number for our property over a single year. We started during the 2020–2021 mass lockdowns precipitated by the COVID-19 global crisis, initiating a continuous, comprehensive census of our property in the manner of a Bioblitz, attempting to find every species of macrobiodiversity that could be observed from our property. This paper documents how we found over 1000 unique species and the knowledge we gained about the local ecosystem along the way. By describing this unexpectedly high biodiversity, we hope to catalyze ecologists and naturalists to participate in house biodiversity censuses. Censuses will allow us to overcome some of the biases in urban biodiversity data collection, a step toward improving understanding in pure and applied ecology.

We conducted our census on a 430-m² urban property and associated three-bedroom house, located 2.7 km from the central business district of Brisbane (−27.503413, 153.029308; Figure 1a), Queensland, Australia. The house

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FIGURE 1 (a) Map of study location. The house surveyed was in medium-density urban housing in the city of Brisbane, Australia, 500 m from the Brisbane River. (b) The total number of species observed in each broad taxonomic group over 12 months during our continuous comprehensive census. We counted any organism we observed to be an organism with the naked eye (or ear). (Images created by Andrew Rogers.)

footprint was 172 m², with 50 m² of open lawn area, which was largely overtaken by self-propagating weeds. The majority of the lot was shaded by large mature trees, with the understory dominated by shrubs in the front yard and various perennial weeds throughout. Some corners of the yard had accumulated small piles of wood and palm fronds. Occasionally attempts were made to garden in the corners of the yard that received sunlight, but without regular irrigation. There was no application of pesticides or herbicides or mowing for at least the preceding 4 years.

The Greater Brisbane region has a subtropical climate characterized by hot, humid summers and mild winters. From April 2020 to April 2021 Brisbane received 1,005 mm of rain, with temperatures ranging between 8 and 35 °C. This climate supports several broad vegetation groups, primarily eucalypt woodland, pockets of rainforest, wet eucalypt open forests, and acacia open woodlands (Neldner et al., 2023). Such vegetation supports considerable biodiversity; indeed, the Atlas of Living Australia, the national biodiversity database, has historical records for 11,089 species within 10 km of the city center. However, the area in which this survey was conducted was highly urbanized and bore little resemblance to wild ecotypes. The property was adjacent to detached houses, 30 m from two-story apartment buildings, 50 m from freight and passenger rail lines, 100 m from a major arterial road and associated retail, 400 m from public infrastructure (hospital and train station), and 500 m from the Brisbane River.

The survey period started 29 March 2020 and continued for 1 year. We deployed a range of survey methods, including weekly sweep netting of the back and front yard, weekly beating of foliage on a hedge, irregular soil/compost/leaf-litter sampling (500 g), and opportunistic transects (spotting organisms during daily routines and watching for animals from vantage points). We also routinely checked ordinary outdoor and indoor lights at least once per night. For a species to count in this survey, it had to be present in or on the property bounds or identifiable from the property. Plants had to be either self-propagated or, if cultivated, regarded as reasonably established, that is, having survived in the ground for at least a year and had naturally entered a flowering or fruiting cycle without human assistance. No microbial species were considered. However, organisms bearing features that required microscopic assessment were examined under a low-power dissecting microscope. All living animals were released alive after examination. Identifications, where possible, were carried out using dichotomous keys and field guides, and through photographs uploaded to iNaturalist or Facebook naturalist

groups or sent to experts. Taxa were identified to the lowest possible taxonomic level. A record was considered a unique species if it had been identified to the species level or to a taxonomic level not represented by other records in the data set.

Over the course of the 12-month census, we found 1168 species, including 1041 animals (955 arthropods), 103 plants, and 24 fungi (Figure 1b; full list in Holden, 2023). Seven hundred and seventy-seven species were recorded in the first 60 days, corresponding to the end of the first summer/wet season. The species accumulation curve then leveled off, except for a small increase near the end of the census during the start of a second summer/wet season (Figure 2a,b). We found approximately the same temporal pattern for each taxonomic group (Figure 2b), with accumulation curves for Coleoptera and Arachnida having the steepest and shallowest rise during the second wet season, respectively (Figure 2b). These fluctuations in population and activity correspond heavily to seasonal fluctuations in temperature and rainfall (Figure 2c,d) and include incursions by migrant species such as trans-Papuan migrant birds, as well as emergences of seasonal insects. Our detection trends are consistent with what we would expect within this context.

In contrast, the species accumulation curve for Brisbane, using Atlas of Living Australia records, over the same period continues to increase steadily at a constant rate and never levels off (green curve in Figure 2a). Additionally, per Atlas of Living Australia records (<https://www.ala.org.au/>; accessed 13 July 2022), we found 1.37 million times more species per square kilometer than what was recorded in Brisbane (house: 1168 species per 0.00043 km², Brisbane City Council: 2667 species per 1343 km²). Thirty-two sightings were made of species with fewer than 10 Atlas of Living Australia records, including three species with zero prior records (Appendix S1: Table S1).

We encountered multiple species whose biology involved a symbiotic interaction, including more than 40 parasitoid wasp species and 10 lycaenid butterflies whose caterpillars are nurtured by ants within their colonies until pupation (Pierce et al., 2002). Two notable examples of obligate commensal moths were *Scatochresis innumera* (Oecophoridae), whose larvae feed and pupate in the feces of common brushtail possum (*Trichosurus vulpecula*) (Phalangeridae) (Common, 1997), and *Parilyrgis concolor* (Erebidae), whose larvae inhabit spider webs and feed on frass (G. Monteith, personal communication, 13 May 2021). The records of *P. concolor* during our census comprised nine of the 13 (69%) Atlas of Living Australia records for this species up to that time.

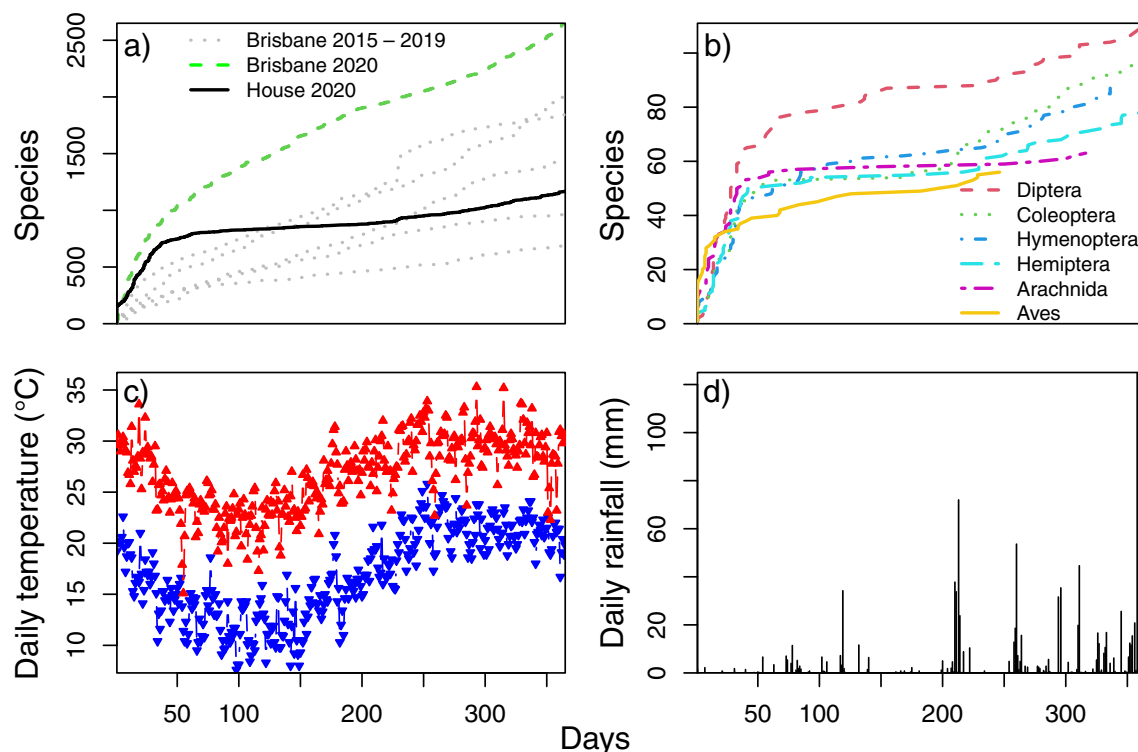


FIGURE 2 (a) Species accumulation curves for the house census (solid, black curve), and Brisbane City Council area (dashed green and gray curves). For the Brisbane curves, species records come from the Atlas of Living Australia. Curves are calculated by summing the first occurrence of a unique species record over the course of the sampling period. “Days” refers to sampling days, which started on 29 March 2020. (b) Accumulation curves for select individual taxa. Note Lepidoptera, as the dominant taxon in the survey, exhibit a nearly identical trend to the total taxa curve in (a) and is therefore not displayed. (c) Daily temperature with red upward and blue downward triangles representing daily highs and lows, respectively; and (d) daily rainfall. Temperature and rainfall were measured at Brisbane (Raymond Park) weather station, 2.6 km from the property. Data and code can be found in Holden (2023).

That over 1,000 macro-organism species could be found in and around a single, small urban property is staggering. It is clear from our data that many more species inhabit the Brisbane metropolitan area than anyone had previously reasonably suspected. The rate of records made at our property vastly outstripped that of the wider Brisbane area. Additionally, we observed three species never previously recorded in Australia’s primer biodiversity database. This included a native mosquito, *Culex edwardsi* (Culicidae), and the terrestrial flatworm, *Platydemus manokwari* (Geoplanidae), an invasive snail predator linked to numerous native snail population declines (Gerlach et al., 2021); our sighting is the southernmost record across global databases (Justine et al., 2015). These species are unlikely to be rare in Australia; rather, their lack of records indicates a vast undersampling of urban landscapes.

The effects of urbanization on species richness are ambiguous (McKinney, 2008), but hyper-urban environments are often thought of as depauperate, with complex ecological interactions compromised due to being dominated by “weedy” or synanthropic species (Shochat

et al., 2010). Our study not only showed that basic urban properties could effectively capture ecosystem complexity; it demonstrated that synanthropy is not the sole driver of urban biodiversity. Only 156 (13.4%) of the species we observed are introduced to Australia, and only 73 (6.3%) are considered pests or synanthropic to some degree, implying that the overwhelming majority of species encountered did not exist in urban space purely because of human influence. The notable exception for this was plants: of the 103 recorded plant species, 100 (97.1%) were non-native, and they included nine species listed as weedy or noxious species of concern at either or both the state and federal levels. Even excluding the 12 species deliberately planted as ornamentals or for food, self-propagating introduced flora were extraordinarily well represented, showing the importance of urban processes in facilitating the establishment and spread of invasive plant species.

It is notable that, despite the extreme prevalence of invasive plants, the number of pollinator and fruit-feeding species was high. Of important pollinating and fruit-feeding insect orders, we recorded 437 lepidopteran, 110 dipteran,

and 87 hymenopteran species over the course of our survey (Figure 2). We also recorded 13 species of frugivorous or nectarivorous birds, many of which were directly observed feeding on the fruits and flowers of plants on the property. These birds included four species (channel-billed cuckoo [*Scythrops novaehollandiae*] [Cuculidae], eastern koel [*Eudynamys orientalis*] [Cuculidae], little lorikeet [*Parvipsitta pusilla*] [Psittacidae], and musk lorikeet [*Glossopsitta concinna*] [Psittacidae]) that show strong seasonal regional or trans-Papuan migration behavior. These four bird species are well established as having adapted to urbanized environments, being frequently observed incurring into, feeding in, and breeding in major Australian cities (Campbell et al., 2022). It is known that frugivorous and nectarivorous birds can show some resilience to urbanization, although net declines in overall richness are still often observed, in favor of pugnacious and more adaptable species (Schneiberg et al., 2020). Given that urbanization is widely regarded as a leading cause of pollinator declines (Vanbergen, 2013), recording such a high diversity of pollinators, particularly insect pollinators, in this heavily urbanized environment seems counterintuitive. It is understood that pollinators do not prefer native over non-native plants (Harrison & Winfree, 2015), but such a dramatic replacement of native flora by non-native flora would almost certainly have resulted in a corresponding shift in pollinator guild in favor of more generalist, adaptable species (Harrison & Winfree, 2015). On the other hand, invasive plants have been shown to create new niches for fauna to exploit and may even be key in sustaining populations against the loss of native flora (Biella et al., 2019). A high richness of unmanaged invasive flora could, hence, be seen as increasing habitat heterogeneity in otherwise homogenized urban environments, thereby acting as refuge for an increased diversity of pollinators and fruit eaters, although native flora remains optimal for encouraging biodiversity in many instances (Fukase & Simons, 2016).

It must be emphasized that, apart from a minimal effort to clear and maintain the surrounding gardens and our deliberate avoidance of pesticides and herbicides, there was nothing especially remarkable about the assessed property to cause it to harbor especially high amounts of richness. The high number of species found in our study therefore highlights the value of small, weedy, minimally disturbed patches of habitat within an urban matrix. Such properties can support high numbers of species (Phillips & Lindquist, 2021), and intentional planting of native vegetation can further increase the diversity of native species (Adams et al., 2020; Berthon et al., 2021; Faeth et al., 2011). Communicating the fact that high numbers of species occupy less-managed urban habitats could improve the perceived value of such areas and help

overcome people's preference for tidy, cleared lawns and parks. Furthermore, by identifying a diverse array of species in urban yards, we demonstrate the ubiquity of nature in areas near people who may be underrepresented in conservation.

Biodiversity appreciation through citizen data-gathering initiatives, like iNaturalist, point to a possible future (Mesaglio & Callaghan, 2021). While there is some concern regarding accuracy and bias in the resulting data, these issues also exist in professionally collected data sets (Binley & Bennett, 2023). Minor modifications to data collection protocols (Kelling et al., 2019), such as sociodemographically diverse communities conducting structured surveys of their homes, may help overcome taxonomic and temporal biases in biodiversity data (Daru & Rodriguez, 2023; Rocha-Ortega et al., 2021). At the same time, such surveys would vastly engage the public in positively interacting with nature (Meeus et al., 2023), improve representation bias in citizen science platforms (Dimson & Gillespie, 2023; Fernández-Álvarez, 2022), and increase equitable access to nature (Grade et al., 2022).

Through the sheer volume of potential data and the accessibility of one's own property, biodiversity censuses of urban properties could generate knowledge rivaling classic richness pattern studies. Associated property species lists, paired with property size, location, environmental characteristics, and temporal information, could be used to improve understanding of species–area relationships (Rosenzweig, 1995), spatial complementarity of species occurrences (Velázquez et al., 2014), species accumulation curves in disturbed environments (Willott, 2001), the maintenance of symbiotic relationships (Shochat et al., 2010), and the spread of invasives and disease vectors (Palmer et al., 2017). Not only are these concepts critical to applied science, such as reserve design (Schuster et al., 2023), but these data would help resolve fundamental questions in ecology (Gaston, 2000).

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

Data and code (Holden, 2023) are available in Zenodo at <https://doi.org/10.5281/zenodo.10371210>.

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REFERENCES

- Adams, B. J., E. Li, C. A. Bahlai, E. K. Meineke, T. P. McGlynn, and B. V. Brown. 2020. "Local-and Landscape-Scale Variables Shape Insect Diversity in an Urban Biodiversity Hot Spot." *Ecological Applications* 30: e02089.
- Berthon, K., F. Thomas, and S. Bekessy. 2021. "The Role of 'Nateness' in Urban Greening to Support Animal Biodiversity." *Landscape and Urban Planning* 205: e103959.
- Biella, P., A. Akter, J. Ollerton, S. Tarrant, Š. Janeček, J. Jersáková, and J. Klecka. 2019. "Experimental Loss of Generalist Plants Reveals Alterations in Plant-Pollinator Interactions and a Constrained Flexibility of Foraging." *Scientific Reports* 9: e7376.
- Binley, A. D., and J. R. Bennett. 2023. "The Data Double Standard." *Methods in Ecology and Evolution* 14: 1389–97.
- Campbell, C. E., D. N. Jones, M. Awasthy, J. G. Castley, and A. L. M. Chauvenet. 2022. "Big Changes in Backyard Birds: An Analysis of Long-Term Changes in Bird Communities in Australia's Most Populous Urban Regions." *Biological Conservation* 272: e109671.
- Common, I. F. B. 1997. *Oecophorine Genera of Australia II: The Chezala, Philobota and Eulechria Groups Lepidoptera: Oecophoridae*. Clayton, Victoria, Australia: CSIRO Publishing.
- Daru, B. H., and J. Rodriguez. 2023. "Mass Production of Unvouchered Records Fails to Represent Global Biodiversity Patterns." *Nature Ecology and Evolution* 7: 1–16.
- di Cecco, G. J., V. Barve, M. W. Belitz, B. J. Stucky, R. P. Guralnick, and A. H. Hurlbert. 2021. "Observing the Observers: How Participants Contribute Data to iNaturalist and Implications for Biodiversity Science." *Bioscience* 71: 1179–88.
- DiBattista, J. D., K. M. West, A. C. Hay, J. M. Hughes, A. M. Fowler, and M. A. McGrouther. 2021. "Community-Based Citizen Science Projects Can Support the Distributional Monitoring of Fishes." *Aquatic Conservation: Marine and Freshwater Ecosystems* 31: 3580–93.
- Dimson, M., and T. W. Gillespie. 2023. "Who, Where, When: Observer Behavior Influences Spatial and Temporal Patterns of iNaturalist Participation." *Applied Geography* 153: e102916.
- Faeth, S. H., C. Bang, and S. Saari. 2011. "Urban Biodiversity: Patterns and Mechanisms." *Annals of the New York Academy of Sciences* 1223: 69–81.
- Fernández-Álvarez, R. 2022. "Socio-Ecological Patterns of Citizens Science Programs: The Case of Forestry Observations in 3 Central Mexico States." *Urban Forestry & Urban Greening* 70: e127513.
- Fukase, J., and A. M. Simons. 2016. "Increased Pollinator Activity in Urban Gardens with more Native Flora." *Applied Ecology and Environmental Research* 14: 297–310.
- Gaston, K. 2000. "Global Patterns in Biodiversity." *Nature* 405: 220–27.
- Gerlach, J., G. M. Barker, C. S. Bick, P. Bouchet, G. Brodie, C. C. Christensen, T. Collins, et al. 2021. "Negative Impacts of Invasive Predators Used as Biological Control Agents against the Pest Snail Lissachatina Fulica: The Snail Euglandina 'Rosea' and the Flatworm Platydemus Manokwari." *Biological Invasions* 23: 997–1031.
- Grade, A. M., N. W. Chan, P. Gajbhiye, D. J. Perkins, and P. S. Warren. 2022. "Evaluating the Use of Semi-Structured Crowdsourced Data to Quantify Inequitable Access to Urban Biodiversity: A Case Study with eBird." *PLoS One* 17: e0277223.
- Harrison, T., and R. Winfree. 2015. "Urban Drivers of Plant-Pollinator Interactions." *Functional Ecology* 29: 879–888.
- Holden, M. H. 2023. "matthewhholden/HomeBiodiversitySurvey: Ecology_Journal_article (V.1.1.1)." Zenodo. <https://doi.org/10.5281/zenodo.10371210>.
- Justine, J. L., L. Winsor, P. Barrière, C. Fanai, D. Gey, A. W. K. Han, G. la Quay-Velázquez, et al. 2015. "The Invasive Land Planarian *Platydemus manokwari* (Platyhelminthes, Geoplanidae): Records from Six New Localities, Including the First in the USA." *PeerJ* 3: e1037.
- Kelling, S., A. Johnston, A. Bonn, D. Fink, V. Ruiz-Gutierrez, R. Bonney, M. Fernandez, et al. 2019. "Using Semistructured Surveys to Improve Citizen Science Data for Monitoring Biodiversity." *Bioscience* 69: 170–79.
- McKinney, M. 2008. "Effects of Urbanization on Species Richness: A Review of Plants and Animals." *Urban Ecosystems* 11: 161–176.
- Meeus, S., I. Silva-Rocha, T. Adriaens, P. M. J. Brown, N. Chartosia, B. Claramunt-López, A. F. Martinou, et al. 2023. "More than a Bit of Fun: The Multiple Outcomes of a Bioblitz." *BioScience* 73(3): 168–181. <https://doi.org/10.1093/biosci/biac100>.
- Mesaglio, T., and C. T. Callaghan. 2021. "An Overview of the History, Current Contributions and Future Outlook of iNaturalist in Australia." *Wildlife Research* 48: 289–303.
- Neldner, V. J., R. E. Niehus, B. A. Wilson, W. J. F. McDonald, and A. J. Ford. 2023. *The Vegetation of Queensland. Descriptions of Broad Vegetation Groups*. Brisbane, Queensland, Australia: Queensland Herbarium and Biodiversity Science, Department of Environment and Science.
- Palmer, J. R. B., A. Oltra, F. Collantes, J. A. Delgado, J. Lucientes, S. Delacour, M. Bengoa, R. Eritja, and F. Bartumeus. 2017. "Citizen Science Provides a Reliable and Scalable Tool to

- Track Disease-Carrying Mosquitoes.” *Nature Communications* 24: e916.
- Phillips, D., and M. Lindquist. 2021. “Just Weeds? Comparing Assessed and Perceived Biodiversity of Urban Spontaneous Vegetation in Informal Greenspaces in the Context of Two American Legacy Cities.” *Urban Forestry & Urban Greening* 62: e127151.
- Pierce, N. E., M. F. Braby, A. Heath, D. J. Lohman, J. Mathew, D. B. Rand, and M. A. Travassos. 2002. “The Ecology and Evolution of Ant Association in the Lycaenidae (Lepidoptera).” *Annual Review of Entomology* 47: 733–771.
- Rocha-Ortega, M., P. Rodriguez, and A. Córdoba-Aguilar. 2021. “Geographical, Temporal and Taxonomic Biases in Insect GBIF Data on Biodiversity and Extinction.” *Ecological Entomology* 46: 718–728.
- Rosenzweig, M. L. 1995. *Species Diversity in Space and Time*. Cambridge: Cambridge University Press.
- Schneiberg, I., D. Boscolo, M. Devoto, V. Marcilio-Silva, C. A. Dalmaso, J. W. Ribeiro, M. C. Ribeiro, A. de Camargo Guaraldo, B. B. Niebuhr, and I. G. Varassin. 2020. “Urbanization Homogenizes the Interactions of Plant-Frugivore Bird Networks.” *Urban Ecosystems* 23: 457–470.
- Schuster, R., R. Buxton, J. O. Hanson, A. D. Binley, J. Pittman, V. Tulloch, F. A. la Sorte, et al. 2023. “Protected Area Planning to Conserve Biodiversity in an Uncertain Future.” *Conservation Biology* 37: e14048.
- Shochat, E., S. B. Lerman, J. M. Anderies, P. S. Warren, S. H. Faeth, and C. H. Nilon. 2010. “Invasion, Competition and Biodiversity Loss in Urban Ecosystems.” *Bioscience* 60: 199–208.
- Tng, D. Y., D. M. Apgaua, N. J. Fisher, and V. W. Fazio. 2021. “Moth Species Richness in an Upland Tropical Rainforest: A Citizen Scientist Assisted Study.” bioRxiv. <https://doi.org/10.1101/2021.11.07.467659>.
- Vanbergen, A. J. 2013. “Threats to an Ecosystem Service: Pressures on Pollinators.” *Frontiers in Ecology and the Environment* 11: 251–59.
- Velázquez, J., J. P. Garrahan, and M. P. Eichhorn. 2014. “Spatial Complementarity and the Coexistence of Species.” *PLoS One* 9: e114979.
- Willott, S. J. 2001. “Species Accumulation Curves and the Measure of Sampling Effort.” *Journal of Applied Ecology* 38: 484–86.

SUPPORTING INFORMATION

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