

Survey Protocols and Habitat Management Strategies for Butterflies at Liberty Pond Natural Area – 2025

By Noah Huber

Summary

Scio Township's parks and nature preserves constitute a series of valuable and ecologically important areas in Washtenaw County. These natural areas support a multitude of wildlife species, many of which are experiencing population declines due to a variety of anthropogenic factors. Butterflies are a critical component of these ecosystems, controlling plant populations as well as providing a valuable food source to mesopredators. The natural areas of Scio Township support a wide variety of butterfly species. During the summer of 2025, I performed butterfly surveys in collaboration with the Michigan Butterfly Association at Liberty Pond Natural Area. I documented 23 species within the confines of the survey protocol, with several additional species sighted outside protocol.

In this paper, I will summarize the results of these surveys, as well as suggesting habitat management approaches that will increase the diversity of butterflies on our properties in addition to securing their populations in the future. Certain species were not documented as frequently as expected. Monarch butterflies are a species of conservation focus in many areas, and I only documented 6 of these iconic animals on our surveys despite an abundance of their main hostplant (common milkweed). The long-term habitat management practices for this site include a forest restoration plan. As this occurs, butterfly species composition will most likely shift in accordance to changes in niche partitioning as a result of the dramatic change in habitat. The results of these surveys were used to inform a few management recommendations including identification of larval host plants to increase lepidopteran at this site.

Introduction

Liberty Pond Nature Area is a 50-acre public preserve primarily consisting of wetlands and grasslands. It features .75 miles of mowed trails. Liberty pond was selected as a survey site for butterflies due to its abundance of wildflowers, herbaceous uplands, and considerable trail

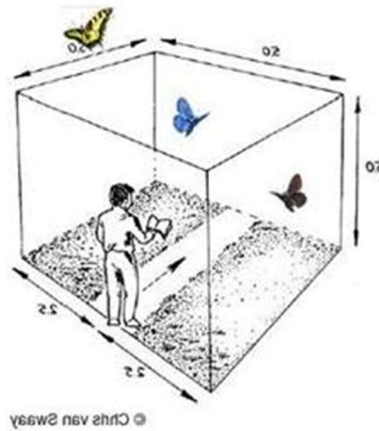


Figure 2

The purpose of these surveys is to formally document the butterfly species composition present at Liberty Pond. This information is of value to the conservation of the natural areas of Scio Township. Butterflies function as important pollinators and natural agents of control towards plant populations and densities. Additionally, they provide a critical food source for mesopredators, including birds, reptiles, amphibians, and predatory invertebrates. Butterflies are presently experiencing widespread declines across the world. Threats faced by these insects include but are not limited to habitat loss and fragmentation from agriculture and development, the proliferation of invasive plants, road mortality, disease, and mowing regimes. By protecting native wildflowers and providing necessary larval host plants, the future conservation of butterflies at Liberty Pond can be secured.

Results

The Liberty Pond butterfly surveys resulted in a total of over 800 individual butterflies logged. 23 species were identified in the confines of the survey, but it should be known that several other species were informally documented outside of the survey parameters. By dividing the number of an individual species observed by the total number of observations, the species composition is derived (Figure 3). The most prevalent species during surveys was the Clouded Sulphur (*Colias philodice*), which represented close to 30% of all butterflies observed. This was followed closely by the Baltimore Checkerspot (*Euphydryas phaeton*). By family (Figure 4), the composition of butterflies documented was dominated by the whites and sulphurs (Pieridae). Pierids represented approximately 46% of total observations. The next most prevalent family was

the brush-footed butterflies (Nymphalidae), constituting 38% of all observations. In third place were the skippers (Hesperiidae), with 8% of all butterflies observed. At 6% were the gossamer-wings and blues (Lycaenidae). The satyrs (Satyrinae) are technically a subfamily of Nymphalidae, but I considered them separately for their distinct habitat specializations. Satyrs comprised slightly more than 1% of all butterflies observed. The least commonly observed were the swallowtails (Papilionidae), constituting 1% of all butterflies observed. Many species were only documented with only a single observation. These include the giant swallowtail (*Papilio thoas*), the silver-spotted skipper (*Epargyreus clarus*), the American copper (*Lycaena hypophlaeas*), the common buckeye (*Junonia coenia*), the dun skipper (*Euphyes vestris*), and the Delaware skipper (*Anatrytone logan*). The Monarch (*Danaus plexippus*) was encountered 6 times, which was lower than expected, especially considering the abundance of their primary host plant (common milkweed) at this site.

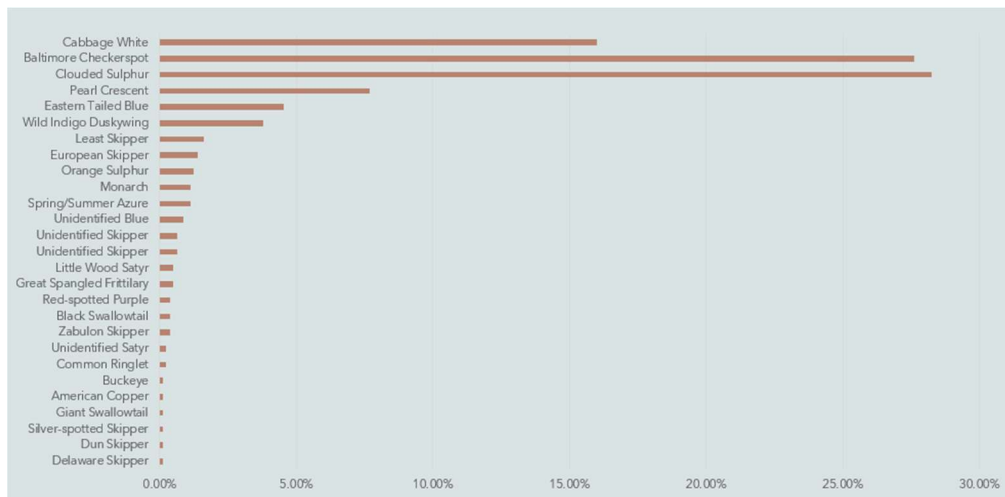


Figure 3

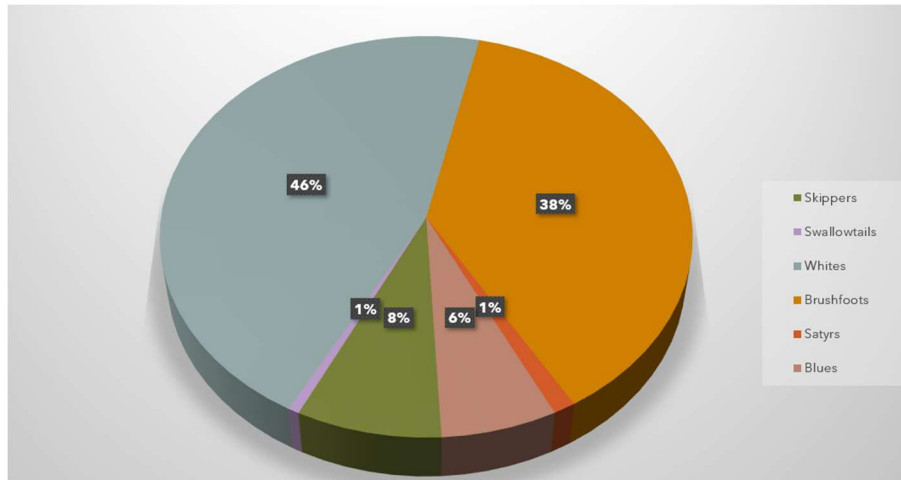


Figure 4

More butterflies were observed when temperatures were relatively warmer (75 degrees+), clear, and calm winds. The most butterflies were observed in our final visit, but the highest diversity was documented in our third visit. Both the least number of butterflies and the lowest diversity was observed on our first visit. This visit was relatively cold (mid 60s) and overcast, so this is understandable. Even so, many Baltimore checkerspots were spotted, as this survey took place during the peak of their flight. 805 total butterflies were documented in the confines of the survey, with an average of 134 butterflies seen per walk.

Discussion

These surveys provide valuable insight into the composition and diversity of invertebrate species at this preserve. These surveys provide a minimally invasive approach to verifiable, archivable observations of species documented. The species composition of this site is equally valuable, providing a baseline of the most common species at Liberty Pond. This information can also inform inferences about plant communities can also be approximated for the general area surrounding Liberty Pond. Although we found 23 butterfly species in our surveys, this number was lower than initially expected. The abundance of invasive plant species at this site provides room for improvement in this branch of promoting butterfly diversity here. Additionally, as forest restoration efforts continue at this site, the composition of species will inevitably shift. The data collected from these surveys is useful for informing both future management plans and in functioning as a reference point from which future surveys can be compared.

One management practice that can enhance butterfly conservation at Liberty Pond is the coordinated removal of invasive plant species on the property. Invasive plants quickly outcompete their native counterparts in both uplands and wetlands. This displacement is harmful to butterfly populations because they have not evolved to recognize or consume them as suitable host plants. Unmitigated spread of invasive plants has been shown to create gaps in usable habitat for animals that rely on native plant communities for food or shelter (including insects). Continued invasive removal should have beneficial impacts on the species composition, richness, and population size.

Host plant recommendations were made in consideration for butterflies that were seen infrequently (less than 10 times) or not at all, as well as plants that were reasonable for the habitat types present at the preserve. Host plants recommended at Liberty Pond include swamp milkweed (*Asclepias incarnata*), American hackberry (*Celtis occidentalis*), common hoptree (*Ptelea trifoliata*), Virginia snakeroot (*Aristolochia serpentaria*), docks (*Rumex sp.*), yellow nutsedge (*Cyperus esculentus*), sassafras (*Sassafras albidum*), violets (*Viola sp.*), black cherry (*Prunus serotina*), tuliptree (*Liriodendron tulipifera*), common pawpaw (*Asimina triloba*), and panicgrass (*Panicum sp.*).