

Results of the GTM NERR Butterfly Monitoring Project

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GTM Research Reserve, Butterfly Monitoring Network

Introduction

The GTM Butterfly Monitoring Project began in April, 2008 and submits data to the Florida Butterfly Monitoring Network. Data obtained from this monitoring allows us to look at various aspects of Biodiversity including Species Richness, Uniqueness, Phenology, and Species Commonality. Currently, 66 species have been recorded from the GTM Research Reserve (GTM). Monitoring occurs on four transects. Transect A is an open habitat from the Environmental Education Center to the beginning of the trails. Transects B-D include different habitats within the forest trail system. September has the highest average species richness and abundance and February has the least. There are 11 butterflies that are considered common and 2/3 of the butterfly fauna at the GTM are either rare or uncommon. There is an iNaturalist guide available at <https://www.inaturalist.org/guides/2511>. This guide gives information on description, similar species, distribution in North America, larval description and host plants, GTM occurrence data, habitat, and conservation status.



The Common Buckeye (*Junonia coenia* Hübner) is considered a common species at the GTM. Most observations are in the open habitat along Transect A. Only a few observations have been made along the forest Transects with Transect C having the most individuals. This species occurs throughout the year with peak abundance from October to January. Buckeye is present, but in low numbers from May to September.

Methods

There are four transects that are monitored within the GTM. Transect A runs from the Environmental Education Center to the entrance of the hiking trails along both sides of the dam and road. This is an open disturbed area with many species of flowers which serve as nectar sources. Transect B explores the Marsh Pond Overlook off of the Yellow Trail. Transects C and D are Glass Wort Loop and the Red Bay Walk respectively. Transects B-D are all within the forested area of the GTM.

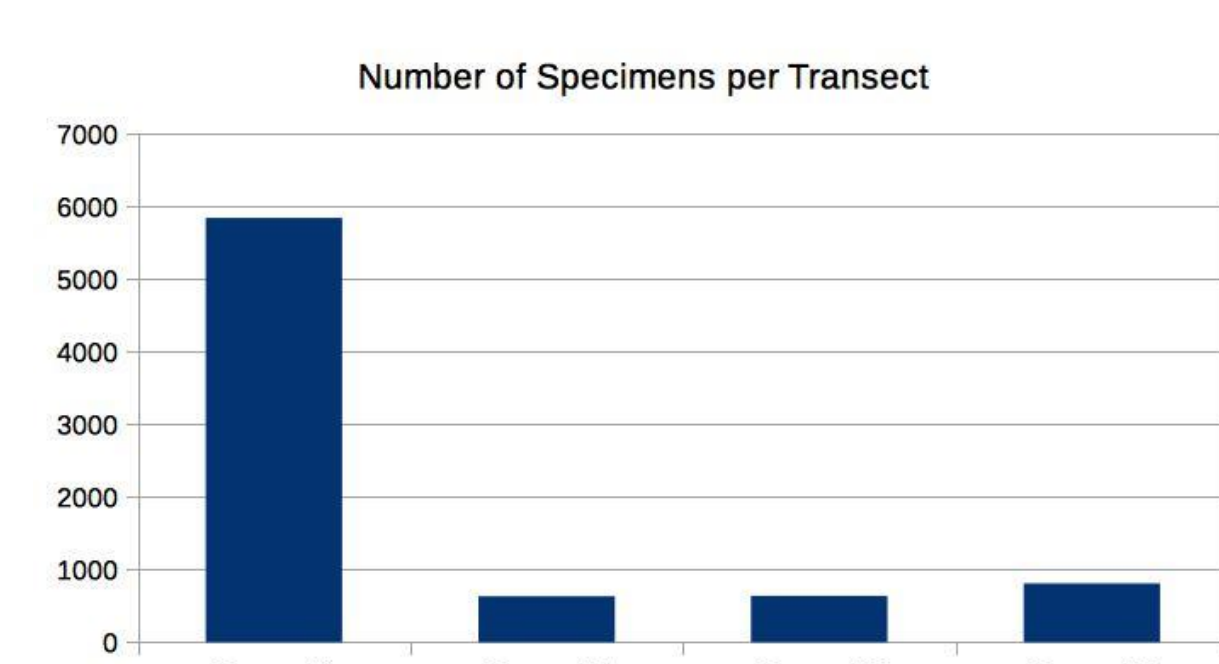
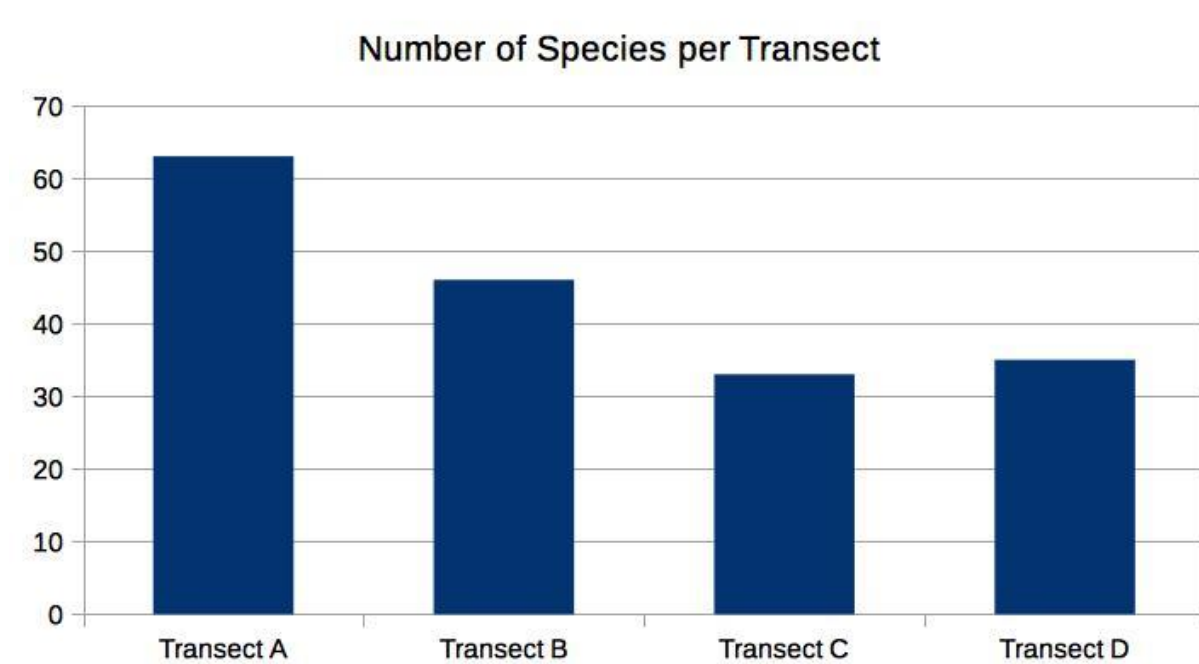
Monitoring is done by two teams of volunteers. One group will walk Transect A and a second group will use an electric golf cart to monitor Transects B-D. Within each group is an observer whose job it is to identify and count the individual butterflies. The recorder tallies the species and their numbers relayed by the observer. The rest of the team points out butterflies to the observer. The observer must see the butterfly for it to be officially recorded.

Some butterflies are difficult to identify from just a casual observation. In these cases the butterfly is netted and placed in a jar for closer examination and comparison to a field guide. After identification the butterfly is released.

Other data recorded are the temperature, sky condition, wind, and time spent on each transect. Weather can significantly effect the observation of butterflies. Cold, overcast, and windy days are poor for butterfly observation.



Butterfly monitoring transects at the GTM Research Reserve.



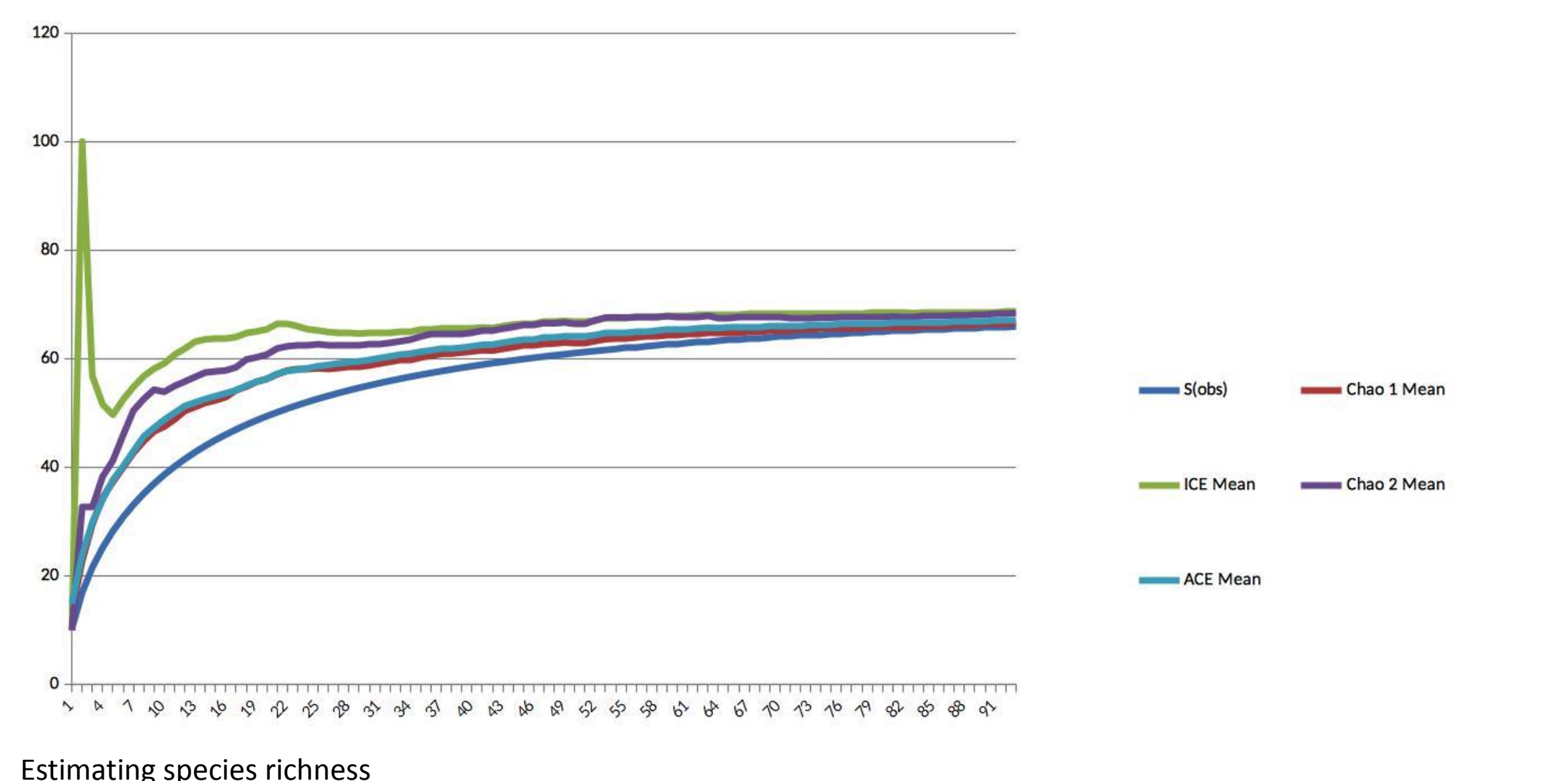
Estimating Species Richness

A program called EstimateS was used to estimate the number of butterfly species at the GTM. The chart has four estimators that were used to predict species richness, 2 abundance based and 2 incidence based.

Abundance based estimators use the number of species represented by a single specimen (abundance) in the sample termed a singleton and by the number of species represented by 2 specimens in the sample, termed a doubleton. These estimators are Chao 1 and ACE on the chart. If the number of singletons or doubletons in a sample is 0, then the number of observed species, S(obs), equal the number estimated species.

Incidence based estimators use the number of species present only once in a sample, singleton and by the number of species present only twice in a sample, doubleton. These estimators are Chao 2 and ICE on the chart. Incidence based estimates differ from abundance based estimators. As an example, there could be 10 specimens of a species in a sample, but these 10 specimens were observed only once. Where in the abundance based estimators this species would not be included as a singleton or doubleton.

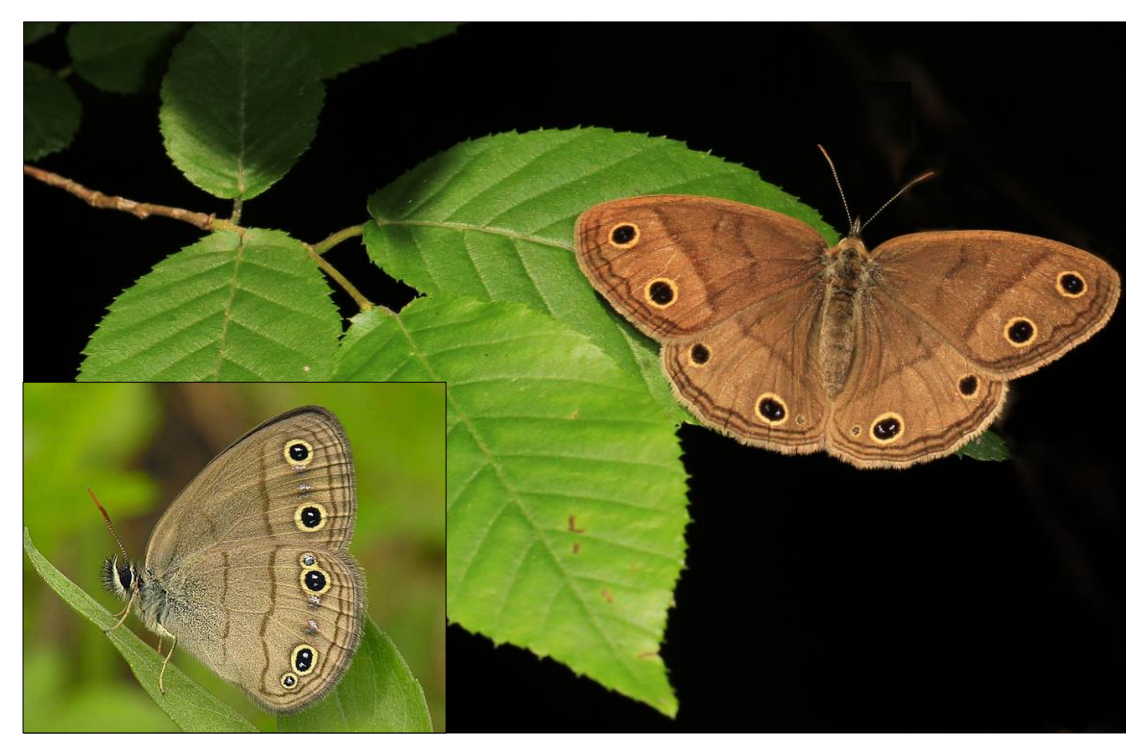
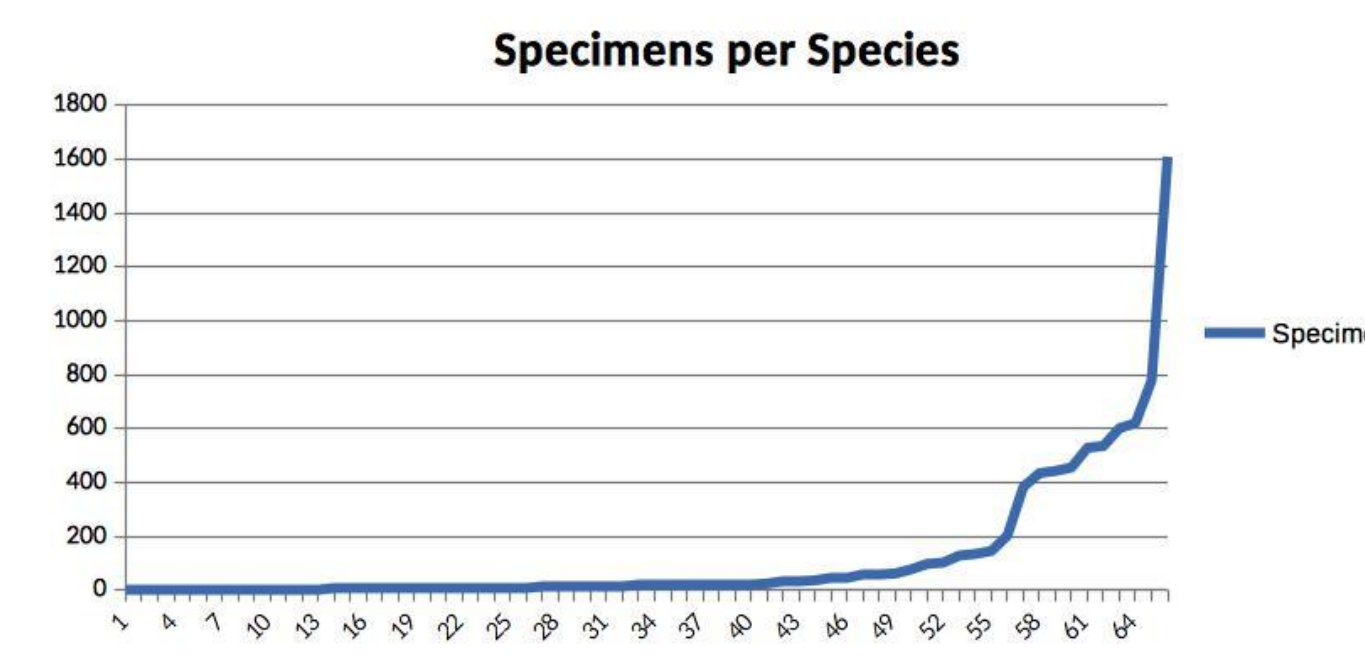
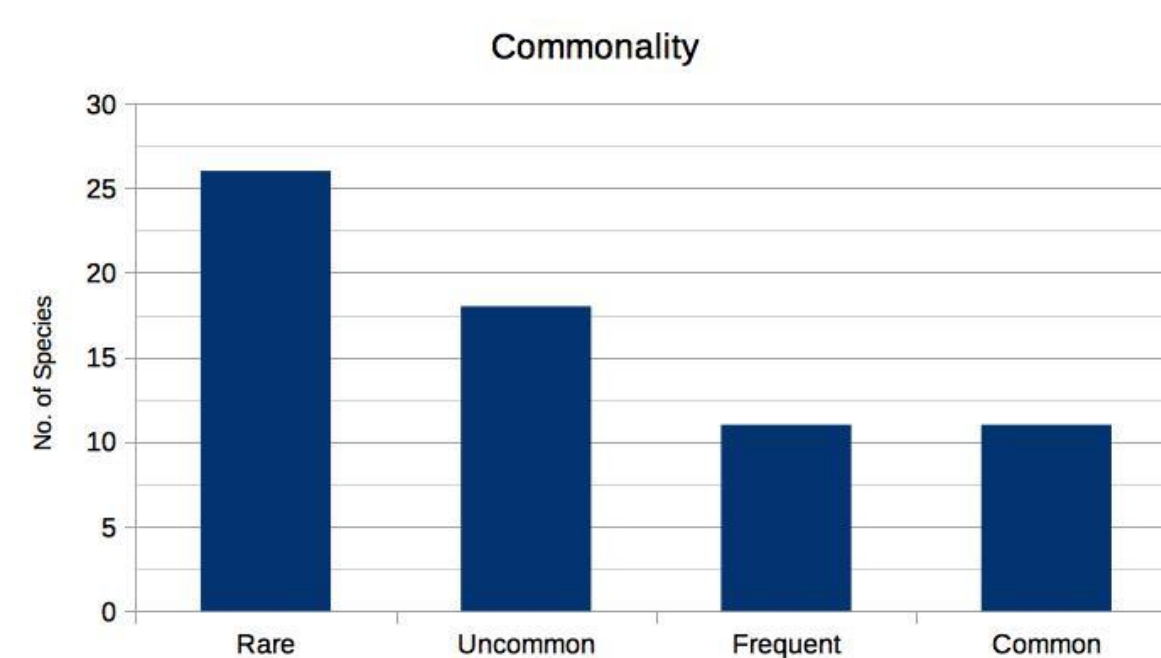
Singleton and doubleton species are different in both abundance and incidence estimators thus giving more predictive power of species richness. The chart shows that all four estimators are predicting a species richness of 66-68. The observed number of species at the GTM is 66. Based on these results it is unlikely that more species of butterflies will be added to the GTM list.



Commonality

Commonality is used to classify the butterfly species into groups that relate to abundance. I have grouped the GTM butterflies into four classifications. Butterflies that are considered rare are those that are represented by 1 or fewer specimens per year. Uncommon butterflies are those that have greater than 1 and fewer than 4 specimens per year. Butterflies with an abundance between 4-20 specimens per year are considered frequent. Butterflies with abundance greater than 20 are considered common. The chart shows that there are 26 rare species, 18 uncommon species, 11 frequent species, and 11 common species. Two-thirds of the butterflies at the GTM are either rare or uncommon.

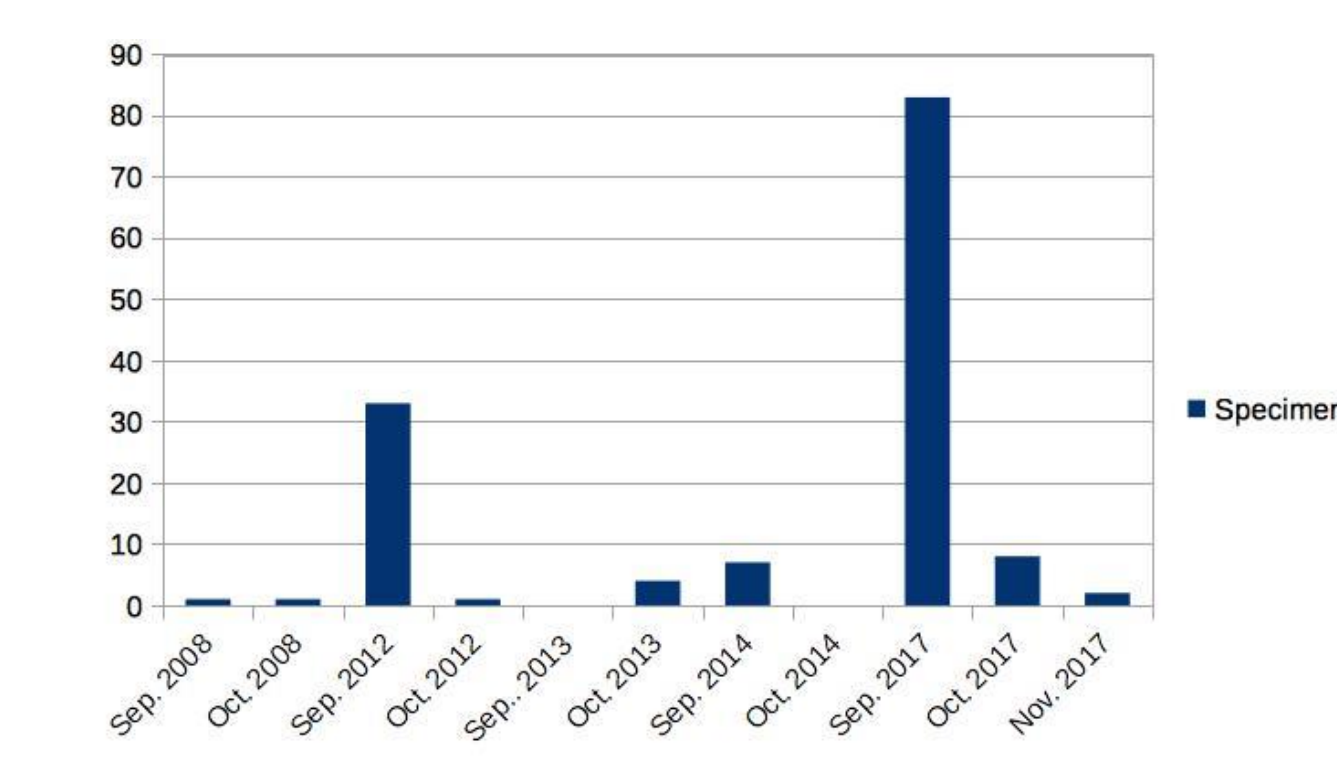
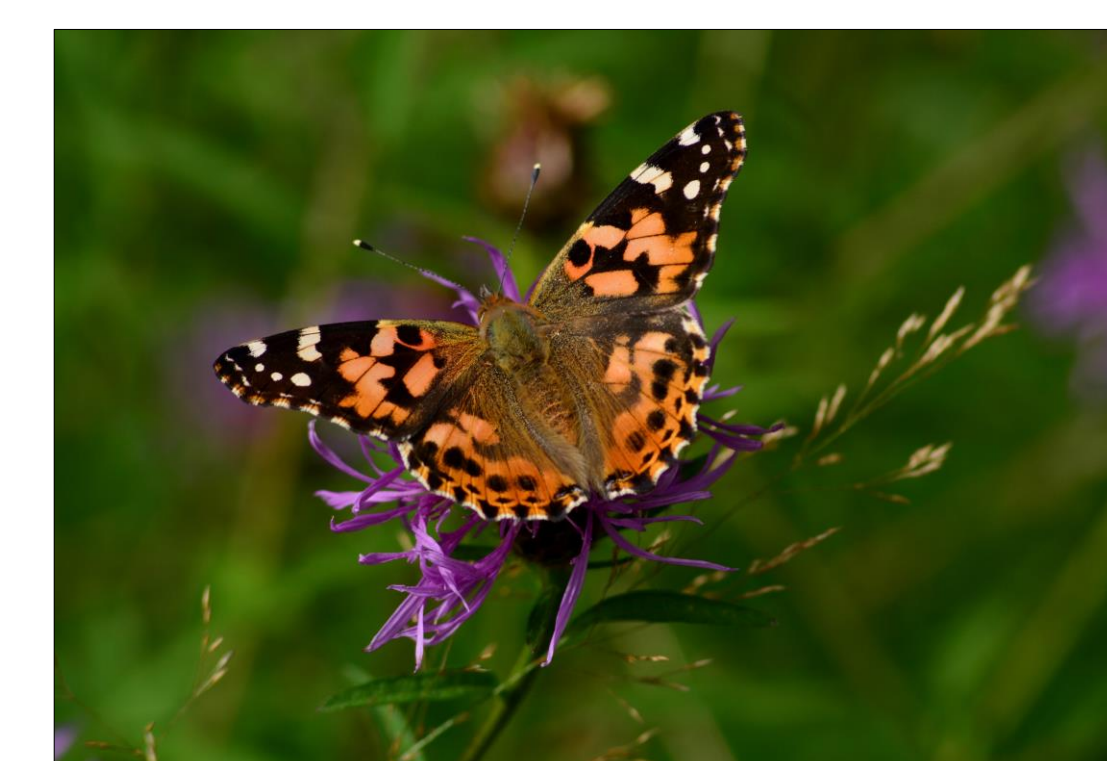
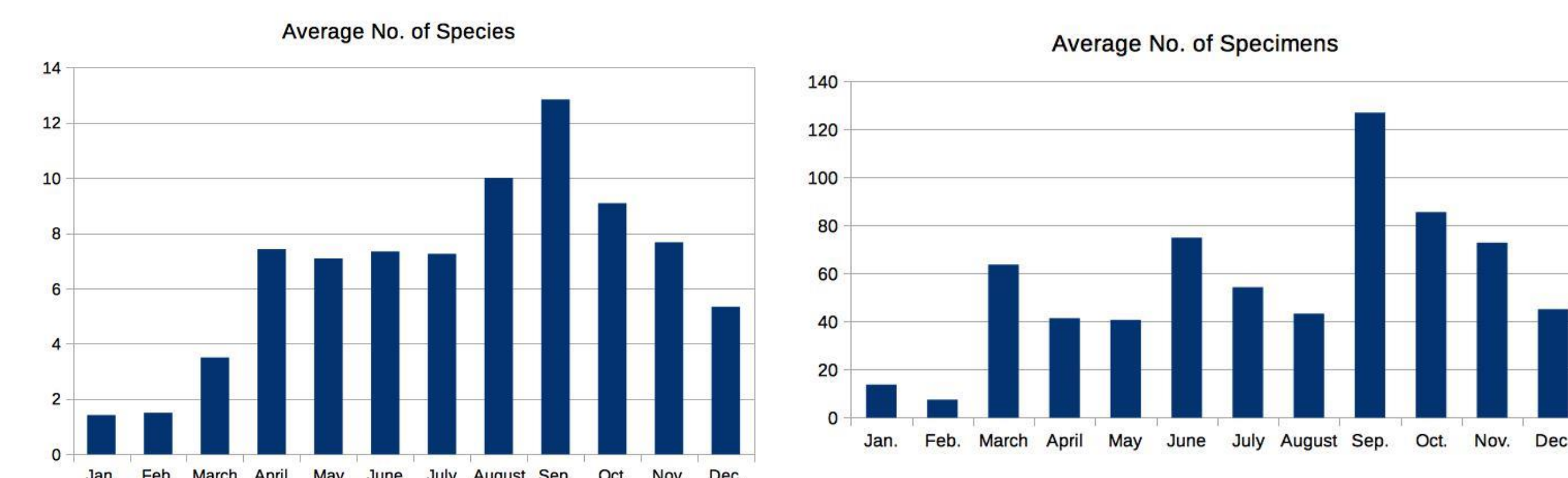
Species that are rare or uncommon can be on their edge of distribution, lack of larval host plant, or lack of a suitable habitat. The Eastern Tiger Swallowtail and the Orange Sulphur are common butterflies in their preferred habitat, but not at the GTM. On a nation wide basis no butterflies at GTM are considered threatened.



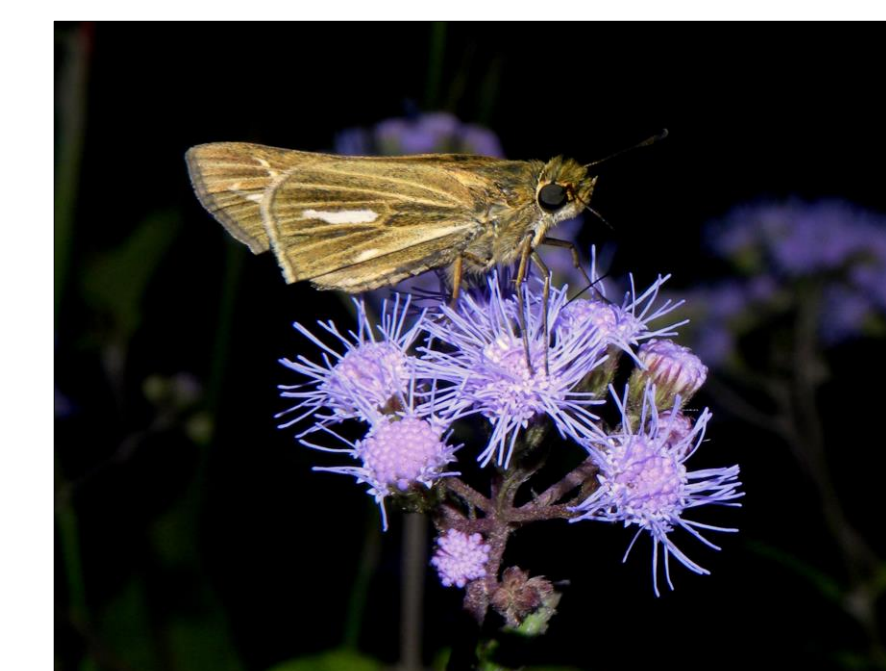
The Little Wood Satyr (*Megisto cymela* (Cramer)) is considered a common species at the GTM. It occurs along all transects, but is mainly a forest dwelling species. It is most abundant along the Red Bay Walk (Transect D) where 89% of the individuals were observed. This is a spring species and occurs only in March (most abundant) and April. Peak abundance of the Little Wood Satyr was in 2009 (223 specimens) and 2011 (198 specimens). In 2014 only 2 specimens were observed.

Phenology

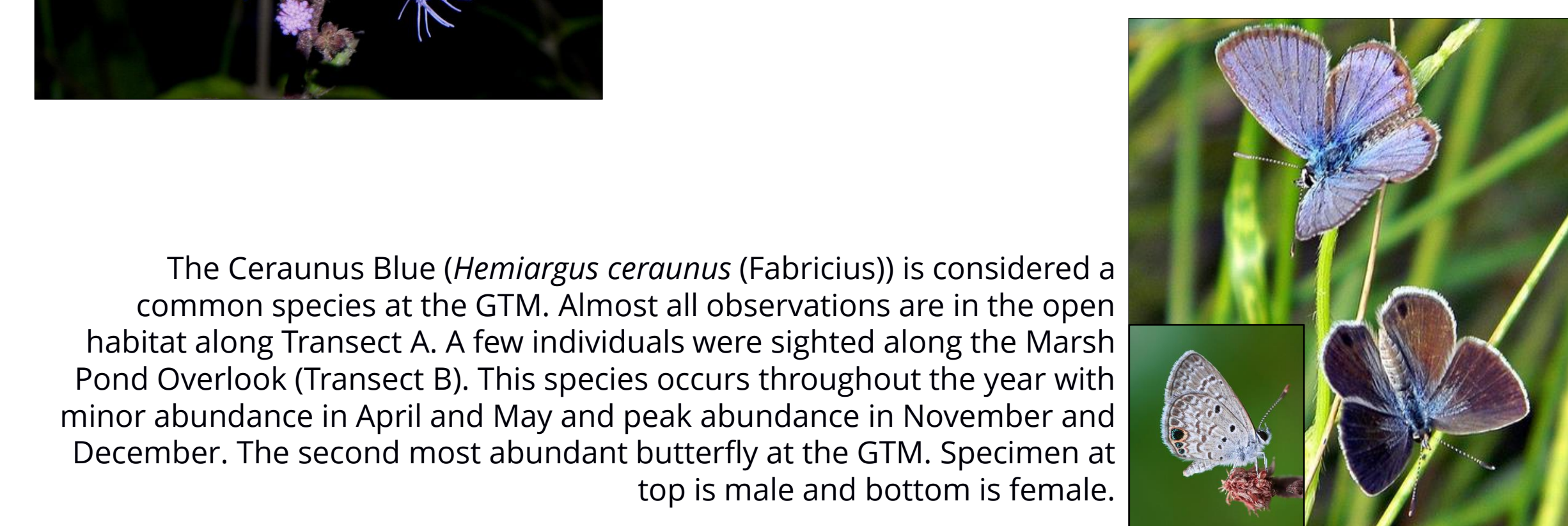
Distribution of butterfly species and abundance varies throughout the year. Chart 1 shows the average number of species at the GTM per month. January and February are typically the coldest months and the numbers of species is the lowest during the year. Unlike the more temperate areas of North America where the summer months show the greatest species richness, butterflies are most abundant at the GTM during late summer and fall, August to October. April through July and November average about 7 species and December with 5. The most species recorded for a single month was in September, 2009 with 23 species observed.



The Painted Lady (*Vanessa cardui* (Linnaeus)) is considered a frequent species at the GTM. Most observations are in the open habitat along Transect A. Only one observation was made on the Marsh Pond Overlook, Transect B. This species has been observed in April, May, September, and October with peak abundance in September. The Painted Lady was absent at the GTM from 2009-2011 and 2015-2016. The Painted Lady is a migratory butterfly and in September, 2017 there were 83 specimens observed which is almost twice the number from the previous 10 years. This could have been a result of Hurricane Irma.



The Salt Marsh Skipper (*Panoquina panoquin* (Scudder)) is the most common species at the GTM. Occurs along all transects but most common in the open habitat along Transect A. Of the forest transects it is most common along the Glasswort Loop (Transect C). Adults fly from March to December with peak abundance in June and September. Present in all years of the survey.



The Ceraunus Blue (*Hemiargus ceraunus* (Fabricius)) is considered a common species at the GTM. Almost all observations are in the open habitat along Transect A. A few individuals were sighted along the Marsh Pond Overlook (Transect B). This species occurs throughout the year with minor abundance in April and May and peak abundance in November and December. The second most abundant butterfly at the GTM. Specimen at top is male and bottom is female.

Acknowledgements

Janet Koehler has been the coordinator of the Butterfly Monitoring Project since its inception in April, 2008. She has done a tremendous job over the years with this program and has passed the wonderful program to myself and Christine Doyle. I hope that we can continue with the excellence of Janet's participation and coordination of this project. Other active volunteers include: Pam Allen, Diane Battle, Mary Ellen Bear, Mike Bentzien, Olivia Diskin, Chris Doyle, Mike and Gail Duggins, Elaine Edwards, Rick and Roz Edwards, Jackie Falconer, Patti and Chris Fox, Peggy Friedman, Rose Ganucheau, Ken Harp, Irene Kaufman, Pam Kleinsasser, Joan Kramer, Margaret Milner, Don Palmer, Vicki Pepper, Joan Rankovitz, Diane Reed, Xo Reyes, Joan Sams, and Elaine and Marty Weber.



Photographed above left to right: Peggy Friedman, Vicki Pepper, Chris Doyle, and Mike Bentzien

For additional information about the Butterfly Monitoring Network, please contact volunteer coordinator, Shannon Ringer, Shannon.Ringiner@floridadep.gov.