

Monarch Research Project 2021 Report

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Project Goals: To provide volunteer opportunities and raise awareness for monarch butterfly conservation by participating in the below citizen science projects. Hopefully, the data we collect will help scientists shed light on what is happening with the monarch butterfly populations, especially in our local area.

SKILLS NEEDED

- Ability to fill out detailed reports
- Ability to correctly identify common milkweed
- Ability to determine the sex of adult monarch butterflies
- Ability to distinguish monarch larval instars using the guide provided
- Ability to bend and stoop to examine milkweed leaves low to the ground
- Ability to work in areas with little shelter from the sun and high temperatures



Optional, but Preferred Skills

- Ability to use the Journey North App where volunteers can report their monarch sightings using their smartphone. If they photograph other animals during their surveys, they can report them using the iNaturalist App and select the CCNRD Project.

REQUIREMENTS AND EXPECTATIONS

- Volunteers and staff must be able to tolerate long periods of time outdoors in areas with limited shade
- Volunteers will be exposed to ticks, chiggers, mosquitoes, bees, wasps, poison ivy, bad weather, and other wildlife.
- Children are a big help chasing and catching butterflies and observing tiny caterpillars on the milkweed; however, a supervising adult needs to accompany them so that data is recorded correctly.
- Volunteers will work independently or in family teams with the guidance of a staff Naturalist.
- Volunteers and staff must understand that zero is important data and that we do not always see monarchs.

VOLUNTEER DUTIES

- In early May, volunteers/staff will help determine milkweed density in the Battle Creek Cypress Swamp Meadow using random sampling.
- Weekly, May through September, volunteers will monitor 100 to 150 milkweed plants for monarch larva and the data collected by them will be reported to the Monarch Larva Monitoring Project.
- From September to October, volunteers can capture adult migrating monarchs and put an ID sticker on them, as well as test them for disease. They can either do this at home or join the naturalist for tagging opportunities in our parks. Data will be reported to Monarch Watch and Project Monarch Health.
- This year, 2021, Monarch tagging and testing was limited to the Cox Family volunteers due to new Project Leaders. This will resume during the 2022 season with staff and other interested volunteers.
- A detail-oriented volunteer can assist with transferring paper data to the websites.



Spring 2021 Intern Sam Long uses a random sampling method to determine milkweed density in the meadow.

TRAININGS

- A video training created by Shannon Steele must be watched by volunteers before they are able to sign up for any Monarch Monitoring volunteer opportunities. It is also suggested that new staff to the project and even returning staff to the project watch this video as it covers all the information needed about monarchs and completing the datasheets. It is a good overview of everything you could possibly need to know while participating in this project
- On the job. Within the first 5-10 minutes of the monitoring activity, the accompanying staff naturalist or knowledgeable volunteer will show new volunteers what to do and how to correctly fill out the data sheet. They will be on hand the entire time to answer questions as they arise.

PROJECT DATES

- Once annually in May, we determine the milkweed density for each study site.
- Weekly, May through September, we examine 100-150 random milkweed plants for monarch larvae in the study sites. Throughout this time up to 30 monarch caterpillars can be collected from the study site and raised through adulthood to collect monarch survivorship data.
- Periodically, September through October, we tag monarchs and test them for disease at the following main locations: Cypress Swamp, the Gatewood Preserve, Biscoe Gray, Point Lookout State Park, & White Oak Farm (private residence).

VOLUNTEER APPRECIATION

- None in 2021 due to staff retirement and COVID restrictions.
- Looking to 2022 it is my plan to continue what we have done in the past. In the past Shannon Steele would lead a van trip to Point Lookout Park in Scotland, Maryland to tag monarch butterflies there. It is an ideal location that effectively creates a funnel for these migrating monarch butterflies. Shannon states that in the past the Point Lookout staff have been very generous by letting us enter free of charge and wander the property tagging butterflies. I will reach out to Point Lookout in the early months of 2022.

SUGGESTIONS FOR VOLUNTEER TRAINING OR STAFF TRAINING

- Monarch Joint Venture. (These are all free.)
 - Monarch Butterfly Conservation Series
 - <https://monarchjointventure.org/resources/monarch-webinar-series>
 - Monarch & Pollinator Presentations
 - <https://monarchjointventure.org/resources/downloads-and-links>

SUMMARY OF 2021 ACTIVITIES

CYPRESS SWAMP MEADOW MANAGEMENT:

In the year 2021 the Cypress Swamp meadow was mowed around March. Trails were also mowed through the different sections of the meadow to accommodate for social distancing due to COVID-19. No additional management was done in 2021.

Management Plans for 2022:

It is my intention in 2022 to mow the meadow in March. After this initial mowing it will be allowed to grow. If we were to leave the meadow as is after this point the milkweed will all be dead by late August and early September. Therefore, I am hoping 2022 will be the first year we can fully implement trimming back the meadow about six inches in late June/early July. As seen in 2020 with a small experiment this should allow new sprouts of milkweed to grow which will provide for monarch larva in August and September when we historically have a higher density. Regular trimming of other plants, such as black berry, will be done on a as needed basis.

In 2022 the certification of the Battle Creek Cypress Swamp meadow as a Monarch Waystations, through the organization Monarch Watch will be finalized. The habitat name for our meadow will now be Cypress Meadows.

MONARCH LARVA MONITORING PROJECT:

[HTTPS://MONARCHLAB.ORG/MLMP](https://monarchlab.org/mlmp)

“Our mission is to better understand the distribution and abundance of breeding monarchs and to use that knowledge to inform and inspire monarch conservation. The Monarch Larva Monitoring Project (MLMP) is a citizen science project involving volunteers from across the United States and Canada in monarch research. It was developed in 1997 by researchers at the University of Minnesota to collect long-term data on larval monarch populations and milkweed habitat. The project focuses on monarch distribution and abundance during the breeding season in North America. As an MLMP volunteer, your contributions will aid in conserving monarchs and their threatened migratory phenomenon, and advance our understanding of butterfly ecology in general. You can learn more about monarch conservation here.”

COVID-19 Modifications for MLMP:

The Cypress Swamp Meadow was divided into six separate flagged areas within the study site to allow for social distancing. Volunteers were provided with equipment placed in individual two-gallon Ziploc bags. Consistent volunteers were not allowed to keep these bags this year. Instead, all bags used were disinfected at the end of each monitoring day and were deemed safe to be used the following week. If needed there was enough equipment to alternate weeks. Volunteers and staff also wore masks when they were in close proximity or indoors. Like last year, these modifications worked well and the volunteers were happy to have an opportunity to be outside and part of a worthwhile study.

Activity 1: Measuring Monarch Density

From May 17th 2022 to September 27th 2022 Calvert Stewards, Interns, and other Calvert County Natural Resources staff helped monitor about 130 milkweed plants each week in the Cypress Swamp Meadow. The purpose was to look for and collect data on monarch eggs, caterpillars, and pupa. The previous year 2020 was one of our more disappointing years out of the five years we have been participating in this project. However, I am happy to report that 2021 marked an improvement from last year’s results. For example, during the first week of September in 2020 we had a large egg count and some 1st and 2nd instar larvae. However, in the first week of September in



Volunteer Karen Ritchie inspects milkweed for monarch activity and other invertebrates.

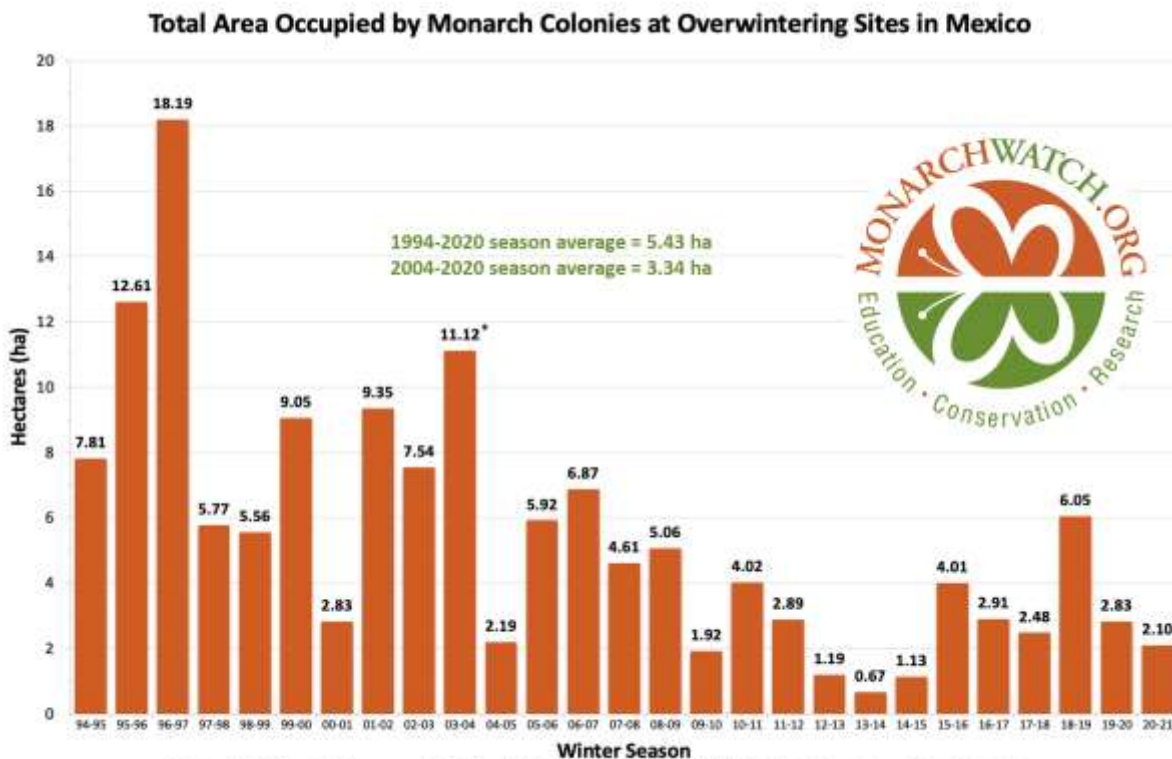
2021 we had a few eggs, but had the presence of 3rd, 4th, and 5th instars. Looking back though through the results of every year we have participated in this study shows an overall decline in the amount of monarchs. 2021 was more successful than 2020, but there was still a significant decrease of monarch activity as compared to early years. Interestingly, we found more similar amounts of monarch eggs when comparing the results of 2021 to early years.

Some possible reasons we saw more monarchs this year than in 2020:

- The Battle Creek Cypress Swamp meadow was bush hogged in March 2021, which allows more herbaceous plants that attract monarchs to grow without being outcompeted by plants such as black berries, winged sumac, and young trees.

Some possible reasons we are still seeing less monarchs than in previous years

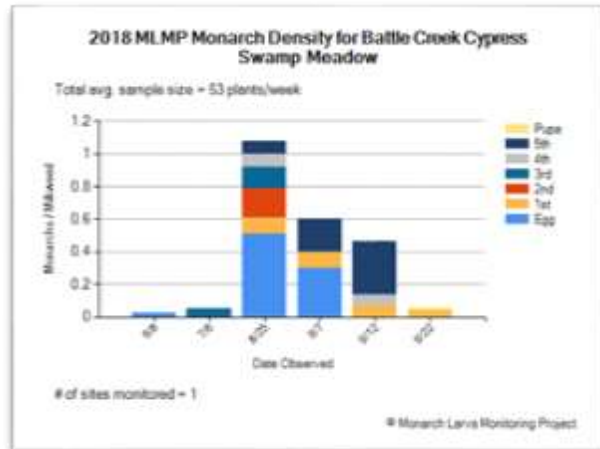
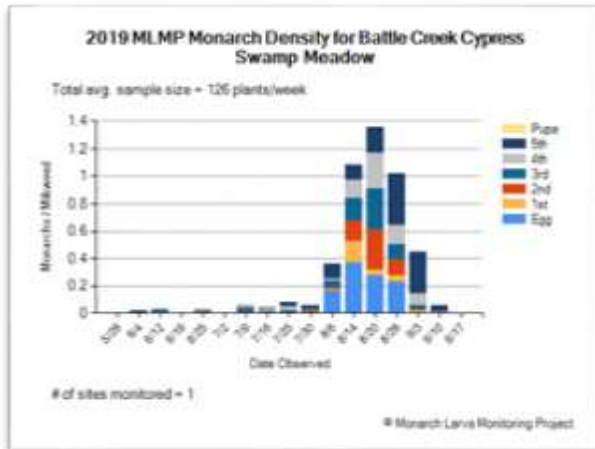
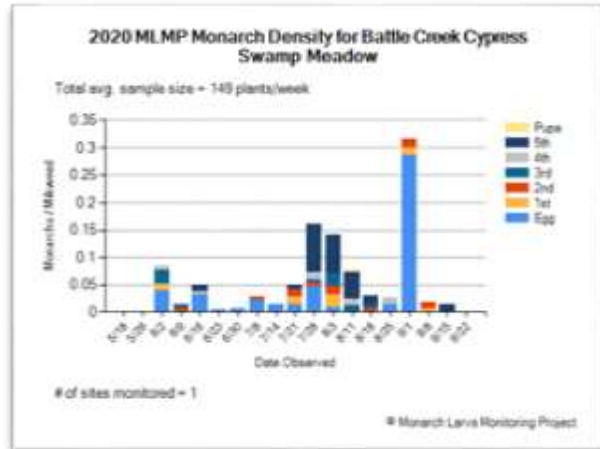
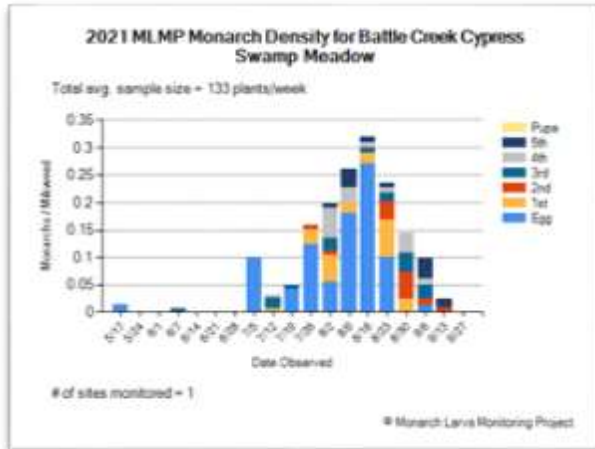
- Even though the meadow was bush-hogged in March 2021, it was not maintained in the same way it has been in the past. For instance, plants were not trimmed back in the meadow during the summer which lead to overgrowth and competition
- The 2021 overwintering population of monarchs was less than the overwintering population in 2020 (see the graph below)



Data for 1994-2003 collected by personnel of the Monarch Butterfly Biosphere Reserve (MBBR) of the National Commission of Natural Protected Areas (CONANP) in Mexico. Data for 2004-2019 collected by World Wildlife Fund Mexico in coordination with the Directorate of the MBBR.

* Represents colony sizes measured in November of 2003 before the colonies consolidated. Measures obtained in January 2004 indicated the population was much smaller, possibly 8-9 hectares. CT

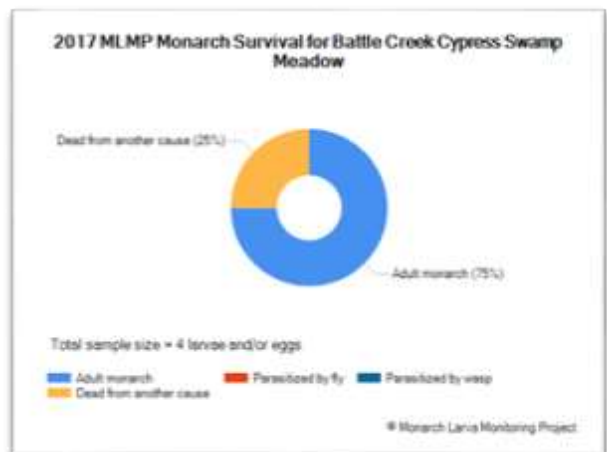
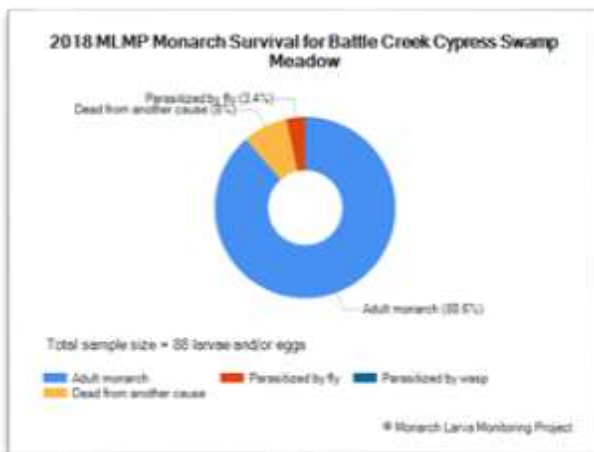
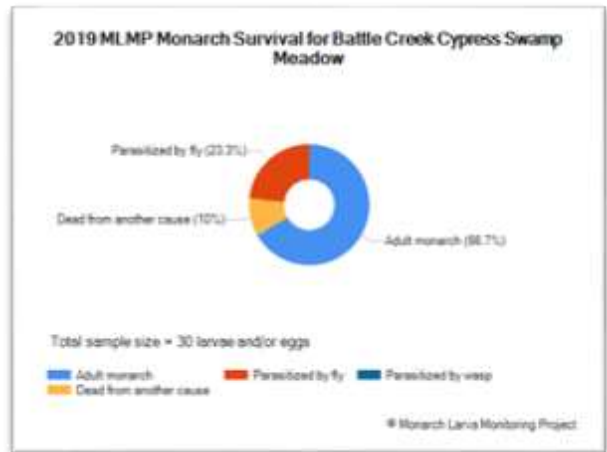
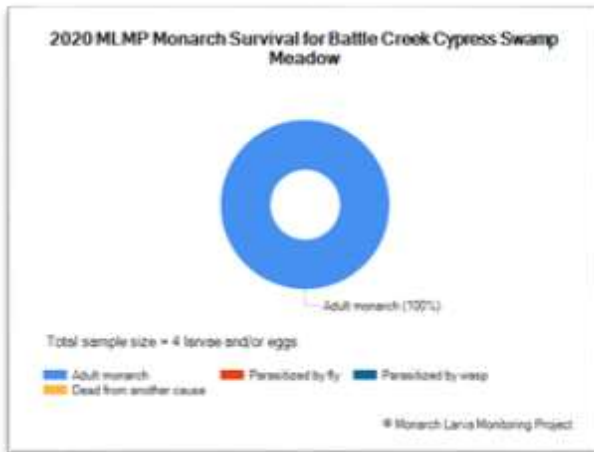
Activity 1 Results:



Activity 3: Estimating Monarch Survival

In the 2021 season this activity was not completed. However, in 2022 I am planning to pick up this activity again, so below I will include observations from 2020 and before as a reference.

First of all, Activity 3 involves collecting 4th or 5th instar caterpillars and rearing them individually until they emerge. Any healthy adults that emerge are tested for OE (*Ophyrocystis elektroscirrha*) and then released. Any parasites like tachinid fly larva that emerge are kept in a container until they become adults. Once emerged as an adult they are frozen until the end of the monarch season and sent to MLMP for identification and analysis.



Project Monarch Health: <http://www.monarchparasites.org/>

“Monarch Health is a citizen science project in which volunteers sample wild monarch butterflies to help track the spread of a protozoan parasite across North America.” Volunteers and staff can catch wild adult monarchs and test them for parasites (being sure to mark their wing with a sharpie so they don’t test the same one), or they can collect them in the 4th&5th instar stage and rear them to adulthood, then test, mark & release them. At the same time, they can record data for MLMP. As an additional complication, at the end of August, any adults that emerge can also be tagged for MonarchWatch.

Data sheets and samples are sent to:
Project Monarch Health
c/o Sonia Altizer
Odum School of Ecology
University of Georgia
Athens, GA 30602-2202

We did not participate in this project in 2021, but plan to resume our participation in 2022.

Monarch Watch: <https://www.monarchwatch.org/>

The Monarch Watch Tagging Program is a large-scale citizen science project that was initiated in 1992 to help understand the dynamics of the monarch's spectacular fall migration through mark and recapture. Tagging was originally used by Dr. Fred Urquhart of the University of Toronto help locate overwintering monarchs and later to determine where monarchs came from that wintered in Mexico. Our long-range tagging program at Monarch Watch continues to reveal much more. Tagging helps answer questions about the origins of monarchs that reach Mexico, the timing and pace of the migration, mortality during the migration, and changes in geographic distribution.

It also shows that the probability of reaching Mexico is related to geographic location, size of the butterfly, and the date (particularly as this relates to the migration window for a given location).

Volunteers & Staff catch-tag-release or raise-tag-release monarchs to help MonarchWatch with the above mission. In Maryland, we shouldn't begin tagging Monarchs until the last week of August because there is a chance that monarchs caught earlier may not be the final migratory generation.

In 2021 this project was completed by the Cox family volunteers.

Tagging Data

- 2021 Tags

Monarch Volunteers

- 2020 Volunteer Hours: 91.75
- 2021 Volunteer Hours: 50.57
 - Cox family hours not included in this total
 - Not tagging or testing monarch butterflies reduced the overall hours of this project
- 2021 Volunteers (* donated 10 or more hours to this project)
 - Cheryl Cox *
 - Jennifer Horsmon *
 - Sue Huseby
 - Jessy Oberright
 - Anne Piccoli
 - Karen Ritchie
 - Maggie Silverman

Notable Volunteer Successes

- Jennifer Horsmon volunteered 9 weeks in a row and was our most dependable and active Monarch Monitoring volunteer of the year
- Cheryl Cox tagged 145 Monarch Butterflies on her family's property!

IDEAS FOR 2022

- Tori Hall will be taking over Monarch Monitoring in 2022
- Will be learning how to mow the meadow and bush hog from Ian, so I can make sure the meadow stays managed throughout the summer season.
- Will trim the meadow in late June or early July to allow new milkweed to grow and prepare for the higher densities of monarchs we get later in summer
- The meadow will become certified as an official Monarch Waystation in 2022 and will now be called Cypress Meadows
- Will participate in Monarch Watch and Monarch Health in 2022
- Will work on taking a volunteer appreciation trip to Point Lookout to tag Monarch butterflies
- Will work on project advertising ideas to increase volunteer participation, some of our decline in participation could have still been from the presence of COVID-19
- Use Kings Landing as another location to conduct monarch monitoring. I can work with the Park Technician Riley Brown and Manager Brian Bussard II to create a suitable habitat at the park first.

Supporting Calvert County's nature parks and natural spaces



CALVERT STEWARDS

VOLUNTEER PROGRAM

A partnership between Calvert Nature Society and Calvert County Natural Resources Division

2021 Annual Report

Date of Issue March 2022

CALVERT STEWARDS VOLUNTEER PROGRAM
c/o Natural Resources Division
2880 Grays Road
Prince Frederick, MD 20678
(410) 535-5327

Volunteer Portal: <https://calvertstewards.galaxydigital.com/>

Calvert Nature Society: www.calvertparks.org

Calvert County Natural Resources Division:
www.calvertcountymd.gov/NaturalResources

