

Scientific Field Journal

By: Ethan (Age 12)

Date: August 3, 2024

Time: 10:15 AM - 11:45 AM Location: Willow Creek Nature Preserve (GPS: 40.7829° N, 73.9654° W) Weather Conditions: Clear sky, 76°F, Humidity 65%, Wind SW 5-8 mph Habitat: Mixed woodland/meadow transition zone

Monarch Butterfly Population Study

[DRAWING SPACE: Highly detailed scientific illustration of a Monarch butterfly with precise wing venation patterns, accurate scale measurements (wingspan: 9.5 cm), and anatomical details. Secondary inset diagram shows close-up of wing scales at 40x magnification with measurement annotations.]

Observational Data:

I conducted three 15-minute observation periods at three different locations within the preserve:

Location	Habitat Type	# of Monarchs	# of Milkweed Plants	Other Butterfly Species
Site A	Open meadow	7	~35 plants	3 Painted Ladies, 2 Swallowtails
Site B	Forest edge	3	~12 plants	1 Red Admiral, 4 Cabbage Whites
Site C	Stream bank	1	~5 plants	2 Question Marks, 1 Mourning Cloak

Behavioral Observations:

- Average feeding time per flower: 35 seconds (n=12 observations)
- Flight pattern: Irregular, heights ranging from 0.5-2.5 meters above ground
- Territorial behavior observed between male Monarchs at Site A (mapped interaction zones on site diagram)

Research Connections:

According to research by Dr. Karen Oberhauser (University of Minnesota), healthy monarch populations show a correlation of approximately 1-2 butterflies per 15-20 milkweed plants. My observations (11 monarchs/~52 plants) suggest this area has a higher-than-average monarch density. This may be due to:

- Protected habitat status
- No pesticide use in preserve
- Deliberate milkweed planting by conservation staff
- Position along known migration corridor

Hypothesis:

If the Monarch butterfly population is affected by milkweed availability, then areas with higher milkweed density should show increased Monarch activity and egg-laying behavior.

Analysis:

My data supports this hypothesis with a correlation coefficient of $r=0.92$ between milkweed plant density and Monarch observations. However, other factors may influence this relationship, including:

- Time of day (observation limited to morning hours)
- Weather conditions
- Proximity to water sources
- Presence of predator species

Next Steps:

- Return to conduct afternoon observations (2:00-4:00 PM) for comparison
- Examine milkweed plants for eggs and larvae
- Collect data on milkweed plant health and maturity
- Install temperature/humidity logger at Site A for continuous monitoring
- Compare data with citizen science reports on Journey North website
- Expand study to include additional sites with varying land management practices

Equipment for Next Visit:

- Digital thermometer
- Hand lens (10x)
- GPS logger

- Camera with macro lens
- Quadrat sampling frame
- Small weather station