

DATA *Nugget*

Little butterflies on the prairie

Featured scientists: The Haddad Lab from Kellogg Biological Station Long Term Ecological Research Program - KBS LTER

Research Background:

Butterflies are insects with colorful wings. You will often see them in a field, flying from flower to flower. Butterflies eat a sugary food made by flowers, called nectar. In return, the butterflies help the plants make seeds by moving pollen. As they travel from flower to flower, pollen is dropped off. This helps plants reproduce and make seeds. This is called pollination, and butterflies are pollinators. We need pollinators to grow many of the fruits and vegetables that we eat!



A Tiger Swallowtail butterfly visiting a prairie flower to drink nectar.

Prairies are habitats filled with many types of flowers. The Midwestern United States used to be covered in prairies. Today, most have been replaced by farm fields. Crops like corn and soybeans are commonly planted in the Midwest. Farm fields are important because we need land to grow our food. But this also means there is less food and habitat for butterflies.

Many farmers are concerned with growing our food while still protecting habitat for butterflies and other species. They want to know - how can we grow food for ourselves while still growing flowers for butterflies? A group of scientists in Michigan is working with farmers to think of solutions. The team is made of people from many different backgrounds and work experiences. The members of the team change over time, but typically 8 scientists are working together at a time. They all come together to brainstorm and do their research at the Kellogg Biological Station in Michigan.

Prairie strips are a new idea that might help both farmers and the environment. These strips are small areas of prairie that can be added to farm fields. They look like rows of flowers and grasses within a field. They create habitat for many species, like butterflies, birds, ants, and even microscopic fungi and bacteria! Prairie strips may also help our food grow better by providing habitat for pollinators.

To figure out if prairie strips are able to draw in butterflies, the research team needed to collect data. They visited a large experiment that had many different kinds of farm



Researchers sampling butterflies and other insects in a prairie strip at the Kellogg Biological Station.

fields. Some of the fields had prairie strips, while others did not. They thought prairie strips would help butterflies by adding habitat for them in farm fields that usually don't have many flowers. They predicted they would see more butterflies in fields that have prairie strips and fewer in fields without these strips.

To count the butterflies in each type of field, the team went out on sunny spring and summer mornings when butterflies were flying around and eating nectar. They walked along the same paths in the same fields at the

same time every week. Each time, they counted all the butterflies they saw within 5 meters. Each walk was 12 minutes long and followed a 150-meter path. They did these counts in 6 farm fields without prairie strips and 6 farm fields with prairie strips. The team counted butterflies like this 20 times over the summer. At the end of the summer, they added up all of the butterflies observed in each field. This number is called **butterfly abundance**.



Members of the Haddad Lab, ready to go out for a day of butterfly sampling in the prairie strips!

Scientific Question: How does butterfly abundance differ between farm fields with and without prairie strips?

What is the hypothesis? Find the hypothesis in the Research Background and underline it. A hypothesis is a proposed explanation for an observation which can then be tested with experimentation or other types of studies.

Scientific Data:

Use the data below to answer the scientific question:

| Year | Prairie strip in farm field? | Farm field number | Butterfly abundance |
|------|------------------------------|-------------------|---------------------|
| 2021 | No | 1 | 22 |
| 2021 | No | 2 | 24 |
| 2021 | No | 3 | 16 |
| 2021 | No | 4 | 18 |
| 2021 | No | 5 | 16 |
| 2021 | No | 6 | 17 |
| 2021 | Yes | 1 | 72 |
| 2021 | Yes | 2 | 48 |
| 2021 | Yes | 3 | 57 |
| 2021 | Yes | 4 | 54 |
| 2021 | Yes | 5 | 97 |
| 2021 | Yes | 6 | 52 |

Average butterfly abundance in fields without prairie strips: _____

Average butterfly abundance in fields with prairie strips: _____

What data will you graph to answer the question?

Independent variable: _____

Dependent variable: _____

Draw your graph below: Identify any changes, trends, or differences you see in your graph. Draw arrows pointing out what you see, and write one sentence describing what you see next to each arrow.



- Fields without prairie strips
- Fields with prairie strips

Interpret the data:

Make a claim that answers the scientific question - how does butterfly abundance differ between farm fields with and without prairie strips?

What evidence was used to write your claim? Reference specific parts of the table or graph.

Name _____

Explain your reasoning and why the evidence supports your claim. Connect the data back to what you learned about prairie strips and what butterflies eat.

Did the data support the Haddad Lab's hypothesis? Use evidence to explain why or why not. If you feel the data were inconclusive, explain why.

What new question(s) should be investigated to build on the Haddad Lab's research? How do your questions build on the research that has already been done?