

# Caterpillars Count!

CITIZEN SCIENTISTS TRACKING THE PHENOLOGY OF BIRD FOOD

We'll begin shortly!

Allen Hurlbert

UNIVERSITY OF NORTH CAROLINA-CHAPEL HILL

A close-up photograph of a bright green caterpillar with small brown spots crawling along the edge of a large green leaf. The leaf has a visible venation pattern.

WEBINAR OUTLINE  
AND RESOURCES

<http://tinyurl.com/CaterpillarsWebinar>

Informational  
Webinar

- What is the origin of *Caterpillars Count!?*
- What can we learn from *Caterpillars Count!?*
- How can you participate?



WEBINAR OUTLINE  
AND RESOURCES

<http://tinyurl.com/CaterpillarsWebinar>

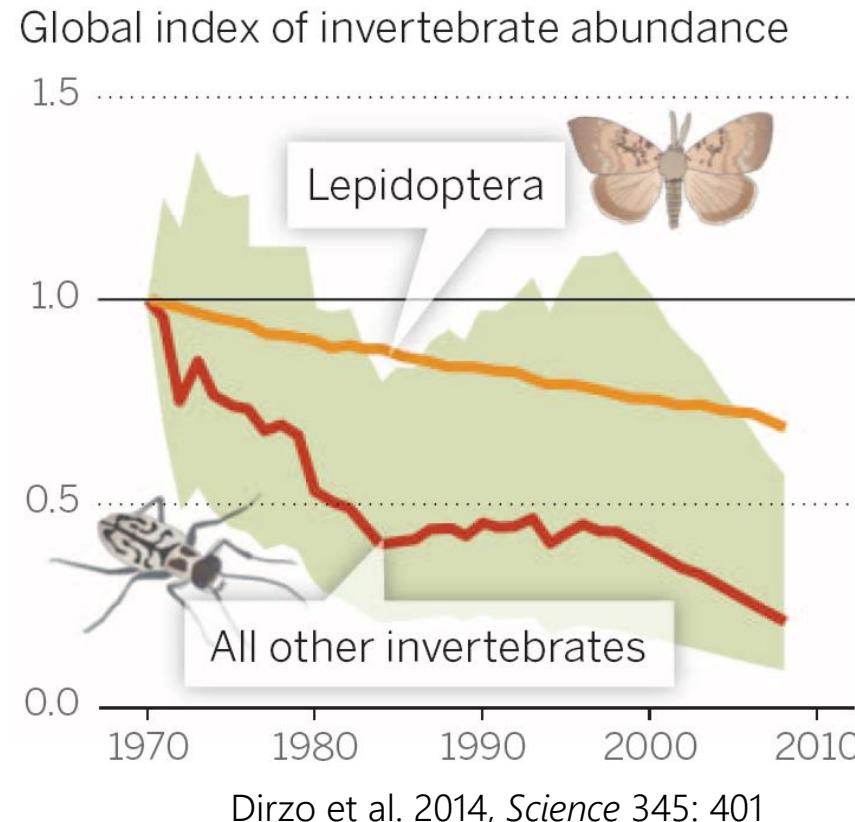


Nov 27, 2018



# The Insect Apocalypse Is Here

What does it mean for the rest of life on Earth?



The New York Times Magazine

Nov 27, 2018



# The Insect Apocalypse Is Here

What does it mean for the rest of life on Earth?



---

January

April

June

Nov 27, 2018



# The Insect Apocalypse Is Here

What does it mean for the rest of life on Earth?



---

January

April

June

1) Are insects declining? Where? By how much?

Nov 27, 2018



# The Insect Apocalypse Is Here

What does it mean for the rest of life on Earth?



---

January

April

June

- 1) Are insects declining? Where? By how much?
- 2) Are insects shifting their seasonal timing?



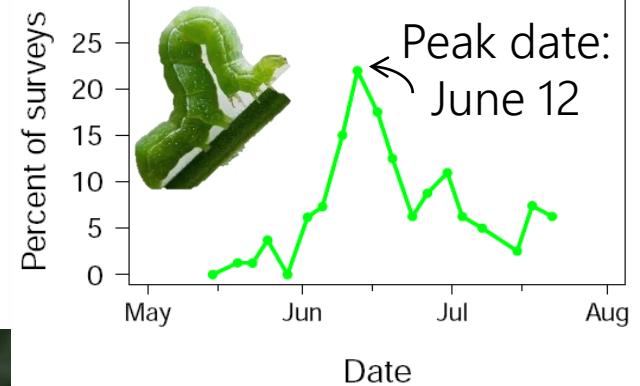
## Training resources / mobile app

Conduct surveys



iNaturalist.org  
integration

Data visualization tools



Join us!



Learning activities

Nature centers /  
school groups





219 sites



1,785 data contributors



104K branches surveyed



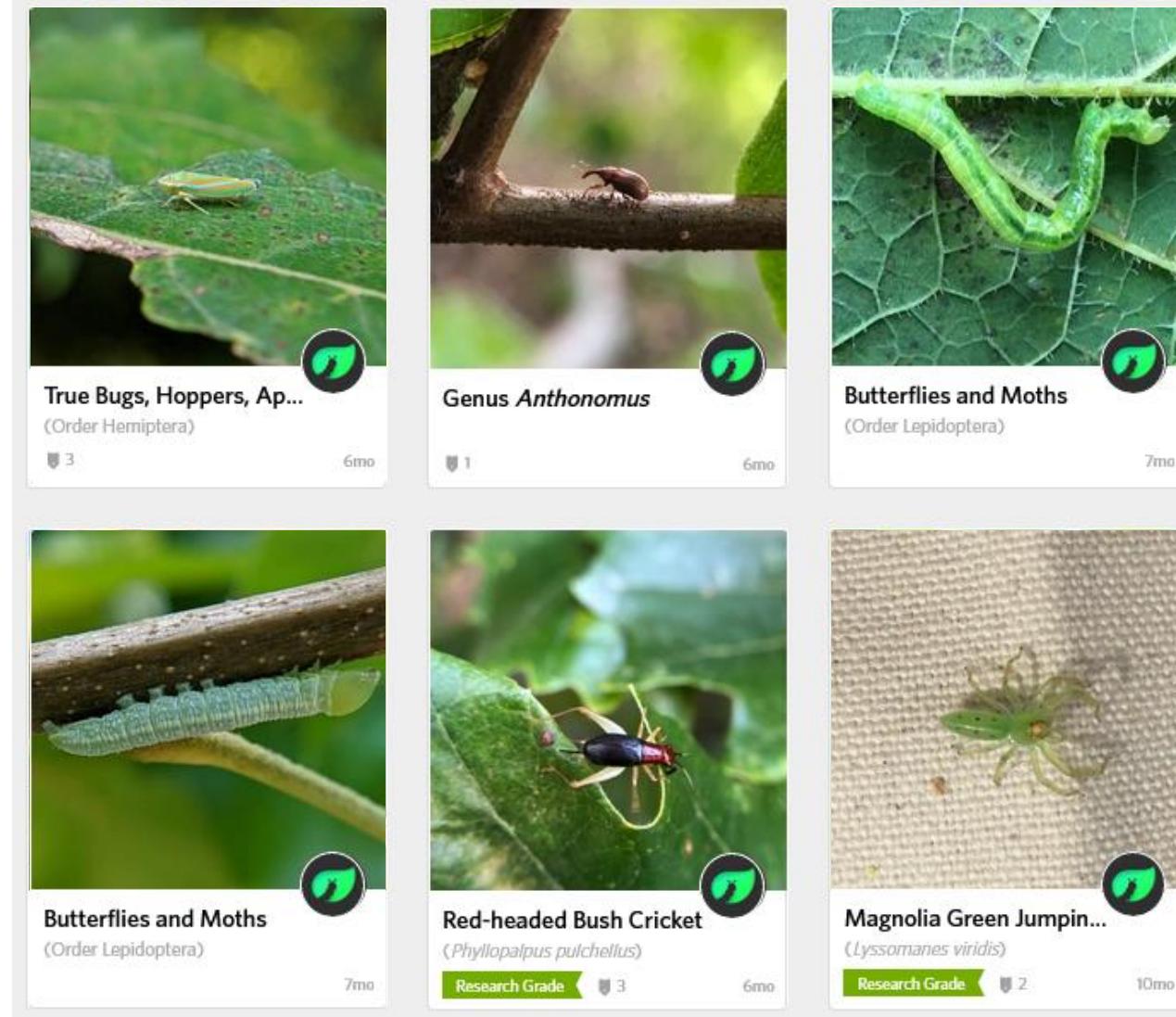
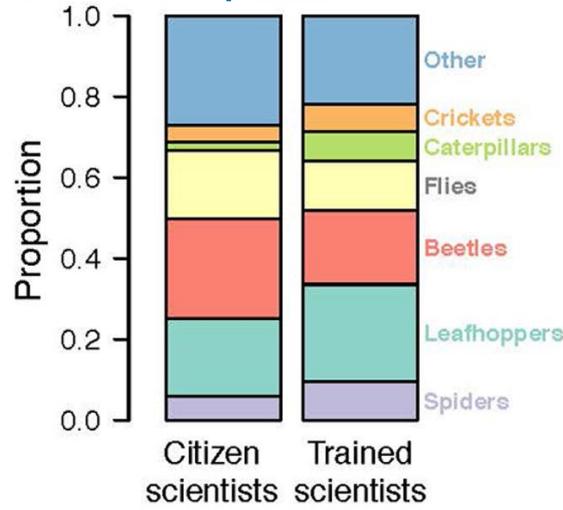
266K arthropods observed



# What have we learned?

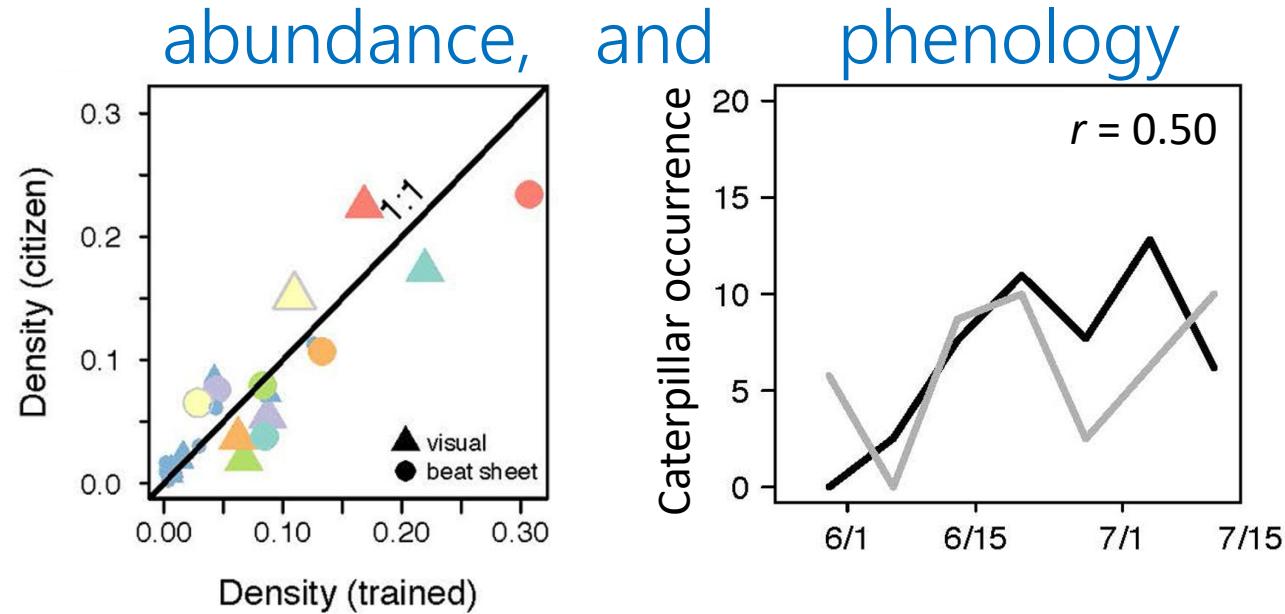
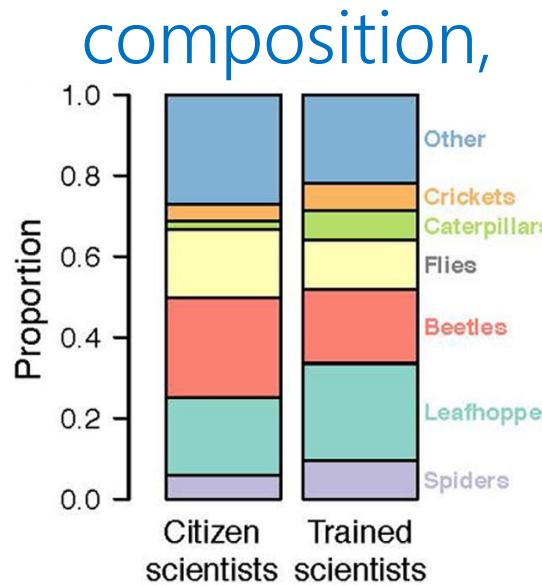
Citizen scientists provide useful data on arthropod

composition



# What have we learned?

Citizen scientists provide useful data on arthropod

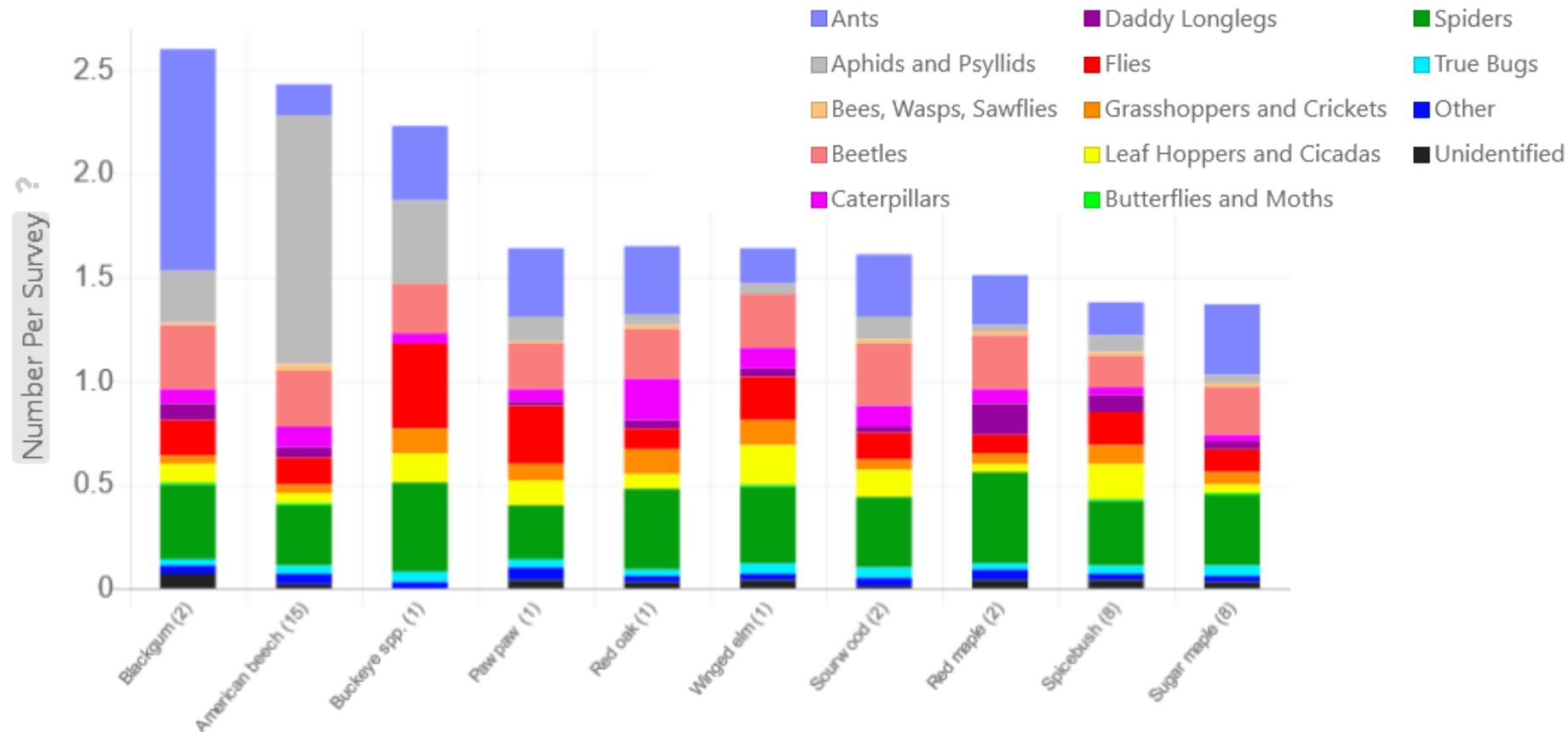


# What have we learned?

# Caterpillar Density

The abundance of bird food varies  
A LOT from place to place!

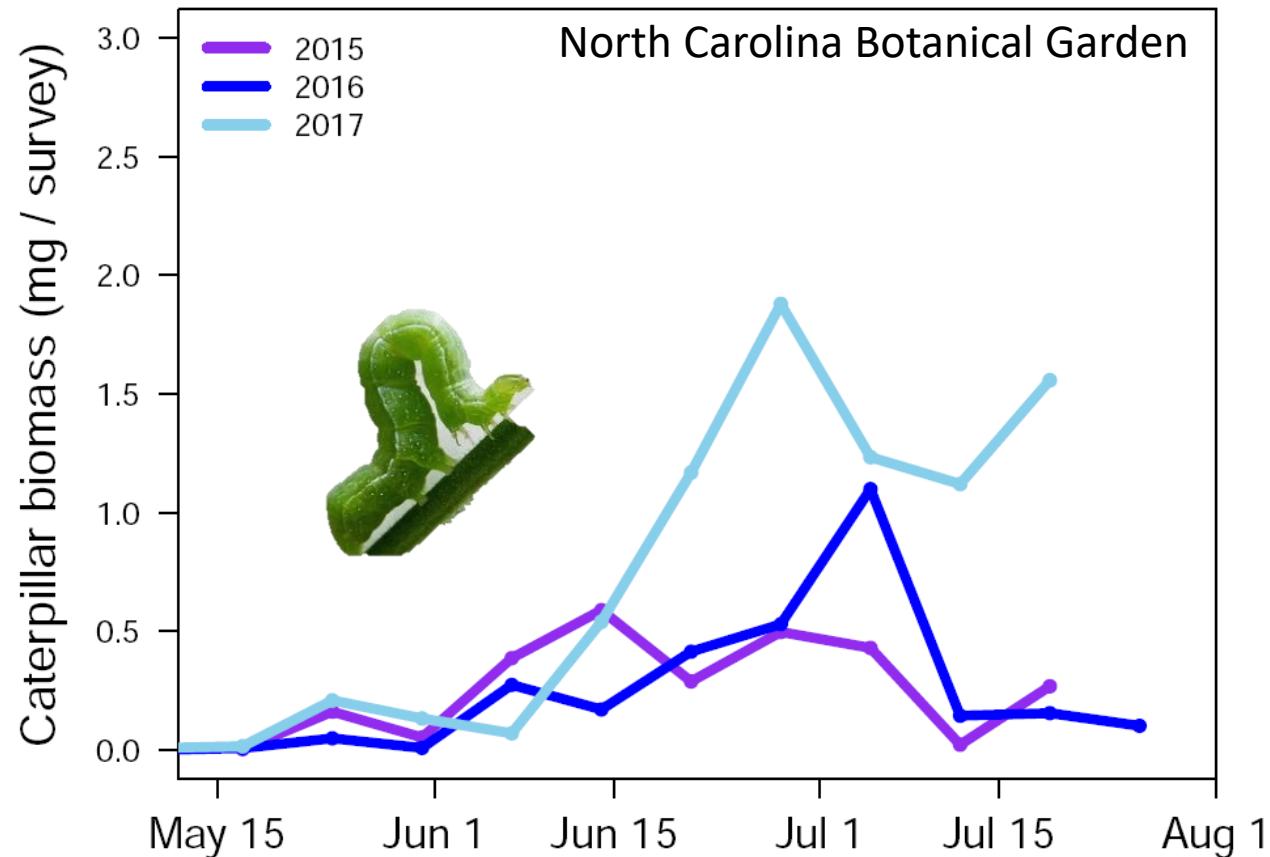
And with *host plant* species.



# What have we learned?

## Caterpillar Phenology

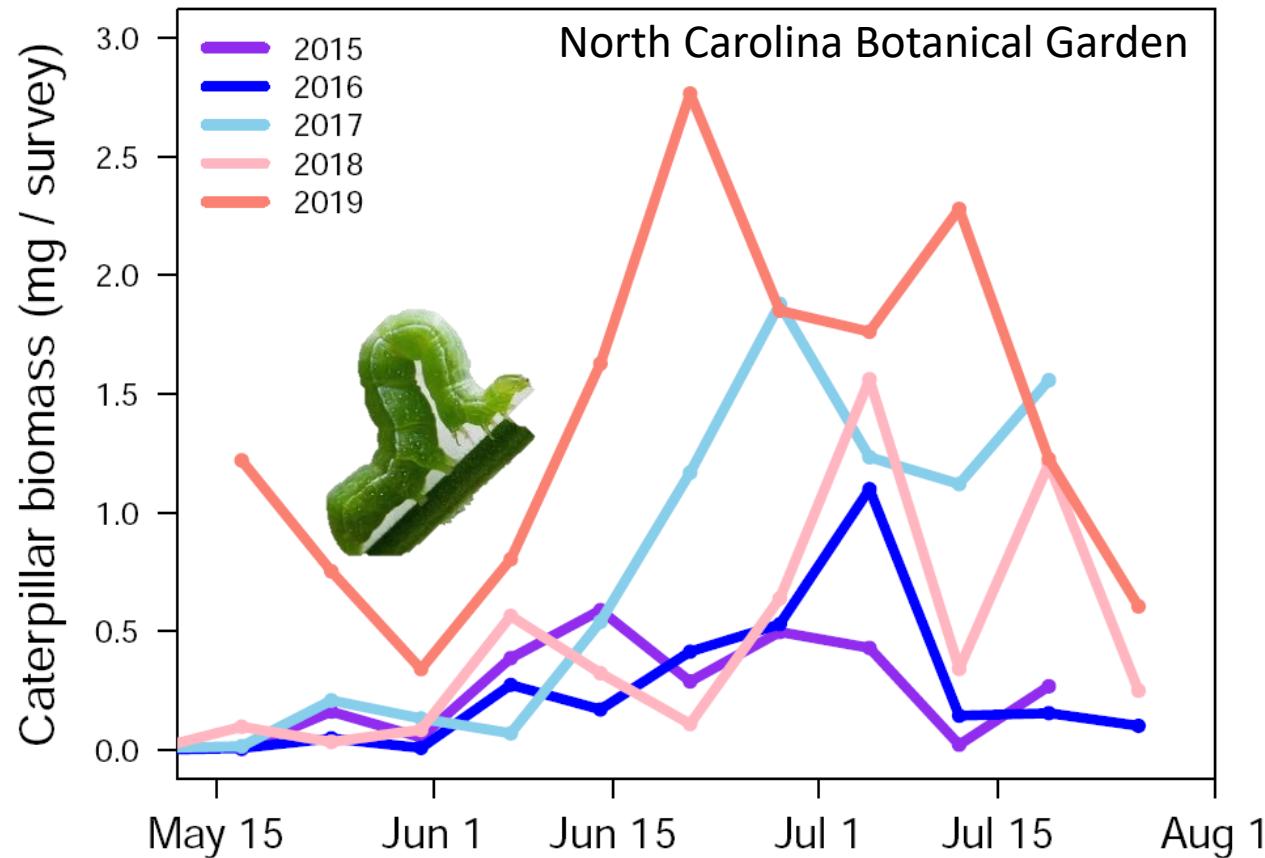
The timing and abundance of bird food varies A LOT between years!



# What have we learned?

## Caterpillar Phenology

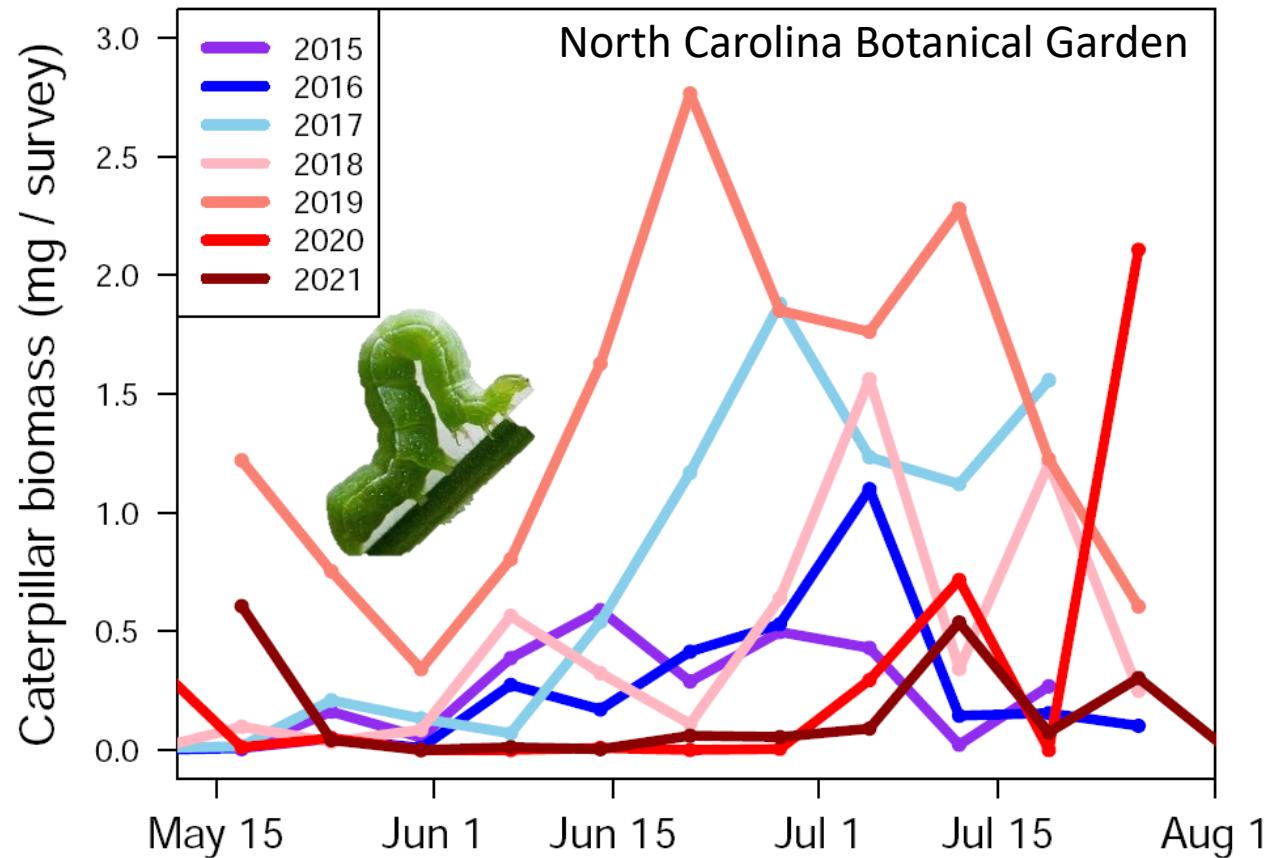
The timing and abundance of bird food varies A LOT between years!



# What have we learned?

## Caterpillar Phenology

The timing and abundance of bird food varies A LOT between years!

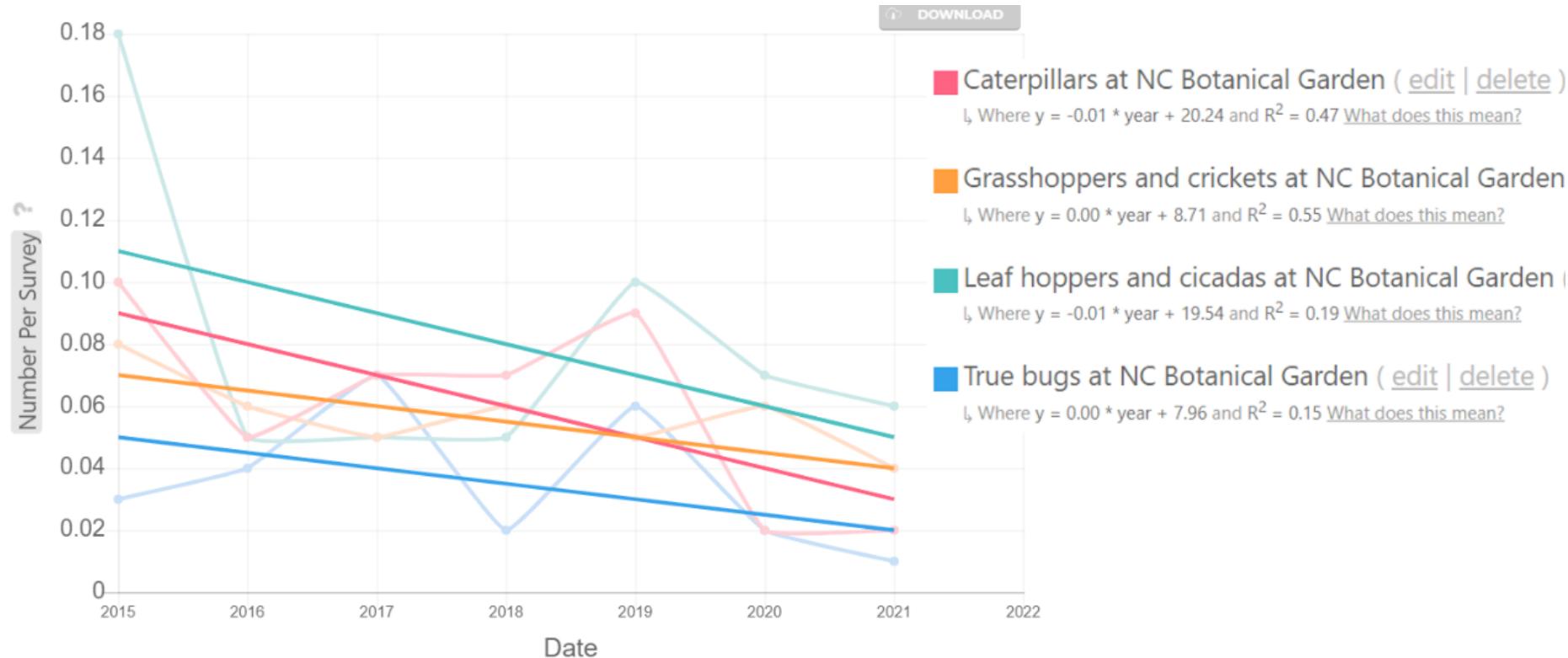


# What have we learned?

## Trends

Is bird food declining in general?

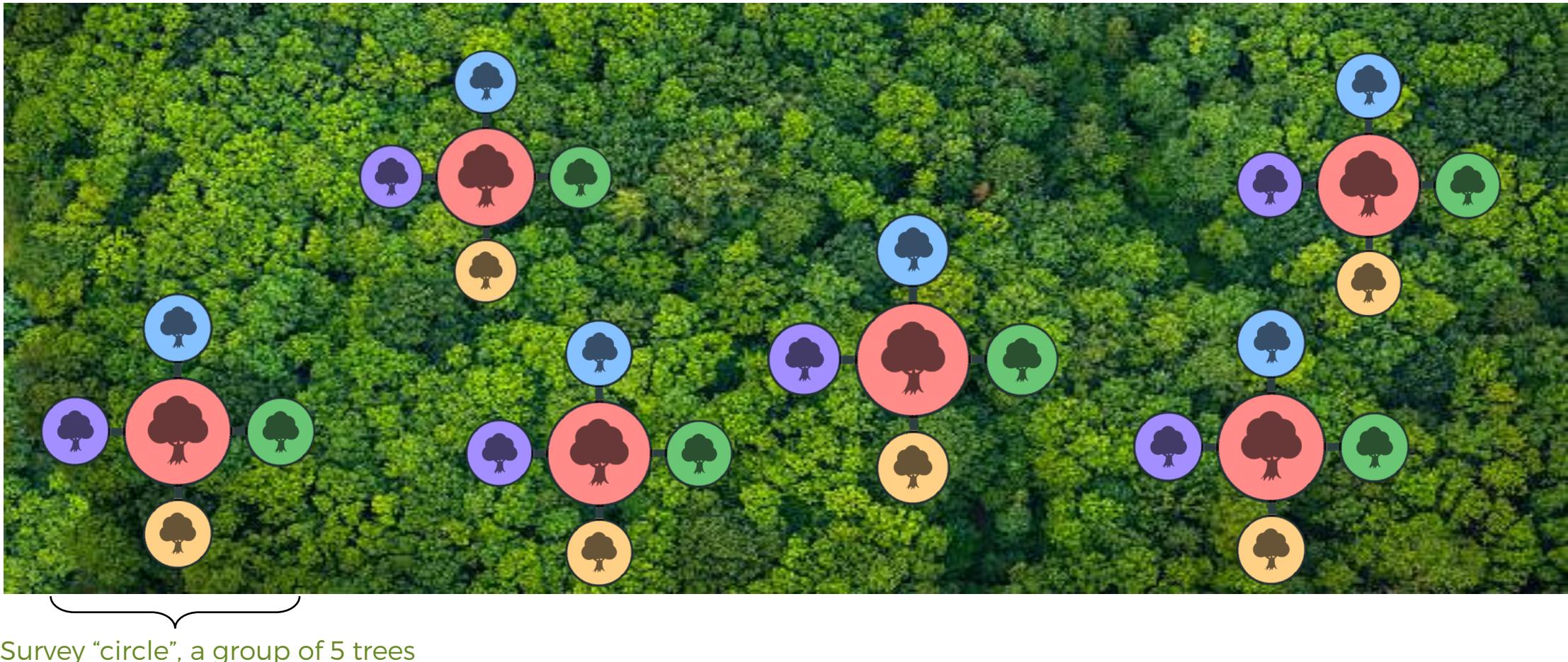
More in some places than others?



# Setting up a site

Suggested set up for nature centers/schools:

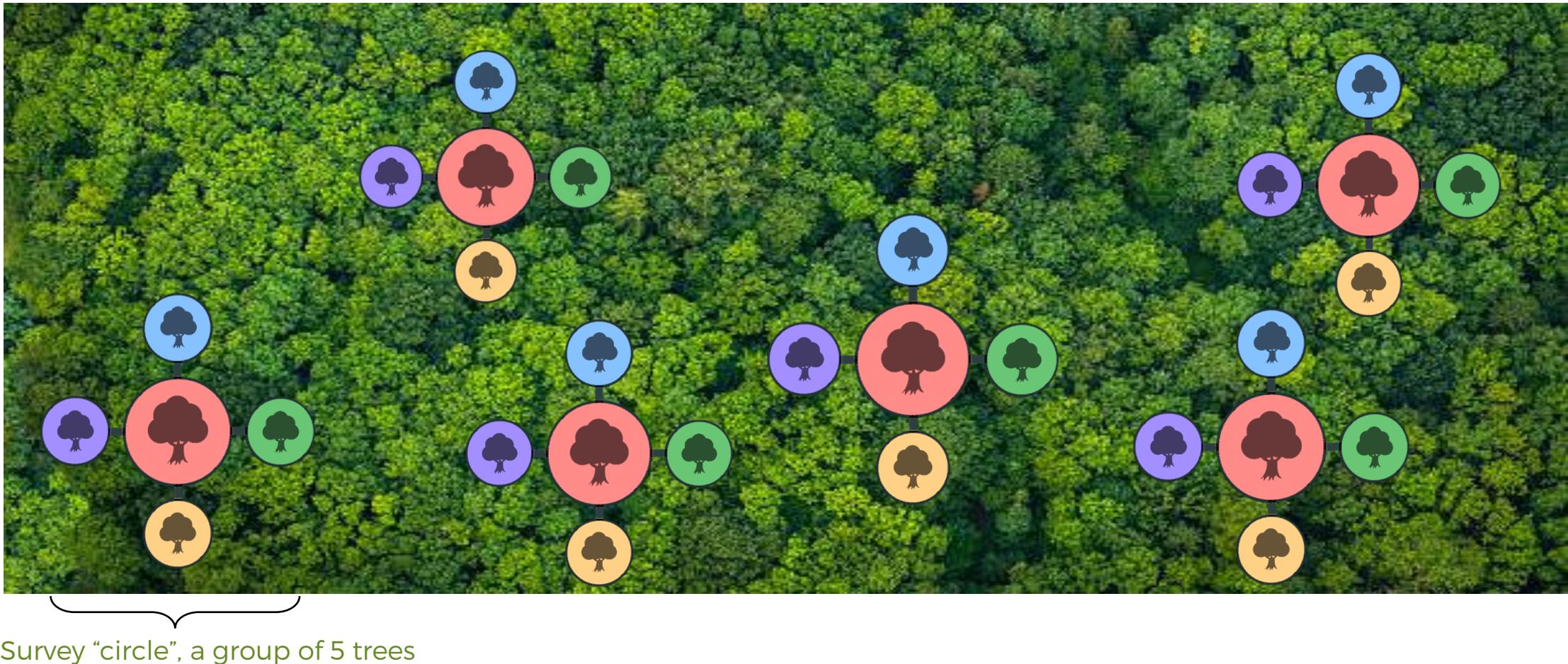
- At least 30 survey trees (6 circles); allow 2.5 person-hours
- Weekly monitoring from May - July



# Setting up a site

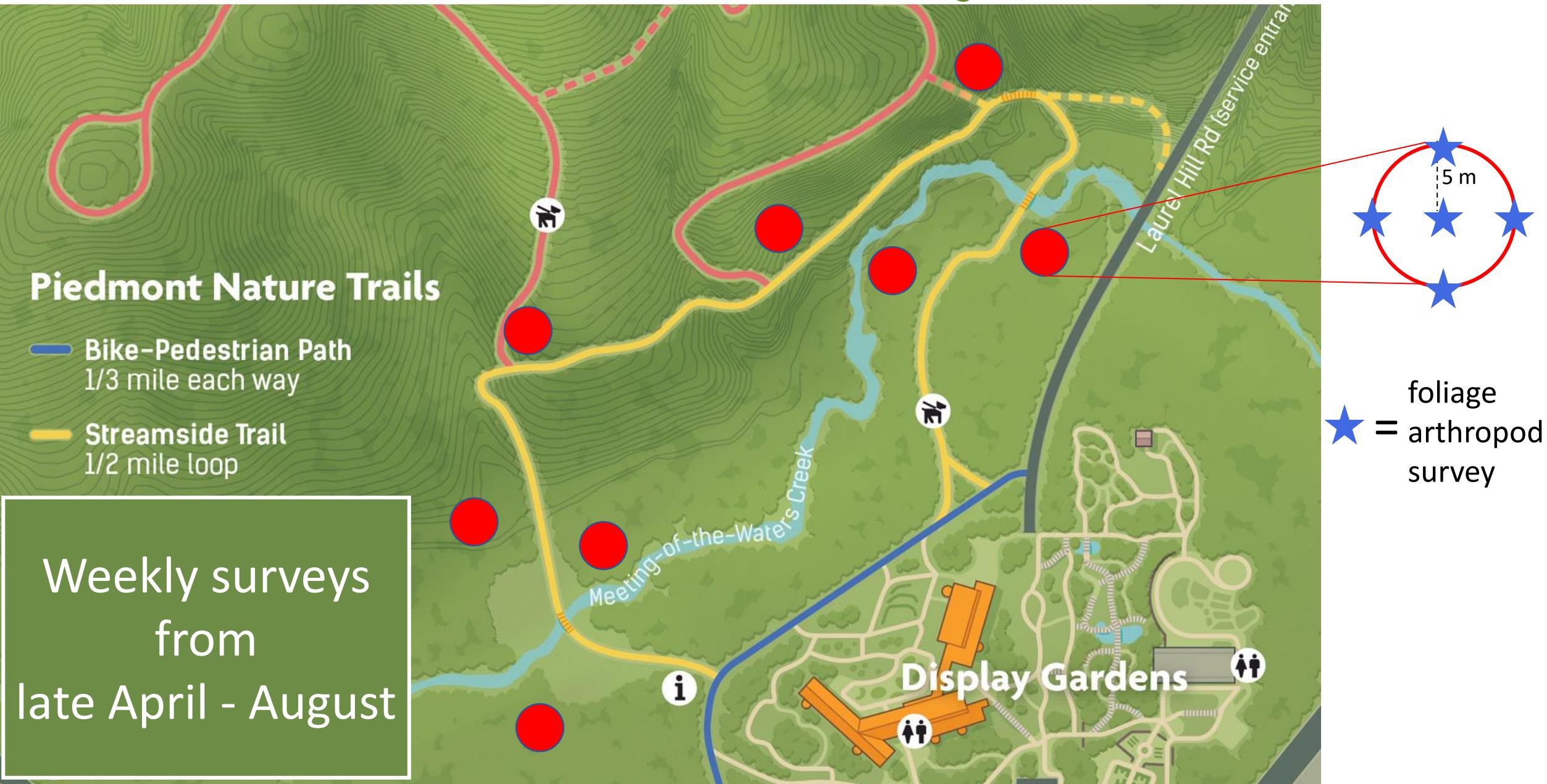
Suggested set up for home/backyard:

- At least 10 survey trees (2 circles); allow <1 person-hour
- Spatial layout is flexible



# Example at NC Botanical Garden:

40 surveys in 8 groups along Streamside Trail



# Create a Site

## CREATE NEW SITE

If you know what it takes to host a site and you're ready for it, then go ahead and create one!

- No permission required!
- First, create an account. Then,
- Website > My Account > Create New Site

SITE NAME:

short and descriptive

ORGANIZATIONAL URL (OPTIONAL):

http://

SITE DESCRIPTION:

Explain briefly the nature of your site, e.g., "Prairie Ridge Ecostation is an outdoor nature center"

0/140

SITE LOCATION (DRAG & ZOOM):



NUMBER OF PLANTS YOU WILL SURVEY:

must be multiple of 5

▲  
▼

SITE PASSWORD (THAT YOU ARE WILLING TO SHARE WITH VISTORS AT THIS SITE):

to verify submissions

?

CONFIRM SITE PASSWORD:

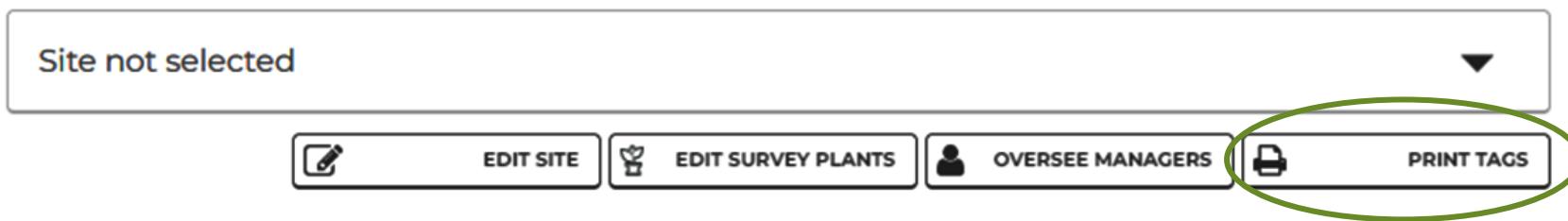
to verify submissions

?

<https://caterpillarscount.unc.edu>

# Create a Site

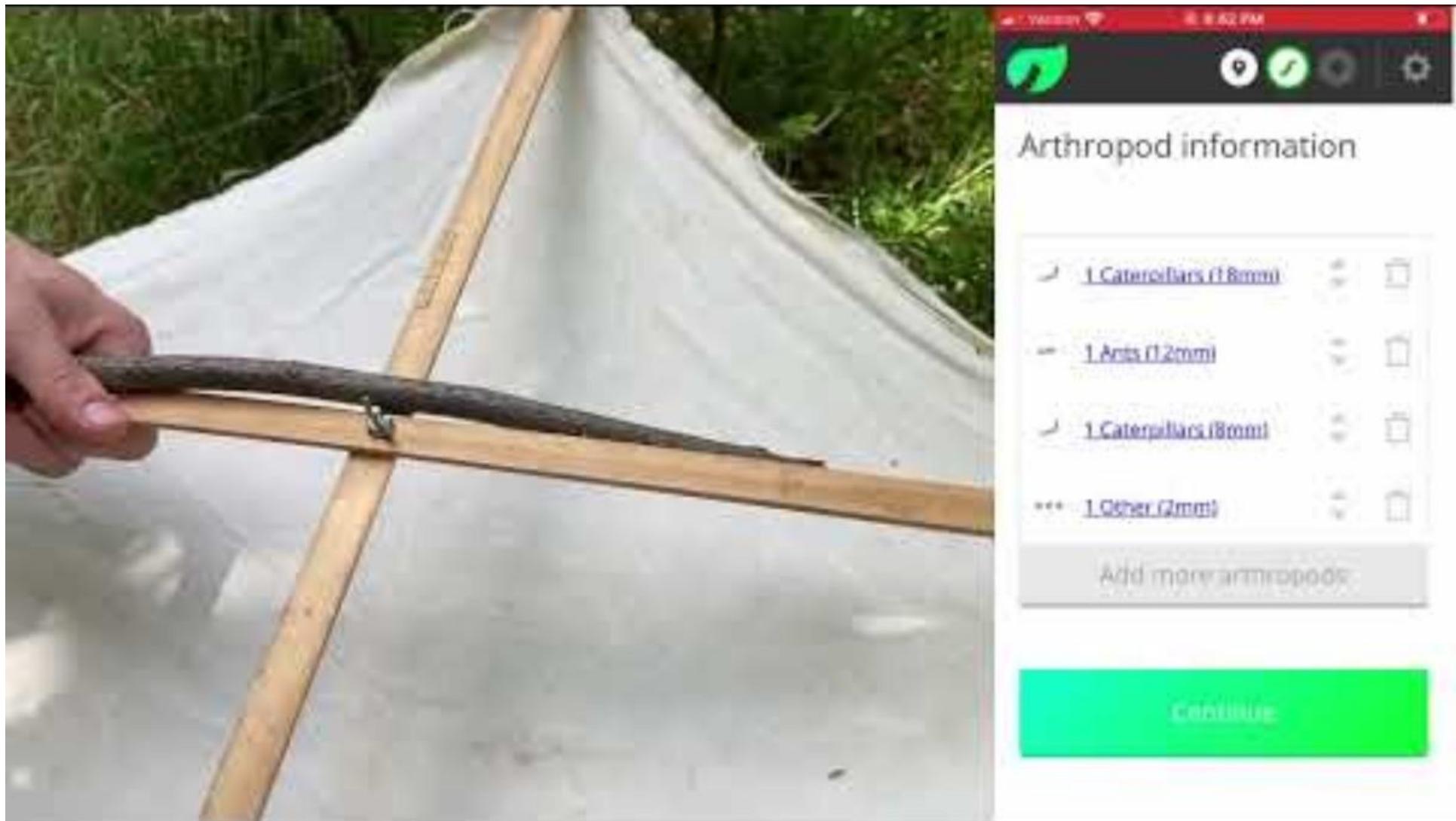
## MAINTENANCE TOOLS:



Acadia NP - Alder, Circle 1 American mountain-ash <b>BQB</b> caterpillarscount.unc.edu	Acadia NP - Alder, Circle 1 Viburnum nudum <b>BQC</b> caterpillarscount.unc.edu	Acadia NP - Alder, Circle 1 Red maple <b>BQD</b> caterpillarscount.unc.edu
Acadia NP - Alder, Circle 1 Viburnum nudum <b>BQE</b> caterpillarscount.unc.edu	Acadia NP - Alder, Circle 1 Viburnum nudum <b>BQF</b> caterpillarscount.unc.edu	Acadia NP - Alder, Circle 2 Viburnum nudum <b>BQG</b> caterpillarscount.unc.edu
Acadia NP - Alder, Circle 2 Viburnum nudum <b>BQH</b> caterpillarscount.unc.edu	Acadia NP - Alder, Circle 2 Viburnum nudum <b>BQI</b> caterpillarscount.unc.edu	Acadia NP - Alder, Circle 2 Alder spp. <b>BQJ</b> caterpillarscount.unc.edu
Acadia NP - Alder, Circle 2 American holly <b>BQK</b> caterpillarscount.unc.edu	Acadia NP - Alder, Circle 3 Red maple <b>BQL</b> caterpillarscount.unc.edu	Acadia NP - Alder, Circle 3 Red maple <b>BQM</b> caterpillarscount.unc.edu

## How to participate

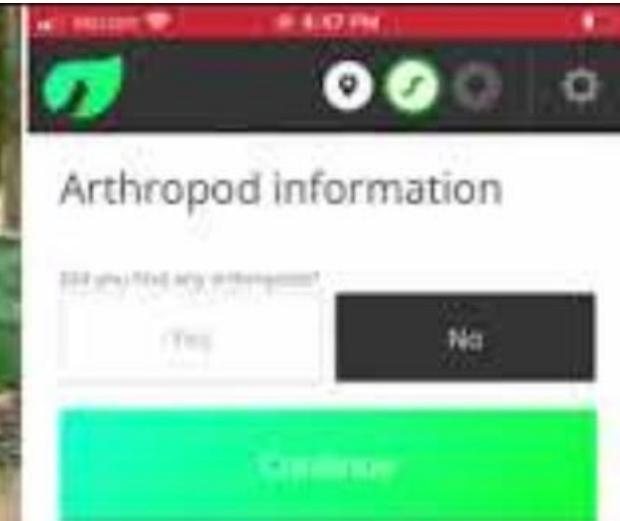
### Conducting surveys: Beat sheet survey (2-3 min each)



[https://youtu.be/rV\\_4bi417uQ](https://youtu.be/rV_4bi417uQ)

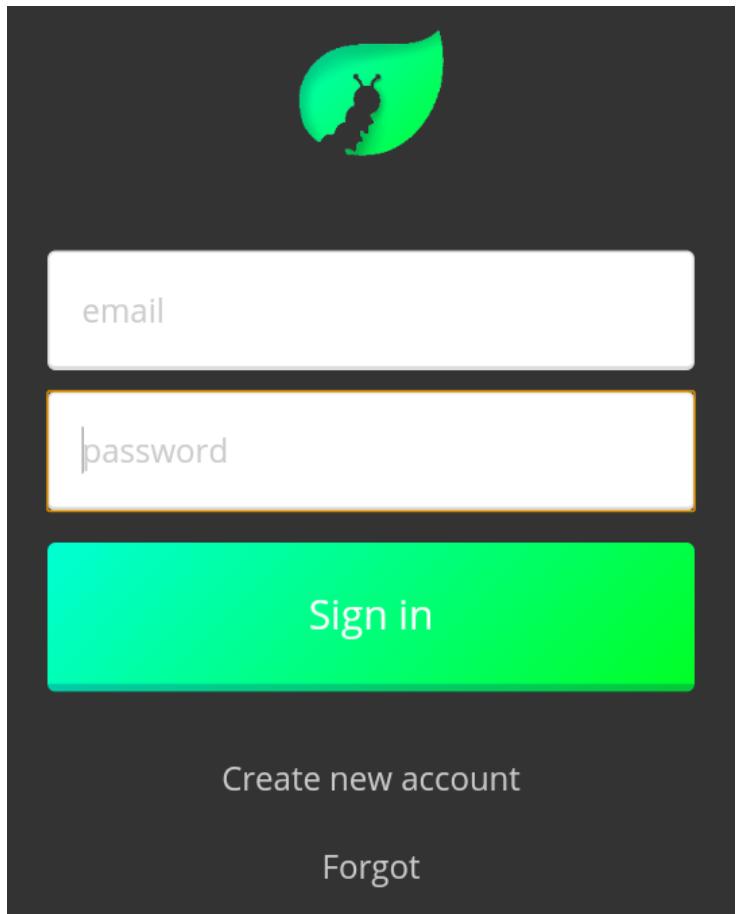
## How to participate

### Conducting surveys: Visual survey (~5 min each)



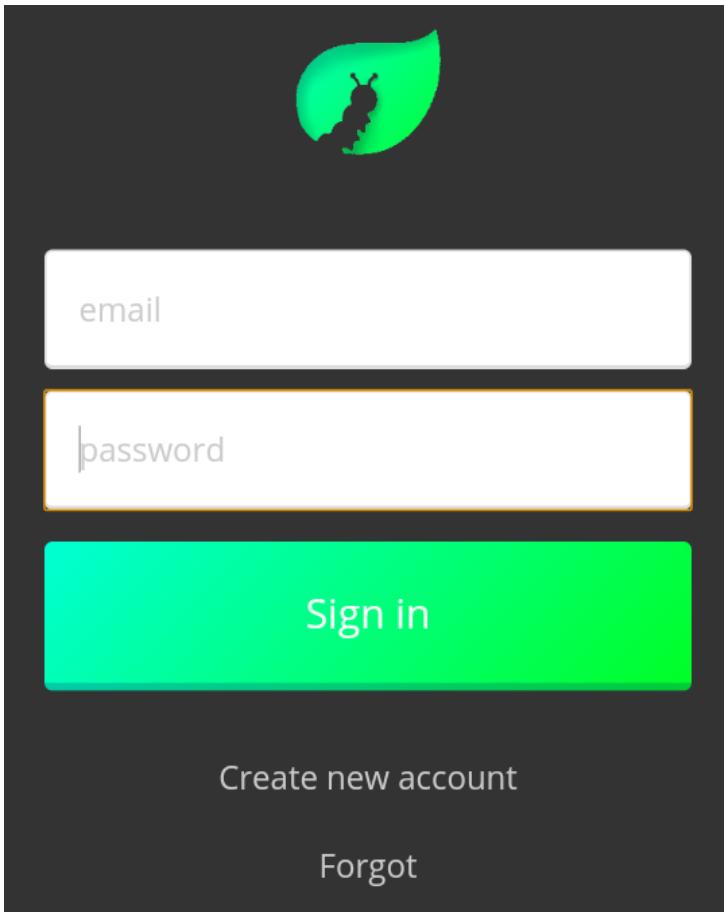
# Mobile app

## Create account / Sign in



# Mobile app

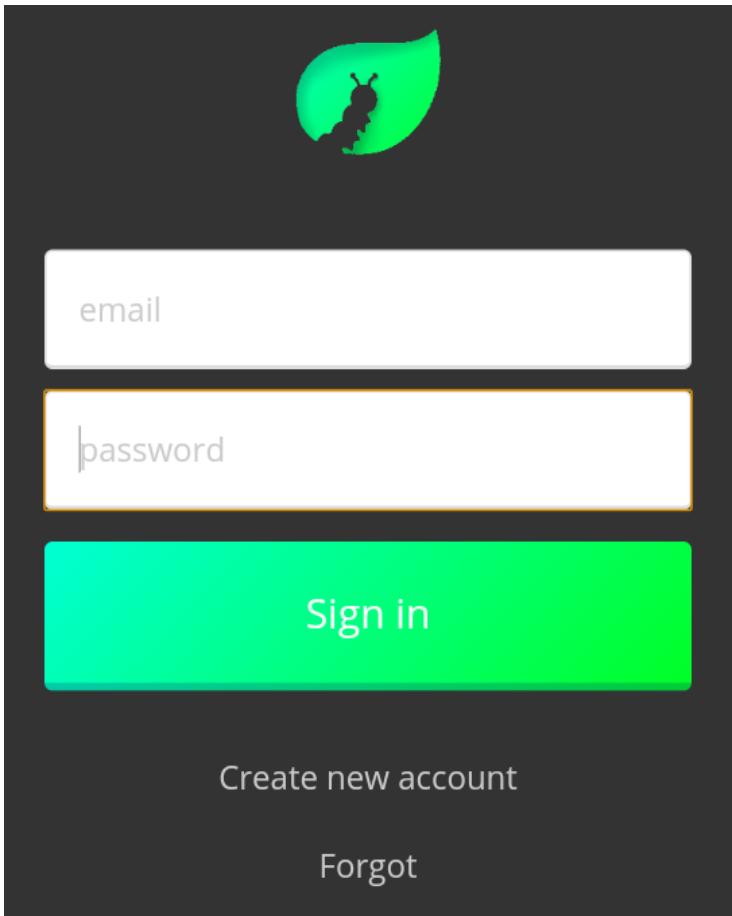
Create account / Sign in



For this test branch, the password = test

# Mobile app

Create account / Sign in



The sign-in screen features a large green leaf icon with a small insect at the top. Below it are two input fields: 'email' and 'password'. A large green 'Sign in' button is centered below the password field. At the bottom are links for 'Create new account' and 'Forgot'.

email

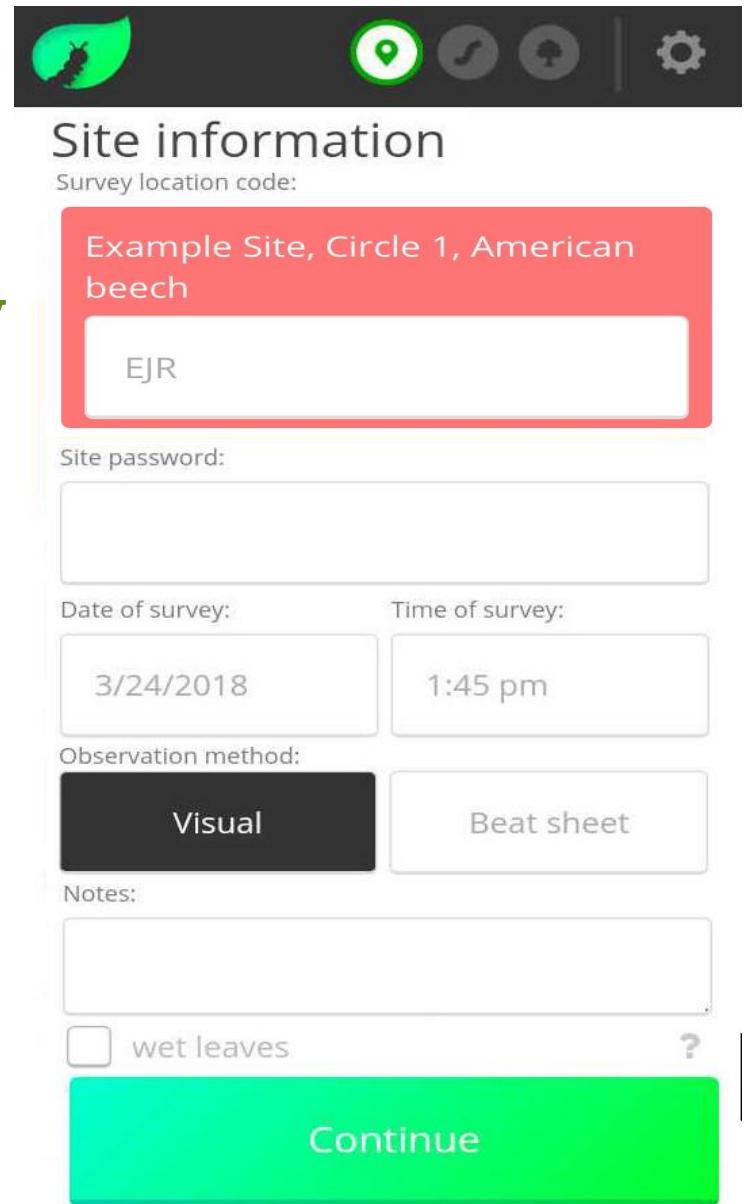
password

Sign in

Create new account

Forgot

Enter unique  
3-letter survey  
code



The survey entry screen includes a navigation bar with icons for location, search, tree, and settings. The main area is titled 'Site information' with the subtitle 'Survey location code:'. It shows an example code 'Example Site, Circle 1, American beech' with the value 'EJR' in a red-bordered field. Other fields include 'Site password' (empty), 'Date of survey' (3/24/2018), 'Time of survey' (1:45 pm), 'Observation method' (Visual selected), 'Beat sheet' (unchecked), 'Notes' (empty), and a checkbox for 'wet leaves' (unchecked). A large green 'Continue' button is at the bottom.

Site information

Survey location code:

Example Site, Circle 1, American beech

EJR

Site password:

Date of survey: 3/24/2018 Time of survey: 1:45 pm

Observation method:

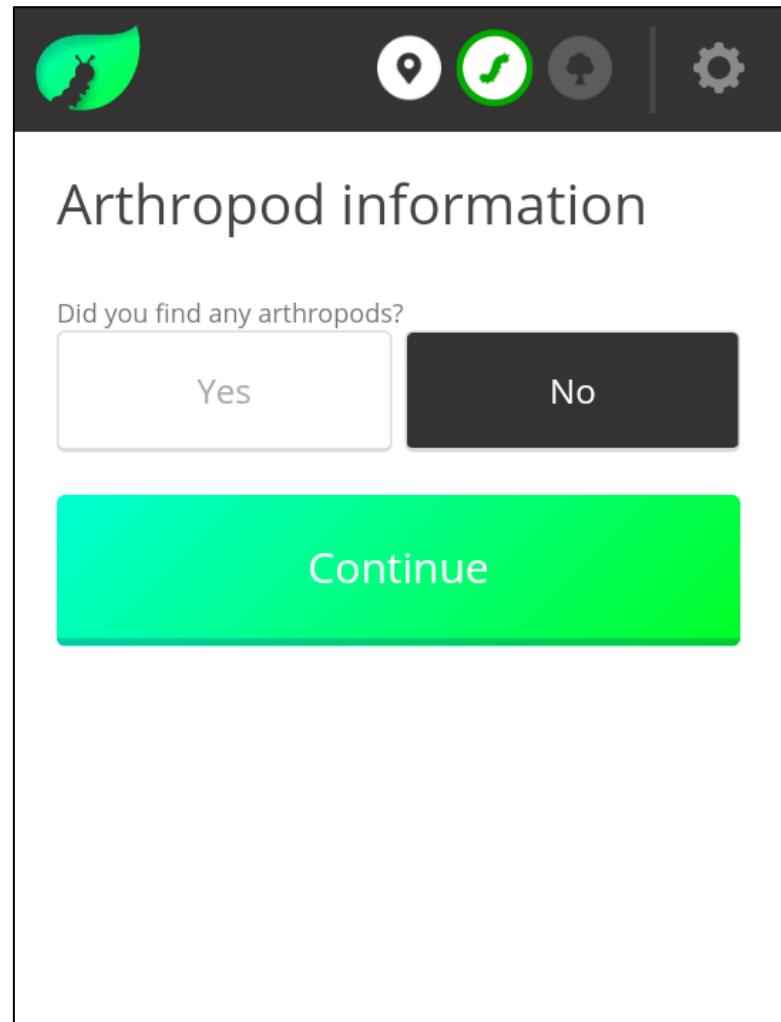
Visual Beat sheet

Notes:

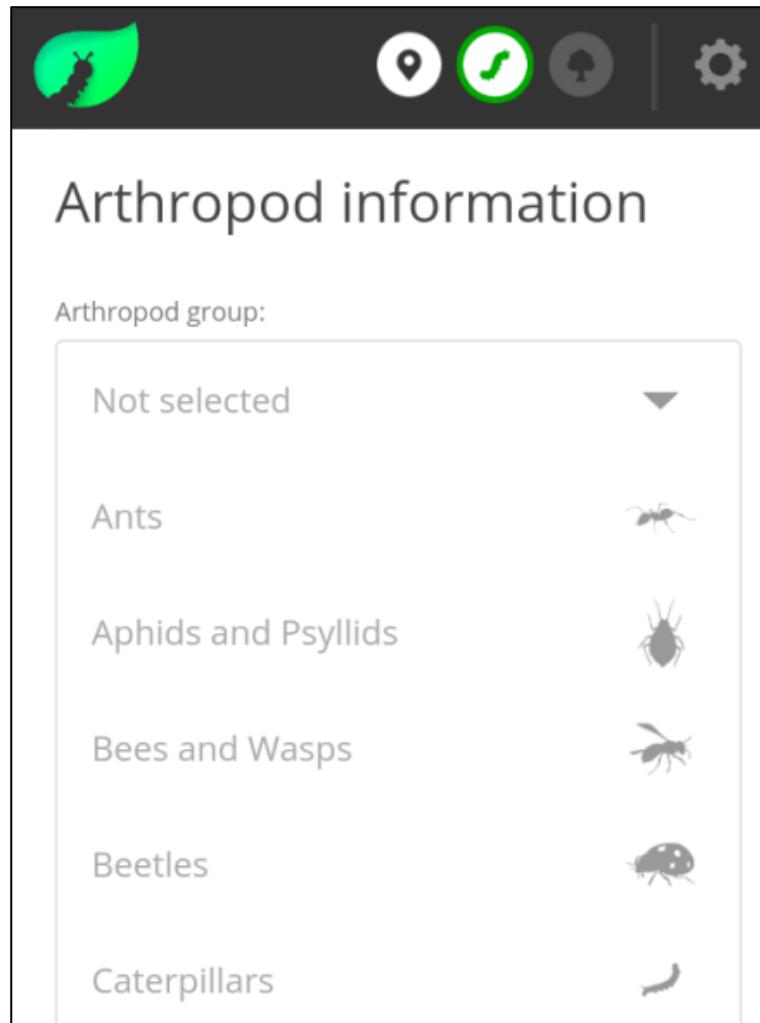
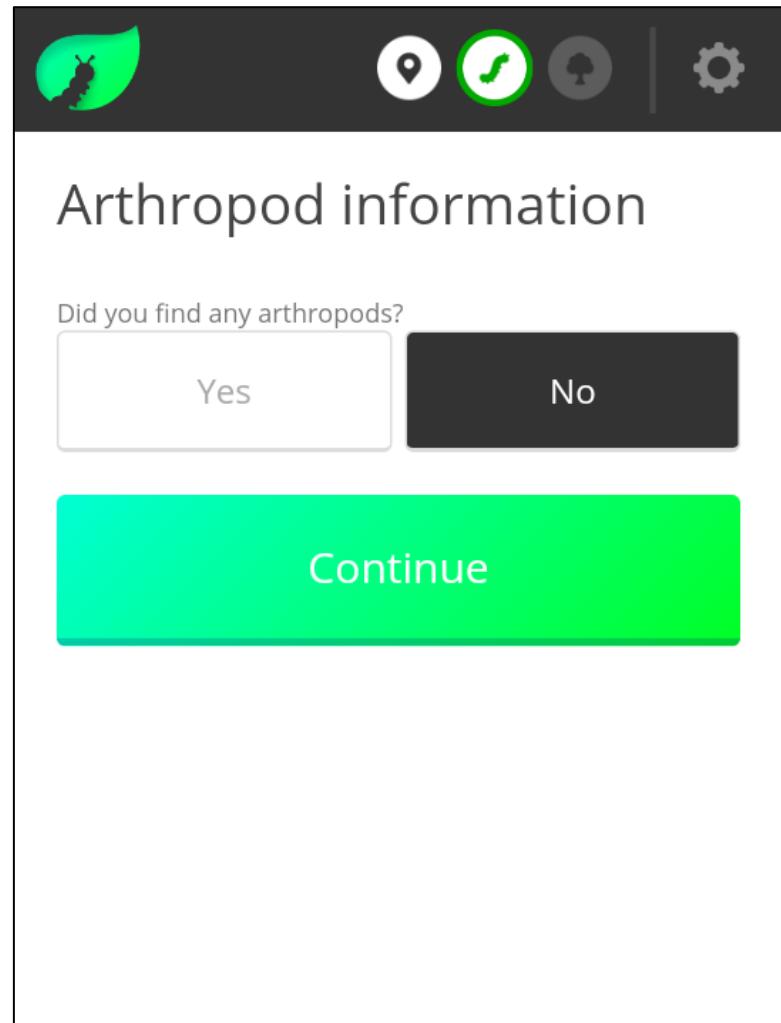
wet leaves ?

Continue

# Mobile app



# Mobile app



# Mobile app

Arthropod information

Did you find any arthropods?

Yes      No

Continue

Arthropod information

Arthropod group:

Not selected

Ants

Aphids and Psyllids

Bees and Wasps

Beetles

Caterpillars

Arthropod information

4 Ants (3mm)

1 Ants (10mm)

1 Caterpillars (35mm)

Add more arthropods

Continue

# Mobile app

The screenshot shows a mobile application interface for recording arthropod observations. At the top is a dark header bar with icons for location, camera, and settings. Below the header, the title "Arthropod information" is displayed. The main form includes fields for "Arthropod group" (set to "Beetles"), "The beetles are" (checkbox for "larvae" is unchecked), "Length (mm)" (6), "Quantity" (1), and an "Optional photo" section. The "Optional photo" section contains a button labeled "Upload a picture?" with a camera icon. A green oval highlights this "Optional photo" area. Below the form are "Notes" and "Cancel/Save" buttons.

Arthropod information

Arthropod group:  
Beetles

The beetles are:  
 larvae ?

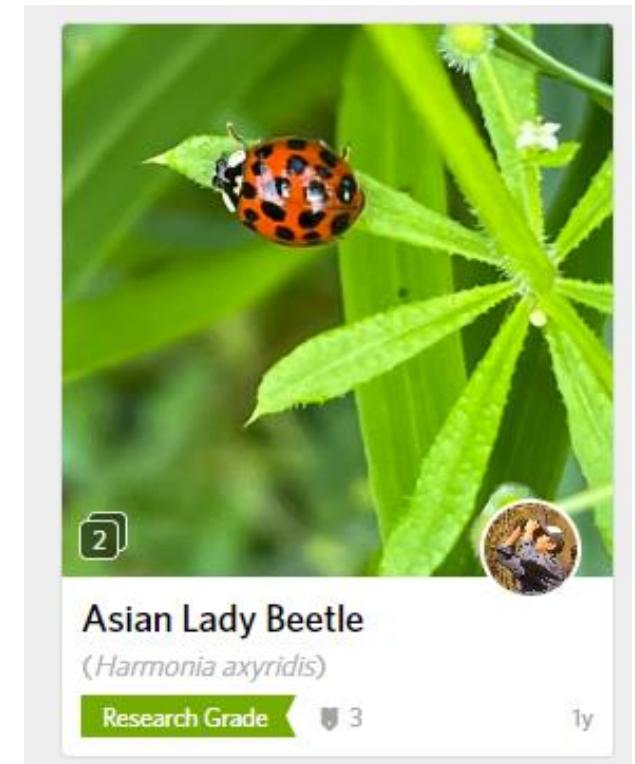
Length (mm): 6      Quantity: 1

Optional photo:  
Upload a picture?

Notes:

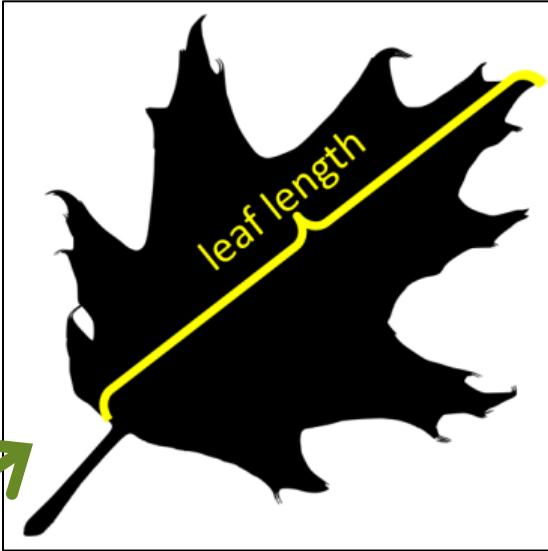
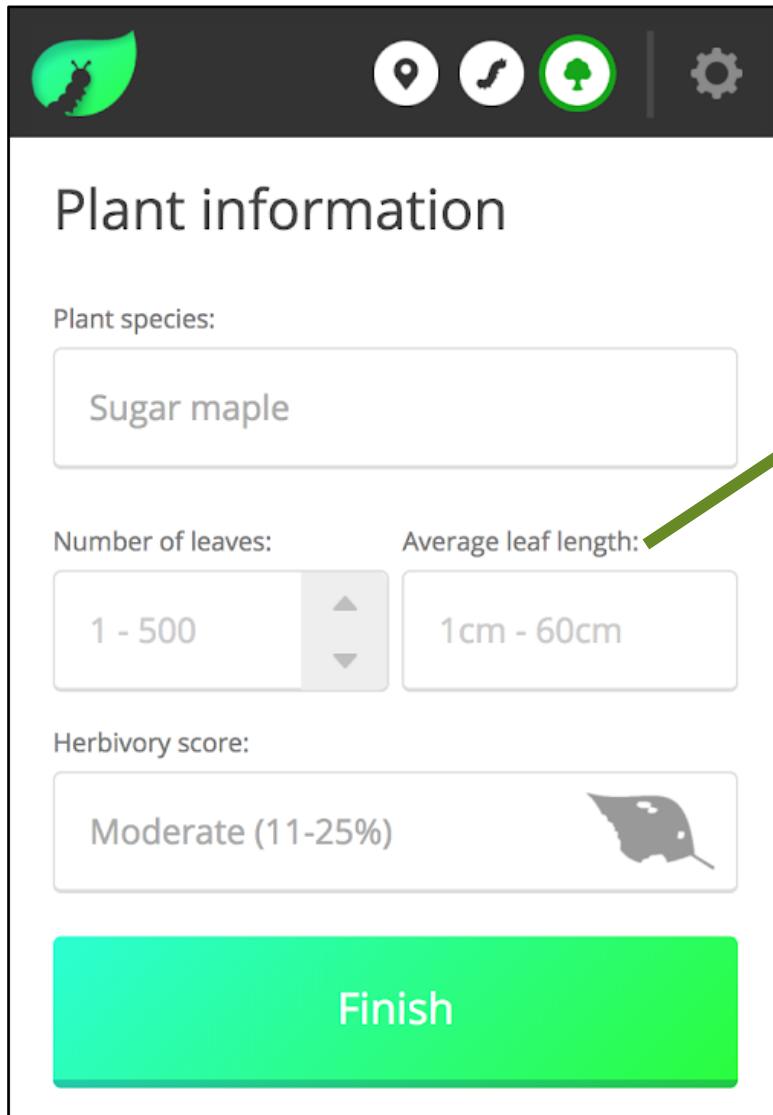
Cancel

Optionally submit a photo...



which gets sent to  
iNaturalist for  
potential identification

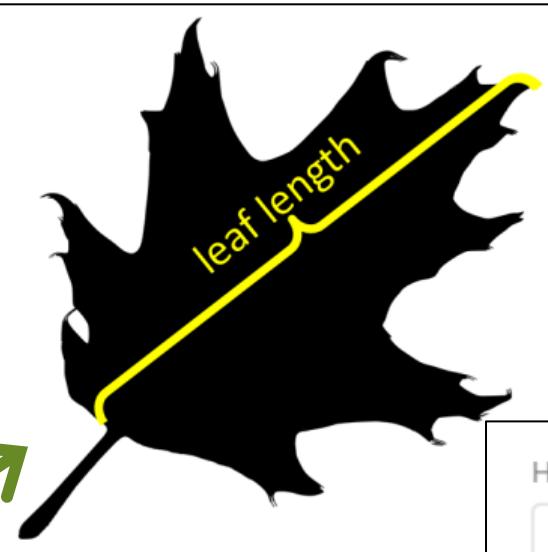
# Mobile app



# Mobile app

The mobile application interface displays the following information:

- Plant species:** Sugar maple
- Number of leaves:** 1 - 500
- Average leaf length:** 1cm - 60cm
- Herbivory score:** Moderate (11-25%)
- Finish** button at the bottom



The herbivory score selection menu shows the following options:

- Not selected
- None
- Trace (1-5%)
- Light (6-10%)
- Moderate (11-25%)
- Heavy (> 25%)

Green arrows point from the "Moderate (11-25%)" selection in the mobile app and the "Moderate (11-25%)" label in the menu to the corresponding row in the menu.

# Virtual Survey

Play our virtual survey game to get practice

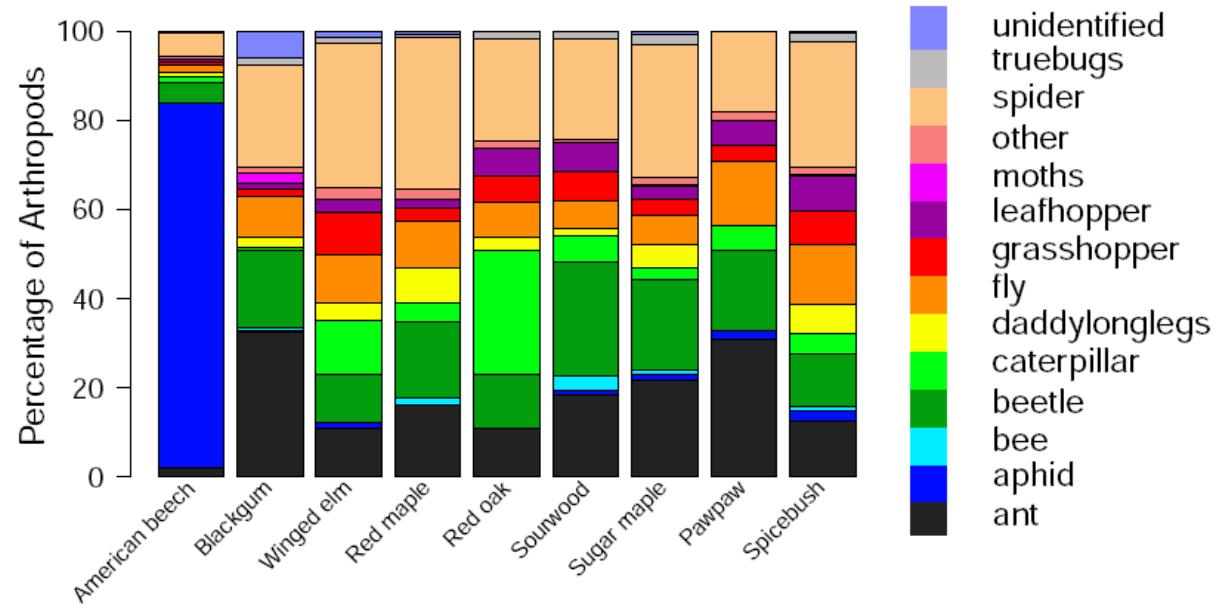
- finding bugs on a branch
- identifying them to order
- estimating their length in millimeters



<https://caterpillarscount.unc.edu/virtualSurvey>

# Data Visualization Tools

<https://caterpillarscount.unc.edu/mapsAndGraphs>



## Resources page

<https://caterpillarscount.unc.edu/resources>

# Annual Site Report

## NC Botanical Garden, 2019 Summary

Thank you for participating in *Caterpillars Count!* Here we provide a summary of what was found at your site this year. For a more in-depth exploration of the data check out our [Maps & Graphs](#) page. The raw data from your site, or any site, can be downloaded [here!](#)

### Site Statistics

NC Botanical Garden joined *Caterpillars Count!* in 2015 and has 40 survey branches spread across 8 survey circles. This season (as of 27 September):

- 11 unique participant(s) submitted observations at your site,
- conducting 833 visual and 840 beat sheet surveys
- on 21 different dates
- observing a total of 2,164 arthropods
- including 158 caterpillars (present on 8.67% of surveys).
- Across all years, 38 unique participants have conducted 7,747 total surveys.

The 1,673 total surveys conducted at NC Botanical Garden this year ranks 3rd out of the 54 sites that participated in 2019.

### Top Participants of 2019

User	Surveys	Arthropods	Caterpillars	% Caterpillars
G Di Cecco	501	618	58	10.38
R Cooper	326	509	36	9.82
A Hurlbert	243	306	32	12.35
G Ni	240	310	10	4.17
C Bridges	239	284	10	4.18
S Snell	74	93	10	12.16
D Pelly	36	29	2	5.56
M Abarca	5	8	0	0.00

# Annual Site Report

## NC Botanical Garden, 2019 Summary

Thank you for participating in *Caterpillars Count!* Here we provide a summary of what was found at your site this year. For a more in-depth exploration of the data check out our [Maps & Graphs](#) page. The raw data from your site, or any site, can be downloaded [here!](#)

### Site Statistics

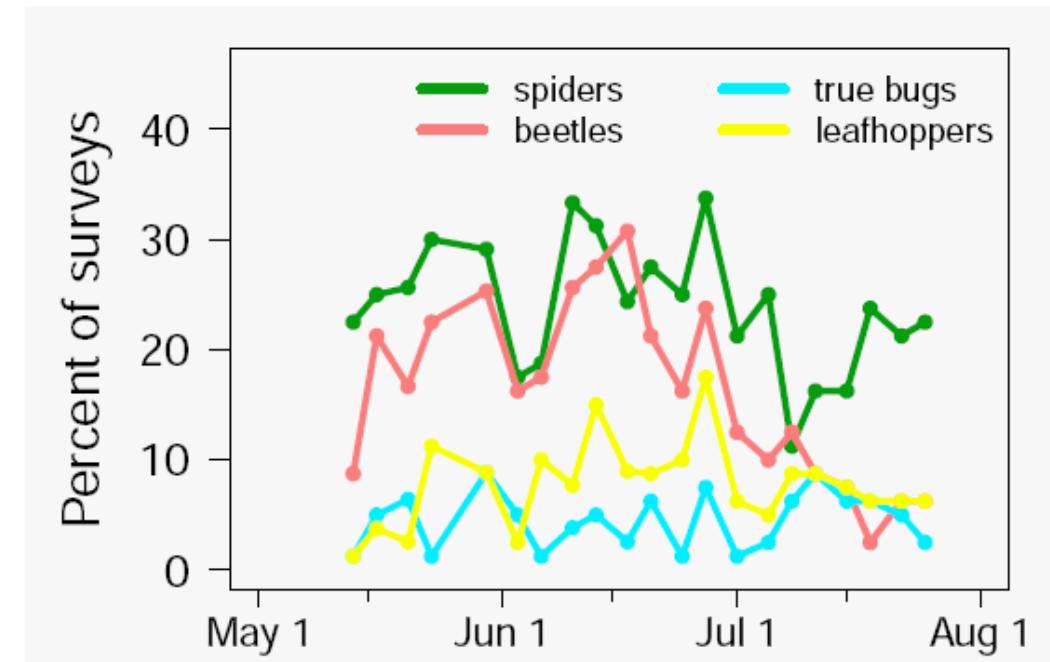
NC Botanical Garden joined *Caterpillars Count!* in 2015 and has 40 survey branches spread across 8 survey circles. This season (as of 27 September):

- 11 unique participant(s) submitted observations at your site,
- conducting 833 visual and 840 beat sheet surveys
- on 21 different dates
- observing a total of 2,164 arthropods
- including 158 caterpillars (present on 8.67% of surveys).
- Across all years, 38 unique participants have conducted 7,747 total surveys.

The 1,673 total surveys conducted at NC Botanical Garden this year ranks 3rd out of the 54 sites that participated in 2019.

### Top Participants of 2019

User	Surveys	Arthropods	Caterpillars	% Caterpillars
G Di Cecco	501	618	58	10.38
R Cooper	326	509	36	9.82
A Hurlbert	243	306	32	12.35
G Ni	240	310	10	4.17
C Bridges	239	284	10	4.18
S Snell	74	93	10	12.16
D Pelly	36	29	2	5.56
M Abarca	5	8	0	0.00



# Annual Site Report

## NC Botanical Garden, 2019 Summary

Thank you for participating in *Caterpillars Count!* Here we provide a summary of what was found at your site this year. For a more in-depth exploration of the data check out our [Maps & Graphs](#) page. The raw data from your site, or any site, can be downloaded [here!](#)

### Site Statistics

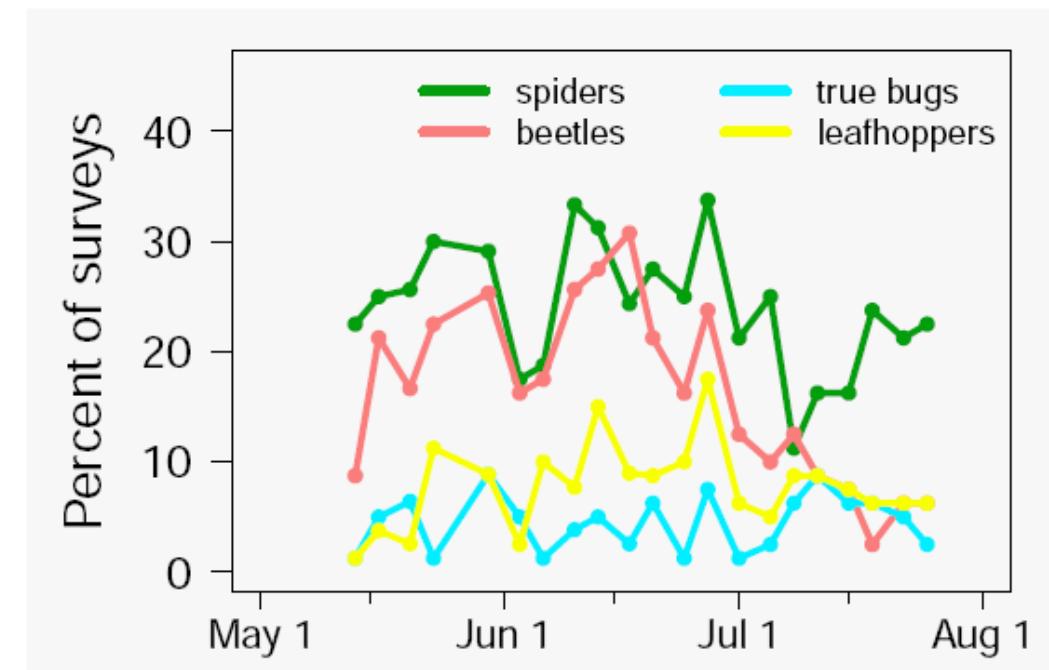
NC Botanical Garden joined *Caterpillars Count!* in 2015 and has 40 survey branches spread across 8 survey circles. This season (as of 27 September):

- 11 unique participant(s) submitted observations at your site,
- conducting 833 visual and 840 beat sheet surveys
- on 21 different dates
- observing a total of 2,164 arthropods
- including 158 caterpillars (present on 8.67% of surveys).
- Across all years, 38 unique participants have conducted 7,747 total surveys.

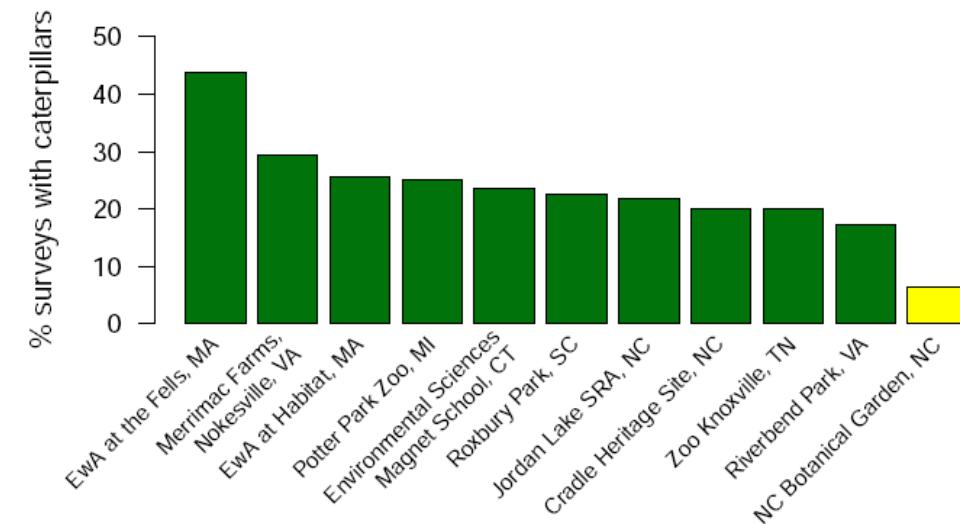
The 1,673 total surveys conducted at NC Botanical Garden this year ranks 3rd out of the 54 sites that participated in 2019.

### Top Participants of 2019

User	Surveys	Arthropods	Caterpillars	% Caterpillars
G Di Cecco	501	618	58	10.38
R Cooper	326	509	36	9.82
A Hurlbert	243	306	32	12.35
G Ni	240	310	10	4.17
C Bridges	239	284	10	4.18
S Snell	74	93	10	12.16
D Pelly	36	29	2	5.56
M Abarca	5	8	0	0.00



Across all surveys ever done at **NC Botanical Garden**, caterpillars have been found 6.5% of the time, which ranks 32nd across sites. The top 10 sites (with ≥20 surveys) are shown below.





# *Join Us!*

Sign up at [caterpillarscount.unc.edu](http://caterpillarscount.unc.edu)

Questions?

Email [caterpillarscount@gmail.com](mailto:caterpillarscount@gmail.com)

Dr. Allen Hurlbert, Project Leader  
Funded by the National Science Foundation