

# Vermont Lady Beetle Atlas

*A Project of the Vermont Atlas of Life*

## Manual for Participants



## **Sponsors and Supporters**

The Vermont Lady Beetle Atlas (VLBA) is sponsored by the Vermont Center for Ecostudies (VCE) with financial support from VCE and friends.

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## **Vermont Lady Beetle Atlas**

**2020 - 2025**

**A project of the**

**Vermont Atlas of Life at the Vermont Center for Ecostudies**

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## Project Overview

The Vermont Lady Beetle Atlas (VLBA) is a project run by the Vermont Center for Ecostudies' Vermont Atlas of Life (VAL).

This project began with a 43 year old document - *Lady Beetles: A Checklist of the Coccinellidae of Vermont*. The authors listed the first and last date each Lady Beetle species was collected in Vermont and the total number of specimens known, providing a snapshot of lady beetle life in Vermont prior to 1976.

This document and data from the University of Vermont Zadock Thompson Natural History Collection, Middlebury College, the Vermont Forest, Parks, and Recreation collection, VAL iNaturalist project and the Lost Ladybug Project through Cornell University showed that forty lady beetle species have been recorded in Vermont. However, 15 of these species have been missing since the mid-1970's.

Are they truly gone? It is possible that their current populations are so small that a handful of scientists alone cannot detect them, however we will not know until we look.

The Vermont Lady Beetle Atlas was inspired by a desire to find an answer. Through our research, we hope to amass an atlas of current lady beetle species in Vermont. Through this work, we want to discover whether missing lady beetle species still exist in small populations in some regions or if they truly are gone. Our long-term goal is to restore Vermont's lady beetle diversity and counteract the proliferation of invasive lady beetles, possibly by reintroducing some of these lost native species one day. Ultimately, by tackling unanswered questions about Vermont lady beetles and keeping our thumb on the pulse of lady beetle populations, we hope to provide insight and support for their conservation.

Volunteers who participate in the Vermont Lady Beetle Atlas survey will visit survey sites from Spring through Autumn and follow the protocol described below to document lady beetles they encounter. With your help, this atlas is projected to take us 5 years to completely survey the state.

# Lady Beetle Survey Instructions

What follows in this manual are step-by-step instructions for participation in the Vermont Lady Beetle Atlas. Before beginning any work, you should read this manual carefully, particularly advice on accurate record-keeping.

You'll find two options for contributing to the survey. Many of you will use both of these options:

1. **Incidental Encounters** – This option allows you to document lady beetles wherever and whenever you find them. Rather than visiting a specific site with your insect net in hand, the atlas allows you to report lady beetle presence on an incidental basis – in your backyard garden, during a visit to a state park, for example, or even while walking your dog. You just need to snap an image with your smartphone or other camera for these spontaneous encounters with beetles and add your sighting to the Vermont Lady Beetle Atlas on iNaturalist.
2. **Full Site Surveys** – This is the most active way to participate in the Atlas. We hope many of you will do at least some of these. Using this survey method, you will intentionally focus your efforts on a specific location or set of locations.
  - Choosing survey site(s), preferably in a priority block.
  - Visiting your site(s) and vouchering the lady beetle species found there while following survey protocols.
  - Submitting your data to the Vermont Lady Beetle Atlas on iNaturalist.

## Option 1 - Incidental Encounters

What if you want to participate but cannot commit to the rigors of a full survey? This option allows you to document lady beetles wherever and whenever you find them. Rather than visiting a specific site with your insect net in hand, the atlas allows you to report lady beetle presence on an incidental basis – in your backyard or garden, during a visit to a state park, or even while walking your dog. You just need to snap an image with your smartphone or other camera for these spontaneous encounters with beetles and [add your sighting to the Vermont Lady Beetle Atlas on iNaturalist](#).

## Option 2 - Full Site Surveys

This is the most active way to participate in the VLBA Survey. Using this survey method, you will visit your own survey sites throughout the season on your adopted priority block or other survey sites to document lady beetle species and abundance.

## Step 1: Choosing a Block Map and Survey Sites

We will gladly accept lady beetle records from anywhere in Vermont—your front yard, your workplace, a nearby field, or a remote bog. But to make sure we survey lady beetles evenly and systematically across the state, the project has adopted a grid mapping system that has been used with previous wildlife atlas projects. The system relies on the 184 U.S. Geological Survey 1:24,000 topographic maps (“7½-minute maps”) that cover Vermont. We’ve divided each of these maps into six blocks of equal size (roughly 3 miles x 3 miles) and numbered them according to the example diagram below. That’s a total of 1,104 survey blocks (184 maps x 6 blocks per map = 1,104 blocks).

Since we don't have the person-power to sample for lady beetles in each and every block, we've randomly selected 184 of these blocks (one per USGS map) for the focus of this atlas. We call these blocks "**priority blocks**" (you'll be hearing a lot about them). The 184 priority blocks make up a representative sample of the Vermont landscape; they're the minimum number of blocks that must be surveyed in order to obtain a good sample of the lady beetle fauna for the entire state.

Although data on any lady beetles anywhere in the state are important, we prefer that you survey regularly in one of the 184 priority blocks if you can. No one in Vermont is far from a priority block. Of course, you may survey for lady beetles outside of a priority block. Perhaps your home or favorite place is not located in one of the priority blocks. That's fine. Remember, the priority blocks are the *minimum* survey blocks we have to cover.

When choosing your survey sites, you have two choices of how to proceed:

1. **Adopt-a-block survey:** If you want to participate in this survey at the highest commitment level, then we encourage you to select a block to monitor from our [online map viewer](#). Over the course of the growing season, you are responsible for conducting lady beetle surveys on this block of land with the goal of discovering as many species as you can find and surveying as many places and habitats that you can. But you don't have to do this alone! Encourage others to help monitor your block. The more people surveying, the better!
2. **Casual survey:** If signing up for a block feels like too much commitment or if none are open in your area, you can still follow the full protocol. Instead of formally adopting a block, you can choose to either routinely survey land that interests you or help survey someone else's block. We still encourage you to survey as much as you can throughout the growing season.



## Step 2: Collecting Data on a Site Survey

The best collection method you use on a survey site will depend on the habitat. You can choose one or more of the following methods to collect data during a survey:

1. **Sweep netting:** Sweep netting is a great method to use if you are surveying a field or similarly grassy area. To sweep net simply swing the net back and forth through the vegetation. [Check out this how-to video to see someone in action](#). You can purchase a [sweep net from a supplier like Bioquip](#), or [make your own using a tutorial](#). When you are done sweeping your net, dump what you find into a bin or onto a sheet to find all the lady beetles and place in containers to hold them while you photograph each one.
2. **Beating sheet:** Beating sheets are used when looking for insects in bushes or trees. You can use pretty much any type of large sheet as a beating sheet, so long as it is a light color (making it easier to see beetles) and there are no holes (tattered fabric, wide stitching, etc). Place the sheet on the ground under the tree or bush that you wish to survey. Make sure that the sheet covers the ground under the plant and extends a few inches past its perimeter. Shake the plant or gently hit it with a stick. Collect any lady beetles that fall onto the sheet and place them in a jar temporarily.
3. **Visual Search:** Visual surveys are fairly simple. Use your eyes to locate lady beetles on vegetation or other landscape features. Carefully grab the ladybugs or tap them into a jar below their perch.

Now that you know what method(s) you plan to use, it is time to head out! Here are a couple of things to keep in mind before you go:

- If you can, pick warm, sunny days for surveying, since lady beetles will likely be most active on those days.
- Scout out your location ahead of time using our survey block map or other resources. This will allow you to get a sense of what landscape features you may encounter in your block, such as patches of wetland or farm fields.
- MAKE SURE YOU HAVE PERMISSION TO SURVEY ON THE PROPERTY.
- Look over the data sheet before heading out. Make sure you understand what information you are asked to provide and ask the VLBA team questions if you need help.
- Organize your equipment ahead of time. Nothing is worse than getting out in the field and realizing you forgot your net/data sheets/pencil/water bottle/camera.

Materials you will need:

- Camera or smartphone
- Data sheet(s) and pencil
- Bug spray, sunscreen, first aid kit, water - anything else necessary for personal comfort and safety

- Beating sheet, sweep net or other survey tools
- Small containers or jars to hold beetles until photographed

## Recording Data

You will record your data in two ways: on the field data sheet and through our iNaturalist project. You should complete your data sheet in the field as you are working. We also encourage you to photograph as many lady beetles as possible. For more information, see the section titled "Photographing Lady Beetles".

The first step in the survey is to fill out a data sheet. Below is an example of a completed data sheet. You can [download a PDF to print datasheets](#) on our web site.

<b>Vermont Lady Beetle Atlas</b> <b>SITE VISIT FORM</b> Return to: Vermont Atlas of Life PO Box 420 Norwich, VT 05055 vlba@vtcostudies.org	<b>Observer name(s):</b> Clare McFarland		<b>Date:</b> 5/13/20
	<b># observers:</b> 1	<b>Location:</b> Mt. Peg Woodstock VT	
<b>Habitat types:</b> <input type="checkbox"/> Garden <input type="checkbox"/> Yard <input checked="" type="checkbox"/> Meadow (not Agriculture) <input checked="" type="checkbox"/> Shrubs/bushes <input type="checkbox"/> Trees/forest <input type="checkbox"/> Wetlands <input type="checkbox"/> Agriculture cropland <input type="checkbox"/> Orchard <input type="checkbox"/> Hay field/grazing <input type="checkbox"/> Building <input type="checkbox"/> Shore/water <input type="checkbox"/> Barren area	<b>Block # (if applicable):</b>	<b>Start time:</b> 10:15 am	<b>End time:</b> 10:50 am
	<b>Search method:</b> <input checked="" type="checkbox"/> Sweep net <input checked="" type="checkbox"/> Visual search <input type="checkbox"/> Beating sheet <input type="checkbox"/> Incidental		
	<b>Number of Individual Lady Beetles Observed</b> 21		<b>Number of Individual Beetles Photographed</b> 14
	<b>Notes:</b> partly cloudy, mild wind, mid 60's		
<b>Photos uploaded to VLBA on iNaturalist?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			

You do not need to complete a data sheet for every lady beetle you see, just every survey you conduct. This means that if you change survey sites (go to a different area), you will need to start a new sheet. A survey site is generally defined as an area of similar habitat bound by physical features. Potential sites include: a wetland, an overgrown field, a hay field, a flower garden, woodland clearing, woods road or trail, a recreation path, and other defined areas. If you change sites, start a new field data sheet.

## Step 3: Add Your Site Visit Form and Images to the VLBA Project on iNaturalist

In addition to completing your data sheet, we also require that you upload your observations to [our iNaturalist project](#). We like to do this at home after we are finished with our surveys for the day. Just make sure to check the box that says “Yes” under “Photos uploaded to VLBA on iNaturalist?” on your data sheet when you are finished.

The basic steps for uploading your observation(s) onto our iNaturalist project:

1. Click the green “Upload” button (computer), circle with a plus sign (Android), or “Observe” button (iPhone) and select the photo(s) you want to upload. For smartphone users, you get to your saved photos by clicking on the stack of photos next to the green button (iPhone) or “Choose photo” (Android).
2. Check that the date and location are correct (the date you made the observation, not the date you uploaded it). If location does not appear, click the box that says “Location” and find your location manually.
3. Click in the “What did I see?”/“Species name” box. If you know what species you saw or feel comfortable making an educated guess, select an exact species. Otherwise, just stick with “Lady Beetle” and the VLBA team will help make a species-level identification.
4. Click on the box that says “Add to Projects” and search for Vermont Lady Beetle Atlas.
5. Select the project and answer as many of the questions as you can. You can transfer all these from your field data sheet.
6. Save your observation(s).

When the survey season is over, please send **all** of your completed data sheets either by mail to the Vermont Center for Ecostudies office (address provided on the data sheets) or by emailing a scan or image of each one.

### What If I Don't Find Any Lady Beetles?

Some days you may go out and fail to find a single beetle. That is ok! When it comes to collecting data, zeros tell an important story. Even if you cannot find any, you still need to fill out a data sheet (just put in zeros for the number of lady beetles and photos). You also do not need to upload any information into iNaturalist. Just make sure to send in these data sheets from beetle-less surveys at the end of the season with all of your field survey sheets.

### Photographing Lady Beetles

Photographs make up an essential component of our dataset by allowing us to identify the beetles you discover to species. Here are some guidelines for photographing lady beetles:



1. Closeups are the best. If you are using a digital camera, use macro mode, often it has a flower symbol on the setting. Get as close as you can with the lens of your smartphone or camera and still have it in focus.
2. Try to take pictures from multiple sides -- top, from the side, face-on. Some lady beetles look very similar except for tiny details that may not be obvious in a photo from only one angle.
3. You do not need to pick the lady beetle up, but it may be easier. Feel free to photograph it on a plant, in the net, or on the sheet. Just make sure you can get clear and closeup images of it from top and sides.
4. It might be easier to chill them out. The problem with collected ladybugs is that they may be too active to get a good image unless you slow them down a little. You can do this in a freezer at home or in a cooler in the field. Lady beetles can be chilled in a freezer safely for 5 minutes (over 6 may kill them!) and this will quiet them for 2-4 minutes. Coolers are not as cold as freezers so it may take 30 minutes to get 1-6 minutes of quiet time. They will survive for days in a refrigerator or chilled cooler.
5. Glare or reflection off the shiny beetle elytra is often more of a problem than not having enough light. Shield the beetle from bright lights or sun and use the flash only if absolutely necessary.
6. Include a size reference, such as a coin, pencil, ruler, marks on a paper, etc. Lady beetles come in many sizes, so including a size reference will help us make a better identification.
7. Please try to avoid group photos, unless the Lady Beetles are grouped in a large mass or you can get several individuals of the same species in-frame. iNaturalist only allows you to identify one species at a time, so having multiple species in the same shot will mean duplicating your observation.
8. Always try to take a photo! Even if the photo will not be high-quality, snap it anyway. Even a poor or partial photo of a lady beetle may allow us to identify the species.

### **Lady Beetle Ethics and Cautions**

- Treat lady beetles with respect. If placing them in a container, make sure that the container stays out of direct sunlight for prolonged periods of time and that you release any beetles before leaving the site.
- Leave habitat intact. In general try to avoid damaging vegetation (clearing away plants from a site, breaking branches, etc) and other animals' homes.
- Do not enter private property without permission.
- Always let someone know where you are going and bring appropriate safety gear (first aid kit, allergy medications, water, phone).
- [Be tick smart!](#)
- Follow all rules for [outdoor recreation in Vermont during COVID-19](#).

## Contact Us for Help!

- Kent McFarland, *Survey Director*, Vermont Center for Ecostudies, [kmcfarland@vtcostudies.org](mailto:kmcfarland@vtcostudies.org)
- Emily Anderson, *Project Coordinator*, Vermont Center for Ecostudies / ECO Americorps [eanderson@vtcostudies.org](mailto:eanderson@vtcostudies.org)
- Nathaniel Sharp, *Field Biologist*, Vermont Center for Ecostudies [nsharp@vtcostudies.org](mailto:nsharp@vtcostudies.org)

## Other Resources

- [Ladybugs of Maine poster](#)
- [BugGuide.net Lady Beetles](#)
- [Lost Ladybug Project](#)
- Discover Life ID Nature Guide, an [online pictorial key for lady beetles](#).
- Robert D. Gordon (1985) [The Coccinellidae \(Coleoptera\) of America North of Mexico. the definitive dichotomous key for North American Coccinellidae.](#) Journal of the New York Entomological Society. 912 pages. Contains keys, illustrations, and distribution maps for all species.