

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

**A project of the
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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 decades 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 at Cornell University showed that forty lady beetle species have been recorded in Vermont. However, 12 of these species have been missing since the mid-1970's, some of them were common at one time.

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 survey, 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 as New York has been doing. 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.

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 (<https://www.inaturalist.org/projects/vermont-lady-beetle-atlas>).
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 survey block.
 - Visiting your site(s) and vouchering the lady beetle species found there while following survey protocols.
 - Submitting your observations to the Vermont Lady Beetle Atlas on iNaturalist and filling out the effort form for each survey you conduct (even if you found zero lady beetles).

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 survey block or other survey sites to document lady beetle species and abundance.

Step 1: Choosing a Survey Block 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 atlasing 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 enough people to survey lady beetles in each and every block, we've randomly selected 184 of these blocks (one per USGS map). We call these blocks "**priority blocks**". Since we are not sure if we will even have enough people to complete all 184 blocks, we have randomly selected half of the priority blocks (92 total) to begin, ensuring that we selected a representative sample across all biophysical regions. The 92 priority blocks, named Lady Beetle Priority Blocks, make up a representative sample of the Vermont landscape; and they're the minimum number of blocks that must be surveyed in order to obtain a sample of the lady beetle fauna across the entire state.

Although lady beetle surveys anywhere in the state are important, we prefer that you survey regularly in one of the 92 Lady Beetle Priority Blocks (highlighted red on the map, and the title “Lady Beetle Priority Block” will appear when you click on the block) if possible. No one in Vermont is far from a priority block, and if a yellow highlighted block is the only block that is accessible to you, feel free to sign up for one of those. Of course, if you can't access a priority block at all, we'd love to have full surveys from anywhere in Vermont - backyards to mountain summits.

When choosing your survey sites, you have two choices:

1. **Adopt-a-block survey (preferred):** If you want to participate in this survey at the highest commitment level, then please select and adopt a block(s) to monitor from our [online map viewer](#).

Over the course of the growing season, you will conduct lady beetle surveys within 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 too! The more people surveying, the better.

2. **Casual surveys:** If signing up for a block feels like too much of a commitment, you can still follow the full protocol. Instead of formally adopting a block, you can routinely survey land that interests you. We still encourage you to survey as much as you can throughout the growing season. Join the Vermont Beetle Atlas on iNaturalist (<https://www.inaturalist.org/projects/vermont-lady-beetle-atlas>) and start submitting your data.

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 use:

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, carefully open the net and scoop any lady beetles you have captured into a clear container to be photographed. This takes some practice - lady beetles are swift! If you open the net too far or too fast, they will likely fly out before you can capture them.
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 PRIVATE 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 (see next page) or using the [online Google Form](#) and through [the Vermont Lady Beetle Atlas on 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.

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 Observations to the VLBA on iNaturalist and Complete the Field Survey Form

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 to add your observation to it.
5. Save your observation(s).

The basic steps for completing a field survey form:

1. You can fill out the forms and send them to us in the mail or via email if scanned. Or, help us save data entry time and [use our online form](#) to send us your data for each survey.
2. 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@vtecostudies.org
- Julia Pupko, *Project Coordinator*, Vermont Center for Ecostudies / ECO Americorps jpupko@vtecostudies.org
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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.
- Vermont Lady Beetle Atlas [Species Profiles](#)