SPRING 2022

# Field Notes

VERMONT CENTER FOR ECOSTUDIES | *Uniting People and Science for Conservation*

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## Butterflies Meet Big Data

### eButterfly: Four wings and a force for conservation

| BY KENT MCFARLAND

From a graduate school student's lofty dream to a full-fledged community science program, eButterfly is celebrating its 10th year, and we are honoring this milestone by expanding worldwide!

The power of eButterfly and other massive online community science programs lies in the strength and diversity of its participants. Anyone interested in butterflies can participate—from novice enthusiasts to observant

*(continued on page 4)*

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# FIELD NOTES

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The Vermont Center for Ecostudies (VCE) is a nonprofit organization whose mission is to advance the conservation of wildlife across the Americas through research, monitoring, and community engagement. With a reach extending from Canada and northern New England through the Caribbean and South America, our work unites people and science for conservation.


Field Notes is VCE's biannual newsletter and is free to our constituents.



**VERMONT CENTER FOR ECOSTUDIES**
PO Box 420
Norwich, VT 05055
(802) 649-1431



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## VCE VIEW

© YOLANDA LEÓN

*Chris and longtime VCE colleague and friend Jim Goetz with a mist-netted Bicknell's Thrush at Las Abejas.*

As VCE approaches our 15-year milestone a few months from now, I am struck by how adeptly we've managed to both diversify *and* hold true to our authentic self. We've weathered the challenges of COVID-19, economic downturns, reduced public agency funding, and the increasing barrage of sobering news that climatic warming imperils global ecosystems. The immense value of—and urgent need for—VCE's long-term wildlife monitoring has become more apparent than ever, and we have redoubled our efforts. Yet, we've also diversified on many fronts, and I want to highlight that diversification here.

First, our science-based programs. We will never waver from our commitment to conduct baseline surveys and track population trends of vulnerable wildlife, both in Vermont and beyond. That's in our DNA. But what so impresses me about my VCE colleagues is their perpetually forward-thinking ambition to take on creative new work. During the year ahead, we'll break new ground in remarkable ways, as we (1) delve into the little-known ecology of fairy shrimp in vernal pools; (2) join a global effort to apply automated computer visioning to monitor moth diversity and phenology; (3) harness millions of community science observations to create insect range maps and predict how climate change will impact the most diverse macro-organisms on earth; and (4) generate lady beetle extinction models using our 2021 atlas data. And, that's just a smattering—VCE's conservation science team is on a roll!

The theme of diversification also extends to our internal staff "family." Our expanded age profile has added delightfully youthful energy and perspectives (you won't see many "gray hairs" on our staff web page, other than me!). We're also tremendously enthused about launching two new internships that will provide students historically underrepresented in the field of ecology with an opportunity to gain hands-on research experience. And, we're diversifying our core science team by adding a community ecologist, who will develop an innovative, applied research program to tackle pressing ecological issues and use VCE's data to affect real conservation change.

One additional change that will take place over the next few months is a transition in VCE's leadership. After a tenure more rewarding than I can begin to express, I'm moving on to make way for a new Executive Director. I do so with a tinge of sadness—mainly because I'll genuinely miss my professional and personal interactions with all of you—but not a shred of regret, *and* with an enormous dose of optimism for VCE's future. This organization has never been stronger or more vibrant. Its promise is unlimited, its potential barely tapped. But, more on that later; I've got a heck of a lot of fulfilling work to do between now and October! FN

*Chris Rimmer*
**EXECUTIVE DIRECTOR**

*A Tricolored Bumble Bee visits the flower of a Grass-leaved Goldenrod at Brookmead Conservation Area, Norwich, VT.*

© JASON HILL

# The Buzz on Flowering Plant Preferences

**Understanding which flowers bumble bees favor helps manage utility rights-of-way for pollinators.** | BY JASON HILL

**Future work will help us determine which plant species are favored—and avoided—by all Vermont bumble bee species.**

Things were buzzing on the power lines last July, and sounds were not just coming from overhead. Last summer, the Pollinators Under Power Lines research team netted 579 bumble bees representing at least nine species on 26 power line sections. These data are a critical first step to help us document and understand the importance of utility rights-of-way for pollinators in New England. Ultimately, our goal is to use this research to help influence management of these working lands to maximize their benefit to globally-declining pollinator populations.

Bumble bees consume nectar and pollen from flowering plants, and pollen is their primary source of proteins. Bumble bees preferentially select flower resources for pollen with high-protein concentrations using flower color, corolla length, plant structure, and other cues. However, they can also *taste* the difference between a healthy meal and 'junk food.' If bees adjust their foraging behavior to encounter nutritious plants, we can likely use their flower preferences as a proxy for the nutritional quality of pollen.

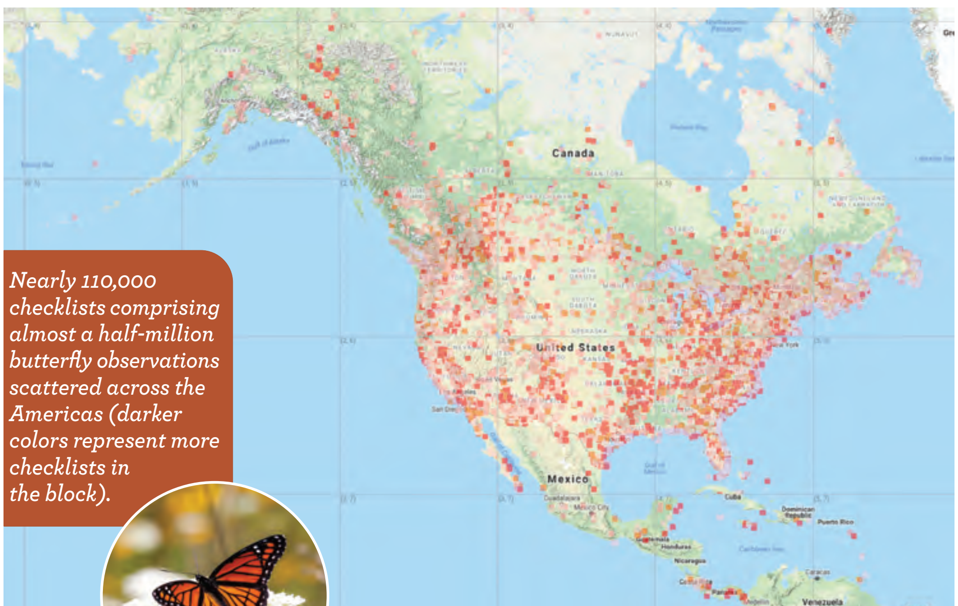
With this in mind, we recorded the flower species that each bumble bee was visiting when we netted it for identification. We also painstakingly identified and counted every actively-blooming flowering plant within each of our 26 transects (200-m long by 5-m wide). Phew—I get tired just remembering that! In total, we counted approximately 30,000 blooming plants of more than 100 species!

Two species were captured most frequently during our field season: the Common Eastern Bumble Bee (44%) and Tricolored Bumble Bee (17%). Both species often visited Common St. John's-wort, the abundant goldenrods, and clovers, but they did so at a neutral rate that suggested no preference or avoidance among these plant species. However, our foraging preference analysis indicates that both species visited plants like Common Selfheal and Bird's-foot Trefoil far less frequently than expected given the abundance of these plants in our transects. Tricolored Bumble Bees showed the strongest preference for White Sweetclover, visiting that species over eight times more frequently than would be expected by chance. Common Eastern Bumble Bees visited the tiny white flowers of Glossy Buckthorn over 10 times more often than we would expect based on the availability of buckthorn on our power line transects.

These initial results mark just the beginning of our analyses, stemming from our first season of research examining habitat use of bumble bees and insect milkweed specialists on power lines. Future work will help us determine which plant species are favored—and avoided—by all Vermont bumble bee species. Those data could be highly informative for deciding which plant species to establish and encourage when creating wildflower habitats to bolster bumble bee populations in utility rights-of-way. FN

*Butterfly watchers identifying, photographing, and counting each one they encounter to share as a complete checklist count on eButterfly.*

© KENT MCFARLAND




*Nearly 110,000 checklists comprising almost a half-million butterfly observations scattered across the Americas (darker colors represent more checklists in the block).*

**From anywhere on the planet, an observer can add a checklist containing any of the nearly 20,000 butterfly species known globally.**

backyard gardeners to seasoned experts. In just one decade, we've had thousands of users share observations with eButterfly. As more participants submit data, a richly collaborative environment of sharing and free data exchange is becoming the norm between butterfly enthusiasts, scientists, and conservationists.

You might say that eButterfly actually took flight over 60 years ago when Jacques Larivée started the Études des Populations d'Oiseaux du Québec bird checklist program. Now, with over 10 million records, it is the longest-running bird checklist program in North America. Its daily checklists have provided remarkably reliable information on changes in bird populations, phenology, and abundance patterns at local, regional, and continental scales. His son Max Larrivée grew up checklisting in eastern Québec. However, it wasn't birds that caught this young naturalist's eye—butterflies captured his attention.

"Because of my dad, I have swum in butterfly and bird checklists since I was five years old," said Larrivée. "I first thought of building a checklist-based butterfly website in 2000 when I entered graduate school."

But it wasn't until he joined the Canadian Facility for Ecoinformatics Research, led by Jeremy Kerr at the University of Ottawa, that Larrivée could act on his idea. They wanted to unify all of Canada's butterfly records into a single database and encourage continued surveys across the country. And the only way they could do that on a meager budget was to unite a lot of professional lepidopterists and amateur butterfly watchers.

"In 2010, I pitted two college computer science teams against one another to build a beta version of eButterfly," said Larrivée. "And that is how I met Xinbao Zhang, who turned out to be a phenomenal programming wizard. We've been working together ever since."

After fine-tuning the system, with extensive support from local butterfly experts across the country, they launched a modest Canadian eButterfly program in 2012. The site was a solid success in Canada, but they knew expansion across the remainder of North America was vital to increase eButterfly's research and conservation potential.

With eButterfly's rapid rise in popularity, Larrivée and Kerr set their sights on its evolution. As a longtime butterfly enthusiast myself, I was hooked on using eButterfly from the moment I discovered it in 2014. Reflecting on my experience managing Vermont eBird, the first state-specific eBird portal, I quickly realized that eButterfly had the potential to be as big and powerful for butterflies as eBird was for birds.

I contacted Larivée with my ideas to converge the data collection and digital design to be more like eBird's and was enthusiastically welcomed to the team. We all soon traveled to the eBird hub at the Cornell Lab of Ornithology, where Team eBird offered invaluable technical advice.

Like eBird, eButterfly collects data as checklists, each of which represents observations and counts from a single butterfly-watching event—like a walk in a meadow or hourlong observation of a pollinator garden. Thousands of checklists merged can provide unprecedented, accurate information on changes in ranges, phenology, and abundance at local, regional, and continental scales.

It took us a few years to grow eButterfly to where we are today. Early on, we were a small team with just one programmer and a shortage of resources. But, we all kept working toward our vision, and now, with several programmers and a part-time coordinator, we are poised for eButterfly to take full flight.

In 2021, eButterfly expanded south to Panama and the Caribbean, covering over 40 countries, more than 3,000 species of butterflies, and three languages. This year it will become available worldwide! From anywhere on the planet, an observer can add a checklist containing any of the nearly 20,000 butterfly species known globally. Uniting butterfly enthusiasts under a global banner, eButterfly is transforming passion for these winged marvels into a powerful digital tool for science, education, and conservation. FN

*The Dead-nettle Leaf Beetle, a Eurasian species first discovered in the US during a Montpelier Bioblitz, has been found at several other sites across Vermont.*

© NATHANIEL SHARP

# Bioblitzing for Big Data

## Discovering new species and expanding biodiversity data through community science. | BY NATHANIEL SHARP

Many people would agree that any day spent outdoors is well spent. Whether you get outside for 30 minutes or from sunup to sundown, time in nature is healing, freeing, and sure to spark curiosity. A Bioblitz is an event that focuses on spending time in nature with a singular goal: letting that sense of curiosity run wild. Simply put, a Bioblitz is a project that aims to identify as many species as possible within a specific area during a given period of time. Documenting an area's biodiversity in this way not only helps develop a baseline of what is there at that time—it can also uncover new or rare species and enable community members to gain first-hand experience in searching for, identifying, and learning about the plethora of species around them.

A Bioblitz recipe is simple! All you need is a location, timeframe, place to store collected data, and as many curious people as you can recruit. However, you can set your parameters in any way that allows you to meet your Bioblitz goals. For example, your chosen location can be as expansive as a wildlife refuge or tiny as a local park, and can even be your own backyard. The same goes for your time frame—you can carry out a Bioblitz in one hour with a school group or stretch it out over several weeks to fully cover a large area.

Undoubtedly, the best way to organize data collected for a Vermont-based Bioblitz is to use Vermont Atlas of Life on iNaturalist. iNaturalist provides a platform to both identify unknown organisms and gather Bioblitz data under one roof, allowing participants to explore and share findings. During the event, Bioblitzers can photograph or record audio of whatever species they encounter and then upload their observations to iNaturalist, assign an identification (even a tentative one), and receive guidance from other users. With no shortage of curious people in Vermont, finding friends, neighbors, or local nature experts to help with your Bioblitz should be a piece of cake!

I've helped with Bioblitzes all across Vermont—run by school classes, land conservation organizations, and informal groups of curious naturalists—and found that each event has its own sense of community, excitement, and discovery. From the first Daylily Leafminer ever recorded in Vermont (discovered during the Merck Forest Bioblitz) to the Northern Wasp Fly (a stunning example of mimicry) found during the Bridgewater Hollow Bioblitz, each event has recorded discoveries of species previously unknown in the local survey area, *and* connected every participant with the overwhelming diversity of life outside their door.

Are you looking to start a Bioblitz of your own? You can peruse other Bioblitzes for inspiration at the Vermont Atlas of Life on iNaturalist (https://www.inaturalist.org/projects/vermont-atlas-of-life) and see all the fascinating discoveries made by other curious naturalists across Vermont! FN

A Wood Frog floats serenely in a vernal pool.

# Automated Audio Analysis

## Frogs in a pond, a canary in the coal mine?

**BY KEVIN TOLAN**

© KATE BUCKMAN

Calling Wood Frogs are an annual harbinger of winter's end throughout the northeast. As snowmelt and early spring rains begin seeping into the ground, these cold-hardy frogs thaw from their frozen torpor and start migrating to their breeding ponds. There are few New Englanders who have not heard the frenetic quacking of this ubiquitous amphibian from vernal pools still partially covered in ice.

This explosion of activity provides an excellent opportunity to track annual phenology (the timing of biological events). By comparing the start date of Wood Frog chorusing and the period over which they call each year, we can monitor how the frogs are responding to a changing climate. These data not only allow us to examine short-term trends, such as year-to-year changes in phenology, they also help us establish a baseline against which to track future changes.

Over the past three springs, VCE's stalwart vernal pool monitors have trudged across the sodden, slippery landscape to deploy autonomous recording units (ARUs) for our Vermont Vernal Pool Monitoring Project. These specialized audio recorders are set to record four, 10-minute periods per day: one in the afternoon and three around dusk, when Wood Frogs are most likely to be chorusing.

After three seasons of monitoring,

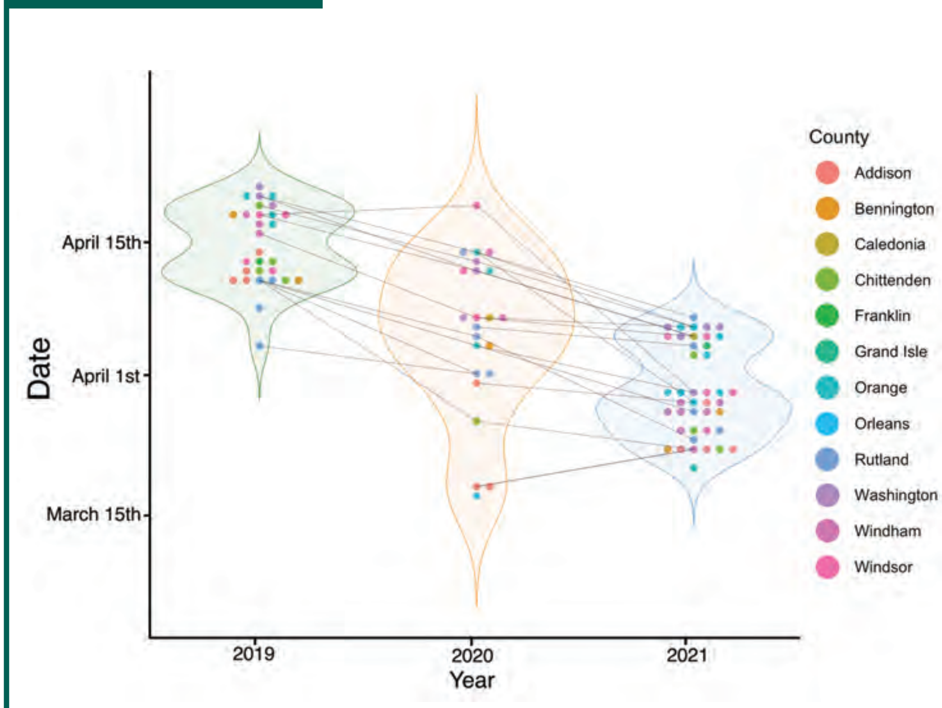
we have amassed more than 3,250 hours of audio data from over 60 sites—far too much for humans to analyze effectively, so we have automated the process! Using R, an open-source analysis software, we have developed templates to "match" against our audio data, such that we can score similarities between the two recording types. Any recordings with a high proportion of similarities to the template are considered matches, i.e., positive Wood Frog identifications. Using this method, we can now run an entire site's audio data with the mere click of a button.

Since this project began in 2019, Wood Frogs have generally started calling earlier at our study sites (see graph). Of course, three years of data are not nearly enough to establish a long-term trend, and we will not know the real implications of our findings for several years. Does earlier chorusing indicate a short-term, cyclical trend, or a more worrisome sign of what is to come?

Looking ahead, we plan to create additional templates to detect other species at vernal pools, such as Barred Owls, common predators at vernal pools. This work may also greatly expand opportunities for ARU deployment in other VCE research programs, like our Eastern Whip-Poor-Will Monitoring Project.

In an ever-changing environment, it is vital to track the responses of wildlife to phenological and ecological factors. Whether monitoring phenology or species presence and absence, developing low-cost, battery-efficient ARUs can potentially expand and enhance field surveys for wildlife. At VCE, we are always eager to explore new avenues and create innovative tools to track our native fauna! FN

## Wood Frog Calling




© KENT MCFARLAND

Since 2019, Wood Frogs have started calling earlier at most study sites. This graph shows the annual date that Wood Frog calling was first detected at monitored vernal pools. Each line connects a given pool's dates. This figure excludes sites with no detections.

*(*The year 2019 did not have a daytime recording period, which may have influenced when first detections occurred.) Code credit: van Langen, J. (2020). <https://github.com/jorvlan/open-visualizations>*

# Creating a Guide to Identify Insect Life on Milkweed

**This new field guide will help you discover that there is more to be found on milkweed than Monarch eggs and caterpillars.**

| BY ABBIE CASTRIOTTA

© BRENDAN BURKE

*Above:* *Blackened Milkweed Beetle, a milkweed specialist with few observations in New England.*

**We welcome you to carry this guide with you to help identify these insects as they begin showing up in your neighborhood this spring.**

Sure, you've seen Monarch butterflies flitting among milkweed patches in sunny fields—perhaps you even remember naming a few that emerged from chrysalises in your elementary school classroom. But chances are you will find it more challenging to conjure up images of the Unexpected Cycnia Moth or the Milkweed Stem Weevil. Monarchs are not the only insects that rely on milkweed; at least 13 milkweed specialist insects call New England home. Over the last two decades, the eastern Monarch population has declined more than 80%. There may well be other milkweed insects facing similar population declines, but with the lack of observations and photographs, much less is known about their population sizes, distributions, and life cycle events.

Last summer's pilot season of the Pollinators Under Power Lines project (which aims to better understand the role of early successional landscapes as pollinator habitat) involved measuring milkweed density and meticulously searching the stems and leaves of 731 individual milkweeds for specialist insects. Only two Small Milkweed Bugs, 14 Milkweed Longhorn Beetles, and one cluster of Milkweed Tussock Moth caterpillars were found. Upon reflection last fall, Jason Hill and I realized that we needed a comprehensive but concise field guide that illustrates all life stages; such a resource would help us researchers, future interns, and community scientists identify milkweed specialist insects under power lines and beyond. Since no such guide existed for our bioregion, we set out to create one.

Our resulting guide (see page 9) will surely benefit our Pollinators Under Power Lines research this summer, but we also hope that it will inspire others to collect insect field data in places such as backyard gardens, nature centers, parks, and schools. We have begun distributing this guide to organizations throughout New England, and we welcome you to carry it with you (or print it from our website) to help identify these insects as they begin showing up in your neighborhood this spring. As more community scientists submit observations of milkweed specialist insects to databases such as iNaturalist and eButterfly, we will start to fill gaps in data surrounding life cycle events, distribution, and population size. Given that these 13 species are found almost exclusively on milkweed, are easy to identify relative to other insect groups, and sport unique aposematic coloring, they provide an excellent entry point for budding entomologists!

We have also created two field guides to New England's bumble bees, another pollinator survey group that lacks guides for our region. Printable PDFs of the comprehensive double-sided guide and single-sided quick reference illustrated version are available on the Vermont Atlas of Life website: https://val.vtecostudies.org/projects/vtbees/bombus/. Happy identifying, and let us know what you find by submitting your observations to iNaturalist and eButterfly!

## What is a Milkweed Specialist?

The white sap that gives milkweed its name contains toxins (cardiac glycosides) that deter insects and other animals from consuming its foliage. Insects known as milkweed specialists have evolved to manage these toxins, some using the toxicity for defense. Instead of breaking down and excreting the cardiac glycosides, these insects store the toxins in their tissues, giving them a bitter taste to deter predators. The insects that have evolved to sequester milkweed toxins in their bodies show aposematic markings, or colors (typically red or orange) and patterns that advertise their toxicity.

# Milkweed Specialist Insects of New England

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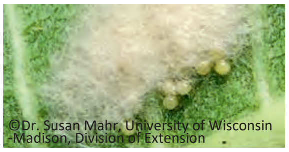
Gray boxes indicate milkweed species preference(s) and months when the species is mostly likely to be seen. All measurements are of total length (from tip of head to tip of abdomen).

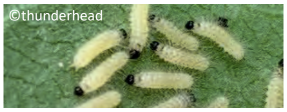
## Lepidoptera (Butterflies and Moths)

### Milkweed Tussock Moth
*Euchaetes egle*

Common Milkweed
*Jun-Oct*


©Dr. Susan Mahr, University of Wisconsin -Madison, Division of Extension

**Eggs** pale gray, laid under fuzzy white mass on underside of milk-weed leaf.


©thunderhead

**First instars** (first developmental stage) gray and hairy. ≤1 cm. Feed in large clusters on underside of milkweed leaves.


©Nash Turley

**Subsequent instars** with tufts of black, orange, and white. ≤3.5 cm. Consume milkweed leaves.


©Cotinis

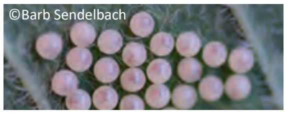
**Pupae** overwinter on the ground in cocoons made with hairs from body. ~1.5 cm.


©Diane P. Brooks

**Adults** grayish wings; hairy, yellow abdomens with black dots. ~2 cm.

### Delicate Cycnia Moth
*Cycnia tenera*

Multiple Milkweed Species
*Jun-Sep*


©Barb Sendelbach

**Eggs** white to light purple, laid in batches of 50-100 on milkweed stems and leaves.


©Barb Sendelbach

**First instars** white to light purple and hairy. Feed in groups of 5-7 on dogbane and milkweed.


©David Cappaert

**Subsequent instars** soft, white to gray hairs. ≤3.5 cm. Consume dogbane and milkweed leaves.


©Alison Hunter

**Pupae** form grayish cocoons using hairs from body.


©Charles Brown

**Adults** white-gray wings and yellow-orange abdomen with black dots. Orange on leading edge of forewing extends almost to apex. ~2 cm.

### Monarch
*Danaus plexippus*

Common and Swamp Milkweed
*Jun-Oct*


©Keith Roragen

**Eggs** cream to light green in color and ovate with longitudinal ridges. ~1.2 mm. Typically laid singly on underside of young milkweed leaf.


©Annkatrin Rose

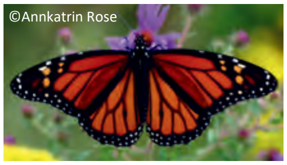
**First instars** have pale green to gray-white bodies with black heads. 2-6 mm. Consume milkweed leaves.


©Tuesdaymuesday

**Subsequent instars** have white, yellow, and black crosswise bands. ≤5 cm. Consume milkweed leaves.


©Susan Elliott

**Pupae** form pale-green chrysalis with gold and black rim around dorsal side near top. ~2.3 cm long. Typically leave host milkweed to pupate—can be found on any plant or structure.


©Annkatrin Rose

**Adults** orange with black veins and black borders with white spots. Wingspan is 7-10 cm.

Viceroy similar but with horizontal black stripe across hindwings.

### Unexpected Cycnia Moth*
*Cycnia collaris*

Butterfly and Whorled Milkweed, especially
*May-Sep*

**Eggs** (not shown) similar to *C. tenera*.


©Ken Potter

**First instars** hairy and orange. ~1 cm. Consume milkweed leaves.


©Claire O'Neill

**Subsequent instars** orange with light gray to dark brown tufts. ≤3.5 cm. Consume milkweed leaves.

**Pupae** (not shown) form cocoons on ground using hairs from body.

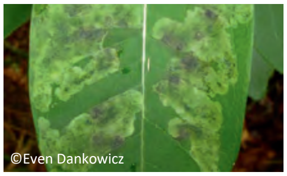

©Chrissy McClarren and Andy Reago

**Adults** white-gray wings and yellow-orange abdomen with black dots. Orange on leading edge of forewing only extends halfway to apex (unlike similar *C. tenera*). ~2 cm.

## Diptera (Flies)

### Milkweed Leaf-miner Fly
*Liriomyza asclepiadis*

Common Milkweed
*Jun-Oct*


©Even Dankowicz

**Larvae** feed between layers of milkweed leaf leaving light green to dark brown scar paths. Only fly known to consume milkweed.

**Adults** rarely seen.

*Rare within New England

# Hemiptera (True Bugs)

## Large Milkweed Bug
*Oncopeltus fasciatus*

Common Milkweed
*Jun-Nov*



**Eggs** (not shown) light yellow turning to red, laid in crevices between milkweed seed pods or within pods.

**Larvae** orange with black legs and wing covers. 5-10 mm. Consume milkweed seeds.

**Adults** orange-red with a thick black bar. 13-18 mm. Consume milkweed seeds, young leaves, flowers, and pods.

## Small Milkweed Bug
*Lygaeus kalmii*

Multiple Milkweed species
*Mar-Nov*



**Eggs** (not shown) light yellow turning to red, laid in crevices between milkweed seed pods or within pods.

**Larvae** similar to *O. fasciatus* but with two diagonal black markings on pronotum. 5-8 mm.

**Adults** black with red X-shape on wings and thin white wing margins. 10-12 mm. Consume insects, nectar, and milkweed pods and leaves.

## Oleander Aphid
*Aphis nerii*

Common Milkweed, especially
*Jun-Nov*


Bright yellow-orange. ~2 mm. Large clusters consume milkweed sap and are tended to by ants which protect the aphids and consume the honeydew produced by the aphids in return.

## Dogwood-milkweed Aphid*
*Aphis asclepiadis*

Common Milkweed, especially
*Jun-Nov*


Greenish-brown/gray. ~2 mm. Large clusters consume milkweed sap and are tended to by ants which protect the aphids and consume the honeydew produced by the aphids in return.

# Coleoptera (Beetles)

## Swamp Milkweed Leaf Beetle
*Labidomera clivicollis*

Swamp, but also Common Milkweed
*May-Oct*




**Eggs** orange and oblong, laid on underside of milkweed leaves in batches of 30-60.

**Larvae** pale and rounded. ~3 mm. Consume milkweed leaves.

**Pupae** (not shown) metamorphose on ground.

**Adults** rounded; dark orange to yellow with highly variable black pattern; black head and pronotum. ~1 cm. Mate on/around milkweed. Overwinter in leaf litter.

## Milkweed Stem Weevil
*Rhyssomatus lineaticollis*

Common Milkweed
*May-Sep*




**Eggs** laid in milkweed stem evidenced by a linear scar (pictured) that fills with latex and often turns black. In late summer, eggs may be laid in pods.

**Larvae** pale, ~12 mm. Complete development in stem while feeding on pith.

**Pupae** (not shown) metamorphose on ground.

**Adults** black and hard-bodied with longitudinal grooves in abdomen. Mouth parts form a snout (rostrum). ~5 mm. Initially feed on young milkweed leaves. Overwinter in soil.

## Red Milkweed Beetle
*Tetraopes tetrophthalmus*

Common, but also Swamp and Whorled Milkweed
*Jun-Aug*


**Eggs** (not shown) red, laid on milkweed stems or in soil.

**Larvae** (not shown) consume milkweed roots, bore into milkweed stems, overwinter in roots.

**Pupae** (not shown) metamorphose on ground.

**Adults** red with black spots. ~1 cm. Consume milkweed leaves, buds, and flowers.

## Blackened Milkweed Beetle*
*Tetraopes melanurus*

Butterfly Milkweed
*Jun-Aug*


**Eggs** (not shown) red, laid on milkweed stems or in soil.

**Larvae** (not shown) consume milkweed roots, bore into milkweed stems, and overwinter in roots.

**Pupae** (not shown) metamorphose on ground.

**Adults** red with large, black, heart-shaped spot. ~1 cm. Consume milkweed leaves, buds, and flowers.

*Rare within New England

Created by Abbie Castriotta—ECO AmeriCorps Member.
Funded in part by the Horne Family Foundation.

*Yolanda (Yoli) León with her first-ever handheld Bicknell's Thrush mist-netted and banded at Grupo Jaragua/VCE's Las Abejas forest restoration site inside Sierra de Bahoruco National Park.*

© CHRIS RIMMER

# Hope in Hand

## An update on VCE's partners in the Dominican Republic.

**BY CHRIS RIMMER**

> We can't help feeling that these birds, and so many other life forms in Bahoruco's exquisitely biodiverse forests, depend increasingly on the success of our efforts.

*January 28, 2022, 6:45 am*

As dawn emerges ever so slowly in the quiet, moist, broadleaf cloud forest at Las Abejas, Yolanda (Yoli) León and I silently unfurl a 12-meter nylon mist net on the narrow foot trail. A Rufous-throated Solitaire utters its quavering, dissonant song from the canopy above; another follows. Yoli and I work quickly—stealth and efficiency will be critical to lure a Bicknell's Thrush (BITH) into our net before full daylight arrives. Our quarry is a bird we heard uttering its nasal, penetrating calls at dusk, less than 12 hours ago, briefly announcing its presence in this remnant patch of intact forest. Yoli has yet to experience an essential rite of passage for any BITHnologist—holding and releasing a banded bird. I'm eager to provide her that tangible, meaningful connection to our shared conservation target.

Only a few hundred meters away from our net lies a landscape of degraded but now-abandoned agricultural parcels; on one, a well-ordered patchwork of tiny "islands" of transplanted native broadleaf seedlings stretch their nascent branches and shoots skyward. Given root less than a year ago by Yoli and her colleagues at Grupo Jaragua, these young pioneers carry huge hopes for recovery of Sierra de Bahoruco's beleaguered cloud forests. With Jaragua's vigilant tending, control of invasive grasses, protection from fire, *and* a measure of good fortune, these seedlings will someday provide shade for overwintering BITH and song posts for solitaires. They are vanguards of an innovative habitat restoration model that Jaragua and VCE seek to apply across Bahoruco's deforested slopes.

Carefully concealing an iPod and tiny portable speaker on the forest floor by our net, Yoli and I swiftly retreat some 50 meters away. Within seconds, playback vocalizations elicit a response, as a BITH counter calls upslope. We listen intently as the bird, sensing a territorial intruder, calls vigorously and approaches the net. Suddenly, all is quiet. I dash to the net and find a BITH hanging in its lower trammel. Moments later, Yoli cradles her first-ever handheld BITH, this bird that has come to embody so much of her (and our) conservation focus in the DR. The moment is deeply poignant for both of us, actually moving Yoli to tears.

We slip metal band #2341-24173 on the bird's right tarsus, measure its wing and tail, age it as a yearling by retained juvenal wing coverts and sharply tapered tail, and release it. Watching the BITH disappear back into the dark, damp forest, we are each struck by the promise—and urgency—of our work. We can't help feeling that these birds, and so many other life forms in Bahoruco's exquisitely biodiverse forests, depend increasingly on the success of our efforts. As VCE looks to help Jaragua acquire additional properties like Las Abejas and restore their degraded habitats, we envision future swaths of conserved and connected cloud forests covering the landscape. It is a vision that inspires and compels us forward. FN

# FIELD NOTES

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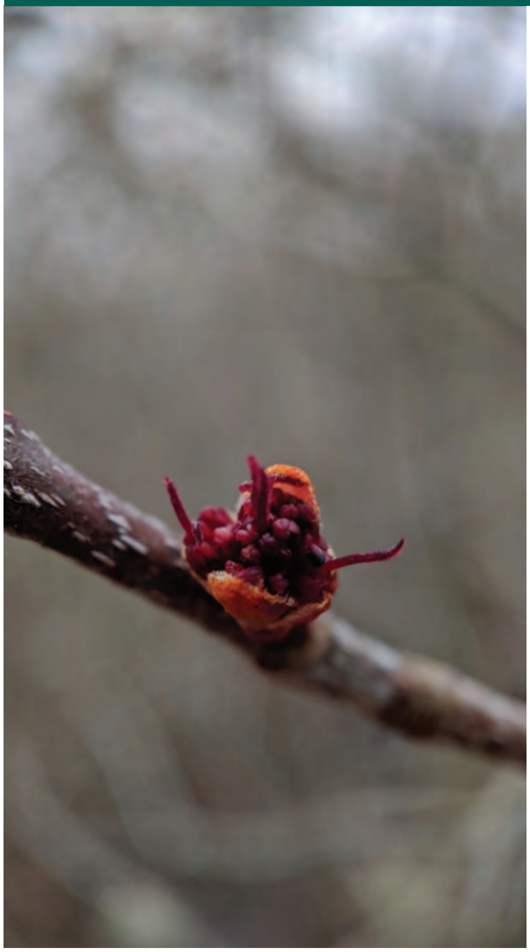
## Red Maple {*Acer rubrum*}



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### A widespread harbinger of spring

BY RYAN REBOZO

As the days lengthen and spring draws closer, plants throughout Vermont are emerging from winter dormancy. One hard-to-miss seasonal sign is the early and prolific flowers blooming on Red Maple trees. While Red Maple's smooth gray bark and scarlet twigs make it easy to identify in winter, this species really starts to stand out when it flowers. Its early-season blossoms are a welcome sight for many spring insect visitors, including several bee species. Some of its floral characteristics, such as exposed anthers and stigmas and abundant, loose pollen grains, indicate an anemophilous, or wind-pollinated condition; however, some insects can effectively cross-pollinate this maple. Red Maple can be either monecious (flowers on an individual tree are all the same sex) or dioecious (individual trees support both male and female flowers). Although exhibiting both traits is not uncommon in the plant world, knowing that both are possible is vital for accurately identifying this species. Later in the spring, Red Maple leaves, which emerge after flowering, support many moth and butterfly caterpillar species. Meanwhile, its seeds (called samaras) become an essential food source for granivores such as squirrels.

Red Maple is one of the most widely distributed tree species in the eastern US. Here in Vermont, it occurs in all 14 counties, and it comprises a major component of seven of the state's 97 natural communities. Its ubiquity in the Green Mountain state is partly due to its tolerance of a wide array of ecological conditions and its ability to colonize open sites readily. This species is generally more shade tolerant and longer-lived than many other early successional species, such as cherries and poplars, allowing it to persist in previously disturbed sites as they transition into later seral stages. Because of these attributes, Red Maple often responds positively when neighboring trees succumb to disease (American Chestnuts and elms) or are selectively logged (Atlantic White Cedar).

Thanks in part to Red Maple's shade tolerance, seed dispersal, seedling establishment, and ability to thrive in a range of ecological settings, the US Forest Service ranks it as the most adaptable tree species in their climate change models. Over the next few decades, scientists will evaluate the prediction that Red Maple will grow increasingly dominant on Vermont's landscape as climate change and other human-made stressors disrupt existing plant communities. In the meantime, keep an eye out for this ubiquitous tree's distinctive crimson flowers as spring unfolds. FN