

# Field Notes

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

## Why Bicknell's Thrush?

**How one elusive bird united biologists across borders**

| BY ALDEN WICKER

**I** suppose you could say I have a love-hate relationship with this bird."

Chris Rimmer, a co-founder and director emeritus of the Vermont Center for Ecostudies, says this as he sits on the front porch of his Vermont home, a five-minute drive from VCE's White River Junction offices. He has the relaxed bearing of a retired mountaineer: fit and weathered. And in some sense, he is just that.

If you're new to our community, you might not know that Rimmer's career has been wrapped around a little brown bird that spends its summers hiding out near the top of the Northeast's highest peaks.

"It's one of the most difficult song-birds that anyone could attempt to study," Rimmer explains. "It's on these mountaintops that are hard to get to. The weather can be harsh. The black-flies can be horrendous. The habitat is virtually impenetrable. The thickets of fir and spruce are often wet. We've had snow in June up there."

Aside from its mountaintop fortress of a home, the bird itself isn't showy. "It's about as drab as a bird can get. It's got no colors on it except

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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.

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### VCE VIEW



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Last month I reconnected with a colleague from years ago—a geologist—who mentioned that he uses iNaturalist in the university classes he teaches. “We contribute a lot of observations,” he said. “Who knows if they’re really of use to anyone?”

So let’s trace the journey of a single bee observation submitted to the platform.

This observation was made in Vermont, so it was automatically added to the Vermont Atlas of Life (VAL) iNaturalist project, which captures all observations within the state’s boundaries. The observer wasn’t sure what kind of bee it was, so she used the program’s suggestion that it was a “Mining Bee (genus *Andrena*)” and clicked “Submit.”

Though bees can be tricky to identify by nonexperts, about 60% of Vermont bee species are identifiable from clear photographs of live bees. VCE biologist Spencer Hardy regularly reviews bee observations in iNaturalist, and from the photo, he determined the specimen to be a Hawthorn Miner (*Andrena crataegi*). Another biologist confirmed, and the observation joined Spencer’s statewide database of some 24,270 research-grade bee observations on iNaturalist, amassed over several years.

VCE Data Scientist Mike Hallworth developed a method to combine this iNaturalist dataset with bee data from other sources into a single analysis. This doubled the dataset to more than 50,000 records, enabling Mike and Spencer to determine each species’ rarity in Vermont, model

species distributions based on host plants and other habitat factors, identify Important Bee Areas around the state, apply climate change scenarios to the models to predict how geographic ranges might shift, and assign state conservation rankings.

VCE’s State of Vermont’s Wild Bees report (available on our website) documents these findings. Spencer’s peer-reviewed catalogue of 352 Wild Bees found in Vermont (up from 98 listed species from the last 1962 effort) will be published this fall in *Northeastern Naturalist*. It includes a supplement that summarizes all the available data records for each species, including this observation of the Hawthorn Miner.

From there, our bee observation left VCE global headquarters in White River Junction and traveled on. The bee dataset was shared to the Global Biodiversity Information Facility and on the VAL data portal, where it has so far been downloaded thousands of times and cited in dozens of scientific publications.

Several organizations joined forces with VCE and UVM’s Bee Lab to form the Vermont Pollinator Working Group, which set to work educating farmers about which bees are critical to which crops and how to protect them. The group’s crowning achievement was educating the Vermont Legislature on the effects of neonicotinoid pesticides on bees, setting the stage for passage of tight restrictions in 2024. The bill’s language cited VCE’s State of Vermont Bees report.

Word spread to other states about the State of Vermont Wild Bees project. Colleagues from Texas, Washington, University of California-Riverside, and the Xerces Society wrote a \$1 million grant to replicate VCE’s methods at a national scale and invited VCE to help make it happen! That project is now underway.

So, if you’ve ever wondered what happens when you snap a photo and upload it to iNat, here’s an example. As you can see, we maximize the conservation power of every contribution you make.

Thank you for making it all possible!

Susan Hindinger  
EXECUTIVE DIRECTOR





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# Data without Borders

Powering global biodiversity science | BY KENT MCFARLAND

**R**enowned writer and naturalist Henry David Thoreau had no notion of climate change when each year he meticulously recorded the first day that wildflowers bloomed and trees leafed out near his cabin. But 150 years later, these data were instrumental for documenting the ecological impacts of a warmer world.

In the past, many scientists viewed the data that they collected as something belonging to them, sometimes guarding it zealously out of fear that they would be scooped by another

scientist or with a sense that the data reflected too much hard work to simply give away. The result was a significant loss of potential insights, simply because we can seldom anticipate how our data might be further used—now and in the future—if it were made accessible to others.

Since VCE's inception in 2007, we've recognized that sharing data is in everyone's best interest and have committed to archiving all of our scientific data on publicly available repositories for open access. The scope of

this undertaking is significant, as it takes time and funding, as well as a substantial shift in how we as scientists think about our work. We believe that the benefits of open scientific data outweigh the costs, and we are proud to be at the vanguard.

The concept of sharing data isn't completely new, but it was impeded for decades by a lack of not only infrastructure, such as hardware, software, networks, and processes, but also common standards. For example, the World Wide Web (which you know as the www at the beginning of website URLs) was conceived as a way to share scientific data through a shared system with a universal protocol.

Today, infrastructure and standards have come a long way, interconnected through the web and now shared under the principles of FAIR data. First proposed by a group of scientists in a 2016 article in the journal *Scientific Data*, FAIR stands for Findable, Accessible, Interoperable, and Reusable. It is now widely accepted.

The Global Biodiversity Information Facility (GBIF), an international network and research infrastructure funded by the world's governments, is a large part of this open-data culture. It aims to provide anyone anywhere open access to data about all types of life on Earth. The GBIF network brings all these data sources together through the use of biodiversity data standards that each provider follows.

VCE's Vermont Atlas of Life has been a GBIF biodiversity data publisher since 2018. Publishers like us provide open access to datasets using machine-readable Creative Commons license designations, allowing scientists, researchers, and others to apply the data in thousands of peer-reviewed publications and policy papers each year.

With each new dataset, I ask myself how our data collected today might be used far into the future. But even today's analyses—which cover topics from the impacts of climate change and the spread of invasive and alien pests to priorities for conservation and protected areas, food security, and human health—would not be possible without this worldwide collaborative effort. **FN**





# Hispaniola in Flight



© JIM GOETZ

**Birding from the ground up, between mountains and mangroves of the Dominican Republic**

| BY JIM GOETZ

**A**s a conservation scientist focused on birds and their habitats, I've worked and sometimes lived on Hispaniola—the island that the Dominican Republic and Haiti share—since the mid-1990s. Accompanied by local colleagues who have taught me much, I've crisscrossed the island, hiking and birding all kinds of forests: dry scrub, wet, cloud, pine, mangrove, and everything in between. Every step of the way I find reasons to skip the rum drinks and tourist beaches, and explore the rest of the island.

What makes Hispaniola so enticing? The surprising interaction of diverse geology and diverse ecology, for one. Diversity begets diversity. (I'll save the island's equally fascinating history and culture for another day.)

Working from the ground up, plate tectonics are the first-order force, driving diversity through the slow-motion smashup of three smaller islands that today form Hispaniola. Layer upon layer of wrinkled, folded bedrock creates a landscape resembling a crumpled piece of paper, with endless peaks and valleys. Sprinkle in sea-level changes repeatedly separating and reconnecting the islands over eons, and we have the main ingredients of the evolutionary recipe for a biodiversity hot spot.

The D.R.'s biodiversity features hundreds of endemic species—ones you'll find nowhere else on the planet—among them orchids, iguanas, frogs, ferns, and (happily for us) 33 extraordinary bird species.



To take in all this diversity, I like to start by birding from the ground up. Are we standing on granite or limestone bedrock? The former has cool rushing rivers and waterthrushes; the latter has caves and White-collared Swifts. In the cool pines we find crossbills, elaenias, and siskins; in the cloud forest, parrots, parakeets, and quail-doves. In coffee and cacao, look for migrant warblers and Red-legged Thrushes (but not Bicknell's). In the coastal wetlands, it's ducks, egrets, and sandpipers.

To bird from the ground up, quite literally, we can start at the island's lowest point, Lago Enriqueillo, a hypersaline lake 150 feet below sea level. Arriving at dawn, the heat is already intense. A tiny lowland bird sings incessantly atop the tallest tree. Grab your binoculars to see the world's second-smallest bird—with a body smaller than the tip of your little finger—the endemic Vervain Hummingbird. Only Cuba's Bee Hummingbird is smaller. As the sun rises, sharp images of cactus, crocodiles, flamingos, and endemic Palm Crows melt and merge in the shimmering heat.



© JIM GOETZ



© JIM GOETZ

The D.R. has dozens of endemic species—ones you'll find nowhere else on the planet.

As we head to the cool mountaintop cloud forests of Sierra de Bahoruco to escape the heat, we stop to watch a Hispaniolan Lizard-Cuckoo methodically search a tree branch by branch and masterfully snatch up a lizard with its long thin bill. In the dry scrub forest of the foothills, we hear the rhythmic calls of what look like neon-green ping-pong balls with bright orange bills. They're lowland Broad-billed Todies, a distant relative of kingfishers. Instead of fishing, they deftly catch insects on the wing. When we hear a nearly identical bird call *chi-qui...chi-qui*, we have found its highland cousin, the Narrow-billed Tody, and are already above 2,000 feet.

When we reach Zapotén at 5,000 feet in late afternoon, clouds bathe the evergreen forest. In this and nearby montane broadleaf forests, VCE has conducted extensive Bicknell's Thrush research and conservation work. Alongside Bicknell's, we find endemic warblers, chat-tanagers, and trogons. As night falls, the haunting song of the La Selle Thrush rises to fill the air.

Only in this habitat, only on this island.

This winter I'll return to the island to work with Grupo Jaragua, VCE's longtime local partner, to install Motus stations: radio receivers for tracking Bicknell's Thrush and other migrant birds that we and others have tagged. I'll also visit our research site at Reserva Privada el Zorzal, a 1,019-acre private forest reserve in the North.

Twenty years of close collaboration between the reserve's caretakers and local landholders have transformed degraded pastures and eroded hillsides into a productive cacao plantation, a lush forest, and a refuge for dozens of bird species, including Bicknell's Thrush. Now Reserva Privada el Zorzal produces a remarkable trifecta: exquisite chocolate, great bird habitat, and a model for linking productive livelihoods and forest restoration that really works. **FN**



Greater Antillean Elaenia (*Elaenia fallax*)

Top: Vervain Hummingbird (*Mellisuga minima*) and its nest.





Merck Forest vernal pool field trip

# Filling the Gaps in Amphibian Protection

| BY EMILY ANDERSON

**Mapping programs like the Vernal Pool Atlas provide valuable tools for decision-makers, conservation professionals, and landowners to use when protecting species and managing land.**

**T**he view out your window may be frosty, but spring is closer than you think—literally. In the woods and ponds near your home, the amphibian heralds of spring are overwintering—all waiting to emerge and trek to their vernal pool breeding grounds.

Despite their ecological importance, these temporary wetlands have lacked robust federal protections. “Fortunately, vernal pools are pretty well conserved at the local level,” explains VCE Staff Biologist Kevin Tolan.

Vernal pool regulations are just one example of how state policies and local protections fill gaps left by weakened federal rules. In Vermont, vernal pools are considered Class II wetlands under the Vermont Wetland Rules, which means a permit is needed for any activity within 50 feet that isn’t an “allowed use.” To get a permit, the applicant must determine

whether the pool supports the reproduction of uncommon pool-breeding amphibians (such as Blue-spotted and Jefferson Salamanders) and assess how the project may affect habitat quality.

Other newer state laws seek to address a threat that lurks beyond the pool’s edge. “My biggest concern is landscape fragmentation and how that impacts population dynamics,” says Tolan. “Because frogs and salamanders migrate to vernal pools to breed, the gene flow among pools can be reduced by road development and other land-use changes that limit their movement.”

Recently passed Vermont laws—such as the Act 250 reform (Act 181) and the 30 x 30 bill (Act 59)—encourage prioritization of actions that will minimize fragmentation and hopefully preserve the landscape connectivity that amphibians rely on.



**“Without having all vernal pools mapped, it’s difficult to tell exactly what we might be at risk of losing.”**

— KEVIN TOLAN, VCE STAFF BIOLOGIST

Over the coming decades, altered weather patterns resulting from climate change are likely to disrupt the normal rhythms of vernal pools, potentially changing their regulatory needs. Earlier pool drying is of particular concern because it’s a death sentence for any water-bound amphibian larvae.

In the past few years, Tolan has begun tracking Wood Frog chorus periods and vernal pool temperatures through our Vernal Pool Monitoring Program (VPMon) to determine how frog activity and pool drying may be shifting. You can read more insights from five years of VPMon in Tolan’s 2025 report. ([vtecostudies.org/vpmon-report](https://vtecostudies.org/vpmon-report))

Within the next year, Tolan also plans to embark on a new VPMon project: updating 2009 vernal pool maps with newer spatial data. “Without having all vernal pools mapped, it’s difficult to tell exactly what we might be at risk of losing,” Tolan says. Mapping programs like this one and the Vernal Pool Atlas provide valuable tools for decision-makers, conservation professionals, and landowners to use when protecting species and managing land.

Even with the rollback of federal protections, data still matter, especially at state and local levels. Thanks to VPMon and other research programs, VCE is able to contribute to evidence-based decision-making in Vermont and beyond, which helps ensure strong species and habitat protections.

If you’re feeling down about the state of the world, there’s no better way to brighten your spirits than traipsing through springtime forests and scouting for amphibian eggs as a volunteer Vernal Pool Monitor. **FN**

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## How to Become an Ecologist

BY ISABELLA SODDU

Halfway through the summer, I found myself near the top of Mount Mansfield. It was 5 a.m., the sun was just beginning to rise over the mountain ridges, and the damp morning fog was clinging to my clothes. We sat in the parking lot, aspiring and practicing biologists curved like Cs over mugs of coffee as we waited out the fifteen minutes before our next mist-net check. In that quiet pause, I couldn’t help but marvel over how lucky I was to be paid for an experience like this.

This summer, I had the honor of serving as the Alexander Dickey Intern at VCE. Dickey was a young naturalist whose life was defined by curiosity, humility, and a profound love of the natural world. His story and reverent approach to ecological stewardship felt kindred to my own, and it was what initially inspired me to apply.

But even with our shared outlook on the natural world, my acceptance to this position initially felt more like a mistake than kismet. Of everyone I knew who deserved such a special opportunity, I felt the least qualified. I was bogged down by a limiting definition of success: x number of lab hours, y amount of fieldwork, z number of connections. Riddled with LinkedIn envy, I had done nearly zero fieldwork. And coming from New York City (where I helped rehabilitate pigeons, mainly), it felt like everyone else had an 18-year

head start with outdoor experience.

But if my time at VCE has taught me anything, it is that being a good ecologist goes far beyond networking and experience. Two very simple ingredients go a long way in this type of work: passion and curiosity.

A genuine love of the natural world permeated every experience I had this summer, from loon monitoring to bird banding to weeding in experimental garden plots. Meeting people who love their work sprinkled magic onto whatever I was doing, no matter how mundane. I saw it in Eric Hanson, who, even after decades, still speaks about loons like they’re friends he never tires of visiting. I saw it in Desirée Narango, crouched in the dirt with us, her face lit up at the sight of an unusual beetle we’d found while weeding. Joy made everything feel purposeful.

Even better, no one batted an eye when I struggled to set up a tent or when I fell behind on a hike. Instead, I was encouraged, guided, and treated like I belonged. That sense of acceptance let me dig deep into the work I was doing rather than shrink away from it.

VCE was exactly what I needed to start my career: a soft place to land and a space to give shape and purpose to my interests. I started falling in love with unexpected things. I became interested in insect identification, staring at tiny details that once seemed invisible. I learned to read landscapes more carefully: the quiet pocket of shoreline where a loon might hide, vegetation along a trail that made a perfect place for a mist net, the subtle signs of a bee hotel already occupied. More than anything, I learned the art of noticing ... and how much life there is to pay attention to, if only you slow down.

One day, I sent my mom a photo of me holding a freshly banded bird. She texted back: “That’s the face of someone who’s found what they love to do.” I hadn’t realized it until then, but she was right. Somewhere during this summer, I’d stopped feeling like an imposter and began to feel like a real ecologist. **FN**

somber grayish brown and white. It's reclusive, enigmatic, hard to get to know," he continues. "It's a crepuscular species—the hours in which it's most active are dawn and dusk." That means biologists who want to study it are awake from as early as 3 a.m. to at least 9 p.m.

"I should have studied robins," Rimmer says. "I would have learned a lot more, had a much bigger sample size, and many fewer gray hairs."

But he doesn't mean that. There's a reason people scale mountains: to satisfy their curiosity about what's up there, to prove to themselves they can, to get a view across hundreds of miles of varying ecosystems and plot a safe path across them, to lift themselves out of the every day and experience awe. In that sense, Bicknell's Thrush (birder shorthand: BITH) delivers for Rimmer and the many birders and biologists who have come to both respect this bird and fight to protect its habitats in the northern mountains and cloud forests of the Caribbean.

## What's Up with This Bird?

In 1992, Rimmer was a songbird specialist working at Vermont Institute of Natural Science (VINS) when he attended an annual meeting of the American Ornithologists Union (now the American Ornithological Society) in Montreal. A Canadian zoogeographer named Henri Ouellet presented a paper exploring whether Bicknell's Thrush, which had been categorized as a subspecies of Gray-cheeked Thrush, should be classified as a distinct species.

Discovered by amateur ornithologist Eugene Bicknell in the Catskills in June 1881, Bicknell's Thrush looks so similar to Gray-cheeked that if you see them during migration, "you can not reliably tell them apart," Rimmer says. But Ouellet noted that their ranges were completely nonoverlapping, both where they breed and overwinter. "He looked at museum specimens. He went out in the field and recorded their songs and played them back to each other, finally

looked at their DNA, and concluded it was a separate species."

Rimmer was intrigued. BITH bred nearby in the Green and White Mountains, but "We didn't know anything about this bird: how many there were, where they occurred on the landscape... we certainly didn't know how they were doing."

Meanwhile, these rare mountain-top ecosystems that this little brown bird relies on— islandlike habitats of spruce-fir forest above 3,000 feet in the Catskills, Adirondacks, Green Mountains, and White Mountains—were getting doused with acid precipitation and mercury pollution as developers were trying to expand ski resorts and site wind turbines.

Their wintering range is confined to four islands in the Caribbean, where they inhabit broadleaf forest from sea level to the highest mountains, with most of the birds living in the Dominican Republic. Their sea-level habitats "have been hammered," Rimmer says, lost and degraded to development and agriculture.

He decided: "We gotta figure out what's up with this bird."

Rimmer and his colleagues scoured the literature to come up with 73 mountain peaks where Bicknell's Thrush had historically been documented. They then invited community scientists to perform hiking surveys in June during 1992 and 1993 on more than 300 different peaks to see if the species was there, equipping the volunteers with playback (BITH song tapes and speakers) to tease them out of hiding.

The Bicknell's song is thrushlike, but not melodious. "You can't put words to it," says Rimmer, who calls it "magnificent. It fits the setting. It's a descending, spiraling, rich—but not complex—song. It goes down the scale and up at the end. It's a little bit dissonant." During courtship and nesting season, BITH also vocalizes with a call that sounds like "BEER! BEER!"

"I did some surveys myself, but we

could have never done what we did without community scientists," Rimmer says. Together they found Bicknell's Thrush on 63 of the 73 peaks where it had been historically found, which was encouraging. Surveying by ear didn't tell them how many birds each peak had, but at least the birds were still there.

Rimmer and his team then established a study site on Mount Mansfield to study the bird's breeding ecology before expanding to Stratton for an annual eight-week period of intensive study on each peak. Many young biologists and ornithologists, including VCE Associate Director Dan Lambert and Caribbean Conservation Coordinator Jim Goetz, got their start on those mountaintops, bonding over the grueling work. "It was so so hard, getting up at three in the morning, getting yourself beat up all day, and coming in at night exhausted," Rimmer says. "But we would have a beer, tell stories, laugh, go to bed, get four hours of sleep, and get up and do it again."

They captured and tagged birds, color-banding them so they could track individuals, and placing lightweight backpacks with radiotelemetry tags to monitor their activities on the mountains and in the D.R. Later, they added GPS tags to track their precise movements during migration.

There are few reasons to get up to see the sunrise on New England's highest peaks day after day. BITH provided one that has endured for more than 30 years. "There are times it's truly magical," Rimmer says. "You're up there, clouds are sweeping across the mountaintop, dawn is coming, and there is birdsong all around you." During courtship at dusk, the male BITHs will put on a moving show, tracing big circles 50 to 100 feet up in the sky as they sing.

## A Bird Flaps Its Wings...

Rimmer calls VCE co-founder Kent McFarland "my absolute co-pilot in the early years of this work." The year they broke away from VINS to found



VCE, they established the International Bicknell's Thrush Conservation Group (IBTCG), which included partners from the Dominican Republic, Canada, American government agencies, and academia. They quickly established an action plan for Bicknell's Thrush conservation. The goal was to increase the population of BITH by 50% by 2060 and not suffer any net loss of its breeding range. The action plan has been through a revision, and Goetz, who is now IBTCG's head, is working on a second revision.

The conservation inspired by Bicknell's Thrush has benefited many other species that also rely on high-elevation habitats. Data collected by Mountain Birdwatch, a VCE monitoring program for ten montane songbirds that grew out of the BITH study, has led to the delineation of Bird Conservation Areas in the Adirondacks and Catskills, and spurred conservation of important properties in Vermont, New Hampshire, and Maine. Other North American wildlife that have benefited from BITH-focused conservation include Canada Lynx, Northern Spring Salamanders, American Three-toed Woodpeckers, Blackpoll Warblers, Boreal Chickadees, Olive-sided Flycatchers, and Purple Finches.

Studying this bird also led Rimmer and his colleagues to the Caribbean, where they've worked with locals in Cuba and Hispaniola who have gone on to have careers in conservation and biology. While they've been studying Bicknell's Thrush, they've also monitored and built new knowledge of endemic birds that occur nowhere else but the cloud forests of Hispaniola. For example, they published the first nest descriptions for two Hispaniolan songbirds: the Western Chat-tanager and the Hispaniolan Highland-tanager. "We've created a lot more awareness. The locals really care about 'their' birds that are unique to the island," Rimmer says.

There is also now a private park in the D.R. because of Bicknell's Thrush: Reserva Privada Zorzal (*zorzal* means



© KENT MCFARLAND

**Studying Bicknell's Thrush has "shown me how compellingly linked events in the natural world are across space."**

— CHRIS RIMMER (above in Dominican Republic)

*thrush* in Spanish). It is the Dominican Republic's first private reserve. Because public reserves receive little protection in practice by the resource-poor Dominican government (for example, avocado plantations encroach with impunity in one key national park), IBTCG partnered with a young anthropologist and forester named Chuck Kerchner and a wealthy Dominican family to protect 1,019 acres. Seventy-five percent of those acres have been designated as forever wild and are being carefully restored to lush Bicknell's Thrush habitat, while the rest have been turned over to sustainable, bird-friendly cacao farming.

One local ornithologist, Hodali Almonte, did her master's research on Reserva Zorzal and found that the population of BITH in the reserve has increased in the past seven years.

Studying Bicknell's Thrush has "shown me how compellingly linked events in the natural world are across space, in particular for a migratory animal," Rimmer says.

For him, it was never just about the bird. "I love the bird, and love being in these beautiful, wild places. But conser-

vation is ultimately about people and changing their behavior in ways that will benefit the natural world. That's really been one of the most fulfilling parts of the work for me—just being on Mount Mansfield and having groups of visitors come by the banding station, showing little kids a bird in the hand and letting them release one."

Now Bicknell's Thrush faces the metathreat: climate change. As the world warms, the conifers necessary for Bicknell's Thrush reproduction are expected to retreat up the mountain, shrinking these islands of habitat until some disappear. Rimmer worries that in 100 years, only the highest, most northern mountain peaks will still hear the song of this rare little brown bird.

"Inaction is not an option or it will go extinct. It might anyway," he says.

McFarland's research interests eventually diverged to focus on butterflies and other pollinators, which requires that he only go out with a net on beautiful, sunny days. But a new BITH team is now camping at the top of Mount Mansfield each summer and then traveling to the D.R. Principal Investigator Desirée Narango, along with Mike Hallworth and Goetz, are building on the foundational work from Rimmer, McFarland, and others to fill in some of the gaps in our understanding of Bicknell's Thrush. They're using tracking technology to illuminate the movement ecology of female thrushes in hopes of identifying where in the annual cycle they're not surviving, determining diet and prey selection during the breeding and wintering seasons, and piloting the first study of habitat selection during migratory stopover in the Mid-Atlantic.

That Bicknell's Thrush demands such sacrifice, commitment, and, increasingly, faith may be the reason it has changed the lives of so many people, and along the way improved the prospects of other vulnerable species with which it shares the forest at both ends of its migratory range. **FN**



Bernie Paquette photographing insects, a practice he refers to as “inverting”



© CHUCK LACY

## Bernie Paquette

**Contributing to invertebrate research from his backyard**

BY ALDEN WICKER

**Paquette has become the top bee observer in the world by number of iNat observations—more than 12,000.**

VCE bee biologist Spencer Hardy first met Bernie Paquette at the 2019 Jericho-Underhill Christmas Bird Count. Paquette had long since retired from his career at IBM in Essex Junction, but had only recently caught the naturalist bug at a 2016 walk hosted by Alicia Daniel, a University of Vermont instructor and director of the Vermont Master Naturalist Program.

Soon after, Hardy noticed that his neighbor (Bernie lives about two miles away) was uploading an astounding number of bee observations to iNaturalist, where he goes by BugEyedBernie.

Since those humble beginnings, Paquette has become the top bee observ-

er in the world by number of iNat observations—more than 12,000, with 6,800 of them high-quality-enough photos to be research grade. He’s also contributed to every invertebrate-related community science project at VCE, including Pollinator Interactions on Plants led by VCE biologist Desirée Narango and the Vermont Bee Checklist compiled by Hardy with his colleagues Kent McFarland and John Ascher.

“He found the first state record of the Mock-orange Scissor Bee which wasn’t even really on my radar,” Hardy says. “And it showed up in his yard.”

We’re not the first to publicly note Paquette’s devotion to the fascinating



Stripe-legged  
Robber Fly  
(*Dioctria  
hyalipennis*)  
eating its prey



world of invertebrates. The Vermont publication *Seven Days* profiled him in June of this year, noting he spends up to eight hours a day photographing butterflies, flies, moths, wasps, bees, caterpillars, and more with his standard digital camera and macro lens.

“Because he puts so much time and also care into taking high-quality photographs for documentation, he’s increased our observations for a lot of uncommon and rare species that we don’t have a lot of data for,” says Narango.

Paquette keeps a blog at vtbugeyed.blogspot.com where he shares his astoundingly detailed macrophotography of insects, from solitary bees digging ground nests to an Asian Lady Beetle chowing down on aphids. He calls the world of insects “the Greatest Show on Earth—an immense world of small, extraordinary wonders. And the best part? The show takes place as close as our backyards.”

At the regional level, Paquette’s observations have significantly expanded knowledge of invertebrate phenology (a species’ seasonal timing) and made it possible to model the northeastern distribution of Vermont’s more rare insects. “I find seeking insects is like treasure hunting, and observing their behavior is like going on a wild safari,” he says.

Paquette also encourages others to contribute observations to iNaturalist. In 2022, he ran a nature photo contest in Jericho, receiving 566 entries. He’s organized native plant sales and, with other volunteers, facilitates monthly, family-friendly nature walks around Jericho.

His partner Maeve Kim leads birding classes and walks, and posts on their Vermont Birds and Words blog, while Paquette offers bug safaris to anyone interested in seeing what is on their own property. He calls going out looking for bugs “inverting.”

Though relatively new to the world of invertebrate biology, Bernie Paquette’s contribution to our science and enthusiastic promotion of all things insects has earned him this year’s Julie Nicholson Community Science Award.

“I believe that inverting will soon be the new birding,” Paquette wrote in an email accepting the award. “I hope to help lift this quiet, crawling, humming world into the public eye.” **FN**

*The Julie Nicholson Community Science Award honors Julie Nicholson’s extraordinary passion and commitment to birds and wildlife conservation through her many years of tireless work as a community scientist. It is presented annually to an individual who exemplifies Julie’s dedication to the cause of community science and conservation.*

## COMMUNITY SCIENCE OPPORTUNITIES



© ALDEN WICKER

### You don’t need a background in science to be a community scientist!

From backyards and bogs to mountains and meadows, you’ll find many ways to get involved and make a real contribution to wildlife conservation. If you’d rather not muck around a swamp or hike to a summit, you can still volunteer for VCE—even from the comfort of home.

### We hope you’ll join us!

#### iNaturalist Vermont

Volunteers share observations of all Vermont biodiversity in this digital project of the Vermont Atlas of Life.

[www.inaturalist.org/projects/vermont-atlas-of-life](http://www.inaturalist.org/projects/vermont-atlas-of-life)

#### Mountain Birdwatch

This summer we’re recruiting for survey routes on mountain ridgelines in Northern New Hampshire and Maine.

[vtecostudies.org/mbw](http://vtecostudies.org/mbw)

#### Second Vermont Butterfly Atlas

Join us as we search fields, mountains, meadows, and your own backyard for butterflies.

[vtecostudies.org/join-butterfly](http://vtecostudies.org/join-butterfly)

To learn more about volunteering with a VCE project, visit [vtecostudies.org/volunteer](http://vtecostudies.org/volunteer).



# FIELD NOTES

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## In the Field

From long-standing monitoring projects to new studies, VCE biologists are leading many major projects. Here are some highlights from the 2025 field season. | BY FIONA MACLEAN



© ALDEN WICKER

As lead on our Grassland Ambassadors Program and Eastern Meadowlark Conservation Project, Staff Biologist Kevin Tolan worked with 30 landowners to survey more than 600 acres of grassland this summer.



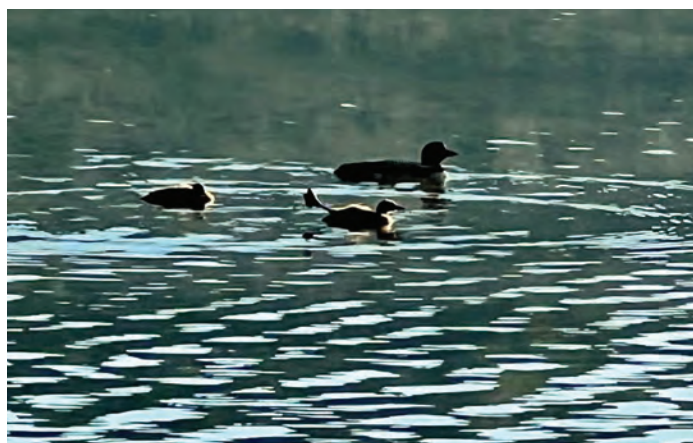
© KEVIN TOLAN

Tolan also manages our vernal pool conservation programs. This field season, the team documented fairy shrimp in six new vernal pools. In the process they discovered two species of fairy shrimp that are new to Vermont.



© CAMILLA PRICE

VCE Director of Conservation Science Ryan Rebozo and Staff Biologist Spencer Hardy are leading a new project exploring the ecology of wild bee populations on commercial farms, where VCE Seasonal Biologist Juno Stahl looks for bees among blueberry bushes. They aim to uncover which bees are supported by specific crops and noncrops and their level of exposure to pesticides.



© CHRISTINE CANO

A dedicated team of volunteers for the Vermont Loon Conservation Project, led by VCE Loon Biologists Eric Hanson and Eloise Girard, documented 92 successful nests and 137 hatched chicks (record highs). As of September 1, 103 chicks were still alive. 2025 was the first year a pair of Common Loons successfully hatched chicks on Shadow Lake in Glover, Vermont.