

VERMONT CENTER FOR ECOSTUDIES Uniting People and Science for Conservation

Hitting the Lottery

Studying Bicknell's Thrush in the Dominican Republic | by JIM GOETZ

The alarm shocks me out of a deep slumber. "Why do we do this?" I groan to no one in the darkness as I roll out of bed.

But this was at least half my own idea, and I know exactly why. We urgently need to figure out why Bicknell's Thrush populations have been decreasing at a rate of 4% per year and why we've lost half of the global population in the last 15 years. I quickly dress, and after a breakfast of perfectly ripe avocados smeared on crunchy sheets of cassava bread, we head out for the first field day of this training workshop.

In the last dark before dawn, a line of bobbing headlamps eases down the muddy slope, crosses the rushing arroyo, and ascends to our field site at Reserva Zorzal.

There are 13 of us—10 college biology students and three seasoned instructors. Despite the number 13's bad rap, I couldn't feel luckier. This is my dream job. When I came on staff in 2023 to coordinate VCE's Caribbean program, it was a

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Anna Peel shows students a Bicknell's Thrush that she just banded and fitted with a Motus transmitter.

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> ADMINISTRATIVE Mistie Boule Toni Luff

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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.

Field Notes is VCE's free biannual newsletter.

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



S omewhere on the coast of Venezuela, a Blackpoll Warbler is staging for its northbound migration. A Black-and-white Warbler, one of the first warblers to return to New England each spring, is foraging for insects among the leaves in a Colombian shade-grown coffee farm. And a Bicknell's Thrush, sporting a radio tag applied by the VCE team, is beginning to feel the restless urge to leave its winter home in the Dominican Republic. Soon they will wing their way north to nest in our part of the world.

Along the way, these birds will cross countless boundaries and political jurisdictions, and their fate as they traverse the hemisphere rests in many, many hands. For decades, VCE biologists and our colleagues have collaborated to advance full life-cycle conservation, working with international partners to collectively plan for and conserve the breeding areas, wintering grounds, and migratory stopovers these birds need to survive. We and our international partners share responsibility for conserving them.

As forces outside our organization urge Americans to close ourselves off to the world and abandon international partnerships, VCE's mission and values compel exactly the opposite.

This is consistent with our commitment to open science. Here are some of the ways open science manifests at VCE:

> Publishing open-access articles in scientific journals

VCE VIEW

> Engaging decision makers proactively so they understand and apply our science in their work

> Recovering, digitizing, and sharing biodiversity records from paper files and obsolete disks, making them freely available to all

Reaching new audiences to engage more people in biodiversity conservation as volunteers, co-creators of projects, and mentees

In the pages of this issue, you will read the latest dispatch from our decades of collaboration with colleagues in the Dominican Republic to tag and track Bicknell's Thrushes. Together, we use that research to inform the restoration of forests around a sustainable cacao farm and nature reserve. This project demonstrates the magic that happens when we collaborate over many years and across geographic boundaries, language barriers, political differences, and cultural priorities.

Still, local action matters. As the migrating birds find their way north, we make countless, seemingly trivial but ultimately critical decisions here at home. Choices we make on weekends in our backyards or woodlots determine what the warblers and thrushes find when they arrive on their breeding grounds. When I plant a tree, the type I choose determines whether the warblers land in an oak tree full of hundreds of caterpillars to feed their young or in a Norway maple whose avian grocery store is empty. When we manage a sugarbush, we can decide whether to clear the understory or to leave tangled shrubs and fallen deadwood where Black-and-white Warblers can nest. By planting native species, allowing our yards to be a bit messy, and avoiding pesticides (including plants seductively labeled "pest free"), we are choosing to support native pollinators and the food webs around them.

Our partners in the Caribbean and Central and South America will soon see off these migratory birds that we care about so deeply. There is much we can do to give them a safe place to land. And that includes opening our doors to collaboration with partners far and wide. Susan Hindinger EXECUTIVE DIRECTOR Our policy efforts have included support for listing Monarchs as threatened on the federal endangered species list.

Policy Conversations

Bringing our science to people in charge | BY EMILY ANDERSON



We believe that sharing science in ways that are engaging and accessible to people on the frontlines of policymaking has never been more critical. Those familiar with VCE's work know that our motto, "Uniting people and science for conservation," underpins all that we do. From collaborating with other conservation professionals on expansive projects to involving regular folks in hands-on science, we believe in creating networks of people who are passionate about biodiversity conservation.

Back in 2022, Director of Science Ryan Rebozo and I acted on this conviction to convene the Science to Policy Working Group as a way to contribute more actively to policy conversations in Vermont. This collaboration has helped us connect legislators with our experts and provide research-based testimony to inform their decisions. The initiative has also deepened relationships with other organizations interested in grounding environmental policy in ecological knowledge. The more we waded into this space, the more we realized how much these conversations—and our organization—would benefit from having a VCE staff member focused primarily on conveying our science to policymakers.

So I am thrilled to tell you that as of late 2024, I am now VCE's science to policy manager. While this means VCE is taking a more active role in conservation policy, it does not mean that we lobby for passage of specific legislation. Having a policy-focused communicator simply makes it easier to contribute expertise to statewide conversations that center on the management and protection of species and their habitats.

So far in this role, I have supported VCE Loon Biologist Eric Hanson's testimony on wake-boat regulations, presented findings from the Vermont Atlas of Life to the Vermont House Environment Committee, and submitted public comment on the proposal to list Monarchs as threatened on the federal endangered species list. I am also developing informational materials to help policymakers and community members better understand and advocate for our region's biodiversity.

KP MCFARLAND

In this tense and uncertain time, many of us are alarmed by reports of declining species and climate change impacts on flora and fauna. We believe that sharing science in ways that are engaging and accessible to people on the frontlines of policymaking has never been more critical. And it will only continue to grow in importance in the coming years.

I could not be more excited to lead this new phase of VCE's science to policy work. I look forward to providing updates on how we are introducing knowledge—knowledge that you have helped build—to people well positioned to act on it.

season.

to prepare for nesting

BY RACHEL MCKIMMY-WARF

Renovations of Loon Rafts mated Common Loon pair prefers As loon pairs return nest sites that are sheltered from to their lakes in May, wind and wave action, usually on an **VCE's Loon Project** island or in a marshy area, both of which biologists Eric Hanson also offer protection from shoreline and Eloise Girard lead predators. But some lakes lack natural teams of volunteers in a raft spring cleaning

Spring Cleaning and

nesting habitat. This could be the result of human development, like cottages and boat docks, or because of fluctuating water levels from managed dams.

Over the years, the Vermont Loon Project has constructed dozens of nesting rafts to help loon pairs breed. Now that the Common Loon population in Vermont is healthy and stable, we rarely build new nesting rafts. In fact, too many rafts can promote competition and combat among loons. Only if a loon

pair's nesting attempts have failed for three consecutive years will VCE consider deploying a raft.

We construct loon rafts using five cedar logs: two on the bottom and three across the top to form a rectangle. Then we affix rubber-coated steel mesh to the top and add mud, moss, leaves, and grass to fill out the mesh frame. This creates artificial ground shaped in a shallow bowl in which the loons can lay their eggs. Next, we plant shrubs, conifer saplings, grasses, and sedges around the edges of the raft to create physical and visual cover for the loons. We anchor the raft in place with cement blocks.

Most loon rafts are left in the water throughout the year. As loon pairs return

A Common Loon and its chick at a raft Top right: Loon Biologist

Eloise Girard checks on a loon raft in early spring.

Right: A loon egg in a raft nest

vtecostudies.org





to their lakes in May, project biologists Eric Hanson and Eloise Girard lead teams of volunteers in spring cleaning to prepare the rafts for nesting season. They check that cables holding the rafts in place aren't twisted; replant vegetation; replace grass, dirt, and moss material in the nest bowl; and add hardplastic floats if the raft is sinking.

By mid-May, loon rafts throughout the state should be ready for the loon couples to move in. Now that the Common Loon population in Vermont is healthy and stable, we very rarely build new nesting rafts. Make your legacy a future for wildlife CHARLES GANGA

with a gift in your will or estate.

Making your gift is simple. We'll be glad to help.

- Include VCE in your will or living trust.
- Name VCE a beneficiary of a retirement plan or life insurance policy.
- Offset capital gains with a gift of appreciated stock or real estate.

To learn more, contact Laura Prothero Director of Development lprothero@vtecostudies.org

802-649-1431 x 208

www.vtecostudies.org/give

A White-throated Sparrow perches on a Balsam Fir in the White Mountain National Forest in New Hampshire. Observed by @elliotdeans and uploaded to iNaturalist in August 2024.

Mountain Birdwatch Turns 25

Mountain Birdwatch makes it possible to detect long-term trends that might otherwise go unnoticed.

BY ALEX JOHNSON

In 2000, Vermont Institute of Natural Science biologists piloted a regional high-elevation bird-monitoring program in the Green Mountain State. Up until that point, just six ridgeline routes, each consisting of five survey stations, had been monitored by volunteers for the Vermont Forest Bird Monitoring Program. That year, support from the U.S. Fish and Wildlife Service enabled an expansion to 50 mountains.

This special new project was called Mountain Birdwatch. By the end of June 2001, the intrepid biologists (who would later go on to establish VCE) had set up 117 hand-selected routes in the Berkshires, Catskills, Adirondacks, and Green and White Mountains, where they and volunteers counted five focal bird species as well as red squirrels, an important nest predator.

The project's goals were to monitor changes in songbird populations and evaluate the role of landscape structure—specifically the composition and configuration of habitat patches—on Bicknell's Thrush abundance. In 2010, after volunteer observations had been used to model Bicknell's Thrush habitat and designate bird conservation areas, new routes were selected using a sophisticated, spatially balanced sampling regime. Mountain Birdwatch 2.0, as we like to call it, ushered in an era of more robust data collection and analysis, including five more focal species.

Since its inception, Mountain Birdwatch has filled a coverage gap left by the roadside North American Breeding Bird Survey, making it possible

SPOTLIGHT ON WHITE-THROATED SPARROW *THE STEEPEST DECLINING SPECIES MONITORED BY MOUNTAIN BIRDWATCH*



to detect long-term trends in remote mountain forests that might otherwise go unnoticed.

One bird we monitor is the White-throated Sparrow, which nests in northeastern mountain forests. While its populations fluctuate naturally from year to year, Mountain Birdwatch data show alarming declines over the last 15 years. Indeed, the population in the Catskills, at the southern edge of the species' breeding range, has declined by more than 90% since 2010. Although rates of decline are less pronounced farther north, they are significant and consistent with predictions of climate-induced range shifts.

Projects like Mountain Birdwatch wouldn't be possible without our dedicated community scientists, who literally climb mountains for VCE every year. If you are interested in volunteering, head over to mountainbirdwatch.org to learn more and adopt a route. We are currently looking to fill a dozen routes across the Northeast. You can also check out the full 2024 Mountain Birdwatch report online at mountainbirds.vtecostudies.org.



A Bittersweet Send-off

After 30 years, co-founder Steve Faccio leaves VCE.

BY CHRIS RIMMER

Steve's conservation legacy will almost certainly be defined by his cutting-edge work in vernal pool research. **B**ack in 1992, long before VCE was even a twinkle in anyone's eye, I hired a quiet and capable conservation biologist into the research department at the Vermont Institute of Natural Science (VINS). Steve Faccio was fresh off a master's degree at Southern Connecticut State University, where he studied the ecology of a reintroduced fisher population. He immediately proved his mettle—and versatility—at VINS. Now, more than 30 years later, I am privileged to give my fellow VCE co-founder a proper send-off into his retirement in June.

Few biologists can match Steve's breadth of field skills. He's climbed along precariously narrow cliff ledges to band Peregrine Falcon nestlings, meticulously censused breeding birds as leader of the Forest Bird Monitoring Program, coordinated Vermont's 23 North American Breeding Bird Survey routes, and investigated bird-friendly maple syrup practices.

But Steve's conservation legacy will almost certainly be defined by his cutting-edge work in vernal pool research. In 2000 he broke new ground with a project to implant tiny radio transmitters in Ambystoma salamanders, discovering that they overwinter in subterranean rodent tunnels. From 2015 to 2017, he documented methylmercury bioaccumulation in vernal pool-breeding Wood Frogs and Spotted Salamanders. He next launched the volunteer-driven Vermont Vernal Pool Monitoring Project, then created the Vernal Pool Atlas, an online database and map of pool locations for community scientists. From 2022 to 2024, he led the first-ever Vermont Fairy Shrimp Atlas, a community sciencebased inventory of these little-known and highly sensitive vernal pool invertebrates.

Steve's absence from the VCE lunch table will leave a noticeable void. Apart



from his wise, succinct insights, Steve's masterful quips and knack for pithy catchlines have lightened many a VCE meeting and endeared him to his colleagues. One epic Faccioism: During a planning session early in VCE's history, he coined our tagline "Uniting people and science for conservation."

Steve epitomizes our motto. While intrigued by research questions and inspired by fieldwork, Steve's focus has never wavered from applying his findings to guide conservation. His published salamander telemetry data led directly to the establishment of legally protected buffer zones around vernal pools. Location data and field verification methods from the Vermont Vernal Pool Atlas are used extensively by wetland biologists to ensure compliance with regulatory protections, and have inspired similar efforts in Canada and the Midwest.

Steve, you have contributed immensely to VCE's robust success. Thanks from all of us, and enjoy your richly deserved next chapter! "Uniting people and science for conservation." Steve epitomizes our motto.



COMMUNITY SCIENCE OPPORTUNITIES



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

Mountain Birdwatch

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

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

To learn more about volunteering with a VCE project, visit vtecostudies.org/volunteer.

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homecoming. I cut my teeth as a VCE field biologist from 1995 to 2000, working closely with Chris Rimmer and Kent Mc-Farland to unravel the mysteries of the Bicknell's breeding and winter ecology.

Now Mike Hallworth and Desirée Narango lead our research effort, and Anna Peel jumped in at the last minute to help catch birds on this trip so that Mike and I can focus on leading the workshop.

When we arrive at the field site, which is dense with trees and plants dripping with moisture, we split into three groups, each taking a different transect to survey for Bicknell's Thrush. One student records the birds we see and hear on the data sheet, one keeps time, and one has our audio-playback device at the ready. The 10-minute timer starts. I whisper the local names of the birds that I hear: Paloma Turca (Scaly-naped Pigeon), Candelita (White-winged Dove), Aliblanca (Hispaniolan Lizard-Cuckoo), Pajaro Bobo (Turquoise-browed Motmot or, literally translated, Silly Bird), Cuatro Ojos (Blackcrowned Palm Tanager), and Gallito Prieto (Greater Antillean Bullfinch).

It's easy to forget that just 15 years ago, before this area became a private reserve, where we stand was mostly cow pasture with scattered trees growing only in the deeper gullies. It's amazing how nature can bounce back if you just let it.

At the start of the third minute, a student plays the recording of Bicknell's Thrush calls. Almost immediately, a thrush responds from 50 yards away, and we stop the playback. It's the first Bick that they've ever heard. As the thrush continues calling, a second one chimes in from a different direction. Then a third.

We stand silently, smiling at each other, and peer through the dense forest hoping to see one of them. We wait, our hope shrinking as the survey ends. We haven't seen them on other counts, either. Then Anna suddenly appears, carrying a thrush that she's captured in a nearby mist net. The group is elated like we've hit the lottery.

Anna has already banded, measured, and fitted the thrush with a backpack harness and a tiny transmitter that will ping a dense network of Motus receiving stations, tracking this bird's movements to the U.S. mainland, up the coast, and to its breeding grounds in the northeastern states or adjacent areas of Canada. On this same trip, we also set up a new Motus station at Reserva Zorzal, the second on the island of Hispaniola and one of a dozen we hope to deploy over the next three years.

After we complete more surveys along the transect, we finish the morning session by retracing our steps to install several pitfall traps to collect insects from the leaf litter. Each morning during the coming week, students will learn to measure the structure of the forest and the amount of fruit in the regenerating habitat. (Berries and insects appear to be critical to Bicknell's Thrush survival in winter.) We will repeat the same surveys in a cacao plantation, a habitat avoided by this bird, to draw a contrast between the habitats that they use and don't use in winter.

In the afternoon, an administrator from nearby La Salcedoa Scientific Reserve talks to us about the practicalities of integrating field research into conservation planning. Each afternoon this week we will dig into another hands-on conservation planning exercise, using a nearby protected area as a case study.

I can look back with pride on 30 years of my own work in conservation, but soon enough somebody else will be leading the way. Giving these students a good start in fieldwork and conservation planning is one thing VCE is doing to pass the torch so that in 2055 and well beyond, anyone who wants to can still hear, see, and study Bicknell's Thrush—both on its U.S. and Canada breeding grounds and its wintering grounds in the Caribbean.

Tracking Species 🕻

How we take species maps to the next level | by brian kron

T t's a source of frustration to me that since moving to New England last year and joining VCE as a postdoctoral researcher, I have yet to see a Moose. That might be because of the population decline of *Alces alces* since 2011, driven by an increase in Winter Tick infestations and Brainworm.

But what if I could look up exactly where a Moose has been found across Vermont and where it's likely to be found in the future, then use that information to locate one? More importantly, what if land stewards could access that information to create habitat conservation and restoration plans?

VCE Data Scientist Mike Hallworth and I are helping them do just that by using species distribution models (SDMs), which are based on observations submitted to the Vermont Atlas of Life by community scientists, in combination with environmental data collected by satellites.

To understand how SDMs work, imagine a stack of papers. Each piece of paper represents a variable collected by satellite—one that might impact where



a species is found and what habitat it can use—such as temperature, precipitation, the amount of forest canopy, or ambient light. On top of this stack, we put a sheet of paper with dots that represent where Moose have been recorded. SDMs put a pin through each Moose sighting and through all the papers in the stack at that location. At each pin, the model identifies the value of each of our environmental variables—that is, which factors most likely explain the Moose's location.

The model then estimates the probability of a Moose's presence at every location across Vermont, using the factors that are most likely to be important to Moose. If, for example, we find Moose mostly in wet forests, our SDM should identify that wet forest habitat is important to finding Moose and show us locations across Vermont where we are likely to encounter this north country icon!

INATURALIST VERMONT / © JULIE FILIBERT

When applied to many species, this tool will help biologists, conservation planners, and curious residents get to know which areas might harbor the most biodiversity, which areas and species need to be protected over the coming years, and which elements of the landscape we can focus on to help them flourish for decades to come. Models built from sightings and environmental data can help us prepare for changing conditions and land use, invasive species, wildlife diseases, and many other threats that may emerge in the coming years.

"Species distribution models allow us to better understand the factors that shape where species are found today and tomorrow, and this enables us to better conserve species into the future," Hallworth says.

To strengthen the predictive power of this exciting tool, you can submit your observations of mammals, birds, fish, invertebrates—any living organism—to VCE's iNaturalist project. Not only will you be improving the practice of conservation, you may also be helping a guy from Pennsylvania see his first Moose.



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In the Lab

Lab work is vital for conservation. | BY ALEX JOHNSON

Much of VCE's research requires time out in the field, but lab work is also vital for some of our conservation projects. Many small invertebrates can only be properly identified with a microscope, as their minute differences are too tiny to see with the naked eye. Several active VCE projects—including the Upper Valley Backyard Tick Project, the Native Plant Ecotype Study, and our invertebrate study on Mount Mansfield—have required collecting specimens in the field and then bringing them into the lab for identification.



Once invertebrates have been preserved and identified, they are then pinned. A label corresponding with each specimen records the species, location, and date of collection. This collection consists of specimens in the family Hymenoptera (bees and wasps).



After our invertebrate trap bounties are collected from the field, they need to be identified in our lab. Most invertebrates are brought into the lab in jars of ethanol, which are then poured into a petri dish.



VCE staff members and interns examine and identify groups of organisms caught in our invertebrate traps. An insect trap can catch many different species, but a microscope is needed to magnify specimens and separate them into species.



A microscope lets us see tiny details that may be essential for identification, especially with ticks. Here we see a range of Black-legged Ticks: an adult female, an adult male, and a nymph (from left to right).

