

Field Notes

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

FOREST BIRDS

A Quarter Century Of Monitoring

BY STEVE FACCIO

For more than a quarter of a century, volunteer birders have crawled out of bed in the wee morning hours to put their bird identification skills to work for the Vermont Forest Bird Monitoring Program (FBMP). This core VCE project started in 1989 with 11 study sites, but it grew steadily, and by 2012 consisted of 31 sites, all located in unmanaged, interior, mature forests. Each June, these bleary-eyed birders fan out across Vermont and systematically survey their “adopted” routes at the crack of dawn, contributing to a database that has amassed more than 62,000 observations of 135 species.

Recently, VCE completed a detailed analysis of FBMP data from 1989-2013, elucidating population trends for 34 species and 13 ecological groups, or guilds: these will be summarized in a landmark 25-year report—*The Status of Vermont Forest Birds*—to be released later this year. Among the 34 species we analyzed, 13 (38%) showed significantly decreasing population trends, while eight (24%) increased, and 13 species showed no significant trend. Similarly, among the ecological guilds, seven

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◀ Ovenbird

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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 citizen 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.

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VCE VIEW



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Every organization must periodically step back and take stock. In the pursuit of our mission and attaining maturity, VCE must also undergo an honest self-evaluation. As we near the 5-year milestone of our first strategic plan [<http://vtecostudies.org/about-us/strategic-plan>], we're pondering VCE's longer-term future. Thoughtful introspection is in order. We're on an exhilarating, positive trajectory, and we have every reason to expect our good fortune to persist. At this stage in our history, we are prompted to ask, "What does true organizational maturity look like for VCE, and how do we achieve it?"

Those questions underlie our current efforts to revise VCE's strategic plan. Convention tells us that we're still early in the nonprofit life cycle after 8+ years—barely beyond the "start-up" phase. To help us chart a deliberate course towards maturity, we've enlisted David Grant, founder of the Moun-

tain School in Vershire and former Geraldine R. Dodge Foundation Executive Director. David's probing questions and seasoned insights are proving a perfect match to shepherd us through the planning process.

It's too early to forecast exactly how our path will unfold, but don't expect dramatic changes. We're comfortable in our institutional skin and confident in our niche—conducting applied conservation science via engagement of citizens and partners. Our core values are hard-wired—passion for the natural world, pursuit of rigorous science, commitment to personal relationships, and collegiality in the workplace—these will still rule the day. But do expect to see us position VCE to (1) achieve success beyond our founders (remember, we're thinking long-term!), (2) develop our next generation of citizen scientists, and (3) orient our work increasingly towards tangible conservation outcomes, i.e. those that impact policy and practice.

Our revised strategic plan will build VCE's capacity, habits, and culture as a "learning organization." It will also unleash the power of good assessment—formative assessment—to increase our effectiveness as we pursue our core mission to unite people and science for conservation. We look forward to sharing details in a few months, but we know for certain that each and every one of you, our constituents, will continue to form the backbone of VCE's success.

Chris Rimmer
EXECUTIVE DIRECTOR

STAFF NOTES

VCE ESTABLISHES ALEXANDER DICKEY CONSERVATION INTERNSHIP

Thanks to the Dickey family's generosity of both spirit and funding, VCE is pleased to establish an annual conservation internship in memory of dedicated volunteer and dear friend, Alexander Dickey. VCE will honor Alex's kind, giving manner and his passion for the natural world by mentoring a prom-

ising conservation biologist each summer, beginning in 2016. This annual internship will offer an enduring tribute to Alex and will enable VCE to provide young biologists with deeply engaging experiences for years to come. Our next issue of *Field Notes* will profile the first Alexander Dickey Conservation Intern.



© CARL COOLEY



Help VCE record every butterfly species in the state. Join us for the Vermont Butterfly Big Year!

A 'Big Year' for Vermont Butterflies

With volunteers to search fields and fens, mountains and meadows, we aim to, in one year, document every species of butterfly in Vermont. | BY VCE STAFF

With the help of an army of citizen scientists, the “Vermont Butterfly Big Year” aims to record every species of butterfly in Vermont this year. It’s a blend of science, education, competition, enjoyment, and a quest to monitor the changing nature of the state. Climate change, invasive species, habitat loss, and other environmental concerns are altering the biological diversity of Vermont. And with your help, VCE is trying to understand what this means for butterflies.

VCE biologist Kent McFarland led a six-year atlas of butterfly diversity across Vermont, involving hundreds of volunteers and producing a landmark report for the state in 2007. The Vermont Butterfly Survey (<http://val.vtecostudies.org/projects/vermont-butterfly-survey>) established a baseline accounting of butterfly distribution and abundance throughout the state.

“It has been almost a decade since the atlas,” said McFarland. “Atlases are typically repeated every 25 years, so we won’t have another effort like that until around 2027. But with e-Butterfly making the task much easier, we thought it was time to get a quick, one-year snapshot across the state.”

The Vermont Butterfly Big Year aims to get volunteers of all kinds to search fields and fens, mountains and meadows, even their own backyards, to help document every species of butterfly in Vermont and in as many locations as possible. Digital cameras and e-Butterfly make this mission easier for volunteers and our biologists. A real-time, online checklist program, e-Butterfly provides a new way for everyone to report, organize, and access information about butterflies in Vermont and beyond. Launched in 2013, e-Butterfly provides rich data sources for basic information on butterfly abundance, distribution, and phenology. It now contains all the data collected during the

Vermont Butterfly Survey too.

Finding all of Vermont’s butterfly species in one year won’t be easy. Vermont has over 105 species, and many of them fly only in selected habitats at certain times of year. Butterfly watchers will only find the secretive Jutta Arctic in a remote spruce bog in June, for example, and they must wait until August to locate the rust-colored Leonard’s Skipper darting around a brushy field. “We’re hoping that all volunteers from the Vermont Butterfly Survey and many new folks will help visit thousands of survey sites across the state,” said McFarland. “e-Butterfly will keep a live tally of our progress, and in the end, we’re hoping that with everyone’s contributions, we’ll have recorded every single butterfly species found in Vermont.”

From the first flight of a Mourning Cloak in April to the last flight of a Clouded Sulphur in the waning days of November, there’s much to be learned during this year’s Vermont Butterfly Big Year. We hope you’ll join us. **FN**



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CITIZEN
SCIENTIST
OPPORTUNITIES

If you enjoy watching wildlife and wish to contribute to protecting our natural heritage, then join the VCE team!

Consider becoming a citizen scientist.

E-BUTTERFLY

Leader: Kent McFarland

Season: Spring-Fall

Beginner to expert

Report and explore sightings of all Vermont butterflies with the innovative online tool, e-Butterfly.

www.e-butterfly.org

email: kmcfarland@vtcostudies.org

MOUNTAIN BIRDWATCH

Leader: Steve Faccio

Season: June

Beginner to expert/hiking required

Adopt a mountain and survey Bicknell's Thrush and other mountain songbirds.

www.vtcostudies.org/projects/mountains/mountain-birdwatch/
email: sfaccio@vtcostudies.org

LOON WATCH

Leader: Eric Hanson

Season: Mid-July

Beginner to expert

Participate in the annual one-day census of Vermont's breeding loons.

www.vtcostudies.org/projects/lakes-ponds/common-loon-conservation/loonwatch/
email: ehanson@vtcostudies.org

VERMONT LOON
CONSERVATION PROGRAM

Leader: Eric Hanson

Season: Spring-Summer

Beginner to expert

Help monitor nests and lakes.

www.vtcostudies.org/projects/lakes-ponds/common-loon-conservation/vermont-loon-conservation-project/
email: ehanson@vtcostudies.org

Visit www.vtcostudies.org/volunteer
to find the citizen science project that's right for you.

Status of New England's Grassland Birds

Looking back at data on grassland birds can be invaluable to assess the current status of populations.

| BY JASON HILL

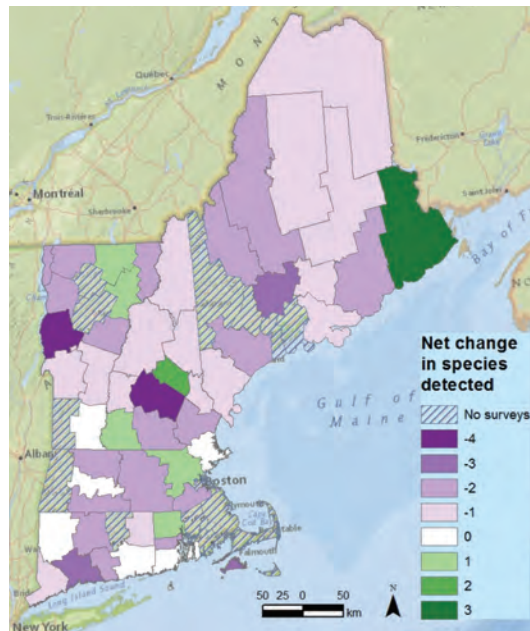
Filed and forgotten in the back of a drawer—that's where many data-sets from completed projects end up. These data can be invaluable to assess the current status and trends of wildlife populations, however, when recent survey data are compared to similar data collected in the past. The North American decline of grassland birds is well documented, and now VCE has helped complete a comprehensive assessment of New England's grassland bird populations by doing just that.

The first regional survey of grassland birds across New England was conducted by Massachusetts Audubon from 1997-2000; this monumental effort covered >1,000 grassland sites (e.g., hayfields, pastures, and airports) across the six New England states and New York. In 2014 and 2015, VCE, the University of Delaware, and Mass Audubon resurveyed grassland birds

at nearly 500 of the New England sites. Technicians carefully duplicated the sampling protocol of the earlier efforts to allow a direct comparison between the first and second survey results. In many cases, this meant poring over old maps and photographs to locate the original survey locations.

Results from our repeat surveys indicate that grassland bird populations at the 495 study sites have undergone tremendous change over the last 20 years. All eight species were found at markedly fewer sites in 2015 than in the 1990s. For example, in 2015, Upland Sandpipers and Eastern Meadowlarks were found at only 4% and 24%, respectively, of the sites they occupied in the 1990s. In 2015, Grasshopper Sparrows were absent from 90% of the Vermont grasslands where they occurred during the first survey period. These declines suggest that grassland bird populations

in New England have become smaller and more isolated over the past two decades. Our collaborative efforts constitute the most comprehensive regional survey of grassland birds since the 1990s, and, assuming we don't relegate the data to a dusty file cabinet, provide a critical baseline by which to monitor future changes in New England's vulnerable grassland bird populations. **FN**



Net change in the number of grassland bird species detected within a county between the 1997-2000 and 2015 survey periods. A value of zero (white polygon) indicates that the same number of species (but not necessarily the same species) were detected in that county during both survey periods.



Bobolinks are on the short list of suspects that carry avian malaria to the islands. Bottom left: One happy collaborator: Dr. Noah Perlut with a Bobolink.

Galapagos Surprise



Preliminary results suggest that Bobolinks are indeed connected to Galapagos endemic birds by more than just geography.

BY ROSALIND RENFREW



The Galapagos Islands: a dream destination for wildlife watchers who gaze upon Blue-footed Boobies and marvel at Darwin's finches. Famous fodder for the unifying theory of natural selection, home to fearless wildlife you can almost touch, and surprisingly, a cesspool of malaria.

Avian malaria, a disease that has contributed to extinctions on the Hawai'ian Islands, is also infecting rare birds of the Galapagos. Dr. Patricia Parker and her graduate students at Mississippi State University have discovered four lineages of malaria in endemic birds such as the Galapagos Penguin. Three of these lineages are brought in from elsewhere, their origins unknown.

Now a prime suspect has emerged. Darwin's collection of specimens from the Galapagos included only one long-distance migratory songbird, a Bobolink. Records obtained since his 1835 expedition indicate that a few individuals stop there annually during fall migration. This places Bobolinks on the short list of suspects that may carry avian malaria to the islands.

Haemosporidian parasites are protozoans found in the blood cells and tissues of their hosts. Their spread depends on insects that serve as vectors, transferring them from one host to another. The genus *Plasmodium* causes malaria and is transmitted by mosquitos. Each *Plasmodium* species has evolved to parasitize a specific host. Humans host five species of malaria,

though only one is responsible for most deaths. Birds host an entirely different array of malaria species, which can also be lethal.

To gather evidence on this phenomenon, VCE and our collaborators collected Bobolink blood from across the species' breeding range. Dr. Parker's lab had previously determined that Bobolinks carry 11 lineages of *Plasmodium*, two of which occur in Galapagos endemics. This exposed Bobolinks as a potential source of the parasite, but did not provide definitive proof.

Undertaking the quintessential "needle in a haystack" mission, Noah Perlut (University of New England), volunteer Jennifer Megyesi, and I were cautiously optimistic that we could reveal the smoking gun by collecting blood samples from Bobolinks in the Galapagos.

It took two full days to travel to San Cristobal, the island with the bulk of scattered Bobolink records, leaving us only 12 days to collect the blood. To our great surprise, on the second day we found two Bobolinks, netted one of them, and celebrated in disbelief. Over the following 10 days, we were able to outsmart eight additional reluctant Bobolinks.

Preliminary results from Dr. Parker's lab suggest that Bobolinks are indeed connected to Galapagos endemic birds by more than just geography. Stay tuned for more details as this fascinating, but potentially troubling, story unfolds. **FN**

FOREST BIRDS

continued from page 1

declined while just two increased.

Before we dig into these results, let's step back and consider why we monitor forest birds in the first place. As Vermont's most common habitat, forests cover 75% of the state. More than just an assemblage of trees, woodlands are interdependent communities of plants, animals, and fungi that interact in complex ways. Among forest-dwelling wildlife, there is no group more iconic than songbirds, whose vibrant colors and voices grace an otherwise green and

Blackburnian Warbler

**WATCH FOR OUR FULL REPORT—
THE STATUS OF VERMONT FOREST
BIRDS—DUE OUT THIS SUMMER!**

quiet landscape.

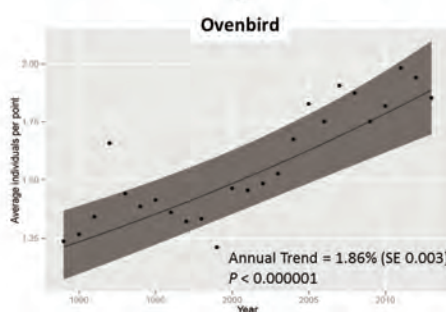
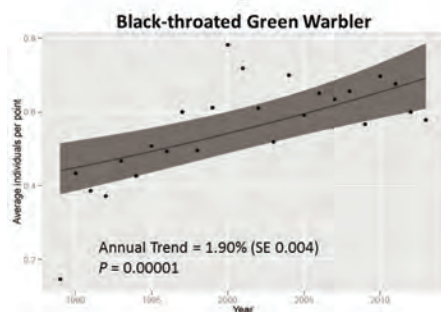
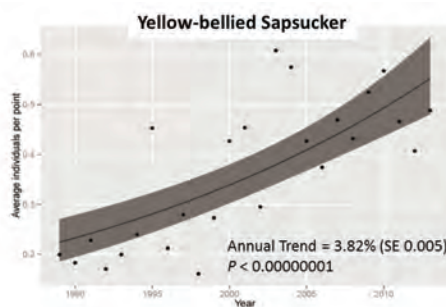
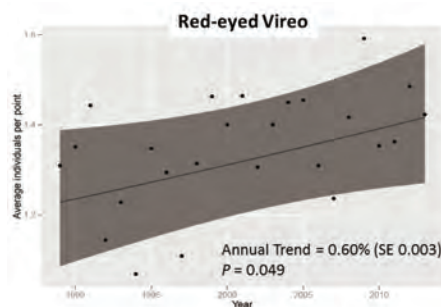
Birds are also the most diverse vertebrate group in our forest ecosystems, with more than 80 breeding

species. And while I think we'd all agree that forest birds need forests, there is a growing body of evidence that forests also need birds, for the critical roles they play in providing ecosystem services, ranging from pollination and pest control to seed dispersal and nutrient cycling. Keeping track of bird populations is a critical step toward gaining a broader understanding of forest ecology, especially at a time when our woodlands appear to be on the threshold of dramatic change from a warming climate and an ever-growing array of invasive species.

We'll start off with the good news. Among the eight species with significantly increasing trends are Ovenbird, Red-eyed Vireo, Black-throated Green Warbler, and Yellow-bellied Sapsucker (see charts). These are some of the most abundant, easily detected, and widespread species on FBMP surveys, bolstering our confidence that their trends are "real." In addition, each prefers slightly different habitats than the others (mature interior hardwoods, mixed forests, and second-growth/forest edges), and occupies different ecological niches (a ground-forager, two canopy-foragers, and a bark-prober), suggesting that Vermont forests are meeting a diversity of habitat and ecological requirements. Moreover, all four are listed as Species of Regional Conservation Concern by Partners-in-Flight, primarily because large proportions of their breeding ranges occur in the Northeast.

But there is also less heartening news: two aerial insectivores, Eastern Wood-Pewee and Great Crested Flycatcher, are among the 13 species that declined significantly. In our region, 19 species are included within the aerial insectivore guild—mostly flycatchers, swallows, and nightjars (Eastern Whip-poor-will and Common Nighthawk)—but since many of these do not inhabit forested habitats, only 11 aerial insectivores were detected on FBMP surveys. As a group, these 11 species showed a significant annual decline of 2.5% on our study sites (see chart), which

The Red-eyed Vireo is one of eight species with increasing population trends.



Four of eight species with increasing population trends on FBMP surveys, 1989-2013. Each prefers a slightly different habitat and occupies a different ecological niche, suggesting that Vermont forests are meeting a diversity of needs.

equates to a 45% drop in their relative abundance over 25 years, corroborating an alarming and widespread trend that ornithologists have noted for this group over the last decade or so.

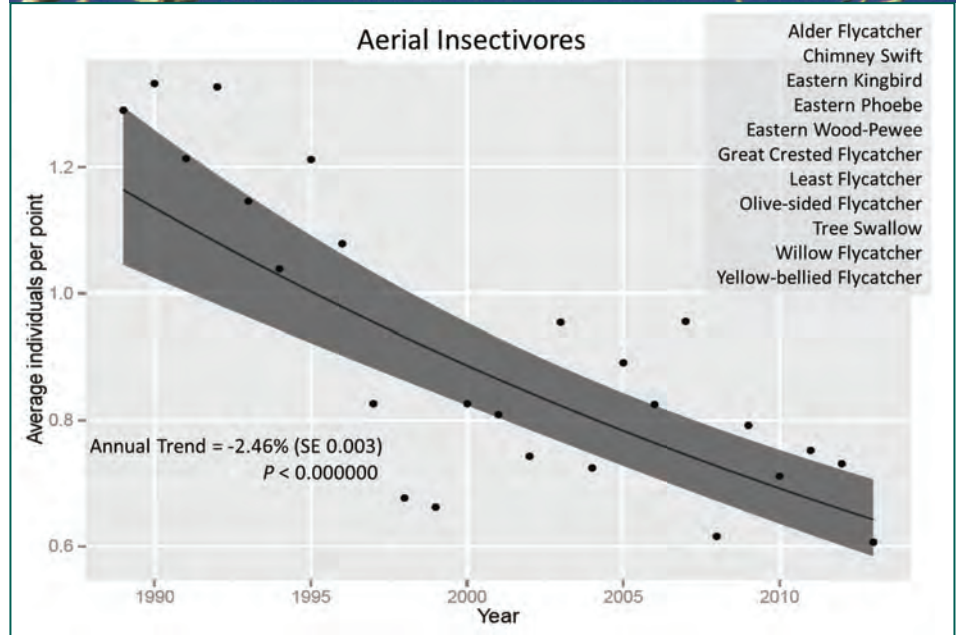
Although the reasons for these steep and troubling declines remain unclear, several factors are likely at play, including reduced abundance of flying insects (possibly due to polarized light pollution, pesticide use, and/or climate change), habitat loss, effects of West Nile virus, and changes in land-use practices. Further, the majority of aerial insectivores are long-distance migrants, overwintering in Central and South America where they may face similar threats.

Other species undergoing notable declines include Winter Wren, Veery, Yellow-rumped Warbler, Blackburnian Warbler, Canada Warbler, Common Yellowthroat, and White-throated Sparrow. Several tenuous threads link these seven species together. One is that they reach their greatest abundance on our survey sites in forested wetlands, and many species show very low counts in the late-1990s, corresponding to the arrival of West Nile virus. If any habitat were to be at high-risk for this mosquito-borne disease, for which birds are the primary host, it would likely be wetlands. Additionally, five of these seven birds nest and feed on or near the ground, suggesting that a change in understory structure could also play a role. For example, if the density or species composition of understory vegetation has changed over the last 25 years, it could affect the birds that breed there.

With the FBMP's 28th year of data collection just around the corner, VCE sends out a hearty thank you to the small army of 59 observers who made these results possible. They faithfully (and literally) contributed their blood, sweat, and time, helping to create an irreplaceable and unparalleled dataset. We hope that knowledge is gratifying, and that the memories of experiencing some of Vermont's finest forest tracts and its coolest birds are a just reward. **FN**



© STEVE FACCIO



As a group, aerial insectivores (consisting of the 11 species listed in the upper right), have declined steeply on FBMP surveys, corroborating an alarming and widespread trend.

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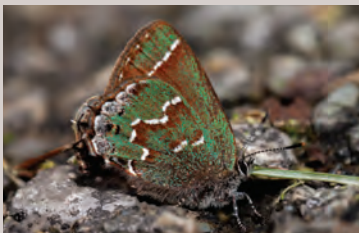


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2016 VCE Birdathon

Though winter never materialized this year, VCE is more than eager to greet the arrival of spring with some serious birding! On Wednesday, May 25th, the Green Mountain Goatsuckers will celebrate the return of Vermont's migratory birds with our annual Birdathon. Starting in the Northeast Kingdom and working our way south, we'll explore areas underrepresented in eBird to identify as many species as possible in a single day. Form your own team and count birds anytime, or sponsor the VCE Birdathon team. Either way, you will help VCE advance our mission of conserving vulnerable wildlife across the Americas.

Suds & Science

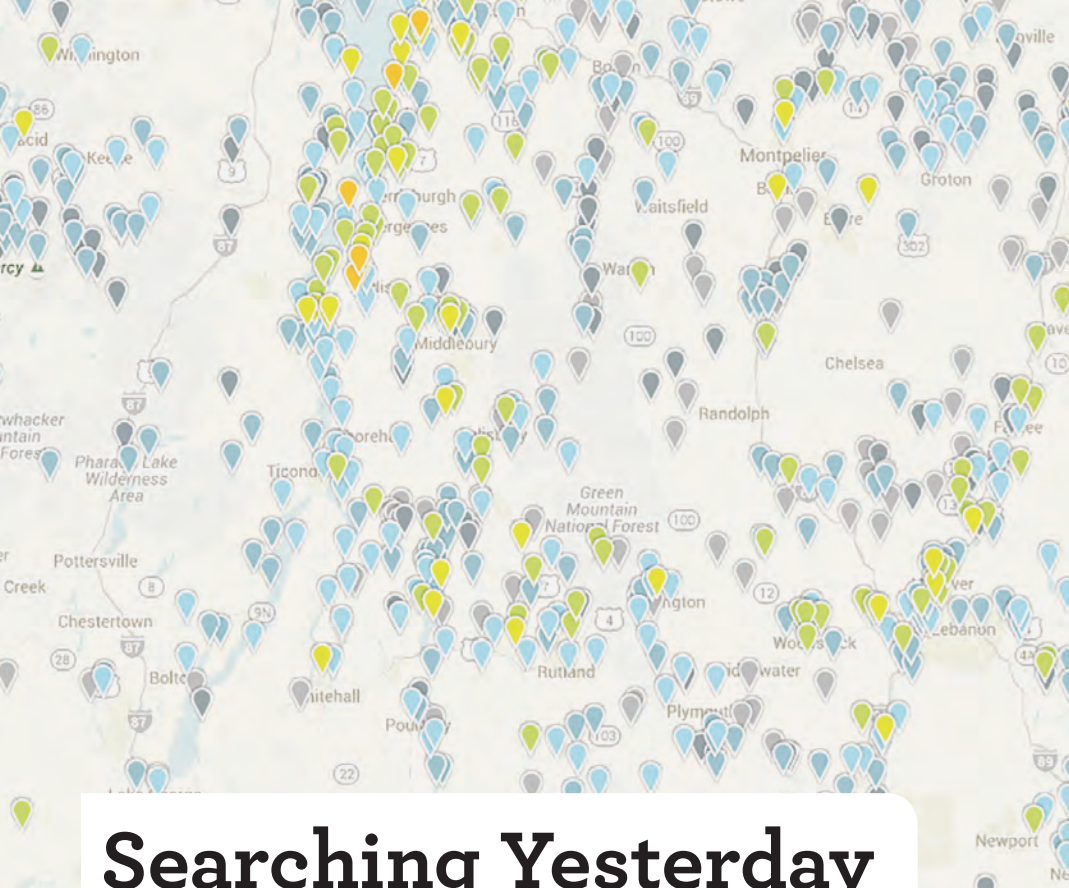
Join VCE scientists and colleagues for hand-crafted brew and lively conversation on the first Tuesday of most months. Suds & Science begins at 7PM at the Norwich Inn in Norwich, VT and is a chance to talk science with VCE biologists, colleagues, and interested members of the community. As we like to say, "You buy the beverage, we bring the science."



© CHRIS ALBERTINE

Outdoor Radio

VCE and Vermont Public Radio (VPR) unite the sounds and science of nature in our monthly feature called Outdoor Radio. Frogs and ferns, finches and fungus—anything is fair game for co-hosts Kent McFarland and Sara Zahendra. Tune in to VPR the third Thursday of every month at 7:50AM, and again on Friday at 6:20PM, or listen anytime online at www.vtecostudies.org/outdoor-radio/



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Historic observations of Evening Grosbeaks (above) Snow Geese (below), and many other species provide insights into Vermont's bird populations.

Searching Yesterday to Understand Today

Observations from yesterday's birders can now be pieced together to weave the history of Vermont's birds.

BY SARA ZAHENDRA

An Upland Sandpiper at Wilder Dam in 1995. Ten thousand Snow Geese at Dead Creek Wildlife Management Area in 1978. Twenty Evening Grosbeaks at a Norwich feeder in 1984. These observations and thousands more, scribbled on faded bits of paper, derelict, forsaken, and effectively useless in their current state—the long-neglected relics of the Records of Vermont Birds (RVB).

For 30 years, Vermont bird watchers dutifully sent in their sightings each season to the RVB committee, which then compiled them into quarterly summaries that became the definitive source of bird observations for Vermont.

Enter VCE and the digital age. Our mission, and we enthusiastically chose to accept it, was to transfer these decades of data into Vermont eBird, a project of the Vermont Atlas of Life. But how does one convert tens of thousands of handwritten bird observations to useable digital data? And perhaps more importantly, why assign ourselves this monumental task?

The answer to the first question is....slowly, and with the help of many dedicated volunteers. The answer to the second question involves history. Like the discovery of an abandoned warehouse filled with vanished Picassos and Renoirs, these accounts weave an invaluable historic tale. Once digitized, our dormant RVB observations will provide a

panoramic view of changes in Vermont bird populations over the course of the last 30 years. But where to begin?

Once again, VCE volunteers rose to the challenge and, with speed and precision, scanned more than 5,000 individual pieces of paper.

Still, we needed to get each observation digitized for entry into eBird. For that part of the process, VCE went migratory. In fact, via the internet, we traveled all the way to Australia and landed in DigiVol. Developed by the Australian Museum in collaboration with the Atlas of Living Australia, DigiVol is an example of crowdsourcing at its finest. Through this platform, volunteers from all over the world can log on, join our “expedition,” view our scanned documents, and digitize each observation.

And did they ever! Within six months, 5,193 pages had been digitized, and volunteers were asking when we'd be ready with the next batch. Another frenzy of scanning by steadfast volunteers, and we opened our second virtual expedition, complete with a daunting 7,000 bird observation notecards.

“We’ve been astounded by the volunteer effort,” said VCE conservation biologist Kent McFarland. “We’re so thankful for the help of these loyal citizen scientists. Their work will reveal new and much-needed insights into Vermont’s bird populations, from shifts in timing of migration and breeding cycles, to changes in distribution and relative abundance.”

Thanks to today’s volunteers from all over the world, relict observations from yesterday’s birders can now be pieced together to fill in the gaps and continue weaving the history of Vermont’s birds. **FN**

Undeterred spirits during a field workshop in epic rainy conditions, Loma La Canela, Cordillera Septentrional, February 2009.

Below: Subsistence crops and commercial avocados surround a Haitian sharecropper's dwelling inside Sierra de Bahoruco National Park, October 2015.



An Evolving Caribbean Conservation Agenda

VCE's research and conservation efforts on Hispaniola provide a telling glimpse into our immersion, commitment, and persistence. | BY CHRIS RIMMER

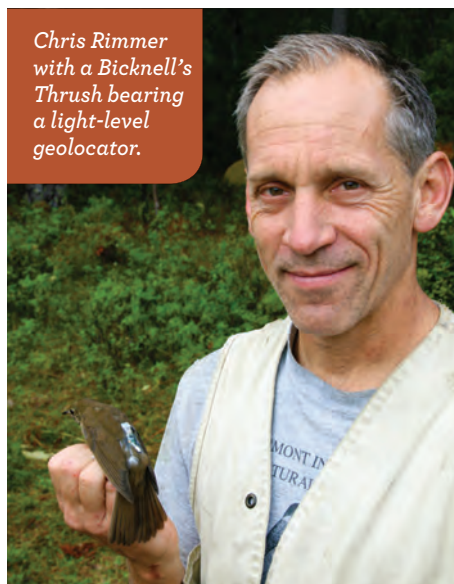
Nearly 22 years ago, in December of 1994, I stepped at dawn into Sierra de Bahoruco, a remote cloud forest in the Dominican Republic (DR), and was greeted by the subdued 'peer' calls of a Bicknell's Thrush. Little did I know then that I was embarking on a two-decade odyssey to study and conserve Caribbean birds—a journey that has evolved and diversified, but retains its core focus on Bicknell's Thrush. A few "statistics" over the span of VCE's research and conservation efforts on Hispaniola provide a telling glimpse into our immersion, commitment, and persistence.

- More than 35 personal trips to Hispaniola, seven to other islands (Dominica, Grand Bahama, Grenada, Guadeloupe, Jamaica, Puerto Rico)
- Five years with a full-time VCE staff Conservation Biologist (Juan Carlos Martínez-Sánchez) stationed on Hispaniola
- More than 4,000 mist-net captures in Hispaniola's montane forests
- Three unprecedented north-south recoveries of VCE-banded Bicknell's Thrushes (two VT—DR, one DR—VT)
- Sixty-four Bicknell's Thrushes and six Western Chat-Tanagers intensively radio tracked

- Six hundred thirty-eight nests of 14 species found and monitored in forests of Sierra de Bahoruco
 - More than 30 peer-reviewed scientific papers on ecology and conservation of Hispaniolan migrant and resident birds
 - More than 100 local students, biologists, and park rangers trained in avian monitoring
 - More than 25 flat tires changed on 4WD trucks and thousands of miles logged on bone-jarring mountain roads
- Six years ago, *Field Notes* featured an article on the importance of Hispaniola's montane forests as biodiversity



© VCE FILE PHOTO



Chris Rimmer with a Bicknell's Thrush bearing a light-level geolocator.

hotspots, and why VCE was sharpening its focus on conservation of these critical, imperiled habitats. For good reason, we continue to use Bicknell's Thrush as an 'umbrella' species to target our efforts on montane forests and their biota. By concentrating research, monitoring, capacity building, and on-the-ground management in montane areas, especially those most at risk, we will most effectively deliver science-based conservation.

Stepping back, how have we done? What have we and our partners achieved? Are Hispaniola's montane forests demonstrably more secure than they were 20? 10? 5? years ago? Have we managed to translate our field science into tangible conservation? These are weighty questions that demand answers as we look to the next phase of VCE's Caribbean Program.

Make no mistake: much remains to be learned about the ecology and conservation needs of Bicknell's Thrush on Hispaniola and the three other islands that comprise its entire winter range—to say nothing of other birds that share its habitats. As scientists, we're keen to delve deeper into ecological mysteries that intrigue us. What is the overwinter survivorship of Bicknell's Thrush sex and age classes in different geographic regions and forest types? Do males and females show habitat segregation outside of Hispaniola? How do birds

respond to recovery of degraded forest, whether by passive regeneration or active reforestation? Can we demonstrate carry-over effects between the wintering and breeding grounds? What is the species' conservation status on Cuba? Jamaica? Puerto Rico? There is no limit to possibilities for new field-based investigations.

Yet as we look forward, one inescapable fact stands out—Hispaniola's montane forests have lost ground and are every bit as threatened as they were two decades ago. That truth alone propels VCE's course from inquiry to action. The science is irrefutably on our side, and we are now focused on helping our local partners catalyze decisive conservation measures. Time is slipping away, but positive developments encourage us. A strategic planning process for Sierra de Bahoruco National Park will target unchecked expansion of avocado plantations and charcoal production. Payments for ecosystems services in Haiti's La Visite National Park are incentivizing local tenants to avoid cutting the last vestiges of cloud forest. Conservation easements are being forged to relocate tenants from inside Loma Quita Espuela Scientific Reserve. Closer to home, VCE is leading a revision of the 2010 Conservation Action Plan for Bicknell's Thrush—this benchmark document will outline explicit conservation measures for Caribbean wintering habitats, and importantly, how to implement them.

A short answer to the overarching question of VCE's impact on conservation of montane forests: we have much work yet to do. Solutions are exceedingly complex, but we're on the right track. We won't abandon our trademark field-based approach by any means—surveys on Cuba and systematic avian monitoring in Sierra de Bahoruco are on the horizon—but action will take precedence. It must. Much hangs in the balance, and VCE's investment in helping to achieve enduring conservation in the Greater Antilles is deeper than ever. **FN**

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To learn more, contact
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Hermit Thrush { *Catharus guttatus* }

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More than just Vermont's official state bird, the Hermit Thrush is admired for its spirited nature and flute-like song.

| BY JOHN LLOYD

Pop quiz: think of one fact about the Hermit Thrush. Yes, it is a bird. And yes, it is the official state bird of Vermont (not an unreasonable designation for a species nesting in good numbers in nearly every part of the state). My 10-year-old son provided these two facts when I gave him the quiz and, although correct, they don't quite do justice to a bird that has served as inspiration for composers, writers, and scads of scientists. In the interest of promoting a slightly deeper appreciation for the Hermit Thrush, or at least providing a few conversation starters for the next time you are stuck on an elevator with an ornithologist, here are a few tidbits about the nightingale of North America:

➤ The song of the Hermit Thrush, often acclaimed for its flute-like musicality, exhibits many of the mathematical principles that underlie human musical scales. In other words, the Hermit Thrush tends towards harmonies similar to those used in our own music. Some scientists have argued that these similarities indicate

that what we call music has an inherent, biological basis.

➤ Not quite as cosmopolitan as its relatives, but perhaps quite a bit hardier, Hermit Thrush is the only species in the genus *Catharus* that winters in North America.

➤ Insectivorous during the summer, Hermit Thrushes expand their diet during winter to include fruit. Indeed, Hermit Thrush is the only known seed disperser of the federally endangered pondberry, a rare shrub of the southeastern U.S. The pondberry knows why we need birds.

➤ Hermit Thrush has extended its breeding range nearly 200 km southward during the past three decades, and it now nests regularly in the high Appalachians as far south as southern North Carolina. The southernmost breeding population, however, occurs even further south on an isolated range of high mountains in Baja California.

➤ Hermit Thrush populations fare poorly when introduced earthworms invade forests. Studies in Wisconsin show that earthworms cause declines in clubmosses, those creeping, moss-like plants of the forest floor within which Hermit Thrushes often place their nest. As the clubmosses vanish, so too do the nesting Hermit Thrushes.

➤ The oldest known Hermit Thrush was almost 11 years old when it was captured and released by a Maryland bird-bander in April 2009; it had first been caught at the same site in March 1999. **FN**