# Uniting People and Science for Conservation





#### DEAR VCE FRIENDS AND SUPPORTERS,

For many summers I have been fortunate to spend two weeks birding, hiking, and kayaking on and around the Leelanau Peninsula in Northern Lower Michigan. I wake early each day, grab my field guides and snacks, and paddle a variety of inland lakes, rivers, and marshes that dot a coastline famous for its extensive dune habitats. The solitude I find there is miraculous and life-affirming. Watching the dew dry on the wings of an immature Meadowhawk Dragonfly at sunrise while Sandhill Cranes rattle and Green Herons scold me for disturbing their roost, I am mesmerized morning after morning as I drift through the myriad of complex life forms and unfathomable relationships on each undisturbed patch of water.

I like to think that the joy and wonder I derive from these daily paddles reflects the heart of the work that drives VCE. The breadth and accessibility of VCE's work affords citizens like you and me a unique opportunity. We are privileged to engage with scientists who share their experience and knowledge in the pursuit of learning and the goal of wildlife conservation. Thanks to VCE, I have become an enthusiastic iNaturalist contributor, and am thrilled to see my observations integrated into the Vermont Atlas of Life. Increasingly, crowd-sourced citizen science data create a powerful and exciting dimension in the environmental science field, and provide a vital tool for VCE. Looking forward, VCE will continue to engage with the public in a thoughtful and productive fashion, offering progressive programs and ample citizen science opportunities for anyone committed to the health and welfare of our natural world.

Simply stated, it is inspiring to be a part of what drives this organization. As you look through this report, note the headings that highlight each section: Discovery, Citizen Engagement, Outreach, Leadership, Collaboration, and Conservation. VCE does all these, and does them exceedingly well. We are a small organization with an impressive scope. At a time when life on this planet is in such flux, VCE has solid footing and deep roots. Uniting people and science for conservation has never been more essential. VCE will continue to do so with energy, pragmatic planning, and clarity, never losing sight of the joy and wonder that form the heart of our work.

what lies ahead.

Peter w Brooke

PETER BROOKE

### MISSION

The Vermont Center for Ecostudies (VCE) advances wildlife conservation across the America's through research, monitoring, and citizen engagement.

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Cover photo: © JAMES P. BAILEY We thank you for your support along the way, and throughout

AT A TIME WHEN LIFE ON THIS PLANET IS IN SUCH FLUX. VCE HAS SOLID FOOTING AND DEEP ROOTS.

"You deserve a great deal of credit for what you have accomplished over the last 11 years. As an outside observer I have always had great confidence in your future. Your honest determination and forbearance naturally encourages others to work with and for you in ways that most organizations can only dream of."

-VCE SUPPORTER



OUR ELEVENTH YEAR FEATURED A STRING OF **SCIENTIFIC** DISCOVERIES.

#### UNITING FORCES FOR CONSERVATION

From dazzling dragonfly migration to rediscovery of a long-lost cuckoo bumble bee in Vermont to the startling documentation of a hybrid Catharus thrush, 2018 featured a string of scientific discoveries for VCE. These contributions to science highlighted another outstanding year, our eleventh.

While wildlife science stokes our passion and drives our conservation agenda, VCE's 2018 accomplishments inevitably boil down to our engagement of people. Let's face it-public involvement in conservation has never been more essential. Our 2018 citizen science stats alone (see p. 11) attest that VCE is staying true to its tagline of "uniting people and science for conservation." From windswept montane forests to the tiniest vernal pools, VCE volunteers tracked vulnerable wildlife that would otherwise slip under the conservation radar. Our crowd-sourced citizen science contributions expanded at a mind-boggling pace in 2018–Vermont's per capita iNaturalist and eBird observations far exceed any other state's!

VCE's cutting-edge science and deepening volunteer engagement in 2018 were complemented by our outreach. We mentored dozens of young professionals, ranging from college interns to Cuban and Dominican partners. We communicated the passion and substance of natural history on multiple fronts, from Outdoor Radio to Suds & Science, eBird workshops to eNews, peer-reviewed publications to informal blog posts. Collectively, this small and relatively young organization reached an extraordinary number of people in profound ways!

With another year of robust health in our rearview mirror, VCE looks ahead to a future that promises, and demands, much more. As Earth's astonishing biodiversity dwindles before our eyes, often before we even recognize what we've lost, VCE is thinking big. Our new five-year strategic plan will soon be in your hands. This aspirational document lays out our ambitions and challenges all of us to meet them together. The plan's overarching goal-perhaps an intuitively obvious one-stretches VCE to emerge as a more impactful leader in conservation science. Three primary tenets underlie our approach:

- core team.

There is no radical restructuring at play here, no 90-degree turns in the VCE path. We're passionate about what we do, and we'll never abandon our roots of scientific integrity, collegiality, and accessibility. While 2018 cemented VCE's vitality on all levels, we can not and will not decelerate. The stakes are far too high, the needs far too great and complex with each passing day. We embrace the multitude of challenges-and opportunities-that face us all, and we relish uniting forces with you for conservation.

Matt (

CHRIS RIMMER

1. We will invest more deeply in pioneering science by strategically building our

2. We will "close the loop" for conservation, seeking to maximize tangible outcomes of our work via stronger collaborations and partnerships across the hemisphere.

**3.** We will broaden our vision for citizen science, enhancing opportunities for participation as we seek to ensure that this vital community of constituentsincluding so many of you—is sustainable and increasingly diverse.

### Discovery

"The breadth, depth, and scientific rigor of the work that VCE staff and volunteers are doing is truly impressive."

—LARRY MASTER, VCE Advisory Council member

#### **REDISCOVERY OF A CUCKOO**

Fernald's Cuckoo Bumble Bee (*Bombus fernaldae*) hadn't been seen in Vermont since 1963, but was rediscovered in 2018 in two places. VCE research associate, Leif Richardson, found it during a bumblebee survey in the Missisquoi National Wildlife Refuge in Swanton. Spencer Hardy, a member of the VCE Vermont Bumble Bee Atlas team, found five drones just a few days later in Franklin County. There are only two historic records for this bee in Vermont—a specimen from 1936 in Whittingham and a second from Island Pond in 1963. Fernald's bumblebee is fairly common elsewhere in the region—it's been spotted in Quebec, New York, and Maine—but confirming the bee is still found in Vermont was key to understanding its conservation status.

 Fernald's Cuckoo Bumble Bee on highbush blueberry.
 See https://www.inaturalist.org/ observations/12807025.



A The Veery x Bicknell's Thrush hybrid fondly known as "Vick" right before he was released after banding.

#### **A RARE THRUSH PHENOMENON**

While carrying out his Mountain Birdwatch route on Stratton Mountain many years ago, VCE biologist Kent McFarland heard the distinct song of a Veery, followed immediately by a nearby Bicknell's Thrush—which he found quite strange, because Veeries aren't usually found in high-elevation forests. But then something even stranger happened: Kent heard a long flute-like song with the first half pure Veery and the second half pure Bicknell's Thrush, rising upward at the end rather than spiraling downward. That's when he realized that one bird was producing a hybrid of the two songs.

Bicknell's Thrushes nest in the high-elevation Balsam Fir forests of the Northeast and winter in the Caribbean, while Veeries usually nest below 2,300 feet elevation in wet hardwood forests and winter in South America. The two species' partitioning of breeding habitat by elevation and forest type limits the degree of ecological overlap and opportunities for contact during the breeding season. How could this hybrid possibly exist?

Determined to know whether this truly was a hybrid thrush, Kent gathered a team to record, capture, and take a blood sample from the mysterious bird they fondly named "Vick" to reflect its apparent mixed heritage. A colleague from the Center for Conservation Genomics at the Smithsonian used DNA from the sample to determine that Vick's mother was a Veery and his father was a Bicknell's Thrush!

Their findings were published in the December 2018 edition of the *Wilson Journal of Ornithology*, and you can read Kent's riveting first-hand account, complete with recordings and photos from the field, on our website at vtecostudies.org/blog/forest-thrush-mix-up.

### Discovery

#### AVIAN NESTING ECOLOGY ON HISPANIOLA

Despite Hispaniola's importance to global biodiversity, surprisingly little is known about the basic biology and ecology of its resident birds-particularly the 31 endemic species that are found nowhere else on Earth. Birds on Hispaniola face chronic threats from deforestation. habitat degradation, and climate change. To effectively inform conservation of the island's vulnerable avifauna, it is crucial to document life histories of resident birds, including their breeding biology. Recognizing this urgent need, VCE and colleagues carried out the island's firstever assessment of nesting ecology and reproductive success of 14 species in the southwestern Dominican Republic's biodiverse-rich Sierra de Bahoruco. Hard work and dogged persistence paid off with the discovery of 643 nests of 19 species, including nests of two endemics (Western Chat-Tanager and Hispaniolan Highland-Tanager, formerly known as the White-winged Warbler) that had never before been described to science! VCE's study established an invaluable baseline of data on nesting birds, demonstrating an additional and serious threat to the region's breeding bird communities from introduced mammalian predators. Their results were published in The Wilson Journal of Ornithology.



▲ Western Chat-Tanager, one of two Hispaniolan endemic species whose nests had never been described to science prior to VCE's Sierra de Bahoruco study.



#### SURPRISING GRASSHOPPER SPARROW MIGRATION

Fundamental questions regarding the timing and choice of migration routes, and what that means for conservation of Grasshopper Sparrows (*Ammodramus savannarum*), have been surprisingly difficult to answer—until now. VCE's Grasshopper Sparrow migration research, published in the journal *Ecology and Evolution*, provides the most extensive examination of the migration ecology for the species to date.

An adult male

Grasshopper

Grafton, ND,

wears a

light-level

route and

area.

overwintering

Sparrow at Camp

geolocator that

helped reveal his

annual migration

To investigate the migratory patterns of Grasshopper Sparrows, VCE biologists deployed geolocators on 180 birds at Konza Prairie in Kansas and at six U.S. Department of Defense installations across the species' breeding range. They were able to retrieve location data on 34 individuals, which yielded surprising results. Among the most astonishing findings was that Grasshopper Sparrows do not begin fall migration in August as biologists had previously assumed; they actually stay put on their breeding grounds until October! The data also revealed that Grasshopper Sparrows make short, nearly daily migration flights. This new information may help transform the way these bird populations are managed, both across international borders and throughout their annual cycle. Learn more at: vtecostudies.org/ projects/grasslands/grassland-bird-migrationproject/#storymap.



#### A BOREAL BIRD ON THE MOVE

Late each fall, and then again in early spring, the eastern subspecies of Fox Sparrow—the Red Fox Sparrow (*Passerella iliaca iliaca*)—travels through New England on its journey to and from its breeding grounds in eastern Canada. Large and brightly colored, at least by sparrow standards, this species is a harbinger of the changing seasons and a delight to watch during its brief and transient appearance.

However, several summers ago VCE biologist John Lloyd encountered several singing males, apparently defending territories, in western Maine in mid-June. By mid-June, migratory songbirds have typically reached their breeding grounds and nesting is underway. Why were Fox Sparrows present so far south during the breeding season? This question led to a two-year effort to piece together its current breeding range and a publication in the online scientific journal *PeerJ*.

VCE's research revealed an unusual development in Red Fox Sparrow ecology. Beginning in the early 1980s in southern Quebec—well south of the documented breeding range of the species—birders began noticing Fox Sparrows during the summer. Fast-forward to today, and Fox Sparrows are being reported nearly every summer in increasingly far-flung locales, from the mountains of western Maine and northern New Hampshire, in Vermont's Green Mountains, and at least one on Whiteface Mountain, New York.

A species never known to nest in New England prior to the 1980s, Fox Sparrows have expanded their breeding range south by about 400 km in a span of less than 30 years, and seem to be on track to continue this remarkable journey. We can think of few other bird species that have shifted their range so dramatically in such a short period of time, and none that have done so by moving north to south! Join in this research by adding your Fox Sparrow sightings to eBird! Read the whole story: vtecostudies.org/blog/foxsparrows-a-boreal-bird-on-the-move.



#### ASTONISHING DRAGONFLY MIGRATION

It's hard to find someone who isn't familiar with the aerial spectacle of migrating Monarchs fluttering southward across North America each fall. But ask about the migration patterns of other insects, and you'll likely be met with, "Other insects migrate?" Yes, indeed they do!

VCE biologists Kent McFarland and Sara Zahendra, in collaboration with researchers from the University of Maryland and Smithsonian Conservation Biology Institute, published a paper in *Biology Letters* describing how the Common Green Darner takes three generations to complete its annual cycle, including an astonishing multi-generational migration of over 600 km (373 miles) on average, with some individuals covering more than 2,500 km (1,553 miles)!

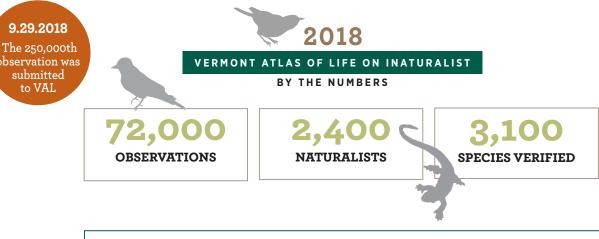
The research team used a combination of data sets, including 21 years of citizen science data, more than 800 dragonfly wing specimens going back 140 years, and specimens caught in the wild. Kent and Sara spent nearly two years collecting dragonflies from Florida to Ontario, Canada, and working with museums to analyze their specimens.

The team analyzed stable hydrogen isotopes in dragonfly wings to infer natal origins. This is possible because the ratio of three forms of hydrogen in the atmosphere shifts with latitude; dragonfly wings record an imprint of the hydrogen ratio at their birthplace, so a scientist can determine where a dragonfly came from by looking at how much of each hydrogen type is present in a tiny piece of the dragonfly's wing. That information revealed the three-generation migration system.

Why is this discovery important? Insects are critical players in food webs, so understanding how their populations are changing is important for conserving a wide range of species, from fish to Phoebes. Learn more at: vtecostudies.org/press-release-green-darner-migration.

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# Citizen Engagement



### **ATLAS OF** LIFE ON **iNATURALIST**

In 2018, the combination of our leadership and your participation shined a spotlight on the Vermont Atlas of Life on iNaturalist (VAL): Vermont led the nation in per capita iNaturalist engagement. Congratulations, Vermont citizen scientists!

VERMONT

"I was so taken by the concept of iNaturalist, that I acquired my first ever 'device,' an iPad, so that I could participate. Participating through iNaturalist has enriched my life immeasurably." -PAMELA DARROW

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#### eBird

Volunteers submit bird sightings early summer, volunteers travel and checklists that are vetted between roadside survey points by experts and added to a to listen for Whip-poor-wills and worldwide avian database. record surrounding conditions.

#### **GREEN MOUNTAIN eBIRDERS RULE!**

Spearheaded by Kent McFarland in 2003, Vermont eBird was the first state portal established for Cornell Lab of Ornithology's global eBird project. With 46,396 complete checklists submitted to Vermont eBird, comprising 591,638 bird records, representing 278 bird species, and tallied by over 2,125 Vermont eBirders in 2018, there is no doubt it was another banner year for birders and Vermont eBird.

#### **CITIZEN SCIENCE OPPORTUNITIES**



#### **Mountain Birdwatch**

Each June. volunteers hit the trails to complete bird survey routes on 123 mountain ridgelines across the Northeast.



#### LoonWatch

On the third Saturday in July, volunteers conduct a one-day census of Vermont's breeding loons. Loon monitoring throughout the summer is optional.



#### **Forest Bird Monitoring**

Each June, volunteers monitor breeding birds on 31 sites across Vermont in one of the continent's longest-running studies of forest bird population trends.



ont eBirders submitted dists from over 10,000

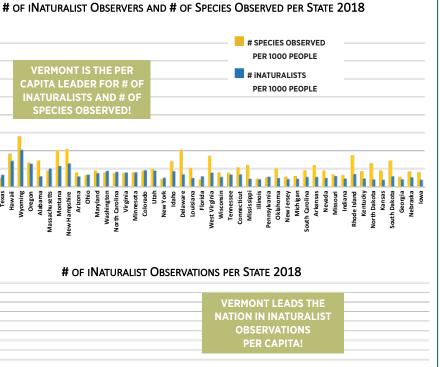
locations representing nearly every town in Vermont in 2018.

#### **Vernal Pool Monitoring**

In April, May, and September each year, volunteers visit and collect data to monitor "adopted" vernal pools following protocols and using using VCE-provided equipment.



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#### **CROWD-SOURCED CITIZEN SCIENCE TOOLS**

e-Butterfly

Volunteers report sightings and submit photos of butterflies across North America.



#### **iNaturalist Vermont**

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

# Outreach

"You make us feel good about everything you do to protect and appreciate wildlife around us. Thanks for allowing me to be a part of it." -VCE SUPPORTER

#### COMMUNICATING SCIENCE

#### **Outdoor Radio**

VCE's Kent McFarland and Sara Zahendra team up with Vermont Public Radio's Chief Production Engineer, Chris Albertine, to educate (and entertain) listeners of our popular monthly show, Outdoor Radio. You never know where they'll show up... In 2018, the crew joined forces with experts from around the state to delve into natural history topics from moose to mussels, and Bald Eagles to Bobolinks. They even did a show about road kill! Tune

in to your VPR station the third Wednesday of everv month at 6:20 PM. and again on Thursday at 7:50 AM, or listen online anytime at vtecostudies.org/ outdoor-radio.

#### Suds & Science

If you were one of the hundreds of folks who attended VCE's 2018 lineup of thought- and discussion-provoking evenings at the Norwich Inn, then you learned (and heard some great stories) about fascinating topics like the evolutionary origins of stress, how warming soils in Arctic mountains interact with global climate change, and the social history of invasive beavers

in the Fuegian Archipelago. Hosted by VCE biologist Jason Hill, Suds & Science isn't a lecture—it's a community gathering where fans of science can enjoy local craft beer and engage with experts from a wide variety of fields. You won't find yourself in a dark room watching boring PowerPoint slides; you'll be part of a lively crowd taking part in stimulating conversations with scientists who are passionate about their work. vtecostudies.org/suds-and-science

#### **Field Notes**

Field Notes, our twiceyearly printed science news magazine, provides in-depth articles about our latest research, findings, and conservation efforts. You won't find tedious text and jargon-rich sciencespeak here; expect the captivating writing and spectacular photography that is the hallmark of VCE's outreach from cover to cover. Find past issues online at vtecostudies.org/ field-notes.

#### 2018 OUT & ABOUT

14 WORKSHOPS

> 16 FIELD WALKS

22 PRESENTATIONS

**Citizen Science** Outreach Naturalist Nathaniel Sharp demonstrates to a group of budding herpetologists how to hold a Common Gartersnake without getting bitten or "musked."

Each month, nearly 4,000 subscribers receive eNews. VCE's electronic newsletter. Catch up on VCE conservation biology news, be inspired to explore the natural world with guidance from our "Field Guide to the Month." check out the winning iNaturalist Photo-observation of the Month, be informed of upcoming events, and so much more! Subscribe at vtecostudies.org/subscribe or find past issues online at vtecostudies.org/enews.

**eNews** 





#### **VCE'S FIRST CITIZEN SCIENCE OUTREACH NATURALIST**

In 2018, VCE amplified our citizen science outreach through the creation of a new position, Citizen Science Outreach Naturalist. We welcomed ECO Americorps member Nathaniel Sharp to serve as your go-to guy for questions about eBird, iNaturalist, e-Butterfly, and other citizen science tools, as well as any questions about Vermont's natural world. He traveled throughout the state, presenting talks and leading workshops about birds, butterflies, and citizen science, and led a few bird walks as well. While birds are his specialty, Nathaniel is a great naturalist, with special interest in butterflies, dragonflies and damselflies, reptiles and amphibians, and trees.



# Leadership

*"Every encounter I've"* had with VCE has strengthened my belief in the work you are doing, and how well you are doing it." -SUSAN GILLOTTI



#### **KEEPING THE NIGHT WATCH FOR VERMONT'S WHIP-POOR-WILLS**

For more than a decade, VCE has led a field project that takes place while most folks are fast asleep. Each summer, over two dozen adventurous Whip-poorwill Project volunteers venture out between sunset and sunrise to listen intently for the unmistakable call of the Eastern Whip-poor-will on moonlit nights. Their efforts helped reveal the precipitous decline in Vermont's Whippoor-will population, which led to the species being listed as state Threatened in 2011. Prior to these nocturnal survey

efforts, information on Whip-poorwill declines was primarily based on day time Breeding Bird Atlas surveys or anecdotal accounts. In addition to supporting volunteer-based surveys, Vermont Fish & Wildlife Department has partnered with VCE to conduct more intensive Whip-poor-will surveys in different regions of the state, providing more refined population estimates. Learn more about project results at vtecostudies.org/projects/ forests/whip-poor-will-project.





#### MENTORING THE CONSERVATIONISTS **OF TOMORROW**

In 2018, VCE further expanded its team of young conservation scientists, adding two ECO AmeriCorps members through the Vermont Department of Environmental Conservation to our two ongoing summer internships. VCE's engagement of these young biologists not only offers them invaluable experience, advances our program goals, and forges a positive collaboration among non-profit, higher education, and public agency partners, but it brings vouthful energy to the VCE lunch table!

Nathaniel Sharp joined the team as VCE's ECO AmeriCorps Citizen Science Outreach Naturalist. An accomplished and passionate birder, Nathaniel set to work immediately, offering birding workshops and eBird tutorials, and teaching members of the public how to contribute observations to the Vermont Atlas of Life using iNaturalist.



Alex Kulungian working in the field.

Alex Wells followed in the footsteps of outgoing

ECO AmeriCorps member Liza Morse as VCE's Vernal Pool Monitoring Project Coordinator. Liza oversaw the 2018 pilot season of this sophisticated, new citizen science project under the leadership of Conservation

Biologist Steve Faccio. Alex joined VCE in September to gear up for an expanded second season. Alex's energy and effective trainings led to a burst of publicity, and and Tara Rodkey he found himself on television news and radio programs!

Alex Kulungian was our UVM Rubenstein Perennial Intern in 2018. He spent the summer steeped in loon surveys at lakes and ponds across Vermont, and scaling mountains for pre-dawn Mountain Birdwatch surveys. Alex recalls, "Working with the staff of VCE was a huge privilege. Learning of the directions that led them to where they are now was highly valuable to me, as it has helped guide me as I consider my plans following college graduation."

Tara Rodkey was selected from a national pool as our third annual Alexander Dickey Conservation Intern. Tara ventured from San Diego, CA to the East Coast for the first time through this internship, which she described as, "an immersion into conservation biology and a community of peers and advisors steeped in all aspects of VCE's diverse work." Tara reflected, "The Alexander Dickey Conservation Internship gave me a chance to build the skills I need to do the work I love." For VCE, that's mission accomplished!

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Nathaniel Sharp and Alex Wells enjoyed helping the Orianne Society with their Wood Turtle surveys.



/CE's Jason Hill was nvited to speak at the national U.S. Postal Service First Day of Issue Dedication Ceremony for the "Birds in Winter" forever stamps at the Vermont Institute of Natural Science. Jason's presentation aimed to raise awareness about the importance of bird conservation, even for our most common birds and he pointed out five simple ways everyone can help.

# Collaboration

"I wanted to say <u>thank you to you</u> and your folks for *your great highlight* of our habitat stamp recently! It is extremely generous of you to support our efforts in this way, and a great help! Our shared mission is both more successful and more enjoyable because of our work together."



### **Crossing Boundaries for Conservation**

Participants in a community planning workshop in the town of Duverge

Team VCE-**BIOECO** (minus photographer Nicasio Vina Davila) in Cuba's Cuchilla de Toa mountain range

> More than 20 years ago, VCE biologists discovered that the Dominican Republic's Sierra de Bahoruco National Park provides critical wintering habitat for Bicknell's Thrush. More recent investigations by long-time Dominican conservation partner Grupo Jaragua revealed extensive deforestation inside the park from unsanctioned agricultural operations and other illegal



#### **ALLIES FOR AMPHIBIANS**

When roads pass through wildlife corridors, consequences can be deadly, particularly for amphibians. In Vermont, road mortality is considered a significant threat for five amphibians listed as Species of Greatest Conservation Need. The first step in alleviating this critical conservation issue is to identify amphibian road-crossing "hotspots" across the state. Toward that end, VCE teamed up with the Vermont Department of Transportation and two GIS modeling experts at the University of Vermont Spatial Analysis Lab to develop and pilot-test a model that can be used to identify potential amphibian-hazardous road crossing locations. When backed up by field verification, the model-based on landscape features, habitat proximity, and road characteristics-will help prioritize future mitigation efforts (such as culverts and "salamander tunnels").

Spotted Salamander

### FROM NEW ENGLAND TO CUBA. **BICKNELL'S THRUSH BONDS BIOLOGISTS**

Building on our newly-forged partnership with Cuba's Centro Oriental de Ecosistemas y Biodiversidad (BIOECO) in 2017, VCE returned to eastern Cuba in 2018 for our second field season in search of wintering Bicknell's Thrush. Despite abnormally rainy weather and numerous bureaucratic hurdles, our bi-national team persevered in Cuba's highest-elevation cloud forests and ultimately counted seven thrushes, successfully mist-netted two, and celebrated as our BIOECO colleagues placed the first-ever Cuban band on a Bicknell's Thrush! A strong bond with our Cuban sister organization only deepened as we hatched collaborative plans for VCE's return visit in 2019, and beyond.

> activities. Left unchecked, these threats would seriously degrade Bicknell's Thrush habitat and could lead to the extinction of many rare, endemic species. Recognizing that any effort to reform management of the park needs support of the government and local communities, VCE and Grupo Jaragua pursued a collaborative planning approach, which culminated in the 2018 Strategic Conservation Plan for Sierra de Bahoruco National Park. This plan aims to halt illegal deforestation and implement collaborative management of the park's unique forests for the mutual benefit of plants, wildlife, and humans.

### Conservation

#### **PREDICTING PRIME HABITAT** FOR BICKNELL'S THRUSH

Bicknell's Thrush breeds only in high-elevation balsam fir-dominated forests of the northeastern U.S. and southeastern Canada, where it is estimated to number fewer than 100,000 individuals. Compounding chronic threats to its summer breeding habitats, the plight of this species' Caribbean wintering grounds is even more dire.

An estimated 90% of the global population of Bicknell's Thrush overwinters on Hispaniola, the shared island of Haiti and the Dominican Republic, where destruction of forested habitats is severe and ongoing. Recognizing that swift and strategic action was needed to save this species' dwindling habitat, VCE biologist Kent McFarland and colleagues took action. Combining statistical modeling methods

with field surveys and occurrence data, they identified remaining key habitat for female thrushes (females tend to inhabit mid-elevation forests that are more vulnerable to human disturbance than the higher-elevation, more remote, relatively pristine cloud forests used by males) Then, applying criteria from their model to a region-wide assessment of private properties, they identified and helped to purchase the Dominican Republic's first-ever private reserve, the 400-ha Reserva Privada Zorzal. Seventy percent of the land in this reserve is designated as forest and "forever wild," while the remainder will support compatible crops such as organic cacao (chocolate). Their study was published in The Condor: Ornithological Applications. VCE hopes to apply these methods to help prioritize additional lands for conservation of Bicknell's Thrush on Hispaniola and elsewhere.

#### **GO KONZA, GO!**

In 2018. VCE's Rosalind Renfrew and Jason Hill invited the public to join them. via blogs and social media, as they live-tracked a freeliving Upland Sandpiper over a full year. Affectionately known as "Konza" in honor of the Konza Prairie in Kansas, where she was fitted for her solar-powered geolocator, this sandpiper gained a devout social media following as hundreds of readers eagerly awaited VCE's updates on her whereabouts.

The Upland Sandpiper is a long-distance migratory shorebird that breeds in northern North American grasslands

and travels 6,000 miles to southern South America each winter. Logging this particular bird's movements not only refined our understanding and appreciation of the species' extraordinary migration, but shed crucial light on habitat conservation considerations along its entire migration route. Watching Konza's progress unfold in real time underscored that management of migratory birds must be coordinated at continental, and even hemispheric, scales. Learn more at vtecostudies.org/blog/ live-updates-tracking-uplandsandpiper-trans-hemispheric-

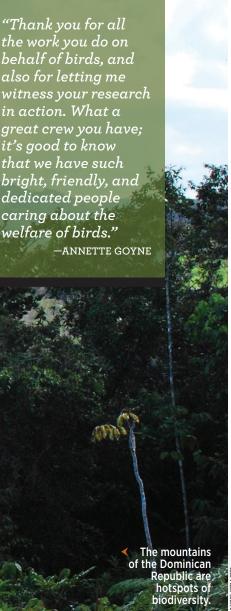
migration.

#### Vermont Forest Bird Monitoring-**Three Decades of Data**

VCE's Vermont Forest Bird Monitoring Program (FBMP) is one of the continent's longest-running studies of forest bird population trends. With the help of citizen science volunteers skilled in bird identification, the FBMP has systematically monitored songbirds in unmanaged, interior forests since 1989, amassing 30 years of population data. Why? Because most of these species are insectivores that play a crucial role in sustaining the ecological balance and productivity of forest ecosystems by consuming leaf-eating insects. Moreover, birds are sensitive indicators of environmental change, and a decline in bird abundance could signal trouble for the overall productivity and health of our forests.

So, what have we found in 30 years? Although by most accounts Vermont forests are healthy and robust, overall bird abundance on our study sites has declined slightly. And, while some species have responded favorably to our maturing forests, others have not. The most troubling sign is a significant decline in aerial insectivores—birds such as flycatchers that specialize in feeding on flying insects captured on the wing. This finding corroborates a widespread trend that ornithologists have documented within this group of birds, suggesting that broad-scale changes in insect populations may be the driving force, rather than effects of habitat loss or disease. Only by continued monitoring will we know if this trend persists or levels off as VCE and other researchers investigate the causal factors. vtecostudies.org/projects/forests/vermont-forest-bird-monitoring-program

"Thank you for all the work you do on also for letting me in action. What a it's good to know that we have such bright, friendly, and dedicated people caring about the welfare of birds."



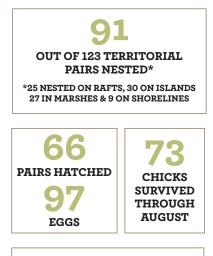




#### **VERMONT LOON CONSERVATION PROJECT**

#### **YEAR IN REVIEW**

With a legion of volunteers and partners, the Vermont Loon **Conservation Project has monitored** and managed the state's Common Loon population for over four decades. Our work brought loons from the brink of extirpation in 1983 (only seven nesting pairs statewide) to the thriving, secure population documented in 2018. While 2017 racked up record numbers of nests and chicks, 2018 saw a record number of adult loons counted on our annual LoonWatch day-356 (up from 308 in 2017)!



**NEW NESTING PAIRS WERE IDENTIFIED\*** LAKE LAKOTA, MITCHELL LAKE, OLD MARSH POND & LAKE PARKER



VOLUNTEERS TOOK PART IN LOONWATCH DAY

THE ANNUAL STATEWIDE LOON COUNT



#### STATEMENT OF FINANCIAL POSITION

ASSETS CURRENT ASSETS	AS OF 12/31/18	AS OF 12/31/17
CASH	\$800,590	\$678,360
CONTRIBUTION RECEIVABLES	23,888	105,476
GRANT RECEIVABLES	65,432	91,138
PREPAID EXPENSES	29,740	19,393
TOTAL CURRENT ASSETS	919,650	894,367
EQUIPMENT, VEHICLE, WEB, NET	48,859	17,600
TOTAL ASSETS	968,509	911,967
LIABILITIES AND NET ASSETS		
LIABILITIES		
CURRENT LIABILITIES		
ACCOUNTS PAYABLE	41,677	7,738
ACCRUED PAYROLL & RELATED TAXES	91,863	73,497
DEFERRED REVENUE	4,076	679
CURRENT PORTION OF CAPITAL LEASE OBLIGATION TOTAL CURRENT LIABILITIES	1,207 138,823	81,914
IOTAL CORRENT LIABILITIES	130,023	01,914
CAPITAL LEASE OBLIGATION, LESS CURRENT PORTION		
TOTAL LIABILITIES	142,627	81,914
EQUITY		
UNRESTRICTED	532,019	507,740
TEMPORARILY RESTRICTED	293,863	322,313
TOTAL NET ASSETS	825,882	830,053
TOTAL LIABILITIES & NET ASSETS	\$968,509	\$911,967

#### **STATEMENT OF ACTIVITIES**

ORGANIZATIONS, FOUNDATIONS 37 INDIVIDUALS 50	2018 EXPENSES           58,648         SCIENCE AND COI           70,825         MANAGEMENT           08,698         FUNDRAISING           49,349	NSERVATION \$789,246 208,229 101,744
OTHER TOTAL REVENUE \$1,0	7,529 95,048 TOTAL EXPENSES	\$1,099,219
PROGRAM FEES 5% OTHER 1% PUBLIC AGENCIES 14% INDIVIDUALS 46% ORGANIZATIC FOUNDATIO 34% The figures that appear in the financial summary shown ab	FUNE MANAGEMENT 19%	SCIENCE AND CONSERVATION 72%



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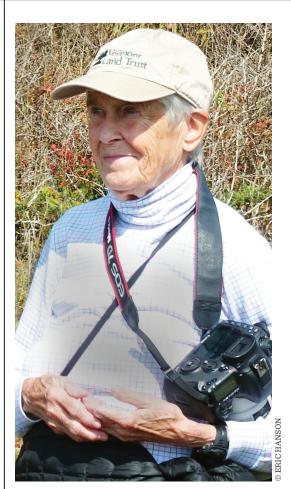
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#### 2018 JULIE NICHOLSON CITIZEN SCIENCE AWARD



### **ELINOR OSBORN**

The Julie Nicholson Citizen Science Award honors Julie Nicholson's extraordinary passion and commitment to birds and wildlife conservation through her many years of tireless work as a citizen scientist and VCE volunteer. It is presented annually to an individual who exemplifies Julie's dedication to the cause of citizen science and conservation. We presented the 2018 award to Elinor Osborn.

Elinor Osborn somehow manages a commanding presence with nary a word. She might be the most capable birder in a group, but you won't know it unless you're listening. Hers is a knowledge borne of experience, a quiet confidence without an ounce of hubris. One gets the impression that she has nothing to prove, but so very much to offer.

Elinor's dedication to the natural word began more than 50 years ago. In the mid-1960s in upstate New York, while working as a music teacher (and her husband George as a trombonist in the Rochester Philharmonic Orchestra), Elinor served as a volunteer wetland site monitor for the Genesee Land Trust, and participated in Project Tanager and Birds in Forested Landscapes projects for the Cornell Lab of Ornithology. Also an accomplished professional photographer, she donated her photography to the Genesee Land Trust and the local chapter of The Nature Conservancy.

After retiring, she had the good fortune to follow the Trumpeter Swan Migration Project, photographing and writing a children's book about it. Elinor and George started coming to Vermont to ski at the Craftsbury Outdoor Center in the early 80s, and moved to the area soon after. That's when Elinor began photographing loons and participating in VCE projects.

"Elinor has covered Great Hosmer Pond as an adopt-a-lake volunteer since the 1990s," says Eric Hanson, VCE's loon biologist and leader of VCE's Vermont Loon Conservation Project. "She and George spent many nights helping me with loon banding efforts and nighttime rescues. They kayaked lakes all over the Northeast Kingdom to monitor loons for VCE."

Before George passed away, he joined Elinor on some of her adventures. She recalls one night vividly-canoeing in the dark amid lurking stumps, watching Eric spotlight and eventually capture a loon. Back on shore, she watched as Eric banded the loon and collected blood and feather samples. "On the same night on another lake, before another capture, we saw clouds of bats darting and shining silver in the spotlight, just above the water. That loon was entangled in fishing line. While I held the loon's beak just enough to keep it from opening, Eric surgically removed the line, then returned the loon to the water. Then we tumbled into our motel beds at 4am after a wonderful night with loons." These adventures and others led Elinor to write and photograph an article on loon conservation in Vermont for Vermont Life Magazine in 2003.

In addition to Elinor's meaningful work with Vermont's loons (you will frequently see her loon photos in VCE materials), she has contributed significantly to other VCE citizen science projects, including The Second Atlas of Breeding Birds of Vermont, the Vermont Butterfly Survey, and the Vermont Bumble Bee Atlas.

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loons on Lake Raponda

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- U.S. Fish & Wildlife Service U.S. Forest Service Office of International Programs
- U.S. Geological Service White Mountain National Forest

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