



**VERMONT CENTER
FOR ECOSTUDIES**

**PARTNERING WITH CITIZEN SCIENTISTS TO PROMOTE
WILDLIFE CONSERVATION**

BY Anne Richter Arnold

PHOTOS COURTESY OF VERMONT
CENTER FOR ECOSTUDIES



Vermont Center for Ecostudies (VCE) works throughout North and South America to promote wildlife conservation by teaming research scientists with volunteers in the field. Across two continents and in every type of ecosystem, VCE biologists gather and analyze information about wildlife, from birds to frogs, all to help understand trends and influence conservation policies. The scale of their work would be minimal without the help of ordinary people in the field—what they call “citizen scientists.” Farmers, landowners, photographers, and backyard wildlife enthusiasts give their time to help collect crucial data for VCE’s important research.

Chris Rimmer, executive director of VCE, says this would be impossible on such a large scale without community participation. “People depend on healthy ecosystems. And increasingly, healthy ecosystems depend on people who have the knowledge and motivation to manage them wisely. At VCE, we excel in science that guides and inspires conservation. Our work gathers strength from volunteers—citizen scientists who monitor wildlife in the Northeast—and from a robust network of partners that extends from Canada through the Caribbean to South America. Our approach is successful because conservation is as much about people as it is about ecology.”

Locally, VCE has several important ongoing projects. Whether watching for birds, photographing wildlife while walking their dogs, or monitoring the landscape for fragile ecosystems in transition, citizen scientists are an important part of VCE.

Volunteers help search for frog and salamander eggs at a vernal pool in Sharon, Vermont. Photo by Steven D. Faccio. **Inset photos, from top:** Tiger Spiketail dragonfly (*Cordulegaster erronea*). This dragonfly travels on streams and rivers east of the Mississippi and rarely this far north. Dale Ferland snapped the photo on the Black River in Springfield, Vermont. It was posted on iNaturalist Vermont, a project of the Vermont Atlas of Life. On rainy spring nights, spotted salamanders migrate en masse to vernal woodland pools to mate and lay eggs, then return to the forest for the rest of the year. Photo by Steven D. Faccio. Male Bobolink in Derby, Vermont. Photo by Doug Gimler.

UPPER VALLEY GRASSLANDS

VCE's biologists work alongside owners, managers, and stewards of grasslands in the Upper Valley and beyond. They help landowners adapt their management strategies to accommodate the needs of nesting grassland birds, which are undergoing a steep population decline, while meeting the overall goals for the property, such as aesthetics, invasive species control, recreation, and hay production. In 2018, the project will expand to include teaching interested participants how to measure and monitor the success of their efforts by learning to recognize and record evidence of breeding and fledgling songbirds in their grasslands.

Project leader Dr. Rosalind Renfrew explains why this project is dependent on the community. "Starting with the landowners is so important because they are there all the time and have a special type of engagement attached to the outcome. We provide information and advice on the land and sometimes point them to where they can get financial assistance through conservation programs. Engaging landowners in stewardship of their properties is crucial for working against a declining trend for a species, and these practices have a direct impact."

Dr. Renfrew adds, "Our objective is establishing a certain number of acres and maximizing the acres to save some habitat for birds. In the past three years, we have put 800 acres under management with 50 landowners. We will now teach them to monitor their own progress in helping the birds have a better habitat, pairing them with citizen scientists to teach them more about the birds and increase their skills. The landowners in the project are so important to its success. We want them to get other landowners involved to show how we can manage the land better in terms of long-term sustainability."

MOUNTAIN BIRDWATCH

One of VCE's longest-running citizen science projects, Mountain Birdwatch, takes place across the entire Northeastern US and adjacent Canada. More than 100 participants learn to recognize the songs and calls of high-elevation nesting songbirds, and then, on one day each June, they hike to a specific mountain ridgeline to conduct pre-dawn bird surveys. The same 103 routes have been completed annually now for more than a decade and have provided valuable data to managers and conservation planners across the Northeast.

Dr. Jason Hill describes the project. "The Mountain Birdwatch takes place every June on a single day, with volunteer citizen scientists observing birds on hiking trails 2,000 feet and up. Because it is only 10 species, it is a manageable number [of birds] to learn, and we give people a lot of training materials to help them become familiar before going out.

"We also give them specific routes with three to six sampling points that remain the same every year. This effort and these data provide information about the population, helping to track and monitor changes in these specific areas. The data are used for a host of conservation efforts in the Green and White Mountains, such as appropriately siting wind turbines and ski trails to minimize impact and to help determine conservation land for rare bird species in the area."

VERNAL POOL CONSERVATION

Vernal pools are seasonal wetlands found in forested areas that are breeding grounds for some species of insects and amphibians, such as the spotted salamander, the wood frog, and the fairy shrimp. Conservation of these wetlands has declined over the years. These species need about three months of water to successfully breed, so they are threatened if their habitats are disturbed or destroyed. They can't easily move to another breeding site, and if conditions change, their chances of survival diminish.

VCE and its partners, Arrowwood Environmental and Vermont Fish and Wildlife, mapped the locations of nearly 5,000 vernal pools across Vermont with help from citizen scientists. The map, updated annually, is already helping landowners,





Clockwise from left: VCE biologist Roz Renfrew talks with dairy farmer Paul Miller about options to protect grassland birds nesting in his pasture. Photo by Cathryn Abbott. **Inset:** Meadowlark. Photo by Dan Kim. Roz with an Eastern Meadowlark, one of the grassland nesting birds. Photo by Dan Kim. Jason Hill in the field. Photo by Jaidon Lalor. A group of birders train their binoculars on peregrines high in the sky. Photo by Kent McFarland.





Clockwise from above: Mountain Birdwatch citizen scientists survey birds at dawn on mountain ridgelines across New York and New England. Photo by Wendy Cole. Steve Faccio in the field. Photo by Susan Hindinger. VCE hosts landowner workshops to discuss hayfield management to benefit grassland birds. Photo by Roz Renfrew.



municipal officials, and citizen naturalists protect these wetlands and their vibrant communities of wildlife. Now that VCE has identified and mapped the location of potential vernal pools in every Vermont town, trained volunteers are field-verifying their exact locations.

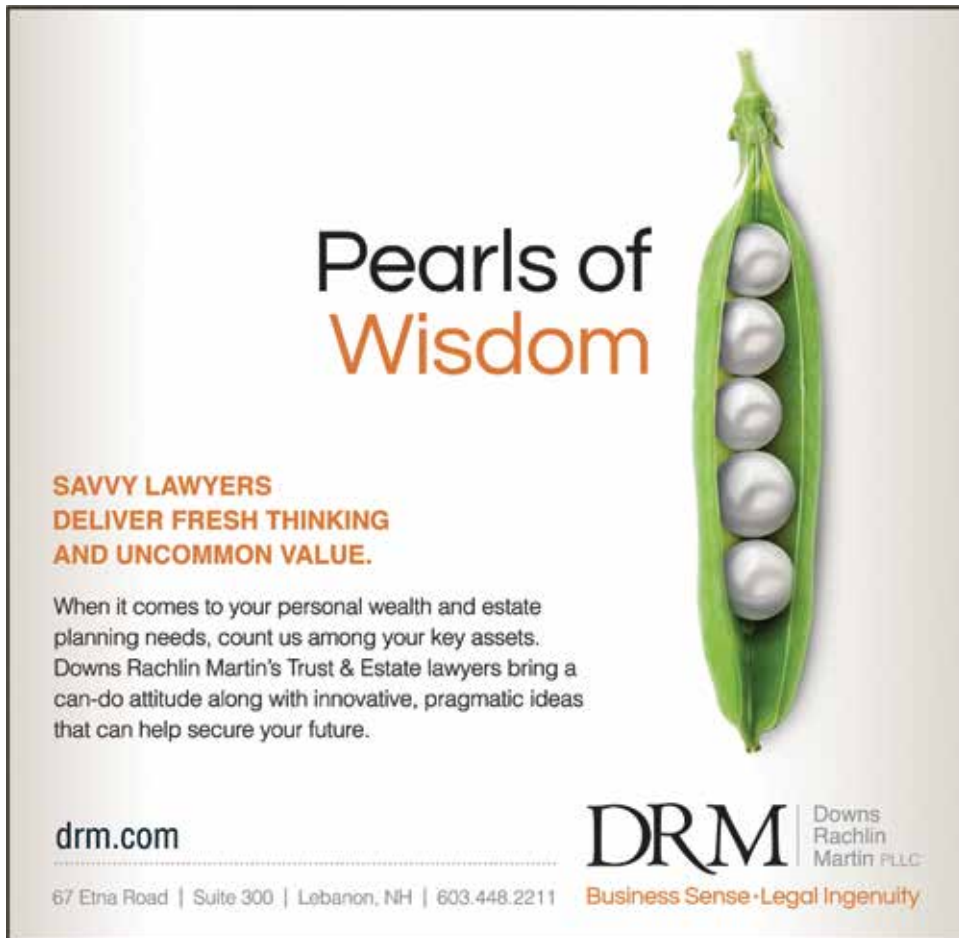
Project leader Steve Faccio explains, "A new vernal-pool monitoring project kicks off this spring and is a long-term endeavor. Currently, we are looking for about 30 volunteers who would work in teams to monitor 15 pools, and in subsequent years, we would like to expand to monitor about 50 pools. The teams will go to the pool two or three times in the spring and observe the breeding wildlife, check water quality and level, and timing.

"This information will help create a picture of how things are changing and how environmental factors affect a species. The data will help to detect changes in these fragile ecosystems, and the protocol will serve as a model for use in other states in this region. Open-source information accessible online provides important information to state and federal agencies that are mandated to protect the species."

HARVESTING DATA

VCE manages several digital tools and databases that gather crowd-sourced information more informally. Perhaps the most familiar of these is Vermont eBird, the first state portal for what is now a global program through the Cornell Lab of Ornithology. Bird-watchers keep checklists of every species they observe and report them on ebird.org. Another digital portal is iNaturalist Vermont, a state portal for the now global iNaturalist.org. Participants can take a photo of any living thing in nature and—whether they can identify it or not—upload the photo to iNaturalist.org. The iNaturalist.org community views each other's observations and confirms or corrects identifications. A third digital portal is eButterfly, which functions just like eBird only with butterflies.

In each of these projects, VCE's role



Pearls of Wisdom

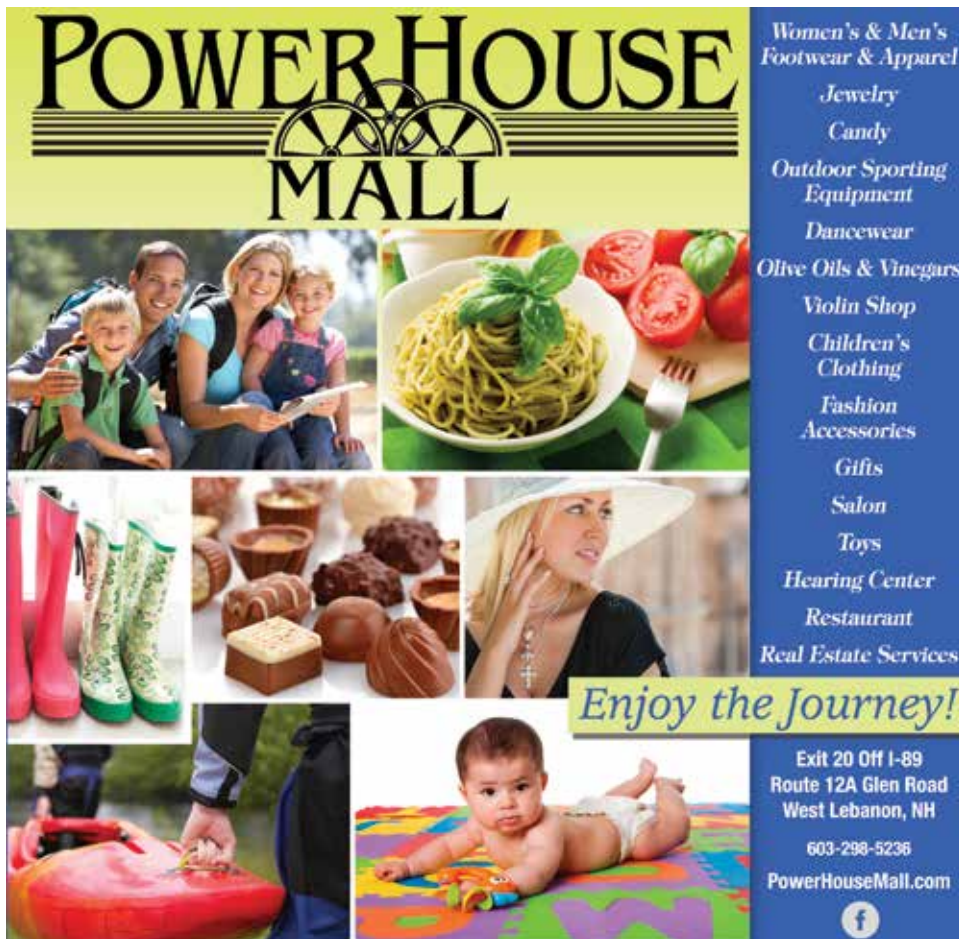
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Sin-ying Ho: Past Forward

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In her ceramic art, Sin-ying Ho shares a worldview that acknowledges the inherent contradictions and challenges of global culture while also anticipating the uncanny beauty emerging all around us.

Sin-ying Ho, One World, Many People no. 2 (detail), 2010, porcelain, hand-painted cobalt pigment, high fire under-glaze decal transfer, glaze. Courtesy of the artist and Ferrin Contemporary.

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is to recruit, educate, steward, and encourage participants, and then to analyze the data these platforms provide, which can be very powerful and cover much larger geographies than the small staff alone could. VCE manages all these citizen science projects under an umbrella project called the Vermont Atlas of Life.

VCE’s Kent McFarland states that these platforms provide a scale not possible with just their research staff. “These projects take advantage of people’s passion to harvest the data for science. We have found that crowdsourcing works well for gathering information. It would be impossible to create this kind of data set by using just biologists, even in a place as small as Vermont.

“We get about a million pieces of data in a year. People who care about nature are putting their observations together with others like pieces of a puzzle to find out what is going on in an ecosystem. For instance, we can get information on what the changes are in bird population, and we can stave off things that can be harming them.”

Kent notes, “Since most people have a smartphone in their pocket all the time, it’s easy to post data with iNaturalist Vermont. With citizen science, people have discovered new populations of plants, dragonflies, and other wildlife in everyday experiences like when fishing or out for a walk, all by accident. Biologists like me look at these photos and record the species. I know of three times people have just taken a photo that turned out to be a new species for Vermont. The impact they can have with one photo is amazing.”

Kent summed up the ease of becoming a citizen scientist. “It doesn’t have to be a National Geographic expedition, it can be a walk in your own backyard. Every little piece of information we get can collectively make a big impact on conservation. If we work together, we can make a huge difference.”

For information on becoming a citizen scientist with VCE, visit vtecostudies.org.