Field Notes

VERMONT CENTER FOR ECOSTUDIES
UNITING PEOPLE & SCIENCE FOR CONSERVATION

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Spring 2009

Uniting People and Science for Conservation

Putting Vernal Pools on the Map

For many, a chorus of clucking Wood Frogs is a welcome sign of spring, a small but important event marking the end of a long winter. To me, it also represents an ecological connection between a group of terrestrial amphibians and the small, isolated breeding pools on which they depend—the symbolic, albeit quacky, voice of an ecosystem unique to the post-glaciated Northeast.

© Steve Faccio

Jefferson Salamanders depend on vernal pools for breeding.

In recent years, scientists and naturalists have documented the surprisingly high diversity and productivity that vernal pools support. This awareness has led to an understanding that these pockets of biodiversity play an extremely important role in the ecological landscape, offering essential habitat to a wide range of species. In fact, many ecologists consider vernal pools to be a "keystone" ecosystem; that is, an ecosystem whose effects on the surrounding landscape are much greater than would be expected based on their size. Vernal pools fit this definition by virtue of their diverse biological communities, substantial productivity of invertebrate and amphibian biomass, and significance as "stepping stones" for dispersing individuals.

Vernal pools are seasonal wetlands, filling with snowmelt and spring rains, but often drying up by late summer. This cycle of flooding and drying, which prohibits permanent fish populations, is the key feature that allows successful breeding of the wildlife species adapted to these unique conditions. Many vernal pool breeders are considered "High" and "Medium" priority Species of Greatest Conservation Need as outlined in the Vermont Wildlife Action Plan. These include Jefferson, Blue-spotted, Spotted, and Four-toed salamanders, and vernal pool-dependent invertebrates such as fairy shrimp, several freshwater snails, and a few dragonflies. In addition, vernal pools are used for feeding and resting by a wide variety of other animals, from Spring Peepers to Grey Treefrogs, Barred Owls to Wood Ducks, shrews to bats, and Spotted Turtles to Garter Snakes.

While most vernal pool-breeding amphibians can reproduce successfully in other fishless wetlands—including beaver ponds, shallow edges of swamps and marshes, and man-made ponds—the significance of vernal pools to persistence of their populations cannot be overstated. The loss of a single vernal pool in any given area of Vermont could easily cause the demise of the local Wood Frog population, along with any pool-breeding salamanders that breed there. Invertebrates like fairy shrimp, which spend their entire lives

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Conserving Birds in the Florida Mangroves

By some estimates, it would require approximately 1.12 million mosquito bites to drain every drop of blood from the body of an average adult human. It has also been suggested that the best place to verify this estimate is in the mangrove forests of southern Florida. Here, during those brief periods when mosquitoes are idle, legions of no-see-ums and other biting flies take their place. South Florida's mangrove forests are also home to other larger, living hazards: American crocodiles, American alligators, several species of sharks, and Burmese pythons, to name a few. Add to these the fact that travel within the mangroves is difficult at best, often requiring a boat and keen navigation skills to negotiate the maze of tidal creeks that drain these wetlands.

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Red Mangrove in bloom.

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The Vermont Center for Ecostudies (VCE) is a nonprofit organization whose mission is to advance the conservation of wildlife through research, monitoring and citizen engagement. With a reach extending from northern New England through the Caribbean to South America, our work unites people and science for conservation.

Our annual appeal will be mailed in mid-November. Your support in any amount will help us achieve our conservation mission.

Field Notes is VCE's biannual newsletter and is free to citizen scientists, donors, and partners.

VERMONT CENTER FOR ECOSTUDIES
UNITING PEOPLE & SCIENCE FOR CONSERVATION

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In Memorium

Two recent developments have brought close to home the key message conveyed by VCE's tag line, "Uniting people and science for conservation". On a very personal level, we were deeply saddened to lose Julie Nicholson, who succumbed to illness on March 23. In addition to being a remarkable person and cherished friend to all of us at VCE, and throughout Vermont, Julie epitomized what a volunteer citizen scientist is all about. She gave generously and graciously of her energy in innumerable ways—busting blocks during both the first and second Breeding Bird Atlases, shepherding the Records of Vermont Birds for 30+ years, serving as a member and de facto coordinator of the Vermont Bird Records Committee for longer than anyone can remember, coordinating the Woodstock Christmas Bird Count since its 1975 inception, conducting scores of Birdathons that raised thousands of dollars for bird conservation…the list goes on.

Julie did all this with a quiet, self-effacing grace and good humor. Never one to draw attention to herself, we feel fortunate that Julie "allowed" us to feature her in our last *Field Notes* (fall 2009). The photo of Julie on a bicycle at the tender age of ~75 says it all to the many of us who knew and loved her. She will be missed as a friend, fellow birder, and ardent conservationist. We dedicate this issue of *Field Notes* to Julie's memory. The Vermont birding and conservation community will benefit from Julie's legacy as long as migrant and resident birds ply our skies, forests, fields, and waters.

A recent report, 'The State of the Birds', provides a further window into why dedicated people like Julie Nicholson are so crucial to advance avian conservation. Mostly sobering, but in part uplifting, this collaboratively-authored document (available on the web at www.stateofthebirds.org) summarizes recent disturbing trends in U.S. bird populations—of 800 native species, 67 are federally endangered or threatened, while another 184 are of conservation concern. As indicators of ecological integrity, birds are bellwethers of our environmental and cultural health. While so many current signals and messages are disheartening, this report also highlights the numerous conservation successes on which we must collectively build. Fittingly, it touts the pivotal role that citizen scientists like Julie have played in contributing to our understanding of bird population trends. The task before us all, to unite people and science for conservation, is now more important than ever.

—Chris Rimmer

Network with VCE on the Web!

Now you can keep updated on the happenings at VCE through our blog, Facebook, Twitter, and Flickr group!

facebook http://www.facebook.com/pages/Vermont-Center-for-Ecostudies/56930912454

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in a single pool, would face certain extirpation. Moreover, if we think of vernal pools as islands in a sea of upland forest, we see that groups of pools form stepping stones of hospitable habitat along which wetland-dependent wildlife may travel. Animals may skip from pool to pool in search of more suitable habitat elsewhere. If the wetland mosaic of pools in an upland matrix is destroyed or severely degraded, wildlife populations may become isolated and more vulnerable to changes in their surroundings.

VERNAL POOLS SUPPORT RICH BIOLOGICAL COMMUNITIES THAT ARE DEPENDENT ON THE EPHEMERAL NATURE OF THESE KEYSTONE ECOSYSTEMS, INCLUDING AMPHIBIANS AND INVERTEBRATES.

Given the important ecological values of vernal pools, and the significant natural heritage they support, it follows that efforts to conserve them should be a top priority. They are wetlands after all, and wetlands, as we know, are protected under a multitude of rules and regulations. However, the very characteristics that render vernal pools so valuable ecologically (small, isolated, and ephemeral), also make them easy to ignore by regulators and difficult to locate remotely. The Vermont wetland rules currently protect only Class I and II wetlands, excluding all but the largest vernal pools. At the federal level, the Army Corps of Engineers can claim jurisdiction over vernal pools only for projects that impact larger, non-isolated wetlands. Complicating all this is that the location and distribution of vernal pools across Vermont's landscape is poorly known because most do not appear on National Wetland Inventory maps, which identify only those wetlands larger than about one acre in size.

To address these short-comings, VCE has launched the Vermont Vernal Pool Mapping Project (VPMP). In collaboration with ecologist Michael Lew-Smith of Arrowwood Environmental, VPMP will map potential vernal pools throughout Vermont and field-verify the presence of a subset of these potential pools using a corps of trained volunteers. In the process, we will develop a GIS layer of potential and known vernal pools, as well as a database populated with biological and physical attributes of each verified pool.

Potential vernal pools will be identified by examining color infrared aerial photographs with a stereoscope, a tool that provides a three-dimensional view of the landscape and facilitates the identification of small pools. This mapping process is laborious and time-consuming, as each potential vernal pool location must be transferred to digital orthophotographs in GIS software. We will conduct this multi-year mapping project in phases by dividing the state roughly into thirds based on regional planning districts. During 2009, we are focusing on the northern third of Vermont, shifting to the central region next year, and to southern counties in 2011.

Conservation begins with knowing where on the landscape a particular resource occurs. Without that critical baseline information, it is too easy for a piece of the ecological puzzle to slip through the regulatory cracks, increasing its vulnerability to loss or degradation. Once completed, VPMP will provide federal and state agencies, as well as municipalities, with information that will greatly enhance conservation planning, help conserve species that depend upon vernal pools, and preserve the ecological values associated with these critical, but often overlooked, wetland habitats.

—Steve Faccio

Help Field-Verify Vernal Pools

If you like hiking off-trail and have an interest in conservation, then the Vernal Pool Mapping Project may be for you. Volunteers are needed to help field-check mapped potential pools, collect biological and physical data, and report locations of unmapped vernal pools. Three volunteer training workshops are scheduled for early May in northern Vermont (visit the website below for dates and locations). Workshops will train participants to identify vernal pools and their indicator species, and how to participate in this new statewide citizen science project.

For more information:
www.vtecostudies.org/VPMP/
sfaccio@vtecostudies.org

2008 Peer-Reviewed Publications

Frey, S. J. K., C. C. Rimmer, K. P. McFarland, and S. Menu. 2008. Identification and sex determination of Bicknell's Thrushes using morphometric data. Journal of Field Ornithology 79:408-420. Documented measurements that allow researchers to more reliably distinguish between Bicknell's Thrush and its near-identical congener, Gray-cheeked Thrush, and between male and female Bicknell's Thrushes. The ability to make such distinctions will enable researchers to learn more about the non-breeding biology of both species.

Hallworth, M., P. M. Benham, J. D. Lambert, and L. Reitsma. 2008. Canada Warbler (*Wilsonia canadensis*) breeding ecology in young forest stands compared to a red maple (*Acer rubrum*) swamp. Forest Ecology and Management 255:1353-1358. Compared the ecology of Canada Warblers breeding in partially harvested versus uncut forest habitat in New Hampshire. Canada Warblers required smaller territories in uncut forest, but males in both forest types had similar reproductive success. Appropriately managed forest stands that are 6-20 years post-harvest can provide Canada Warbler breeding habitat.

Read the full text and find more articles on our website.

Hallworth, M., A. Ueland, E. Anderson, J. D. Lambert, and L. Reitsma. 2008. Habitat selection and site fidelity of Canada Warblers (*Wilsonia canadensis*) in central New Hampshire. Auk 125:880-888. Evaluated selection of breeding habitat by Canada Warblers in New Hampshire to determine the type of habitat in which they are most successful. Males breeding in forests with dense subcanopy vegetation were most successful in terms of pairing success, return rates from one year to the next, and fledging young. Timber harvest practices that create or maintain high shrub density and residual standing trees could help stabilize declining Canada Warbler populations.

Lambert, J. D., D. I. King, J. P. Buonaccorsi, and L. S. Prout. 2008. Decline of a New Hampshire Bicknell's Thrush population, 1993-2003. Northeastern Naturalist 15:607-618. Documented a 7% annual decline in Bicknell's Thrush populations over a 10-year period in New Hampshire's White Mountains. The first paper to demonstrate Bicknell's Thrush population declines.

Renfrew, R. B., D. H. Johnson, G. Lingle, and D. Robinson. 2008. Avian response to meadow restoration in the central Great Plains. Proc. North American Prairie Conference 20:313-324. Compared grassland bird assemblages on natural and restored meadows in Nebraska. Natural meadows supported higher densities of upland bird species, whereas generalist species occurred at higher densities in restored meadows that were characterized by more woody vegetation and greater vegetation height and density.

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The first described nest of a Western Chat-Tanager.

Rimmer C. C., L. G. Woolaver, R. K. Nichols, E. M. Fernandez, S. C. Latta and E. Garrido. 2008. First description of nests and eggs of two Hispaniolan endemic species: Western Chat-tanager (*Calyptophilus tertius*) and Hispaniolan Highland-tanager (*Xenoligea montana*). Wilson Journal of Ornithology 120:190-195. Expanded our limited knowledge of the breeding biology of Hispaniolan birds by describing the first known nests and eggs of two endemic species. Highlighted the serious problem of nest depredation by feral cats and rats of these and other endemic Hispaniolan birds.

Rodenhouse, N. L., S. N. Matthews, K. P. McFarland, J. D. Lambert, L. R. Iverson, A. Prasad, T. S. Sillett, and R. T. Holmes. 2008. Potential effects of climate change on birds of the Northeast. Mitigation and Adaptation Strategies for Global Change 13:517-540. Used models to assess potential effects of climate change on the distribution of birds breeding in the Northeast, including high-elevation species such as Bicknell's Thrush. Evaluated the effects of climate change on habitat quality of a migratory songbird, the Black-throated Blue Warbler. Bird communities are predicted to change dramatically, and even the most common species such as Black-capped Chickadee are predicted to decline markedly in abundance. Over half of the region's high-elevation habitat will be lost with only a 1°C increase in mean July temperatures. Reduced habitat quality for mid-elevation species like the Black-throated Blue Warbler is predicted to result in lower fecundity and ultimately population declines.

Mangroves—continued from page 1

These and other features, while daunting to humans, have kept many aspects of this beautiful and remarkably wild ecosystem clouded in mystery. Two bird species that occur in the mangroves of Florida, Mangrove Cuckoo and Black-whiskered Vireo, are found nowhere else in North America. Mangroves also harbor two distinct subspecies restricted to this habitat: the Florida Prairie Warbler and Cuban Yellow Warbler. All four of these birds are virtually unstudied in North America. Contrast that with Bicknell's Thrush, which has been the focus of nearly 20 peer-reviewed scientific publications in the last decade alone! We know almost nothing of the specific habitat requirements or population sizes of any mangrove-dependent bird species, and little about their life history, breeding biology, or distribution.

Our ignorance about magrove birds is especially problematic given the array of threats facing this unique habitat. Nearly all remaining mangroves occur on public land, mostly in Everglades National Park, but even these protected forests are at risk from rising sea levels, the spread of exotic plants and animals, and increasingly destructive hurricanes. Efforts to better understand, predict, and perhaps lessen the consequences of impending changes for mangrove avifauna hinge on our ability to better understand their needs. Further, the mangrove bird community may act as an early-warning system, alerting us to changes in the health of this ecosystem.

With all of this in mind, I and my colleague Gary Slater, of Ecostudies Institute, initiated a study that spans nearly all the remaining mangroves in Florida. With support from the Florida Fish and Wildlife Conservation Commission, the National Park Service, and the US Fish and Wildlife Service, we are conducting the first-ever comprehensive survey of mangrove avifauna. Since 2008, we have collected data on the abundance, distribution, and habitat use of birds in mangroves. Our short-term goals are to estimate population size and determine habitat requirements of birds breeding in these forests. Ultimately, we will establish protocols for long-term bird monitoring in mangrove habitats.

Results from our 2008 field season revealed preliminary details about the structure and composition of this unique avian assemblage. We found that the mangrove bird community is dominated by several relatively abundant and widespread species: Northern Cardinal, White-eyed Vireo, and Red-bellied Woodpecker. A second group of species, including American Crow, Florida Prairie Warbler, and Great-crested Flycatcher, occur at more moderate abundances, with detections at approximately 50% of our survey points. The remaining species are rare and patchily distributed. Cuban Yellow Warblers appear to be expanding northward, but are still found only on the Florida Keys and the smaller back keys scattered across Florida Bay. What, if anything, prevents them from colonizing the mainland remains unclear. We rarely detected Black-whiskered Vireos, but they occurred in nearly every type of mangrove forest. Mangrove Cuckoos are perhaps the most enigmatic mangrove-dependent species. We detected only a handful, all along the fringes of Biscayne Bay in southeastern Florida. They almost certainly occur elsewhere, but their secretive behavior may demand more intensive survey methods if we are to unravel the elusive details of their life history.

© John Lloyd

Aerial view of the intricate weave of a mangrove swamp.

Our work in mangroves, slated to continue for several more years, is an important first step, but much remains to be learned. Unfortunately, time is not on our side. Although we hope the scientific community will focus greater efforts on this ecosystem and its birds, amateur ornithologists can play an invaluable role. Answers to the myriad of remaining questions can be gained simply by having more keen observers afield. Are Mangrove Cuckoos migratory—as is currently thought—or resident year-round in Florida's mangroves? They are rarely found in winter, but this may be because they escape detection when not singing. When do Florida Prairie Warblers begin breeding? We time our surveys based on studies conducted in the Keys (where the species breeds in April and May), yet individuals can be heard singing during January in Everglades National Park. Which, if any, migratory species overwinter in the mangroves of Florida? The breeding season of mangrove-dependent species is thought to be shaped in part by competition from migrants that visit these forests in winter, but we know very little about composition of the bird community inhabiting mangroves outside of the breeding season. Mosquitoes and alligators? No problem. The risks they pose are far outweighed by the many natural history wonders that await visitors to the mangrove forest. Now you can add citizen science among the reasons for your next birding trip to south Florida.

—John Lloyd, Mountain Birdwatch Director (VCE) & Florida Mangrove Director (Ecostudies Institute)

Citizen Science: A Human Perspective

Citizen science involves a unique partnership between volunteers and scientists, a relationship with lasting, tangible benefits to both parties. The volunteer often learns new skills and can contribute to a meaningful research project. Scientists can address their research question at a much larger scale with less demand on resources. But what about the less obvious benefits? I'd like to diverge from our usual feature of an outstanding citizen scientist and devote this article to exploring some of the personal benefits I have gained from coordinating a citizen science program.

I have been coordinating Mountain Birdwatch for three years. Mountain Birdwatch is arguably the most arduous ecological citizen science project in existence. Volunteers adopt a mountain on which they conduct standardized counts for high-elevation birds. They hike up steep terrain for miles, often in remote areas on muddy trails while being devoured by that most infamous of northern forest blood suckers—black flies. Moose encounters are regular. Trails are often poorly-marked.

© Kent McFarland

Julie Hart, Mountain Birdwatch Coordinator, atop Mount Washington.

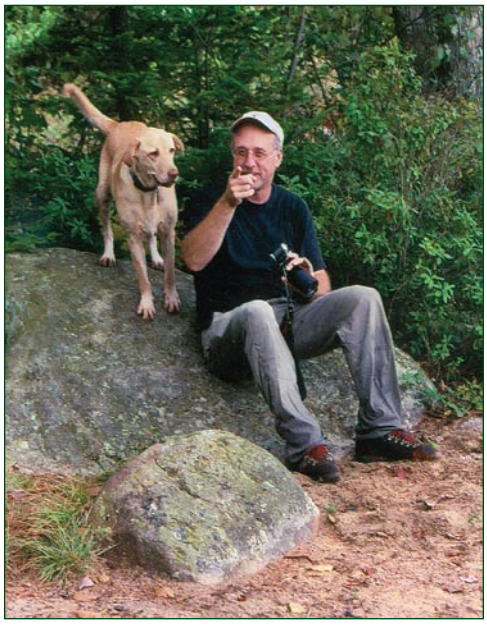
The survey itself begins at dawn (~4:15 a.m.), which requires camping out the night before or hiking in the pre-dawn darkness. There is only a three-week window to conduct the survey, right in that frequently stormy period during the first half of June. Surveys are often foiled by unexpected thunderstorms or high mountain winds. Temperatures can vary dramatically, from a humid 80 degrees during the hike up, to below freezing overnight. To top it off, the focal species, Bicknell's Thrush, is often never heard, much less seen.

Despite these formidable challenges, our network of 150 dedicated Mountain Birdwatch volunteers keeps returning year after year, their enthusiasm unabated. Never has a person shied away from surveying because the expectations were too high. On the contrary, volunteers express a feeling of guilt that they will let down the program, and ultimately hinder the chances for successful conservation of the birds and habitat we survey. The "excuses" I have heard range from the self-deprecating, "I don't know the birds well enough" or "I'm getting too old to hike and hear Blackpoll Warblers," to the responsible "I have bought a new home and am in the middle of moving," or "I just started a new job and can't make the time." More often than not it is life's major milestones that seem to interfere—childbirth, sickness, or death. It is these intimate glimpses into so many people's lives that reinforce my great admiration and respect for the volunteers I work with.

I can tell you who has "retired" or taken a year off to have a child, and who has had a serious illness or a death in the family. I am astounded when people express remorse or guilt for missing a survey because their child has a brain tumor, their parents have passed away, or they have been in a car accident that resulted in broken bones. And I tell you, it happens every year, multiple times a year. This is what gives me inspiration—amazing people, doing something good on their own precious time, with no expectation of compensation, who feel responsibility for unpredictable and unavoidable events.

This summer will be a little different for me. One, it will be my last season working with these wonderful people: I will be moving on to start a PhD program in Wyoming next fall to study avian ecology and conservation. It will be a new adventure for me, but it will make this summer bittersweet. Second, and far more importantly, our network will be two fewer. This past fall, two Mountain Birdwatch volunteers passed away, sadly and unexpectedly.

Allyn Culver lived in upstate New York where he was the Head of the Parole Department at the Franklin County Correctional Facility. He was the adoptee of an isolated peak north of the Adirondacks, Debar Mountain, which overlooks Meacham Pond. I covered for Allyn one summer and I can vouch for the fact that Debar was not an easy route. I am a native Vermonter and have hiked throughout the Northeast my entire life, but never have I experienced such relentless mosquitoes! They



© Tina Culver

Allyn Culver and dog Chloe, at Lake Lila in the Adirondacks.

easily pierced my synthetic clothes, leaving me with no choice but to wear long-sleeves, pants, gloves, hat, and bug net in 80 degree heat—even then I had to run to keep from being eaten alive. Seriously. You can visit yourself this June if you don't believe me. On top of that, the first survey location requires a bushwhack over a deep ravine. Remember that the survey starts at dawn, and you won't be surprised to hear that I had balsam fir whiplash in my eye. I vowed never to return. But Allyn was dedicated and took it all in stride. Debar was "his" mountain. Debar Mountain does not support Bicknell's Thrush, and Allyn passed before he ever saw or heard one. This summer, Allyn's widow, Tina, is adopting Snowy Mountain to continue his legacy. Allyn's favorite quote was by Desiderius Erasmus, translated as, "Whether summoned or not, God is present." I have faith that Tina will feel Allyn's presence when she hears the wiry song of a Bicknell's Thrush blowing through the fir trees atop Snowy this summer.

Airie Lindsay, from St. Johnsbury, Vermont, inherited the birdwatching gene from her mother as a child in Connecticut. She was devoted to helping wildlife and began developing her naturalist skills as a camp counselor in her teenage years. Around 15 years ago, while listening to bird audio recordings, Airie observed that there were no training tapes combining the songs and calls of birds with their habitat and natural history. She hatched the idea to create her own "BirdTalk" series. She participated in a sound recording workshop in the Sierra Nevadas with the Cornell Lab of Ornithology and was working on the project right up to her passing. Education was very important to Airie. As President of the Northeast Kingdom Audubon Society, she developed opportunities for children to become birdwatchers and led bird walks for people of all ages. The Airie Lindsay Scholarship Fund was created in her memory to send children to nature camps in Maine.

© Libby Hillhouse

Airie Lyndsay, Mountain Birdwatch, loon recovery, and bird atlas volunteer.

Airie did it all: she was a Mountain Birdwatch volunteer in northern New Hampshire, most recently for Percy Peaks, as well as an active atlasser for the Vermont Breeding Bird Atlas and a volunteer for the Vermont Loon Recovery Program. While talking to her family for this article, Airie's energy and passion for the outdoors were palpable.

Airie and Allyn will be missed, that much is clear. But this article is about more than that. It is meant to inspire and reflect the passion of the countless individuals who devote their energy to citizen science programs. It is truly a win-win situation—for the volunteer, the researcher, our community, and our shared natural history heritage. I continue to be reminded of the good in people, of how much we achieve every day, and of the fragility of our lives. I feel truly blessed to know so many wonderful people.

—Julie Hart, Mountain Birdwatch Coordinator

Citizen Science Opportunities

If you enjoy watching wildlife and wish to contribute to protecting our natural heritage, then it's time to join the VCE team. Consider becoming a citizen scientist.

Project	Website/email	Leader	Season	Ability
Vermont and Hispaniola eBird Report and explore bird sightings with this online checklist.	ebird.org/content/vt/ ebird.org/content/hispaniola/ kmcfarland@vtecostudies.org	Kent McFarland	Year-round	Beginner to expert
Mountain Birdwatch Adopt a mountain and survey Bicknell's Thrush and other mountain songbirds.	www.vtecostudies.org/MBW/ jhart@vtecostudies.org	Julie Hart	June	Beginner to expert. Hiking required.
Loonwatch Participate in the annual one-day census of Vermont's breeding loons.	www.vtecostudies.org/loons/ ehanson@vtecostudies.org	Eric Hanson	mid-July	Beginner to expert
Vermont Loon Recovery Program Help monitor nests and lakes.	www.vtecostudies.org/loons/ ehanson@vtecostudies.org	Eric Hanson	Spring-Summer	Beginner to expert
Forest Bird Monitoring Program Help track long-term changes in populations of interior forest songbirds.	www.vtecostudies.org/FBMP/ sfaccio@vtecostudies.org	Steve Faccio	June	Able to identify forest birds by sight and sound. Hiking required.
Vernal Pool Mapping Project Help map vernal pool locations statewide by conducting field visits to potential pools.	www.vtecostudies.org/VPMP/ sfaccio@vtecostudies.org	Steve Faccio	Primarily Spring, also Summer and Fall	Beginner to expert

A Muddy, 15-year Milestone on Hispaniola

December 9, 1994—walking silently at dawn into pristine broadleaf forest of the remote Sierra de Bahoruco, my heart skipped a beat as a familiar *'beeer'* call sounded from thick understory. A broad grin followed, and a new chapter in my life began. This first encounter with a wintering Bicknell's Thrush launched what has since become one of VCE's signature programs. I recently returned from another trek to Hispaniola, probably my 22nd or 23rd visit (I lost count long ago), and I'm amazed at how much VCE and our many partners have accomplished there over the past 15 years.

© Pat Johnson

Chris Rimmer and the training crew at Loma la Canela on the one sunny day of our 2009 field expedition.

This recent trip was hands-down my most multi-faceted, a reflection of VCE's diverse conservation agenda on the island. My activities over 16 days spanned a full gamut from slogging through indescribable mud in the rain-drenched Cordillera Septentrional, to teaching eager young biology students proper bird-handling techniques, to presenting talks at a formal workshop of 60 Spanish-speaking participants. It was a whirlwind two-plus weeks—exhilarating, challenging, heartening, frustrating, entertaining, productive.

This trip was especially memorable for the networking and relationship-building opportunities it presented. Courtesy of a MacArthur Foundation grant to colleague Eduardo Iñigo-Elias of the Cornell Lab of Ornithology for local capacity building on Hispaniola, we were invited to lead an intensive field training session in the Dominican Republic. We assembled eight aspiring conservation trainees (three Haitians and five Dominicans) for separate week-long workshops at two long-term VCE study sites. Our goals were to provide hands-on instruction in avian field monitoring—bird identification, mist-netting and banding, point counts and spot-mapping, accurate data recording, and general principles of conservation biology. Fundamentally, we sought to immerse these young professionals in a concentrated field experience that would inspire their pursuit of conservation careers.

Space precludes full details here, but the first workshop at Loma la Canela was indelibly characterized by two elements: rain and mud. Rain began during our second night and fell with only intermittent breaks over the next five days. Picture 13 people camping in a remote mountain location, tromping repeatedly back and forth over trails that quickly transformed from caramel-colored clay to butterscotch mousse, in nearly unrelenting rain. Mud, serious mud, unimaginable mud ruled the day, all five days, in fact. Yet incredibly, our group, despite a few downcast moments, rose to the occasion in a way I'd never have thought possible. Their collective spirit stared down the challenging conditions with humor, patience, optimism, enthusiasm, and team work. We spent countless hours huddled under blue tarps, with a few rain-free interludes that enabled netting and banding, but many mad dashes to close nets as clouds suddenly unleashed their moisture. We managed to capture 45 birds overall, including seven Bicknell's Thrushes (two recaptures from 2008), and everyone was able to try their hand at all aspects of the banding process.

The group next headed to Sierra de Bahoruco for the second (rain-free) workshop at Pueblo Viejo, while I remained behind for a series of meetings that culminated in a formal workshop to launch an innovative conservation initiative for the eastern Cordillera Septentrional. Focused on Bicknell's Thrush as a biodiversity "indicator" for this important region, our goals are to forge a locally-based program combining economic incentives, protected areas infrastructure enhancement, and forest habitat restoration. Sixty attendees participated in our workshop, and the day was aptly summed by Jaime Moreno, a local businessman and environmentalist, who proclaimed to all: *"Thanks to this little bird, all of these people have finally come together"*. The collective energy has been summoned, the players assembled, and the momentum established. There is much yet to do, and the hurdles remain high, but the next phase of VCE's work on Hispaniola holds great promise. It's all about collaboration and partnerships.

—Chris Rimmer

Read Chris's full report at http://www.vtecostudies.org/hispbird/

Do Sign Buoys Protect Nesting Loons?

Boaters visiting many of Vermont's loon lakes in recent summers have surely observed white sign buoys floating near islands or at the entrances to marshy coves. These signs urge boaters to stay outside the designated area, in order to minimize the risk of disturbing loons on nearby nests. The Vermont Loon Recovery Project (VLRP) began using warning sign buoys in the late 1980s, when fewer than 15 loon pairs nested statewide. With the steadily increasing trajectory of Vermont's population (61 confirmed breeding pairs in 2008), VLRP has been eager to evaluate the effectiveness of this management tool.

Circumstantial evidence, and our own strong intuition, suggest that warning signs have played an important role in increased loon nest success over the past 15 years. However, to test this perception and generate meaningful data, we needed a science-based study. Enter Anika Klem, a Sterling College student who approached us about conducting her senior project with VLRP. We quickly settled on a project that would combine VLRP's 30 years of loon nest success data with a targeted research project to document recreational impacts to nesting loons. Anika developed a protocol to measure the vulnerability of nest sites using a "nest exposure index" (NEI), where the relative exposure of individual nests to potential human disturbance (e.g., boat traffic, human shoreline activity) was divided into three categories of low, medium, and high nest exposure.

In 2008, we placed 2-8 sign buoys on 35 loon territories, at distances of 10-50 meters from known nests. Most buoys were situated around exposed nest sites, such as those on islands and nesting rafts, rather than around nests tucked away in coves or on well-concealed shorelines. Anika had to account for this difference in her study design and data analyses using the NEI; raft and island nests have higher success than shoreline nests, largely because of their relative inaccessibility to predators. In 2008, nest success on rafts and islands was 91% and 81%, respectively, while only 65% of shoreline nests successfully hatched chicks.

Preliminary results of Anika's study strongly suggest that VLRP nest warning signs have had a major positive impact on loon nesting success in Vermont, especially at "high risk" sites (Table 1). This preliminary assessment of sign buoy effectiveness did not, however, explicitly account for differences in nest site location as well as other factors that might influence nest success (e.g., shoreline development, recreational access, recreational activities, components of the NEI, lake size). We plan to conduct a more rigorous statistical analysis to include these other factors. As data on nest success and corresponding next exposure become available from other Northeastern states, we intend to conduct a comprehensive regional assessment.

Table 1. Loons have a higher nesting success when signs are anchored near their nests.

Nest Warnings Signs	Nest Success	
	High Nest Exposure	Low Nest Exposure
Signed	81% (246 nests)	89% (85 nests)
Unsigned	55% (143 nests)	71% (215 nests)

Most boaters and other lake recreationists have learned to respect loon sign buoys, contributing to a steadily growing "culture" of loon awareness on Vermont lakes. These buoys have created a self-perpetuating positive feedback loop, by influencing some vigilant lake users to warn unaware boaters to stay outside signed areas. One drawback is that the signs do attract attention, especially when placed around newly-established nesting sites. Several years may be required for a lake community to fully understand and respect sign buoys, but there is little doubt that they constitute a valuable tool in VLRP's management repertoire.

—Eric Hanson (VCE) and Anika Klem (Sterling College)

© Ray Richer

Common Loon with two young taking advantage of the safety afforded by protective signs.

Drink Responsibly

With thoughtful consumption, an army of coffee drinkers could help both army ants and our native songbirds. Army ants travel in colonies of over one million individuals through Central American rain forests, or in this case, coffee plantations. But not every plantation is a good base for the troops.

Army ants swarm across the ground and up tree trunks searching for food. Anything alive and small enough to carry back to the colony is fair game. Most insects, spiders and centipedes don't have a chance. Even some small frogs and snakes can be taken. Prey scatters while attempting to escape.

A shade-grown coffee plantation in Nicaragua, where over 30 species of Neotropical migrants have been reported.

Some songbirds get their meals by perching on a low branch in front of the marauding ants and catching the fleeing prey. The relationship between birds and ants is so tight that some species of birds are never found far from army ant swarms.

So what does all of this have to do with coffee? Sun coffee plantations are the dominant means to produce coffee. Sun coffee is a hybrid coffee that shuns the shade. The natural forest is cleared and coffee trees are planted in tidy rows. The ground is kept clear of weeds, and pesticides and fertilizers are applied. Production is high, but so are the ecological costs to ants, birds and local people.

Under natural conditions, coffee is an understory shrub that thrives in deep shade. Traditionally, small farmers grow coffee under a thick canopy of trees, usually without the use of chemicals. These rustic coffee plantations mimic a natural forest, complete with thick leaf litter covering the soil, humid and cool air, and army ants and birds. Scientists have found that a typical shade coffee plantation can harbor up to 90 percent more bird species than sun coffee.

A team led by University of Georgia researcher Dina Roberts spent two years studying birds that live in the vicinity of western Panama's coffee plantations and forests. Two species, the Ruddy Woodcreeper, a small brown bird that often clings to tree trunks like a woodpecker, and the Gray-headed Tanager, a bluebird-sized songbird with a gray head and bright yellow underparts, were only found near swarming ant colonies. The scientists documented 124 species of birds that were most often found near marauding army ants. Many of these were migratory songbirds that nest in New England.

"One of the most vivid accounts of bird attendance at the swarms, especially by a migratory species, was Swainson's Thrush," noted Roberts. "Comparatively small numbers of these birds wintered at our sites and at any particular swarm, one would detect between one and three Swainson's Thrushes. However, during the northward migration in April, on several different occasions I came upon ant swarms or detected a swarm raid by the thrush calls. It was common to see over ten thrushes foraging above one swarm. Once I saw 23 Swainson's Thrushes at a swarm. They would forage on insects and then often flew to a shade tree to eat fruit."

Roberts and her colleagues never found army ants and the attending birds in sun coffee plantations.

So, how can that steaming cup of java in your hand help? If it is a cup of certified shade-grown, organic coffee it could help promote a local market, a group of traditional family farmers, an army of ants, and a beautiful spring song.

Not all shade grown coffee is created equal. Coffee grown under the Smithsonian Migratory Bird Center's "Bird Friendly®" certification program is based on years of careful biological research. It literally has science behind the certification. Farms must meet stringent criteria for rich and structurally complex habitat. Other shade grown coffee may originate from plantations with just a single species of shade tree, heavily pruned and supporting little more biodiversity than sun grown plantations.

VCE believes that science-based certification is the best way to ensure your cup is filled with conservation coffee. That is why we recently teamed up with triple-certified Birds&Beans coffee, to help you drink responsibly. Please join us in drinking certified "Bird Friendly®" coffee!

—Kent McFarland

VCE Events

Natural History Exploration in Grafton


© Kent McFarland

Dusted Skipper

When: Saturday, June 6th, 2009, 7 a.m. to 1 p.m.
Where: Riverledge Farm in Grafton, Vermont
Registration: Call Melissa, 802-649-1431 x7

Join VCE and the Nature Museum of Grafton on Saturday, June 6 for a morning of nature exploration at Riverledge Farm in Grafton, Vermont. A diverse group of naturalists, professional biologists and educators will lead natural history walks, bird banding demonstrations, and other hands-on activities throughout this special property. Our goals will be to have fun, generate excitement, and compile a list of all flora and fauna that we find on the Riverledge property. Field explorations will take place in three back-to-back sessions beginning at 7 a.m., and participants will have the opportunity to experience different activities in each session. Activities include guided walks to search for birds, reptiles and amphibians, butterflies and dragonflies, stream critters, and plants. Bird-banding demonstrations will be offered throughout the morning, and several activities will offered for children. The morning will conclude with a noon lunch and popular talk on climate change adaptation by ornithologist, climate change expert and southern Vermont resident, Hector Galbraith.

Registration will be required for this event, with a modest admission fee of $6 for adults and $3 for children under 12 to help defray costs. Please register by calling Melissa, 802-649-1431 x7. Space is limited.

VCE Birdathon 2009

When: May 16th to 23rd, 2009
Where: Anywhere
Registration: www.vtbirdathon.org

Spring is here and once again the VCE staff invites you to be an active conservation supporter by venturing out to celebrate the return of our migratory birds with the VCE Birdathon. We are planning our annual low-carbon hike up Pico Mountain in search of the elusive Bicknell Thrush, followed by miles of biking along back roads. We encourage you to join us by forming your own Birdathon team or sponsoring our team: www.vtbirdathon.org.


© Roz Renfrew

The VCE 2008 Birdathon team, dressed for snow, sleet, and rain.


© Doug Hardy

Check out our Annual Report for 2008, featuring program highlights and a financial summary. Available on our website.

Receive the next issue of Field Notes in your inbox! Sign-up for an e-version on our website.

Field Notes
Vermont Center for Ecostudies
PO Box 420
Norwich, VT 05055

Wood Frog (*Lithobates sylvaticus*)

© Steve Faccio

In early April when spring rains and melting snow begin to seep into the ground, Wood Frogs are aroused from their frozen state and undertake their annual migration to breeding pools. Remarkably adapted to the cold, it is not unusual to find individuals scampering across old snow or swimming in water amidst breaking-up ice. Wood Frogs are explosive breeders, and most mating in a given pool takes place over just a few days. The loud duck-like calls of males are often a key to finding these pools. Females often deposit their gelatinous egg masses communally, and hatch 20-30 days later. By mid- to late-summer nearly all juvenile frogs have left the pool as it dries up; >70% of these will succumb to predation before reaching adulthood. Surviving males return to breed at the age of one to two years, while females do not breed until they reach two years.

Cool Facts

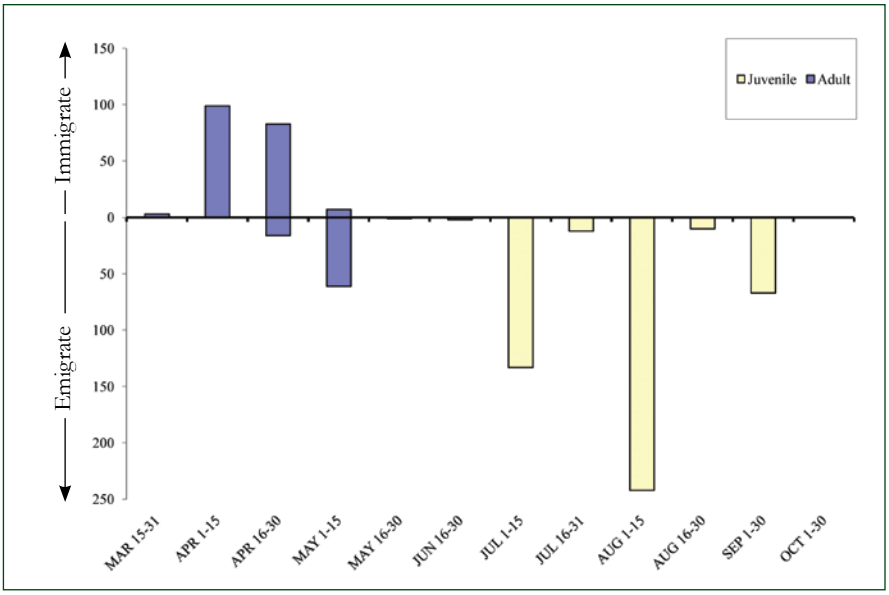
- Wood Frogs are the most widely distributed amphibian in North America, even reaching north of the Arctic circle.
- Eggs often become covered by symbiotic algae (*Oophilia ambystomatis*) that enhance the oxygen supply to developing embryos in exchange for nutrients and carbon dioxide.
- Mark-recapture studies have shown that nearly 100% of adults return to pools in which they originally bred, and only about 18% of juveniles disperse away from the pool in which they were born.
- The center of an egg mass may be up to 5°F warmer than the surrounding water, speeding development.
- When ice begins to form inside the body of a Wood Frog, glucose levels increase in its blood by as much as 200-fold in just eight hours. This "antifreeze" effect preserves tissues and organs through the long winter.

Conservation

Wood Frog populations can be directly affected by habitat destruction, especially loss of vernal pools to development, poor forestry practices, and highway maintenance. A study by VCE biologist Steve Faccio found that Wood Frog tadpoles in montane forests had high mercury burdens. Tadpoles sampled from a vernal pool on the summit of Stratton Mountain, Vermont, had an average 0.193 ppm of mercury.

How You Can Help

Report any vernal pool breeding sites or help verify vernal pools with the Vermont Vernal Pool Mapping Project: http://www.vtecostudies.org/VPMP/.



Phenology of Wood Frog migration to and from breeding pools at Marsh-Billings-Rockefeller National Historical Park, Woodstock, VT.