

Field Notes ¶ Ecology

*A Publication of
The Field Naturalist ¶ Ecological Planning Programs
at the University of Vermont*

*Volume 22
August 2010*



Table of Contents

Editor's Note	3
Buzz Words and Band Wagons	4
Sustaining Change	5
Meet the class of 2011: <i>Alces alces</i> (AA)	6
Meet Our Unsung Hero: Lillian "Porky" Reade	9
Good Natural History	10
Raven Ridge: A Story of Place	12
Midwinter	14
Transformation in a Bristol Landscape	15
What did you do last summer? Z10 Master's Project Experience	16
Trees, East and West	20
Hidden in Plain Sight: Culture and Ecology in the Champlain Valley	21
Inspiration and Action	22



Editor's Note

Early last fall, we jokingly considered publishing our most creative speculations on natural history and conservation in a scientific journal -- but we could not imagine an interested venue. Instead we opted to publish our own journal. As we began to edit this year's issue of *The Ecolog*, we dubbed it "The Journal that Cares" to indicate our willingness to consider more open-minded, 'out-of-the-box' approaches to conservation. Scientific reality should drive conservation initiatives, of course, but that reality holds little sway if the public is not interested. The antidote? A widespread, deeply held conservation ethic that comes from a heightened sense of place and a greater appreciation of the connection between people and nature. In the end, heart-felt caring opens ears and minds to realities that otherwise would be ignored.

In this issue, you will find evidence of transformation— altered perspectives, towns in transition, and new approaches to conservation. All reflect the energetic evolution that characterizes the Field Naturalist-Ecological Planning (FNEP) program. To date, we have graduated 26 cohorts of Field Naturalists (teams A – Z) and ten cohorts of Ecological Planners (teams 1-10). Last May we graduated the "Z10" team, leaving us with a quandary: with the alphabet exhausted, how should new FNEP teams be identified? We considered many possibilities but ultimately decided to become the "AA team" to reflect the diminishing division that exists between the FN and EP program - our collective cohort is now one. To celebrate this milestone, we have chosen to share identities with an organism with which we share initials, *Alces alces* (the moose). We're still working on how we should comport ourselves as FNEP moose, but our spirit, energy and dedication certainly haven't diminished. We're still committed to saving the world!

As we seek to guide the next face of conservation, the *Alces alces* team of FNEPs pays tribute to naturalists from days of yore, drawing from them our inspiration for the living history photos (featuring AA team members) on pages 6 -8.

Read, enjoy, ask questions, and stay in touch.

The AA Team Newsletter Editors (ordered alphabetically):

Tate Bushell
Rose Graves
Neahga Leonard
Sam Schafer-Joel

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Other Photos: The AA and Z10 Teams

Artwork: Charlie Hohn, Rosemary Mosco and
Pamela Johnston

Comments? Questions? Feedback? Personal
updates? We'd love to hear from you!



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Buzz Words and Band Wagons (or) How to Get Nowhere After Lots of Trying

Jeffrey Hughes

What is your immediate, knee-jerk reaction to the following?

*critical habitat habitat fragmentation non-native species
environmental education liberal right wing*

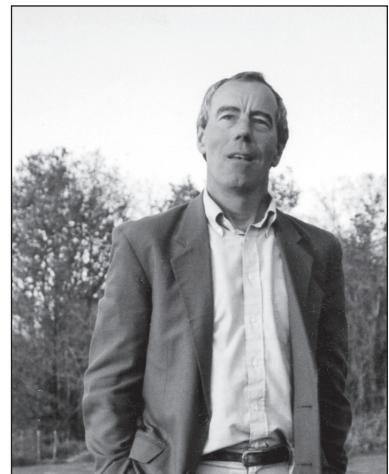
How would Rush Limbaugh react to those same terms?

Rush Limbaugh and well-meaning environmentalists share a number of defining traits: both are crusaders who preach a gospel of absolute truths, both are effective at energizing their choir, both seek to broaden their choir by educating the clueless, and both scratch their head a lot wondering how seemingly smart people can hear their truths and still not get it. In the back-and-forth war of discordant proselytizing, both sides try to find answers to three interlocking questions: How do we win more battles? How do we get our message to soak in? How do we effect “change” in others?

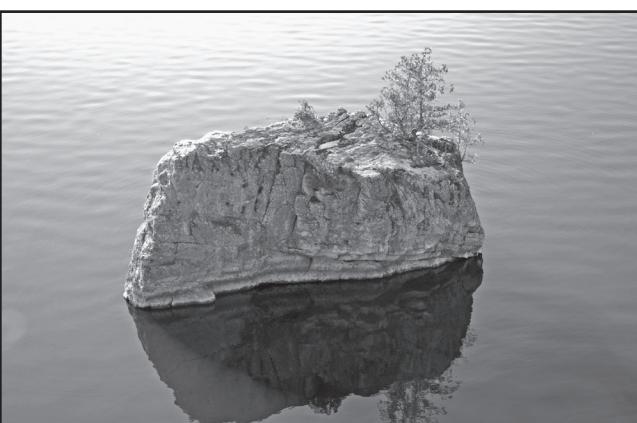
One way to bring about change is to study and employ the tactics of successful rabble-rousers and firebrands. History certainly proves that focused anger can move mountains. Not every committed environmentalist has the aggressive temperament needed to foment anger in the citizenry, however, and many on the sidelines respond better to a more reasoned approach. That’s where education fits in – sort of.

Reality check: when you propose “education” as a critical action step, what is your real intent? Is it to open minds to new ideas and ways of thinking (regardless of whether or not listeners ultimately embrace your viewpoint) or is it to get people to accept your favored values and perspectives as the right ones? There is quite a difference between “education” – which seeks to open minds to limitless possibilities – and “indoctrination” -- which seeks to close minds to a singular view. Even dumb people see indoctrination for what it is, and they distrust it. Indoctrination posing as “education” undermines our efforts to do good.

Meaningful education only works if people are open-minded, of course -- if they’re willing and able to withhold judgment and give fair consideration to ideas and perspectives that differ from their own. True open-mindedness, unfortunately, tends to be in short supply. The way to improve it in others is straightforward: recognize that you’re probably not all that open-minded yourself. Open-mindedness is more than letting others have their uninformed say before you straighten them out with the truth. If you’re not willing to give careful consideration to what others have to say, and to challenge your own views as vigorously as you challenge the views of others, you’re no better than those you rail against. Open-mindedness is a two-way street; set an example and others will follow.

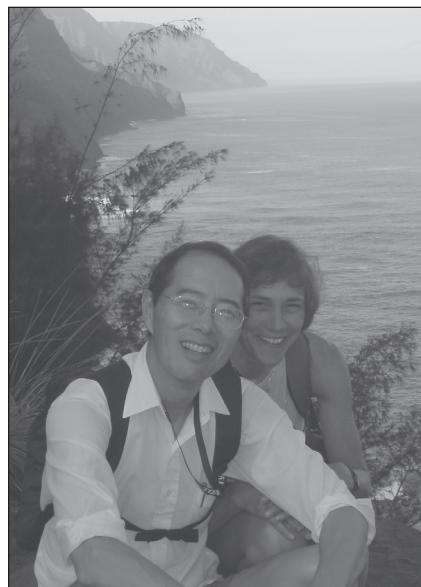


Jeffrey Hughes is the director of the Field Naturalist graduate program, and an associate professor in the Plant Biology Department and the Rubenstein School of Environment and Natural Resources.



And be careful about what you say and how you say it. When trying to convince the unconvinced, avoid facile “enviro-speak”: nothing erodes credibility faster than using buzzwords that you can’t defend or explain clearly. If you claim a place to be “critical” or “unique” habitat, for example, be prepared to explain exactly what you mean by that. Critical habitat for which species? When? Why? If you can’t defend a word or statement, don’t use it.

Last, do your homework before jumping on bandwagons -- always know where the wagon is going before hopping aboard. Bandwagons carry lots of baggage and, as a bandwagon groupie, you will be held accountable for that baggage.



Deane Wang is the director of the Ecological Planning program and a professor in the Rubenstein School of Environment and Natural Resources.

In this complex world, where everything is connected to everything else, sustainability has emerged as an important criterion for decision-making. Sustainability principles suggest ways in which we can evaluate behaviors that would increase our probability of maintaining a desirable long-term future. As most of you working in this area know, the ambiguity of translating principles into specific defendable action is high. An additional challenge is the changing context of environment and society from local to global scales. What we choose to sustain one day might create unintended challenges tomorrow. Sustaining agriculture with chemicals, for example, evolved into excess nutrient problems, and sustaining health through pharmaceuticals has caused rapid population growth in some areas and chemical residuals in water that now threaten normal biological development.

As we search for a deeper kind of sustainability, we need the skills to rigorously and critically evaluate diverse information from a complex world. We need to be adept at organizing and synthesizing data from seemingly contradictory disciplines (e.g. classical economics and ecology). We need adaptable frameworks that allow us to see and understand the complex relationships among the things we care for. We need to be able to bare our own values and biases and open our minds to alternative ways of understanding the world so that we can find common ground among seeming adversaries.

No academic program can prepare you to do all this; no curriculum can give you the complete set of knowledge on how to create sustainable ecosystems; no menu of action creates harmony between humans and the natural world; no comfortable place can be found to escape the uncertain future we bring upon ourselves. Yet many solutions to many parts of the puzzle are being implemented every day. Vermont is a hotbed of invention and re-creation of a human and natural community that can function more smoothly as one. The Ecological Planning and Field Naturalist experience will challenge you to think harder and work harder than you have before... and in doing so help you along your path to sustaining change.



Meet the class of 2011: *Alces alces* (AA)



Tate



Rose



Charlie

Tate Bushell

I believe in the little things: saying hello to strangers, rising early to watch the sun rise, and pausing to watch a leaf fall from the sky. Beyond this the world gets pretty complicated. I have spent the past few years banding shorebirds, rehabilitating raptors, and teaching children. Currently, I am working with the New Hampshire Nature Conservancy to monitor revegetation of pine barrens ecosystem prescribed burns. I am very interested in the relationships that humans have with themselves and with nature.

I have dreams of being the oldest person in a town whom all of the people come to see. They ask me about the forest, the river and the wild things I know so well. I sit smiling and tell the story of it all.

Rose Graves

I was raised in the Northeast Kingdom of Vermont where I spent most of my childhood running around in the woods, streams, and fields and have been lucky enough to never spend a full summer inside. After earning a degree in Wildlife Ecology from the University of Maine, my restless need to learn about nature and contribute to conservation and land stewardship

led me from New England to Montana and South America. I've worked with high altitude birds in Vermont, tracked mammals in the snow of New Hampshire, and monitored all kinds of wildlife in burned and riparian habitats in Montana. My roots run deep and ultimately I returned to learn more fully about my place and contribute to conservation of working and wild landscapes. I believe deeply in the power of people, community, exploration, and education. In the meantime, I am still lucky enough to spend plenty of time running around hills, wetlands, woods, and fields.

Charlie Hohn

Charlie Hohn spent his childhood years exploring a suburban wasteland south of Los Angeles, California, where he searched for nature under rocks, in puddles, and on tree bark. Soon he left the suburbs to study Environmental Horticulture at University of California at Davis, but fate later led him back to the mountains around Los Angeles, where he mapped vegetation communities and did battle with invasive plants. Charlie was also inspired to bring

some of the beauty found in natural ecosystems back into the urban landscape, and propagated hundreds of native plants, many of which ended up in the planters of his family and friends.

Charlie came to Vermont and soon fell in love with both the exuberance of eastern summer and the cold reticence of northern winter. He can often be found singing quirky science themed songs, sketching plants, and angrily shaking his fist at invasive species.

Pamela Johnston

Pam grew up on one acre of grass, garden & fruit trees outside of Salem, Oregon, within easy travel distance of ocean, mountains, and high desert. A biology degree from the University of Oregon propelled her towards research adventures in Pacific tidepools, then to the Alps of Austria and Italy, and back again. She taught marine ecology for the Northwest Outdoor Science School on the Pacific coast, and environmental field studies at Smokey House Center (a non-profit organic farm and education center in Danby, Vermont). She is thrilled to have found the Ecological Planning program, where the real class-



Pam

room is far beyond university walls.

Pam enjoys the smell of soil and tomato plants, dancing, and improv fiddle. Besides changing the world, she has ambitions of raising heritage chicken breeds, making useful folk art from natural materials, and learning how to better wield power tools.

Zac Ispa-Landa

... a star exploding a billion years ago, the Ozark Plateau, twelve tribes in a desert, cold Russian winters, form and emptiness, Central Missouri, the Appalachian Mountains, Northern California, a purple house on the Winooski River. These are all answers you might get if you ask Zac where he's from. But to be clear, he did grow up among the caves, fireflies, thunderstorms and good people of Missouri, and it's still the place he calls home. He's left footprints all over the world from Greece to Panama and worked as a park ranger, a wilderness guide, a gardener, and a teacher. He's now immersed in studying the ways of the Field Naturalist, which luckily aligns with many of his interests: storytelling, tracking, keeping bees, sitting by the river, and cultivating wisdom and compassion. Adding to these diverse interests, he also makes time for throwing pots and eating pie.



Zac



Neahga

Neahga Leonard

Neahga, known to childhood friends as "Little Bear", grew up in California exploring, climbing trees, eating honey, and picking berries. Neahga's interests are as varied as a bear's spring diet, but the underlying theme is a need to understand, appreciate, and communicate the richness and complexity he sees in life.

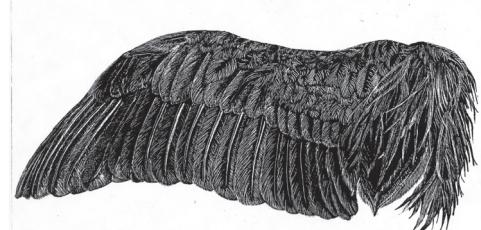
He believes that there is no concept so complex it cannot be explained simply and that there is always another way to do things. These two beliefs underlie Neahga's main goal in life, which is to find a different, less destructive way for humans to live with each other and the rest of the world. If he ever settles down, Neahga will build a house from his own design and divide his spare time between esoteric projects, reading science fiction, and traveling

ments: mountains, jungles, deep river gorges, and Buddhist stupas. She finished high school in Cambodia before returning to Canada for university.

After graduating with a degree in Geography and Global Development Studies, the travel bug carted her to the Canadian Arctic, where she did environmental remediation work on decommissioned military sites- relicts of the Cold War. The work was fun, but after digging one too many soil/garbage pits through stinky landfills, Bryarly decided that she would prefer to work on the less malodorous side of the environment sector: conservation instead of remediation. Her desire to learn more about natural ecosystems and communication led her to the Field Naturalist program, where she has developed an interest in transformative education.

Bryarly McEachern

When Bryarly was six, her parents flew her and her six siblings to Jordan, where she spent two happy years living outside Amman, surrounded by olive orchards, sheep flocks, and dusty pines. After Jordan, the clan migrated to Nepal. This is where Bryarly discovered her love for diverse environments:



Meet the class of 2011: *Alces alces* (AA)



Bryarly



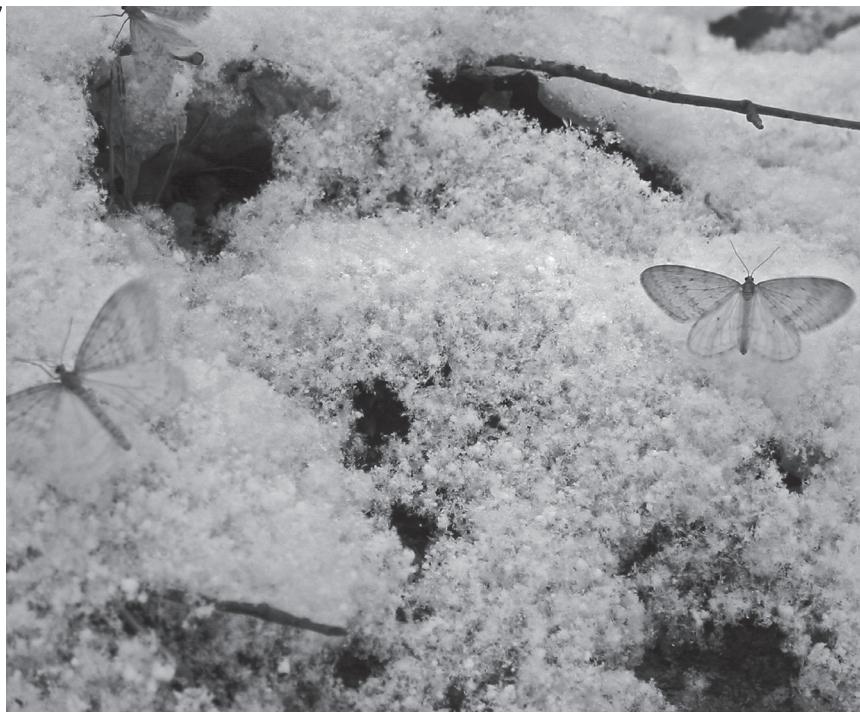
Team Alces alces



Sam

Sam Schaefer-Joel

Sam was raised in the green Pacific Northwest where he developed a deep love for ferns and big trees. Seeking to understand the inner workings of life, he studied biochemistry at Western Washington University. After a year of research and development work at New England BioLabs, he began the search for a livelihood that let him spend more time outdoors. From environmental education in Washington to working at a farm and botanical garden in Mexico, he explored and deepened his love of both plants and communication, learning to speak Spanish along the way. Sam worked several seasons on small organic farms in the West, and joined the Field Naturalist program in order to have a greater impact protecting the natural world he has such affection for. He enjoys teaching flying yoga and playing music with his fiancée, Kelli Mae, and may be found juggling in a park on a sunny day.



Meet Our Unsung Hero: Lillian “Porky” Reade

From my humble beginnings to the riches in my life this is who I am: an assistant to the Field Naturalist Program and one of the luckiest people to inhabit this wonderful, crazy, difficult and sometimes turbulent world that we all call home.

A few days ago, as I was sitting in one of my gardens happily mixing humus, manure and garden soil, I noticed some of my plants popping out of the earth. Things were growing again. Spring is a time of renewal and my favorite time of the year. It's my time to reflect on the things that I am grateful for, and to take joyous pleasure in what I have to look forward to. I will never be rich but I have had more fortunes in my life than I dare think I should have been graced with.

I'm a daydreamer of sorts. I can sit and look out my bedroom window and visualize being in a place of beauty in the forest; a soft and warm breeze on my face, sun streaming through the trees, studying the shadows of mushrooms and jewels of the earth that the sun can't find. I can almost smell the earthy aromas that fill my head with pleasure and longing.

I am a parent of wonderful sons. This has been both the greatest gift of my life and the challenge of the hardest job I have ever loved. I like to feel that I have been somewhat successful in this venture and it has been an incredible learning experience.

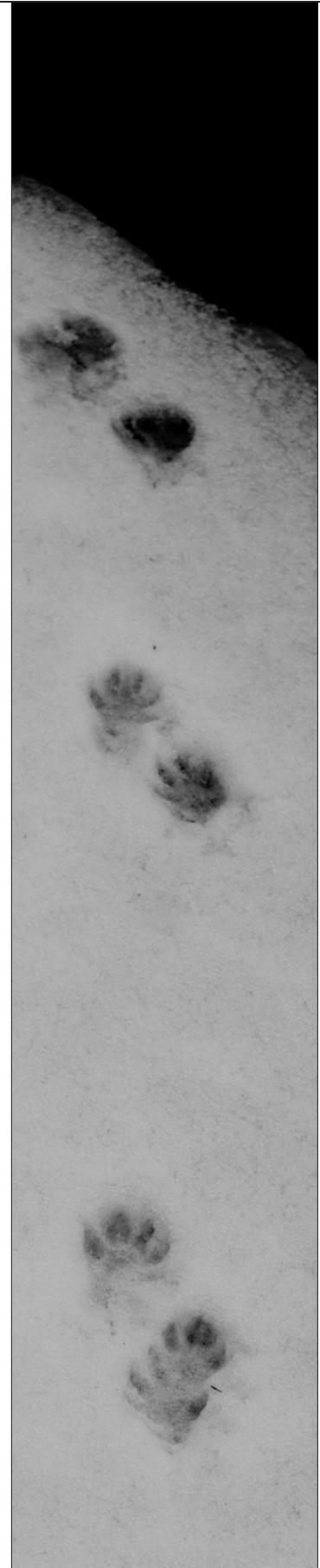
I am involved with the greatest group of Field Naturalist and Ecological Planning students on a daily basis. I often get to live my dreams vicariously through their experiences and successes. I so enjoy coming to work each day to receive fabulous hugs, wonderful conversation, and smiles that brighten even the darkest days of March. How can one not smile or have a happy thought bumping into one of these gems?

I keep myself centered with Tai Chi and find it a wonderful way to relax and reflect on just being me. I take pleasure in the simplest things that life and peers offer each and every day.

Porky Reade

FN Program Assistant

Editor's note: In case you didn't know, "Porky" is the nickname given to her as a young girl for her love of porcupines.



Good Natural History

Alicia Daniel

In February I visited the El Verde Field Station in Puerto Rico after a 20-year hiatus. The E, F, and G teams of Field Naturalists had traveled around the island in the early 90's visiting different ecosystems and tackling special projects. I was surprised when I stepped into the still mildewed-smelling field station office to see so little had changed. But I was even more surprised to see a familiar sky blue document lying on a metal desk.

Chris Nyttch (Y9), who coordinates Long Term Ecological research for the station, picked up the document. "You guys wrote this. I am using it as an orientation guide for my seedling interns. It has the best natural history of the island I've found. Nobody here writes this stuff."

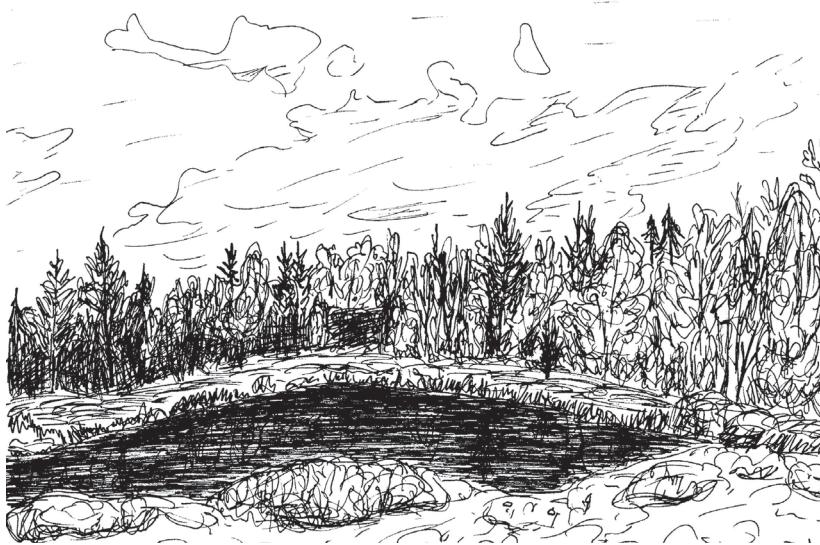
We wrote the guide, "Puerto Rico, You Lovely Island . . .," in 1991 as a way to familiarize Field Naturalists traveling to Puerto Rico with the island. Authored by the F and G teams and edited by Beth Farnsworth, it is organized by the layer cake approach. The chapters start with geology and work up through the soils, plants and animals. This guide includes special sections devoted to hurricanes, landslides and the local culture. All this is served up with that wry sense of humor for which FNEPs are famous.

I interact with "historic" FNEP documents on a regular basis and invariably find the stories they tell about a place captivating. This past fall, for instance, team Alces alces (AA) followed in the footsteps of the I team which explored the Molly Bog wetland complex 15 years ago. The intervening years had witnessed dramatic changes in the part of this landscape called Percy's Bog. The bog had been clear-cut and ditched just a few years before the "Sphagnum PI" (I warned you about the humor!) investigators arrived on the scene. I remember walking with them through a field and entering an area studded with

pitcher plants scattered among stumps. The cut over bog was at the elevation of the surrounding pastureland then. The ground felt level. There was no topographic hint of the basin beneath our feet although the vegetation told us something was up—or down.

When we returned this fall, rapid decomposition had dropped the surface of the wetland 20 feet below ground level. We had to hike into the basin to find what remained of Percy's Bog. A calamitous spiral of collapse that began with clear-cutting red spruce and ditching of the bog (events that dried the bog's surface and introduced oxygen into the peat mat) was now in its final

stages. The sound of running water coupled with the establishment of young hardwoods, like paper birch, led beavers to occupy the basin. Today, beaver dams ring the perimeter of the bog as the animals try in vain to staunch the radial flow of the water from the decomposing peat. Now a soggy wetland, the once wide-spread bog rosemary is hard to find.



The I team's written history of the Molly Bog complex informed our present understanding of the landscape with John Sanderson, Dave Campbell and Peter Neitlich's voices emerging from the past to guide us in the present. Many naturalists refer to these Vermont-based FNEP natural history documents--(thank you!). Chris Fastie's voice still narrates the La Platte River's clayplain forests; Jeff Severson and Michael Shepard tell us about the Bristol Talus Slope. I could go on and on.

Yet somehow this chance encounter with a field guide in Puerto Rico felt different. I sat down in a rickety swivel chair and found myself absorbed in the document, learning many things I had forgotten. Details of the island's volcanic origins. The effects of hurricane Hugo in the

fall of 1989. The guide reminded me of half-forgotten tales: the crazy jeep rides at Will Scott's plantation, the rotational landslides that followed in the wake of Hugo, the beautiful lighthouse at Cabo Rojo, and the foot-long centipedes that haunted the corridors of the ranger's station in Boqueron.

As I sat there in this remote place it dawned on me that good natural history writing is timeless. The information in this guide had not grown stale. This simple document had taken on a life of its own because of its powerful clarity. Good natural history skills are also placeless. That is--they can be transplanted from place to place where they quickly take root. Of course we master the art of telling stories about our own backyard, but our innate curiosity and intimate love of even a "strange" place comes through in each natural his-story that we tell. And people all over the world are hungry for these stories.



Molly Bog

By Alicia Daniel and Alces alces

Cotton grass floats tiny clouds over cities of sphagnum,
towers of orange fungi,
shapes of all sort emerging from fuzzy carpet
that remember where our feet have been.
Squish and slosh of feet in
mucky troughs of concentrated stepping.
The sphagnum giving and slowly sinking to accommodate
our presence.

Small tasty berries, cranberries,
tart, the taste like madrone berries,
resilient between my teeth, soft on my tongue. Yumm . . .
The berries actually seem huge and full of life.

The sky and the peatland touch and understand each other.
Stillness, presence, all are waiting for something.
Stillness is also dynamic.
Time moves slowly.
Silence pervades.

Soft swirls of tamarack needles just turning golden
above the blood red sphagnum.
Brilliant greens reflecting brilliant reds.
Vibrant rainbows in all things with purpose and beauty.
Beauty in minutiae,
crows talking in the distance.
Tamarack needles glowing in sunlight
threads of moss rising up from the muck.



Raven Ridge: A Story of Place

The towns of Monkton, Charlotte and Hinesburg intersect over an impressive bedrock landmass rising up from the Champlain Valley to a stately 780 feet above sea level. On the ridge, you will find vernal pools, bobcat dens, a cedar swamp, beaver ponds, potential Indiana bat maternity sites, cliffs, caves, clayplain forests, and a hemlock forest deemed “Fairy-land”. This land of complexity and diversity is Raven Ridge, a 366-acre parcel recently acquired by The Nature Conservancy (TNC) of Vermont.

Raven Ridge, conserved with partial help from a large federal grant aimed at conserving endangered Indiana bat habitat, became the living classroom for the 2010 Place-based Landscape Analysis (PLA) course. Taught by Walter Poleman (an FN from '96), PLA forms part of the backbone curriculum for the Field Naturalist and Ecological Planning programs. The Nature Conservancy engaged PLA to perform an ecological assessment and provide recommendations to guide management of its most recent preserve. As the spring semester quickly passed, our team learned the stories written in the landforms, flora, and fauna of Raven Ridge.

As we finalized our report to TNC, we realized that we'd also learned the story of team process— How do a dozen people agree on how to map the vegetation of an inundated red maple swamp, the ethics of bobcat trapping, or what font to use for the final document? Like all great things it started with a concept map and included lots of adaptability.

Here, we present a project through the eyes of a FNEP learning to manage time, people, and information, all while keeping an eye on the ultimate objective: to create a useful document for TNC.

January 25th, 2010



Our team first laid eyes on Raven Ridge today through driving wind and rain. This surprise mid-winter thaw made the entire ridge seem like a wetland—rivulets ran down the trails and puddles swallowed our feet. The weather wasn't able to dampen our excitement and curiosity, and soon we were pointing fingers at potential vernal pool locations and tracking patterns across the landscape. First thoughts: It's cold, it's huge, and there's lots of porcupine feces.



February

The last several weeks have been devoted to developing a strategy: meetings with Joan Allen from TNC and Bob Linck from the Vermont Land Trust, conceptualizing the roles of stakeholders, visualizing the process through concept maps, and creating a work plan. We are all eager to get back "on-the-ground" but some good has come out of the indoor process: four working teams have been born to investigate the physiographic, vegetative, wildlife, and cultural features of Raven Ridge. Each team is tasked with compiling as much information as possible to share with other PLA members at our formal "teach-in" on March 15th. Until then, it is DIRT TIME!



March 15th

The teach-in! Each team spent an hour presenting its findings through maps, stories, lists of species, reports, and discussion. The teach-in marks a major milestone in the development of a document for TNC, but the unknown territory of producing a deliverable still lies ahead of us. The teach-in illuminated a dozen new questions about the landscape. After a round of panic attacks, we regrouped and committed to definitive action -- new groups were formed to explore upland vegetation, wetlands, wildlife, and cultural features, and to create management recommendations for each. Each of us, needing more work of course, took on an additional technical or administrative responsibility: mapping, document layout, editing, presentation, and interpretation. Together we are unstoppable!



March 29th

Today, we were blessed by the botanizing brains of Liz Thompson and Bret Engstrom. Together we discovered Sedge meadows, seeps, balsam fir pockets, and a rare plant (????). The experience and perspectives of Liz and Bret acted as mental life rafts in the confusing sea of ecological mapping.

April 5th

The team spent the afternoon inside discussing the finer points of the

document we are creating. Among the many questions posed was the recurring "just what the hell are we doing here?" After discussing our roles as consultants, our limitations as students, and our intent for the management plan, we all retired for the day with mixtures of frustration, enthusiasm, and a desire to create more hours in every day. The completion date of May 3rd is fast approaching, but even more pressing: submit everything to the editing team by April 18th!



April 18th

The last couple weeks were filled with frantic fieldwork, more dirt time, swearing at deadlines, and GIS software. As we suspended personal deadlines and abandoned sleep in favor of unfathomable internal emails, our last document pieces came together. Finally, everything has been placed in the hands of the editing team! The rest of us can sleep, relax, and plan the final presentation.

May 3rd

Success! The PLA team assembled at a charming little church in Montpelier to present 'Ridge: A Place-based Landscape Analysis'. The Nature Conservancy applauded us for our hard work and vital contribution to their mission. Jeff asked very hard questions and tried, but did not succeed, to ruffle our collective calm. As we gathered over a pint in the local pub, we reflected on the remarkable team effort needed to produce a conservation document of this type when time and resources are in short supply. It is that effort that makes conservation successes possible.



Midwinter

Charlie Hohn

The January thaw has come and gone, taking with it the deep, fluffy snow that fell after New Years Day. The ground is brown and frozen, and the snow has been banished to drifts and snowplow piles. There is talk of snow in the week ahead, but on this chilly night, there are only fitful flurries.

Three thousand miles to the southwest where I am from, canyons roar with water and mud. Summer-deciduous sages and bush sunflowers

are covered in leaves, and a few flowers are starting to emerge. The steep, raw coastal hills of southern California are being drenched in the first persistent heavy rains in five years. Everything is green and full of life.

Since arriving in Vermont six months ago, this is the first time I have been homesick for California-- but it is a mild homesickness, mixed with excitement for more drifting snow, followed by vernal pools, spring ephemeral wildflowers and summer thunderstorms.

This has been my first snowy winter.

When I left California, some people told me I would soon grow to hate the snow, the cold, and the dark. Of these three, however, only the dark has been a challenge, and it is already receding. New friends in Vermont warned me that I would tire of snow by the third snow, by the sixth snow, by February... I am still not tired of snow. Winter is amazing and beautiful. When I miss the smell of sage in the air, or long for California's canyons, I slip away to Centennial Brook, study the always-changing ice formations, and remember just how remarkable this new world is.

I expected cold, snow, and ice. However, there are so many things that come with winter that no one told me. For instance, no one told me that when ice freezes or thaws in

moving water, it makes SOUNDS - amazing sounds, deep and squeaky at the same time. Or that the ice on a frozen river changes its shape every day, or that snowflakes here are beautiful, complicated crystal shapes, not the boring wet globs of California's mountains.

Vermont's wintry mix is not an ice cream flavor, but instead a muddy, slippery, fascinating mess. There are good reasons

for mud porches, salt will find its way onto your floor, and an inch of snow on a road is a good thing, because it isn't ice. Snow at 33 degrees F feels immeasurably colder than snow at 29 degrees. Scarves are a survival technique, not a fashion accessory. Most importantly, it is the warmth of the people close to us that makes winter warm.

Every day is still full of surprises; I am making the greatest of efforts to hold the sense of wonder that I felt on the first day everything was covered in

an inch of new snow. So far, it has worked. I am not going to deny that I will appreciate spring's warmth more than I ever have before. But with winter only a bit over half way passed, I am eagerly awaiting the new revelations to come from a frozen northern world.



Transformation in a Bristol Landscape

Liz Thompson

Willy was mad. He'd had a rough day at school, and the afternoon had gone from bad to worse. It was a beautiful spring day, mild and sunny, yet he was inside the house banging around and looking for trouble. At 4:45 I sent him outside. "Go down in the woods," I said, "and calm down." There is a little patch of woods straddling a brook down below our house at the edge of Bristol Village, and this place has been a haven for all of us since coming here from the city six months ago.

He stormed out of the house, in a rage, yelling, "Fine! I'm never coming back! You can get another son!"

I let him be. I knew he'd be safe. Bristol is like that.

Bristol, Vermont, is a picture-perfect village. It sits on a broad, flat plateau, its east-leaning back nestled against the Green Mountains, its legs wading westerly in the fertile farmlands of the Champlain Valley, its left hand dangling in the brisk New Haven River to the south, and its right hand in the placid Bristol Pond to the north. The downtown is vibrant, neighborhoods are friendly, and the kids walk to school.

As I write, I am sitting on the eastern edge of the plateau, near the High School, admiring the view. The valley spreads before me, and snow-covered Mount Abraham is at my back, in the distance. More immediately, I witness the depths of the plateau, and the dilemma of Bristol.

The plateau is a postglacial delta, a huge wash of sand and gravel spewed out from the Green Mountains into the murky and placid glacial Lake Vermont some 10,000 years ago. This, and the surroundings, made for a perfect town – a flat, well-drained terrace, easy to build on and easy to bury the dead in, with a mill stream at hand and forests uphill just waiting to be cut. As time went by, it also came to be known as a perfect place for mining gravel and sand, and today the Bristol plateau is pockmarked with gravel pits, small and large. One cannot walk around the out-

Transformed and strange, my soul turns back and questions me.

How should I answer?

-- Hermann Hesse

skirts of town without encountering the steep and dangerous slopes and the no-trespassing signs of the pits. Humans have transformed this landscape in a major way. The plateau is shrinking.

Gravel mining has defined the town for over a century, and sadly divides it now. A recent proposal to open a new pit near the village center has completely divided the town: the haves and the have-nots, the environmentalists and the property-rights advocates, the new and the old, the left and the right. We moved here just in time to weigh in, and we did, voting against the new pit. We want the village center to remain vibrant, and we want gravel mining to be well thought out. We like natural landscapes.

At 5:45 on that sunny but stormy afternoon, I went out to find my son. An hour had passed. I wasn't worried, but I wanted him to know that I was thinking of him. I went down into the woods. As I walked, I encountered the trash that signaled I was close to the dump. I passed by the dump, then came out into the openness of the gravel pit.

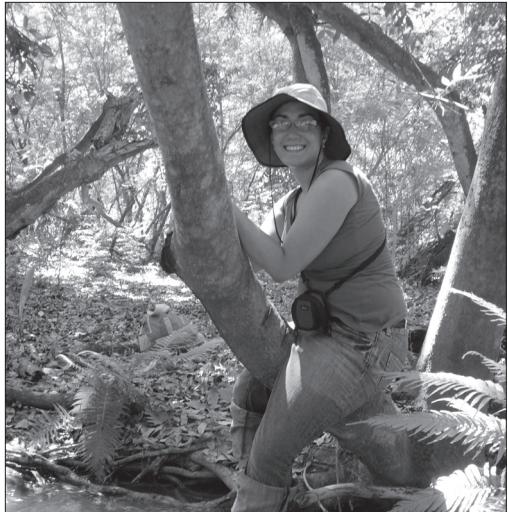


"Willy!" I called. "Mommy, I caught a frog!" came the joyous reply. He ran to show me. This pit, mined down to groundwater level, is now haven to a series of frog ponds and wetlands. A week ago, in early April, we'd been here at dusk and had been nearly deafened by the sound of spring peepers. This evening, in mid-April, the sound of peepers was replaced by the sound of grey tree frogs. The season was progressing, rapidly.

And here, playing in the ponds, was a boy transformed. Glad to be alive. And doing his own brand of mining – finding frogs, making rock castles, gathering clay at the fringes of the pit, sliding down sand banks.

In the cool evening, I felt transformed, too. I don't want a new gravel pit in town, but in the waning light I felt grateful for the old, played-out pit, grateful for the frogs and blackbirds calling, the sounds of springtime fertility. We walked home happily, crunching the variegated scouring-rush, pushing aside cattail stalks, and dodging puddles.

What did you do last summer?



Nathaly



Autumn



Kim

Nathaly Agosto Fillon

Seeking a real-world application for her political activism on climate justice, Nathaly returned to her birth country, the Dominican Republic. She worked with the president's National Council on Climate Change, interviewing community members coping with a flooding Lago Enriquillo about their readiness to prepare for the localized impacts of climate change.

Lago Enriquillo, a hypersaline lake, is an ancient remnant of the Caribbean Sea that is famous for its flamingos and American crocodiles. The lake is the largest and lowest-lying water body in the Antilles, but tropical storms and high evaporation rates cause the size of the lake to expand and contract dramatically. In the summer of 2009, however, nearly two years after tropical storms Noel and Olga, flooding had not yet begun to subside. In fact, it seemed to still be increasing! The lake had grown by 7,000 hectares, flooding much of the region's agricultural lands, large patches of the main road, and even the local customs office.

With global climate models predicting a rise in the frequency and severity of tropical storms, Nathaly sought out stakeholder group leaders to strategize how they might adapt to a changing cli-

mate. Her work will be succeeded by an initiative to strengthen local institutions working on climate adaptation.

Autumn Foushee

Coastal ecosystems are dynamic and diverse environments. They are also sensitive and heavily favored for development as population and industrial centers. As climate patterns change and land use pressures increase, coastal communities want to track related environmental changes.

Autumn traveled to the south coast of Oregon and partnered with the Coos Watershed Association and the South Slough National Estuarine Research Reserve to do just that for the Coos Watershed. The goal of the project was to develop a suite of potential ecological indicators of climate change and land use impacts. These indicators were based on public values, a review of the literature, existing data, and a review of existing indicator programs in other coastal watersheds.

The greatest lesson came from public meetings where citizens identified their values and concerns for the Coos Watershed. More often than not, public values tied into topics scientists also felt were most important. Mutual con-

cerns, such as the loss of local fisheries and degradation of water quality, highlighted the potential for bringing scientists and residents together to dialogue about how to track and respond to undesirable changes in the Coos Watershed.

Kim Hoffman

I spent last summer completing a landscape assessment of a 3,000 acre parcel of Forest Service land in southern Vermont. The Forest Service faces a daunting challenge: satisfy the differing values and interests of numerous stakeholder groups. Knowing the land - understanding the parcel's resources and where they are located -- provides an informed starting place for decision-making.

I began the assessment by consulting soils and geology maps and by studying a time series of aerial photos of the area. Field work included looking for indications of past and present human use of the area, mapping natural communities, evaluating existing trail conditions, documenting non-native invasive plants, and searching for signs indicating the presence of bear, deer and moose. These data helped me develop a set of defendable recommendations for the Forest Service as to how the parcel might be managed.

Z10 Master's Project Experience



Lydia



Caitlin



Rosemary

Lydia Menendez

The Land Stewardship Program (LANDS) began as a 2007 FN Master's project. A partnership between the University of Vermont and the Student Conservation Association, LANDS trains college students with natural resource backgrounds to provide land management organizations with affordable and professional services. The Land Stewardship Program has engaged 25 college interns from across the Northeast during 27 program weeks, serving a total of 17 different community partners on over 15 distinct projects (check out the website to learn more: http://www.uvm.edu/~conserve/lands_website/).

The purpose of my Master's project was to develop a "College Sustainability Corps Program Implementation Manual" to help other universities replicate the LANDS program model. Now in its fourth year of programming, LANDS has had great success teaching students practical conservation skills, providing much needed land stewardship services to under-resourced organizations, and building university/community partnerships - all positive steps towards changing our world for the better. More students, more communities, and more universities need to be involved. Building our nation's

capacity to address sustainability by training future environmental problem-solvers, and engaging more communities and universities is one small, compounding way to change the world.

Caitlin McDonough

"But all my life — so far — I have loved best how the flowers rise and open" (Mary Oliver)

My master's project took me to the mountains, where the spring came slowly and coldly, to watch the alpine flowers bud and bloom. Climate change threatens to warm New England's peaks and alter these alpine habitats. Tracking the reproductive phenology of plants — the timing of budding, blooming, and fruiting — allows us to read how they are responding to climate change. The Appalachian Mountain Club (AMC), my master's project sponsor, has been monitoring alpine plant phenology since 2005. Their methods are two-fold: AMC researchers monitor plants at established plots with air and soil temperature probes. Volunteer hikers fan out across the Whites to observe more flowers in more places. But can volunteers, or "citizen scientists" tell *Vaccinium uliginosum* from *Vaccinium vitis-idaea*? Or are they just blinded by their love for *Diapensia lapponica*? I worked with the AMC to assess the citizen science program and improve volunteer

data reliability. In the end, I hope this partnership between volunteers and the AMC will make climate change research more accessible to hikers. We must remember that even when we leave the trails, our actions continue to impact the alpine zone.

Rosemary Mosco

Rosemary spent the summer creating an outreach web site for the City of Burlington's Climate Action Plan. This project aimed to make climate change relevant to the Burlington community by discussing its likely effects on parts of the local and regional environment, given the tremendous uncertainty of local climate change.

After a period of research into web-based outreach and climate science, including many interviews with local researchers and activists, Rosemary expanded her web programming skills with help from UVM's Center for Teaching and Learning. She illustrated the web site and wrote the content, and tested the site with members of the community.

Like all Field Naturalist Program projects, this one was highly integrative. Rosemary's web site framed climate change in terms of seasonal natural and cultural histories, such as maple sugaring, winter sports, bird watching, gardening and other

Z10 Master's Projects



Teage



Emily



Jennifer

activities that sit at the intersection with schools in the future? My research of environment and culture. She used then shifted to conducting interviews the FNEP 'place-based approach' to with teachers and administrators to incorporate local knowledge into the gain insight into how successful part- climate change story. A diverse and nerships with schools can be forged. supportive community made it all possible.

Teage O'Connor

South Burlington is a wealthy, mixed-ag/urban suburb of Burlington - that is, if a city of 40,000 can have a suburb. Working for the PLACE program (Place-based Landscape Analysis and Community Education), my role was to facilitate community engagement in, and excitement about, South Burlington's natural world. This proved rather difficult as South Burlington lacks an urban center, a town hall, and any real sense of identity - even its name refers to what it is not rather than to what it is.

Will they remain stable? Will the wetlands succeed toward a new community type? Will global climate change have any effect? The wetland monitoring protocol I designed for my master's project hopes to answer those questions. Last summer I worked with the Maine Natural Areas Program (MNAP), an organization that oversees state-run Ecological Reserves that seek to protect natural communities and preserve biological diversity. We identified 18 protected wetlands to study, and field-tested my

To begin forging this connection, I led a series of outings that focused on "reading the landscape" techniques. I also wrote a column for the local newspaper highlighting seasonal (phenological) changes in ecological events. With the wonderful help of Jen Cirillo of Shelburne Farms I am partnering with the middle school to implement a place-based curriculum through quantitative sampling. This next year. This partnership took longer than anticipated and so the question arose, how can the PLACE program more effectively partner with schools in the future? My research of environment and culture. She used then shifted to conducting interviews the FNEP 'place-based approach' to with teachers and administrators to incorporate local knowledge into the gain insight into how successful part- climate change story. A diverse and supportive community made it all possible.

Emily Stone

How will relatively pristine, protected wetlands change through time?

Over the past year, I examined how the Oregon Department of Forestry, an early action state, and Pacific Gas and Electric Company's ClimateSmart program worked together to help small scale forestry efforts benefit from carbon offset markets. I collected information on how these organizations have created an enabling policy environment, developed creative partnerships, and provided direct outreach to interested parties. I contacted state personnel, participating forest landowners, Arcata Community Forest members and other forestry stakeholders to collect information on programmatic details and implications. Additionally, I used a market chain analysis to visually depict the roles and relationships among the players involved in bringing a forest carbon project to market.

Oregon and Vermont have important lessons to share with other states and organizations attempting to assist community forestry projects or climate policy development. My final report describes the program and summarizes lessons learned. Ensuring communities' engagement in shaping carbon emission initiatives while incorporating and acknowledging the role of forests is paramount in addressing the global challenge of climate change. For more information, please visit our website www.uvm.edu/forestcarbon.

A Poem



- Rosemary Mosco



Five dark figures went out one night
To search for beaver in full moon light
But the tricky moon herself did shroud
Behind a blanket made of cloud.

Turning and twisting through the trees
Slipping on the dampened leaves
The five did walk up and down
'Til finally a pond was found.

When silently they tried to approach
A splash! responded in reproach.
The beaver knew that they were there
And seemed to vanish into air.

The venturesome group sat and waited
For their curiosity to be sated
And finally the figures five
Did hear the sounds of night alive.

From the hidden banks of stream
The softest noise of chewing did seem
To give new hope to the sight
Of beavers swimming in the night.

At long last a beaver came
Just before the drops of rain
As if to say good night to those
Who, true to pact, I suppose

Had ventured out under the moon
With one another to commune.
May this poem serve as a token
To preserve the pact they shared unbroken.

-Rose Graves



Trees, East and West

Neahga Leonard

I grew up near the Pacific Ocean climbing trees: redwoods, Douglas firs, Bolander pines, Monterey cypress, California bay laurel, madrone, and big leaf maple. My favorites were the oaks—massive, ancient, and multi-trunked—that arch over wildflowers and ferns far below. Thickly muscled trunks and branches, some thicker than my torso, come to rest on the earth, making one tree seem like its own small forest. The deeply fissured bark is like rock, and can be scaled like a cliff. Complex communities of lichens and mosses cling to the

limbs. Black-and red ants are ever-present, smelling sour as they bite intruders and spray them with formic acid. The ants march on patrol in narrow lines along the branches. However, if you are careful and unhurried, they will leave you alone while you doze on a sunny limb.

Vermont trees grow differently. Trunks are packed close together and are under regular danger of losing limbs to snow and ice build-up. The maples, cherries, birches, and oaks here expand vertically rather than horizontally, with limbs angling upwards. This changes the climbing experience, directing the exploration upwards rather than outwards. There are fewer branches suitable for lounging, but the view from the top of the trees is fantastic, especially after the leaves have dropped.



The arboreal communities in these two ecosystems reflect the difference in branching structure. In wetter parts of California where the rainfall is comparable to Vermont, many of the limbs of older trees host thick mats of vegetation. Old growth redwood forests have up to 3 feet of soil accumulation on broad limbs high above the ground, creating miniature ecosystems replete with salamanders, cocopods, dwarfed trees, shrubs and ferns. Mats of polypody ferns with thick, leathery leaves blanket the upper limbs of Douglas fir and

big-leaf maple. These arboreal stands of ferns trap detritus which breaks down into soil. This soil is so rich that big-leaf maples send adventitious roots from their limbs into the detritus mat to collect the nutrients. In Vermont, the epiphytes do not grow so thick; they are regularly stripped from the trees by the weight of snow and ice. Lichens stay small and close to their substrate. Ferns tend to grow only in the forks of the trees, if at all.

Climate clearly plays a major role in shaping the differing forms and functions of Vermont and California trees. Try climbing them in winter, spring and summer to see for yourself!



Hidden In Plain Sight: Culture and Ecology in the Champlain Valley

Zachary Ispa-Landa

Gravel crunches under soggy hiking boots, and small rivulets of water snake through mud and grass alongside Rotax Road in Monkton, VT. The water will eventually empty into Lewis Creek and from there into Lake Champlain. On this rainy spring afternoon the Alces alces team is exploring Raven Ridge – a spine of bedrock rising from the Champlain Valley floor, stretching north for a mile and a half and sinking back into the fertile lacustrine soils.

We had been exploring the bedrock, soil, vegetation, natural communities, and wildlife of Raven Ridge, but a lucky discovery that day revealed a whole new dimension to the 366 acres. As the rain let up, one of us slowed; something in the mud had caught his attention. He reached into the soggy road-bank and picked up a stone spearhead. It had been resting in the soil for millenia.

The Champlain Valley has been continuously inhabited for 12,000 years, since Lake Champlain was a sea and mastodon roamed the frozen ground. Archeological findings and the oral history of the native Abenaki agree that humans followed close on the heels of the receding glaciers. The first people who arrived in the wake of the glacier were part of the Clovis culture, named for the clovis-shaped stone points on the ends of their spears. The Abenaki people still tell stories of these early times: harvesting whale from hide-covered boats, hunting wooly mammoth by spear, and witnessing ice so heavy the earth bent under its weight.

A few days after finding the projectile point, the Archeology Department. He con- had been shaped by human hands duced that it had been shaped by human hands hundred human generations.

Back in Burlington, the Intervale long and rich human history. might dump an old car; six might hunt, fish, gather medi- cinerae).

Butternuts are on the decline, on the river bank across the one the other day, I contem- looked like to those early Clovis maples, oaks, or hickories. There hillsides. This area was a tundra alders were scattered across the lichens.

As the climate warmed, the park-tundra supported mastodon, moose-elk, caribou, “hypsithermal” period led to further ecological and oak appeared. The last moose-elk and mastodon lived and died. As time went on, the bow and arrow replaced spear and atlatl, sophisticated tribal governments emerged, and corn arrived from the Southwest. Standing at the edge of the Intervale just prior to the arrival of Europeans, you would have seen something familiar: hundreds of acres of carefully tended farmland.

Still sharp thousands of years after it was made, the spear point reminds me of our direct connection to the past and the future. As naturalists, teachers, and students, it is important that we keep in mind the long and dynamic cultural history of the Champlain Valley. Six hundred generations of people lived on this land before us, and many more will follow. How did they shape the land, and how in turn will we shape it for future generations?



we walked across campus to visit John Crock in firmed that the piece of monkton quartzite 3,000 to 6,000 years ago—up to three hun-

along the Winooski River also has a Thirty years ago it was a place you thousand years ago it was a place you cine, and collect butternuts (*Juglans*

but there are still a few young ones street from my house. Sitting against plated what this landscape might have people. There would have been no would have been no densely forested ecosystem; spruce, fir, larch, birch, and open landscape of grasses, willows, and

landscape gave way to spruce-fir forest that musk-ox, elk, deer, moose, beaver, and wolf. The cultural changes. Greater numbers of pine, hemlock, and New technologies and cultural elements appeared: the atlatl became a formidable hunting tool, elaborate burial rituals took place, plant foods took on greater significance, and humans roamed less widely. As time went on, the bow and arrow replaced spear and atlatl, sophisticated tribal governments emerged, and corn arrived from the Southwest. Standing at the edge of the Intervale just prior to the arrival of Europeans, you would have seen something familiar: hundreds of acres of carefully tended farmland.

Inspiration and Action

Field Naturalists and Ecological Planners spend hours studying plants through hand lenses, digging soil pits, talking about and committing to personal responsibility and community empowerment, and exploring connections. We find inspiration in nature, in each other, and in the changes we want to see in the world. Other conservationists, of course, are also inspired—and at times outraged—by the human-nature interface. What changes do they see as critical? What inspires them to commit their lives to “fighting the good fight”? We asked three conservation leaders these questions.

Jon Young is a tracker, naturalist, author, and mentor. Chris Rimmer directs the Vermont Center for Ecostudies, a non-profit devoted to understanding and conserving wildlife. Bill McKibben, founder of 350.org, is an environmentalist, author, and educator.

What is the most critical change that humans need to make for conservation to succeed?

Jon Young (JY): People will need to renew and rehabilitate their true connection to nature. That's not about information or knowledge, it's about building relationships that are real. This will take a great shift in culture, and it seems far off. Yet, with the work inspired by Richard Louv and the amazingly active Children & Nature Network, I can see hope. There are other signs that hope is there as well. People seem to be awakening to the need for a different quality of life and this is at its core about relationship building. We need to remember to include nature in this new movement towards quality time, slow food and good living.

Chris Rimmer (CR): Adopt a long view of ecological sustainability by sacrificing personal convenience and short-term gain.

Bill McKibben (BM): A price on carbon, and all that follows.

What is the greatest conservation issue of our time?

JY: People's disconnection from nature. Without connection there will be no love or concern for nature. Period. The rest will take care of itself if people are inspired and interested and truly care rather than being motivated by fear of fines or of the destruction of resources-- all too theoretical. People move like heroes naturally when they care. We need heroes right now!

CR: The biggest challenge right now is climate change, hands-down.

BM: Climate.

What makes you most hopeful about conservation today?

JY: Richard Louv and the Children & Nature Network inspire hope for me about the future of conservation. Shifting interests in how to manage the land that has been set aside has me really excited too. Work from groups like the Center for Whole Communities focuses on how to develop healthy and socially just patterns of land use; re-envisioning land conservation as integral to community health is essential. Ultimately, without the support of the people, the future of conservation is really questionable. So, I am excited about these trends, though small at this time.

CR: The fact that we have such a detailed base of science-based knowledge to inform our actions, and a dedicated corps of both professionals and citizens to implement those actions.

BM: Well, at 350.org we managed to organize what CNN called ‘the most widespread day of political action in the planet's history’ last fall, and it was enough to persuade 117 nations to sign on to our 350 ppm target. That makes me hopeful.

What concerns you most about conservation today?

JY: Again, disconnection of the public.

CR: Two things: 1) that people influencing decision-making either

don't 'get it' or are guided by short-term thinking and personal gain; 2) far too many youth are afflicted by 'nature deficit disorder' and poorly connected to the natural world; they are unmotivated to caretake it.

BM: Unfortunately, the nations that signed our 350 ppm target were the wrong 117--the richest, most powerful, and most addicted nations haven't done a thing. That concerns me.

Can one person make a difference or a change in the world? and What single change would you encourage everyone to make?

JY: Go outside and adopt the robin in your backyard as an extended member of your family. Talk to your neighbors about the sparrows and the spring flowers blooming. Build relationships with nature and people, and people and nature.

CR: I'm a believer in the 'think locally, act globally' paradigm, such that any individual can make a difference by his/her actions. One individual's actions may not in and of themselves produce tangible change in the big picture, but many small changes can lead to a groundswell. And, there are plenty of instances where one person can single-handedly make a profound difference, mainly by affecting the actions of others. I'd encourage each and every citizen to make every possible effort to 'live lightly', create the smallest human footprint possible and influence others to do the same. Reducing carbon output would be the one single concrete action that I'd urge everyone to make.

BM: Organize politically.

What natural place inspires or motivates you?

JY: I love the sea. I love the place where the fresh water meets the sea. I love the watersheds that send their network of life giving water through soils, springs, multitudinous plant species, the wildlife relying on them, and the streams and rivers. In my neighborhood on the coast of California, in the Santa Cruz Mountains, I am very inspired by the returning steelhead and salmon that work hard against many challenges to continue their life cycle. I am inspired by bald eagles nesting in my childhood stomping grounds in New Jersey, when as a boy I had no hope of ever seeing a bald eagle at all. Let these stories unfold in every watershed again.

CR: Because it is fresh on my mind, I'm very inspired by Hispaniolan cloud forests, which are habitats critical to Bicknell's Thrush and other North American migrants, as well as to a host of endemic flora and fauna on the island. Not only are these forests hotspots of biological diversity, but they possess a beauty and splendor that truly inspires me to help conserve them. Further, they are threatened by an array of human-related activities (including climate change) that put their future viability very much at risk

BM: The Siamese Ponds wilderness in the central Adirondacks.

Alces alces: Photos from the past year



Master's Project Call for Proposals

Do you need technical assistance with a high priority field research project? We seek to match Field Naturalist and Ecological Planners from the class of 2012 with Master's projects sponsored by environmental organizations on the cutting edge of conservation science.

We are looking to link FNs and EPs with projects that challenge them to use their intensive training to its fullest. Our graduate students are professionals who are expected to demonstrate their unique skill sets while working with sponsoring organizations. FNs and EPs work closely with their communities and sponsors throughout the process to ensure that the product directly addresses the sponsor's needs.

In return for the services provided, we ask sponsors to contribute \$5,000 to our Sponsored Master's

Research Project Fund. This contribution is used in its entirety to help defray tuition expenses of the student.

We plan to match students with projects by January 2011 so that students can work with sponsors during the spring (2011) semester to plan for the summer field season. Data analysis and report writing continue into the fall semester, with products delivered to sponsors between December 2011 and May 2012. If you are interested in having an FN or EP work with your organization, please contact:

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