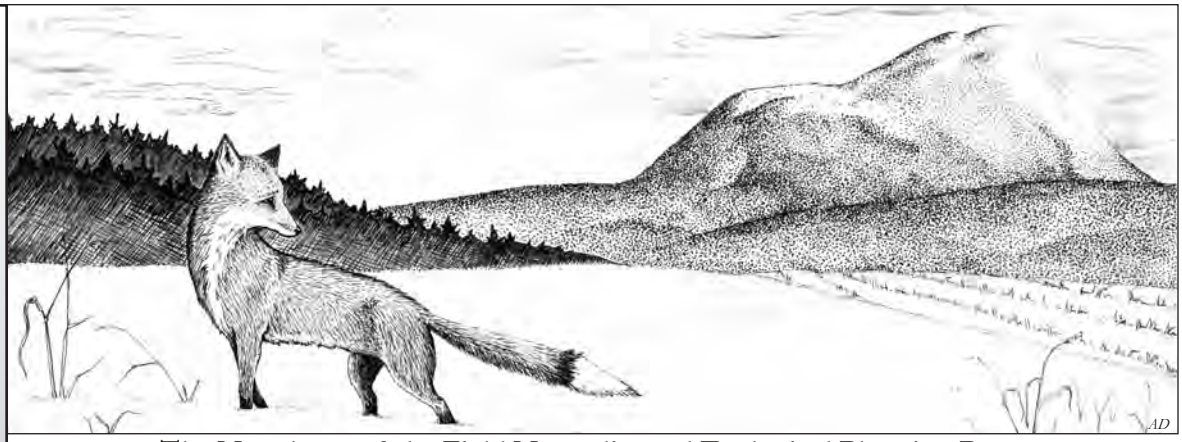
FIELD NOTES



The Newsletter of the Field Naturalist and Ecological Planning Programs
The University of Vermont
April 2005, Volume 16

Annals of a Field Naturalist

Field Naturalists and Ecological Planners are notorious for keeping journals. At the end of a long field day, there is nothing like reliving the highlights (and sometimes "lowlights") of the day and penning them to revisit later. Below is an excerpt from the journal of **Jen Cramer***, from one of her favorite and most challenging days of field work last summer.*

Morning. . . .

Today's temperature is only 95 degrees, nearly 10 degrees cooler than last week. And thank heavens, because there is no swimming hole near this fen. The road is so winding and bumpy that it inspires a coin toss to see who must endure the backseat. When we finally reach our parking spot, a dirt road blocked by a golf cart-sized boulder, we pack a gallon of water each and several dozen pounds of field equipment -- plot frames, plot markers, data sheets, clipboards, pencils, meter tapes, GPS., water pH kit, and cameras—and set off on foot. We march down a parched, abandoned forest road, littered with the red and yellow plastic of empty shotgun shells. Hans walks first, keeping an eye out for cougars and bears. I am not far behind, navigating with a map in one hand, compass and GPS. in the other, distracted by the newly ripened red huckleberries lining the road. Happy-go-lucky Keith lags a bit behind, as he always does. Keith and Hans are great field assistants, rarely complaining that the work is repetitive, which it is, or that they aren't being paid, which they're not.

Continued on pg. 19

Naturalist Journals
Toby Fulwiler

A journal, of one kind or another, is standard issue equipment for the working naturalist, capturing what is thought, seen, done, and planned for the future. A good journal also catalogs techniques, methodologies, books, papers, and ideas that need exploring and remembering. And by connecting seemingly disconnected thoughts, musings, observations, and speculations, it also helps you see the forest as well as the trees.

In simplest terms, a journal is a daily record of an observed life (the root "*jour*" is French for "day"). Records of daily life are also kept in notebooks called diaries, daybooks, logs, or field notebooks. No matter what you call them, such records serve the thoughtful writer well—and who is more thoughtful? From what I can tell, naturalists commonly keep one of three kinds of journals—and many naturalists keep all three: 1) personal journals that record the pieces, processes, and patterns of one's life; 2) dedicated journals written to document particular projects or journeys, and 3) field journals that are the constant companions of working naturalists in the field, and often contain a mix of both personal and professional notes. The characteristics these notebooks have in common make them journals.

Sequence. No matter what the focus, journals capture thoughts sequentially, from one day to the next. Over time, the entries form a cumulative record of what you witnessed, experienced, and thought in the order these happenings, observations, and ideas occurred. All journals are

Continued on pg. 14

From the Director's Desk

Evolving the Practice of Conservation

The curious among you may wonder about the altered format of the Field Naturalist and Ecological Planning newsletters - rather than creating two separate newsletters (as we have in the past), we have joined forces this year and created a single, shared newsletter. That is what you have before you.

Depending on your point of view, this expression of collaboration might be seen as monumental or inconsequential. On the one hand, choosing to develop the newsletter as a shared undertaking speaks volumes about how closely knit the students and programs have become. On the other hand, the increasingly close collaboration does not mean that either program has abandoned its identity: the Field Naturalist Program continues to base its existence on "hard science in the field"; the Ecological Planning curriculum continues to base its existence on "ecology as the foundation for conservation planning." Both programs continue to emphasize interdisciplinary approaches to conservation, integration across the sciences, and effective communication to both professional and public audiences.

As with all heady concepts, "interdisciplinary" and "integration" are easily espoused but not easily practiced. For example, does bringing together diverse stakeholders in a public meeting constitute "integration"? Likewise, does a roomful of experts from different fields qualify as "interdisciplinary"? Clearly, we don't think so. These multi-disciplinary efforts are commendable and essential first steps, but they do not address the complex interactions that make a human or natural ecosystem more than the sum of its parts. They also fail to address the complex interactions that result from resource use or abuse.

These realities have created the stage on which the Field Naturalist and Ecological Planning programs find themselves, and that defines our ever-evolving curricular challenge: "Integrated field science" and "ecological planning" may be distinct educational endeavors, but practitioners in the field question the desirability of these distinctions, just as Field Naturalists question the desirability of separating soils from plant ecology, and Ecological Planners question the utility of separating resources from planning.

Can the FN "layer cake" and "pieces-patterns-process" integrative framework adequately address the dynamics of the biocomplexity imbedded in our human altered ecosystems? Does planning theory, rooted in ecological understanding, give us the tools we need to lead the conservation charge? These questions are the drivers behind our effort to better integrate the academic curricula that support conservation science and conservation planning.

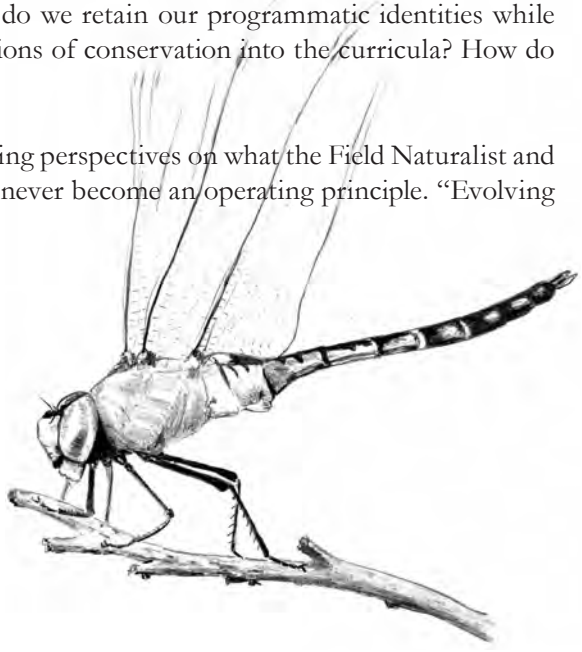
Ultimately, this translates to a couple straightforward questions: How do we retain our programmatic identities while working to develop ways of integrating other increasingly important dimensions of conservation into the curricula? How do we do more without losing depth? That's not so easy…

That's where you come in. As we have in the past, we soon will be soliciting perspectives on what the Field Naturalist and Ecological programs could or should become. Relying on past successes can never become an operating principle. "Evolving the Practice of Conservation" must continue to be our order of the day.

So, stay tuned. We'll be in touch soon.

Best wishes for a pleasant spring,

Jeffrey Hughes, Director, Field Naturalist Program
Deane Wang, Advisor, Ecological Planning Curriculum



Drawing by Bernd Heinrich

A Week in the Maine Woods
Charley Eiseman, FN-V

Friday, January 7—midday

Delayed 15 hours or so by a winter storm, seven Field Naturalists and Ecological Planners trudge up the hill to Bernd Heinrich's cabin near Weld, Maine, eager to start this year's Winter Ecology class. Soon after we arrive, Bernd emerges from the woods and informs us that we are right on time. After a light brunch consisting only of mugs of red wine, we embark on our first of seven daily group explorations of the surrounding forest.

Gluttons for punishment: Winter Ecology, January 2005

Friday, January 7—evening

"I think those are the northern lights!" Bernd exclaims to those of us sitting around the small bonfire outside his cabin. His excitement is infectious, and all eyes fix on the faint reddish glow. It looks like light pollution from a city, but the mere suggestion of Aurora Borealis is enough to convince us to focus on it with rapt attention. Before long, we become aware of a faint, bluish blob, drifting east and towards the horizon as it slowly fades in and out. The rest of the group is summoned from inside the cabin, and we all look on as the blob continues to drift, becoming brighter and greener with each slow pulse. It is a rich, minty green by the time it reaches the horizon and fades out for the last time.

Saturday, January 8—morning

We repeatedly encounter the tracks of coyote and bobcat investigating our own tracks from yesterday. Throughout our walk we see and hear ravens signaling something big and dead nearby. We fail to pinpoint where the action is, but are treated to observations of red squirrel taps on sugar maples, deer browse on lichens, impossibly small shrew tracks, and other curiosities.

Saturday, January 8—afternoon

After lunch we set out to make preliminary explorations for our research projects. Amanda, Chris, and Jesse spread out in different directions to look for patterns in the placement of deer beds. As I crash through dense thickets of balsam fir to investigate the food preferences of snowshoe hares, I periodically hear, reverberating through the woods, the distinctive 'thud!' of Abby, Lisa, and Ryan giving trees a single whack to see what kinds of invertebrates will drop from their branches onto the snow.

Continued on pg. 11

Field Notes

Editors: Chris Detwiller EP '06
Amanda Devine FN '06
Lisa Passerello FN '06
Artwork: William Abbott FN '05
Amanda Devine FN '06
Bernd Heinrich
Dan Wells SNR '06

The Field Naturalist (FN) and Ecological Planning (EP) Programs provide graduate-level science training for environmental professionals. EPs and FNs learn a "pieces, patterns, and processes" approach to landscape analysis, acquire powerful environmental problem-solving skills, and hone their abilities to communicate effectively with a broad spectrum of audiences.

Field Notes, an annual publication, encourages the exchange of news and ideas among past and present FNs, EPs, and friends, while presenting the programs to audiences beyond the UVM campus. We welcome all comments and submissions.

Field Notes Editorial Staff
Field Naturalist Program
Department of Botany
University of Vermont
Burlington, VT 05405

A Brief History of FN/EP Team V-6

Each fall, a new cohort of Field Naturalists and Ecological Planners joins the ranks of The University of Vermont's Graduate College. While the two programs are housed separately in the Botany Department and the Rubenstein School of Natural Resources, respectively, first-year FNs and EPs work and play as a team. This year's team brings to the table diverse interests, backgrounds, and aspirations, yet all share the common goal of identifying and solving environmental problems.

Chris Detwiller comes to the Ecological Planning program at UVM a graduate of Skidmore College, where he majored in Geology with a minor in Environmental Studies. During his time there he traveled West, where he explored Grand Teton, Yellowstone, Craters of the Moon, Hagerman Fossil Beds, Glacier, and Banff National Parks, studying the impressive geologic history of the region. In his junior year he spent a semester at the School for Field Studies' Center for Wetland Studies in Baja California Sur, Mexico. There he researched the effects of anthropogenic stressors on aquatic species, and studied the ecological, social and economic aspects of environmental conservation.

After receiving his degree, Chris returned to Mexico. He took on a 14 month long position as a research assistant at the Center for Coastal Studies, where he studied water quality, brown shrimp populations, sea turtle conservation, and gray whale ecotourism. He also spent two months backpacking throughout Mexico, including a month in Oaxaca, where he worked on perfecting his Spanish in an immersion course. Through his travels he fell in love with the country's natural beauty and rich culture.

Most recently he worked as a fisheries observer for the National Marine Fisheries Service, where he worked on commercial fishing boats collecting data to inform fisheries management decisions. His time working as a conservationist alongside fishermen and other people who rely upon natural resources for their survival led him to realize the need for building bridges between stakeholders on different sides of environmental issues. His dedication to building these bridges, and his passion for the natural world, led Chris to the Ecological Planning program at UVM.

Amanda Devine originally hails from Chesapeake, Virginia, where she spent much of her childhood playing with the critters under the porch and in nearby tidal pools. Having moved all around the east coast after several years in suburban Virginia, she settled on Maine as a more-or-less permanent home while attending Bates College. During the fall of her junior year, and following a summer working as a fisheries research assistant in the Alaskan Arctic, she bucked the tradition of a typical semester abroad to study at the Center for Northern Studies in Wolcott, Vermont. It was here that she learned the foundations of field botany, glacial geology, and paleoecology, which remain among her favorite pursuits. She graduated with a degree in Biology, a knack for painting and sketching, and a full-blown passion for far northern ecosystems. She further developed this passion during a two-summer stint as a naturalist and guide in Denali National Park, Alaska. During the intervening winter, she returned to Maine to work as a baker, woodcutter, and volunteer for The Nature Conservancy, all the while pursuing the perfect telemark turn (which continues to elude her).

Dissatisfied with her perceived lack of direct action in the field of environmental conservation, she has rededicated herself as a Field Naturalist to the full-time study of natural history, from bedrock to redox. This summer she will continue to hone her skills as a field scientist while conducting her masters project at the H. J. Andrews Experimental Forest in Blue River, Oregon, examining carbon accumulation in montane hemlock and Douglas fir forests.

When she's not wracking her brains coming up with inventive new ways to save humanity from itself, she enjoys baking, home brewing, and traipsing around mountains, and with very little provocation will belt out Bob Dylan songs in the not-quite-right key. She is and forever shall be grateful to her parents and big brother, who have always pushed her to succeed at endeavors she never thought possible.

Charley Eiseman spent his childhood in western Massachusetts, watching (and occasionally borrowing) the newts, frogs and other animals in his backyard. His interest in his natural surroundings grew over the years, and he decided to major in Wildlife Conservation at the University of Massachusetts. While his classes were exposing him to the scientific side of life, he simultaneously became active in a newly formed group of students who approached nature study from a different perspective. With this unofficial 'Woodsy Club,' Charley set aside his school work a few times a week to go tracking; make fire without matches; twist plant fibers into rope; sleep in shelters of sticks and leaves; forage for wild greens, roots, nuts and berries; skin animals and work with their hides; and take part in projects like making a canoe out of *Phragmites*. It was through this group, along with a summer internship at Mass Audubon's Wachusett Meadow Wildlife Sanctuary, that Charley's relationship with nature took on its current shape—a passion for assimilating natural history observations, for reveling in the interconnections of living things, and for sharing new discoveries with anyone willing to listen.

Meanwhile, Charley began a long series of seasonal field jobs, seeking out positions that would broaden his ecological knowledge and sharpen his identification skills. He developed his understanding of natural communities through summer jobs with the Massachusetts Division of Fisheries and Wildlife, the Housatonic River Biodiversity Assessment Project, and the Connecticut chapter of the Nature Conservancy. He pursued his interest in birds with a summer of banding with the Klamath Bird Observatory in Oregon, a summer studying Black-throated Blue Warblers at Hubbard Brook in New Hampshire, two summers conducting point counts throughout Vermont, and seven seasons of migration banding with the Braddock Bay Bird Observatory in New York. In the gaps between these jobs he co-created and co-taught a winter term class at Amherst College called "Ecology Through Animal Tracking," assisted in a long-term study of marbled salamanders, and found and documented 50 vernal pools for his town's conservation commission. Before beginning grad school, Charley spent the summer obsessively photographing and identifying moths, butter ies, and beetles. He has come to the Field Naturalist program to continue his naturalist pursuits while gaining a better understanding of what constitutes sound science, and how best to share his passions with others. His life's work will be to help people reconnect to their natural surroundings, and to facilitate decision-making that benefits native ora and fauna as well as humans.

This summer, Charley will inventory and assess the forest structure on properties owned by the Winooski Valley Park District, a regional land trust based in Burlington. He will predict future forest composition, identify threats to the forest structure, and present recommendations for the long-term protection of wildlife habitat and oral diversity.

Abby Hood likes to attribute her passion for the natural world to a particular chipmunk from upstate New York. As a little kid, Abby kept its larder well-stocked in exchange for her first up-close encounters with wildlife. They would not be the last. Years later, when she was in high school, Abby landed a job at a wildlife park, where she reared orphaned moose, fisher, and other mammals and birds. She went to Mount Holyoke College, where she studied wildlife and ecology. A semester in Kenya, spent studying wildlife management, opened her eyes to the social and political complexities of conservation, and led her to abandon her study of French in order to design a minor in Environmental Politics and Policy. She completed a thesis on genetic variability in the northern pitcher plant, graduating summa cum laude in 1999.

Abby's first job after college brought her to the Virgin Islands, where she walked moonlit beaches night after night, studying nesting hawksbill sea turtles. As exciting as the work was, Abby spent the next summer walking Vermont's Long Trail and then working as a backcountry caretaker, occupying herself by watching newts and juncos, moose and broad-winged hawks.

When the hawks migrated, so did Abby, and she ended up in Florida earning her living rehabilitating injured birds and spending her free time assisting with the care of an orphaned pygmy sperm whale. A year later she was back to the mountains of Vermont, working with raptors. Abby's work as a rehabilitator, though fulfilling on many levels, left her wanting for a more integrative, holistic, and effectual approach to environmental problem-solving. It left her sure that only by crossing boundaries and melding disciplines could real change be achieved.

After leaving the field of rehabilitation, Abby spent another pensive season as a Long Trail caretaker. It was during these months that, blessed with ample solitude and a beautifully wild home to explore, Abby discovered she could no longer tolerate not learning everything she could about the natural systems around her. She sought to understand wildlife and humans in the context of their shared environment. She found the Ecological Planning program and has been happily crossing boundaries and melding disciplines ever since.

Childhood memories of running barefoot through fields and woodlands, chasing chickens, and herding cows continue to drive **Jess Mohr's** passion in seeking balance among his desires to protect both native ecosystems and the working components of landscapes. His formative years were spent working the family's 185-acre farm in upstate New York. Living and functioning within this complex interface of the managed and natural worlds prompted existential wonderings such as: how do we, as humans, fit into the ecosystem? How can our needs be balanced with the needs of native species? These were questions Jess carried with him to the Evergreen State College in Olympia, Washington, where he focused his studies on applied Forest Ecology.

The incredible beauty and untamed wilderness of the Pacific Northwest stands in stark contrast to denuded industrial forestlands. Jess found it impossible to keep his passion for forests within the realm of science, and soon found himself captivated by the forest activism community, particularly Earth First!. While activism can be an important vehicle for forest protection, Jess came to realize that long-term preservation of forestlands could benefit from the integration of activism with responsible management. Following this line of thinking, Jess devoted his remaining studies to the applied programs of "Sustainable Forestry" and "Ecosystem Management".

During a three-year hiatus from Evergreen, Jess took time to explore the beauty of the Pacific Northwest but, as finances dwindled, he found work as a Washington Conservation Corps supervisor. During his stint with the WCC, Jess witnessed first-hand the implementation successes, failures, and economics of fire, wetland, trail, and salmon restoration projects. This opportunity complemented the hands-on approach to protecting forest health Jess sought in college.

Field experience, implementation know-how, and an ability to function in a highly interdisciplinary team were the key factors cited when Jess was hired as Evergreen's first "Restoration Coordinator". Grappling with the many complex issues of managing an 1100-acre recreation and research forest is challenging enough, but Jess found that appeasing the often ill-informed and reactionary student and activist communities was physically, and especially emotionally, distressing. While he succeeded in drafting and implementing a recreation management plan, Jess found himself with more questions than answers.

The natural and human worlds are complex in their own rights. When these two worlds collide, the complexities grow exponentially. The desire to balance human needs with the perpetuation of healthy and functional ecosystems–and to find his own place within this interface–has led Jess to the Ecological Planning program at UVM.

Few would have predicted that the **Ryan Owens** of 15 years ago would find his way to the woods of Vermont and the Field Naturalist program. Through his childhood he dreamed of becoming a professional golfer, or at least a businessman with a corner office. By teen-age, however, Ryan was escaping the vortex of Syracuse, NY to spend summers at a wilderness camp in northern New York. Leaving behind the noise and clutter of suburbia, he soon discovered that trees have names, soil is not dirty, and humans can survive happily without plumbing, television, or deodorant. Those experiences led to Dartmouth College and an initial choice of environmental studies as a major, which led to a semester in Zimbabwe. Though enlightened by the time abroad, he found environmental studies to be frustratingly vague and switched his major to ecology. After a season of field studies in Costa Rica prior to graduation, Ryan was again disillusioned, this time by the lack of humanity and applicability of pure research.

An ill-fated attempt at teaching in the Deep South came next, followed by an unwelcome but successful bout with cancer. Drawn back to New England, and spurred by a desire to find balance between science and conservation, Ryan then took an internship with The Wilderness Society where he helped advocate for additional wilderness designation in the Northeast. The internship evolved into a permanent position in high-donor fundraising, and Ryan was soon managing the Boston office and directing the Major Gifts direct-mail program for the entire organization. His time with The Wilderness Society was a valuable lesson in non-profit management and communication, but thousands of licked envelopes later he was ready to get back to the woods.

And so this convoluted journey has led Ryan to a two-year home in the Field Naturalist community. Few places offer the opportunity to explore in such depth the questions he now finds himself asking: "What is 'natural,' and why do we always define nature by an absence of all things human? What have we really achieved when we conserve threatened landscapes, yet alienate stakeholders or export the problem somewhere else? Can a more open-minded and sensitive dialogue dissolve the rancor that so often characterizes the environmental debate?" As a Field Naturalist, Ryan hopes to turn these questions back on the conservation community and reunite nature with culture. He will begin this summer while working for the Green Mountain Club to inventory a parcel of state land and draft a management plan that balances the diverse needs of black bears, Bicknell's thrushes, and backcountry skiers. In his spare time he bakes bread, drives slowly, and fruitlessly tries to convince his colleagues that plants are

Lisa Passerello is excited to finally live in a place where the snowy winters rival those of her childhood home, Michigan's Upper Peninsula. There, she found a deep appreciation for the natural world by wading chest-deep in rivers – "fishing" – though she often found everything except fish.

After graduating from the University of Michigan (BS Biology) in 1999, she immediately boarded a plane, and 36 hours later awoke on the "Big Island" of Hawaii. She remained in Hawaii for nearly two years, where she worked as an insect ecologist in the sloping lowland between Mauna Kea and Mauna Loa in Puhokuloa Training Area (US Army Garrison, HI).

After finally learning to paddle an outrigger canoe and to surf (both daunting endeavors for a mid-westerner), she made the tough decision to return to the mainland to teach ecology to children. Since 2001 she has worked as an educator (Institute of Ecosystem Studies, NY and Ferry Beach Ecology School, ME) and as an ecologist (The University of California, Davis). But one can't work all the time, so she recently hit the trail with her partner, Matt, taking off on foot from Yosemite National Park along the John Muir Trail. Three weeks later, she was atop Mt. Whitney. With barely a moment to catch her breath, she then embarked on another journey by foot – this time through Nepal's Annapurna and Tarai regions.

Her last journey ended in Vermont, where she has temporarily put down roots in the FN program. When not puzzling over landscapes and teasing out their stories, she is known to turn her naturalist's perception inward and to smile at how differently she views the world and her place in it since beginning the program.

Drawing by William Abbott

Where Are They Now?
FN/EP Team U-5 Masters Projects

William, browsing

Predicting Invasive Species Distributions in Clayplain Forests: A Tool for Conservation?
William Abbott, FN-U

Last summer, I romped around a couple dozen patches of Valley Clayplain Forest in Addison County, Vermont. I was working for The Nature Conservancy, which had delineated this mostly agricultural area that included these patches of rare forest as having a high potential for biodiversity conservation. My project had two different goals: to study the distribution of exotic invasive shrubs within these forested patches, and to prioritize the conservation potential of each such forested patch.

The invasive species of focus were common buckthorn (*Rhamnus cathartica*), Morrow's honeysuckle (*Lonicera morrowii*), and Tartarian honeysuckle (*L. tatarica*). Invasive density was plotted against size of forested patch, the ratio of the patch edge to interior area, and the distance to the edge of the patch. Only one of these experiments panned out: there was no relationship between the density of the invasives and the area of forested patch or the ratio of patch area to patch perimeter; density of invasive species stems were weakly related to the distance to the edge of the patch, however (*Lonicera* spp.: r-squared = 17.4 and $p = 0.067$; *Rhamnus cathartica*: r-squared = 35.7 and $p = 0.05$).

Land-use history (interpreted from 1942 aerials) was subsequently analyzed to see if it could better explain the occurrence of these invasives on the landscape. It did (with chi-square values for cross-category comparisons as high as 251.37, $p < 0.0001$). Specifically, invasive stems were present much more often in areas of recent reforestation or areas that had scattered pasture trees 60 years ago. Differences between the two suites of species (*Rhamnus cathartica* on one hand, both *Lonicera* spp. on the other) was apparent as well: it appeared that, 60 years ago, buckthorn had established in areas of medium light availability, whereas the *Lonicera* spp. were restricted to areas with high light availability. These data favor the conservation of existing patches of forest more than 60 years old and make less favorable the possibility of active forest restoration, due to increase in threat of invasives.

Forested patches were ranked for conservation potential on two separate scales: ecological and spatial. The ecological attributes used in ranking were the Simpson's Index of Diversity (1-D) for all woody plants encountered; the number and size of standing dead snags; the number and size of downed woody debris; the average diameter at breast height of trees; and the variance of the former metric (which serves as a surrogate for determining whether a forest is comprised of even- or uneven-aged stands). Spatial attributes used in ranking were the size of the forest (acres); the shape of the forest; the proximity of one patch to all other patches in the conservation target area; and the percent of the forested patch that has remained continuously forested since 1942 (as a surrogate for invasive species presence).

Three non-contiguous areas of forested patches received high ranks and comprise three loose cores – targets for the conservation of Valley Clayplain Forest. I advocate for the conservation of such high-ranked patches in their current state as a primary conservation goal of the site, and the potential linkage between such patches (the infill of the core areas) and core areas (the creation of corridors) only as a secondary conservation goal.

Riparian Birds of Gates of the Arctic National Park, Alaska: Where are they and why?
Sally Andersen, FN-U

A resident arctic tern greets Sally

Gates of the Arctic National Park is an 8.2 million acre wilderness in the central Brooks Range of Alaska. The Park is home to an estimated 150 species of birds, and because it is both large and difficult to access (there are no roads leading into or out of the Park), little is known about the abundance and distribution of most of these bird species.

In the summer months of the central Brooks Range of Alaska, a wealth of invertebrates draws Olive-sided Flycatchers, Blackpoll Warblers, and Gray-cheeked Thrushes to riparian shrublands and forests. The U.S. Fish and Wildlife Service lists these species as "species of concern," because of declining populations or threats to their habitats. I spent the summer of 2004 conducting an inventory of birds in riparian zones of five major rivers of the Park. In addition to surveying birds, field crews on each river measured a number of vegetation variables (such as tree height and canopy cover) to characterize the habitat of the area.

The brief arctic summer has been followed by a longer winter of data analysis. My analysis compares the relative abundance and species diversity of birds between rivers. I am using the vegetation metrics, along with bird count data, to create species-specific habitat models meant to predict where we can expect certain bird species to occur. These models will eventually allow us to predict species diversity even on rivers that we are unable to survey, a useful tool for resource managers trying to manage bird populations in a Park larger than the state of Vermont.

Jen and her dutiful field assistants

The Biscuit Fire and the Flora of Serpentine Fens of the Klamath-Siskiyou Region (Can they stand the heat or did they get out of the kitchen?)

Jen Cramer, FN-U

Q: What do you get when you combine a beautiful mountain range, bizarre geology, complex hydrology, crystal clear swimming holes, six sedges, five endemic species, four orchids, three carnivorous plants, two lilies, and one gigantic wildfire all in a highly politically charged environment?

A: One heck of a master's project! During the summer of 2002, the Biscuit Fire burned 500,000 acres in the Klamath–Siskiyou Region of southwestern Oregon and northwestern California. The Biscuit Fire was unique because it burned across North America's largest exposure of serpentinized rock, which is characterized by high levels of heavy metals and low levels of available calcium. The unique chemical properties of serpentine soils give rise to distinctive plant communities, including a high proportion of endemic species. Serpentine fens have a unique flora of obligate hydrophytes that can tolerate severe edaphic and climatic conditions on the exposed ultramafic slopes of the Klamath-Siskiyou. These isolated wetlands support such species as the carnivorous cobra lily (*Darlingtonia californica*), as well as five taxa that have been considered for federal listing as Threatened or Endangered.

My research examined the differences in plant community composition in burned and unburned fens and tracked changes in rare species populations in order to guide management considerations in the Serpentine Fen Conservation Agreement, currently under development by the U.S. Forest Service, Bureau of Land Management, and U.S. Fish & Wildlife Service. This agreement seeks to establish a framework for conservation of the five rare taxa and their habitat. To better allow for future discoveries of the complex interactions in these amazing places, I also established a permanent plot monitoring system.

After months of data crunching, it appears that, initially, the Biscuit fire had a small but significant impact on the species composition of serpentine fens. There were a few species found only in burned fens, but no species found only in unburned fens. Rare species populations remained stable or increased following fire. However, dominance did shift following fire, with the carnivorous cobra lily dominating unburned fens, and Criniger's cottongrass (*Eriophorum crinigerum*), a sedge, prevailing in burned fens. Continued monitoring of permanent plots that I established will yield insight into the competitive dynamics and abiotic changes in serpentine fens in the years following wildfire, informing management decisions and providing awe-inspiring fieldwork to a lucky naturalist.

Bats in the Bunker

Jim Eikenberry, EP5

What does an 800 foot-long WWII era concrete bunker have to do with the conservation of the natural world? That was one of the many challenging questions I asked myself this past summer while I was conducting an ecological inventory and wetlands assessment at Fort Nathaniel Greene in Narragansett, Rhode Island. It turns out that barn swallows nest in the large hooks on the ceiling of a gunport in the bunker, formerly used to support massive sixteen-inch guns designed to protect the Narragansett Bay from enemy attack. Bats also live in the bunker, sleeping during the day and flying out at dusk and early dawn to feed on the mosquitoes, moths, and other insects that live in the wetlands, fields, and forests. Eastern coyotes are also common at the Fort and they den in a smaller bunker just north of Battery Hamilton, (the 800 foot bunker). Though it's not a classic example of swords into plowshares, it seems close enough to count.

My research was part of a larger project between the 94th Regional Readiness Command of the US Army Reserve and UVM's Field Naturalist, Ecological Planning, and Historic Preservation graduate programs. As project manager, working under Principal Investigator and Field Naturalist Program Director Dr. Jeffrey Hughes, I collaborated with Army Reserve managers, Kristen Puryear (T-team) and Roger Ciuffo of the Historic Preservation Program. Separately and collectively, we scoured the 104 acre landscape and learned its story by mucking through the wetlands, struggling through dense patches of greenbriar (*Smilax rotundifolia*) and grape vines (*Vitis labrusca*) and examining the old stone walls, foundations, and of course, the big concrete bunkers.

Lessons about the integrated nature of landscapes abound at Fort Greene. The densest thickets of greenbriar and grape were typically found in wetlands that were abandoned from agriculture when the Army took over in 1941. Open grown red maples (*Acer rubrum*) and swamp white oaks (*Quercus bicolor*) marked even earlier eras of agricultural abandonment, and raccoons, fox, coyote, and deer still live in and pass through the bunkers at the Fort. Happily, the Army Reserve is concerned about conserving and managing the natural and cultural elements of the Fort Greene landscape. They recognize that their goals also encompass conserving the landscape of Fort Greene, both to provide realistic training for Reservists and to protect the habitat and wildlife surrounded by an otherwise suburbanized landscape.

Eastern Box Turtle finds sanctuary at Ft. Greene

Stories of Shelburne Through the Seasons: Using Phenology as a Framework to Engage Communities in the Natural Cycles and Processes of their Landscape

Matt Kolan, FN-U

Our tendencies to observe and mark seasonal mileposts run deep. Over the course of the past year I have been delighted to join residents of Shelburne, Vermont in recording the phenology of their town landscape. Literally defined, phenology is the study of nature's events as they unfold through the seasons. The blossoming of bloodroot through the leaf litter in early spring, the first ethereal song of the hermit thrush, the annual migration of salamanders and frogs to their breeding grounds, the first flashes of fireflies on warm summer evenings—these are some of the phenological events of our passing seasons.

Working with the PLACE (Place-based Landscape Analysis and Community Education - see inset on page 18) Institute, I have had the opportunity to provide local residents with a forum and framework for exploring and understanding the natural history of their town landscape. Partnering with local schools, town commissions, nursing homes, and planning and conservation organizations, I have helped to facilitate the development of an integrated series of experiences (field walks, community workshops, presentations, student and teacher programs) and resources (interactive websites, photo-journals, phenological calendars) designed to tell the story of Shelburne through the seasons.

As this project continues, seasonal events will be tracked from year to year so that comparisons can be made and trends can be analyzed. These observations will be used to inform local decision-making processes and will be compiled into a year-round story of Shelburne—alerting community members, educators, and visitors to the times and places of exciting seasonal events.

A late summer Jerusalem artichoke in bloom

Landscape-Scale Conservation at Katahdin IronWorks

Jane Moscowitch, EP5

Before the leaves had fallen from the trees last fall, Team U5 sat around the Botany conference room table discussing their dream master's projects. While other team members had concrete visions, I remember staring out the window at the foliage and thinking that I wanted to remain in the Northeast, and that I wanted the project to be BIG. I guess I got both of my wishes.

The Maine Woods Initiative is the Appalachian Mountain Club's (AMC) largest conservation and recreation effort in its 127-year history. AMC's goal is to secure the conservation of a large block of land for the purposes of biological conservation, backcountry recreation, environmental education, and sustainable forestry. After surveying the Northeast, AMC decided to focus their attention southeast of Moosehead Lake, in a remote area along the Appalachian Trail known as the "100-Mile Wilderness." The first stage of this project was completed when AMC purchased Little Lyford Pond Camps in the summer of 2003, and the surrounding 37,000 acres from International Paper the following December.

Research assistant Elias adds ballast

The parcel, also known as the Katahdin Iron Works property, lies 11 miles east of Greenville, Maine with the Appalachian Trail traversing it. The property includes ecologically significant features such as the West Branch of the Pleasant River, which supports a high-quality natural fishery and is a source of water for the Gulf Hagas Gorge - one of the most outstanding natural features along the Appalachian Trail. The property also includes a wetland complex of more than 1,000 acres, including the 300-acre Caribou Bog, one of the largest contiguous, non-forested wetlands in the region. Additionally, it includes and buffers the highest peaks between the Bigelow Mountain Range and the Katahdin area.

While extensive broad-scale information on the 37,000-acre parcel had been acquired before this study, no detailed field work had been performed. My work represents the first piece of AMC's management plan for the property. Its purpose is to provide a thorough list of the property's natural resources, including descriptions and maps of the biophysical features of the property, natural communities and rare plants found therein, plant and bird species lists, and areas identified as ecologically significant. In addition, I completed an analysis to determine the most appropriate area for an ecological reserve of 12,000 acres to capture both the physical and biological diversity across the property and the natural processes necessary to maintain them over time.

My work provides an ideal educational resource that can be used to inform and unite the many parties living in the area, as well as those who come from afar to enjoy the property. Conservation and management of the Katahdin Iron Works property should reflect the AMC's mission, while ensuring the long-term viability of the property's ecological resources. In doing so, the AMC will foster a greater sense of community respect, understanding, and stewardship for the local landscape.

"A Week in the Maine Woods," *continued from pg. 3*

Sunday, January 9—morning

We stop for a while to watch a pair of red-breasted nuthatches flitting back and forth between a fir and a sugar maple. We discover that they are carrying seeds from the fir cones, one at a time, to cache in clusters under the bark of the maple. Later we watch a chickadee pick through little piles of red spruce scales we have just seen a red squirrel drop, looking for seeds the squirrel has missed.

Sunday, January 9—afternoon

Abby, Lisa, Ryan, and I set out to observe the dynamics of the mixed species foraging flocks that we have repeatedly encountered in our explorations over the past few days. Of course, now that we are looking for them, they are nowhere to be found, but it isn't hard to find other ways to occupy ourselves. We sample a number of twigs to consider why deer, moose, and hares might prefer some plants to others. We find fir twigs to be sticky but not unpleasant-tasting; spruce has a lemony bathroom cleaner sort of flavor; hobblebush starts out cardboardy but has a spicy aftertaste; beech and red maple are nothing to write home about. Later in our wanderings we find a patch of ground littered with promethea moth cocoons that a red squirrel has munched and dropped from above.

Monday, January 10—evening

After dinner, Amanda discovers a use for the bottle of 150-proof rum that stands by the window: bananas flambé. We all oooh and ahhh at the eerie blue flames swirling in the cast-iron pan in the otherwise dark cabin.

Tuesday, January 11—morning

We stop to watch a feller-buncher at work on a dense, even-aged stand of skinny spruces. With efficiency both beautiful and frightening, it effortlessly knocks down whole groups of trees, then sucks them in one at a time, quickly shucking off the branches and cutting the trunks into even lengths.

Wednesday, January 12—mid-day

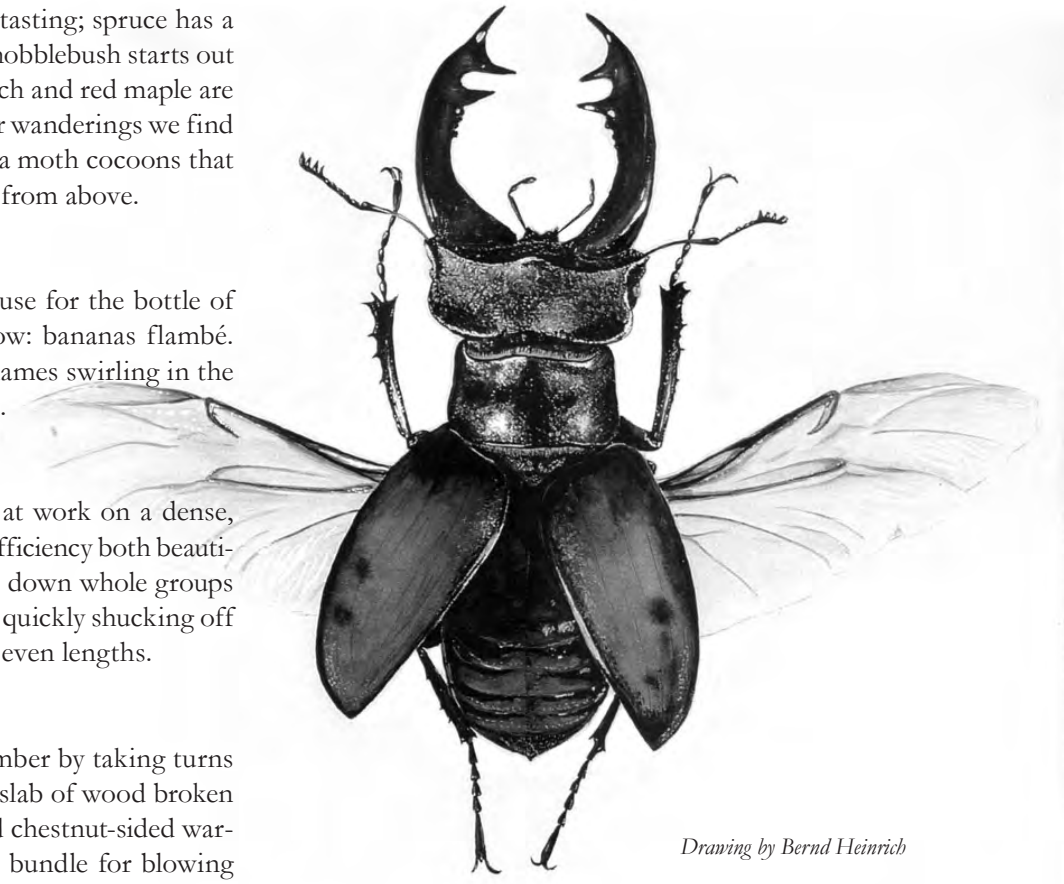
Two of us are able to produce an ember by taking turns drilling an evening primrose stalk into a slab of wood broken from a northern white cedar tree. An old chestnut-sided warbler nest proves to be the perfect tinder bundle for blowing the ember into flame.

Thursday, January 13—evening

After a delicious dinner of red beans and rice and Abby's birthday cake, we laugh ourselves senseless playing a round of "Oh, Crap, My Nuthatch," a game in which people alternately write sentences and draw pictures on a piece of paper. Each sentence or drawing is supposed to capture the essence of the preceding drawing or sentence, but the paper is folded so that only the most recent entry can be seen. And so 'The porcupine spitefully girdled all the beech trees' becomes 'His cilia all aquiver, George, the world's largest single-celled organism, reeled in his first fish,' and so on.

Friday, January 14—midday

After Bernd quizzes us on the identification of tree bark, buds, cocoons, animal tracks, and the like, we head back to Burlington—stopping only for pumpkin whoopie-pies.



Drawing by Bernd Heinrich

Road Plans and Aqueducts: An Ecological Planner's Awakening to Nature

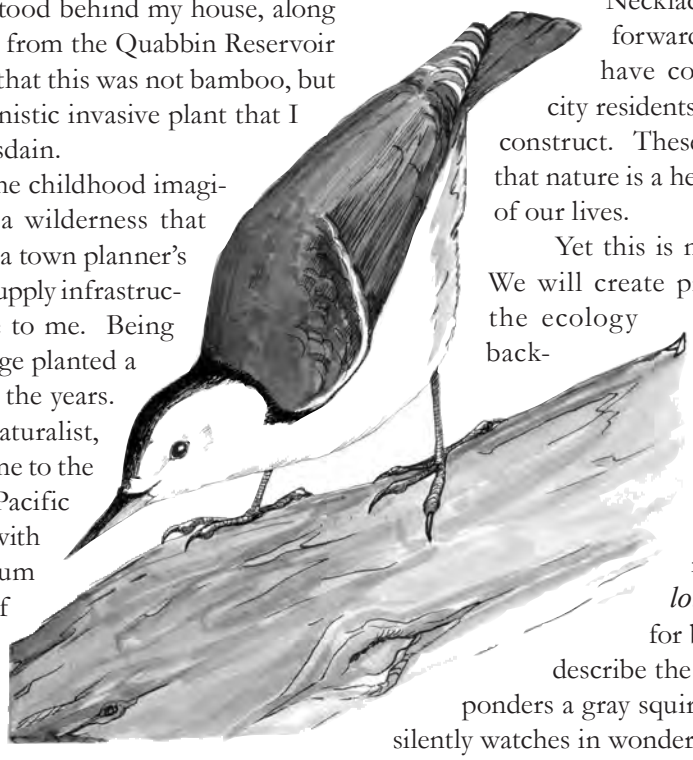
Chris Detwiller, EP6

"It is in man's heart that the life of nature's spectacle exists…"
- Jean-Jacques Rousseau, 1762

My childhood was filled with adventures into untamed wilderness. I spent countless afternoons roaming through the forest and wading through dense thickets of bamboo; camping out under the stars, surrounded by trees, lying in soft grasses; building teepees from downed trees; setting up traps- boxes propped up by sticks, sneakily connected to a carrot, eagerly checking each morning to see if I had caught a rabbit.

I didn't grow up in the wilderness, though. I grew up in a suburb of Boston, in a small 1940s Cape, on a 1/4 acre lot. Yet I have an intense connection to and appreciation for nature. My forest, if you look at a map, is Bacon Road. For reasons still unknown to me the road was never built, so in its place stands a small woodland of oak, sugar maple, and beech trees. My thickets of bamboo stood behind my house, along an aqueduct, transporting water from the Quabbin Reservoir into Boston. I came to find out that this was not bamboo, but Japanese knotweed, an opportunistic invasive plant that I am supposed to hold in great disdain.

In retrospect I marvel at the childhood imagination that provided me with a wilderness that was perhaps nothing more than a town planner's oversights and municipal water supply infrastructure - but it was so much more to me. Being exposed to nature at this early age planted a seed in me that has grown over the years. It has turned me into an avid naturalist, hiker, and camper. It has taken me to the mangrove-lined estuaries of the Pacific coast of Mexico, where I worked with school children to create a museum interpreting the natural history of their own rich ocean and desert ecosystems. It has taken me to Grand Teton, Craters of the Moon, Glacier, Banff, and Yellowstone National Parks, where I learned about the radically different geologic and biologic processes that drive each landscape. And it has taken me to the Atlantic Ocean, off the coast of Gloucester where, while collecting fisheries data for the National Marine Fisheries Service, I sat for hours on the bows of boats, looking miles out to the horizon, watching humpback whales spyhop in the distance and pods of white-sided dolphins jump alongside the bow. On one occasion I saw one of only 350 remaining North Atlantic right whales come up from under the starboard side of my boat to breach the surface not 30 feet away.



And throughout all of this I never felt like I was an observer. In fact, during these times I felt more like I was part of a greater whole than ever before. In the experiences I shared with children, I could see in their eyes that they felt it too - a connection to everything we share the planet with; a connection that makes us more whole than any manmade experience could inspire. This is the connection that needs to be fostered in people. Reconnecting humans with nature will instill in them a sense of place and restore a balance in our role in the world.

To accomplish this we need not only bring people to nature, we can bring nature to people. As Ecological Planners and Field Naturalists we will create and implement strategies for conservation, planning, and smart land use that will instill this value of nature in people. A visionary like Frederick Law Olmsted was ahead of his time when he laid out the plans for Central Park in New York and the Public Garden and Emerald Necklace in Boston. It is thanks to his forward thinking that these urban areas have continued to thrive and connect city residents to nature, even if it is of human construct. These areas instill in people a feeling that nature is a healthy, peaceful, and valuable part of our lives.

Yet this is not enough. We will go further. We will create programs to teach people about the ecology of the parks right in their own backyards and the plants and animals that have adapted to live in a highly developed ecosystem. We will nurture people's curiosity to study the caching habits of *Sciurus carolinensis* and the nocturnal behavior of *Procyon lotor.* This lingo won't be reserved for brainy academics, though. It will describe the backyard scientist who curiously ponders a gray squirrel burying nuts in the grass and silently watches in wonder as a raccoon and her kits quietly slip through the bushes at night. For nature is not something that can be set aside from society, it is all around us, all the time, in urban parks as well as rural landscapes. We need not travel far away to experience nature, we can make these connections all around us every day. They can be made through a walk on the beach, a trip to a city park, a day at a museum, or a walk down Bacon Road. Once the seed has been planted in a culture that offers the right growing conditions, we will be able to cultivate the naturalist in everyone.

Paintings by Amanda Devine

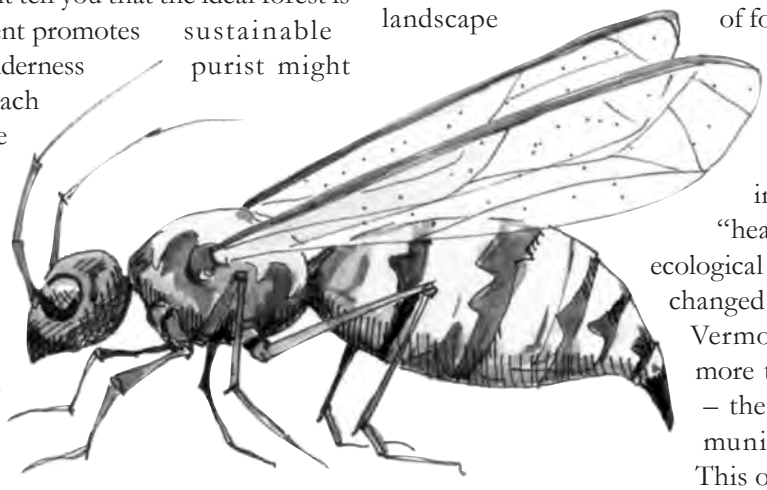
Towards an Integrated Vision of Stewardship

Ryan Owens, FN-V

The Judeo-Christian tradition proclaiming humankind's dominion over the earth has long reigned as the prevailing paradigm of our relationship to the land. That dominion has existed in many forms, from early subsistence agriculture to the current large-scale exploitation of natural resources. In recent times, informed by a growing understanding of ecology and our place in the natural order, many of us are beginning to eschew our role as the dominant exploiter, replacing it with one of comparatively benign paternalism. Indeed, "stewardship" has become the buzzword of 21st century environmentalism. Concepts of appropriate stewardship vary widely, however, as we each bring our own perspectives and values to the land management table. What are we to do, then, with this diversity of potentially conflicting approaches?

Most land stewards would claim that they make management decisions in the best interests of the land. But what is the measure of goodness from the land's perspective? Is wilderness, which often bears no evidence of human activity, the ecological ideal? Are bountiful timber and food harvests indicative of healthy land, or is natural resource exploitation of any type undesirable? The problem is that an idea of goodness, as far as land is concerned, is merely the product of our own uniquely human perspectives. Ask ten Vermonters to describe their ideal landscape and you will likely get ten different answers. The forester, for example, might tell you that the ideal forest is one in which active management promotes sustainable timber production, while the wilderness purist might counter that a hands-off approach is best, as succession will guide a forest to its ideal community. The hunter may claim that early-successional patches are needed to sustain healthy deer herds, while the farmer may describe sustainable food production as the best land use. These are simplistic generalizations, but they illustrate a point: many perspectives, from the extractive to the non-invasive, claim to promote good land stewardship, yet each prescribes different – even conflicting – land management. Rather than viewing these competing perspectives as obstacles, I believe there is room for multiple interpretations of stewardship, provided that management decisions work toward the shared viability of human and natural communities. One of the defining experiences of my first semester as a Field Naturalist was a visit to Vermont's Green Mountain National Forest, where a number of local partnerships are working to promote healthy human communities alongside healthy natural communities. One such group,

Moose browse on a red maple - a.k.a, "Spaghetti Stripping"



a partnership of local tourism-related business owners and the Forest Service, advanced a vision of stewardship that favors selective clearcuts to provide habitat for the deer and other wildlife that tourists expect to see, in combination with maintenance of open meadows to reflect the stereotypical Vermont landscape of forest and field. At the time, I was quick to criticize what I saw as ecological naiveté; I found the mere suggestion that logging and mowing could promote ecosystem "health" hopelessly ignorant of ecological reality. In time, my opinion changed with a recognition that the Vermont landscape involves far more than mere ecological reality – the needs of the human community are equally important. This organization was achieving a compromise that both supports a sustainable and profitable industry – nature-based tourism – and conserves the natural landscape. Yes, a few trees are cut and unnatural clearings maintained, but the landscape remains largely intact. Given the alternatives – large-scale logging or condominium development – these sacrifices are easily accepted.

Indeed, human and natural community health may actually promote one another, as this example suggests, yet each must make sacrifices to the other in the form of management compromises. Partnership and collaboration across a range of stakeholders are key. In this and other similar cases, the

Continued on pg. 18

The Product of Place
Jess Mohr, EP 6

While applying to the Ecological Planning program, I visited the University of Vermont's Rubenstein School of the Environment and Natural Resources. Upon entering Aiken, the building where the Rubenstein School is housed, my olfactory, auditory, and visual senses were pleasantly greeted: a flood of natural lightning and greenery, the taste and smell of pure air, and gentle bubbling emanating from the self-contained aquatic ecosystems near the entrance. The character of Aiken was purposefully crafted by the building's architects, designers, and planners to incorporate ecological elements into an academic environment both functional and stimulating.

After a brief meeting with Deane Wang (EP advisor extraordinaire), I exited Aiken and crossed the walkway into another building to complete my interview process. During these remaining interviews, I found the prison-esque architecture of this other building to be quite adept at stifling my creative spirit. Little did I know, this building across the walkway from Aiken, whose name I had not bothered to learn, is the site of one our nation's greatest educational experiments and, undoubtedly, the hotbed of this program's collective 1st year learning experience.

As plans for our new "Green" Aiken materialize, the Rubenstein School of the Environment and Natural Resources continues to be among the forefront of environmental news. But, it is important to recognize that Marsh Life Science, the inefficiently designed cinder block that sits across the walkway from Aiken, has housed, fostered, and even seen the retirement of some of our greatest conservation leaders. The Field Naturalist program, which is part of the Botany Department and sister program to the Ecological Planning program, began molding cross-disciplinary scientists and future conservation leaders over 20 years ago. Today, developing future conservation leaders is a bit ordinary, but developing future conservation leaders capable of throwing off the stifling atmosphere of their concrete workspace–reminiscent of many state and federal offices – and still able to envision solutions for tomorrow, is extraordinary. This 20-year plus workspace experiment, which Field Naturalists and Ecological Planners unknowingly participate in, has rarely been executed with the success it has achieved here at UVM.

As an Ecological Planner, I am privy to the benefits of being both a botany and natural resources student, and the mild dose of schizophrenia that accompanies this dual schooling. A luxurious office, a soon-to-be sustainable building, the plethora of resources, and otherwise high profile schooling is bestowed upon students of Rubenstein, and yet I am also blessed by the incredible, yet functional, visionary force of Marsh.

While graduate school demands a certain incurring of debt, an individual considering the Ecological Planning program should recognize that the stated tuition really represents two schoolings for the price of one: the practical, visionary edification of Marsh, and the final provisioning for future conservation leaders leaving the Ecological Planning program back in Aiken. Maybe the two combined experiences do not quite equal two degrees, but it should at least equal one and a half. As my first year draws to an end, I have found a warm embrace hidden within Marsh's concrete interior, felt the cold draft of an empty room in Aiken, and learned that an innovative workplace atmosphere is a product of people, not place.

Drawing by Amanda Devine

'Naturalist Journals*," continued from pg. 1*

arranged, one way, or another, according to dates, sometimes within topical categories (field and dedicated journals), other times, with no separations at all (personal journals). Dating each entry provides a traceable record of when something was seen, thought, or read—chronological information that often proves crucial for later analysis and interpretation.

Audience. Journals are written to explore what's important to the writer/naturalist at the time of writing, not to directly communicate information or ideas to someone else. What is written in a naturalist's journal is a seedbed for ideas that will go public only later, as reports, policies, presentations, conference papers, research projects, grant proposals, or publications. In short, letters, reports, and proposals are aimed at external audiences, but journal entries are aimed at the writer's self.

Language. Since the journal audience is the writer's self, the style, tone, and conventions are whatever a writer wishes - wide open. The only rule is, maybe, that the writer can reread his or her handwriting. In other words, journals focus on ideas, data, reflections, and observations rather than on correct spelling, proper punctuation, complete sentences, or specific format. What follows is a brief description of how journals work in the hands of FN/EP professors.

Bernd Heinrich, biologist, keeps journals for all occa-

sions, quite literally writing his way through his life. Once he loaned me one of his personal journals, a bound notebook of some seven-hundred pages, covering a number of years, and I observed him observing the world as only a naturalist does, attending on one page to carpenter ants, another to raven droppings, and yet another to a thriving raspberry crop, with notes about family, running, writing, and teaching woven throughout. Bernd also keeps a variety of dedicated journals, with collected thoughts focused on specific research projects.

Dave Barrington, botanist, keeps, in addition to personal journals, ones dedicated to particular research journeys such as his winter trips to Mexico and Costa Rica where he finds order and sense in the world of ferns the rest of us take for granted, such as "*Polystichum fournieri* . . . a rare species known only from Oaxaca to Chiapas, Mexico."

Jeff Hughes keeps a general-purpose field journal, divided into sections that include to-do lists, personal speculations, data observations, and resource records. He asks his students to do the same, hoping that collecting scattered and diverse thoughts in specific places within a single binder will provide a unity and synthesis otherwise missing in both the wider world and the writer's mind.

Me? I'm now keeping a number of journals, writing notes about the most common of daily routines—filling the wood box, feeding the chickadees, reading books, watching films, skiing, snow-blowing and, soon, planting and lawn mowing. I'm likely to keep any and all ramblings in my small loose-leaf, leather-bound personal journal, but at the same time, I keep other journals dedicated to motorcycle traveling, timber harvesting, and tomato canning.

Most recently, however, I've written with extra passion, even anger, in my personal journal, trying to make sense of the leukemia now attacking my thirty-four-year-old daughter, Megan. "It's not fair," I write too often, trying to make sense of T-cells in the bloodstream gone mad. "But then life isn't, is it—fair, I mean?" Quite often, lately, when no one else is around, writing and reading my own words provides some solace even if it doesn't exactly answer all my questions. At the same time, my journal—along with Dr. Grant—also tells me that the prognosis is hopeful, my daughter strong, and life, soon, will be good again.

Photo credit to Dan Wells

A Dichotomous Key to Ecological Planners and Field Naturalists

A1. Lower mandible at least occasionally hirsute or pubescent
- B1. Height greater than 1.8 meters
  - C1. Pelage dark
    - D1. Accompanied by canine
      - Canine answers to "Frankie"……Matt Kolan
      - Canine answers to "Corrie"……Jess Mohr
    - D2. Not as above……Ryan Owens (see below)
  - C2. Pelage light……Chris Detwiller
- B2. Height less than 1.8 meters
  - Pelage dark……Jim Eikenberry
  - Pelage light……Charley Eiseman

A2. Lower mandible glabrous or puberulent
- E1. Pelage less than 5 cm long……William Abbott
- E2. Pelage greater than 5 cm long
  - F1. Pelage dark
    - G1. Accompanied by canine
      - Canine answers to "Elias"……Jane Moscowitch
    - G2. Not as above
      - Pelage less than 40 cm……Lisa Passerello
      - Pelage greater than 40 cm……Jennie Cramer
  - F2. Pelage light
    - H1. Accompanied by canine
      - Canine answers to "Hank"……Sally Andersen
      - Canine answers to "Marley"……Abby Hood
    - H2. Not as above……Amanda Devine

Ryan Owens taps a sugar maple (or was it a red?) at the Vermont Audubon Society's Huntington property, a recently recognized Important Bird Area, and the site of Team V-6's Landscape Inventory and Assessment project.

The Pavement Barrens is a Nature Conservancy preserve located in upstate New York. What follows is one Field Naturalist's interpretation of the site's unusual geologic history and potential for restoration. Apologies are decidedly due to Robert Service.

The Spell of the Barrens
Amanda Devine, FN-V

We loaded our van at U. VM;
Walt swore not to drive like a putz.
Were they red lights or green? We went through 'em,
In search of hot drinks and dough-nuts.
We needed the fuel for our voyage;
Jane warned us our minds would be blown
At the landscape awaiting – What carnage
Had been wreaked by the ice on the stone!

Oh, the tale of the Barrens is older
By far than the Quaternary,
Though glaciers moved cobbles and boulders,
It was rifting that caused them to be.
In the days 'fore the Proterozoic,
The continents came and they went.
The result of convection? You know it!
A massive uplifting event.

The Grenvilles – (My god, to have seen them!)
Rose up from Iapetan waves,
And the sands sifting down in between them
Settled out in discrete bedding planes.
While sands from the mountains eroded,
Into ripples and troughs they were tossed.
They're preserved there today, which we noted
Since there ain't any soil on top.

And through the Precambrian basement,
In fissures and fractures from stress,
Intruded these dykes that are mafic,
Making stratigraphizing a mess.
The sandstone that sits at the surface -
Most depauperate rock that I know -
For the purpose of plant growth is worthless
(Unless you're content to grow slow.)

But this place doesn't end with the sandstone.
Oh, there's far more than that here to see!
There are lichens and soil that's wind-blown,
And ledges and twisted pine trees.
These ledges were formed in an uplift
Ten million or so years ago.
The compression that came about post-rift
Caused thrust faults to fracture them so.

The result of the thrusting and lifting
Has created these ledges like stairs,
Which collect all the soil that's drifting
And allow bigger pines to grow there.

Drawing by William Abbott

And speaking of pines – did you see them?
Did you notice serotinous cones?
For it's fire the seeds need to free them
And keep woodland a-crowning the stone.

But the jack pines here now haven't always
Borne witness to rainfall and snow,
For it hasn't been long since those cold days
When Pleistocene glaciers did grow.
The ice crowned this land for an era;
Or so, to the mammoths, it seemed.
But till should be marking just where the
Great Laurentide ice sheet had been.

But it's gone! No surficial deposit
Attests to the glacier's advance;
The rock - no striations upon it;
They never had much of a chance.
For the ice dammed a whole bunch of water,
(I swear that this isn't a ploy!)
And as soon as the climate grew hotter,
Came the breakout of Lake Iroquois.

The depth of debris must have been huge,
But erratics and boulders and till
Were all carried away in a deluge
When an ice dam burst at Covey Hill.
So while glaciers seem to have been slacking,
It was due to the force of the flow
That surficial deposits are lacking
Where pitch pines and jack pines now grow.

Before there were pines there were spruces
A-growing in front of the ice,
Browsed by mastodons and stag-mooses,
Giant beavers and sloths and the like.
But after the ice sheets diminished,
The peat cores have led us to know
That the reign of the spruces was finished,
And these spindly pines stole the show.

For the climate had slowly grown drier
Once the glaciers departed the scene,
And the frequent occurrence of fire
Marked a brand new disturbance regime.
While this landscape has clearly been altered
By fire, by ice, and by us,
The planet's rotation hasn't faltered
So why all the restoration fuss?

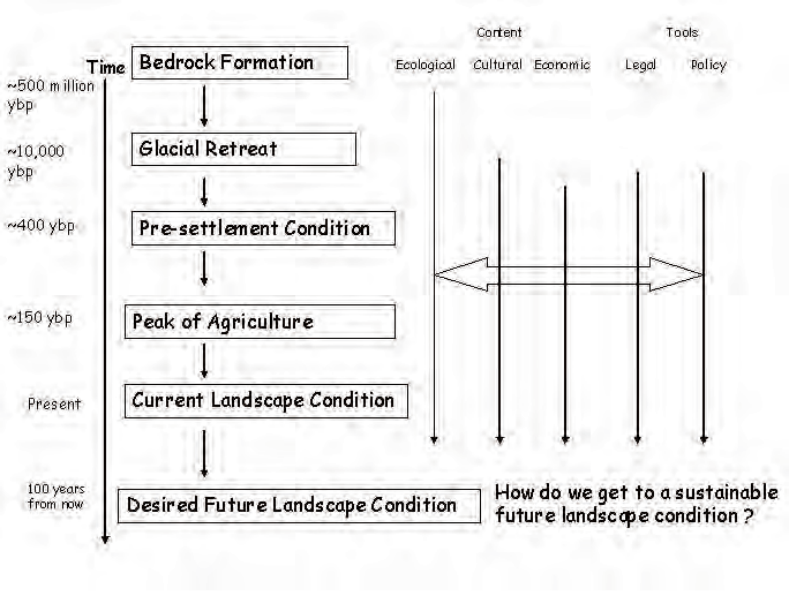
Come the next Milankovitch cycle
The slate will be quickly wiped clean.
And perhaps this is too existential,
But what does restoration really mean?
Just give it a few more millennia
To return to the ice ages' chill;
I'm broke but still willing to betcha
That the ice may come back – and it will!

"Stewardship," *continued from pg. 13*

needs of private, for-profit entities, the multiple-use mandate of the Forest Service, and the conservation goals of environmental groups are merged and balanced for the common good. It has become clear that land conservation does not have to be a black and white issue; indeed, such an inflexible approach is doomed to fail. Stewardship, exercised through willing partnership and informed compromise, will be the key to successful land conservation in the 21st century.

The PLACE Program

A joint initiative of UVM and Shelburne Farms, and inspired by the Field Naturalist program, the PLACE (Place-based Landscape Analysis and Community Education) Program provides Vermonters with a forum for exploring and understanding the natural and cultural history of their town's landscape. Working directly with local schools, town commissions, historical societies, and conservation organizations, PLACE staff members develop integrated series of presentations, field trips, workshops, and printed materials designed to facilitate residents' understanding the natural and cultural history of the local landscape.



The PLACE Institute

Building upon the experience of the PLACE Program over the past 4 years, the goals of the PLACE Institute are to:

1. Promote PLACE programs in towns throughout Vermont
2. Establish UVM and Shelburne Farms as internationally-recognized centers for place-based education, landscape analysis and community planning
3. Create a university outreach/extension model that is replicable in other states
4. Provide town residents with opportunities for continuing education in the areas of landscape analysis, conservation leadership, and communications
5. Provide service-learning opportunities for UVM students (primarily at the graduate level) interested in landscape analysis, community engagement, and conservation.

www.uvm.edu/place/

"Annals of a Field Naturalist," *continued from pg. 1*

An unexpected visitor. . .

We will be three of perhaps ten people who have visited this fen on Gasquet Mountain in the last three centuries, as it is located in the middle of a remote, wild area where hunting is poor and access is nil. Keith and I are chatting excitedly as we tromp down the road, when Hans stops dead in his tracks with a resounding "Holy sh-t!" We comically bump into each mirroring the Three Stooges, and then my eyes fix upon it. Its shimmering, muscular body is the most beautiful emerald green I have ever seen, and then I hear it: the ominous rattle of a Western Diamondback. Hans's foot is inches away. Our gazes remain fixed while we fumble unsuccessfully for our cameras. The disturbed, basking rattler again shakes its tail, asserting dominance, and then slowly retreats to its rocky den below a gnarled Port Orford cedar. We look at each other, stunned, not because rattlers are rare or even uncommon, but because this is a glimpse into the eyes of true wildness. After several more exclamations, we cover the next mile of road in near silence. We are slightly more aware than when we awoke that morning, each slightly more satisfied with life. Although we had known all along that we share the landscape with these amazing predators, we feel more complete having met them eye to eye.

Bushwacking. . . . .

After an hour hike down the road, it is time to bushwhack. We look at the map and set our compasses for south, weaving in and around a tangle of manzanita, rabbitbrush, and more huckleberries. After being thwacked in the face by branch after branch, and gouged in the shins by protruding twigs, the initial romance of bushwhacking fades. I begin to long for open ground. My mood begins to sour from eager anticipation to frustration, and, finally, to momentary loathing. Just when I think I can't stand it anymore, I see a trickle of water emerging from the ground - the headwaters of the fen. I follow the trickle, and it becomes a small stream with measurable flow. The frustration subsides as I fumble over rocks and push through brush and thinning cedars. I can see the light breaking through the canopy to the the streambed, and quicken my steps until, finally, I hurdle the last of the snarled shrubs and arrive. And. . . it is more beautiful than I could have possibly imagined. Never mind that this is the 24th fen I have been to. Never mind that I have done this everyday for two months. It is as if this is the first time I have seen a serpentine fen, and no words of wonder, no descriptions from friends, no warnings could have possibly prepared me for this beauty.

Jen Cramer
18 August 2004

Tips for Incoming FNEPs

1. *Coffee: it isn't just for breakfast, lunch, and dinner anymore!*
2. *Bring Tupperware with you wherever you go.*
3. *There is usually free food at seminars and lectures (see #2).*
4. *You can sleep after you graduate!*
5. *GIS is fun. GIS is fun. GIS is fun. Keep repeating that.*
6. *Winters in Vermont are cold: eschew low fat foods.*
7. *The more you swear at your laptop, the faster it will process.*
8. *Expect to get your boots wet.*
9. *You* will *learn how to tell red maple bark from sugar maple bark without looking at the buds. It* will *hurt you more than it will hurt Bernd.*
10. *Cookies make everything better.*

Drawing by Bernd Heinrich

Masters Project Call for Proposals

Do you need technical assistance with a high priority field research project? Once again we seek to match Field Naturalists and Ecological Planners from the class of 2007 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 in integrated field science to its fullest. The relationship between sponsor and student is far more than that of intern or consultant. We expect that the design, implementation, analysis, and problem-solving phases of the projects will result in a high level of creativity and professional output on the part of the student. Students work closely with their committees 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 through a research assistantship.

We plan to match students with projects by January 2006 so that students can work with sponsors during the spring (2006) semester to plan for the summer field season. Data analysis and report writing will continue into the fall semester, with products delivered to sponsors between December 2006 and May 2007. If you are interested in having an FN or EP work with your organization, please contact Jeffrey, Walter, or Deane.

Thanks!

Jeffrey Hughes
jwhughes@zoo.uvm.edu
(802) 656-0708

Walter Poleman
wpoleman@zoo.uvm.edu
(802) 656-0424

Deane Wang
dwang@zoo.uvm.edu
(802) 656-2694

Field Naturalist Program
Department of Botany
(802) 656-2930
www.uvm.edu/naturalist
and
Ecological Planning Program
Rubenstein School of Natural Resources
(802) 656-2694
www.uvm.edu/envnr/ep/

University of Vermont
Burlington, VT 05405

Address Service Requested

Printed on recycled paper