ECOLOG

Newsletter from the Ecological Planning students, School of Natural Resources, University of Vermont
Spring 2002

Volume 3

Conversations on Possible Futures

Kerstin Lange

To a time-traveling anthropologist, the scene at Deane and Becky Wang's house on a recent February evening might have looked something like a literary salon in 17th century Paris: a group of people engrossed in conversation, with ideas criss-crossing the room like ping-pong balls. What might have tipped the observer off, though, was that the conversation revolved around the situation in which the human species is finding itself at the beginning of the 21st century.

The salon-like gourmet dinner gathering was part of a seminar led by Deane Wang, entitled "Redesigning the Human Environment." In addition to the seven graduate students from various concentrations in Natural Resource Planning, ecological design gurus John Todd and Nancy Jack Todd were present for the occasion. This seminar's purpose is to develop an understanding of what "Ecological Planning" means to us, and to create clear visions of possible futures.

These goals hint at a delicate point of tension for many of the seminar participants, whether formally Ecological Planners or not. Most of us would consider a title like naturalist or conservation biologist most suitable to our interests and convictions. As it is, we are being trained in a school of natural "resources" and will leave here with a planning degree – both indications of a human-centered worldview. And yet, if we look at the seminar's title from its flipside, we are reminded that the natural environments we feel so drawn to do not exist in a vacuum. The prevailing Western scientific worldview is, after all, based on the notion that humans can (and should) design, manage, and change the world.


KL

Redefining humanity's place in the landscape.

A passage by wildlife ecologist Raymond Dasmann illustrates this tension well:

> " …But deer must have suitable habitat, and that involves land and water and the uses that people make of these resources. This unfortunately leads to a consideration of the future of habitat for deer and people, and that leads to consideration of political, economic, and social factors that determine the uses made of land and water. Which is where planning comes in, often accompanied by feelings of frustration and desperation."

So we continue on along this frustrating and exciting path of tension. It's a tall order to think that we can nudge the planet's fate onto a sustainable path. Our task is not (only) about thinking noble thoughts but about fostering structures – physical, mental, social and political – that make sustainable living on this fascinating planet practical, economical, and fun. This is, of course, a high-flying goal. However, we had better aim at something high, because (like Thoreau said), in the long run we hit only what we aim at.

The dinner salon served as a joyful reminder of how we can nourish not only our bodies and minds, but also our spirits on this path: we need to do things that keep us connected to ourselves and others. The synergy produced by a community of people over a shared meal is more powerful than the high you can get from the best German chocolate.

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What is the EcoLog?

The Ecolog is the publication of the Ecological Planning curriculum of the University of Vermont's School of Natural Resources. The Ecolog is published once per year in the Spring semester. http://nature.snr.uvm.edu/ep

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What is Ecological Planning?

Ecological Planning is the interdisciplinary study of how to apply ecology to policy and decision making. Along with the related disciplines of Ecological Design and Ecosystem Management, Ecological Planning addresses the question of how people can build a sustainable world that still includes people.

The Ecological Planning curriculum at the University of Vermont's School of Natural Resources is a concentration within SNR's Natural Resource Planning Program. Ecological Planning is an intense two-year learning experience that emphasizes teamwork, interdisciplinary thinking, and personal growth.

With most of its roots in hard field science, the Ecological Planning curriculum prepares students to assess landscapes though an ecology-colored "pieces-patterns-process" handlens--developing vegetation, soils, and natural community assessment skills. Students concurrently develop speaking, writing, and problem solving skills.

The curriculum's roots also reach into the social sciences. Students take courses in land conservation, integration and natural resources planning, allowing them to create conservation solutions that address the complicated human side of many environmental problems.

Who are the Ecological Planners?

Ecological Planning has been a part of SNR since the year 2000. In 2001, one of the editors of this newsletter was confused about whether the phrase "first years" referred to the 2001 or 2003 cohort. So, we have established the following notation: EP^1=class of 2001, EP^2=class of 2002, EP^3=class of 2003.... Our sister program, the Field Naturalist Program in the Botany Department, uses letters. Thus the current FNs are the R- and S-Teams. This may be more than you wanted to know, but this is the only place you'll find it written down!


JR

Balancing natural history and planning at Battell Woods - hands on learning in the field.

Ecological Planning[3] Master's Project Previews

Kerstin Lange - Ecological Assessment of the new VINS property

The Vermont Institute of Natural Science (VINS) recently purchased a 45-acre property in Quechee, Vermont, to develop a new headquarters and visitor center. To develop a sound management plan and effectively structure its educational programs, VINS needs comprehensive information about the animal and plant populations present at the site.

Among Kerstin's first tasks will be to spend a series of rainy spring nights observing the elaborate mating rituals of blue-spotted salamanders and other critters that need wet places to breed. Somewhat later in the spring, Kerstin will tune her ears to the choruses of Vermont's eleven frog species, which are often easier heard than seen. Counts of these and other amphibians will help her evaluate species richness and relative abundance of species breeding in a vernal pool on the site.

Throughout the summer, Kerstin will inventory the major plant communities on the property. She will identify ecologically sensitive or significant areas, and rare, threatened, and endangered species. Based on these data, Kerstin will make recommendations for how VINS should structure its on-site activities to maximize educational benefit and minimize ecological impacts.

Josh Rapp - Loons, Moose, and Bald Eagles (and maybe a few black flies)

Josh will be in the North Woods this summer, exploring the landscape of the Lake Umbagog National Wildlife Refuge. Located on the border of New Hampshire and Maine, Lake Umbagog sits in the heart of a region that has historically been dominated by timber companies but is now in transition as many timber companies are selling off large holdings. This change presents a huge opportunity for land conservation but also opens the door to development.

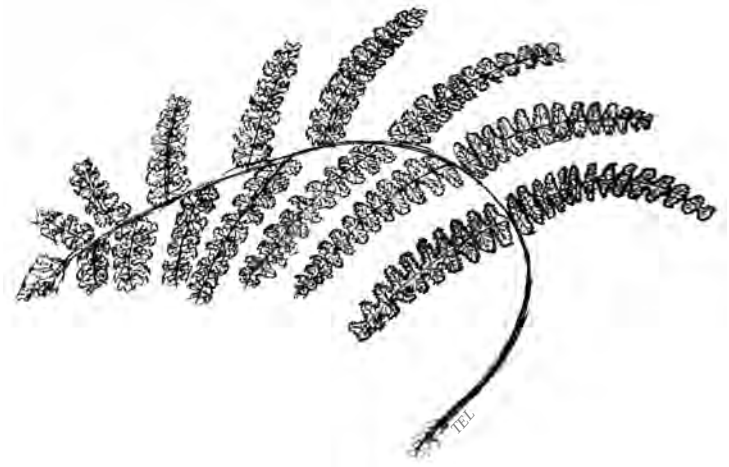
The Trust for Public Land is developing conservation priorities in the region and helping the U.S. Fish and Wildlife Service develop a long range conservation plan for the refuge. By mapping natural communities, Josh will provide information that can be used to guide conservation actions in the refuge and surrounding area, and will further his own understanding of the North Woods landscape.

Jon Kart - Wildlife Inventory and Ecological Modeling

Jon will spend this summer, butterfly net in hand, racing around New Hampshire's Ossipee Pine Barrens, a 2,000-acre pitch pine-scrub oak barrens managed by The Nature Conservancy. It is home to a number of rare butterflies and moths as well as four declining bird species.

After decades of fire suppression have degraded this ecosystem, TNC wants to revive the Pine Barrens by restoring natural processes, including fire, to the area. TNC must first determine the specific habitat requirements of key plants and wildlife and how they might respond to management actions.

Jon will sample rare lepidoptera and birds and then try to figure out what they need from this site to survive. Are they dependent on a specific plant, forest structure, or hydrological regime? Jon will use this information to develop ecological models to help in the development of a management and restoration plan for the barrens. Claire Dacey, in the Field Naturalist program, will also be working at Ossipee developing natural community maps and modeling plant responses to habitat changes.



Kinglets in the Cold: Small Survivors

Joshua Rapp

Twilight comes early on the shortest day of the year in western Maine. Walking through mixed woods on a gray day with temperatures in the 20s, I came across a flock of foraging songbirds at dusk. Chickadees and golden-crowned kinglets were busy doing their final foraging before the light failed. The 'zee-zee-zee' of the chickadees was familiar to me, but I was less familiar with the kinglets' 'tsee-tsee-tsee'. I had heard the sound a few times earlier in the week, but I had not actually seen them. Their call is diffuse, seemingly coming from every direction and nowhere at once, making it hard to tell where they were. Their small size (little larger than a humming bird) and preference for the thick foliage of conifer trees makes them hard to spot. This time though, I spotted a pair on a small balsam fir about 15 feet from where I stood.

As they foraged among the needles and outer branches of the tree, they were in constant communication. Their thin call notes didn't carry far but didn't need to since the pair stayed on the same tree while they searched for food. After a couple of minutes the pair flew off, landing on another small fir. I followed, hoping to learn something of their feeding habits and perhaps see where they roost for the night. It was now after sunset and the light was becoming dim. Soon it would be time for the kinglets to settle in for the night, since these highly visual creatures are only active in daylight.

After about five minutes, the pair flew again. I didn't see where they went initially. Spotting another small fir about 60 feet away I moved closer and heard the now familiar chatter that keeps pairs of kinglets in constant contact. They had indeed flown to the nearest fir. These golden-crown kinglets were being true to their nature and showing a definite preference for foraging in evergreens. I was able to walk within 10 feet of the tree without disturbing the birds and observed them for several minutes. The two individuals foraged in different areas of the tree. One was particularly active, moving from the top of the 30 foot tall tree to ground level, staying among the needles of the outer branches the whole time. At one point, the bird landed on the ground and explored under a branch whose tip was buried under snow, making a perfect kinglet-sized shelter. I wondered if the kinglet was looking for a place to overnight. I couldn't know for sure because the bird didn't stay under the branch. It may have merely been looking for food. In either case, the same bird soon flew into the branches of an adjacent birch tree and appeared to scan the area, while at the same time calling loudly. After a brief return trip to the fir, it flew to another birch on the opposite side of the fir, looking about and calling. A few seconds later both birds were gone.

In the failing light I didn't see where they went. I visited the closest evergreens, more balsam fir along with a few red spruce, but I didn't find the birds. Had they flown farther away, or merely grown silent? It is nearly impossible to locate them by sight alone. Given the time of the day, it would be reasonable to guess that they found a place to spend the night and stopped calling when they were huddled safely in a protected spot. Their disappearance left unanswered the question of where these tiny birds overnight during the cold winter nights. It seems amazing that kinglets can survive the harsh winters in the mountains of western Maine, but their cheery chatter can be heard in the woods on the coldest days. How do they survive in this climate?

My observations of kinglets have given rise to more questions than answers, but there are several ways in which birds can deal with cold weather. One way is by increasing their metabolism to generate more internal heat. Kinglets are extremely active, constantly flitting about. This activity creates heat, allowing kinglets to stay warm even in low temperatures. High metabolism requires that kinglets eat often. Indeed, they forage constantly during the daylight hours, searching for protein and fat-rich food to fuel their souped up metabolism. Kinglets feed mostly on insects, which is difficult in winter when most insects are dormant and hidden away in crevices and under bark. Kinglets work hard to find and eat the few insects that do continue to live in the open.

Bernd Heinrich, a biologist at the University of Vermont, has examined the stomach contents of golden-crowned kinglets in winter to find that they feed on a variety of insects, including spiders, moths, caterpillars, and snow fleas.

The golden-crowned kinglet's preferred habitat may also be an adaptation for coping with cold winters. Foraging amongst the bushy needles of conifers, they are partially protected from cold winter winds. Needles act as a wind block, creating a slightly warmer microclimate than what is found around bare deciduous twigs.

During the day kinglets stay warm by eating enough and staying active, but long winter nights lasting 14 hours or more must be hard for these little birds. By shivering they burn the fat stored in their tissues during the day to produce heat, but since they don't eat at night and are not moving around, their heat production must decline. Heat conservation must be important if fat reserves are not enough to maintain a daytime metabolic level. One way to conserve heat is to find a sheltered spot to spend the night. Kinglets may overnight against tree trunks, inside cavities, or under thick vegetation. It is also likely that kinglets do not spend the night alone, but instead huddle together in pairs or in groups of a few birds. This effectively reduces the bird's surface area to volume ratio, decreasing the total amount of heat lost. In essence, each individual bird expends less energy keeping warm.

Another strategy for coping with cold winter nights is for organisms to decrease their body temperature by entering a state known as torpor. With this drop in body temperature, metabolism can decrease and the bird needs less oxygen, which greatly reduces their daily energy expenditure. In this state, birds are incapable of normal activity and it takes time for them to warm up again. Though it is not known whether golden-crowned kinglets enter torpor, this may be one reason why kinglets seem to get a later start on the day than other birds. It takes small birds an hour to rev up their metabolism and warm up enough to resume normal activity.

While there are several possible ways in which golden-crowned kinglets cope with harsh New England winters, much remains a mystery. Whenever I hear their fairy-like calls while walking in the woods, these questions will come to mind, and I will search out and observe these fascinating little birds. Perhaps they will reveal their secrets some quiet, cold evening.

Notes from Afield- *Where in the world is EP[1]?*

What's happened to the first flock of Ecological Planners after they fledged the SNR nest?

Jillian Butler

Jillian accepted the position of Important Bird Area (IBA) Program Coordinator for Audubon New York in June 2001 and is based at Cornell's Lab of Ornithology in Ithaca, New York. Her job involves promoting the protection and proper management of New York's 127 IBAs for the long-term conservation of birds, other wildlife, and their habitats. She is also very happy to announce that she and Eric Liner were engaged in early February.

Brian Carlson

After leaving UVM last spring, Brian spent a summer working with The Nature Conservancy inventorying natural communities in a 63,000 acre block of forest in the Manchester, Vermont area. Since October, Brian has been working with the Winooski Valley Park District assessing the impacts of a proposed bikepath through Colchester's Delta Park. If the funding works out, he will be starting a reptile and amphibian inventory of the Park District's lands this spring.

Elissa Arnheim

Elissa continues to define her place in Oregon, and is enjoying the big fluffy flakes of snow this winter. Elissa has recently been working in the wilds of Olympic National Park and expresses how wonderful it is to be out in the ancient northwest forest again.

Heather Fitzgerald

Heather is enjoying being in Burlington, finishing her project, learning about bugs from Ross Bell, and searching for a fabulous job. She is currently pursuing several science journalism options.

Introducing the Current EPs

EP² - Class of 2002

Tom Lautzenheiser

As Tom approaches his launch into the world outside of the George D. Aiken Center as an Ecological Planner, he has spent some time reflecting on his experiences here and elsewhere. Time spent crashing through the woods of Vermont, pondering the forest vegetation, digging soil pits, looking under logs, listening to quacking wood frogs, and working with his fellow Ecological Planners and Field Naturalists has convinced him of two things. First, Tom will use the principles of ecological planning and design to guide his decisions; his love of nature and natural history will light his path. Second, collectively, there is nothing that the EP²/FN-R team cannot do when we put our effort to it.

Tom thinks that, while commonly viewed as antiquated or even passé, the natural history approach continues to have relevance today. He says, "The value of observing life in place cannot be understated. Although satellite and aerial imagery are effective tools, and computer-produced virtual fly-overs are nifty, nothing replaces the information we can get on the ground. When people ask the question, 'why should we care?' the answers that will win hearts to conservation will come from the stories of specific places and things, gained through careful attention of people in the field."

Tom considers the Ecological Planning curriculum to be like an atlatl, an ancient lever that increases the force of thrown spears. With the skills he has gained here, he is a spear for the forces of conservation.

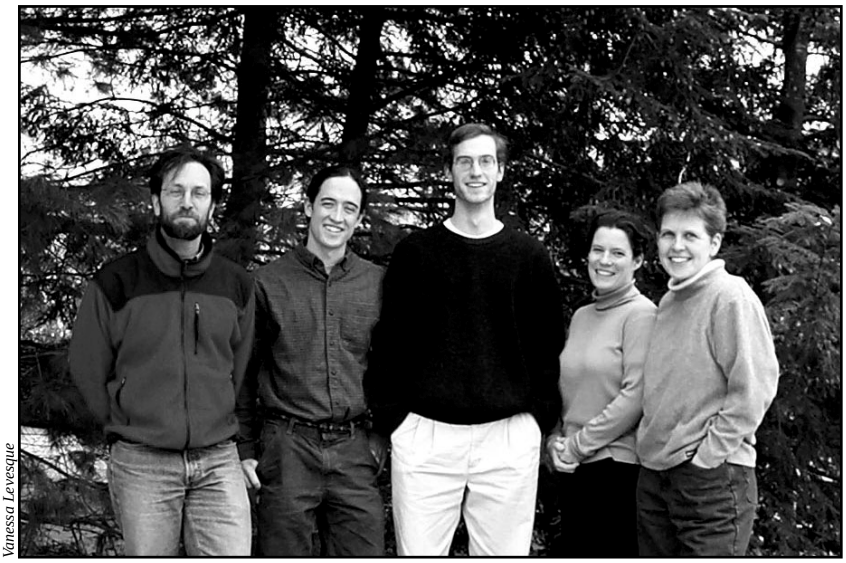
Tess O'Sullivan

Tess went to Colorado when she was fourteen and fell in love with the mountains, the canyons, and the immense sky. Romantic turnover is fast at that age and she quickly developed a new crush when she returned home. Swooned by John Muir during a history assignment, Tess recalls reciting his words at the kitchen table. "I had a connection to places that felt wild and selfishly wanted to work to make sure those places were still available to me, my kids, and all the wild things that lived there."

Since graduating from Yale, Tess has spent a lot of time looking at the natural world through the eyes of young people. Most recently she worked among towering douglas firs in Seattle's city parks. She recalls days singing nature tunes with soggy feet: "I got paid to hike with kids and track down slug slime." While helping young people gain a love for wild places is important to future conservation efforts, she wanted to build formally on her scientific knowledge.

Tess's views on conservation have evolved since those wide-eyed days reciting Muir. Some of the romance was broken when she moved to a small town in northern California engulfed by public land, spotted owl habitat, and contentious debate on forest management. Working with a nonprofit to develop links between community, environment, and economy, she learned that strategies for conservation need to incorporate local people.

Now at UVM, Tess is learning how to further those linkages between science and management within the EP concentration. After graduating, Tess plans on putting her integrated field science and planning skills to lead conservation efforts.



Vanessa Levesque

Jon, Josh, Tom, Tess and Kerstin.

EP[3] - Class of 2003

Jon Kart

For the past decade Jon has been working to protect threatened and endangered species and ecosystems in the Pacific Northwest. As a conservation lobbyist, he helped elected officials, land management agencies and the general public to see forest, riparian and high desert ecosystems in terms other than board feet of lumber, Kilowatts, or livestock feed units.

"I'm proud to have helped bring about significant policy changes," said Jon. "For instance, the Northwest Forest Plan that, while imperfect, manages the region's federal forests on an ecosystem-wide basis and includes late-successional forest reserves and, proposals to designate several million acres of northwest land as Wilderness are gaining support from the public and elected officials."

While he found it both challenging and rewarding to make change happen at the policy level, Jon now wants to translate that policy into on-the-ground improvements to ecosystems. To do so he realized he needed more training.

He saw UVM's Ecological Planning concentration as a natural choice. He hopes that that his understanding of our political system coupled with training in ecology and natural resource planning. will allow him to make contributions to the design and implementation of conservation strategies that are firmly rooted in sound science and have the political and social support to be implemented before they become moot.

Kerstin Lange

Kerstin came to Vermont in 1995 to spend a summer living in a log cabin on the Long Trail as a ranger-naturalist for the Green Mountain Club. Her personal mission was to find out whether she "really loved the woods or had just read too much Thoreau and Anne LaBastille." Not surprisingly, it turned out that she really did love the woods, and Vermont.

Growing up in a city in Northern Germany with as many residents as all of Vermont, Kerstin's early years did not bode well for a naturalist career: as a child, she could not have identified any bird or tree with more detail than, well, "bird" or "tree." The world of woodthrushes, white-throated sparrows, Eastern hemlocks, and sugar maples began to beckon to her much later, as a student of anthropology and environmental studies in upstate New York.

Prior to joining the EP program, Kerstin spent the last five years designing, operating, and guiding educational group tours for an international tour company. Last year, she decided to shift her focus more explicitly to natural history and conservation. She joined the EP program in order to deepen her understanding of "how things work," in and out of the woods, and to learn the tools of the conservation trade. She believes that a personal connection with, and understanding of, the places we live in is essential for a conservation ethic. Kerstin's goal is to make connections between field science and people's everyday lives, in order to help bring about more sustainable ways of living on this fascinating planet.

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Josh Rapp

At age seven Josh and his family moved from New Mexico to upstate New York via a circuitous route that visited 15 national parks. Though the long car rides have vanished from memory he has vivid recollections of staring across the expanse of Death Valley, climbing granite boulders in Yosemite, and exploring tide pools on the Olympic Peninsula. These early experiences planted the seed for Josh's love of beautiful landscapes.

Though his focus shifted to athletics in high school, Josh didn't forget his love for travel and wild places. The woods and fields around his house provided a peaceful retreat where he could wander and enjoy nature. During a course in the geology of national parks at Duke University, Josh became fascinated by landforms and the processes that create them. While geology gave insight into why landscapes look the way they do, a worldview limited to one discipline didn't satisfy him. He wanted a more comprehensive view that included the life above the rocks.

After graduation Josh set out to see more of the world for himself. Living, working, and traveling in diverse places such as Colorado, New England, California, Honduras, and Chile reinforced his love of landscapes, and fueled in him the desire to learn more about the natural world. "I've come back to school to focus on understanding how landscapes work by integrating pieces, patterns, and processes into a synthetic whole and to more effectively convey the wonder, beauty, and complexity of nature to others. My hope is that through understanding people will develop an appreciation for the natural world that will grow into a determination to protect the beauty everywhere around us."

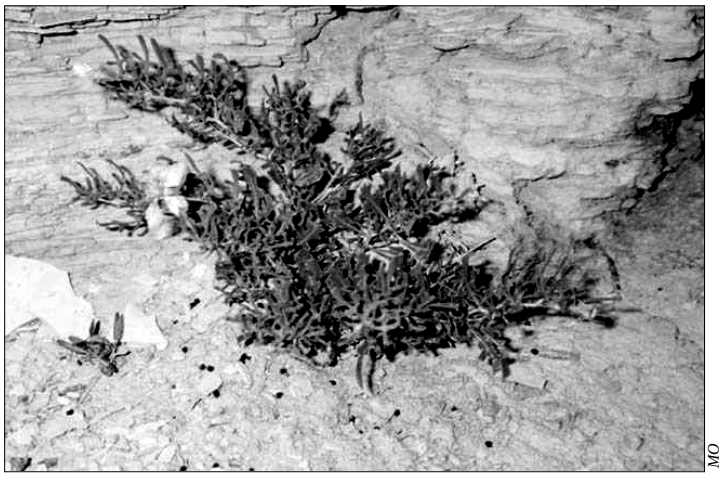
Rangelands, Rare Plants and Biodiversity Conservation

Tess O'Sullivan

The Cathedral Bluffs in Northwest Colorado mark the western boundary of the Piceance Basin, an 1100 mi^2 basin unified by a unique geologic substrate, estimated to contain 1,200 billion barrels of oil in the form of oil shale (Murray and Haun 1974). The same rock that boasts the potential oil production is habitat for many species that have only been discovered in the last twenty years and which have extremely limited ranges. Sixteen species are restricted to shale outcrops of the Green River Formation. This high number of endemic species makes the Piceance Basin an important site for biodiversity conservation.

High noon on the Colorado Plateau.

The Nature Conservancy (TNC), a frequent partner with private companies, initiated a collaborative project with Shell Exploration and Production Company (Shell), one of the many oil companies with land in the area. The goals of this project were to: 1) develop a collaborative relationship between The Nature Conservancy and Shell, 2) inventory the property for rare plants, natural communities, and animals, 3) identify ecologically sensitive areas, and 4) provide recommendations regarding land management practices with a focus on the ecologically sensitive areas



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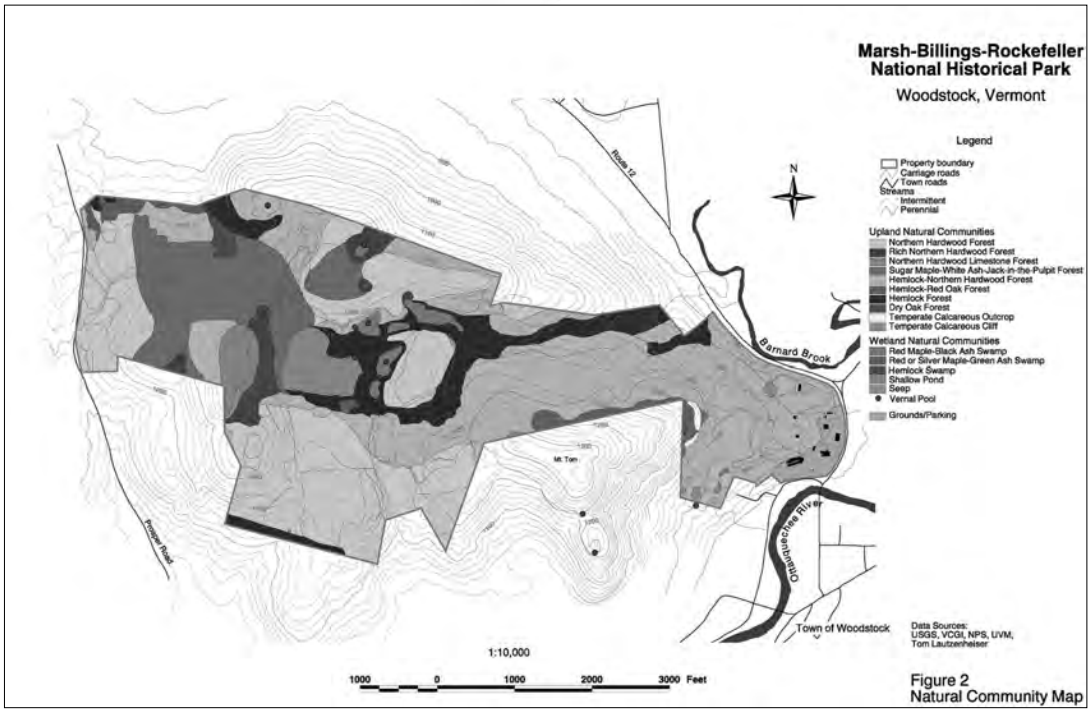
Mentzelia multicaulis, *a denizen of the oil shale.*

While TNC was initially concerned with the potential impacts of oil shale development, Shell was more immediately concerned with grazing management. Shell currently leases its land to several ranchers and was interested in making sure their rangeland stewardship was environmentally sound.

My role was to determine which areas of the 19,000 acre property merited the most attention. With the help of the Colorado Natural Heritage Program, I determined ecologically sensitive areas, based on the presence of rare plants and natural communities. I mapped locations of rare species and communities and recorded information regarding the size, condition, and landscape context of the occurrences.

I also compiled information to assist with the preparation of a management plan; I investigated critical wildlife habitat (for sage grouse and peregrine falcons), and provided recommendations regarding grazing management, noxious weeds, fire, and reclamation.



A map is born: Tom's natural community map after 9 months of gestation.

Natural Community Mapping at Marsh-Billings-Rockefeller National Historical Park

Tom Lautzenheiser

At the Marsh-Billings-Rockefeller National Historical Park, in Woodstock, Vermont, history weighs in heavily in management and interpretation. The Park's mission to interpret the evolution of conservation stewardship in the United States through the stories of George Perkins Marsh, Frederick Billings, and their successors, challenges the National Park Service to find a delicate balance between historical and modern practices. To be true to the environmental pioneers whose names grace the Park, the Park Service seeks to find new ways to understand and manage the Park's landscape.

My contribution to the Park Service's effort is a natural community inventory and map, produced over the summer of 2001.Through extensive field work and Geographical Information Systems (GIS) wrestling, I mapped and described 16 natural community types in the Park. Some of these types were widespread and abundant, like the Northern Hardwood Forest and the Hemlock-Northern Hardwood Forest. Others types were isolated to a patch or two here and there, like the Dry Oak Forest and Temperate Calcareous Outcrop communities. Falling between these extremes were larger patch communities, such as Rich Northern Hardwood Forest and Sugar Maple-White Ash-Jack-in-the-Pulpit Forest. A highlight was a Rich Northern Hardwood Forest patch where wild leek (*Allium tricoccum*) was so abundant I could smell it hundreds of feet away.

The Park's 562 acres form a diverse landscape, and include the slopes of Mt. Tom, a 14-acre pond, hayfields, pastures, forests, wetlands, and some of the oldest continually-managed plantations in the United States. A picturesque network of carriage roads winds through the forest. This landscape's diversity and history make it an interesting place to map natural communities, for not every human impact on the land is as obvious as a Norway spruce plantation or a gravel road Throughout the summer, the question I asked myself repeatedly was "why is this place like it is?"Using soils, vegetation, landform and other clues, I answered this question again and again, gradually building a picture of the landscape's ecology.

With the natural community map and other information in hand, the Park Service is now in a position to better integrate ecological considerations into the management of the Park, and to further its educational, scientific, and interpretive goals.

Amy Mark

Getting to the bottom of a soils question at MBR.

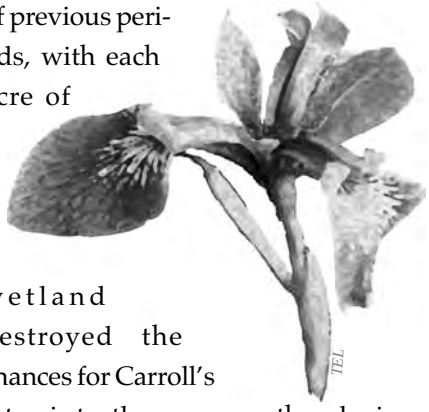
The first step in wisdom is to know the things themselves. - Linnaeus

The Natural Guard

Tom Lautzenheiser

When naturalist, artist, and author David Carroll first had the idea for *The Year of the Turtle*, he intended it to be a celebration of his experiences with these animals and their habitats. He achieved this goal there, and in his successive books. With *Trout Reflections* and *Swampwalker's Journal* (winner of the 2001 Burroughs Medal for natural history writing), his self-described "wet sneaker trilogy" is a wonderful, patient exploration of his local streams and wetlands. Through words and watercolors, he paints pictures of the lives of turtles, trout, salamanders and other fauna with clarity only achieved through years in the field. At the same time, a strong current of loss runs through the trilogy. These books emerge as a critique, a lament, a plea, and a tirade.

Carroll's matter-of-fact anger is not misplaced, for his beloved, saturated landscape is under siege. On one hand, since the late 1980s the United States government has professed a no net loss of wetland policy. On the other, the U.S. Fish and Wildlife Service reports that between 1986 and 1997 more than 1,000 square miles of wetlands were destroyed in the contiguous 48 states, primarily through urban development and agriculture. In this single decade, federal, state, and local regulators allowed the piecemeal, cumulative destruction of an area of wetland approaching the size of Rhode Island. While the rate of loss for this period is much less than that of previous periods, with each acre of wetland destroyed the chances for Carroll's totemic turtles—or any other denizens of soggy places—decreases. Regulations attempt to offer some protection to wetlands and rare species, but, as Carroll says, "if Conservation Commissions are your first line of defense, don't go to the Super Bowl." With development pressure and property rights trumping conservation goals, Carroll truly walks in a landscape of loss.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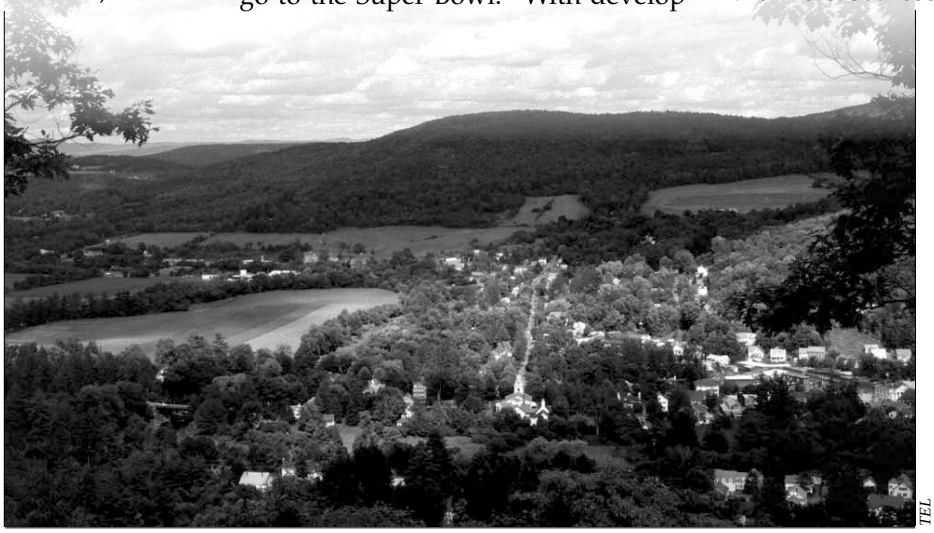
Much energy, time and skill goes into solving environmental problems such as these, yet environmentalists don't seem to make much progress. One cause of this conundrum is that most conservation actions respond to an immediate threat or opportunity. Conservation in the United States today is primarily a reactive practice.

National conservation groups such as the Trust for Public Land, The Nature Conservancy, and The Conservation Fund have recently participated in deals to purchase more than 625 square miles of land in the Northeast. While these purchases are conservation victories, creating easements and long-term management plans that protect the ecological values of the areas has been controversial. Most conservation organizations continue to think in terms of human needs when buying lands. Further, the increased costs of acquiring prop-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erty force even the most ecologically-minded to accept agendas that dilute the primary goal of the preservation of species and ecological integrity--not of human benefit. Many conservation deals end up creating little more than passive-recreation theme parks. Carroll's response: "If the emperor has no clothes, you can't pretend he's wearing ermine… It's time to show a little impatience." To truly conserve our environment, "We need something stronger than what we have. We need to look at the hard realities."

Idealistic, Carroll believes there may be a solution. Is education the answer? Not entirely. Is voluntary landowner cooperation the answer? Probably not. "We need a banner to rally around," he says: the banner of the naturalist.

Picture, if you will, a Natural Guard, traveling over the landscape. From place to place, its members identify those areas that contain high-quality ecosystems, and weave stories that tie together an area's soils, geology, vegetation, wildlife, climate, and culture, and the interactions between them. Its mission is to create ecosystem reserves, with significant human exclusion: conserving nature for nature. In its path people experience newfound connections to nature, see things they hadn't noticed before, become more involved in the care of their communities. As it travels, more people will join the Natural Guard, because it's not an organization in any formal sense—it's a movement.

This movement grows out of a rich tradition. Natural history has a history of naturalists-errant that continues to the modern day. From Linnaeus through Darwin, Thoreau and Wilson, naturalists have sought many things-knowledge, understanding, enlightenment, and transcendence among them. Whether wandering or not, these and others have constructed great syntheses built on their observations of the natural world; their ideas shape our system of naming things, our understanding of nature and evolution, our interest in biodiversity. Their eloquence and observations inspire our love of nature.

Often, the product of a naturalist's work is awareness, increasing the odds that people will think twice before running over a turtle or filling in a swamp. When the bulldozers are fired up, someone who has listened to a naturalist might say, "No, you can't do that." But the time has come for a more concerted effort. In our time, we have some great opportunities. In many areas biodiversity and habitat complexity are recovering from former retreat. As Carroll says, "where things have not been beaten into a corner, we have a wedge of wilderness."

The naturalist's banner is raised, and we must call ourselves to arms. We must gather our binoculars and hand-lenses, augers and spades. It's time to push into the world to find and conserve those places where ecology has the upper hand.

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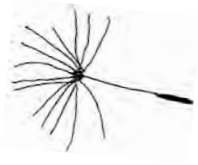

Future Talk

Deane Wang, Associate Dean and Chair, Natural Resource Planning Program

The data are in. We are undergoing an unprecedented global change — in climate, atmospheric composition, UV-b radiation, sea level, glacial area, loss of biodiversity. Human presence and impact on global, regional, and local ecosystems intensifies due to both increasing population and increasing per capita development. The appropriate response is complex, long-term, and fundamental. It involves structural change at all levels including both public and private institutions. It involves personal changes in behavior and aspirations.

Though we are a powerful and developed society, we are not ready for such change, nor convinced that it must happen. In the meantime, we must train the world-saving warriors — the environmental leaders that can help guide the way now and in the future. Ecological Engineering, Ecological Design, Restoration Ecology, Ecological Economics, Ecological Planning — all endeavors newly developed to address the current and coming crisis of imbalanced systems. The presence of the term "ecological" suggests an understanding of the complex interactions of multicomponent phenomena. The ecological planning curriculum is one small response to these demands. However, there is no single formula for successful training. The real superheros of the new millennium will be passionate thinkers with a commitment to act in both small and large ways. Their tool box of skills will be highly varied and always incomplete. Collaborations, joint ventures, partnerships, etc. will allow the building of more holistic teams of problem-solvers. Team work, excellent communication skills, and open-minded, out-of-the-box thinking will be critical. Theories of how the biophysical and social world works must be blended with the field realities of real people and issues.

The ecological planning curriculum seeks only to help practitioners on their way. A relatively new program, students provide an essential insight into what works for them... and graduates provide feedback on what we can include and what we need to pursue. Come visit with us and chat about our future.

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