

## Conifers, Hardwoods Can Reforest Areas of Hemlock Mortality

Native conifers, as well as some hardwoods, show a high likelihood of successful use in reforesting areas suffering from mortality of Eastern hemlocks (*Tsuga canadensis*) caused by the hemlock woolly adelgid (*Adelges tsugae*), according to a 2.5-year study in Black Rock Forest. Funded with a grant from the Arthur Ross Foundation, the study involved planting seedlings of a variety of species in test plots in two sites impacted by heavy hemlock mortality, and analyzing how the results of active tree planting compared with the natural reclamation of these sites, both with and without fencing to exclude deer. Black Rock is characteristic of the 2-million-acre Highland Physiographic Province that stretches from Pennsylvania to Connecticut and is similar in many ways to other oak-dominated forests throughout the eastern deciduous forest.

"The ongoing destruction of eastern hemlock by the woolly adelgid, a tiny imported insect, is one of the most serious current threats to the forests of New York state," explains Forest Director Dr. William Schuster, who conducted the research. "It not only leads to the death of individual trees and entire stands, but it also has major impacts on forest health, including increased fire danger, re-

duced ecosystem productivity, greater climate extremes, and stream warming, and it can potentially also lead to loss of soil nutrients and soil, water quality diminution, and stream sedimentation. Quick reforestation could minimize or avert these consequences, but there is insufficient information about how best to protect and reforest such areas, especially in light of heavy deer browsing."

### The Nursery

In 2000, prior to the start of the reforestation trials, the Forest established a new native tree nursery and stocked it with nearly 5000 seedlings of promising native conifer and hardwood trees, concentrating on white pine (*Pinus strobus*), because it is fast-growing, inexpensive, widely available, and successful in plantations throughout the region, but also including tamarack (*Larix decidua*), white cedar (*Chamaecyparis thyoides*), red spruce (*Picea rubra*), sycamore (*Platanus occidentalis*), dogwood (*Cornus florida*), which is persisting despite a blight, and white birch (*Betula papyrifera*).

Over the next two years, Forest staff cleared a 1400-square-meter (0.34-acre) site in the Black Rock Brook watershed and an 1860-



Vigorous growth of white pine seedlings at Black Rock Brook site.

## Education

### Fall in the Forest for City Public Schools

"Boundless excitement and joy." That's how Michele Kahn, the principal of New York City's [Public School 220](#) in the Mott Haven section of the Bronx, described the reaction of the school's fourth and fifth graders to their October visit to Black Rock Forest. This fall, PS 220 joined [PS/IS 176](#) from northern Manhattan's Inwood neighborhood as a participant in the School in the Forest program and a member of the Black Forest Consortium. Five classes from each school spent a day at Black Rock this fall, engaging in compass work, hiking, collecting and identifying leaves, finding evidence of the presence of animals, and exploring the scientific process.

Started with a generous grant from the New York Community Trust, the School in the Forest project is designed to give public schools from New York City the same opportunities to participate in the Forest's science education programs that independent schools in the city and public schools in Orange County have enjoyed for fourteen years.

### School in the Forest

The program currently involves two one-day trips to the Forest for each class, but will expand to include an overnight stay once the Forest Lodge is completed this spring. Additionally, teachers attend an orientation session at the Forest and return to their classrooms with the lesson plans and materials they need to prepare their students for the field trips to the Forest. During this preparation period, staff from the Forest, including the project's

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## Black Rock Forest Consortium

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The Black Rock Forest Consortium is an alliance of public and private schools, colleges, universities, and scientific and cultural institutions engaged in research, education, and conservation in the 3785-acre Black Rock Forest in New York's Hudson Highlands.

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## Report from the Forest Director

Earth's climate has been getting warmer, and it is now predicted that global temperatures will rise by 1 to 6°C in this century. Even small changes in temperature can have big effects on ecosystems, including forests. Direct effects of temperature on plants include changes in primary metabolism, development, and growth of organs. Indirect effects can include altered competitive interactions, herbivory patterns, changes in range distribution, and increased growing season length. This warming may over time result in much different forests with serious implications for critical parameters such as forest productivity, supply of timber and water, and biological diversity. Shifts in forest composition and productivity will certainly impact habitat and suitability for animals, with potentially traumatic impacts on some species. A [recent paper in the journal \*Nature\*](#) suggests that massive extinctions may occur just due to the warming expected to occur by 2050.

Most research has focused on mean increases in temperature applied uniformly both day and night, but nighttime temperatures have been increasing, and are predicted to continue to increase, at *twice* the rate of daytime temperatures. The effects may be more marked in the forests of northeastern North America where maximum daytime temperatures have remained relatively constant over the last 50 years.

Warmer nights will have impacts independent of daytime temperatures as photosynthesis and respiration respond independently to temperature. Plants appear quiescent at night, but continue to respire, based in part on how much they photosynthesized that day. Research by investigators Kevin Griffin and Matthew Turnbull has identified an important mechanism with the potential to affect patterns of photosynthesis and growth in seedlings under predicted future environments. Nocturnal warming can significantly impact dark respiration, reducing carbohydrate reserves and leading to increased photosynthesis on the following day. Their research in growth chambers has shown important changes in biomass and seed production in many species due to

nocturnal warming. Thus, predicted increases in nighttime minimum temperatures may have a more significant influence on net plant carbon uptake than increases in daytime maximum temperatures. Enhanced night warming also reduces the daily temperature range, which has its own impacts on seed germination and the growth of several important forest tree species.

More research should probably be focused on potential ecological and physiological responses to night warming. Drs. Griffin and Turnbull are currently proposing research at Black Rock Forest to assess the effects of predicted increases in nocturnal temperature on the regeneration of important tree species in northeastern forests, a major concern in an area where most forests are aging and often little regeneration exists in the understory. They seek to determine if nocturnal warming will have unexpected impacts on seedling performance under field conditions, and how it will vary among key species.

It has been shown that atmospheric CO<sub>2</sub> concentrations will continue to increase around the globe even if we start reducing fossil fuel emissions now, and there have been few concerted efforts to reduce emissions. The increased CO<sub>2</sub> will have its own direct impacts, but there will also be associated impacts, and warming, especially night warming, seems a likely part of our future.

What will be the outcomes? First, we need to determine if the responses in growth chambers and greenhouses will also occur in nature. Warmer nights will not happen in isolation and will likely interact with other changing factors such as storm frequency, fire regimes, precipitation, and humidity. We already know that the ecosystem response to rising levels of CO<sub>2</sub> will vary depending on temperature. The results for things we care about such as forest health and environmental quality are not clear, but it is not too early to bring the focus of science to bear on this issue. We hope to be able to contribute to better understanding of future conditions through research and education at Black Rock Forest. ■

— Dr. William Schuster

# New Guide Invites Teachers to Use Forest Resources

When Antonia Daly, a math and environmental sciences teacher at [Friends Seminary](#), first started thinking about her sabbatical, her thoughts naturally turned to Black Rock Forest. "I'd been the faculty representative to the Consortium's Board for five years," she notes, "and I realized I could combine my environmental interests with the development of the Forest's education programs." Now, after spending one day a week for five months in the Forest, and just in time for the spring 2004 opening of the Forest Lodge, Ms. Daly has created *A Teacher's Guide to Black Rock Forest: A Manual for Use in the Classroom and the Field*.

## Overview and Resources

The 44-page guide begins with an introduction to the Forest and a discussion of how Black Rock can benefit the curriculum. After providing suggestions for subjects ranging from biology to chemistry and physics, Ms. Daly identifies topics relevant to arts and social studies, as well as other uses schools can make of the Forest, such as retreats, teacher training, associations with other Consortium members, student internships and mentorships, and community service. "The manual is designed to be practical and inspirational," she explains, "to inform teachers about the many opportunities at the Forest, to invite them to become comfortable with its resources, and to empower them to make creative and independent use of the facilities."

Ms. Daly also lists the plethora of resources for teachers at Black Rock Forest: facilities (the Center for Science and Education, with its labs and classrooms, and the Forest Lodge), equipment (many field, lab and classroom supplies), ready-to-use curricula and lesson plans ("the centerpiece treasure of teacher resources," with 35 activities and lessons developed by Forest staff and Consortium teachers), technological features (the data sensors, GPS/GIS, and a set of lessons using these data developed by Dr. Kim Kastens from [Lamont-Doherty Earth Observatory](#)), and information collections (the library, research archives, and herbarium), as well as the opportunity to get involved

in ongoing projects and connect to the Forest from the classroom. The most important resource is the Forest itself – 3785 acres of forest, meadows, ponds, and streams, from lowlands to mountain tops, networked with trails and observation points.

## Sensors, Lessons, Research

Next come two sections on the Forest's sensors, the data they provide, and the ways teachers and students can use the data. "This was the original heart of my project," Ms. Daly says. "I wanted to make this wonderful store of data, lessons, and activities accessible, relevant, and exciting." To this end, she first describes the locations of the sensors, the environmental variables they monitor, and the way the data are recorded. She then provides some general ideas for using the data and three specific examples of high school lessons using water data (chemistry, stream flow, conductivity), weather station data (air and soil temperature, wind direction, solar energy), and building data (geothermal heating, power use, water use). "These are just pointers and guides," she explains, "pieces of data with suggestions for how teachers can adapt them to their own classes."

Applications for lower and middle school students follow. Although Ms. Daly teaches at the high school level, Friends Seminary asked her to include resources for kindergarten through eighth grade teachers in the guide. During her weekly visits to the Forest from February through June, 2003, she worked with Black Rock's new Education Coordinator, Joyce Baron, and Rebecca Sussman, a student intern from Dalton, as well as with Forest Manager John Brady and Data/Network Manager Matt Munson, to learn about the diversity of programs and lessons available for younger students. Besides identifying curricular concepts and themes (such as cycles of nature, ecological systems and biodiversity, water ecology, forests, trees and leaves, plant and animal identification, geology, and geography/maps and compass), and providing a list of the 35 ready-to-use curricula, she discusses the Forest's trout breeding program (see ["Brookies at Black Rock,"](#) Spring

2003) and the School in the Forest (see "Fall in the Forest," p. 1). She also explains how teachers can design lessons for students using research information available online from the Forest and from other Consortium members, such as the [American Museum of Natural History](#), that conduct research at Black Rock.

This leads naturally to the next section on scientific research at the Forest and the benefits of including research papers in the high school curriculum. More than 300 research publications are on file at the Forest; Ms. Daly includes a partial list of recent research projects by scientists and graduate and undergraduate students at Black Rock and notes that teachers can find information on such topics as forest health, environmental changes, and population studies. The manual concludes with practical information for visiting the Forest and an appendix on carbon sequestration, introducing equations to quantify the biomass and carbon content of various tree species.

## Using the Guide

Friends Seminary plans to print approximately 200 copies of the manual and distribute it widely to its teachers and among Consortium member institutions. The Forest is developing plans to make it available online.

Ms. Daly believes that experiencing the ecological relationships within the Forest can allow teachers to understand the interconnections between their subjects and others, or the "ecology of education." "The Forest itself is the curriculum," she says, "and, ultimately, it is the informed and motivated teacher who will forge a connection to Black Rock for the students. I hope I have been able to convey its resources and pleasures to fellow educators."

"This manual represents an important step in making the Forest and Consortium resources even more beneficial to school programs," notes Forest Director Dr. William Schuster. "We look forward to working with new teachers as a result of its distribution and to helping them develop outstanding programs for their students, building on the many resources described in this guide." ■

## Browning Ninth Graders Conduct Research in Forest

Ninth-grade students from the Browning School, a long-time member of the Black Rock Forest Consortium, conducted their own science research projects in the Forest this fall. They used the Forest's web site to learn about research opportunities and the availability of archival data, developed their own research questions, visited the Forest twice to conduct research, and prepared both written and oral reports.

The twenty-seven students worked on seventeen projects, including analyzing dissolved oxygen concentrations at different reservoir depths, comparing the number and variety of spiders in three areas, investigating why hemlocks are diseased or possibly dying, photographing coyotes retrieving bait hanging from a tree, analyzing phototropic effects, comparing aster growth rates at different fertilizer dilutions, seining the streams and reservoir for living organisms, and investigating differences in red maple growth in various parts of the Forest.

"A science research project is a major piece of each student's ninth grade assessment," explains Sam Keany, chair of the independent boys' school science department. "This was the first year we used Black Rock as the site for the projects, and the staff were a tremen-

dous resource for both the boys and the teachers." He noted that Forest Director Dr. William Schuster helped the students during the planning phase, responding rapidly to e-mail questions about conditions, species, and equipment; that Forest Manager John Brady and Data/Network Manager Matt Munson provided excellent logistical support and advice about setting up experiments; and that students used a rowboat, waders, sein-



**Browning student strapping motion-sensitive camera to tree to determine whether a coyote would take fresh bait.**

ing nets, depth samplers, and water testing kits provided by the Forest.

Working in pairs or alone, the students developed proposals for their research, including an aim, a

procedure, and a working hypothesis, before their first visit to the Forest. During that visit, they set up their projects, collected and analyzed data, and encountered some problems, including finding suitable locations, learning to use the equipment, and finding successful testing methods. Some needed to revise their projects. "It was important for the students and for Cynthia Jackson, the boys' biology teacher, and me to follow through with experiments," notes Mr. Keany, "even if they initially yielded null results, or if unforeseen problems arose." On their second visit, a month later, the boys were more confident and comfortable, showing greater independence in getting around and carrying out their research.

"This was definitely a learning experience," Mr. Keany concludes. "The students discovered that research needs preparation, revision, and thoughtful interpretation. We look forward to maintaining this as a feature of the ninth grade science experience." Dr. Schuster points out that "there can be more work and difficulties when the projects are student-designed, but the results can be richly rewarding and of long-lasting impact. The Consortium is interested in working with teachers to develop further experiences in real research for students." ■

**Public Schools** (continued from page 1) director, Joyce M. Baron, an experienced educator and administrator, visit the classrooms to build the students' confidence and knowledge; they also provide a parent education component. (See "City Public Schools Gain Forest Access," [Spring 2003](#), for more information.)

### Forest Activities

Two fourth grade classes, two fifth grade classes, and one combined fourth/fifth grade special education class from PS 220, and two combined fourth/fifth grade classes, one fourth grade class, one fifth grade class, and one sixth grade class from PS/IS 176 visited the Forest this fall. Each class arrived at the Forest around 9:30 AM. After reviewing what they had already learned about how compasses work,

and practicing with them outdoors, the students, their teachers, and Forest staff hiked to Black Rock Hollow for a treasure hunt. Rhymed clues (such as "Yellow trail marker, here you are, you will not travel very far. Set your compass to 150, you will find the next stop nifty") led the students from site to site, using their compass skills along the way, until they found the treasure – a snack of apples and cider.

Afternoon activities varied for each group, but all involved hikes to different Forest locations with Mrs. Baron and other members of the Forest staff, including Network/Data Manager Matt Munson, as well as Jamie Kamlet, a retired Cornwall Schools teacher, and Norman Baron, former head of Connecticut's Mead School. For example, the fourth and

fifth grade classes from PS 176 hiked to either the Hill of Pines or Black Rock Mountain where they continued their compass work at the summits; so did the fourth graders from PS 220, but they also engaged in leaf and tree identification. The PS 220 fifth graders broke into several groups, hiking to Split Rock, Eagle Cliff, or Mount Misery. Along the way to Split Rock, the students learned about finding evidence of the presence of animals without actually seeing the animals, and one group recorded twenty-nine sightings of this kind of evidence. The Split Rock groups were also able to see New York City from two vantage points.

The sixth graders from PS/IS 176 were old hands at visiting the Forest, having been part of the initial School

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**Reforestation** (continued from page 1) square-meter (0.46-acre) site in the Canterbury Brook watershed. Hemlock trees grow well, and have been most severely impacted, on cool, north-facing slopes ranging from wet to dry soil conditions. The selected sites represented the two largest stands of hemlocks within the Forest, and both had experienced dramatic hemlock mortality. Both were on northwest-facing slopes with gentle grades, thick glacial till soil, and hemlocks between 120 and 140 years old. Each site was prepared by removing all remaining trees, as well as stumps and large rocks, where possible, and erecting 3-meter-tall deer-exclusion fences.

Then, in the fall of 2001, 1378 trees were planted in a fenced 492-square-meter section of the Black Rock Brook site; the following fall, 1800 trees were planted in a fenced 980-square-meter section of the Canterbury Brook site. Each site also included an unfenced and unplanted area and a fenced but unplanted area so the researchers could track the course of natural vegetation and analyze the impacts of excluding deer.

### Survival Rates

As of the fall of 2003, overall survival of planted seedlings was 89 per-

cent, with white pine and white cedar showing the greatest survival of the conifers (around 95 percent at both sites), and hardwood survival ranging from 75 percent for sycamore to 100 percent for dogwood. (Hardwoods were only planted at the Black Rock Brook site since they showed significant natural regeneration at the Canterbury Brook site, including abundant stump sprouts of oak and maple from live trees cut to establish the planting area.) White pine seedlings were the tallest of the planted conifers, followed by tamarack.

The hardwoods, both planted and volunteer species, showed good height growth as well, particularly sycamores, black birch, and tree-of-heaven (*Ailanthus altissima*), an exotic and invasive species. Naturally volunteering vegetative cover exceeded 75 percent in both fenced and unfenced areas at the Black Rock Brook site; however, tree seedling volunteers were nearly three times more numerous in fenced areas than in unfenced ones.

### Prospects and the Future

The researchers conclude that there is a high likelihood of successful reforestation given the type of clearing, fencing, and planting program instituted, but caution that re-

forestation would be more difficult in extremely steep and rocky sites; that it is too early to project the number of years needed to reestablish a closed-canopy conifer forest; that deer fencing is probably necessary until the seedlings are safely above the height of deer browsing (about five years for white pines, but longer for other species); that competition for space, light, and water from other woody volunteers may eventually prove detrimental to long-term conifer dominance and may require aggressive cutting of volunteers; and that insect herbivores, pathogens, and drought may also threaten future survival of the trees.

"We are extremely grateful to the Arthur Ross Foundation for funding not only this study, but also the next year of our research," notes Dr. Schuster. "In the future, we plan to quantify the natural reforestation and woody biomass increment rates in fenced, unplanted areas in comparison to the planted areas, and to determine how long unfenced areas of hemlock mortality will remain dominated by herbs, grasses, and unpalatable woody shrubs. Some areas will recover quickly from hemlock mortality, but others apparently will not, and in all cases the forest is being changed substantially."■

**Public Schools** (continued from page 4) in the Forest group as fifth graders. Forest Director Dr. William Schuster worked with this class, following up on the water quality testing work they did last spring. Starting at Tamarack Pond, they discussed how acid rain lowers pH and can lead to a loss of reproductive capacity in some amphibians. They learned how to follow a trail on a hike to Split Rock and they practiced compass use at the summit.

On the hike back, Dr. Schuster showed the students different ways of studying forests, including the use of such tools as calipers and increment borers. He also reviewed the scientific process with them: after explaining the hypothesis that deer browsing limits forest regeneration, he asked them to think about how they would test the hypothesis, showed them an experimental deer enclosure, and let them draw their own conclusions.

In the spring, all these classes will return to the Forest, where they

will use their compass skills to see just where the sun rises and sets, test the pH levels of the ponds, take a "night hike," sing around a campfire, and compare the trip with their fall experiences.

### School Reactions

The principals of the two schools are excited about the opportunities the Forest offers to both their students and their teachers. "Black Rock gives our students the opportunity to see nature undisturbed and to observe the natural processes living things go through in a forest," explains PS/IS 176 principal Miriam Pedraja, "and it affords the teachers the resources to expand and enhance the curriculum. In the long run, the studies will hopefully influence the students' appreciation for the part they can play in safeguarding our natural resources."

PS 220 principal Michele Kahn notes that the program offers parents the opportunity to collaborate with

teachers and "actively engage in the education of their children." She adds that the teachers have been able to "reinforce the valuable outdoor lessons with nature journals, artistic expressions of their experience in the Forest, and tree and leaf identification." The school, whose theme is arts and environment, is planning to build a greenhouse.

The Consortium would like to expand the School in the Forest program to include more schools and to permit overnight visits, but this depends on obtaining additional funding to complement the start-up grant from the New York Community Trust. "The teachers, administrators, and students from PS 176 and PS 220 have been great to work with, and we've had a terrific start to this program," notes Forest Director Dr. William Schuster. "We are very pleased to be able to provide these experiences for kids from New York City public schools, and hope that the program will have a long life."■

## Current Research at the Forest

The Black Rock Forest Consortium is committed to encouraging collaboration among member institutions and also between researchers and students. To help members learn what other members are doing and explore opportunities for collaboration, we here present a list of current research projects at the Forest, along with contact information. ■

**Biodiversity of Spiders of the Black Rock Forest.** Vladimir Ovtsharenko and Kefyn Catley (American Museum of Natural History). *Contact: Vladimir Ovtsharenko.*

**Long-Term Carbon Storage in Wetlands.** Dorothy Peteet (Lamont-Doherty Earth Observatory of Columbia University) and Terryanne Maenza-Gmelch (New York University). *Contact: Dorothy Peteet.*

**Long-Term Study (75 years) of Tree Population Dynamics and Carbon Storage.** William Schuster (Black Rock Forest). *Contact: William Schuster.*

**Management of Eastern Hemlock Decline in the Northeastern United States.** William Schuster and John Brady (Black Rock Forest). *Contact: William Schuster.*

**Coyotes of the Hudson River Highlands and the New York Bioscape Initiative.** Fred Koontz (Wildlife Trust). *Contact: Fred Koontz.*

**Floristic Changes Over Time in the Black Rock Forest.** Kerry Barringer and Steve Clemants (Brooklyn Botanic Garden). *Contact: Kerry Barringer.*

**Forest Management, Fragmentation, and Insect Biodiversity.** James Danoff-Burg (Center for Environmental Research and Conservation at Columbia University). *Contact: James Danoff-Burg.*

**Hydrologic and Chemical Fluxes in the Black Rock Forest.** H. James Simpson (Lamont-Doherty Earth Observatory of Columbia University). *Contact: H. James Simpson.*

**Controls on Carbon and Nitrogen Cycling in the Cascade Brook Watershed of Black Rock Forest.** Kevin Griffin (Lamont-Doherty Earth Observatory of Columbia University). *Contact: Kevin Griffin.*

**Ground Source Geothermal Power Systems: Assessing Energy Efficiency and Local Heat Flow.** Dallas Abbott (Lamont-Doherty Earth Observatory of Columbia University). *Contact: Dallas Abbott.*

**Long-Term Studies of Painted Turtle Population Dynamics and Dispersal.** David Karrmann and Christopher Raxworthy (American Museum of Natural History). *Contact: David Karrman.*

**Delineating Detailed Ecological Land Units in the New York Bioscape Using Multi-Temporal Landsat Imagery.** John Mickelson (CIESIN at Columbia University), William Schuster (Black Rock Forest), and Fred Koontz (Wildlife Trust). *Contact: John Mickelson.*

**Delta <sup>18</sup>O in *Pinus strobus* Needle Cellulose: Assessing the Potential for Recovering Subseasonal Cell Maturation Information.** Edward E. Cook and William E. Wright (Lamont-Doherty Earth Observatory of Columbia University). *Contact: Edward Cook.*

**The Potential Role of Physiology in the Age-Related Decline of Red Oak Productivity at Black Rock Forest.** Kevin L. Griffin (Lamont-Doherty Earth Observatory) and Will Bowman (Center for Environmental Research and Conservation at Columbia University). *Contact: Kevin Griffin.*

**Survey of Bees (Hymenoptera, Apoidea) of Black Rock Forest.** Jerome G. Rozen, Jr. (American Museum of Natural History). *Contact: Jerome Rozen.* ■

## Hermit of Black Rock

For 56 years, from 1927 through 1983, Victor J. A. Martineck, an artist and nature lover, lived off and on, in solitude, in a tarpaper shack in Black Rock Forest; he died in 1991 at the age of 93. In the fall of 2003, the [Museum of the Hudson Highlands](#), the Forest's neighbor in Cornwall, presented an exhibit on the "hermit of Black Rock."

Born in London in 1897, Mr. Martineck immigrated to New York from Switzerland in 1920. In 1927, he built his camp in the Forest; it became the "anchor of his life," according to Dave Noland, a local writer who became friendly with him and who organized the recent exhibit. Until well into his 70s, Mr. Martineck visited the Forest in every season, staying sometimes for months at a time. He rambled, painted, and wrote hundreds of letters to former Forest Managers Ben Stout and Jack Karnig, with whom he had "close and friendly relationships," among others. Sadly, he became obsessed by a delusion that a hiker he had met was vandalizing his camp and even attempting to kill him. In 1983, after some 20 years of "cataloging the never-ending crimes of The Vandal," he asked two friends to help him destroy his camp. He never returned.

Mr. Noland tracked down paintings belonging to Jack Karnig and the family of Ben Stout, as well as some that he and the Forest owned; most depicted Black Rock scenes, with many of Sutherland Pond. He selected about fifteen of Mr. Martineck's "cheerful, chatty letters, sprinkled with obscure puns and literary jokes . . . [covering] a dazzling variety of subjects, from his philosophy of art to the mating habits of the black-capped chickadee," gathered other items kept at the Forest, such as old family photos and funny little camp relics, and wrote the accompanying text. Bob Petrilli, a graphic artist, prepared the labels and an arresting poster of Mr. Martineck with a backdrop of the Forest.

Many parts of the exhibit will reside permanently at Black Rock Forest and may appear in future exhibits in the Science and Education Center, in the Lodge, or on the Forest's web site. ■

### Forest News in Brief

**2004 Small Grants Available.** The Consortium has announced its 15th annual Small Grants program, with awards of up to \$5000 for scientific research and up to \$3000 for education projects conducted in the Black Rock Forest. This program is funded by a generous grant from the Ernst Stiefel Foundation. Grants will be awarded on a competitive basis and can support purchases of equipment, summer stipends for students, transportation costs, and other needs. Housing facilities are available. Guidelines and application materials are available from Consortium institutional representatives and from the [Forest web site](#) (click on either Research or Education, and then on Small Grants). Proposals are particularly solicited in six priority areas, listed on the web site. Consultation with the Forest Director is suggested. The deadline is February 1, 2004.

**Forest Receives NSF Grant.** The National Science Foundation has awarded a \$58,606 grant to the Black Rock Forest Consortium for a proposal by Drs. William Schuster and Frank Moretti to modernize and expand the Forest's ecosystem monitoring network.

**Naming Opportunities for New Lodge.** Naming and sponsorship opportunities are available for contributors to the new Lodge. Please contact the Forest office for more information.

**Improvements to Forest Entrance.** Significant safety improvements have been made to the main entrance to the Forest from Route 9W at its intersection with Reservoir Road. These include bringing Reservoir Road up to

an even grade with the highway, rerouting its path so that it intersects the highway at a right angle (enhancing sight distance and enabling a right turn to the south), widening the incoming and outgoing lanes, paving with a thick new layer of asphalt, and installing a guide rail. The project was funded primarily by the Black Rock Forest, but with the support of the Village of Cornwall-on-Hudson for the paving. Thank you State Senator William Larkin for helping to expedite the review and final approval of the plans by the New York State Department of Transportation.

**New Property Added to Forest.** An ecologically important 13.47 acres of forest have now been permanently protected and added to the Black Rock Forest thanks to a recent acquisition by the [Open Space Institute](#). The property was essentially an inholding within the northwestern corner of the Forest on the northern slopes of Sackett Ridge on the west side of the Canterbury Brook watershed. The property is owned by OSI, but will be managed by the Black Rock Forest and now becomes part of its Canterbury Brook Ecological Reserve. It includes ridge-line, slope, and riparian habitat, and contains a number of very old hemlock trees and mature specimens of many hardwoods. Thank you OSI.

**Mountaineering Play Benefits [Museum of the Hudson Highlands](#).** On February 7, the [Storm King School](#) will host the opening of a play by John Pielmer, who also wrote the award-winning *Agnes of God*, about mountaineer Willi Unsoeld, one of the first Americans to climb Mt. Everest. For information, call 845-534-5506, x. 204. ■

## Join Us! Become a Friend of Black Rock Forest!

New Member or  Renewal

- White Oak \$1000 or more
- American Beech \$500
- Hemlock \$250
- Sugar Maple \$100
- Individual \$20
- Student/Over 65 \$15
- Family \$25

Name \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_

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I would like to volunteer to help with the following:  
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Please mail this coupon with your contribution to: Black Rock Forest, 129 Continental Road, Cornwall NY 12518-2119.  
 Please make checks payable to the Black Rock Forest Consortium.  
*Thank you!*

*All contributions are tax-deductible as the Black Rock Forest Consortium is a 501(c)(3) organization.*

## Report from the Forest Manager

Interest in the coyotes of Black Rock Forest has intensified with the beginning research of Fred Koontz of the [Wildlife Trust](#), another student of the "Lessons of the Coyote." I have been a disciple of these lessons for over twenty years, but still feel a tenderfoot. Lessons are taught in many ways; vivid memories of visual and personal contacts come to mind.

While tracking deer, censusing the forest's overwintering population, many other wild animal tracks are discovered on miles of the route. Some years back, while tracking along the road at Sutherland Pond on a beautiful clear day after a wet snowfall of 2 to 4 inches, I approached a curve in the road with very limited sight distance. As I approached the bend, an upcoming coyote met me, probably tracking too. At a distance of about three paces our eyes met. This quick moment revealed volumes: the brilliant yellow eyes of the coyote were bright, alert, and focused. The wild nature of the glare froze me in my tracks and my tongue began to

swell, choking my throat. With the hair on the back of my neck standing up, I was in awe. The coyote's reaction was quite different, not comprehending the words awe or fear. Without breaking its jogging strides, the canine turned onto the pond. As it crossed the pond, slush splashed from the front paws, leaving an enlarged print; the hind paw followed in the hole made. My mind was trying to capture everything that was happening: a healthy coyote of at least 40 pounds, with a coat of black, brown, white, and red, was galloping away on a snowy Sutherland Pond with blue sky and an ancient backdrop of pine, hemlock, and stone.

Realizing the fleeting moment, I did not want it to end. Remembering being told by a mentor of the coyote's hatred of cats, I did my best to imitate a catcall. The results were immediate: the coyote stopped, turned, and ran towards me, faster than before and with tongue hanging and teeth showing. I impressed myself, but soon realized, "now what do I do," my

tongue began to swell again. As the coyote neared, he stopped suddenly at ten paces and must have determined the source of the cat wailing, as he turned and resumed crossing the pond. Further attempts by my sorry calls were met only by a turn of the head, then ignored. Upon reaching the far side of the pond, the coyote disappeared in the forest, and I was standing still in the same footprints trying to figure it all out. He or she went back to being a coyote and I a human.

Continuing, the coyote would reappear on boulders, watching across the pond. Not until I used the catcall, poorly again, did the coyote vanish for good. This did succeed in giving me the sense of being watched for another mile or two.

The lessons learned can be interpreted many ways. The experience lives with me forever; the coyote caused all my senses to peak and I got a glimpse of how old man coyote's senses are always peaking. ■

— John Brady

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