BLACK ROCK FOREST NEWS

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New Forest Lodge to Start Construction This Spring

Plans are almost complete for the new Black Rock Forest Lodge, a two-level facility that will be able to house up to 48 overnight visitors within the Forest itself. Like the Forest's award-winning Center for Science and Education, the Lodge will incorporate "green" and "smart" features to support the study of nature in a sensible, sensitive, and sustainable manner.

As visitors head towards the Science Center along the access road from the parking lot, the Lodge will stand on the "bench" to the right, oriented along the contour to maximize views. A long structure built into the hillside, it will blend into the background more than the earlier building. Its external appearance will recall some of the features of the Center: a standing seam roof, clapboard siding, use of fieldstone, and comparable windows. Like the Science Center, its central area will be topped by a roof monitor to direct light and airflow into the building. Also similarly, access to both the main and lower levels will be from the upslope side of the building.

The bedrooms will be located on the main level; current plans call for six rooms with four beds and four rooms with six beds, for a total of 48 beds. Toilet and shower facilities will be available in each wing, and Forest staff will be able to divide groups between the two wings of the building and among the rooms to suit the needs of both students and researchers. Rooftop skylights will project daylight into the central corridors in each wing.

The central area of the Lodge will house a flexible common space that can accommodate up to 100 people for talks or 50 people at round tables for dining; prepared meals can be served from an adjacent catering kitchen. It will also contain an administrative office and provide access to an outside deck.

The lower level will include a large room that will primarily function as a lounge; it may also contain some study corners, and could potentially accommodate eight to ten people in sleeping bags. There will be additional bathroom facilities on this

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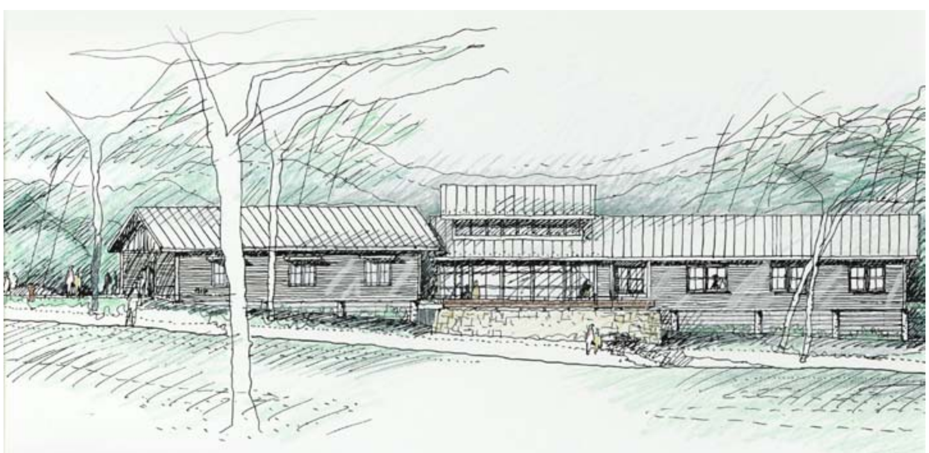

Architect's rendering of Black Rock Forest Lodge (Fox & Fowle).

Education

Teacher Resources

Starting with the 3785 acres of the Forest itself, and its experienced and dedicated staff, Black Rock offers a large and diverse set of educational resources to Consortium teachers who bring their classes to the Forest. "The infrastructure and facilities have been systematically expanded to support educational uses," explains Forest Director Dr. William Schuster. "We also can provide lesson plans, biological and environmental data sets, access to the environmental monitoring network, and a full complement of equipment and supplies."

An Educational Forest

Black Rock Forest encompasses many different habitats over an altitude variation of 1100 feet: among them are four major stream systems, seven ponds, numerous vernal pools in spring, hilltop scrub woods, forested swamps, shrub swamps, and open marshes. Forest cover includes native deciduous and coniferous trees, as well as planted pine and spruce. Long-term forest study plots enable students to examine data on past tree growth, mortality, and regeneration. Rock outcrops offer views from Manhattan to the Catskills; the Hudson River is only two miles away. Sixteen miles of dirt roads, closed to the public but open to Consortium members, lead to all major areas of the Forest, and hiking trails wind through Black Rock's forest stands to its ponds and mountaintops.

The 9000-square-foot Science and Education Center, constructed in 1999, contains two 1150-square-foot teaching/laboratory areas that can each accommodate up to 50

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Black Rock Forest Consortium

Black Rock Forest News is published three times a year by the Black Rock Forest Consortium.

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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Brooklyn Botanic Garden
Browning School
The Calhoun School
Columbia University
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The Dalton School
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Black Rock Forest News

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Report from the Forest Director

In portions of the eastern United States where development pressures remain strong, people are often surprised to learn that we have as much or more forest land now than we did 100 years ago. Some point to this to argue that all is well with our current forests. A group supported by wood products companies, Forestinformation.com, states that US forests are "abundant and growing," highlighting on its web site (www.forestinformation.com/beta/Forest_Statistics.asp) a national statistic that the country has nearly the same amount of forest land as in 1920, despite a more than doubling of the population. However, our forests face serious challenges to their health (see "What Is Happening to Our Forests?," p. 5). The trends relating to amounts of land in forest cover also deserve closer analysis.

A recent report by The John Heinz Center for Science, Economics and the Environment (www.heinzcenter.org/ecosystems/index.htm) provides more detailed historic data on forest cover at the national and regional levels. Between the early 1600s and 1850, 15 percent of the eastern US forest was lost by clearing, primarily for agriculture but also for development of towns; a further 25 percent was converted to other land uses between 1850 and 1900. The twentieth century produced a period of near stasis, as forest clearing and development were nearly offset by forest regrowth (the east had 396 million acres of forest in 1900, versus 384 million acres in 1997).

Such regional data obscure trends that are more apparent in state-by-state data from the US Forest Service Forest Inventory and Analysis program (www.fia.fs.fed.us). Instead of a sequence of three temporal periods (slow forest loss, rapid forest loss, stasis), New York State shows larger swings through at least five different periods. Rapid forest conversion to agriculture started earlier in New York and adjacent areas, as more than half of the forest cover in the state was lost before 1850. Rates of forest loss slowed between 1850 and 1900. Forest regrowth began in earnest around 1900, as the impacts of increasing population and development were swamped by the abandonment of agricultural lands, but slowed greatly after 1950 and stopped around 1980. New York State does now have more than twice the acreage of forest that it had 100 years ago (18 million acres compared to 8 million), but the most recent data document that this regrowth period is over. Forest cover has remained at around 62 percent since 1980 in New York, and at 60 percent in Connecticut and around 42 percent in New Jersey since 1985.

The 2002 New York-New Jersey Highlands Regional Study (www.fs.fed.us/na/highlands/draft_report) suggests that a new era of forest losses may have begun. Data indicate that the rate of forest loss to development has been increasing in the Highlands region (Pennsylvania, New York, New Jersey, Connecticut). The amount of developed land in the New York-New Jersey Highlands increased from more than 280,000 acres in 1984 to nearly 350,000 acres in 2000. Another 32,000 acres in the Highlands (15,000 acres of farmland and more than 17,000 acres of forest land) are likely to be developed by the year 2010. The report cites these trends as threats to the quantity and quality of water supplies and other critical resources.

Forest regrowth in our region has brought us back to about 60 percent of the original forest cover, but we are unlikely to get any more. Remaining agricultural lands now typically face the prospect of development, rather than conversion to forest, and developers are increasingly looking to forested areas. The forests that remain are mostly quite fragmented, face serious health challenges, and will likely see further reductions in some areas. Thus, details of their health are increasingly important. These native ecosystems surround us and are our responsibility, and they directly support human health and a host of dependent organisms. Forest regrowth that occurred in earlier decades is not a sound reason for any reduction in emphasis on proper stewardship or on serious efforts to attain ecological sustainability.■

— *Dr. William Schuster*

Birds of Different Feathers Flock Together

Although he initially hoped to research the effects of food availability and perceived predation risk on the formation of mixed-species flocks of forest birds in tropical Brazil, Columbia University graduate student Gonçalo Ferraz found the winter environment of Black Rock Forest the perfect locale for this part of his doctoral thesis. For three winters, he braved temperatures that dropped below 0°F, quickly discovering the benefits of thermal clothing and solving the vital frozen sandwich problem, because the Forest provided an ideal study system: reasonably sized flocks of birds with three easily identified core species; species that frequently show their legs so colored identification bands can be seen; and flocking that occurs only in winter when, with no leaves on the trees, visibility is at its best.

In Black Rock, black-capped chickadees, tufted titmice, and white-breasted nuthatches are seen together throughout the winter, occasionally joined by downy woodpeckers, golden-crowned kinglets, and brown creepers. In order to monitor flock formation and composition at the individual bird level, Mr. Ferraz and his field assistants Mariana Vale and David Okines (who is also an expert bird trapper) initially trapped the birds and marked them with colored leg bands. "This enabled me to be sure that any response to my experimental manipulations was a result of behavioral changes among a stable group of individual birds, rather than a result of turnover in the individuals in my study area," he explains.

Flock Formation

To test whether birds of different species do indeed form flocks (as opposed to mixed-species groups resulting from chance encounters), Mr. Ferraz used a computer simulation to obtain the expected frequencies of groups of different sizes if birds encountered each other at random. By comparing the observed frequencies of groups of different sizes with these expected group frequencies, he determined that large groups occur more often than they would with random encounters.

He further found that the composition of the mixed-species groups reflects the availability of birds within a given area, rather than a preference for flocking with any particular species. "Birds are not favoring mixed-species encounters over same-species encounters;" he notes, "they are just grouping with whatever birds are around."

Food Manipulation

To change food availability, rather than food distribution, Mr. Ferraz placed 32 small feeders in each of his two study sites, allowing the birds to go about their regular flocking behavior without being drawn to one single, superabundant food source. His results suggest that flock formation is mediated by the predictability of the food source. Flock formation tended to increase when food was added in a reliable, superabundant pattern, and tended to decrease when food was added randomly, as individual birds then made different decisions about how to look for the food.

"Peanut," a merlin used in the predator manipulation experiments, on perch at the Old Headquarters building at the end of a working day.

Predator Manipulation

To manipulate perceived predator pressure in a sustained way, Mr. Ferraz ruled out classical approaches such as playing back predator calls or placing stuffed animals in the study area because birds quickly learn that these do not pose real danger. "In winter, birds need to keep their metabolism running fast," he explains. "They're alive because they are good at avoiding real predators and don't waste their time running away from meaningless threats." He partially solved the problem by having falconer Peter Capainolo fly trained predators — merlins, a species of falcon — in the study area.

While this approach worked well at the beginning of each experiment, it presented several problems: the use of merlins rather than the natural predators of the study birds (Cooper's and sharp-shinned hawks) which are among the most difficult to train and maintain in captivity; the need to avoid killing the study birds, which necessitated having the falcon fly at low altitude within sight of the birds without actually flying at them for a kill; and the difficulty of dissociating the image of the falcon from the falconer carrying it in a box and then releasing it. Thus, there were no consistent, significant effects from this manipulation: the birds fled at the beginning of the manipulation, but appeared to understand that the falcon posed no serious threat and there were no sustained changes in flocking behavior. "The attempt to implement this technique was fascinating," Mr. Ferraz notes, "and I'm sure it will happen in the future with more success. Falconers and researchers need to keep interacting."

Rewards of Research

"I had never worked on such a physically demanding project, despite field work under very harsh conditions in Africa and South America," Mr. Ferraz concludes, "but it was exceptionally rewarding. At the end of the first year, I seriously doubted that I could understand these flocks. By the second year, the little that I thought I had learned looked completely different. Finally, by the third year, I was prepared to see changes and I started to perceive patterns that persist from year to year. This is the attraction of long-term field research: one has to put in a lot of initial effort, but eventually it pays back, and it pays back in the most surprising ways."■

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visitors at a time, a sophisticated 700-square-foot wet laboratory (with refrigerators, freezer space, ovens, centrifuges, distilled water, a fume hood, and analytical equipment), and more than 20 computers with cable internet access, It also houses the Consortium's staff and a library. Constructed in a natural setting a mile into the Forest, it is a "green" and "smart" structure, demonstrating such sustainable and energy-efficient features as the use of local, native materials, passive solar design, a geothermal heat pump for heating and cooling, and composting toilets.

The Old Forest Headquarters, currently the Consortium's main overnight lodging accommodation, features 16 beds in four bedrooms, a full kitchen, and a screened porch. Located just outside the Forest, it can be reserved on a first-come, first-served basis for $10 per person per night ($5 for students or others not supported by institutional funds). Additional lodging will become available in about a year when the new Lodge is completed (see "New Forest Lodge to Start Construction This Spring," p. 1). The Stone House, an 1834 farmhouse in the center of the Forest, offers a starting point for many educational activities and contains a variety of teaching materials. It can also serve as a rustic overnight facility (no electricity or running water); guidelines for its use are available from Forest staff.

Curricula

Visiting teachers, along with Forest staff, have developed a plethora of lesson plans over the years, on topics as varied as watershed explorations, tree measurement and identification, forest ecosystem studies, species diversity and identification, geology and soils, and climate and global warming. Many of these are listed on the Forest web site and are included in a Black Rock Forest Curriculum book available at most Consortium institutions; this book also includes a teacher and staff orientation section that provides basic information on preparing for group visits and observing forest safety procedures. Both field and digital activities are available. Although most of the lessons are written for the middle-school level, they can be adapted for older or younger students.

"The water resource activities for both ponds and streams are quite popular and effective," notes Dr. Schuster, "because we have such great aquatic resources and plenty of equipment, as well as existing data sets for comparisons; teachers are able to tailor the activities to their needs. The same is true for the forest resource activities. So far, only college-level classes are using our tree growth and inventory records, but tree ring studies could provide an exciting activity for high-school-age students. Map and compass skills are also important and fun to learn, but not often taught in school."

Other education possibilities in the works include hands-on experience with global positioning system (GPS) units and the use of remote infrared-trigger cameras to identify and study the life cycles, habitats, and diets of animals in the Forest.

Sensors and Data Sets

Teachers and students can access the Forest's environmental monitoring network and the data it generates. They can easily visit the Open Lowland and Ridgetop sensor stations, which track temperature, precipitation, soil conditions, and solar radiation. The Cascade Brook stream station records streamflow and, in the growing season, water temperature, pH, conductivity, and dissolved oxygen. The Science Center station continuously monitors air temperature,

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Amphibian Project at Cornwall Elementary School

For twelve weeks last spring, fifth graders in the Cornwall Elementary School's Amphibian Project took on the role of scientists as they studied salamanders and explored how environmental conditions affect their populations in Black Rock Forest. They gathered background information through library and internet research; used scientific instruments to measure soil and water pH and air, soil, and water temperature; collected, identified, and released salamanders; recorded data in log books and with digital photography; created Excel spreadsheets and PowerPoint presentations to document their work; and analyzed their observations over time, drew conclusions from them, and presented their work to a community audience.

The 31 students in Joy Alessandro's classroom were divided into six groups, each assigned to a portion of a vernal pool in Black Rock Forest. Each student in each group had a job (data recorder/writer, equipment manager, photographer, facilitator/leader, and species identifier); the group members switched jobs each time they visited the Forest so each student had a chance to do each job. In addition to Ms. Alessandro, computer teacher Grace Fiedler, science teacher Caryn Mante, librarian Jane Disare, enrichment teacher Jamie Kamlet, and then-assistant principal (now principal) Greg Schmalz all participated in the project.

Students test pH of soil.

The school hopes to expand the project to cover a longer time span and to include other grades in activities that will lead up to the full-scale field research experience. "The children benefited greatly from this project," notes Ms. Fiedler. "They did a great job of not disturbing the environment while they were studying, and they needed the hands-on experience to understand many different concepts. It's what science is all about."■

Education *(continued from page 4)*
humidity, water usage, energy usage, and other parameters. A groundwater well is available for sampling and analysis, and scientists at Lamont-Doherty Earth Observatory are planning to install a seismic station from which data will be readily available.

Black Rock has a rich and varied set of biological and environmental data available for educational use, much of it in digital form. Biological data include species lists for trees and other plants, birds, mammals, reptiles, amphibians, and fish; Forest tree inventory data and tree growth records from 1930; bird migration dates; spring plant phenology for the last 10 years; deer population data for the last 15 years; turtle population data for the last five years; and acorn production. Environmental data include temperature and precipitation data from the early 1800s to the present from adjacent West Point; data on each precipitation event in the Forest itself for the last 44 years; data on acid rain and other precipitation components for the last 19 years; streamflow and pond and stream chemistry data for the last 10 years; and detailed hourly and daily meteorological, soil, and solar radiation data for the last seven years. The database also contains maps dating to the late 1800s, aerial photos dating to 1940, and Geographic Information System (GIS) data from 1995.

Equipment

The Forest maintains a full complement of equipment and supplies to support educational activities. Supplies for field use include sampling and measuring equipment for streams, ponds, soil, and trees; nets and traps for catching insects, fish, turtles, and small mammals; GPS units and remote cameras; plant and animal field guides; plant presses; spotting scopes and hand lenses; and backpacks, clipboards, maps, compasses, waders, first aid kits, and some camping supplies. Lab supplies include a teaching collection of skins, skulls, and skeletons; an herbarium; a tree-ring analysis station including tree cores and slabs; soil sieves; water chemistry meters; dissecting kits; and tanks and terrariums, as well as basic laboratory equipment such as microscopes, glassware, ovens, refrigerators, freezers, a hood, distilled water, and ice. Classroom teaching supplies include computers, printers, scanners, overhead and digital slide projectors, VCRs and videotapes, a library with books, maps, and journals, and access to the internet and the Forest database.

"Using the Forest to enhance understanding of natural systems is a central mission of the Consortium," Dr. Schuster explains. "These many resources that the Consortium has amassed contribute towards this mission and enhance the programs and opportunities of Consortium member institutions at the same time. Consortium teachers may contact the Forest office for more information."■

What Is Happening to Our Forests?

"Forest health and sustainability are significantly challenged, and substantial future change is likely." That's the message Forest Director Dr. William Schuster conveyed in a talk, sponsored by Friends of Fishes, at the American Museum of Natural History on October 15, 2002.

Dr. Schuster first defined forest health in terms of productivity, biological diversity, conservation of nutrients and materials, and the production of "ecosystem services" (such as clean air, water, forest products, and climate control) for human populations. Sharp and/or sustained declines in these parameters not only represent reductions in forest health, but also threaten sustainability, or the ability to remain healthy and provide services over a long period of time. A proper forest analysis requires study of all forest components, living and non-living, above and below ground, as well as the processes that operate within and among these components, including energy flow and nutrient and material cycling.

Pollen records from Black Rock Forest and elsewhere indicate that various species of oak have dominated the southern and central parts of the eastern deciduous forest for 10,000 years, and sugar maple and American beech, along with white pine and eastern hemlock, further north. Although charcoal deposits indicate fires were important disturbance factors throughout this period, the greatest impacts to regional forest health occurred when nearly the entire eastern deciduous forest was cleared off, chiefly between 1700 and 1850, during the settlement and expansion of European colonists. There was widespread (though largely undocumented) loss of soils and nutrients, and of many plant and animal species. When regrowth started in the late 19th century, there were only young trees. Species dependent on older forests disappeared or were restricted to refugia; the most opportunistic and resilient came to dominate the new forest communities.

Other factors affecting forest health in the 20th century include fire suppression, which favored fire-sensitive species over fire-resistant ones; extirpation of top predators, resulting in increased herbivore populations and herbivory and thus dramatic reductions in tree regeneration in some areas; emissions from human activities leading to changes in atmospheric composition and altered cycles for important nutrients; and the introduction of exotic species, starting with the chestnut blight fungus in 1904 and continuing today with drastic declines in eastern hemlocks and American beech caused by introduced organisms.

Noting that "predicting the future is always tenuous," Dr. Schuster concluded with six points about 21st century trends: forest regrowth has probably ended, and we have as much forest as we will ever have; alien, invasive species will continue to arrive and dramatically impact our forests; significant threats to environmental quality and ecosystem services, such as the ability of forests to provide adequate supplies of clean water, are likely; disease transmission and parasite levels are on the rise in some animal species, compromising wildlife health; continuing climatic changes will influence species composition; and new tree species may eventually dominate northeast forests as major dominants like beech, hemlock, sugar maple, and oaks experience threats from exotic species and often fail to regenerate.■

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 (70 years) of Tree Population Dynamics and Carbon Storage. William Schuster (Black Rock Forest). *Contact: William Schuster.*

Multiple Trophic Impacts of Hemlock Wooly Adelgids on Eastern Hemlock Communities. James Danoff-Burg and Shahrina Chowdhury (Center for Environmental Research and Conservation at Columbia University). *Contact: James Danoff-Burg.*

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

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) and Robert Dunn (University of Connecticut). *Contact: James Danoff-Burg.*

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

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

Controls on Ecosystem Water Use in a Forest with Moderate Topographic Relief: Modeling Results. Kevin Griffin and Mark Stieglitz (Lamont-Doherty Earth Observatory of Columbia University). *Contact Kevin Griffin.*

Developing Data-Based Investigations Using Environmental Sensors at the Black Rock Forest. Kim Kastens (Lamont-Doherty Earth Observatory). *Contact: Kim Kastens*■

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level, as well as basement space for storage and the equipment for the composting toilets and other building support activities.

Green Features

The sustainable and energy-efficient design features in the Lodge will be similar to those in the Science Center. They will include geothermal heating and cooling (using extra capacity from the wells already drilled for the earlier building); composting toilets on the main level, and possible reuse of gray water for irrigation; high-efficiency lighting; operable windows and fans for ventilation; "sandwiched" roof panels and staggered wall studs with cellulose insulation for high thermal efficiency; building orientation to capture sunlight; and sustainable materials, including wood and stone from the Forest itself. "We hope to make the Lodge even "greener" than the Science Center," notes Sylvia Smith, a principal at Fox & Fowle Architects, who designed both buildings.

"The Consortium Board of Directors recognized a serious need for enhanced lodging facilities as early as 1990," notes Forest Director Dr. William Schuster. "The current facilities are often booked well in advance and are too small for many groups. The new Lodge and accompanying improvements will complete the Consortium's 1997 facilities master plan and will enable more practical, prolonged, and productive use of the Forest for a wide range of purposes. New academic year and summertime programs such as residential field courses, science camps for students, and training courses for educators are now being considered and planned."

Current plans call for finishing the construction documents and gaining local approvals by late winter, enabling construction to begin in the spring and end late in 2003. When the Lodge is ready to open, Forest staff will provide Consortium members with information about making reservations, arranging for transportation and meals, using the facility, and costs. Until then, visitors may still stay at the Old Forest Headquarters just outside the Forest and in the Stone House.■

Forest News in Brief

2003 Small Grants Available. The Consortium has announced its 14th 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.

Proposals are particularly solicited in six priority areas: creation of science curricula that use the Forest's database and data from its environmental sensor network; research into the impacts of humans on the health of the forest ecosystem (particularly, but not only, the impacts of roads and trails); studies that extend from the Forest more widely through the New York – New Jersey Highlands; integrated studies of the Cascade Brook watershed; development of the Forest's geographic information system (GIS) and global positioning system (GPS) capabilities; and production of documentary and/or instructional materials or displays about the design and construction of the Center for Science and Education (video and still archive available).

Consortium member researchers and educators interested in applying for one of the Small Grants may obtain guidelines and application materials from their institutional representative or from the Forest web site (click on either Research or Education, and then on Small Grants). Consultation with the Forest Director is suggested prior to proposal preparation to help in defining appropriate projects, methods, transportation options, and budgets. The application deadline is February 1, 2003.

Program for New York City Public Schools. The Consortium has received a generous three-year grant from The New York Community Trust to create a new program, called the School in the Forest, that will enable New York City public schools to participate in scientific and environmental activities in Black Rock Forest. Joyce Baron, an experienced educator most recently principal of the Ethical Culture Fieldston School in Manhattan, has been hired as a part-time Education Director to develop this program and to work on other educational projects.

New Members. The Calhoun School and the School at Columbia University, both in New York City, have joined the Black Rock Forest Consortium.

Ice Storm. On the night of November 16-17, 2002, a cold rain turned to ice in the central, high elevation region of Black Rock, and then the winds kicked up: by the time the ice storm was over, there were many downed tree limbs and extensive tree mortality over some 300 acres of the Forest. "While destructive, this event provides opportunities to study how the forest ecosystem responds to large-scale disturbance under modern conditions," notes Forest Director Dr. William Schuster. "Some populations will suffer, while others will benefit, and efforts to study these and other associated changes are encouraged."

Help Update the Mailing List. Please send any name or address changes to the Forest office by mail or e-mail.■

Join Us! Become a Friend of Black Rock Forest!

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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.

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Report from the Forest Manager

The historical trails and roads of Black Rock Forest were established over centuries with a purpose.

They began when Native Americans followed runs of fish along the Hudson River and made occasional journeys into the Highlands in search of fur, fruit, and game. Following paths bordering streams and brooks flowing into the Hudson would have been a sensible option. Majestic Canterbury Brook, which descends into Cornwall Bay, originating from what is now known as Black Rock Forest, would have been a likely choice.

Most likely the worn, abandoned paths along Canterbury and Mineral Springs Brooks, meeting at Sutherland Pond, known as a possible trading and meeting point, were the first trails in Black Rock Forest.

With the arrival of European settlers and the establishment of the Village of Cornwall, access to the Highlands was needed to satisfy needs for fuel, lumber, and food. The old Indian paths became more developed to handle horses and wagons. Eventually these routes were inadequate for such travel due to water seeps and steep terrain encountered in every direction.

New Highland routes were cut and built by hand to provide adequate conditions for horses, oxen, and mules. The most notable route was the Continental Road, which bisects the Forest from north to south. Another road entered from the west, continuing from Mine Hill Road to Cat Hollow, and finally to Old West Point Road which connected Mountain Road to West Point on the east side of the Forest.

During the early 1800s, spur trails branched off from these main arteries to wood-cutting lots and temporary homesteads. Made by picks and shovels, these followed land contours and hand-built walls and often connected nearby freshwater springs. These woodland paths were built and maintained by their users, all in a day's work.

With the evolution of vehicles and tractors, some of the wood paths were eventually upgraded to the current 16 miles of wood roads with drainage ditches and culvert pipes, and with graded road stone from the Forest stone crusher. Other wood paths would become the Forest's extensive 24-mile trail system. The remaining wood paths are melding into the landscape. Occasionally a road outline can be seen or a bloom of mountain laurel is detected that tends to follow the old disturbance. Single rows of stone can be found still retaining the soil they were intended to, when a woodsman knew the slope was slightly too uneven to support his beloved horse and wagon.

The evolution of wood paths has followed the progress of mankind. The early pathmaker was driven by his needs, guided by the rules of nature to read the land. The modern road builder is also driven by his needs, guided by his tractor's joystick, and studies history and science to understand the land.■

— John Brady

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2003 Small Grants Deadline February 1
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