

# BLACK ROCK FOREST

A forest preserve administered by a consortium of institutions for the purpose of scientific research, education & preservation



At left is a portrait of Cornwall Hospital founder and Black Rock Forest preservationist Dr. Ernest Stillman, painted by Durr Freedley for Cornwall Hospital in the 1930s.

### Black Rock Consortium Members

- American Museum of Natural History
- Barnard College
- Brookhaven National Laboratory
- Brooklyn Botanic Garden
- City College of New York
- Columbia University
- Dalton School
- Friends Seminary
- Lehman College
- Newburgh School District
- New York Academy of Sciences
- New York University
- Storm King School
- United Nations International School



**B**lack Rock Forest is the zenith of the Hudson Highlands, a 3,700-acre wilderness environment complete with mountains, ponds, wetlands, innumerable brooks, well-maintained trails, and lots of wildlife. And it's nearby, located in Eastern Orange County.

The forest is administered by the Black Rock Forest Consortium, a group of 14 public and private research and educational organizations. The members range from the American Museum of Natural History and Brookhaven National Laboratory to the Newburgh City School District. Their goals are to maintain and preserve the forest while encouraging education and scientific study.

This encouragement results in lots of hands-on activity. On any given weekday, the forest is host to schoolchildren taking measurements, orienteering, identifying habitats and generally learning about the importance of taking good care of the environment. The weekend crowd consists mainly of folks who want to avail themselves of the therapy of wilderness hiking and mountain biking, working up a good sweat and breathing pure, fresh air.

The forest has a series of seven ponds, all at altitudes of over 1,000 feet. They are connected by wetlands and brooks, which aerate and cleanse the water on its way from the forest to the villages of Cornwall and Highland Falls. The neighbors of Black Rock are protective and concerned, not only because it's their watershed, but also because they recognize what an important asset it is. In the late 1960s, Con Edison proposed a pumped-storage plan for producing extra energy for New York City's peak hours. This plan included taking land from a section of Black Rock Forest for a large storage reservoir. The neighbors kicked up quite a fuss, eventually nixing the whole idea.

The grass-roots movement to protect Black Rock was insistent and arose from many quarters. Its proponents weren't the first to feel that the forest was worth preserving. Dr. Ernest Stillman, the man responsible for Black Rock's preservation as we know it today, was a research physician with a keen interest in forestry, who devoted much of his free time to protecting Black Rock Forest.

The expansion of New York City in the late 1800s had kept brickyards producing at full tilt from Haverstraw to Kingston. The massive amounts of cordwood required to fuel the brickmaking process had come largely from the Hudson Highlands. Dr. Stillman's father, James, a banker and associate of William Rockefeller, had bought up tracts of land along the Hudson at the turn of the century when Tuxedo Park and the Harriman estate were being developed. The area that is now Black Rock was in terrible condition, having been extensively logged, farmed and fragmented into little homesteads with poor soil that wouldn't support the families on them.

Dr. Stillman and his wife were given a portion of the land as a wedding present by his father in 1911, and they added to it as parcels became available, creating a timber reserve. Stillman's goals were to restore the forest to health, protect it once it had become useful and healthy, and use it to advance the science of timber management.

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Above, Terry Murray of Cornwall, left, and Thelma Burton, the mother of two students from the Primary Magnet School in Newburgh, take in a view of the forest. Murray works with the school district through the Black Rock Forest Preserve. At left, Black Rock executive director Dr. William F. Schuster stands on the stairwell of the old fire tower.

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Story by Sherry Svec  
Photos by Phillip Kamrass

# Black Rock For

The Black Rock Forest Preserve, a not-for-profit corporation, was founded in 1989 to purchase the forest from Harvard University. The forest is leased to and run by the Black Rock Forest Consortium, a group of 14 research and educational institutions. Their mission is to maintain the integrity and health of the forest and to stimulate scientific education through field research.

Education through use of the forest occurs on many levels, from kindergarteners' field trips to graduate students' doctoral dissertations. Dues from consortium members pay to operate the forest. Private donors also contribute. In addition, there is a research fund available to initiate scientific studies. All the parts of the forest — trees, animals and soil — interact with each other and with

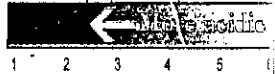
the atmosphere. Together they form an ecosystem that balances nutrients, water and gases. Trees trap solar energy, which flows through the forest when the herbivores feed on them and they are in turn consumed by predators. Seeds and pollen are distributed in part by the animals. When animals die, their bodies are broken down into minerals and carbon that are recycled into the system.

When one part of an ecosystem is disturbed, the effects are felt throughout the whole. One of the most important aspects of Black Rock is that the forest is a healthy, complete, mature ecosystem. As such, it improves not only the air and water quality of the region, but also the spirits of those who visit.

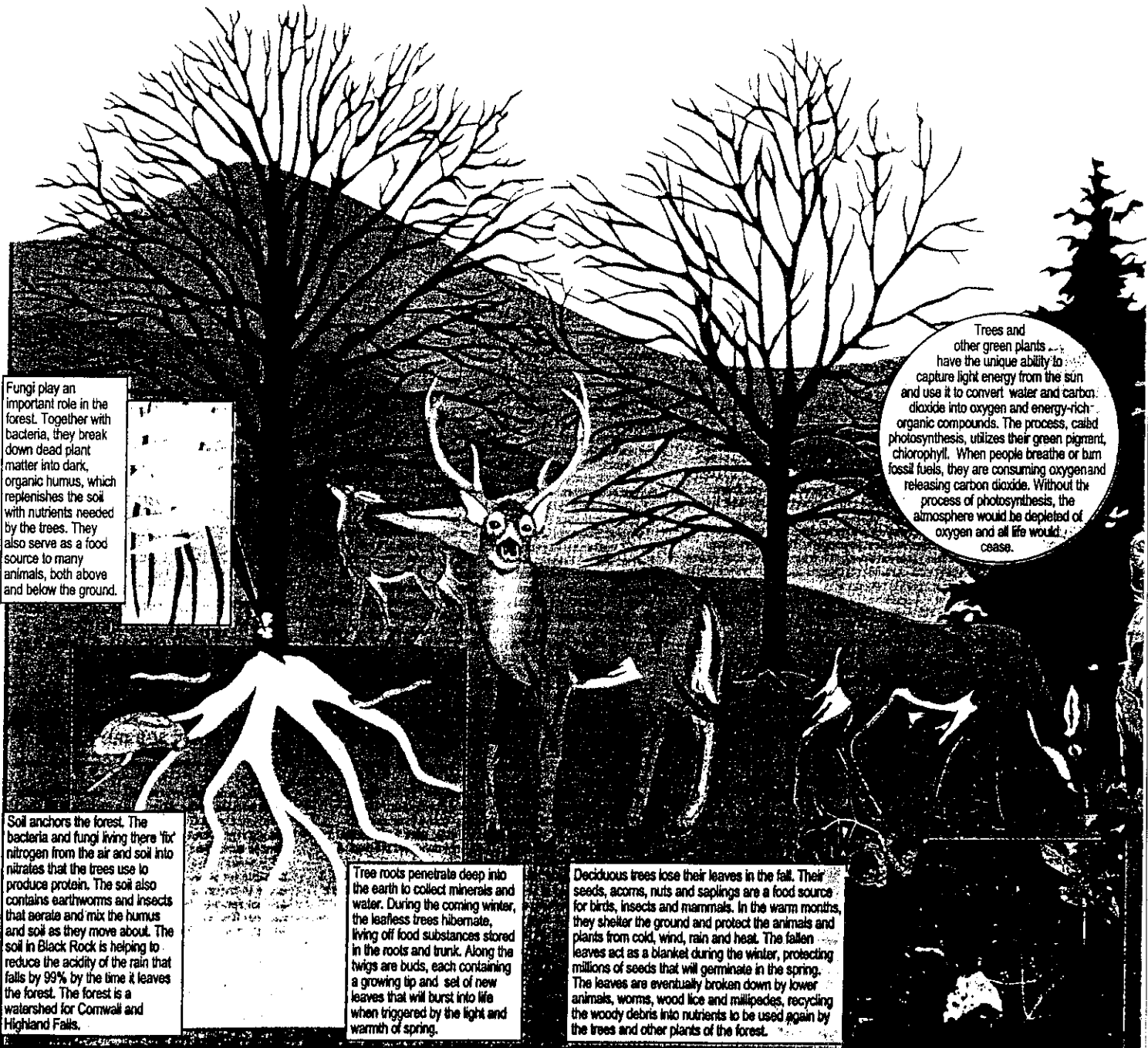
Text and graphics  
by Sherry Svec

## The forest's

Lemon juice    Orange juice  
Vinegar



The acidity of a liquid is indicated by its pH. The lower the value the stronger the acid. When it rains through clouds of air pollution, the result is a relatively weak acid, which is nonetheless strong enough to destroy life in lakes, damage trees and even erode marble. Since Black Rock is a watershed for Cornwall and Highland Falls, the quality of the water is very important. Rain with a pH of 5.5 or less is considered to be acid rain. Samples taken in late October showed the rain falling into Black Rock had a pH of 4.2 and



Fungi play an important role in the forest. Together with bacteria, they break down dead plant matter into dark, organic humus, which replenishes the soil with nutrients needed by the trees. They also serve as a food source to many animals, both above and below the ground.

Trees and other green plants have the unique ability to capture light energy from the sun and use it to convert water and carbon dioxide into oxygen and energy-rich organic compounds. The process, called photosynthesis, utilizes their green pigment, chlorophyll. When people breathe or burn fossil fuels, they are consuming oxygen and releasing carbon dioxide. Without the process of photosynthesis, the atmosphere would be depleted of oxygen and all life would cease.

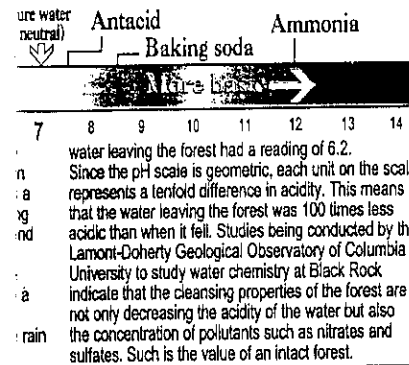
Soil anchors the forest. The bacteria and fungi living there fix nitrogen from the air and soil into nitrates that the trees use to produce protein. The soil also contains earthworms and insects that aerate and mix the humus and soil as they move about. The soil in Black Rock is helping to reduce the acidity of the rain that falls by 99% by the time it leaves the forest. The forest is a watershed for Cornwall and Highland Falls.

Tree roots penetrate deep into the earth to collect minerals and water. During the coming winter, the leafless trees hibernate, living off food substances stored in the roots and trunk. Along the twigs are buds, each containing a growing tip and set of new leaves that will burst into life when triggered by the light and warmth of spring.

Deciduous trees lose their leaves in the fall. Their seeds, acorns, nuts and saplings are a food source for birds, insects and mammals. In the warm months, they shelter the ground and protect the animals and plants from cold, wind, rain and heat. The fallen leaves act as a blanket during the winter, protecting millions of seeds that will germinate in the spring. The leaves are eventually broken down by lower animals, worms, wood lice and millipedes, recycling the woody debris into nutrients to be used again by the trees and other plants of the forest.

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## Effect on acid rain

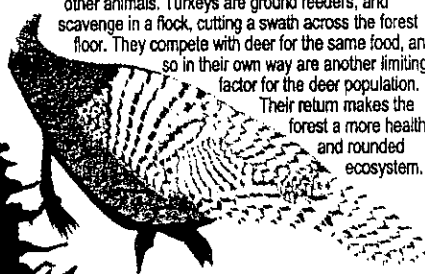


The wetlands between Jim's Pond and Sutherland Pond are used as a corridor for water-loving mink and river otters. Sutherland Pond is the only natural pond in the forest and is not a part of the water supply for nearby villages. In August, 1991, researchers from New York University set up a drilling platform on two boats and floated out to the center of Sutherland Pond. Using ground-penetrating radar, they located a suitable area and extracted a 32-foot-long core

of bottom sediments. The core is rich in pollen and fossils that have been accumulating since the last ice Age, 15,000 years ago. The pollen provides a record of the region's vegetative history. Scientists are now studying and dating the samples in order to understand the changes that occurred in our area's climate. This information will be used to help develop models of future climate changes, such as global warming.



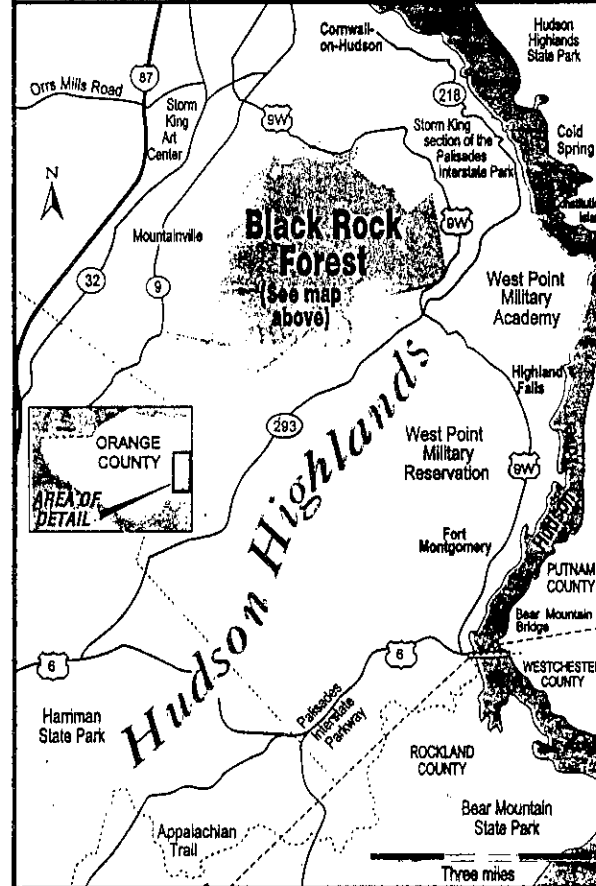
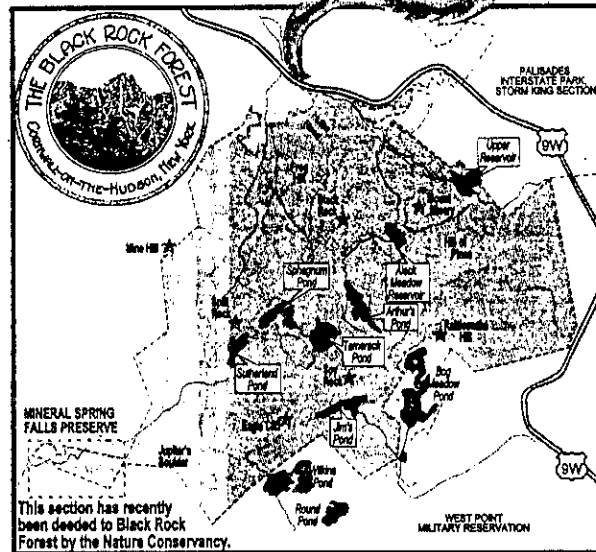
Diversity of species is an indication of health of any ecosystem. Wild turkeys have made a strong comeback in Black Rock. When they left the forest, a niche was created that was only partially filled by other animals. Turkeys are ground feeders, and scavenge in a flock, cutting a swath across the forest floor. They compete with deer for the same food, and so in their own way are another limiting factor for the deer population. Their return makes the forest a more healthy and rounded ecosystem.



For the past 100 years, the forest has been without a major predator. Ten years ago, however, coyotes made their way back into Black Rock from up north. They are very welcome here and fill a valuable ecological niche. Coyotes are an opportunistic species, eating whatever is available: berries, rodents and other small mammals are the staples of their diet, but they also lick up nests of termites and ants from under dead wood. They are becoming a factor in the natural control of whitetail deer. Without a predator the deer population grows out of control. When that happens the deer consume all available saplings, resulting in:

- 1) undernourishment and a general weakening of the deer as a species and
- 2) altering the development of the forest by robbing it of the succeeding trees.

Although the coyotes trickled in at first, they have become established in the forest. They are successfully breeding and now hunt in groups identified as families. Their presence makes the forest a complete ecosystem, a rarity in this densely populated part of the country.



# Black Rock

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S tillman had done research on influenza and pneumonia at Rockefeller Hospital in New York City from 1911 to 1949 and trained medical technicians during the war. While attending Harvard University and Columbia Medical School, he'd learned the value of scientific methods. He hired a forester, Henry H. Tryon, who worked with him for 20 years, planting, keeping detailed records and striving to improve the forest's condition. Those records, preserved by Harvard University, provide a wealth of information about environmental changes.

Stillman gave the forest to Harvard upon his death in 1949 to be used for field research. He endowed the gift and also left the Cornwall Press for publication of various bulletins and research papers. When Harvard's intent to sell the forest became apparent, many concerned factions went on alert, including area residents, municipalities and conservation groups. Daniel Steiner, then Harvard's general counsel, maintained that Harvard had no intention of selling the land for development; there weren't many other offers to buy such a huge tract, and years passed.

Finally, William T. Golden, a scientist, ecologist and philanthropist, took action. Golden, chairman of the board of the American Museum of Natural History and the American Academy of Sciences, looked at the forest and saw a wonderful opportunity to advance the cause of education, scientific research and development. "We felt that the increased use of the forest, with its varied topography, trees and geology, would be a natural way to further public awareness and concern for conservation," says Golden, who played a key role in setting up the Black Rock Forest Preserve, a non-profit organization that bought the forest from Harvard in 1989. The consortium members are encouraged to use the forest for educational programs, classes and research.

An endowment and private donations fund scientific research grants, awarded annually. Current grants include studies of water chemistry (the decreased pollution and acidity of the water between the time it falls as precipitation and the time it gets to Cornwall as drinking water), pollen and fossil sedimentation in Sutherland Pond, which dates back to the last Ice Age; vegetation changes in the forest between the 1930s and the present; and forest ecology and water quality studied by junior high students who used their findings to restore an inner city park.

Scientists and researchers appreciate the wealth of data kept since Stillman and Tryon nursed the forest.

"Beautifully documented, it's a unique chance to fill in the blanks," says Kerry Berringer of the Brooklyn Botanic Garden. "There's a record of every cut, planting and clearing since the 1930s. It's a way to see what 50 years of benign care will do for a forest. You can see what will happen when you do x, y or z to a forest — or don't."

Berringer adds that several nuisance plants have started to invade Black Rock, among them phragmites — "a giant, obnoxious reed with no redeeming value, that crowds out native plants" — and the ubiquitous purple loosestrife, which does its damage to wetlands in the same manner. So far the loosestrife is limited to the entrances to the forest, says Berringer, who enjoys field work at Black Rock, giving glowing reviews to such spots as Eagle Cliff, from which you can see clear to New York City.

The Department of Agriculture recently published a study of the million-acre New York-New Jersey Highlands, which includes Black Rock Forest. The study was conducted jointly by members of the Forest Service, the N.J. Dept. of Environmental Protection and Energy, the Palisades Interstate Park Commission, the N.Y. Dept. of Environmental Conservation, representatives from various interest groups, and other federal, state and local officials. Their aim was to take inventory of forest resources, land ownership patterns, impacts of changes and alternate conservation strategies. The report notes that most of the forested areas are fragmented, that ozone levels here exceed national standards and that water is the region's most valuable resource.

Leslie DiCola, a member of the Highlands Study team that produced the report, sees the effort as a tool to balance economic development and conservation. "There are 92 municipalities in the study region," says DiCola. "While they are making decisions that may be sound for themselves, they should be aware of the impact of those decisions on others down the line."

Jack Karnig, recently retired from the position of director of Black Rock, says that the people who worked on the report did a fine job and got a lot done, but also sees the study as "an ill-conceived effort on the part of the Forest Service to acquire Sterling Forest, to put it out of reach of developers. Sterling Forest is a water supply for Newark, N.J., and they want to maintain the quality of the water and not have to pay to remove a lot of pollutants before drinking it."

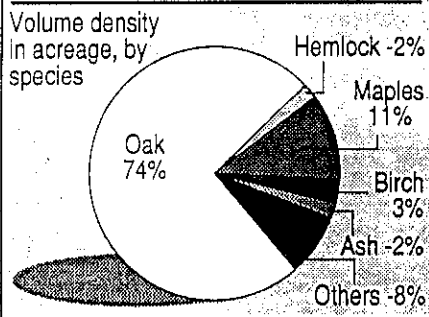
One development proposal closer to Black Rock is Charles Kim's Canterbury Brook Ranch, which would be located on Black Rock's northwest edge. The proposal includes 200 expensive homes, a community center and a private golf course. Currently in bankruptcy court, Kim is attempting to liquidate other holdings in order to proceed with his plans. The bankruptcy court judge and the Cornwall Planning Board hold the cards on that development.

Dr. William Schuster took over from Jack Karnig in June. Schuster's background as an environmental protection specialist and forest biologist have been recognized by grants from the USDA Forest Service, the



PHILIP KAMRASS/The Record

## Tree types in Black Rock Forest



SHERRY SVEC/The Record

Nature Conservancy and the National Science Foundation. He has spent the past five months getting to know the forest and is beginning to initiate new programs. He wants to build links between the educational facilities that use the forest, and eventually hopes to expand those links to become a voice in area conservation policy developments.

"The intrinsic value of the forest has many facets," he explains. "The production of wood and wood products has been going on for over 200 years here; the watershed has been used by the Village of Cornwall-on-Hudson for over 100 years, and the money from that (water usage) exceeds the revenue from the trees. Recreation, aesthetic value, the use of the forest as an educational tool and resource for scientific study, the cleansing properties for both air and water, the value as a wildlife habitat, and the intact forest ecosystem — that has to be among the highest value of all. Not only does the forest provide all of these things, but it does so simultaneously."

Forest manager John Brady has been with Black Rock for 13 years. An expert on whitetail deer management and that of other resident wildlife, he's in tune with everything that goes on in the forest. This summer, his coyote calls brought pups down from their caves to wrestle and play while he looked on. During the winter, snow reveals tracks that he translates into case histories of the forest's wildlife, its struggles and dramas. He leads field trips and organizes labs that inspire children with a deep interest in science and the world around them.

Walter Millman, associate superintendent of schools in Newburgh, says that the magnet schools program had funded Newburgh's membership in the consortium. "The potential of Black Rock is astounding for all levels of instruction," says Millman. "The forest is a means to reach all of our children and impress upon them their importance in the world we live in. The program encompasses not just science, but humanities, poetry and mathematics."

For Newburgh Middle School students, Black Rock provides a setting for an innovative curriculum that matches teachers with children for three-year periods. They embark on personal field studies, with each child responsible for collecting data at his own test station. A current project studies water quality at 54 spots in the forest. During each season, samples from each station will be collected, tested and documented, as the children learn responsibility, cooperation and the pride of making a contribution as a scientist.

Pat Dugan, one of Black Rock's neighbors, recently recounted a bit of Mountainville history and told of his appreciation for Black Rock and nearby Schunners Mountain. "Don't tell anyone about this place," he said. "It's in great condition because the people who use it respect it." Upon meeting Schuster, he asked about joining a Friends of Black Rock committee to do volunteer trail maintenance or whatever is needed. Schuster is planning on organizing such a group in the spring.

Former director Karnig admits he feels like a fish out



In top photo, John Brady, left, talks with student visitors from the Newburgh Magnet Middle School. Above, visitors walk through the forest.

of water since his retirement — and still spends time on work parties in the forest with members of the Black Rock Fish and Game Club, who have exclusive hunting and fishing rights on the forest. Karnig recently discussed a plan to make part of the forest handicapped-accessible.

"It wouldn't take much — make an existing trail suitable for wheelchairs or golf carts, create a circular route to traverse untouched forest," he says. "We need to attract funding; maybe we could approach someone like Central Hudson to take on the project; they've done work like that before. Perhaps GM would donate a dozen golf carts or so — can you imagine what it would mean to someone with limited mobility to be able to sit above Aleck Meadow Reservoir and soak up the atmosphere? It would be worlds different than the paved parks that are now their only outdoor option."

When you visit Black Rock Forest, first stop by the office on Continental Road, across Route 9W from the entrance. There you will find trail maps, guidelines for forest use and dedicated people to answer your questions.