

Protecting  
water  
quality  
in the

# MODEL FOREST

By JoAnne Castagna, Ed.D.

Deep in the Catskill Mountains, a new forest road has been formed. Along its path, travelers are guided by signs that don't say "Stop" or "Go," but instead demonstrate the positive and negative effects various forest management methods can have on the environment.

The "road" is actually a two-mile walking path that meanders through the Frost Valley YMCA Model Forest—a 400-acre patch in Claryville—and funded by the U.S. Army Corps of Engineers' New York District. The model forest is a "living classroom" designed to increase public awareness about forestry methods that yield economic benefits to foresters while protecting the region's water supply.

## Frost Valley YMCA

The "Y" sits on 6,000 acres of high elevation land in the Catskill Mountains atop the Neversink River watershed. The watershed is part of the 2,000-square-mile New York City watershed system that supplies roughly half the state's population with drinking water.

"This water is potentially vulnerable to non-point source pollution caused by poor forestry practices, and over 75 percent of the watershed is forested," said Douglas Leite, Project Manager of the Corps' New York District. "Non-point source pollution is contamination that is not directly placed in water. For example, in areas where timber is being harvested, rain can wash erodible sediments that contain nutrients, such as phosphorus, from forest roads into mountain streams and eventually reservoirs," said Leite. "Algae can feed off these nutrients and deplete the water's oxygen, adversely affecting the quality of the water. There are improved techniques for timber harvesting that can reduce...non-point source pollution."



Information is presented along the trail in kiosks and via educational signs. Staffers lead tours and answer questions.

## Educational Opportunity

These improved techniques can be learned through public education. In 1998, under the Corps' Watershed Environmental Assistance Program, Frost Valley YMCA was chosen to be one of several watershed locations to host a model forest to serve two purposes: to educate forestland owners how to implement voluntary practices to prevent non-point source pollution during timber harvests; and to keep forests working through management and sustainable harvesting so landowners can afford to pay their taxes and retain large tracks of land. Maintaining large tracts of contiguous forestland reduces habitat fragmentation, parcelling, sprawl, and development.

Officially opened in 2003, the Frost Valley YMCA Model Forest is visited by 31,000 people annually. These visitors include landowners, foresters, timber harvesters, students, and families who come to learn techniques that will help them manage forest lands responsibly without degrading habitat or water quality. The project was developed and continues to be led by a team of specialists from various partnering agencies including U.S. Army Corps of Engineers, Watershed Agricultural Council, Frost Valley YMCA, State University of New York College of Environmental Science and Forestry (SUNY ESF), U.S. Department of Agriculture Forest Service, U.S. Geological Survey, New York City Department of Environmental Protection, New York State Department of Environmental Conservation, Catskill Forest Association, and Cornell Cooperative Extension.



At this weir, scientists collect data on nitrate and oxygen levels, pH, temperature, sediment loads and macroinvertebrates before, during and after timber harvest. This provides scientists an idea of the impact harvesting has on water flowing through the forest.

## Tours Offered

Professionally guided tours for visitors are conducted along a two-mile road through the forest where educational signs and panels are posted, and kiosks have been constructed. Visitors can also observe demonstrations as they walk through 16 experimental treatment parcels—each approximately 19 acres in size—that are treated with various silvicultural techniques consistent with sustainable forest management. (The term “silviculture” refers to the art, science and practice of establishing, tending and reproducing forest stands with desirable characteristics.) In addition, the land serves as a demonstration site for best management practices and a location for ecosystem research projects.



Forest landowners and industry professionals can visit the model forest and view 16 experimental treatment parcels as part of a guided tour.



Frost Valley visitors can also learn about threats to forest health.

## Best Management Practices

Best management practices on display at the model forest show visitors how water quality can be improved, even while forest management is taking place. Water quality can be protected through the use of temporary skidder bridges, water bars and culverts, said Kevin Brazill, Watershed Forestry Program Manager for the Watershed Agricultural Council. “Three temporary skidder bridges have been installed in the forest so far, and they are placed over streams to protect the water from pollution from vehicles. We also show water bars that are ‘sculpted’ on forest roads to divert water away from the road so road pollution doesn’t directly enter the water. Finally, we have installed culverts beneath a road to channel stream waters quickly and safely off the road into filtered areas.”

Visitors can learn about the importance of road layout during timber harvest, the kinds of heavy equipment used for logging, and the role a forester, logger, or landowner plays in decision-making, Brazill said. Visitors are also shown forestry management practices that meet other landowner-driven objectives, such as economic benefit, aesthetic values, or wildlife enhancement.

Several ongoing silvicultural methods, including crop tree release and patch cut, are being practiced in the model forest to see what effect they have on the forest. “Crop tree release involves the removal of all stems in a given area with the exception of a few individual trees with desirable shape and genetics, ‘crop trees,’” said Brazill. “These crop trees drop their seeds on the ground and they take root and grow into a new, healthy forest consisting of the desired species. The saplings are thinned out every 5-10 years with the best trees selected for growth. Over time, as the small trees grow and the original parent trees age, the parent

trees are harvested to give the younger trees sunlight, yielding economic benefit to the landowner, while the younger trees grow into merchantable timber.”

Patch cutting involves cutting all trees from a relatively small area or “patch” of a forest. “This yields a variety of benefits to the landowner including increased forest edge to attract deer and various songbirds, grouse, or turkey,” said Brazill. “Patch cutting creates a new opening in the forest to enhance growth of desired tree species along the edge of the forest.”

In addition, several ecosystem research projects on water quality and timber harvesting are being conducted in the model forest. For example, SUNY ESF and the U.S. Geological Survey have set up a weir in a forest stream. At this weir, scientists collect data on nitrate and dissolved oxygen levels and pH before, during and after timber harvest. The data helps scientists understand the effects of harvesting on water flowing through the forest.

## Partnerships Formed

The creation of the model forest will never really end, said Brazill. “The forest road was completed by this summer, additional kiosks and interpretive signs are being created, and data collection from the silvicultural prescriptions will continue for several years. The end result has been a wonderful place to learn about forestry and conservation of private land,” he added. “Thousands of school children from New York City come to the YMCA annually and we are confident that the model forest will help them understand the importance of forested ecosystems as they relate to water coming from their taps.”

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**If you go:** 

Please visit [www.frostvalley.org](http://www.frostvalley.org) or [www.nycwatershed.org](http://www.nycwatershed.org) to learn more about the model forest. To schedule a visit for an interpretive hike, landowner conference or self-guided tour, please call the Frost Valley YMCA in advance at (845) 985-2291.