



## Forestry in Virginia

Everyone knows that trees clean our air and water. And who doesn't love the blaze of colors provided by our forests during a cool autumn day? Yet, while most people enjoy these and other benefits for free, they come at a cost to those who own that land. The Virginia Department of Forestry is working to ensure its forest landowners have sufficient opportunities to earn a return for their investment in our natural resources.

Nearly 65 percent of Virginia is forest land area. This represents a significant potential to contribute critical benefits that are essential to human life and a high standard of living. Forests are our natural capital and provide vital ecosystem services.

Ecosystem services are the goods and services that people obtain from the environment. This includes: clean water and air; forest products; fish and wildlife habitat; scenic beauty; recreational opportunities; carbon sequestration; open space; mitigation of global climate change, and energy independence. Ecosystem services provide critical functions that help prevent ecosystem degradation. There is an important linkage between these services and human well-being. Economic sustainability is becoming strongly linked to environmental

sustainability. Forest land and the ecosystem services provided by forests have played, and will continue to play, an important role in that relationship.

This link between economic and environmental sustainability is driving the emergence and development of new ecosystem service markets. Developments in the markets for ecosystem services will present some new opportunities for forest landowners and land managers as there is increasing recognition of the importance these services provide to society. Many of these services, such as clean air and water, have been provided by forest land with little consideration of their market value to the landowner.

In the past, many of these ecosystem services have been considered free, public goods, and forest landowners have not been adequately compensated. If we are to slow the alarming trend of forest land being converted to other land uses, we must begin valuing these ecosystem services and financially compensating our forest landowners. Virginia annually loses approximately 27,000 acres of forest land to conversion to other land uses. We need to develop processes and markets to begin transferring some of this ecosystem service value to private forest landowners to help slow this disturbing trend.

Inside, some of the key ecosystem service opportunities are discussed. This information is meant to be only an introduction to current market-based developments that are being explored.

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## FORESTS: PROVIDERS OF ECOSYSTEM SERVICES

*Economic stability is strongly linked to environmental sustainability and forests play an important role in that relationship*

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## Carbon Sequestration

Levels of carbon dioxide (CO<sup>2</sup>) in the atmosphere are now capturing considerable interest. CO<sup>2</sup> is one of the major greenhouse gases. Greenhouse gases have been linked to global warming. Forests play a major role in the global carbon cycle through the ability of trees to withdraw, or sequester, carbon from the atmosphere. In Virginia, it is estimated that our forests sequester approximately 20 percent of all carbon emissions that occur in the state. This amounts to approximately 6.42 million metric tons of carbon being sequestered annually.



Market-based mechanisms are one way to regulate greenhouse gas emissions. Sectors of the economy that contribute to carbon dioxide emissions can offset their emission levels through purchasing carbon credits generated through forest management and tree planting projects. An example of this would be a company that desires to limit its emissions of greenhouse gases at a specific capped level. The business would be able to

purchase carbon "credits" to help offset its emissions to stay at or below the capped level. Generally, a carbon credit is equivalent to a metric ton of carbon sequestered through forest management.

The development of the carbon market is leading to forest landowners being compensated through the sale of carbon sequestration credits.

## Water Quality

Unlike carbon markets, which can be global, water quality markets are usually geographically limited to a local or regional watershed. This is because water quality markets are usually driven by local or regional issues, such as a wastewater treatment plant needing to keep nutrients like nitrogen and phosphorus discharge at a permitted level. Nutrient credit trading helps regulated dischargers of wastewater meet their permitted allowances.

In time, Total Maximum Daily Loads (TMDL) may create a market for agricultural and forestry offset projects. Waterbodies are classified as "impaired" when they exceed the determined TMDL for a particular pollutant. The TMDL implementation plan for some pollutants may allow forestry and agricultural practices to mitigate addressing the impairment.

These factors all help contribute toward creating a market for the water quality ecosystem service. Water quality trading provides a market-based process for interested purchasers to buy water quality "credits." Whether this credit is to promote forest cover in a municipal water supply watershed or to help mitigate wastewater treatment concerns, the markets work towards compensating landowners for establishing forest cover on their property.

## Wetlands and Species Mitigation Banking

Species, stream restoration and wetland mitigation banking are other potential markets for ecosystem services. When land developers disturb or destroy wetlands or the habitat of an endangered species, they are required by regulation to obtain a permit. This permit requires that the developer offset any loss to wetlands or endangered species habitat.

Wetland and species mitigation banks are comprised of projects that create and enhance wetlands and endangered species habitat. These "banks" then sell credits to developers to satisfy permit requirements. Regulatory agencies approve a set number of credits, usually based on acreage, that are used to mitigate development activities. Wetlands and species mitigation banking is a new industry that has emerged in the United States with the expressed purpose of providing developers and private landowners with mitigation credits they need to get their development projects approved. In Virginia, the Department of Environmental Quality is the regulatory agency that manages the wetlands mitigation program.

## For More Information

To learn more about how ecosystem services can work for you and your forest land, contact the Virginia Department of Forestry Division of Forestland Conservation at (434) 977-6555.

For more information on how the Virginia Department of Forestry can help you, call your local VDOF office or visit the agency Web site at [www.dof.virginia.gov](http://www.dof.virginia.gov).

