

From: The Virginia Forest Landowner Update V 22 No. 1, Winter 2008

Ecosystem Services: New Markets for Forest Landowners

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This article was reprinted, with permission, from the Fall 2007 edition of *Virginia Forests* magazine.

Global warming and carbon sequestration, nutrient credit trading, wetlands banking, conservation banking, and ecosystem services are all issues we are increasingly hearing more about. What's all the buzz about? How will it benefit forest landowners? What are ecosystem services?

Ecosystem services are the goods and benefits provided by forest land. They include such services as water quality, carbon sequestration, air quality, biodiversity, wildlife habitat, recreation, aesthetics and timber products. In the May 15, 1997 issue of *Nature* magazine, Robert Costanza and others estimated the current value of 17 ecosystem services for the entire biosphere in the range of \$16-\$54 trillion per year, with an average of \$33 trillion per year. As a comparison, global gross national product total is around \$18 trillion per year.

With the exception of timber products, the economic value of these benefits and services are not adequately captured in our market economy. Therefore, they are often services and benefits provided by forest landowners free-of-charge to society. They are considered public goods. Because of the lack of landowner compensation for these ecosystem services, the loss of these services is not always considered in land use conversions or the sale of forest land. This fact is partially responsible for Virginia's current trend of losing 26,000 acres of forest land annually.

Landowner compensation for ecosystem services in our market-based economy offers hope and opportunity for forest landowners, as these services offer an opportunity to increase the cash flow from forest land. Though it will not be an easy undertaking, efforts are underway to bring ecosystem services into the market.

Ecosystem Service Types

Some existing efforts currently in place include wetlands mitigation and threatened and endangered species mitigation. Mitigation efforts involve a landowner entering into an agreement with a regulatory authority and/or an environmental firm that engineers and develops the mitigation work on their property. The project creates a bank of credits that can be marketed to groups such as land use developers or constructors of transportation projects. These mitigation bank credits are purchased by developers to offset the environmental services destroyed by their projects. This kind of environmental mitigation project often requires a landowner to enter into a permanent easement.

One important ecosystem service that forests provide is carbon sequestration. Trees do an exceptionally good job of removing carbon dioxide from the air and converting it into wood fiber. Once the carbon is converted to wood fiber, it is considered sequestered. Hence, the term carbon sequestration is derived. One acre of a 20-year old loblolly pine plantation in the southeast may sequester 6 six metric tons of carbon dioxide annually. At the current rate on the Chicago Climate Exchange, a ton of sequestered carbon dioxide is worth about \$3.50 per metric ton. This equates to a potential landowner payment of \$21 per acre per year.

When dealing with ecosystem services transactions, the term credit is usually heard. A credit is basically a unit of measurement for a particular ecosystem service. For example, a carbon credit is a ton of sequestered carbon dioxide. If a landowner's 40-acre reforestation project sequesters five tons of carbon dioxide per year, then they have 200 carbon credits (five tons per acre x 40 acres) they can market.

Carbon Credit Eligibility

So how does a landowner get into this market? Currently, the carbon market in the United States is voluntary. This means that it is not driven by any regulatory mechanism such as the cap and trade program for sulphur dioxide emissions. Under a cap and trade program, large emitters of pollution such as power utilities are limited, or capped, at a certain level. They need to either invest in technology to reduce emissions or purchase offset credits for the amount they pollute above their allowances. Therefore, if a cap and trade program for carbon dioxide occurs, the regulatory driver will be in place to enhance the carbon market more than the current voluntary market.

Some voluntary transactions do occur. The reasons can be for companies to demonstrate good environmental stewardship, public relations purposes, or to reduce a company's environmental "footprint". To be eligible for the carbon market, a landowner may need to be enrolled in a registry. A registry is simply a listing of projects that meet the registry's criteria and the carbon credits enrolled are eligible to be sold on the market. Being enrolled in a registry is only a first step; it is not a guarantee of payment and no money changes hands. Currently, several registries are being developed across the country for landowners to enroll their forestry projects into. In Virginia, Governor Kaine recently signed into The Climate Registry. Currently, this carbon registry encompasses 32 states. The protocol for enrolling in this registry is still being developed. For landowners to enroll in any registry, they need to learn about acceptable projects and necessary criteria and obligations.

Many of the carbon transactions that occur are through the Chicago Climate Exchange. This exchange offers a mechanism where willing buyers of carbon offsets can purchase from willing sellers. More information about the Chicago Climate Exchange can be learned from their website www.chicagoclimateexchange.com/.

Market-Based Approach to Water Quality

Other opportunities for forest landowners may include market-based approaches to ecosystem services related to water quality. Forests provide clean drinking water, mitigate against storm events, help ameliorate issues related to nutrient and sediment laden runoff, and help resolve some water impairment issues. Hopefully, these services can also be incorporated into a market-based approach.

Developing the methodology for bringing ecosystem services into a market will take time. Registries for enrolling forestry projects, developing the metrics to calculate a quality credit, and developing the policy and regulations associated with these markets need to be carefully planned. Some ecosystem services such as carbon sequestration may be easier since it has recently achieved high visibility because of global warming and may one day be driven by regulation.

The loss of these ecosystem services represents our social costs of converting forest land to other uses. Currently, these social costs are considered external costs in our market-based economy. We need to begin the process of internalizing these costs into our markets so that we may truly value our forest lands and place dollars into the hands of our landowners for the services their forest lands provide.

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