

Forest Management and Policy Issues:

Defining Conservation and Land Use on Forest Land

INTRODUCTION

Virginia's forests are a unique and treasured resource valued for their natural beauty and environmental services as well as their economic contribution to the state's diverse forest industry. Threatened by over-harvesting in the early 1900s and conversion to farmland, Virginia's forests now face a new pressure through conversion to developed land uses.

According to the Virginia Department of Forestry (VDOF), approximately 15.8 million acres, or 62%, of Virginia's land area is in forests. The use of this forestland is largely dependent on ownership. Virginia's forestland is made up of federally owned National Parks and National Forests, state forests and conservation lands, corporate timberland, and individually owned timber tracts. Approximately 75% of Virginia's forestland is identified by VDOF as non-industrial private forestland (NIPF). This NIPF land is becoming increasingly fragmented, both biologically (smaller tract size) and in ownership (smaller parcel size). Despite the loss of forestland to suburban sprawl, Virginia's forests are still growing more timber than is being harvested. This success is due to better forest management practices and extensive efforts in landowner education. Additionally, harvesting and wood utilization practices have improved in recent decades. In some areas of the state, forestry cooperatives and sustainable forestry initiatives are having a positive impact. However, timber markets are in upheaval, forest fragmentation is accelerating, and industrial ownership of forestland is dramatically decreasing. Timber harvesting in National Forests has also dropped dramatically due to changes in US Forest Service policy that have occurred in response to pressure from environmental organizations. These trends will, no doubt, have a negative impact on future timber availability and harvests.

This issue brief reviews key **management practices and approaches** in Virginia's forests, **federal forest management policies** that affect forest resources in the state, **emerging trends and issues** related to forest management in Virginia, and some **sustainable forestry certification options** for public and private forests.

FOREST MANAGEMENT PRACTICES

Forest management in Virginia can be defined generally through four practice approaches. Private or public forest managers may focus on one or several of these practices to meet the needs of the land, both the human and natural community, and the market that provides their livelihood. While some management approaches allow forests to exist



Source: Southern Appalachian Forest Coalition

more for the benefit of the plant and animal communities that inhabit them, "working forests" are actively managed for timber products. However, managing primarily for timber products does not necessarily preclude management for other resources. Possible focuses of forest management are **timber production**, **wildlife management**, and **recreation**.

1. Timber

Managers of "working forests" focus on harvesting techniques that produce profitable and healthy forests. The Virginia Cooperative Extension Service distinguishes between commercial and silvicultural harvesting techniques, although a practice can be both commercial and silvicultural. Though focused on timber production, silvicultural harvesting techniques consider timber management through a long-term, scientific/biological lens. Forest managers attempt to manage for a specific species or species association, ensure adequate and desirable regeneration or protect the quality of the residual trees left after harvesting. Commercial methods include the following principles:

Commercial clear cutting is a timber harvesting technique where all the marketable trees in a timber harvesting area or sale are harvested. This type of cutting can also be considered silvicultural when dealing with certain species or forest types. For example, clearcutting is part of the management regime for pine forests in the south and other conifers in the west (e.g. Douglas Fir). Clear cutting is also silvicultural when the forest being harvested is of poor quality as the result of previous poor harvesting practices and/or management. Clear cutting may also be considered silvicultural when it is employed in a salvage situation after fire damage or insect/disease devastation. In other cases, clear cutting can be considered strictly commercial when a landowner seeks to maximize income, or tract size precludes other harvesting methods from being profitably employed. This case is especially frequent on NIPF lands where tract size

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is smaller than on public or industrial land holdings.

Commercial clear cutting is often criticized by the public and environmental groups, but does have a firm biological/silvicultural basis. Often the criticism stems from the aesthetics of a freshly clear cut tract. However, the aesthetic impact of a clear cut should not always be equated with biological destruction. To be sure, many clear cuts are not biologically sound, especially if follow up management is lacking. Conversely, clear cuts can be used as an effective tool to improve forest quality, health, and diversity if applied in appropriate situations. Virginia's State Forests and many industrial and National Forest sites provide ample proof of this. While the practice of clear cutting can be misapplied, it definitely has an important role in sustainable forestry initiatives and is vital to the perpetuation of some timber types.

High-grading is a commercial harvesting technique that selects the largest and/or most valuable trees in a forest while leaving the remaining trees behind. This harvesting method is often mistakenly called selective harvesting. However, the latter is actually a silvicultural technique. High-grading can be criticized because it removes the most valuable trees or species from a site, leaving the smaller and weaker residual forest. The remaining forest may have an entirely different species composition, and overall forest health may be degraded. Recurring "high-grading" harvests may diminish forest quality to a point where a silvicultural clear cut is the best management alternative. High-grading has no place in any sort of sustainable forestry initiative.

A **diameter limit** harvest removes trees down to a minimum diameter and allows the smaller diameter trees to remain and grow. Common diameter limits in the south are 12 to 14 inches in diameter. It should be noted that most forest are even-aged or have a two-age structure, so this technique tends to leave the more slowly growing and weaker trees in the forests. Thus it is not considered an effective method for sustainable forestry.

There are three silvicultural techniques utilized in Virginia. These are **selective harvesting**, **shelterwood**, and **group selection**.

Selective harvesting is a technique that produces marketable timber while pursuing the objective of improving stand structure, species composition, stand quality, and forest health. In Virginia, this term is used frequently to describe the aforementioned high-grading, but the two techniques produce drastically different results. Selective harvesting is best applied in uneven-aged stands and in deciduous hardwood

forest stands or mixed pine-hardwood stands. While the term "selective harvesting" is used frequently in Virginia, the practice is uncommon and is mostly applied on federal lands or by forestry cooperatives in western and southwestern Virginia.



Shelterwood in loblolly pine forest

Photo by Jim Johnson.

Shelterwood methods employ partial cuts over time to allow seedlings to grow and progressively use more sunlight as second and third stage cuts are made. Costs may be higher, though yields are sustained evenly over time.

Group selection is the removal of small groups of trees to create openings and allow new growth to fill in from the edge, creating an uneven aged forest. Careful cutting practices must be used to minimize damage to re-growth.

2. *Wildlife*

Forests may either be solely devoted to wildlife habitat or be managed for timber and a productive wildlife population together. The Virginia Department of Game and Inland Fisheries and the Department of Forestry provide information on habitat and wildlife protection through responsible timber management. Wild animals have specific **habitat requirements**, including food and water for nourishment, cover from weather and predators, space to gather food in and attract mates, and safe corridors between habitats. Beneficial practices of thinning timber for wildlife require a balance of the most economical, production-oriented management with that of encouraging wildlife and plant species diversity within a stand. Some recommendations for wildlife-oriented forest management include:



Red Shouldered Hawk

Source: Virginia Tech Department of Fisheries and Wildlife Sciences

- Leave a variety of mast producers (oaks, hickory, beech, etc.) for wildlife food;
- Encourage grapevines in a stand whenever possible. Grapevines can be detrimental to quality timber production, but they provide food and cover for a variety of wildlife species;
- Leave wildlife cavity trees or den trees; these trees provide critical habitat for cavity nesting birds and mammals, such

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as squirrels, raccoons, owls, woodpeckers, etc. Two to four den trees per acre is standard;

- Stabilize all haul roads, skid trails, and log landings with a grass mixture beneficial to wildlife;
- Protect spring seeps. They provide valuable feeding areas for wildlife during winter when the countryside is frozen or snow covered;
- Protect old home sites and abandoned orchards as they provide unique habitats and usually contain a wide variety of plant life, including fruit trees and shrubs, and are heavily utilized by wildlife.

It should be noted that no single timber management regime is good for all wildlife. Some species may benefit from uneven aged management practices and silviculture harvests, while commercial harvests may be more beneficial to other species.

Fire management is also an important component of creating and maintaining wildlife habitat. Prescribed burning practices can greatly improve habitat for certain species as well as minimize or eliminate the danger from wildfires. However, prescribed burns are being limited near urbanizing areas by local burn ordinances and public opposition.

3. Recreation

Forests managed for timber products may afford some opportunities for recreation. The opportunities are greatest on large federal holdings (mostly National Forests) where timber harvests can be dispersed over a large acreage. While timber harvesting and recreation have coexisted in National Forests for many years, recreation interests have become increasingly vocal about timber harvesting and have affected policy changes that have reduced timber-harvesting activities. With good communication, education, and compromise among recreation and timber interests, recreation and timber production are both viable activities on National Forest lands. Steep slopes, riparian areas, and viewsheds should be protected when timber harvesting is considered, as should areas with unique character or endangered species. Recreation interests need to appreciate the role timber harvesting can play in the local economy and in improving overall forest health and productivity.

While recreation and timber production can also coexist on NIPF land, the variety of recreation activities may be limited. Recreation opportunities on NIPF land are often limited by tract size, privacy concerns, or other factors. In many cases, recreation access to NIPF land is only granted to local residents for limited activities such as hunting and fishing. Hunting

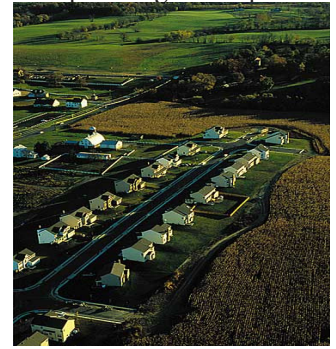
and fishing are also the primary recreation opportunities on industrial forest holdings and access is often granted by lease to hunting clubs or other organizations.

The Department of Conservation and Recreation administers state parks for recreation as well as acquiring and managing natural areas of statewide significance through the Natural Area Preserve System. The Department of Game and Inland Fisheries manages forested lands as Wildlife Management Areas.

VIRGINIA FORESTRY ISSUES

Suburbanization and Fragmentation

Two trends, which are strongly related are of major concern to future forest management in Virginia. These are suburbanization/sprawl and forest fragmentation. From approximately 1940 – 1980, Virginia saw a period where there was a net positive reversion of once-agricultural land to forestland. This has begun to change over the last 40 years as more agricultural land has been converted to suburban and community development than has been allowed to revert to forestland. Sprawling development, seen all over Virginia but most notably in Northern Virginia and Tidewater, was a major factor in this. Along with the loss of forest and agricultural lands to development, the fragmentation of forests also increased dramatically.



Suburban development
Source: S. Leen, Boston University

Two types of fragmentation are occurring. **Biological fragmentation** occurs when forested tracts are divided into smaller blocks by development, land clearing, transportation corridors, etc. **Ownership fragmentation** occurs when the same block of forest, while remaining intact on the ground, has more owners due to portions being sold, gifted, or inherited. This can be a problem when multiple owners of a large tract have different management objectives. Forest fragmentation reduces the economic and ecological value of a forest due to small tract size, conflicting management objectives, and the subsequent threat of further conversion to non-forest uses such as residential and commercial development or conversion to agriculture.

Wildland-Urban Interface

Due to threat from suburbanization, an increasing number of local governments are adopting policies to reduce forest conversion at the rural/urban fringe or Wildland-Urban Interface (WUI). The USDA defines WUI as a zone of physical, ecological,

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and social changes resulting from rapid conversion of rural to urban land uses.

In past studies, the Department of Forestry used GIS data to refine its Forest Inventory land use information. VDOF found growing impacts of rural and suburban development on current forest resources, specifically commercial timber production areas. The assessment identified 56% of forestland available for production as fragmented due to residential and commercial development (~3.1 million acres – urban; ~3.9 million acres – unsuitable due to slope, small acreage or spatial arrangement). The increasing impact from the development of suburban land uses raises the need for greater attention to preserve the remaining forest cover in these areas.

Forest management at the WUI also demands fire risk and prevention analysis. The Department of Forestry is working toward updating resources to better collect and assess wildfire risk to protect populated communities in Virginia that will help the agency perform community FireWise outreach, better allocate prevention resources, and increase response preparedness.



Forest fire near a residential area
Source: Fish and Wildlife Service

Economic Benefits

Each year, Virginia's forests provide more than \$27.5 Billion in direct economic benefits to the Commonwealth. These economic benefits include:

- More than \$23.4 Billion generated by the forest products industry and related activities
- \$208 Million paid to forest landowners for the harvest of products
- 144,380 jobs in the forest products industry
- Forest-related recreational spending in excess of \$2.4 Billion

In addition to the direct economic benefits, the extensive cover of forestland in Virginia provides its citizens with many valuable ecological services, including:

- Protection of water quality

- Protection of air quality
- Aesthetic quality
- Moderation of climate, including the offsetting of carbon emissions that contribute to global warming
- Provision of habitat for many plant and animal species

These “non-market” services have been conservatively valued at more than \$1.7 Billion annually.

However, over the last decade there have been several major changes in sectors of the forest industry. The furniture industry shifted thousands of jobs overseas where labor and other costs were cheaper. This had a ripple effect that led to closures of sawmills and other support industries. In late 2009 International Paper announced the permanent closing of southern Virginia's Franklin paper mill that had been in operation for over 70 years.

Some of these voids were filled by cabinet companies expanding in Virginia and the location of IKEA's first North American plant located in Danville. Increases in demand for renewable energy have led to several wood pellet plants locating in the state. Various other forest-related businesses have also been locating or expanding in Virginia.

The recent recession has been very hard on all sectors of the forest industry leading to additional business closures and job losses. This has been compounded by the housing market problems, since many forest products are related to housing.

To improve business, forest industry has been increasing exports of both raw and finished products. These exports help meet the growing needs of other countries and to also supply factories with the raw materials to build furniture and other products that we import. As the value of the dollar decreases, exports increase because our products become more economical to other countries.

The Alfred P. Sloan Foundation's Forest Industries Center (FIC) at Virginia Tech is working to identify innovative strategies to make the domestic timber industry more competitive in the global marketplace. The Center examines the business and technological needs of the wood products industry in Virginia through research and policy analysis focused on supply-chain efficiency and consumer preference as well as 'lean' manufacturing and workforce diversity training for forest industry actors.

Forest Health

The introduction of exotic species can have a severe impact

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on the health of Virginia's forest resources. The introduced chestnut blight fungus, for example, led to an almost complete elimination of American chestnut from Virginia's forests during the last century. Chestnut was once the dominant hardwood tree species throughout the Appalachian region. Other tree species may be under threat from new invasive pests.



Gypsy Moth Caterpillar
Source: VDACS



Adult Male and Female Gypsy Moths
Source: VDACS

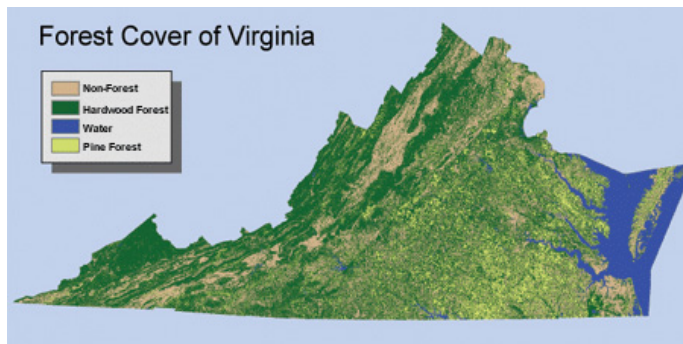
A few major examples of exotics in Virginia's forests include:

- Emerald ash borer (insect)
- Gypsy moth (insect)
- Beech bark disease (fungus + insect)
- Dogwood anthracnose (fungus)
- Tree-of-heaven (invasive plant)

The gypsy moth is one of the most damaging forest pests in the Commonwealth today. Its preferred host – oak trees – make up a major proportion of the oak-hickory and oak-pine forests that dominate our landscape. Likewise, the southern pine beetle, a native insect pest, has historically killed millions of dollars worth of pine timber during outbreak years. Programs are in place to survey and monitor most of these pest problems, while additional efforts towards proactively managing and mitigating these impacts are underway.

Land Conservation Mapping

The Virginia Department of Conservation and Recreation has created Virginia's first comprehensive, continually maintained GIS map layer that contains conservation lands administered by state agencies, non-profit conservation organizations such as the Nature Conservancy, Virginia Outdoors Foundation, private land trusts and others. Active forests may co-exist on conservation properties per easement



Source: Virginia Department of Forestry

contracts and an increasing number of landowners are opting to conserve forest resources by designating forestlands under conservation easements. Collecting and maintaining a database of conservation properties will better inform land use decisions in the state and identify areas of particular value or concern.

FEDERAL FOREST MANAGEMENT POLICIES IN VIRGINIA

Healthy Forestry Initiative

Virginia's National Forests and Parks are administered under both US Department of Agriculture Forest Service and Department of Interior National Parks Service regulations. On May 21, 2003, the House of Representatives passed the Healthy Forests Restoration Act of 2003 by a vote of 256 to 170. The Act is also known as the Healthy Forest Initiative (HFI). HFI created opportunities for National Forests and Parks to expedite high-priority fuel-reduction and forest restoration projects in forests and rangelands. The goals of the Act were to safeguard forests and nearby communities against the dangers of high-intensity fires, as well as open more land to harvesting and clearing.

NEPA Categorical Exclusions

Another factor in national forest management policies is National Environmental Policy Act (NEPA) Categorical Exclusions that allow priority fuel treatments (thinning and planned burns) and forest restoration (reseeding and planting) projects with a lower level of analysis and documentation than is used in Environmental Assessments (EA) or Environmental Impact Statements (EIS). With Categorical Exclusions, the Forest Service, along with all other federal agencies, may find some activities with no individual or cumulatively significant impacts be excluded from documentation in an EA or EIS. There is debate on the level of documentation that should be required for these projects.

2009 Wilderness Land Preservation Legislation

On March 30, 2009, President Obama signed legislation that sets aside more than 2 million acres of protected wilderness land in nine states. According to the Huffington Post, President Obama said the new law was amongst the most important in decades "to protect, preserve and pass down our nation's most treasured landscapes to future generations." Obama also said that Americans "will not take our forests, rivers, oceans, national parks, monuments, and wilderness areas for granted, but rather we will set them aside and guard their sanctity for everyone to share. That's something all Americans can support." The law is one of the largest expansions on wilderness protection in a quarter-century. This expansion is "almost as much wilderness

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as designated during the past eight years combined. The law protects land in California, Colorado, Idaho, Michigan, New Mexico, Oregon, Utah, Virginia, and West Virginia.

Opponents of the law have called the land preservation a “land grab that would block energy developments on vast swaths of federal land”. The bill also “resolves several long-standing disputes over water rights, including implementation of a 2006 legal settlement to restore the San Joaquin River in California, brining water and salmon back to a now-dry stretch of the waterway”.

Forest Management Planning

In early 2004, the Forest Service released revised Management Plans for National Forests in Virginia, South Carolina, Tennessee, Georgia, and Alabama. Plans dictate the direction of forest management for the next 10-20 years by defining zones for a range of uses including timber harvesting, watershed protection and recreation. The process provides an opportunity for the Forest Service to recommend areas of forests for legislative protection such as Wilderness Areas and National Scenic and Recreation areas. Following the release of the Plans, the Southern Environmental Law Center (SELC) submitted administrative challenges to the new plans, raising the following objections:

- Allowable logging quotas are too high;
- Forest resources are not adequately protected from road building and protected land enforcement;
- Wildlife management policies are inadequate.
- The joint appeal from Southern Appalachian Forest Coalition, SELC, and WildLaw was addressed in a July 2006 appeal decision. The appeal decision identified eighteen consolidated appeal issues and found no violation of law, regulation, or policy in seventeen of them. On the remaining issue, the Jefferson National Forest was instructed to delay implementation of the Forest Plan Off-Highway Vehicle route designation until after further analysis was completed.

The Bush Administration repealed the 2001 Roadless Area Conservation Rule in May 2005 and implemented a process requiring individual states to petition for the amount of protection desired. During his term in office, former Virginia Governor Mark Warner petitioned the Forest Service to designate more than 380,000 acres of mountain wilderness, restricting road construction and commercial activity in George Washington and Jefferson National Forests. The petition asked Secretary of Agriculture Mike Johanns to restore a 2001 regulation prohibiting development in wild areas in

the nation except for areas of public and health safety concern. Through his petition, Gov. Warner became the first governor to petition for the state protection, listing 100% protection of Virginia’s roadless areas. Since then, Federal Courts have issued conflicting decisions enjoining the State Petition Rule and reinstating the 2001 Roadless Area Conservation Rule and enjoining the use of the 2001 Roadless Area Conservation Rule. These cases are still in various stages of appeal and review.

EMERGING TRENDS IN VIRGINIA FORESTRY

Forest Ownership¹

Most of Virginia’s forestland (more than 12.9 million acres) is privately owned. More than 373,600 individuals and families hold a total of 10.1 million acres. These private holdings average less than 75 acres in size, but range from a few acres to thousands of acres.

By 2007, ownership of forestland by forest products firms had declined to less than four percent of the total (550,000 acres). This is a reduction from seven percent in 2001 and 11 percent in 1992. Timber investment management organizations (TIMOs) and real estate investment trusts (REITs) account for more than 300,000 acres of forestland divested by forest industry. These two categories of owners continue professional forest management on the properties in their holdings. However, the long-term trend is likely further subdivision and development of these lands.

The balance of Virginia’s forestlands (16 percent) is owned by federal, state and local governments – the largest entity being the USDA Forest Service National Forest lands at 1.6 million acres.

The Virginia Department of Forestry – through its 19 state forests – holds 57,553 acres of forestland.

Ecosystem Services²

Virginia’s forests provide a vast array of ecosystem services. Simply defined, ecosystem services are the many benefits and services that forests provide. These services include: ameliorating nitrogen and phosphorus nutrient load reductions; carbon sequestration; biodiversity; pollination; recreation; aesthetics, and air quality improvements to name a few. The Virginia

1 Virginia Department of Forestry, 2009 State of the Forest report <http://www.dof.virginia.gov/info/2009-SOTF.htm>

2 Virginia Department of Forestry, 2009 State of the Forest report <http://www.dof.virginia.gov/info/2009-SOTF.htm>

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Department of Forestry is committed to increasing awareness of these vital services and finding solutions that keep working forests on Virginia's landscape sustainably providing ecosystem services.

Forest growth in Virginia annually sequesters, or captures and stores, about 6.42 million metric tons of carbon dioxide emissions. This growth roughly offsets about 14 percent of the total annual carbon dioxide emissions in the State. Voluntary markets are beginning to emerge to help forest landowners capture a value for the carbon sequestration service. The ability of forest growth to sequester carbon dioxide emissions and help provide solutions to climate change is a positive story to tell. However, each year, approximately one 1 million metric tons of carbon dioxide is emitted into the atmosphere due to land-use changes, such as the loss of forest cover.

In addition to carbon markets, other market opportunities are emerging for landowners. Tree planting projects on open land are being looked at as solutions to reduce nitrogen and phosphorus loading and, therefore, enhance water quality. There is a tremendous effort to reduce nutrient loading in the Chesapeake Bay, and forestry will have a role to play.

Other ecosystem services, such as providing for and enhancing biodiversity, are extremely important. How we manage our forests and plan for the development of Virginia's landscape need to consider biodiversity values. The Department of Forestry is working with Virginia Tech and other state agencies to develop tools that will enhance our ability to include ecosystem service considerations in our land-use planning efforts.

SUSTAINABLE FORESTRY CERTIFICATIONS

There are a wide range of sustainable forestry certification programs, created from groups with interests as diverse as wildlife habitat to long-term timber production to forestland conservation. A few of the major certification programs include:

- FSC certification - Forest Stewardship Council
- Sustainable Forestry Initiative (SFI) - American Forest and Paper Association
- Tree Farm - American Forest Foundation
- GreenTag - National Forestry Association

Each program approaches the definition of "sustainable forestry" from a unique perspective and includes a range of products, expert support, and purpose. The FSC and SFI

programs are two of the dominant certification programs available to private timber harvesters nationwide. Where FSC approaches certification from a strong NGO focus on the environmental and social values of natural forest ecosystems, adding an economic dimension, SFI certification takes a strong industry focus on forestlands acquired or owned for production, adding an environmental dimension to market viability.

“ Good foresters must always look toward harvests that they will not live to reap.”

Wendell Berry

Resources:

Alfred P. Sloan Forest Industries Center at Virginia Tech
<www.forestindustries.vt.edu>

Dylan H. Jenkins and James E. Johnson. *Sustainable Forestry: A Guide for Virginia Forest Landowners*. Virginia Cooperative Extension. Publication Number 420-139, Revised April 2003.

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<www.safc.org>

Southern Forest Network
<www.southernsustainableforests.org>

Virginia Department of Forestry, 2009 State of the Forest report
<<http://www.dof.virginia.gov/info/2009-SOTF.htm>>

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