VIRGINIA DEPARTMENT OF FORESTRY

2009 State of the Forest

Annual Report
on Virginia's Forests

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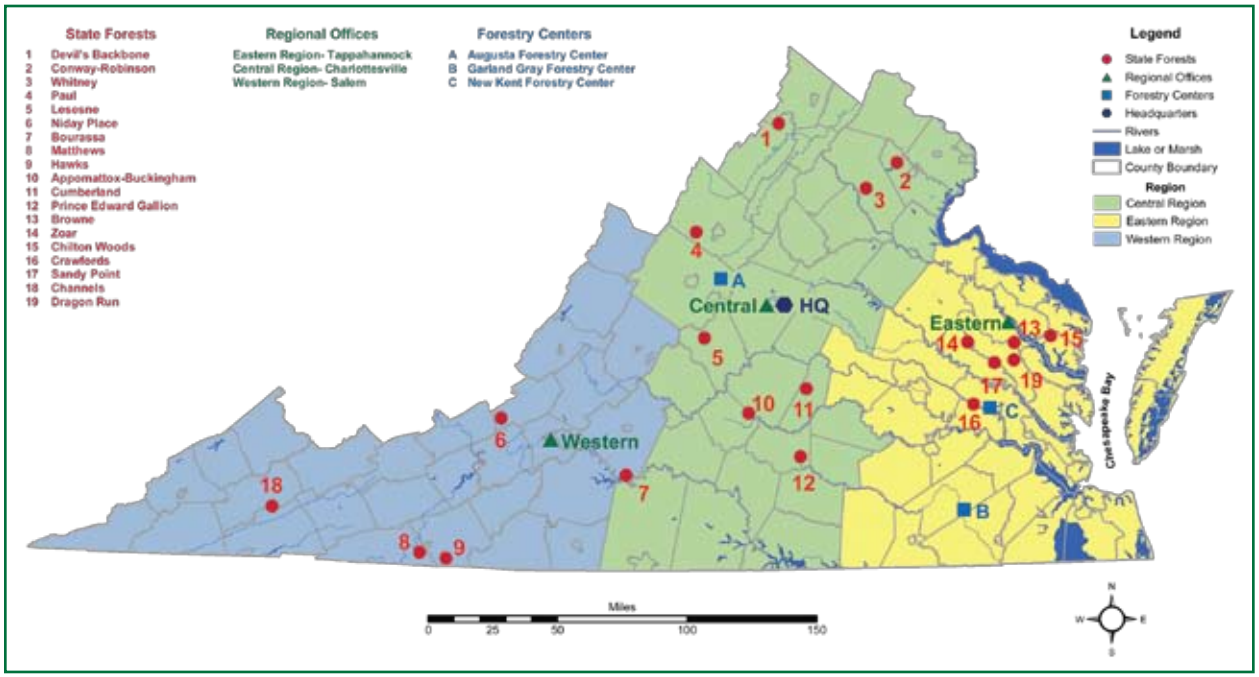
From the State Forester

An old forester once told me that things in the forest don't change much year to year. Real change, he said, takes decades. In many respects, I think he was right. But it certainly isn't an accurate portrayal of all that's taken place in forestry and the forest industry over the past year. Everything from the economy to wildland fire to forest health has experienced significant, and sometimes painful, change.

This, my fifth annual report to you, is a candid assessment of the challenges and opportunities that faced the Virginia Department of Forestry; the forestlands of Virginia, and, ultimately, the quality of life in our great Commonwealth from July 1, 2008 through June 30, 2009. On the Agency side, the biggest challenges that we dealt with were the multiple rounds of budget reductions. Since we were already a small and efficient agency with an annual general fund budget of just $18 Million, the $4 Million in cuts we endured shook us to the core. To deal with these reductions while continuing to protect and serve the citizens of the Commonwealth, we implemented nearly 20 strategies ranging from reducing the number of cars in our pool, to extending the life of our fire plows by five years (from 20 years to 25 years), to laying off most of our part-time employees. We also merged our regional operations, reducing the number of regions across the state from six to three. Not one of these decisions was easy, and each of them has caused us to change the way we work and deliver services. But all were required if we are to continue to protect the lives and property of Virginians.



The forest industry also suffered last year as the economy suffered its worst slump in decades. Timber harvests were down about 10 percent as the demand for lumber dropped because of a slow down in construction. (This reduction in harvests led to a loss of sales at our two tree nurseries. Seedling sales for the year were 25 million, down from the previous year's sales of 33 million. That means 8 million less trees were planted by Virginia landowners.) Some pulp and paper mills cut shifts to reduce output or even had to close. In addition to the forest industry positions that were lost, jobs that exist because of the forest industry were also cut. It's been a difficult year for sure.

There were, however, many bright spots. We hosted a national conference on ecosystem services, which easily sold-out due to tremendous interest in this nascent market. And we held a successful bio-energy conference in northern Virginia that brought together municipal officials, energy advocates, biomass producers and regional leaders to discuss the emerging market for municipal solid waste and wood as energy sources in urban and exurban areas.

In the forest health arena, we saw a huge drop in the number of acres that were defoliated by gypsy moth – 29,000 acres this year down from 112,000 acres the year before. The 3,000 traps placed in northern and central Virginia to capture emerald ash borers (EAB), which were detected in Fairfax County in the summer of 2008, have not indicated any spread of this invasive pest beyond some sites in that county. A ban on the movement of firewood and other wood products in several northern Virginia counties and localities has slowed the spread of EAB, which poses a major threat to the Commonwealth's 250 Million green and white ash trees. And southern pine beetle, which has remained relatively quiet over the past seven years, has seen another program – a logger incentive program that provides cost-share funds for pre-commercial thinning on pine tracts of 50 acres or less – established that will inhibit its abilities to attack the state's pine trees.

Frequent rain helped keep the spring 2009 fire season in check. VDOF firefighters responded to 802 wildland fires that burned 6,836 acres from Jan. 1, 2009 through April 30, 2009. These figures represent a 15 percent decrease in the number of fires and a 73 percent decrease in the acreage burned during the same period in 2008. More than 900 homes and other structures were protected by wildland firefighters between July 1, 2008 and June 30, 2009.

We more than doubled the size of the Dragon Run State Forest (King and Queen County) through the addition of a 2,410-acre tract. This vital part of the Chesapeake Bay Watershed is now in excess of 4,200 acres. Our Division of Forestland Conservation helped protect from development 1,885 acres of private land through the establishment of conservation easements with 10 landowners. These easements mean the tracts will be forested forever yet remain the property of the individual landowners. An additional 1,600+ acres were conserved by VDOF through US Forest Service Legacy program funds and money received from the Virginia Land Conservation Fund. All of these conservation measures contribute to Governor Kaine's initiative to conserve 400,000 acres of land across the Commonwealth during his four-year term.

I invite you to read through this report to learn more about the challenges and opportunities we faced this year. Doing so will give you a better understanding of the state of forestry in Virginia. Thank you for your continuing interest in, and support of, the Virginia Department of Forestry.

Sincerely,

Carl E. Garrison III
State Forester

Virginia Forest Trends

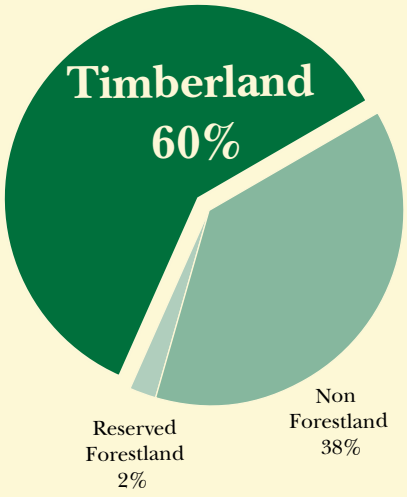
In August 2008, Virginia Department of Forestry staff completed the first panel of the ninth inventory of Virginia's forest resources. Information from nearly 5,000 plots measured during the past five years was analyzed and summarized by the USDA Forest Service and posted to the Internet in April 2009.

Forested Land

In 2008, more than 15.8 million acres – more than 62 percent of the Commonwealth – qualified as forestland. Of this forestland, 15.3 million acres are categorized as commercial timberland and 500,000 acres are categorized as reserved forestland. With an average plot re-measurement period of five years, the net loss of forestland was 27,000 acres per year, up from 20,000 acres per year during the seventh survey period. This translates to a rate of one acre lost every 20 minutes. If the long-term trend continues, Virginia could lose one million acres of forest within the next 25 years. By comparison, Virginia's largest state forest (Appomattox- Buckingham State Forest) is slightly less than 20,000 acres in size.

Interestingly, the loss of forestland to other land uses is dynamic – other land uses are reverting back to forestland simultaneously. During the 2001 to 2007 period, for every four acres diverted to non-forestland uses, three acres reverted back to forest within the state. The coastal plain experienced the highest ratio of diversions to reversions with almost two acres of forestland cleared for each acre reverted.

Virginia Land Use



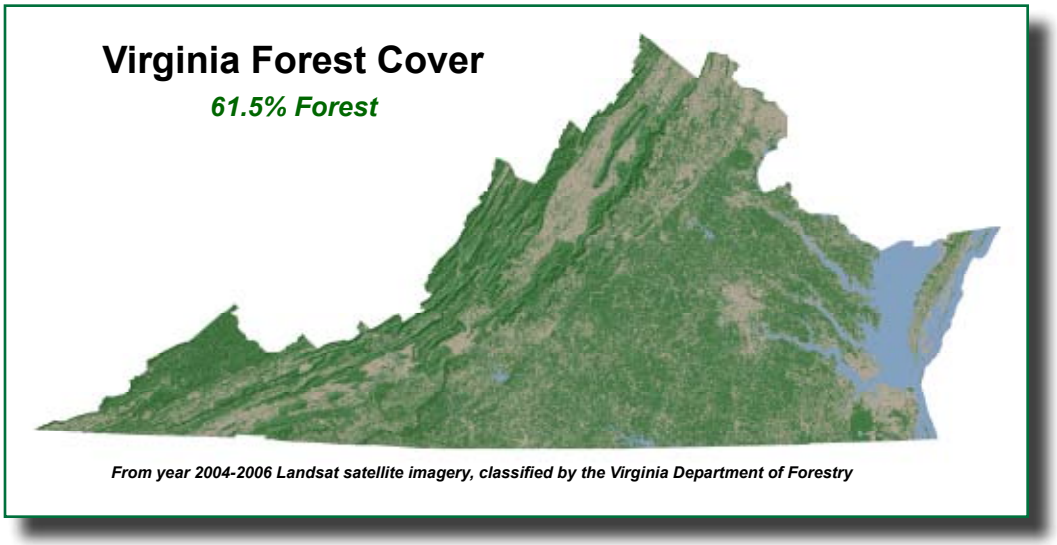
Land-Use Changes 2001-2007

(acres)

Region	Diversions from Forestland	Reversions to Forestland	Ratio
Coastal Plain	107,334	64,238	0.60
Southern Piedmont	86,164	76,381	0.89
Northern Piedmont	107,200	82,792	0.77
Northern Mountains	74,739	52,849	0.71
Southern Mountains	109,529	78,122	0.71
Statewide	**484,965**	**354,381**	**0.73**

Glossary of Forest Inventory terms

Forestland – Land at least 10 percent stocked by forest trees of any size, or formerly having such tree cover, and not currently developed for non-forest use. The minimum area considered for classification is one acre. Forested strips must be at least 120 feet wide.



Timberland – Forestland capable of producing 20 cubic feet of industrial wood per acre annually and not withdrawn from timber utilization.

Reserved Forestland – Forestland withdrawn from timber utilization by legislation or statute, e.g. National Park lands or designated Wilderness Areas.

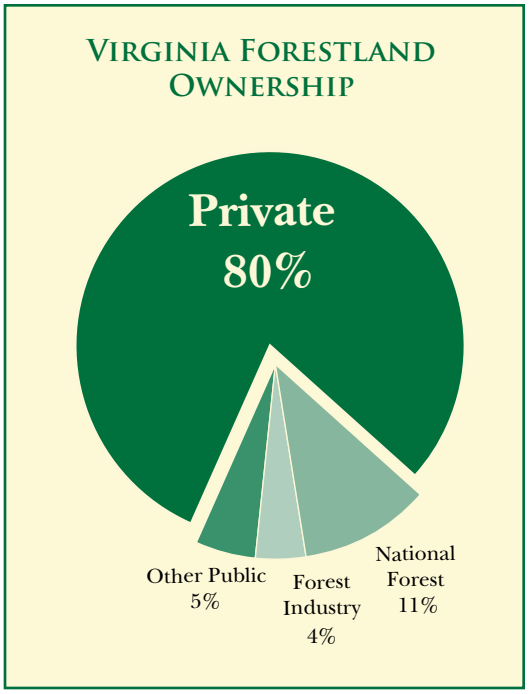
Forest Ownership

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.



Forest Sustainability

"We envision forest resources that support and enhance a healthy living environment."

"We protect and develop healthy, sustainable forest resources for Virginians."

-DOF 2014 Shaping Virginia's Forests (Strategic Plan)

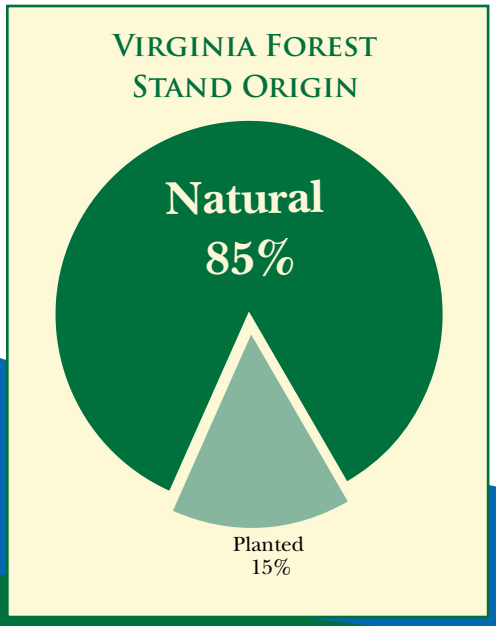
When we address the issue of whether Virginia's private and public forests are healthy and are being managed sustainably, we can look at several indicators. One of these is the ratio of the net growth versus the removal of forest volume, due to harvesting and land conversion. The latest available forest inventory data indicate a net growth to removal ratio of 1.42 for hardwoods statewide. In other words, for every unit of hardwood removed, 1.42 units have grown to replace it. For softwoods (pine), the ratio is also positive: 1.11 statewide.

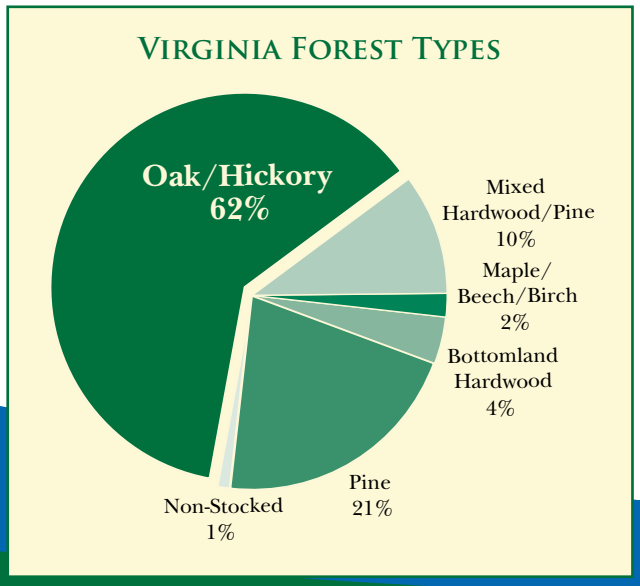
In terms of composition, the forests of Virginia continue to display good diversity. Hardwood and hardwood-pine forest types make up more than 12 million acres of the Commonwealth's forest – more than 78 percent. The area of hardwood forest types has increased steadily since the first forest inventory in 1940, when 8.1 million acres existed. The hardwood forests of Virginia are maturing, with more than 6.6 million acres in stands 60 years old or older.

Concerns do exist with the hardwood resource. While five upland oak species are among the top 10 tree species for total volume in the state, only two upland oak species – white oak and chestnut oak – occupies a top 10 position for number of individual trees. The exclusion of fire and presence of high-grading are significant factors in limiting oak regeneration. In its place, shade-tolerant regeneration – such as red maple and blackgum – is becoming more prevalent.

Pine forests represent approximately 3 million acres (more than 20 percent) of Virginia's forestland. This is a decline from the 6.2 million acres of pine found during the 1940 inventory. Pine plantations now constitute more than 50 percent of the pine acreage. Plantations help offset the loss of natural pine acreage, due to their higher productivity when intensively managed. These productivity increases should continue in the future with the use of genetically improved seedlings from the Virginia Department of Forestry nurseries.

A number of tree species have suffered significant decline over the latest inventory period: table-mountain pine, pitch pine and shortleaf pine, due to southern pine beetle infestation, and eastern hemlock, due to hemlock woolly adelgid infestation.





Several uncommon tree species in Virginia are receiving special attention: Atlantic white-cedar stands are being actively regenerated in the Great Dismal Swamp, and the Virginia Department of Forestry is actively promoting the propagation and planting of longleaf pine.

Ten Most Common Tree Species in Virginia by Number of Trees

Forest Types	No. of Trees
Red Maple	1,409,672,312
Loblolly Pine	1,046,480,418
Yellow-Poplar	846,035,017
Sweetgum	697,418,160
Blackgum	618,087,417
Virginia Pine	471,683,467
American Holly	443,890,629
White Oak	437,716,069
Chestnut Oak	359,767,912
Flowering Dogwood	320,737,921

Ten Most Common Tree Species in Virginia by Volume

Forest Types	Cubic Feet
Yellow-Poplar	5,107,951,438
Loblolly Pine	4,263,493,317
Chestnut Oak	3,101,666,446
White Oak	3,021,351,320
Red Maple	2,289,964,979
Northern Red Oak	1,666,825,810
Virginia Pine	1,455,328,247
Sweetgum	1,127,619,390
Scarlet Oak	1,053,714,774
Black Oak	1,045,775,421

Stewardship Plans

The right to own land is one of the most valued rights of Americans. If you are like most landowners, you take pride in your property. And people who own forestland have some unique opportunities, including:

- Improving or maintaining a healthy forest;
- Increasing wildlife habitat on their property;
- Enhancing natural beauty and land values;
- Increasing recreational opportunities;
- Reducing soil erosion and improving water quality;
- Protecting the property from wildfire, insects and disease;
- Increasing income from forest products, and
- Reducing tax liabilities.

Virginia's Forest Stewardship Program is a landowner assistance program developed for non-industrial, private forest landowners by the Virginia Department of Forestry (VDOF) and the USDA Forest Service, State and Private Forestry. The VDOF provides the forestry professionals who work with the landowners, and the USDA Forest Service provides program oversight and the grant funding that makes this program possible. Through the cooperation of these state and federal agencies, a wealth of forest management information, expertise and experience can be at the landowner's finger tips through a personalized document called a Forest Stewardship Management Plan.

The plan is the first step toward a healthy, productive woodland. VDOF foresters are available to provide management plans for woodland owners. Each stewardship plan is designed to achieve the specific landowner's objectives.

To learn more about forest stewardship plans, please visit http://www.dof.virginia.gov/mgt/index-stewardship.htm .

Forest 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;
- $350 Million paid to forest landowners for the harvest of products;
- 144,380 jobs in the forest products industry, and
- 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, and
- Provision of habitat for many plant and animal species.

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

Ecosystem Services

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 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.

Conserving the Forest Land-base

Land conservation may be one of the few pieces of good news related to America's current economic downturn. The decline in the real estate market has slowed demand for open space for development. This reduced demand may help some forest landowners to choose to keep their land in forest rather than selling for development. This pause also gives us an opportunity to conserve some parcels of forestland that previously were destined for development.

As the demand for real estate for development has declined, the interest in land conservation has jumped. The latter half of 2008 and the beginning of 2009 has been a very busy time for land conservation at the VDOF. The two conservation specialist positions that were filled in 2008 have enabled VDOF to serve the growing demand for donated conservation easements from forest landowners. In the past year the VDOF accepted conservation easements from 10 landowners, protecting 1,885 acres from development, more than three times the acreage we protected in the previous year. In early 2009, the VDOF also closed on the acquisition of a 2,410-acre addition to the Dragon Run State Forest in King and Queen County.

All of these conserved acres contribute to achieving Governor Kaine's goal of placing 400,000 acres under permanent protection from development. The VDOF is working on three other large acquisition projects to protect working forests from conversion and provide public access for outdoor recreation.

This year, the VDOF was awarded funding through the USFS Forest Legacy program to purchase conservation easements on two properties along the New River in Grayson County. VDOF also obtained funding from the Virginia Land Conservation Fund to purchase a conservation easement on 1,100 acres of forestland in Rockingham County. This property represents a significant inholding within the George Washington National Forest.

While the VDOF has been protecting forests since its inception, the forestland conservation program is relatively new. Much of our recent work has been to establish a conservation program that is focused on protecting the most important working forests from development. Managed, or working forests, provide a sustainable flow of natural goods and services that benefit all Virginians. Because larger blocks of working forest provide the greatest range of benefits, the VDOF conservation program focuses on keeping the forestland intact and unfragmented, protecting the ability of current and future landowners to manage their forestland for timber products and environmental benefits.

We have used GIS analysis to rank all of the forestland in Virginia based on its contribution to water quality; wildlife habitat; production of forest products, and the relative threat of conversion. The resulting maps should be available in late 2009, and they will be used to prioritize our conservation efforts. We have also been working over the past year to develop language for our conservation easement agreement that specifically addresses protecting working forests.

Earlier this year, we concluded a study of comprehensive plans for all of the counties in the Chesapeake Bay watershed to determine what tools localities have in place to protect forestland from conversion and to promote forest management. The results of this study will help to identify where improvements can be made in the development process as it relates to forestland conservation. During their first year, the conservation specialists have worked with the local governments in their regions to promote the benefits of forests and to increase protection of working forests through the local planning process.

Forest Management

Forests provide a multitude of benefits to the Commonwealth and its citizens. These include: forest products; clean water; pure air; habitat for wildlife; outdoor recreation; natural classrooms; defense against environmental stresses, and settings for quality living. The value and quality of these benefits can be greatly enhanced through planning and implementation of good forest management practices. In 2009, the Department continues to emphasize planning and practice implementation in the agency's performance measures.

Forests are, by nature, long in development and duration. Because of this, long-term planning is essential to realize long-term benefits. Planned forest management practices, implemented over time, will ensure sustainable and continuous benefit from forest resources. The Virginia Department of Forestry has a small but strong corps of professional foresters who accomplish this planning on private and state-owned forestland. All steps are critical in planning, beginning with determining landowner objectives. This is followed by a site examination; development of recommendations, and, finally, a schedule for implementation of practices. Department foresters partner with other state agencies and private natural resource professionals, including game biologists; soil and water conservation specialists, and private consulting foresters, to develop and encourage the implementation of these plans. In the 2008-09 fiscal year, foresters completed plans on 213,682 acres.

Planning provides the blueprint. Building active, working forests is done using tools and workers to implement projects. Department of Forestry staff, landowners, contractors and other professionals cooperate to put the plans into action. Silviculture, the art and science of producing and tending forests, is the means to build these forests. There are many different types of forest management practices used: preparing sites and planting trees; thinning; controlling competing or invasive vegetation; fertilizing; partial or complete harvesting for natural forest regeneration, and prescribed burning. In the 2008-09 fiscal year, 4,034 forest management projects were implemented, located throughout the state, from less than an acre to hundreds of acres, from rural to urban settings, all designed to build healthy, valuable and productive forests.

There are a number of programs designed to encourage and assist private landowners in implementation of these practices. In addition to planning assistance, state and federal programs help to offset landowner cost of doing the work. The flagship program for planting and improving pine forests is Virginia's Reforestation of Timberlands Program. Begun in 1970, the program is funded by the wood-using industry and general funds. Since its inception, the program has supported work on nearly 1.5 million acres, a tremendous accomplishment. In the past year, program funding and accomplishments remained at high levels, with RT providing assistance on more than 55,000 acres at 1,484 different sites, with an RT fund investment of more than $2 Million. Of this $2 Million, forest industry supported the RT effort by providing $1,497,298 in forest products taxes.

Another essential part of any comprehensive forest management program is education and outreach to non-industrial private landowners. The VDOF has formed a strong partnership with the Virginia Cooperative Extension Service to utilize the best of both agencies' strengths to provide forest resource management programs for landowners. In 2008-09, through this

cooperative effort, the VDOF provided more than 20 educational opportunities that reached more than 750 landowners.

The VDOF has strong cooperative relationships with the Virginia Department of Conservation and Recreation; the USDA Natural Resource Conservation Service (NRCS), and the Farm Service Agency and the assistance programs they administer. The VDOF and Virginia NRCS working relationship through the Environmental Quality Incentive Program has been used as a national model for other states. Private support for forest management is active as well, specifically in 2008-09 by Vaughan-Bassett Furniture; the Glatfelter Pulpwood Company; Plow and Hearth Catalog Company; Belfort Furniture, and the We Think in Ink printing company. Together, these firms funded the purchase of more than 416,000 seedlings for planting by private landowners.

Accomplishing the work in forest management is truly a cooperative effort with private owners, forest industry, loggers, consulting foresters and contractors all playing a role. Historically, VDOF has worked very closely with private landowners to coordinate and implement forest management projects. Recently, the Department has been working to increase the role of the private sector in project implementation. Successful examples in 2008-09 include five regional tree planting and three spray area pine site preparation and release contracts developed and aggregated by VDOF, but accomplished by consulting foresters and private contractors. A total of more than 27,000 acres of pine plantations were released and/or site prepared in 2008-09.

Two of the important native pine species in Virginia, longleaf and shortleaf pine, have declined significantly over time. Longleaf pine, the premier southern pine for lumber, naval stores and wildlife habitat, which used to occupy 1.5 million acres in Southeast Virginia, has been reduced to a scattered handful of native specimens. Shortleaf pine, the tree that built the heart of Virginia and once abundant statewide, has declined to less than 10 percent of 1940 levels. The Department worked closely with our federal agency co-operators to help revise existing cost-share programs to encourage the planting of longleaf pine in their native Virginia ranges.

Through this and other efforts, nearly 500 acres of each species were planted in the 2008-09 planting season. Planning and professional advice prior to harvest is the key to successful resource management. Pine forests in Virginia have been very successfully and intensively managed through genetic improvement of seed, planting and intermediate stand treatments. Hardwood forests are more diverse, occupy a much larger acreage and have a longer growth cycle. These forests produce trees that are used for a wide range of products – from pallets and crossties to high-quality furniture and flooring. There remain many opportunities to improve management of hardwood forests through proper planning and appropriate management practices.

Protecting Virginia's Forests from Wildfire

The Virginia Department of Forestry responds to more than 1,280 wildland fires that burn more than 12,400 acres annually (based on a 10-year average, 1999 – 2008).

Although nearly 70 homes and other structures are damaged or destroyed by wildland fire each year, on average, agency efforts protect more than 1,200 others at a value of more than $178 Million dollars.

From July 1, 2008 through June 30, 2009:

- 1,019 fires burned 8,779 acres;
- more than $5 Million of timber was damaged;
- damage to homes and other buildings exceeded $1.1 Million;
- 1,613 homes, worth more than $329 Million, were protected, and
- 987 other structures, worth an estimated $15.5 Million, were protected.

The Agency relies on highly-trained and experienced personnel operating a fleet of 200 4x4 engines; nine specially equipped Hummers; five specially equipped wildland brush trucks, and 89 bulldozer/wildland fire plow suppression units for quick response to any reported wildland fire or other weather-related emergency. The assistance of Virginia's 765 fire departments and close working relationships with Federal land management agencies and other public and private landholders in the Commonwealth ensure that wildland fire response in Virginia is both efficient and effective.

Virginia Department of Forestry wildland firefighters and support employees also came to the aid of other states throughout the nation. During the latter part of 2008 and early 2009, 124 VDOF personnel deployed to other states to fill critical incident management and fire suppression roles. Assistance was provided to the states of California, Montana, Nevada, North Carolina, Wyoming and Texas.

Virginia is a recognized leader in the national Firewise Communities USA program, which identifies and works with high-risk woodland home communities to reduce the potential for damaging wildfire. Virginia is third in the nation for the number of fully certified communities at 34.

Dry Hydrant Program

The Virginia Dry Hydrant Grant Program is funded by the General Assembly using money from the Virginia Fire Programs Fund. The program is administered by the Department of Fire Programs and the Department of Forestry and is assisted by an advisory committee.

The objectives of the program are to:

- Conserve energy by reducing losses from fire;
- Conserve energy by reducing miles traveled to shuttle water;
- Fund the installation of dry hydrants that otherwise would not be installed, and
- Conserve processed domestic water supplies in urban and urbanizing areas.

Those organizations eligible to apply for dry hydrant grants include the fire departments listed with the Department of Fire Programs. A total of 29 new dry hydrants were installed through the program last year.

Fire departments submit grants based on established priority locations; secure any local permits necessary, and obtain landowner permission for the establishment of a dry hydrant. There is a standard specification for dry hydrant installation, so any special requirements or additional costs would have to be borne by the specific fire department. Communities and homeowner associations can obtain a dry hydrant by working with the local volunteer fire departments to secure a grant.

Volunteer Fire Assistance Program (VFA)

The Volunteer Fire Assistance Program continues to increase the fire protection capability in Virginia. This is accomplished by making available financial assistance to rural volunteer fire companies to provide additional training and the acquisition of small equipment and wildland personal protective equipment (PPE). Since the inception of this program in 1975, 4,949 grants have been made providing a total of $2,622,196 in matching grant funds.

The grant program improves the capability and effectiveness of America's 26,000 Rural Volunteer Fire Departments – 585 of them in Virginia – to protect lives and other rural investments. The purpose of this program is to provide financial, technical and other assistance to State Foresters and other appropriate officials to organize, train and equip fire departments in rural communities. In 2008, 158 rural volunteer fire departments in the Commonwealth received $214,914 in Volunteer Fire Assistance funds made available to Virginia. Requests for support continue to greatly exceed the available funding.

FireWise

Each year, Virginia Department of Forestry personnel respond to more than 1,200 wildland fires – the vast majority of which are caused by human activity. To prevent your life and property from becoming a wildland fire statistic, we encourage you to make your home and other structures FireWise.

FireWise is a national program used by VDOF to help Virginians reduce the risk of a wildland fire. Through "fuel modification," you will be creating a landscape that will make your home and other structures less vulnerable to wildfire.

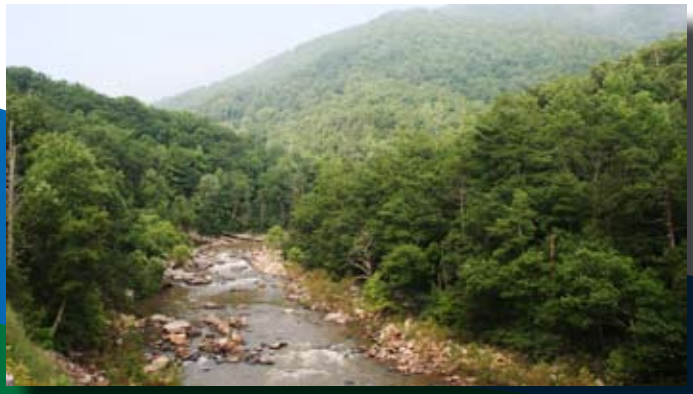
First, clear dead wood and dense vegetation within 30 feet of any structure; move firewood away from your home. Keep trees and shrubs pruned. Keep your gutters, eaves and roof clear of leaves and other debris. Remove tree branches that are less than six feet above the ground. Use less flammable plants, such as azalea, viburnum, crepe myrtle, spirea, hydrangea, annual and perennial flowers, ferns, dogwood, redbud, red maple and oak. And mow, maintain and water your lawn regularly.

In addition to the landscaping recommendations, there are a number of FireWise construction tips that you can use to help protect yourself, your family and your property from the ravages of wildfire. To learn more, visit www.firewisevirginia.org.

Protecting Virginia's Water Quality

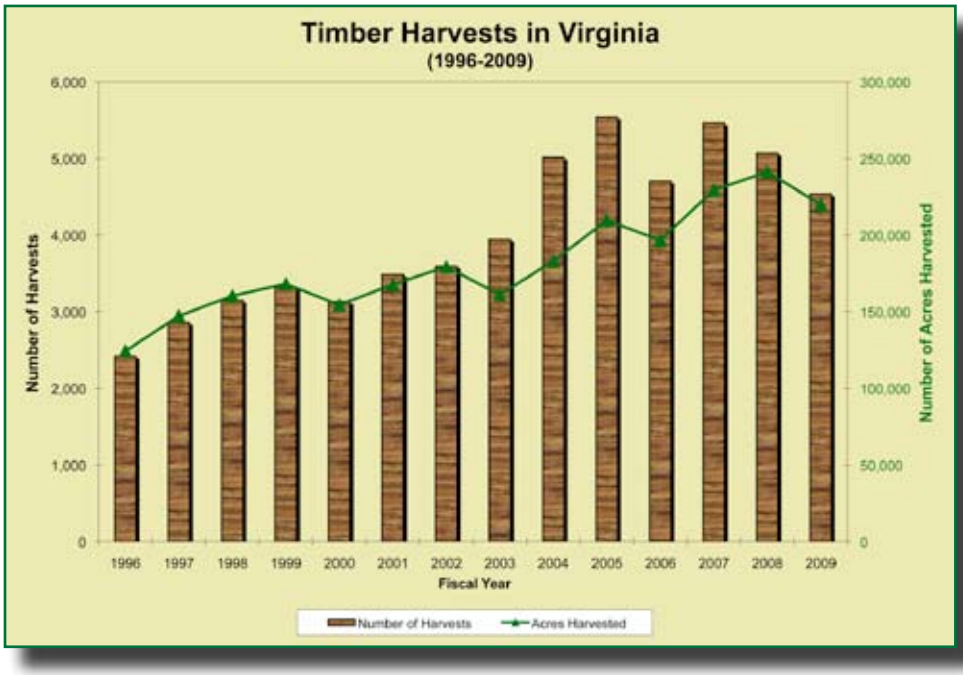
Water quality is important to all Virginians. Studies have shown that the cleanest water comes from forested watersheds. These watersheds are critical sources of pure drinking water; habitat for important fisheries, and areas that are treasured for their recreational value and purity of life. Two of the Department's important measures involve water quality. One focuses on Best Management Practices on forest harvesting operations and protecting streams from sediment. The other focuses on improving and protecting watersheds through management and land conservation.

The Virginia Department of Forestry has been involved with the protection of our forested watersheds since the early 1970s with the development of our first set of Forestry Best Management Practices (BMPs) for Water Quality. The Department is now utilizing the fourth edition of those guidelines, and has circulated copies of its latest version nationwide as well as to numerous countries worldwide. The backbone for the Department's water quality effort is the harvest inspection program, which began in the mid-'80s. This program has provided for one-on-one contact between VDOF and the harvest operators and a welcomed opportunity to educate the operators on BMPs and the latest in water quality protection techniques. In fiscal year 2009, VDOF field personnel inspected 4,245 timber harvest sites across Virginia on 207,226 acres.



Another main focus of the VDOF water quality program is logger education. Since the development of the first BMP Manual for Virginia, the VDOF has been involved in the training of harvesting contractors in water quality protection techniques ranging from harvest planning, map reading and the use of GPS units to BMP implementation. This occurred through training that the agency sponsored and, more recently, through VDOF participation in the SFI® SHARP (Sustainable Harvesting and Resource Professional) Logger Training Program. Since 1996, this program has enabled VDOF to assist in training 6,370 harvesting professionals in 193 different programs relating to water quality protection. For fiscal year 2009, there were eight training programs offered with 168 attendees present. Three of these courses were in the core area with 76 attendees, and the remaining five courses were for logger continuing education and had 92 attendees.

In July 1993, the General Assembly of Virginia – with the support of the forest industry – enacted the Virginia Silvicultural Water Quality Law, §10-1-1181.1 through §10.1-1181.7. The law was created to provide Virginia with an enforcement mechanism to address water pollution originating from silvicultural activities. The law grants the authority to the State Forester to assess civil penalties to those owners and operators who fail to protect water quality on their operations. This law was amended by the General Assembly in 2009 to require inspection of timber harvest sites and to require timber operators to provide landowner contact information as part of the notification process. Virginia continues to be the only state in the southeastern United States that grants enforcement authority under such a law to the state's forestry agency. In fiscal year 2009, the VDOF was involved with 323 water quality actions initiated under the Silvicultural Law. Of these actions, 17 resulted in Special Orders being issued for violations of the law. Several of these proceeded to the issuance of civil penalties. All penalties collected under this law are placed in the Water Quality Penalty Fund, which is a non-reverting fund to be used for education,



demonstration and research.

A statewide audit system has been in place since 1993 to track trends in BMP implementation and effectiveness. This system was revised during fiscal year 2008 and brought Virginia into compliance with the Southern Group of State Foresters' BMP Monitoring Protocol. This new audit process has added more tracts and will be able to provide more specific information on areas to concentrate additional training for harvest operators. Results from the first complete year of data show that overall BMP implementation on 300 randomly selected tracts is 82.4 percent and that BMPs associated with stream crossings on those same tracts is 81.4 percent. The significance is that stream crossings are the place where significant water quality impacts can occur, and BMPs will mitigate any possible water quality impacts. The audit results also show that 97.9 percent of the sites visited had no active sedimentation present after the close-out of the operation.

Beginning July 1, 2009, the VDOF began use of its enterprise database system IFRIS (Integrated Forest Resource Information System) for Water Quality. This involved a redesign of the entire Water Quality Program over the past year to incorporate the use of hand-held data recorders and a GIS-based system for recording timber harvest inspection information. The information that is collected from this point forward will be linked geographically by GPS coordinate to a specific watershed. In conjunction with this, timber harvest operators have all been assigned a unique Logger Identification Number that will make it easier for the logger to be able to notify their timber harvesting operations as well as enable the agency to be more efficient in communicating with loggers on important issues. A unique component of this system allows the timber operators to have access to maps and aerial photographs for harvest-planning purposes if they notify the agency of their operation using GPS coordinates. Additionally, the VDOF has teamed up with the SHARP Logger Program to offer GPS training to harvest operators and actually provide cost-share assistance towards the purchase of a recreational-grade GPS unit to those logging companies that have participated in the training class.

During fiscal year 2006, the VDOF developed and implemented a BMP Logger Cost-Share Program. Funding for this unique initiative was made available through a grant from the Commonwealth's Water Quality Improvement Fund. This program provides a 50 percent cost-share to timber harvesting contractors who implement appropriate BMPs on eligible stream crossings. The projects must be pre-approved by the VDOF, and harvesting contractors must be SHARP Logger certified to be able to participate in the program.

The program will cover items, such as culvert pipes, equipment time to construct water diversion structures as well as material to revegetate the site. But probably the one feature of the program that will have a lasting effect on water quality in the Commonwealth is that the program will provide cost-share for the purchase of portable timber bridges that will continue to provide water quality protection for sites beyond the original site for which they were purchased. In fiscal year 2009, this program funded 46 BMP projects throughout the Commonwealth with 70 percent of those being in the Chesapeake Bay Watershed. Of those projects, 32 involved the purchase of portable bridges.

Watershed Protection

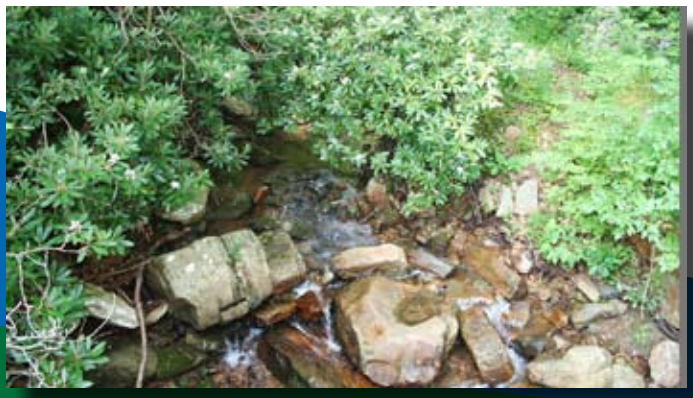
Forests provide the best protection for watersheds. Because of this, one of the Department's goals is to increase the amount of forestland conserved, protected and established in Virginia's watersheds. The concept here is to focus on tools and practices that will have a high benefit to water quality, specifically conserving land permanently; establishing and maintaining riparian buffer zones; planting trees on non-forested open land, and increasing urban forest canopy by planting trees. All of these activities are closely related to meeting water quality goals associated with the Chesapeake Bay restoration and watersheds for Virginia's southern rivers.

The Department and other state agencies have been very active and have made significant progress in promoting land conservation that will protect watersheds and other forest benefits. In 2008-09, land permanently protected through purchase or private land conserved through a VDOF-held easement totaled 4,295 acres.

New riparian forest buffers were established by planting trees on 2,089 acres. Many of these areas were agricultural or pasture land. Forested buffers provide significant water quality benefits through nutrient uptake; reduced runoff, and by livestock and cropping exclusion.

Virginia's Forestry BMPs that address harvesting have been highly successful. One of the most valuable BMPs for water quality is the uncut or partially cut streamside management zone. This voluntary measure assures an unbroken forest groundcover near the stream; shade for the water, and wildlife corridors. Landowners can elect to receive a state tax credit for a portion of the value of the uncut trees in the buffer. By doing so, they agree to leave the buffer undisturbed for 15 years. The number of landowners electing this option is increasing, and in FY 2009, landowners participated in this watershed protection option on 663 acres.

Forests provide superior watershed benefits over nearly every other land use. Because of this, the Department is encouraging planting of open land with trees. This is a particularly valuable option on marginally productive pasture or crop land and land that is no longer being farmed or managed for other purposes. Other benefits include carbon storage; air quality improvements, and wildlife habitat. In the 2009 season, trees were planted on 2,027 acres of open land.

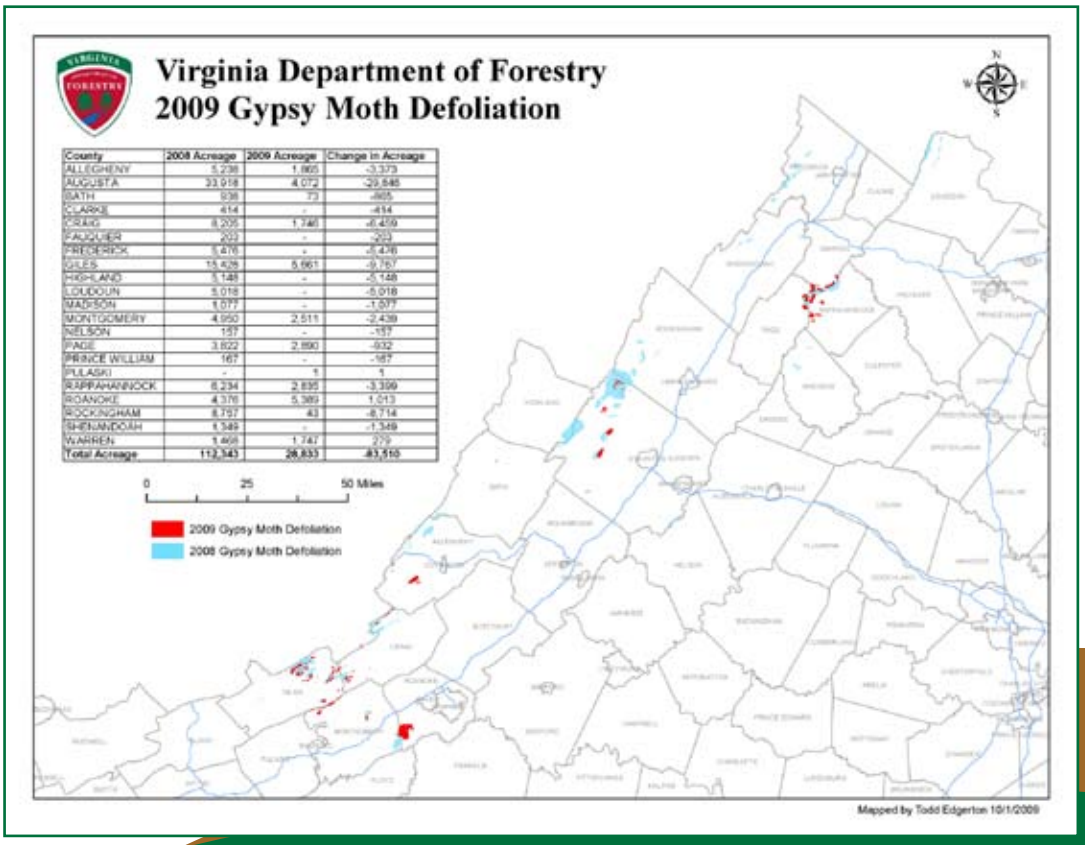


Forest Health

Virginia received some much-needed relief in 2009 following four years of moderate to severe drought conditions. Unusually cool, wet weather predominated during the spring and summer months. Drought and unusually warm temperatures have been a regular occurrence in Virginia and other parts of the South during the last 10 years. The cumulative effects of drought and severe storms in some locations during the past five to seven years have taken their toll on many trees, particularly urban and landscape trees. Drought and record-high temperatures have exacerbated the impacts on previously stressed trees, leading to widespread secondary insect and disease problems and subsequent tree mortality. Red oak trees are among those that continue to be hard hit, although most tree species suffer from sustained drought. For 2009 at least, some of these stresses on the landscape have been alleviated.

Heavy, continuous rains during the spring also had a dramatic effect on gypsy moth populations, which had been steadily rising for the last four years. This year, gypsy moth populations were decimated by a naturally occurring fungus called Entomophaga maimaiga, which thrives during moist spring weather. While last year we experienced heavy defoliation on more than 112,000 acres of forest, 2009 saw mostly light defoliation on only 29,000 acres. Since the fungus does not kill gypsy moth larvae until they are almost mature, initial defoliation levels looked serious. However, this feeding was eventually interrupted while re-foliation of damaged trees occurred quickly due to the continuous rainfall. The majority of the defoliation that was detectable from aerial surveys was spread among 12 counties in the mountainous western part of the Commonwealth, from Warren County in northern Virginia to Giles and Montgomery counties in the southwest (see map). For some areas, such as Poor Mountain and Bent Mountain near Roanoke, this was the fifth year of widespread defoliation. Thousands of acres of dead oak trees litter the landscape in those areas due to the multiple years of heavy defoliation that were experienced. Insecticide spraying is effective at controlling damage locally, but it cannot stop overall gypsy moth numbers from surging once these build-ups gain momentum. Only diseases, such as the fungus and a naturally occurring virus, can cause these populations to crash so dramatically. However, it can often take a number of years of severe defoliation before this happens. If we see normal rainfall activity next spring, defoliation levels during 2010 may be insignificant.

The southern pine beetle has been relatively quiet during the last seven years. The last significant outbreak was during the late 1990s and had a major impact on pine in the mountains, particularly in southwest Virginia. As a



County	2008 Acreage	2009 Acreage	Change in Acreage
ALLEGHENY	5,238	1,865	-3,373
AUGUSTA	33,918	4,072	-29,846
BATH	938	73	-865
CLARKE	414	-	-414
CRAIG	8,205	1,746	-6,459
FAUQUIER	202	-	-202
FREDERICK	5,476	-	-5,476
GILES	15,426	5,661	-9,767
HIGHLAND	5,148	-	-5,148
LOUDOUN	5,018	-	-5,018
MADISON	1,077	-	-1,077
MONTGOMERY	4,950	2,511	-2,439
NELSON	197	-	-197
PAGE	3,822	2,890	-932
PRINCE WILLIAM	167	-	-167
PULASKI	-	1	1
RAPPAHANNOCK	6,234	2,835	-3,399
ROANOKE	4,376	5,389	1,013
ROCKINGHAM	8,757	43	-8,714
SHENANDOAH	1,349	-	-1,349
WARREN	1,468	1,747	279
Total Acreage	112,343	28,833	-83,510

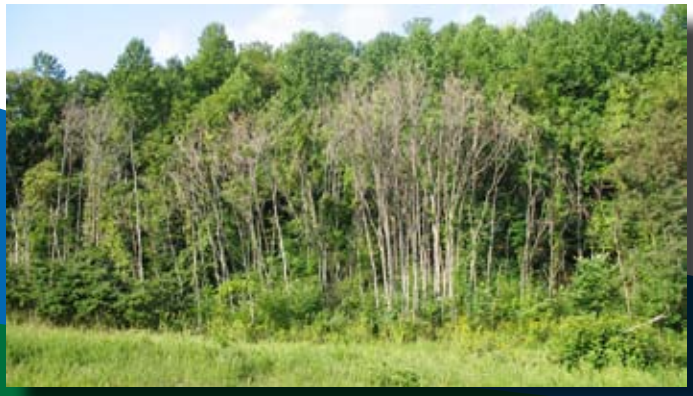
result, many isolated areas once dominated by pine will revert to hardwood cover. However, the pine resource in central and southeast Virginia remains healthy and productive. Federal funds from the USDA Forest Service, Forest Health Protection support our (Southern Pine Beetle Prevention) cost-share program with landowners for pre-commercial thinning of pine stands. To date, Virginia has pre-commercially thinned about 25,000 acres of loblolly pine out of approximately 130,000 acres estimated to be overstocked and in the appropriate pre-commercial age class. First commercial thinnings on small tracts are also being supported with a new logger incentive program. Due to high moving costs, loggers often lose money visiting tracts smaller than 50 acres. Because of increasing rates of fragmentation and parcelization in Virginia, smaller tract sizes are becoming more common but are in no less need of thinning to maintain health.

Invasive species remain the most significant threat to forest health. During the last century and most recently, our efforts to keep invasive species from entering North America and wreaking havoc represent a battle that we are largely losing. The pathogens that cause chestnut blight and Dutch elm disease have virtually eliminated the American chestnut and American elm, respectively, from our natural and urban forests. The pathogen that causes sudden oak death in western forests can potentially devastate Virginia's oaks and other species, if introduced. Other pathogens that cause butternut canker, dogwood anthracnose and beach bark disease threaten those tree species with serious decline over longer time scales.

Eastern hemlock faces the same threat from the hemlock woolly adelgid, an insect that has killed up to 90 percent of the hemlocks in Shenandoah National Park and other areas in Virginia during the last 50 years.

The most recent threat is the emerald ash borer, discovered during the summer of 2008 in three locations across Fairfax County. Evidence suggests these infestations were at least two to three years old, meaning the pest has likely spread to other areas. Eradication is not being pursued – at this stage it would be too expensive and, more importantly, very unlikely to succeed. Virginia and the nation face the prospect of losing all ash species from the natural and urban landscapes in the forthcoming decades, an impact that could eventually cost the state hundreds of millions of dollars. Its primary means of spread is through the unrestricted movement of firewood across state lines by private citizens. A survey by the Virginia Dept. of Agriculture and Consumer Services also demonstrated that firewood is being brought into Virginia for sale from 15 states and three countries. At the very least, all out-of-state firewood for sale in Virginia should be kiln-dried.

All of this tree mortality in conjunction with trends towards increasing land parcelization and forest fragmentation serve to disturb intact forest and create ideal environments for invasive weeds. Many species of invasive weeds, including trees, shrubs, vines, grasses and forbs, plague Virginia's forests. Some of these plants were brought here by European colonists hundreds of years ago for urban and landscape plantings and erosion control. What most of these plants have in common are their ability for rapid growth and reproduction and their ability to colonize disturbed habitats, such as roadsides and forest edges. Once established, many



invasive weeds are able to encroach upon intact forest, out-competing native plant species. Complete eradication of well-established invasive plants is all but impossible, and management is often impractical. Forests dominated by invasive weeds typically have less biodiversity, productivity and natural beauty.

To change this disturbing trend will require bold, decisive and enforceable legislation at the federal level to ensure that no new organisms are introduced into North America via international travel or trade. Likewise, major restrictions on the movement of firewood, mulch and other unregulated or untreated goods between states must be in place to limit or slow the spread of newly established pests. Compliance must be enforced at all levels. Anything less than this and we will continue to put Virginia's forests at risk of catastrophic changes.

Emerald Ash Borer

The forests of Virginia are no strangers to pests. For a number of years, pine trees have been attacked by the southern pine beetle; oaks have been defoliated by gypsy moths, and hemlocks have been disappearing from the landscape due to infestations of hemlock woolly adelgid.

The newest threat to trees in the Commonwealth comes from a shiny green pest known as the emerald ash borer. While green ash trees are the preferred target, the EAB also can attack white ash. That means more than 250 million ash trees in the state are at risk – the bulk of which are found in our cities and towns.

The Virginia Department of Forestry and the Virginia Department of Agriculture and Consumer Services are on the lookout for the tell-tale signs of EAB. More than 3,000 individual traps have been set up in locations in northern and central Virginia. The bright purple traps are checked regularly for signs of the pest. Fortunately, EAB has been found only in Fairfax County. But, with recent finds in West Virginia and Kentucky, it's only a matter of time before additional localities are forced to deal with EAB.

One of the best methods for slowing the spread of this invasive insect is to not move firewood from one location to another. For more on EAB, please visit http://www.emeraldashborer.info/.

Forest Research

The VDOF continuously tests new information and techniques to improve the health and productivity of our forestlands as ownership patterns and objectives evolve. Our Forest Research Program has been developing and demonstrating breakthrough ideas for the Commonwealth's forest landowners for more than half a century. Numerous individual tests continue being installed, maintained or monitored across the Commonwealth addressing diverse subjects ranging from diminished species restoration to new techniques for controlling Nantucket pine tipmoth (the most damaging insect pest of young southern pines). The findings are shared in the semi-annual Research Review publication, which is also available online at www.dof.virginia.gov.

Pine Silviculture

In conjunction with the other members of the NC State/Virginia Tech Forest Nutrition Cooperative, VDOF this year completed installation of a major study and demonstration area in a 14-year-old loblolly pine stand on the Appomattox-Buckingham State Forest. From an original stocking of nearly 500 trees per acre (tpa), various plots were thinned to 300, 200 and 100 tpa, and all densities were repeated both with and without fertilizer application. The objective is to determine the best combination of thinning and nutrients for maintaining forest vigor and increasing productivity. We expect the study to yield important results for years to come and to serve as a research area for numerous university faculty members and graduate students in addition to VDOF staff.

In 2008, we installed tests of two new insecticide products (PTM and SilvaShield) for tipmoth control in young loblolly pine stands. Both products are absorbed through the tree roots and taken up into the foliage. We installed tests in seven newly-planted sites around Virginia. After nearly two growing seasons, treatment with either product has reduced tipmoth infestation significantly. This has successfully demonstrated that these are effective tools for improving the health of newly-planted pine stands – the first labelled products to offer such effective and long-term protection.

About half of the biosolids produced annually in Virginia are land-applied - historically, mainly to agricultural fields. But interest in using biosolids as fertilizers in forest stands has increased in recent years. In October of 2006, we installed a study of loblolly pine growth comparing the effects of biosolid applications to those of traditional inorganic fertilizers. After two years, there has been a significant early benefit of added nutrients - either biosolids or traditional inorganic fertilizers: fertilized plots have grown about 36 percent more in diameter than the untreated plots. Foliage data proves that the added nutrients have substantially enhanced the trees' nutrient status.

Hardwood Silviculture

In recent years, we've installed a number of studies that demonstrate the positive effects of crop tree release on individual young hardwoods. More recently, we've added fertilization and repeated treatment to the suite of potential activities a small landowner could rely on to accelerate the growth of desirable hardwood trees. Our test of release plus fertilization of 15-year-old white oaks shows a clear response in diameter growth to both release and fertilization through two years, and the trends indicate that the response is likely to become more pronounced in coming years. Our newest study

– of repeated release and fertilization in southern red oak – shows that a second release treatment and fertilization adds another increment of gain in diameter growth. These results give us growing hope that these tools can give small forest landowners the chance to improve the species composition of their hardwood stands while substantially shortening the rotation length. We plant to expand our work in this subject area.

Tree Improvement

Mass Controlled Pollination (MCP) is a tree breeding technique that increases genetic gains compared to traditional wind-pollination. The best-performing male and female parents are chosen in advance from seed orchard trees, and flowers are isolated at an early stage of development to prevent pollen contamination by covering them with pollinating bags. Then, fresh pollen from the best male parents is introduced into the bags. The traditional wind-pollinated seed orchard produces seeds of average gain since the pollen from all the trees in the orchard has equal access to female flowers. This does not take advantage of the fastest growing or best formed selections in seed orchards. MCP will offer the Virginia forest landowner additional gains of 10 percent to 20 percent or more in volume and sawtimber quality over second- and third-generation, open-pollinated (OP) seedlings. The resulting stands will be more uniform in growth and vigor because variation caused by uncontrolled pollen sources will be removed.

In the spring of 2009, we conducted a pilot-scale MCP operation in the 3rd cycle loblolly orchard at the New Kent Forestry Center. Working on 123 individual trees of our eleven best selections, we installed 4,133 pollination bags. We estimate that the average productivity gain from a mix of the resulting seed will be 50 percent over unimproved seed as compared to 37 percent from the best offering DOF has previously produced. And individual crosses will have gains as high as 60 percent. If our efforts this spring are successful, we will have roughly 1 million MCP seedlings for our nursery crop in 2011.

VDOF also continues to collaborate with the many other agency and industry members of the North Carolina State University Tree Improvement Program to support the ongoing selection, testing and deployment of the best loblolly pine for Virginia citizens. The faster growth and better form of these elite families means quicker reforestation and higher financial returns in the future for landowners who elect to plant them.

Invasive Plant Control

Non-native invasive plants threaten natural ecosystems because they can replace diverse native plant communities with monocultures. Tree-of-heaven (Ailanthus altissima) - the 46th most abundant tree species in the Commonwealth - is considered by many to be the most serious, non-native, woody invasive plant in Virginia. VDOF initiated a series of tests in early 2006 to evaluate the effectiveness of basal bark herbicide treatments applied using a backpack sprayer at various times through the year to determine whether treatment effectiveness varied with season of application.

Tree-of-heaven is consistently controlled by this treatment, but the response pattern varies depending on application timing. With a March application, about half of the trees leaf out although all were dead by the end of the growing season. After a June application, the trees wilt and are dead within one week after application. Following September or January applications, many of the trees leafed out in the spring, but the foliage is sparse and severely stunted. By late summer, nearly all were dead.

Urban and Community Forestry

Trees and forests in communities provide numerous benefits to the citizens of Virginia. Aesthetic appeal, shade and contact with nature are the readily apparent benefits associated community trees. Less apparent, but perhaps even more important, are the positive impact community forests have on clean air, water quality, business district enhancement, view-shed protection, community health and the quality of life in general. Through its Urban & Community Forestry Program, the Department of Forestry helps Virginia communities maintain and enhance their community forests.

The Department of Forestry provides technical assistance to communities of all sizes, from large metropolitan areas to small cities and towns. The Department provides expertise on tree selection and long-term tree maintenance through direct contact with communities as well as through a variety of workshops and conferences it organizes and/or supports. The Department administers the Tree City USA program that promotes standards for community forestry. Participation in this program continued to increase, reaching 54 communities and military installations with a combined population of more than four million during 2009. Virginia also added its first Tree Campus USA (Virginia Tech) during the year.

Through its Urban and Community Forestry Assistance Program, the Department supports the capacity building efforts of municipalities, county governments, non-profit organizations and educational institutions. Since its inception in 1991, the program has funded an average of 45 projects annually and has assisted 62 cities and towns, 22 counties, 65 non-profit organizations, and a number of universities, colleges and community colleges. The program has funded 28 educational events, several of which continue to be offered on an annual basis. Recent cuts in federal funding, which have diminished our capacity to support grant projects in the last few years, are now being reversed. It appears that funding for projects and new federal initiatives could mean an increase in program activity and community support over the next three to four years. The Department of Forestry also administers project funding with funds under the Water Quality Improvement Act (WQIA). Under the urban component of WQIA, VDOF's Urban & Community Forestry Program supported 24 community water quality projects that involved tree planting and other habitat improvement in 2009.

The Urban & Community Forestry Program continues to maintain strong partnerships with Virginia Tech and the University of Virginia, as well as several community colleges. At Virginia Tech, the program supports the urban and community forestry curriculum in the School of Natural Resources and the Urban and Community Forestry Coordinator serves on college's advisory board. The program also is a major supporter of the Community Design Assistance Center (CDAC) that provides open space and landscape design planning to interested communities. CDAC's projects help underserved communities across the state and often include referrals by and involvement of VDOF field staff.

VDOF continues to support research projects funded at Virginia Tech's Hampton Roads Agricultural Research & Extension Center. At the University of Virginia, the program has a strong partnership with the Virginia Natural Resources Leadership Institute (VNRLI), providing both financial and training support. VNRLI just completed its eighth year-long session and was

recognized by the Virginia General Assembly by resolution for its outstanding leadership training. VNRLI focuses on critical natural resource issues; conflict resolution through collaborative effort, and leadership. VDOF is developing a new partnership with Virginia State University and hopes to launch new initiatives with that institution in 2010.

In 2009, VDOF made significant progress in helping Virginia's municipalities establish urban tree canopy (UTC) goals. The Chesapeake Bay Agreement has identified the development, retention and enhancement of urban tree canopy as an effective strategy to improve the health of the Chesapeake Bay. The Chesapeake Bay Agreement bases this strategy on USDA Forest Service research that has shown that urban tree canopy makes a significant contribution to urban water quality and storm flow reduction. The Chesapeake Bay Agreement has established a goal of five Virginia municipalities establishing UTC goals by 2010. The Department has identified 16 target municipalities to work with on UTC goals. The Department has already done comprehensive UTC assessments in eight of these communities and will complete this work for the remaining communities in 2010. Already, four municipalities have formally established UTC goals.

In addition to water quality, urban tree canopy can also make a significant contribution to improving urban air quality. The Environmental Protection Agency (EPA) now allows tree planting as a voluntary measure in State Implementation Plans (SIPs) for air quality. The Northern Virginia SIP, adopted in 2007, was one of the first in the nation to include this voluntary measure. The Department is continuing to work with partners in this region to monitor the implementation of tree planting for air quality and to assess its contribution to air quality improvement in this high-profile "non-attainment" area. The VDOF has secured federal funding for a second year to support the work of its partners in this effort.

Many formerly rural areas are now in what is called the "wildland-urban interface." This is a landscape where urban and suburban influences intermingle with the rural landscape and present a whole host of environmental and forest management challenges. In this setting, conserving the forestland base is vital. Like many other southeastern states, Virginia is consuming land for urbanization at a rate three to four times the rate of population growth. Unless effective strategies are developed to identify and conserve critical forestlands in the "wildland-urban interface," important forestland resources will be lost. The Department, through its Urban & Community Forestry Program, has been promoting the "green infrastructure" approach to strategic forestland conservation. The Department is partnering with and/or financially supporting efforts in a number of Planning District Commissions (PDCs) to develop and conserve green infrastructure networks. Green infrastructure networks have already been mapped and presented to elected officials for inclusion in long-range comprehensive plans in several counties. VDOF has established a partnership with the Green Infrastructure Center (GIC) to continue and expand this work. One effort of the GIC, supported with USDA Forest Service funding, is to develop a green infrastructure process manual to guide the green infrastructure planning process. When completed, this manual will be distributed throughout the USDA Forest Service Southern Region (Region 8) and establish Virginia as a leader in promoting green infrastructure planning in the south. Working cooperatively with the Virginia Department of Conservation and Recreation (DCR), VDOF is developing a green infrastructure video that will be completed in late 2009 and disseminated to PDCs and local governments across the state. VDOF is also supporting a green infrastructure curriculum for graduate planning students at the University of Virginia.

Urban Storm Response

In 2009, VDOF continued its regional leadership in responding to urban storm events. Over the last decade, climate change has impacted the south with severe and destructive weather patterns. VDOF has trained 14 members of its staff who are ISA certified arborists to become members of urban forest storm damage response teams. VDOF has more members of these response teams than any other southern state. Several of its response team members are now qualified as team leaders and have assisted with the training of personnel from other southern states. In late 2008 through the summer of 2009, VDOF employees responded to requests for assistance in Baton Rogue, La., (Hurricane Gustav) and several communities in Arkansas and Kentucky following a severe ice storm in January 2009. These urban forest storm response teams are trained to assist storm-damaged communities by coordinating with FEMA and state emergency response agencies to provide estimates of tree debris as well as assess the condition and safety of the residual urban forest.

Greenways

The Department has been encouraging the development of greenway projects throughout the Commonwealth. Greenways are environmental corridors that often contain recreational amenities, such as trails and parks, and are important components of a community's green infrastructure. Greenways are recognized as important community assets for recreation, environmental protection and public health. Again in 2009, the Department is providing greenway planning funds for several communities; offering technical assistance, and supporting local greenway advocacy groups. The Department works closely with the Department of Conservation & Recreation (DCR) and the National Park Service (NPS) to assist interested communities. The Department's role in the greenway arena is to provide conceptual planning and see that projects gather grassroots support. The other agencies, DCR and NPS, implement detailed planning and construction of greenways on the ground. This partnership with DCR and NPS has resulted in the implementation of several successful projects. The more recent projects the Department has supported include greenway/trails planning in Front Royal and Dante; work on the Great Eastern Trail, and support of a volunteer coordinator working on a portion of the Tobacco Heritage trail in Mecklenburg and Brunswick counties.

Trees Virginia Partnership

Through its partnership with Trees Virginia (the non-profit Virginia Urban Forest Council), the Department continued to host the quarterly Northern Virginia Urban Forestry Roundtable. Urban forestry professionals, tree board members and non-profit representatives attend these educational and urban forestry policy forums from numerous northern Virginia jurisdictions. In 2009, the roundtable planners will host their third biennial conference-featuring speaker of national prominence on urban forestry issues. Trees Virginia is now developing a similar roundtable format for urban forestry advocates in the Tidewater area. Trees Virginia also sponsors other educational events and uses the profits from these efforts to support scholarships for students in forestry and horticulture. Trees Virginia also assisted in the development of the very popular Remarkable Trees of Virginia book authored by Jeff Kirwin and Nancy Hugo Ross, which was released in late 2008 and went into a second printing in 2009. The Department and Trees Virginia worked to expand the number of volunteer tree steward groups across Virginia. These citizen volunteer groups assist municipalities in caring for public

trees. A committee of tree steward volunteers is updating the Tree Steward Training Manual that has already been distributed nationwide.

Certified Arborist Program

The Department continues to support the training and professional development of ISA-certified arborists. The Department has 26 certified arborists on its staff, more than any other state forestry agency in the south. The Department hosts one certified arborist training in its headquarters facility each year. The Department also continues to work with Virginia's utility companies to promote the planting of utility-appropriate species in cities and towns to minimize tree/utility conflicts. While funding limitations have forced reduced activity in this program, the Department still supported the establishment and monitoring of utility arboreta in 2009.

American Chestnut

Once the king of the forests, the American chestnut trees were decimated by a blight in the early part of the 20th century. American chestnut trees were prized for their excellent wood products and the bountiful nuts that provided sustenance for both humans and animals. Before the blight struck, American chestnut trees grew tall (100 feet or more) and wide. The blight killed virtually all American chestnuts from Maine to Georgia, leaving only stunted resprouts that grow to no more than 20 feet.

For more than 40 years, the Virginia Department of Forestry has been involved in research designed to bring the American chestnut trees back to their rightful place in the ecosystem.

At the Lesesne State Forest in Nelson County and, more recently, at the Matthews State Forest in Grayson County, VDOF foresters have been crossing blight-resistant Chinese chestnut trees with American chestnut trees and out-planting them to test for blight-resistance. While the crossing effort takes years, DOF researchers now have trees that are 15/16ths American chestnut. We are closing in on the final step – a backcross of two 15/16ths American lines that could yield blight-resistant American chestnut trees.

If this successful venture continues, it won't be too long (10 – 15 years) before blight-resistant American chestnut trees are growing tall and wide once again in the forests of Virginia.

To learn more about American chestnut research being conducted by the VDOF, please visit http://www.dof.virginia.gov/research/chestnut-amer-hist-rest-in-va.shtml .

Accomplishment Report

July 2008 - June 2009

Objectives	Goal/Target	Accomplished
Goal 1: Protect the citizens, their property and the forest resource from wildfire.		
Measure 1.1.1: Percentage of human-caused fires	96%	96%
Measure 1.1.2: Percentage of all emergency response equipment and vehicles in good repair and ready to respond to a wildfire.	95%	97%
Measure 1.2.1: Percentage of eligible rural volunteer fire departments receiving available state and federal financial assistance.	40%	30.3%
Measure 1.3.1: Number of full scale mock exercises completed to test VDOF readiness and implement changes based upon the results/findings of the test.	2 exercises	2 exercises
Measure 1.3.2: Agency Continuity of Operations Plan (COOP) Assessment Score. Target: Increase the average assessment score by 5% each year.	72%	94.5%
Measure 1.4.1: An uninterrupted transition of existing VDOF radio communication systems carried out in a safe, timely transition to STARS.	1 transition	1 transition
Goal 2: Protect, promote and enhance forested watershed, non-tidal wetland and riparian areas.		
Measure 2.1.1: Percentage of harvest sites with sediment not reaching streams.	97%	97.9%
Measure 2.2.1: Number of acres of forestland conserved, established and/or protected in Virginia watersheds. (Comprised of other measures and strategy targets - see 2.3.1, 2.4.1, 3.1.1, 4.3.1.2 and 4.4.1.4).	5,500 acres	9,074 acres
Measure 2.3.1: Number of acres in newly established riparian buffers.	1,000 acres	2,089 acres
Measure 2.4.1: Number of acres of riparian forest protected (acres in riparian forest buffer tax credit).	663 acres	663 acres
Goal 3: Conserve the forestland base.		
Measure 3.1.1: Number of acres conserved through acquisition and VDOF-held easements.	2,000 acres	4,295 acres
Measure 3.2.1: Percentage of forest conservation knowledge base incorporated into the career tracks for Foresters and Technicians.	100%	50%
Measure 3.3.1: Number of yearly meetings concerning forestland conservation with partners and cooperators sharing the newest information and tools to assist in conservation with emphasis given to working forests.	1 meeting	1 meeting
Goal 4: Improve the stewardship, health and diversity of the forest resources.		
Measure 4.1.1: Number of acres of all forest management plan types achieved on private and public forestland.	32,500 acres	53,421 acres
Measure 4.1.2: Number of stewardship plans.	300 plans	484 plans
Measure 4.1.3: Number of certified stewardship owners.	64 owners	47 owners
Measure 4.1.4: Begin implementation of state restoration plans for diminished tree species, including longleaf and shortleaf pine.	TBD	TBD
Measure 4.2.1: Percentage of eligible Reforestation of Timberlands incentive received by landowners.	92%	96%

Objectives	Goal/Target	Accomplished
Measure 4.3.1: Number of forestry management and conservation projects implemented on private land.	625 projects	1,008 projects
Measure 4.4.1: Number of communities assisted with forest and/or tree resource management.	104 communities	112 communities
Measure 4.4.2: Increase participation in the Tree City USA program while maintaining participation of existing communities already in the program.	52 communities	54 communities
Measure 4.4.3: Number of Greenway conceptual plans.	2 plans	2 plans
Measure 4.4.4: Number of major urban and community forestry training opportunities annually.	4 training opportunities	8 training opportunities
Measure 4.5.2 Number of forest acres of federal and state threatened and endangered species habitat treated/restored (State and Private Forestry Redesign Indicator 8a).	TBD	86 acres
Measure 4.5.3: Number of non-threatened and endangered forest acres of wildlife habitat treated/restored (State and Private Forestry Redesign Indicator 8b).	TBD	5,484 acres
Goal 5: Promote the development of ecosystem service markets for forest landowners.		
Measure 5.1.1: Number of outreach efforts/programs.	6 programs	19 programs
Measure 5.2.1: Deliver ecosystem services calculator tool, through cooperative and contractual obligations with Virginia Tech, for desktop application by September 11, 2008.	100%	75%
Measure 5.2.2: Integrate the ecosystem services desktop calculator tool into server-level tool for user testing (beta testing) by March 1, 2009.	100%	50%
Goal 6: Collect, maintain and disseminate forest resource information.		
Measure 6.1.1: Number of forest inventory count panels measured annually.	1 panel	1 panel
Measure 6.2.2: Number of forest research reports issued annually.	6 reports	6 reports
Measure 6.2.3: Number of educational and informational events providing results of research and latest forest information.	6 events	5 events
Measure 6.3.1: Submission of a statewide assessment and resource strategy to the U.S. Secretary of Agriculture.	1 assessment	1 assessment
Goal 7: Manage agency resources to effectively and efficiently accomplish the strategic initiatives.		
Measure 7.1.1: Percentage of the Governor's Management scorecard categories VDOF meets expectations.	100%	83.3%
Measure 7.2.1: Percentage of customers who rate the quality of VDOF's seedlings as satisfactory.	85%	94%
Measure 7.3.1: Percentage increase in net revenue generated by the state nurseries.	2.5%	0%
Measure 7.4.1: Percentage of scheduled State Forest management Plans updated annually.	100%	100%
Measure 7.5.1: Percentage of annual allowable harvest actually harvested.	80%	76%

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