



# STATE OF THE FOREST

December 2005



ANNUAL REPORT  
ON VIRGINIA'S FORESTS

# CONTENTS

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FROM THE STATE FORESTER	3
VIRGINIA FOREST TRENDS	4
FORESTED LAND VOLUME	4
FOREST OWNERSHIP	5
FOREST BENEFITS	6
FOREST SUSTAINABILITY	7
PROTECTING OUR FORESTS	8
PROTECTING OUR FORESTED WATERSHEDS, NON-TIDAL WETLANDS AND RIPARIAN AREAS	9
CONSERVING THE FOREST LAND-BASE	10
IMPROVING THE STEWARDSHIP, HEALTH AND DIVERSITY OF THE FOREST RESOURCES	11
WHAT IS THE FUTURE OF VIRGINIA'S FORESTS?	13
ACCOMPLISHMENT REPORT	14



# FROM THE STATE FORESTER

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Greetings. I am proud to present to you Virginia's first State of the Forest report. This is the equivalent of an annual report that will set baseline data to measure the success and accomplishments associated with the Virginia Department of Forestry's strategic plan – DOF 2014 Shaping Virginia's Forests. In addition, this account will document the challenges we envision the agency having to address in the coming years.

The 2004-2005 year was one of great change in the agency. My predecessor, James Garner, retired in October '04 after serving the Commonwealth for 46 years – the last 21 as your State Forester. In November '04, Gov. Mark Warner appointed me only the sixth State Forester in the 91-year history of the DOF. Just two months later, the Hon. Robert Bloxom was installed as Virginia's first-ever Secretary of Agriculture and Forestry. Together we set out to raise awareness of the value that our forest resources provide the Commonwealth. We sought to provide new and better services to the citizens of the Commonwealth. We expanded our education, outreach and fire prevention efforts. We stepped up our forest management, forest research and forest health programs. We restructured the management staff and its accountability. We redesigned the agency's shield to better reflect our many and diverse roles in ensuring healthy, sustainable forest resources for Virginians. And we increased awareness of the agency and its mission in the minds of the public.

Most importantly, Virginia's 15.8 million acres of forest land are in relatively good health. While parts of the state saw hundreds of oak trees die and other areas are dealing with problems associated with the hemlock woolly adelgid, we experienced virtually no southern pine beetle or gypsy moth activity. Development pressures continued, however, as 20,000 acres of privately owned forest land were converted to other uses. Two new State Forests (Sandy Point in King William County and Browne in Essex County) totaling 2,172 acres brought the number of State Forests to 17. We now have a total of 48,112 acres of forest land under the protection and management of our agency. Department staff developed plans for landowners that covered another 147,088 acres. This year, our nurseries harvested and sold more than 33 million seedlings, and DOF staff oversaw the planting of more than 25 million of those seedlings. This renewed another 80,331 acres of forest land.

Our Resource Protection efforts aided in a 54 percent reduction in the number of fires (579 versus our five-year average of 1,250) and a 64 percent reduction in the number of acres burned (4,028 vs. the five-year average of 10,500). To ensure the steady flow of clean water, we inspected nearly 5,000 logging jobs this year – with 78 penalties (1.6 percent) assessed.

While many challenges remain, the future is positive for Virginia's forest resources – an economic engine that drives more than \$30 Billion in benefits to the Commonwealth each year. I invite you to take a few moments to review the rest of this report – I'm certain you'll find it to be well worth your time.

Sincerely,

Carl E. Garrison III

State Forester

# VIRGINIA FOREST TRENDS

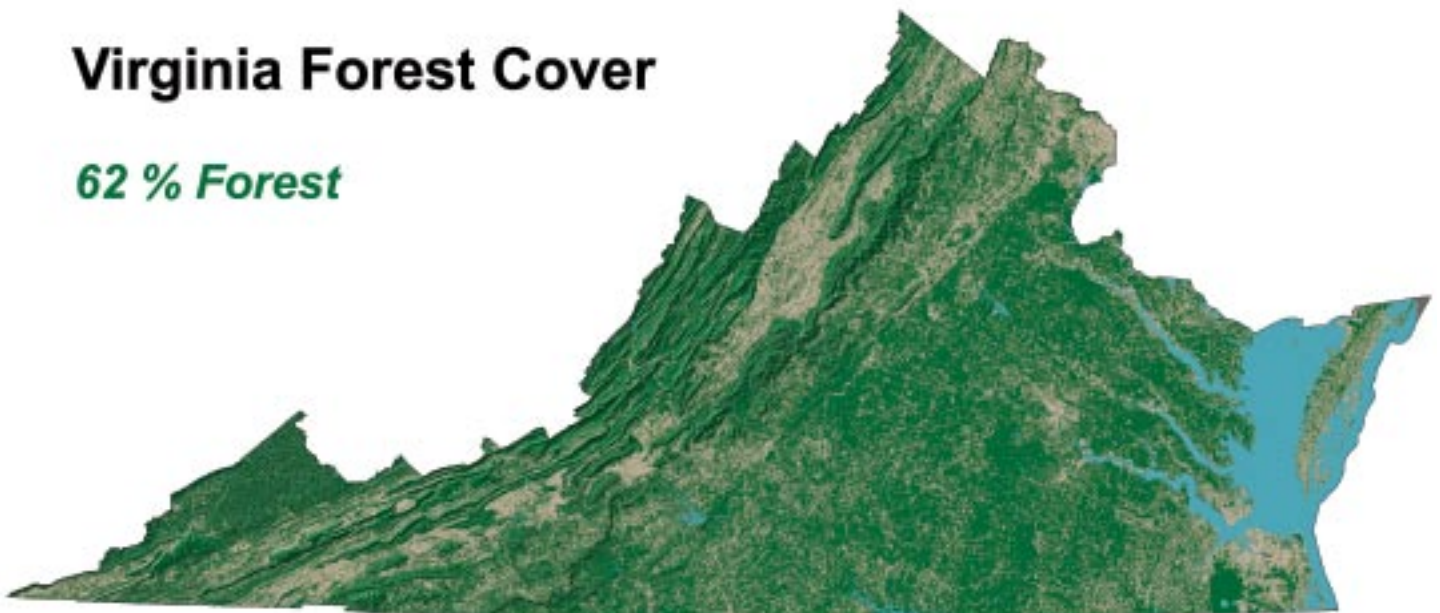
## FORESTED LAND VOLUME

With 15.8 million acres of forested land, Virginia is 62% forested. From 1992 to 2001 urban growth and development resulted in an average net loss of 20,000 acres per year. (More acres of forest are developed

each year but reversion of some agricultural land to forest partially offsets the loss). If current development trends continue, it has been projected that Virginia will lose a million acres of forest in the next 25 years.

### Virginia Forest Cover

**62 % Forest**

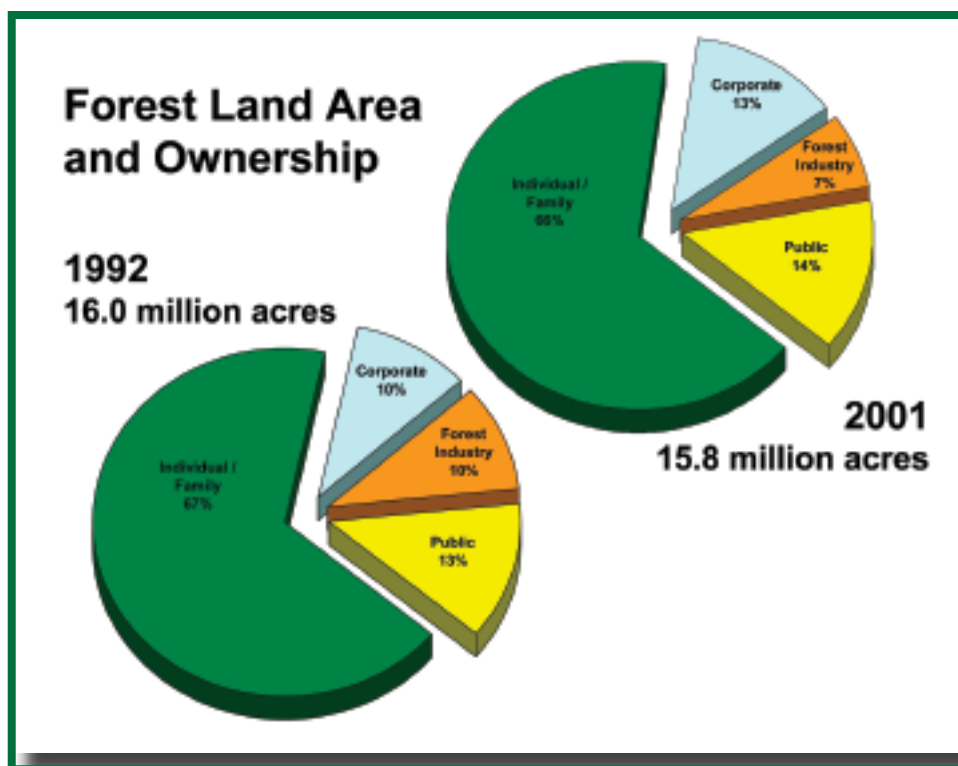


*From year 2000 Landsat satellite imagery, classified by the Virginia Department of Forestry*

## FOREST OWNERSHIP

While some 2.1 million acres of Virginia's forests are owned by the federal, state and local governments, the greatest amount, 13.7 million acres, is privately owned. The single largest category is the more than 384,000 individuals or families who together own in excess of 10.1 million acres. While family ownership ranges from a few acres to a few thousand acres, most parcels are relatively small. About half of the land owned by families is in parcels of 75 acres or less.

Corporations own two million acres, including one million acres held by forest products firms. Since 1992, forest products firms have sold off more than 500,000 acres of forest land. TIMOs (timber investment organizations) and REITs (real estate investment trusts), which represent a new category of landowner, ended up with about half of the divested industry lands. This new ownership category has slowed the subdivision of former industry land into smaller parcels and has maintained professional forest management on these lands. The long-term trend is likely to be further subdivision and development of these lands as these corporations seek to maximize investor returns.



## FOREST BENEFITS

The extensive cover of forest found in Virginia provides its citizens with many valuable ecological services, including the following:

- ▲ Protection of water quality
- ▲ Protection of air quality
- ▲ Moderation of climate, including the offsetting of carbon emissions contributing to global warming
- ▲ Provision of habitat for many plants and animal species
- ▲ These non-market services have been conservatively valued at more than \$1.9 billion annually

In addition, direct economic benefits are derived from:

- ▲ More than \$25.4 billion generated annually to the Virginia economy by forest products industry and related activities
- ▲ \$345 million paid to forest landowners for the harvest of products
- ▲ 248,000 jobs in forest product industries
- ▲ Forest-related recreational spending contributes more than \$3 billion annually





# 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)

Is the current use and management of Virginia's private and public forests maintaining healthy forests and is it sustainable? We can first ask whether we are growing as much as we are harvesting. The answer is yes. Programs of reforestation and forest management have maintained the growth of trees at a level higher than the amount removed. For every unit of hardwood volume harvested, 1.65 units are replaced by growth. For every unit of softwood (pine) volume harvested, 1.07 units are replaced by growth.

Are we maintaining a good mix of forest types and a good age structure? Again, the general answer is yes.

Virginia has more than 12.3 million acres of hardwood and hardwood-pine forest, and the area in hardwood types has steadily increased from the 8.1 million acres found in the 1940 survey. The hardwood forests of Virginia are maturing, with more than 7 million acres in stands 60 years old or older. Since the first survey in 1940, board-foot volumes have more than tripled – from 24.3 billion to 87.5 billion board feet. We do face challenges in the regeneration of young oak trees to replace the mature oaks, which dominate our forests. The exclusion of fire and high-grading harvesting practices are the major factors limiting oak regeneration.

Virginia has about 3.5 million acres of pine forest, a decline from the 6.2 million acres found in 1940. Plantations of pine have served to slow the decline in pine forest and now comprise slightly more than half of the pine acres. Natural pine stands, especially those of shortleaf, pitch and table-mountain pine, have declined significantly – especially in the mountains and largely due to southern pine beetle infestations.

Special forest types found in

Virginia include the Atlantic white-cedar swamps of the Great Dismal Swamp; the spruce forests of the Mt. Rogers area; the oak-gum-cypress forests of the Coastal Plain, and scattered remnants of longleaf forest in Southeastern Virginia.

While the sustainability of our use and management is generally high, specific challenges and problems do exist. Some of these will be addressed in the forest health section. What are possibly the largest challenges -- maintaining a sufficient area of forest and stemming fragmentation -- will be addressed under land base conservation.



## PROTECTING OUR FORESTS

The Department responds to slightly more than 1,250 wildland fires that burn more than 10,500 acres annually (based on a five-year average, 2000 – 2004).

Although more than 70 homes and other structures are damaged or destroyed by wildland fire each year, agency efforts protect more than 1,200 others at a value of more than \$151 million.

The Department relies on a fleet of 200 4X4 engines, nine specially equipped Hummers 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 local 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. A long history of proactive wildland fire prevention, wildland fire risk assessment, and commitment to the protection of woodland home communities from the risks of wildland fire have made Virginia a national leader in resource protection. Every Department employee has a role in wildland fire prevention and protection, either on the fireline or in support roles.





## PROTECTING OUR FORESTED WATERSHEDS, NON-TIDAL WETLANDS AND RIPARIAN AREAS

Studies have shown that the cleanest water comes from forested watersheds and that timber harvesting, if done correctly, is not a major cause of water-quality problems.

The Department developed Best Management Practices (BMPs) to ensure that harvesting is done right and avoids the potential sources of erosion from logging.

Virginia's Silvicultural Water Quality Act of 1993 (Article 12, §10.1-1181.1-7) authorized the DOF to act to prevent pollution of state waters from silvicultural activities. The Act was amended in 1998 to require prior notification of all timber harvesting operations and again in 2002, to allow for the issuance of a civil penalty against the operator for failure to notify the Department of Forestry of a commercial timber harvesting operation. The Department inspected almost 5,000 logging jobs in 2004 as a result of these efforts.

An important component of the Agency's efforts at maintaining high-quality logging standards is an educational component to teach and demonstrate effective and efficient harvesting practices. This effort has been accomplished in conjunction with the American Forest & Paper Association's (AF&PA) Sustainable Forestry Initiative (SFI) program. This effort in logger education, known as the "Sustainable Harvesting and Resource Professional" or SHARP Logger Program, has now trained 4,752 individual loggers and foresters on harvest planning and BMPs since its inception in 1996.



## CONSERVING THE FOREST LAND-BASE

"We are consuming land at a pace that far exceeds the rate of population growth; each person uses from four to five times more land per person than just 40 years ago." Chesapeake Bay Foundation

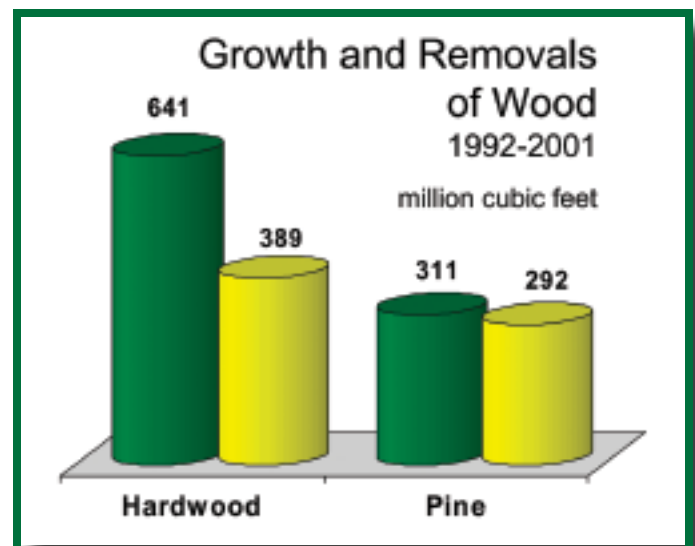
From 1992 to 2001 Virginia land in forest use declined by nearly 200,000 acres, a rate of more than 20,000 acres per year. In view of the largely individual and family ownership of forest land, the challenge is to make forest land use an economically viable and attractive option for the forest landowner.

The Department has taken several steps to address the declining landbase. Throughout the state, Department field personnel work with local governments and citizens in comprehensive planning that emphasizes the values and benefits of forests. Department staff also assists with and promotes use value taxation and Agriculture and Forestal Districts, both of which help foster an environment conducive to continued forest use. The Department is heavily involved in promoting active forest management with private forest owners. Active management fosters the growth of productive and valuable forests, which help landowners maintain rural forest lands.

Specific programs that conserve forest land include the Forest Legacy Program, a federal program administered in the state by the Department of Forestry, and the Virginia Land Conservation Foundation. Both programs

offer landowners methods to establish permanent conservation easements on their property. The Department also serves Virginia landowners by providing technical information on the value of conserving Virginia's forests.

Landowners, through Forest Legacy easements, have protected 3,866 acres of forest land, with more being considered each year. Department-owned State Forest land protects an additional 48,112 acres. These 17 actively-managed forests produce timber and multiple resource benefits, such as outdoor recreational activities and the aesthetic appeal of large forested landscapes, that the Commonwealth's citizens can enjoy. The Department also partners with other state agencies, such as the Department of Conservation and Recreation, in land conservation efforts administratively as well as in land management through the state parks system.



## IMPROVING THE STEWARDSHIP, HEALTH AND DIVERSITY OF THE FOREST RESOURCES

"A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community." Aldo Leopold

Department Foresters developed plans for landowners on more than 147,088 forested acres in the past year, with objectives from timber production, to wildlife management, to recreational forest use. Renewing forests following harvest, as well as establishing new forests, is critical to sustained management. Each year, an average of 80,331 acres is renewed through tree planting, with pine being the species most commonly planted. In addition, large areas (mostly deciduous trees) successfully regenerate naturally into new forests. Active management through forest stand improvement and thinning is conducted on an average of 22,455 acres each year. Well-managed forests foster stand health through the culture of the appropriate tree growing in the right locations, with sufficient space to thrive.

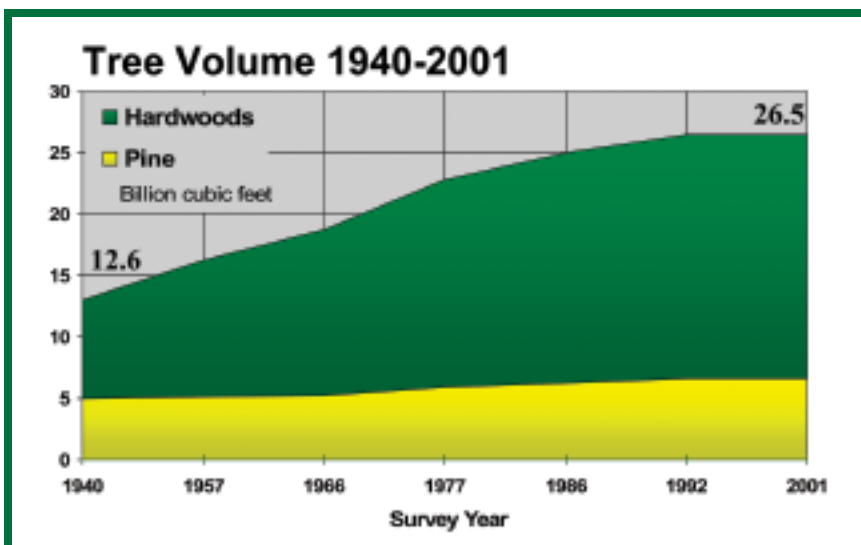
Unfortunately, many landowners conduct partial timber harvests in Virginia without professional advice. In many cases these harvests result in high-grading – the removal of more valuable trees, leaving an insufficient number of trees likely to become quality sawtimber in the future. The practice of high-grading also does not provide for adequate regeneration of desirable species of trees, such as oaks, into the future.

While the acres in pine forest have declined since the 1940 survey, growth rates have increased and have more than kept pace with harvest. Department research efforts have led to programs of genetic improvement of loblolly pine; high-quality seedling production; proper planting density, and the control of competing vegetation. The net effect has been the ability of Virginia's forests to produce more pine volume on fewer acres, allowing more acres to naturally succeed to hardwood forest types.

Programs of forest genetics and seedling production have been at work for more than 50 years to produce high-quality pine and hardwood seedlings, of locally-adapted and improved genetics, needed for reforestation. The loblolly pine improvement program is its third generation of improvement and has produced trees with much higher stem quality, and growth rates averaging 30% higher than unimproved trees. In 2005, our nurseries produced 40 million seedlings of pine and hardwoods.

The Department has identified and targeted several species for restoration work. Specifically, the premier southern tree, the longleaf pine, is being promoted in easternmost parts of the state. Remaining remnant individual trees have been mapped, and used to establish areas for seed production. Acreages of shortleaf pine, a high-quality and once widely distributed species, have plummeted in recent years. Work is underway to establish new seed orchards and increase planting of this species throughout the State. Research is underway to produce American chestnut seedlings that are resistant to the devastating blight that occurred early in the last century.

Taken as a whole, the forests of Virginia are in basic good





health, with positive net growth for most forest types, low mortality rates and accumulating biomass. However, specific problems and threats do exist.

**Oak decline.** The cumulative effects of drought, hurricanes 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, particularly among oaks and other hardwoods. Baseline mortality levels among hardwoods may as much as double during this and subsequent years. This will likely represent only about 2% - 3% of forest trees and is a relatively normal event when viewed over ecological time frames.

The southern pine beetle has been relatively quiet during the last few years, although the outbreak during the late 1990s had a major impact on pine in the mountains, particularly in Southwestern Virginia. Many isolated areas once dominated by pine will revert to

hardwood cover. However, the pine resource in central and southeastern Virginia remains healthy and productive. Federal funds from the U.S. Forest Service, Forest Health Protection



support our cost-share program with landowners for pre-commercial thinning of overstocked pine stands and will, hopefully, mitigate future impacts of pine beetle outbreaks.

The gypsy moth has abated during the last couple of years due to very wet spring weather, which favors a fungal disease of the caterpillars. However, a dry spring this year has led to a resurgence of populations in isolated areas, which may portend an upswing in gypsy moth activity in 2006. Significant outbreaks of gypsy moth in the coming years could have a major impact on oak survival, particularly in mountainous areas where many oaks are already undergoing decline from weather and site-related stress factors.

Hemlocks throughout the Commonwealth continue to die in many locations due to hemlock woolly adelgid infestations. Only five counties in extreme Southwestern Virginia remain uninfested. Despite dogged efforts by the U.S. Forest Service and several universities to mass produce and release biological controls, this will not save most hemlocks currently infested. Shenandoah National Park has already lost 95% of its hemlock trees. Hemlock has or will very likely become ecologically extinct in many areas.

In addition to already established invasive species, such as those mentioned, we face additional threats from a long list of other pests, including the emerald ash borer, Asian long-horned beetle, and European wood-wasp – all of which have been found in other parts of the county and are causing widespread tree mortality in those areas. Only constant vigilance through survey, monitoring and eradication of incipient infestations will allow us to avoid these pests.

Finally, invasive weed species, such as tree of heaven or kudzu, have encroached upon many of our forested areas. Invasive exotic species are most common in or near our cities. Continued forest fragmentation and urban sprawl create more disturbed habitat and facilitate establishment of many weeds. While it will be impossible to completely eradicate many of these widespread species, efforts to slow their spread and eradicate them locally can be undertaken.

# WHAT IS THE FUTURE OF VIRGINIA'S FORESTS?

Recognizing that forest resource benefits are dependent on land protected and retained in forest, forest land conservation is paramount and serves as the agency's core foundation. A resource-based, healthy, living environment requires both natural and social interactions with forest land at the center.

If our management of the forest resource is successful, the forests of Virginia will:

- ▲ Be protected from damaging fire, theft, insects, pathogens and weeds, including invasive species;
- ▲ Be diverse in age, species, location, pattern and size;
- ▲ Provide extensive cover in all 14 river basins;
- ▲ Include unique and fragile habitats;
- ▲ Be available for use and enjoyment of all, and
- ▲ Contribute to the state's financial diversity and provide economic vitality to the rural communities.

Specific challenges include:

- ▲ Conserving the forest land-base;
- ▲ Maintaining the ability to respond to wildfire and other emergency incidents;
- ▲ Providing for continued growth and sustainable harvests from our forests;
- ▲ Maintaining the diversity and health of our forests, and
- ▲ Ensuring that benefits of clean water and clean air continue to flow from our forests.



# ACCOMPLISHMENT REPORT

JULY 2004 - JULY 2005

Objectives	Ongoing	Accomplished
<b>Goal 1: Protect the citizens, their property and the forest resource from wildfire.</b>		
Objective 1.1: Limit acres lost to less than .75 acres burned per thousand acres protected.		🌲
Objective 1.2: By July 1, 2005, and bi-annually thereafter, determine the local needs for DOF wildfire and emergency response in order to provide necessary resources.		🌲
Objective 1.3: Change existing statewide radio system to meet FCC requirements for narrow band technology by July 1, 2007.	🌲	
<b>Goal 2: Protect, promote and enhance forested watersheds, non-tidal wetlands and riparian areas.</b>		
Objective 2.1: By July 1, 2006, ninety percent (90%) of audited silvicultural operations will show no evidence of active or potential sediment pollution.	🌲	
Objective 2.2: Increase full BMP compliance to 8% of audited tracts by January 1, 2008.		🌲
Objective 2.3: By January 1, 2005, determine the criteria and parameters needed in order to conduct an assessment of watershed forest lands.		🌲
Objective 2.4: By July 1, 2007, increase landowner participation in the riparian tax credit by 25%.		🌲
Objective 2.5: By December 31, 2010, establish an additional 1,200 miles of riparian forest buffer in the Chesapeake Bay watershed and 600 miles in the Southern Rivers watershed.	🌲	
<b>Goal 3: Conserve the forest land-base.</b>		
Objective 3.1: Create an index defining conservation priorities by January 1, 2005.		🌲
Objective 3.2: Create a map of prioritized potential forest land by July 1, 2006.	🌲	
Objective 3.3: Present pertinent conservation information to County Planners in 50% of the Region's counties in 2005 and 50% in 2006.	🌲	



Objectives	Ongoing	Accomplished
<b>Goal 4: Improve the stewardship, health and diversity of the forest resource.</b>		
Objective 4.1: By July 1, 2005, characterize the local needs for forest management services and the resources necessary for effective implementation.		🌲
Objective 4.2: Restore shortleaf and longleaf pine on 500 suitable acres by July 1, 2006.	🌲	
Objective 4.3: Provide workshops to forest managers, customers, landowners on invasive species, their threat, control options and other information by January 1, 2006.	🌲	
Objective 4.4: Provide workshops to forest managers, customers, landowners and entrepreneurs on small woodlot management including harvesting systems by July 1, 2006.		🌲
Objective 4.5: Provide 600 Forest Stewardship plans by July 1, 2005.	🌲	
Objective 4.6: Part A. Complete 30,000 acres of natural regeneration by July 1, 2005.	🌲	
Objective 4.6: Part B. Complete 65,000 acres of artificial regeneration by July 1, 2005.		🌲
<b>Goal 5: Facilitate the development and implementation of a statewide forest policy.</b>		
Objective 5.1: By July 1, 2005, define the agency position on key forest resource issues.		🌲
<b>Goal 6: Collect, maintain and communicate forest resource information.</b>		
Objective 6.1: Establish an information system that integrates spatial and statistical data by July 1, 2007.	🌲	
Objective 6.2: Have a public information team in place by July 1, 2006.		🌲
<b>Goal 7: Manage agency resources to effectively and efficiently accomplish the Strategic Plan.</b>		
Objective 7.1: By January 1, 2006, examine and revise Water Quality Program so that time/resources allocated are reduced with no loss of effectiveness.	🌲	
Objective 7.2: Implement the DOF Safety Plan by December 1, 2004.		🌲
Objective 7.3: Develop internal personnel satisfaction survey by January 1, 2005.	🌲	
Objective 7.4: Fully develop and implement career path program for foresters, program support technicians and mechanics by July 1, 2007.	🌲	
Objective 7.5: By March 15 of each year, the assistant regional foresters (ARFs) will review and evaluate the objectives by determining their status, making adjustments and reporting to the Strategic Management Team.		🌲



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