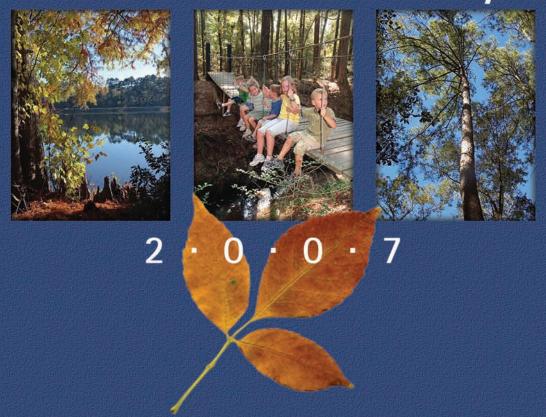
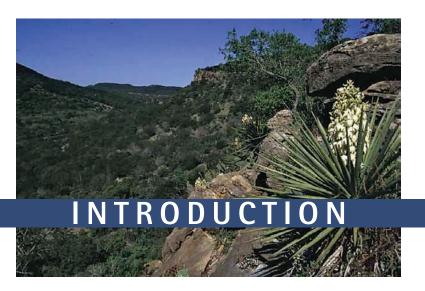
Texas Forests Today







miles of forests, woodlands, prairies, mountains and desert. With 23 million Texans, 84 percent of who reside in or near an urban area, protecting Texans and sustaining the state's forested lands are two of the greatest challenges facing Texas today.

For more than half a century, forestry and the management of the state's forest resources was essentially static. But in the past five years, forestry has been transforming at lightning speed resulting in changes in Texas forests. Three important and dynamic changes affect private forestland in Texas: Land development fueled by economic and population growth; increased population density in and around forests; and the restructuring of the forest products industry, which until recently held some of the largest and most productive tracts of forest land in the state. Rapid changes are accelerating the necessity for rapid solutions.

From the pinyon pine forests in West Texas to the vast live oaks in Central Texas, to the lush pine forests in East Texas and urban and community forests clear across the state ... now more than ever, the vibrant Texas forests need to be sustained to ensure the health of the state's economy and environment and the quality of life for Texans.

This report contains the latest data available on the status of Texas forests. It addresses the impact of forestry on the state's economy and environment, and presents specific opportunities for sustaining our forests for generations of Texans to come.

James B. Hull

State Forester and Director, Texas Forest Service



Forest Trends



Protecting Texas Forests



Benefits of Texas Forests



Sustaining Texas Forests



Opportunities Today and Tomorrow



es Imperatives I for Action

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FOREST TRENDS

What is a forest?

Land is considered forested if it is at least one acre in size and has 10% crown cover or 60 tree seedlings per acre in East Texas; 5% crown cover or 40 seedlings per acre in the rest of the state. From the Pineywoods of East Texas to the wooded Cross Timbers prairies of Central Texas to the High Plains and Gulf prairie marshes of this great state, forests and trees abound.

Forest Area in Texas

About the Forest Inventory and Analysis—it is not just counting trees:

Texas Forest Service began conducting current statewide tree and woody species inventory in Central and West Texas in 2004 to measure forest cover, forest health and fire risk from vegetative fuels. As part of the national Forest Inventory and Analysis program of the USDA Forest Service, Texas Forest Service foresters collect data from selected permanent plots on land belonging to corporate, government and private owners. Past surveys dating back to 1930 only gathered data from East Texas where most of the commercial tree species are found. The expanded statewide survey is scientifically verifying how much of the state's 261,000 square miles of land is forested. More importantly, it increases knowledge of statewide issues, such as the amount of fire fuel, tree regeneration rates, invasive species encroachment and overall forest health.

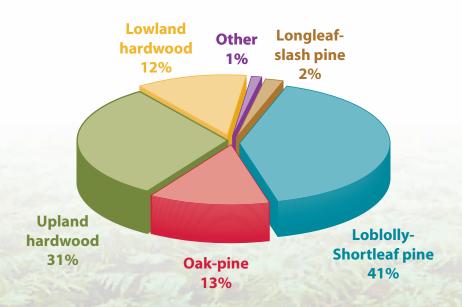
East Texas survey results are reported annually but it is still too early to data from the rest of the state. Aerial estimates over Central and West Texas estimated 35% forested land, but with on-the-ground validation currently in progress, closer to 50% of the plots are forested. It is quite possible that verified forested land in Texas could easily rise to the tens of millions of acres.

East Texas Forest Area

Overall timberland acres have increased slightly since 2003. Of the 21.4 million acres in East Texas, 11.9 million acres (56%) are covered in flourishing, green forests. The trend of small forest land acreage gains in Northeast Texas and small forest acreage losses in Southeast Texas continued. Softwood volume (trees with needles) declined slightly (9%) in 2006 on industry and industry-divested lands. Hardwood volumes (trees with leaves) continued to increase.

In Southeast Texas, pine timber growth is 13% above removals and represents an excellent opportunity for forest-based economic development. However, in Northeast Texas, pine timber growth is 8% below removals, creating a deficit situation that requires significant improvements in reforestation to create a sustainable timber supply.

Hardwood growth continues to be significantly higher than removals in both Northeast and Southeast Texas.



Overall, both pine and hardwood forests are being managed sustainably more volume is being grown than is being harvested in East Texas.

Ownership

For decades prior to 2000, family forest owners held nearly 2/3 of the East Texas forests, forest industry owned nearly 1/3, and a small percentage was public ownership. The nearly 4.5 million acres of industry land were owned by seven major companies.

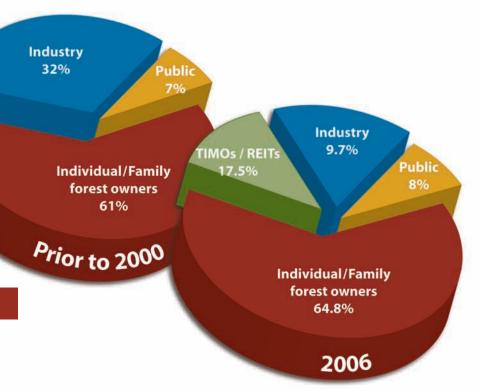
Current ownership patterns for the 11.9 million acres of East Texas forests continue to change rapidly.

Individual/family forest owners

A recent survey of forest owners in Texas indicates there are approximately 200,000 family and individual forest owners with land in East Texas. Interestingly, 86% (170,000) of this group owns less than 50 acres; of this group 44% (87,000) own between one and nine acres of forested land.

In terms of reasons for owning forestland, well over two-thirds of the owners listed aesthetics, nature protection, land investment, part of a home or cabin, part of a farm, privacy, and family legacy as very important or important on a seven-point scale. Only about 13% (26,000) listed timber production as very important or important. However, there is a direct correlation between the number of acres owned and the importance of timber production for economic reasons. It was listed as very important or important on 2.7 million acres (43 percent) of the acres.

Over 50% of owners are concerned about insects/ disease, fire, illegal trash dumping and property taxes.



Industry

By 2006, only one fully-integrated forest products company still owned forest land in East Texas, representing less than 10% of the total forest land area. The other 3 million acres have been sold primarily to investment ownership by timber management investment organizations (TIMOs) and real estate investment trusts (REITs). The trend of fragmenting these large blocks of industrial land into smaller parcels creates a challenging landscape for the forest ecosystem. (Note: On Feb. 26, 2007, the last remaining timber company in East Texas announced its intention to divest all of its forest land holdings, bringing the remaining 1.1 million industry-owned forest land acres in Texas to zero.)

TIMOs and REITs

Indications are these new corporate owners are maintaining a high level of investment in timber production and good forest management practices. However, the long-term sustainability of these forestlands is unknown as TIMOs and REITs strive to maximize return on investment to their stakeholders.

Public

Forestlands owned by federal, state or local governments provide stable blocks of non-fragmented forest cover, thus their conservation value is high and expected to increase with the state's rapid urbanization.



PROTECTING TEXAS FORESTS

Hurricane Rita

Historically, Texas forests experienced more loss from pests and diseases than any other factors; however in recent years-notably the last two years-Texas experienced more loss from natural disasters and wildfires than from forest pests and diseases. By far, Hurricane Rita caused more damage and destruction to the East Texas forest resource than any other disaster in recent decades, including the record-breaking 2005-06 wildfire season.

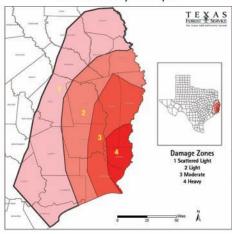


September 24, 2005: Hurricane Rita is the most significant environmentally and economically damaging event to the East Texas forest resource in recent decades.

- 771,000 acres of timber damaged (dead) or affected (trees leaning, crown and foliage partially lost and may or may not die)
- \$833 million worth of timber damaged or affected representing 6% of East Texas' total volume of timber
- 533 million cubic feet of timber damaged in Southeast Texas representing more than 75% of the total amount of timber harvested for industrial use in all of 2005 across East Texas

The damaged timber volume-533 million cubic feet-is enough to have made \$3.7 billion in forest products. Such a level of forest industry economic activity could have supported a total economic activity in East Texas worth \$13.2 billion.

Hurricane Rita Timber Damage Assessment Forest Inventory & Analysis



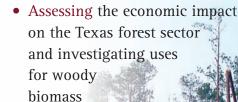
Damage from Hurricane Rita represents a significant economic loss for East Texas.

Hurricane Rita Recovery Efforts

An estimated 9.2 percent of the damaged East Texas timber volume (1.5 million acres) was salvaged. Much of the damaged volume may not have been salvageable due to the general poor quality of the wood following the event, transportation challenges and the logistics of moving a large volume of wood to the mills that were already full.

A \$5.9 million federal supplemental grant for Hurricane Rita forest and tree recovery is enabling Texas Forest Service to assist landowners and communities with:

- Restoring and replanting damaged rural forestlands and city/community trees
- Developing forest conservation plans
- Enhancing wildfire protection, mitigation and prevention activities
- Educating landowners and community groups about forest health and protection issues associated with hurricane-damaged trees



"One home destroyed by wildfire is one too many; one lost life is intolerable; one entire burned out community is unthinkable.

Yet this has become the unimaginable and unacceptable reality now facing 23 million Texans and it doesn't have to be this way."

James B. Hull, January 10, 2006

2005-06 Texas Wildfires

The most severe, most catastrophic wildfire occurrence the state has ever experienced, occurred over the span of 20 consecutive months of continuous emergency response by Texas Forest Service, beginning in January 2005 ... an unprecedented, record-breaking occurrence for the state and nation.

Statewide (January 1, 2005 - December 31, 2006)

19 deaths2.3 million acres burned\$643.1 million damage755 homes destroyed

Extreme wildfire behavior like the state has experienced since early 2005, and in seven of the past ten years, is not an isolated, one-time weather event. In the midst of a 25-30 year drought period, even with occasional rain events, Texans can expect a long term situation with an increase in the number and severity of wildfires, unlike anything seen in 50 years. Texas Forest Service has developed a solution, the Texas Wildfire Protection Plan, which when fully funded at base level and implemented, will cut

wildfire losses by 80%; reduce the state's fire expenditures by one-half; and slash national mobilization costs by 80%.







Forest Health

Forest loss from southern pine beetle (SPB) infestations in East Texas has been light or non-existent over the past decade. Healthy, well-managed and properly thinned forests continue to be the best defense against destructive pest invasions. Funding from USDA Forest Service, Forest Health Protection supports an SPB prevention landowner cost-share program for pre-commercial thinning of 6-12 year old pine stands and first thinning of overcrowded pulpwood-sized stands within specified areas of East Texas known to be susceptible to SPB outbreaks. To date (Feb. 2007), hazard reduction treatments have been successfully completed on more than 27,000 acres of individual/family forest lands in East Texas and \$1.3 million in cost share grants have been distributed to participating landowners.

Healthy, well-managed and properly thinned forests continue to be the best defense against destructive pest invasions.

Oak wilt is the major cause of live oak mortality in about 60 counties in **Central Texas**. The Oak Wilt Suppression Project, administered by Texas Forest Service, has helped by decreasing the spread of oak wilt. Since the project's inception in 1988, over 635 miles of containment trenches have been installed with federal cost share funding to control 2,415 expanding oak wilt centers. Early detection, public awareness and prompt action are essential for successful management of this devastating disease. The Texas Oak Wilt Information Partnership—a collaborative project with Texas Forest Service, USDA Forest Service, Central Southwest/Gulf Coast Information Node of NBII,

Texas Chapter of the International Society of Arboriculture, and the Lady Bird Johnson Wildflower Center—helps reach landowners with early detection and management information as well as provide a venue for sharing knowledge about oak wilt identification, management, and research. An estimated 385,000 visit the partnership's Web site annually, www.texasoakwilt.org.





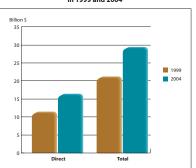


BENEFITS OF TEXAS FORESTS

Economic Impact

According to a recent economic study by Texas Forest Service¹, the total economic impact of the Texas forest sector is \$30.6 billion. The forest sector generates more than 173,000 jobs and \$7.6 billion in annual labor income. In 2005, timber ranked sixth in agricultural cash receipts with cattle/calves, cotton, broilers, greenhouse/nurseries, and milk ranking from one to five respectively.

Economic Impact of the Texas Forest Sector in 1999 and 2004



Future economic impact gains could be realized by an increase in production from existing primary and secondary forest product facilities, or by adding additional production capacity in the form of a new sawmill. Southeast Texas currently has a

significant surplus of pine timber. Even after Hurricane Rita, additional utilization of at least 1.5 million tons of round wood annually is still possible under a sustainable scenario in Southeast Texas. The economic impact of a 130 million board feet sawmill, for example, would generate \$113 million in output and the creation of 382 jobs with over \$15 million in labor income.

The forest sector is a key component contributing to the health of the state's economy. Programs and policies—such as those encouraging landowners to keep their forests forested—need to be created that protect our forests and the viability of the forest sector to ensure a healthy state economy.

Environmental Benefits

One acre of mature trees can absorb the carbon dioxide of one car driven 26,000 miles annually.

Clean Air

Poor air quality can impair human health, damage crops and other vegetation, and reduce visibility. Studies have documented that forests and urban trees help improve air quality by reducing air temperatures, directly removing pollutants from the air, and reducing building energy use and consequent pollutants from power plants. Because forests convert atmospheric carbon into vegetation, increasing the quantity of carbon stored in forests has the potential to offset carbon released from manufacturing plants and other fossil fuel burning operations. This inherent asset of trees-to sequester carbon—is now being traded in the new arena of ecosystems service markets as carbon credits.

Arbolitos por Adopción - Cleaning up the air in West Texas

In an air quality mitigation effort, Texas Forest Service teamed with Texas Commission for Environmental Quality (TCEQ), Los Tree Amigos, a regional tree program support council, and Las Hormigas de rancho Anapra, a volunteer group

in Mexico, to deliver, distribute and plant 1000 seedlings in a small colonia near Juárez, Mexico.

Each family registered their seedlings and carried them home to be planted. The new seedling owners received planting and care instructions in Spanish and a contract of adoption of their new baby pines (arbolitos por adopción). Each seedling planting has been documented and tree growth will be monitored for years to come. The trees were strategically planted on the Mexico side of the border in an effort to improve air quality throughout the common airshed shared by

Juárez, El Paso, and Sunland Park, N.M.

Crossing borders and agendas, this was a successful project for two state agencies and two non-profit organizations in two countries working together for the benefit of the whole community," said Oscar Mestas, TFS' El Paso regional urban forester.



Clean Water

Over 60 percent of Texas freshwater resources originate from East Texas, making the 11.9 million acres of forestland a critical factor in the clean water equation. Forests not only act as natural filters to trap sediment, they also absorb rainfall, reduce flooding and provide habitat to wildlife and aquatic life. Studies have shown that swamps and riparian forests (land bordering rivers, streams and lakes) can trap over 80% of sediment and nutrients, as well as reduce peak flood periods by 50%.

As the state's population continues to grow, so will its demand for clean water.

Texas forestry leaders have developed the Best Management Practices (BMPs) program to protect East Texas streams and creeks during forestry activities such as harvesting, road building, chemical treatments and tree planting. BMPs are non-regulatory; however, survey indicates 92% of Texas landowners, loggers and consulting foresters implement these practices².

How do we know forestry BMPs protect water quality? Texas Forest Service is testing the effectiveness of the state recommended BMPs with an innovative, high-tech monitoring project. Stream habitat, biological communities and physiochemical properties are being measured before and after forest operations. Samples show tremendous species diversity—over 35 different fish species and the organisms they eat—in East Texas forested streams, indicating forestry BMPs are effective in protecting water quality and aquatic stream health.

Enhancing Wildlife Habitats

The W. Goodrich Jones State Forest in Montgomery County and the I.D. Fairchild State Forest in Cherokee County are home to 14 active clusters of the endangered red-cockaded woodpecker (RCW). For many years, Texas Forest Service in cooperation with Texas Parks and Wildlife and U.S. Fish and Wildlife, has managed the birds and their associated habitats. Careful management practices such as banding baby birds, keeping track of the birds, and removing dense undergrowth on active clusters have ensured the health and safety of these endangered birds.



Forestry best management practices prevent 12,000 tons of sediment from directly reaching Texas streams, lakes and rivers.

That's enough sediment to fill a football field 35 feet high!

Recreation & Wildlife

Hunting, fishing, hiking, horseback riding, wildlife viewing and bird watching are but a few of the outdoor activities drawing urban residents to the pine forests of East Texas and the hills and prairies of Central Texas. Eco-tourism is an emerging, naturebased market of interest to landowners who are deriving economic benefit by making their land available for recreational opportunities. Texas forest landowners



by enhancing their habitats. The Texas Forest Service nurseries online seedling stores direct landowners to appropriate species for wildlife management based on planting zones.

http://texasforestservice.tamu. edu/forest/nurseries/default.asp

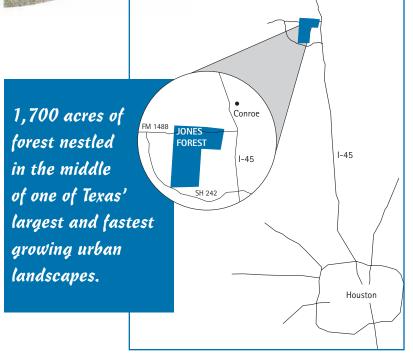
W. Goodrich Jones State Forest

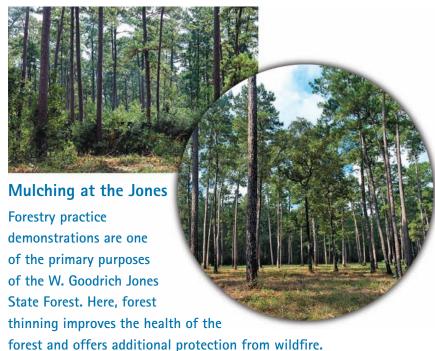
The Jones State Forest draws an average of 50,000 visitors annually who enjoy horseback riding, hiking, biking, jogging, nature photography and nature watching along the 15 miles of roadway/trails. Between March and July, thousands of birding enthusiasts—some from as far away as Japan, Europe and Canada-visit the forest to catch a glimpse of the endangered red-cockaded woodpeckers that reside in the tall pine trees on the forest.

A host of organizations and

schools use this green expanse of forest, streams and trails as a living classroom. **Exploring Houston's** Backyard touches the lives of 1,000 innercity fifth graders each year. Since 1995, more than 12.000 Houston students have had unique outdoor environmental experiences by visiting the W. Goodrich Jones State Forest.







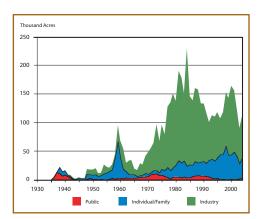


SUSTAINING TEXAS FORESTS



Reforestation in East Texas

A total of 103,601 acres were planted by forest landowners in 2005 representing a 9% decrease from the previous year.³ More than likely, this was due to the effects of the state's extended drought and weaker timber markets. A



slowing in planting by industrial owners seems to be the trend since a high of 120,000 acres in 2000, due to industrial owners divesting more than two-thirds of their land in the last five years. Texas forest landowners need to step up tree-planting efforts considerably if Texas' forest resource is to be sustained for generations to come.

Urban and Community Forests

Texas' urban forests, comprised of city and landscape trees, are found in every community and neighborhood across the state. Nearly 84% of the state's 23 million Texans reside in or near a city. With the population expected to swell to nearly 34.7 million by 2030, keeping trees in the ground and healthy are becoming constant challenges.

In 2003, Texas Forest Service initiated NeighborWoods, a program which helps communities organize a lowcost, community-wide public tree-planting effort. Texas Forest Service provides the technical expertise and local governments, non-profits, civic groups and businesses join together with homeowners to replant their communities. NeighborWoods was introduced to 31 cities in three short years.

Trees in Texas communities provide beauty and add to property values, but new evidence suggests trees also save money and promote health and well-being by reducing storm water runoff, energy costs and air pollution.⁵

Texas Forest Legacy Program

The Texas Forest Legacy Program, administered by Texas Forest Service and funded by USDA Forest Service, is a voluntary program supporting the protection of economically and environmentally important forest lands threatened by conversion to non-forest uses.

The program focuses on the acquisition of development rights on private forests lands through perpetual Working Forest Conservation Easements. Landowners can capture up to 75% of the value of real estate development while retaining private ownership of the property for producing timber products or securing income from ecological services such as watershed protection or resources for biofuels.

Houston's Regional Forest⁴

From the region's pine forests and bottomland hardwoods to the street and yard trees that grace neighborhoods, each tree in the eight-county region surrounding the city of Houston is an integral part of the region's tree cover. Houston's Regional Forest: Structure • Functions • Values represents a three-year collaborative effort between USDA Forest Service, Texas Forest Service and Houston Area Research Consortium researchers to quantify the green infrastructure of the region and is the first report of its kind in Texas. A sample of the findings includes:

- The replacement cost of the region's 663 million trees is valued at over \$205 billion.
- Trees save \$131 million in residential energy costs and avoided power plant emissions each year.
- Houston's trees remove over 60,000 tons of air pollution
- Urban trees work harder: the average urban tree stores 75% more carbon and has a 76% higher replacement value than

the average rural tree.

Between 1992 and 2000, forest cover declined by 17%a decrease of 486 square milesresulting in a net loss of over 78 million trees.





Forest Biomass: An alternative energy source

Since the sharp rise in oil prices in 2005 and 2006 and the corresponding increase in interest in alternative energy, researchers are looking to forest biomass as a possible source of energy production and chemical extraction. About 2.8 million tons of logging residue (tops, limbs, and

cull trees) is produced each year in East Texas.⁵ Logging residue is generally not utilized and is left at the logging site or removed/destroyed in subsequent site preparation for reforestation. Acres with pre-merchantable, smalldiameter trees are also potential sources of biomass.

Ecosystem Services Markets: Buying and selling trees' environmental assets

Forest landowners are realizing that in addition to timber production, trees give back to society by providing environmental assets such as clean water, clean air and beautiful landscapes. These assets are free and society's expectation is that they continue to be free. However, a move is now underway whereby landowners can sell their forests' natural assets to the consumers of that service. Cities may be willing to pay landowners for protecting water that flows through the landowner's upland forested property, developers may be willing to pay landowners to maintain natural vistas adjacent to their projects, and some landowners may obtain a payment for the carbon

that their trees store. These would offer additional market based financial incentives for landowners to sustain their forested land.

Mainstreaming market-based ecosystem service transactions is challenging because of fragmented government rules and policies, difficult property rights issues, and the complexities of matching supply and demand.

With a grant from the USDA Forest Service, Texas Forest Service is moving the market based trading of ecological services forward. Informed forest landowners will be in a better position to realize future opportunities as this market emerges. Texas Forest Service is serving as a market motivator between buyers and sellers of ecological services, and third party organizations, such as land trust organizations and other non-profit entities that have an interest in conservation and seeing this market emerge. The agency's goal is to provide landowners an additional option for maximizing the value of their forests with the added benefit of sustaining the state's healthy forest resource for current and future generations.



IMPERATIVES FOR ACTION

Texas must invest in the state's capacity to protect its citizens and the forest resource from the ravages of wildfire by investing in the Texas Wildfire Protection Plan (TWPP), a proactive approach to wildfire protection with prevention, hazardous risk reduction and rapid response as the cornerstones.

Changing land use with increased fire-prone vegetation and a fast-growing state population have contributed to the devastating and persistent wildfire situation, all occurring in the midst of the current 25-40 year drought. Whether it is the East Texas Pineywoods, the West Texas plains, or anywhere in between, prevention, hazardous risk reduction and rapid response are critical to protecting 23 million rural and urban Texans from wildfires. Fully funding the TWPP at an annual base level of \$20.4 million will begin to resolve the increasing statewide deficiency in firefighting resources and build a solid wildfire protection infrastructure leading to a greatly reduced number of wildfires.

A statewide master forestry plan needs to be developed which identifies opportunities and priorities that define forests and trees as the solutions to a healthy future for Texans.

While traditional forestry practices have served the state well for over half a century, it is time to move forestry and landowners in directions that are sustainable for the new century and beyond. Based upon comprehensive assessments and evaluations involving multiple stakeholders and organizations, the statewide master forestry plan will be developed at a landscape scale across all landowner and geographic boundaries. It will encompass forest ecosystems, communities, watersheds and all of the physical regions of Texas.

Explore the emerging ecosystem services and credit trading markets as additional potential resources for landowners.

Private landowners, government leaders, industry representatives, university researchers, and non-profit organizations are now discussing economic-based approaches to protecting ecosystems—strategies employing a carefully considered combination of enforceable constraints on ecosystem impairment and meaningful economic incentives for ecosystem conservation. Policies need to be developed promoting the exploration and feasibility of marketing the inherent environmental qualities of trees and forests as an option for sustaining forestland while creating additional income for landowners.

Develop long-range policies for increasing rural forests and urban tree cover by investing in statewide reforestation and tree-planting initiatives.

Tree planting across all ownerships is on a downward trend. To enhance, or at the minimum retain, the integrity of the state's forests and related ecosystems, local and regional leaders of today must commit to long-term tree-planting initiatives to ensure the environmental and economic benefits of trees will be realized by future generations.



The mission of the
Texas Forest Service
is to provide statewide
leadership to ensure
the state's trees, forests
and related natural
resources are protected
and sustained for
the benefit of all.

Sources

- 1. Xu, W., Economic Impact of the Texas Forest Sector, Texas Forest Service, November 2006. http://tfsweb.tamu.edu/sustainable/article.aspx?id=100
- 2. Simpson, H., A History of Forestry BMP Implementation Monitoring in Texas, Texas Forest Service, Feb. 2007. http://tfsweb.tamu.edu/sustainable/article.aspx?id=710&t
- 3. Xu, W. Harvest Trends 2005, Texas Forest Service, August 2006. http://tfsweb.tamu.edu/sustainable/article.aspx?id=100
- 4. Smith, P., M. Merritt, D. Nowak, and D. Hitchcock, Houston's Regional Forest: Structure, Functions, Values. USDA Forest Service and Texas Forest Service, September 2005. http://texasforestservice.tamu.edu/shared/article.asp?documentid=1166
- 5. Xu, W. and B. Carraway, Biomass from Logging Residue and Mill Residue in East Texas, 2005. http://tfsweb.tamu.edu/sustainable/article.aspx?id=100

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