

LOUISIANA 2020 FOREST ACTION PLAN

A Statewide Forest Resource Assessment and Strategy



Louisiana Department of Agriculture and Forestry

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Louisiana 2020 Forest Action Plan: Statewide Forest Resource Assessment and Strategy

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Produced by

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Cover photo: Ouachita River, Ken Clough, U.S. Fish & Wildlife Service

Common Abbreviations

CWPP	Community Wildfire Protection Plan
EPA	Environmental Protection Agency
FIA	Forest Inventory and Analysis
FLA	Forest Legacy Area
FLP	Forest Legacy Program
FPP	Forest Productivity Program
LDAF	Louisiana Department of Agriculture and Forestry
LDWF	Louisiana Department of Wildlife and Fisheries
LFA	Louisiana Forestry Association
LSU	Louisiana State University
USDA	United States Department of Agriculture

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INTRODUCTION

The State of Louisiana hosts diverse forest ecosystems that provide important economic, ecological, and cultural services for its residents. Louisiana's forests occupy more than 13.2 million acres, most of which are forested wetlands or evergreen forest. Nearly 90% of forests and timberland are privately owned, and many large landowners rely on their forestland for income. Louisiana diversity of forest types provide a number of values, goods, and services to the public. Some of these benefits derived from forest resources have clear economic impacts—sawn pine logs for construction, paper manufacturing, hunting leases, and floodwater management. Other forest-based public services—improvements in air quality, viewsheds and aesthetic value, providing a sense of culture and place—are more difficult to assign a monetary value but are nonetheless valued by Louisiana's landowners and citizens.

Economic Impact

The forest products industry directly affects the Louisiana economy by providing jobs, wages, and tax payments, and stimulates other sectors of the economy by purchasing goods and services necessary for the production of forest products (LSU AgCenter 2015). Forest industry directly employs more than 19,000 workers, and its wood and paper manufacturing shipments alone are valued at \$7.12 billion (American Forest and Paper Association 2018). The majority of workers directly employed in forest industry are concentrated in the 4th and 5th Congressional Districts, where local economies may be somewhat to moderately dependent on the forest product-based economy (LSU AgCenter 2015). Although demand for forest products has fluctuated, forest industry still accounts for a large segment of Louisiana's agricultural economy, currently contributing an annual \$86 million in state and local taxes (American Forest and Paper Association 2018).

Forests & Water

Forested riparian areas, floodplains, and wetlands act as expansive water filtration systems that regulate water quality and quantity. Forests are absolutely vital to providing clean public drinking water as they filter pollutants, moderate water availability, reduce the need of additional water treatments at utility facilities, and lower overall treatment costs. Watersheds that are stripped of forest cover and managed inappropriately are vulnerable to the emergence of new contaminants that are not currently tested or monitored, spikes in pollutant loads after storms and floods, and increased treatment and utility costs (Barnes et al. 2009). Because so much forestland along the Mississippi River has already been converted to non-forest use, and due to heavy use of fertilizers upstream in the Midwestern States, protecting and re-foresting wetlands is a critical step to securing clean water for Louisiana's public utilities and fisheries.

In addition to providing clean drinking water, marshes and forested wetlands also provide a

natural defense against storm surge and flooding during tropical and extreme weather events. Hurricanes and tropical storms are near-annual occurrences, and the combination of an extensive coastline and vast low-lying areas make Louisiana vulnerable to flooding. The United States' wetlands are quickly disappearing due to habitat alteration and destruction as well as natural erosion processes. Louisiana's wetlands represent 40% of all wetlands in the continental U.S., but approximately 80% of wetland losses have occurred in Louisiana (Williams n.d.). Louisiana coastal wetlands recede at a rate of 75 square kilometers annually—a staggering loss that impacts recreational and agricultural use as well as the State's billion-dollar seafood industry. Stabilizing wetlands has proven costly in many cases, but protection efforts, mitigation banks, and plantings are steadily making progress, at least in the case of forested wetlands. The floodplain of the Atchafalaya River hosts the best examples of forested wetlands in the State and the largest remaining floodplain swamp in the continental U.S.

Wildlife Habitat & Recreation

Louisiana's forests and forested wetlands are highly valued for recreational opportunities and wildlife habitat. According to the 2016 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, the West South Central region of the U.S., which includes Louisiana, has a 17% fishing participation rate (national rate=14%), 5% hunting participation rate (national rate=4%), and 26% wildlife-watching participation rate (national rate=32%; USDOJ & USDC 2018). Louisiana's segment of the Mississippi

Flyway is one of the most consistently hunted regions in the country. Each year, more than 325 bird species journey between northern breeding grounds to southern wintering grounds via the Mississippi Flyway, and Louisiana's forested wetlands play a key role in providing habitat that benefit birds and waterfowl hunters alike.

The 2010 Forest Resource Assessment & Strategy

The 2008 Farm Bill amended the Cooperative Forestry Assistance Act of 1978 directing States to develop a long-term Statewide Assessment and Strategy for Forest Resources. The purpose was to determine the status of the forest resource through an assessment—what's there, who owns it, what are its threats, and how can federal funds help to manage it. Strategies would then need to be developed to address issues raised from the assessment. The completion of the assessment and accompanying strategies enables States to be eligible to apply and compete for federal funds through annual grant cycles.

The Louisiana Department of Agriculture and Forestry (LDAF), in cooperation with the National Association of State Foresters, led the effort to complete the assessment and prepare the strategies for Louisiana. The goal of the 2010 effort was to describe the history of forestry and its role in shaping the state, identify external threats to healthy trees (e.g., insects and disease), and address issues related to maintaining forest as a land cover and use (e.g., urbanization).

Louisiana published its first Statewide Assessment and Strategy for Forest Resources in July 2010. The 2010

Assessment discussed several forestry-related issues: wildfire protection, insects and disease, invasive species, urban sprawl, longleaf pine regeneration, cypress-tupelo management, extreme weather events, and hardwood regeneration. The 2010 Assessment also evaluated the State's potential for a biomass industry; however, corporate interest in supporting a biomass market has waned.

The 2020 Forest Action Plan

Ten years after the publication of states' first forest resource assessment and strategy, States were once again tasked with evaluating the conditions, sustainability, and threats to their forest resources. An updated assessment and strategy, commonly referred to as a Forest Action Plan, evaluates how forest resource conditions and threats have changed in the last decade and what strategies are most likely to support the economic, ecological, and cultural function of forests for the next decade. Louisiana's 2020 forest resource assessment provides a comprehensive analysis of the forest-related conditions, trends, threats, and opportunities within the state using a combination of qualitative, quantitative, and geospatial data.

Louisiana's forest resource strategy follows the assessment by providing a plan for investing state, federal, and partner resources to address the management and landscape

priorities identified in the assessment. It incorporates existing statewide forest resource management plans, and provides the basis for future program, agency, and partner coordination.

The dominant threats identified in the assessment fall into three broad categories:

1. ***Lack of Active Management on Private Lands***, which includes logging- and milling-related challenges facing non-industrial private forestland owners;
2. ***Challenges to Forest Health***, which includes insects, disease, and invasive species; and
3. ***Challenges Facing Wildland Fire Management***, which includes smoke management and urbanization-related challenges facing wildland firefighting and prescribed burning.

For each threat, strategies are identified that can prevent further damage, mitigate current impacts, adapt to changing conditions, and enable landowners to take action as appropriate. Strategies also include the necessary resources the State Forester needs to successfully address threats and implement strategies. These strategies, when utilized in cooperation with our partners, will help to conserve working forest landscapes, protect forests from existing and emerging threats, and enhance public benefits from forests.

FOREST RESOURCE ASSESSMENT

ECOLOGICAL REGIONS AND FOREST ECOSYSTEMS

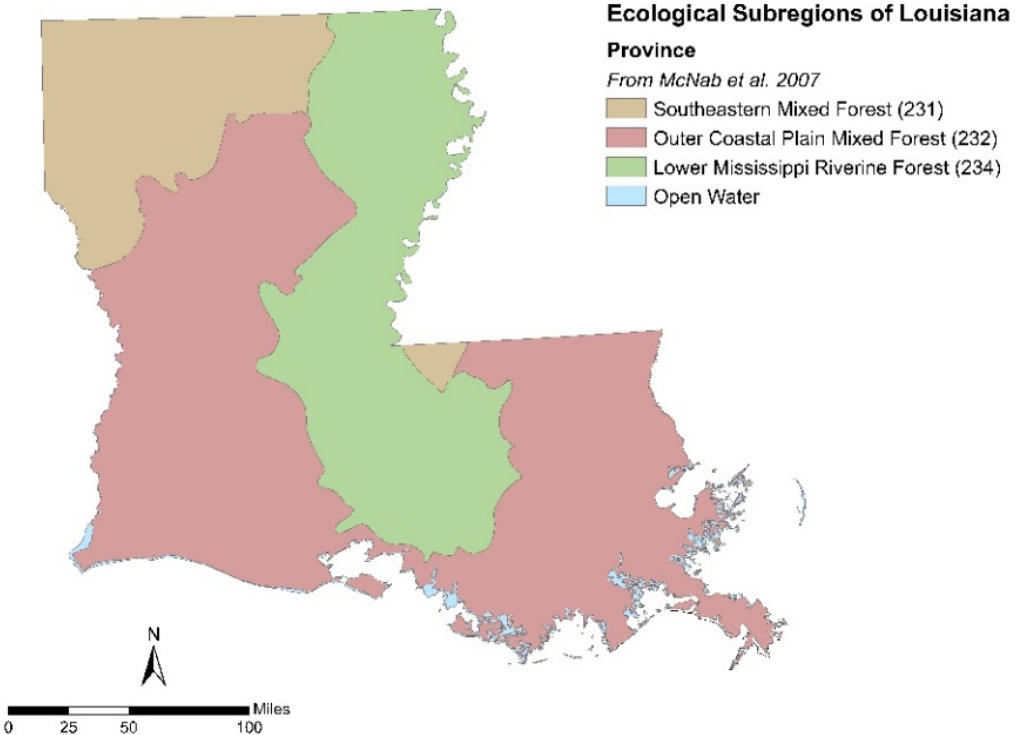
Three major terrestrial ecological subregions, or provinces, occur across Louisiana, as described by McNab et al. (2007) and USDA Forest Service: Southeastern Mixed Forest, Outer Coastal Plain Mixed Forest, and Lower Mississippi Riverine Forest (Figure 1).

Southeastern Mixed Forest Province (Subregion 231)

Two portions of this province occur in Louisiana: the Mid Coastal Plains—Western Section, occupying much of northwestern Louisiana, and the Coastal Plain—Loess Section, extending southward into Louisiana from Mississippi along the alluvial plain. In Louisiana, both sections of Southeastern Mixed Forest Province are characterized by

loblolly-shortleaf (*Pinus taeda*-*P. echinata*) pine, oak-pine (*Quercus*-*P.* spp.) , oak-hickory (*Q.*-*Carya* spp.), and oak-gum-cypress (*Q.*-*Nyssa*-*Taxodium* spp.) forest types. While marine sands and clays typify the Mid Coastal Plains—Western Section, deep, fine-textured loess soils and gently rolling hills characterize the Coastal Plain—Loess Section.

Figure 1. USDA Forest Service ecological subregions, or “provinces,” in Louisiana (McNab et al. 2007).



Outer Coastal Plain Mixed Forest Province (Subregion 232)

Dominant forest types include longleaf-slash pine (*P. palustris*-*P. ellioti*), loblolly-shortleaf pine, and oak-hickory cover types with oak-gum-cypress occurring along rivers. Large portions of this province have poorly draining soils, and large, shallow depressions are common. Hurricanes are a frequent disturbance.

Lower Mississippi Riverine Forest Province (Subregion 234)

Three sections occur in the Lower Mississippi Riverine Forest Province in Louisiana: Southern Mississippi Alluvial Plain, Atchafalaya and Red River Alluvial Plains, and Arkansas Alluvial Plains. Periodic flooding of the Mississippi River and other waterways shaped the ecology of this province. Within Louisiana, this ecoregion encompasses all lands in the historic Mississippi River floodplain. Bottomland hardwood forests and cypress swamps, also referred to as forested wetlands, are the dominant natural plant communities in this region. Over the past two centuries, the extent of bottomland hardwood forests in the region has declined from 24 million acres to 4.9 million acres. In addition to the sheer loss of bottomland hardwoods, this once unbroken forest has since been divided into more than 40,000 distinct patches scattered throughout the floodplain, reducing the forests' capacity to

regulate floodwaters, sedimentation, and runoff; filtrate and purify drinking water; and provide high-quality aquatic and riparian wildlife habitat. The high degree of forest fragmentation in the Mississippi Alluvial Plain has had dramatic effects on wildlife especially to Louisiana black bear (*Ursus americanus luteolus*), freshwater mussels, and more than 70 species of neotropical migrant songbirds. Although land cover was once dominated by mesophytic hardwoods, much of this province has been converted to agricultural land use. Fragmented natural vegetation consists of oak-gum-cypress, longleaf-slash pine, loblolly-shortleaf pine, oak-hickory, oak-pine, and prairie. The Lower Mississippi Riverine Forest Province approximates the Environmental Protection Agency's Level III Ecoregion of Mississippi Alluvial Plain (Figure 2).

EPA Ecoregions

The U.S. Environmental Protection Agency (EPA) has established ecoregions in a nested, hierarchical schematic that includes four levels, Level I being the coarsest and Level IV being the finest subdivision (Bryce et al. 1999, U.S. Environmental Protection Agency 2005). The EPA's approach to identifying ecoregions lies in the analysis of patterns of geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology. The continental U.S. contains 104 Level III ecoregions, six of which occur in Louisiana (Figure 2).

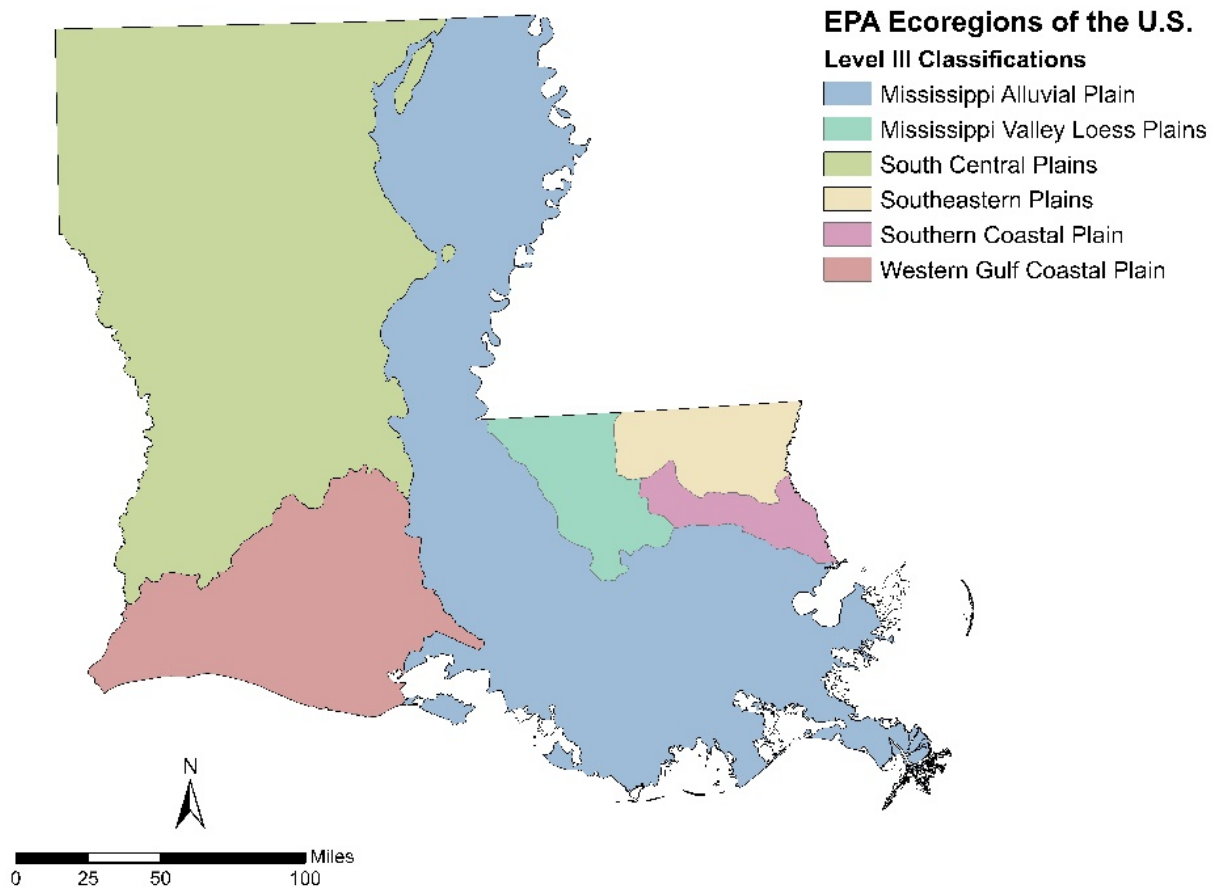


Figure 2. U.S. Environmental Protection Agency's (2005) Level III ecoregion classifications in Louisiana.

FOREST RESOURCE CONDITIONS AND TRENDS

Most of the information for this section is summarized from data collected through the Forest Inventory and Analysis (FIA) Program of the USDA Forest Service. Through data collection on permanently established field plots, FIA reports on status and trends in forest area and location, in the species, size, and health of trees; in tree growth, mortality, and removals by harvest; in wood production and utilization rates by various products; and in forestland ownership. Geospatial data from the National Land Cover Database 2016 (Yang et al. 2018) was used alongside USDA Forest Service's Forest Inventory and Analysis Program using static reports loaded in the online Design and Analysis Toolkit for Inventory and Monitoring (FIA 2019), Timber Products Output (USDA Forest Service 2012), and National Woodland Owner Survey (Butler et al. 2016, Butler et al. 2020).

Summary of Forest Resource Conditions and Trends

- Forests occupy more than 13 million acres, or 44% of the state. On-the-ground estimates of forestland area from FIA indicate that forests have slightly expanded since the 2010 Louisiana Statewide Forest Resource Assessment and Strategy.
- The most heavily forested areas of Louisiana are the South Central Plains in northwestern Louisiana and Western Gulf Coastal Plain. The distribution of forest has remained relatively constant in the last decade.
- The most common forest type in Louisiana is loblolly-shortleaf pine followed by oak-gum-cypress. Oak-gum-cypress and elm-ash-cottonwood forest types have expanded slightly since 2005.
- Annual timber removals have fallen each year from 2009 to present, resulting in a 21% decline in removals over the last decade. Concurrently, growth-to-drain ratios have increased slightly to 1.5.
- Average annual mortality has held constant over the last decade, but localized outbreaks of southern pine beetle continue to impact forest health and wildland fire fuel loading at smaller scales.
- Forestland and timberland have remained overwhelmingly in private ownership (87% and 88%, respectively). Nearly half of forestland is held by private corporate entities.
- Only 8 percent of landowners, affecting 25 percent of family forestland, have a forest management plan.
- The top concerns of family forest owners were trespassing and poaching followed by misuse of wooded land, keeping land intact, wildfire, and high property taxes.

Forestland Area

Louisiana’s forests cover an estimated 13.26 million acres or 44 percent of the state (Table 1, Figure 3) based on the most recent satellite imagery analysis from the National Land Cover Database (Yang et al. 2018). Forestland area estimates from FIA are slightly higher: 15.05 million acres currently, which is a slight increase from 14.54 million acres at the time of the 2010 Louisiana Statewide Forest Resource Assessment and Strategy (FIA 2019). Forested wetlands and evergreen forests make up 48% and 44% of Louisiana forests, respectively (Yang et al. 2018). Forested wetlands lie along Louisiana’s extensive riverine systems: Sabine, Calcasieu, Red, Little, Ouachita, Boeuf, Bayou Macon, Tensas, Atchafalaya, Mississippi, Amite, Tangipahoa, Bogue Chitto, and Pearl Rivers, among others. Forested wetlands shelter the shorelines of numerous lakes, from Cross Lake in the northwest to Lake Pontchartrain in the southeast, providing critical habitat for fisheries and mitigating stormwater runoff and nutrient loading from nearby agricultural operations. The magnitude of evergreen

forests is a legacy effect of strong pine markets and widespread loblolly pine plantings before the recession of the late 2000s. Pine markets and plantation holdings of private corporations continue to drive forest industry in the state.

Prior to the impacts of Hurricane Katrina in August of 2005, forests covered an estimated 12.98 million acres (National Land Cover Database 2001; Yang et al. 2018). Following Hurricane Katrina, extensive damage to privately owned forestland in the Florida Parishes resulted in heavy losses of timber. Many properties were re-planted in pine in the years immediately subsequent to Katrina, leading to homogenization of stand age- and size-class structure in the Florida Parishes. Ninety-eight percent of forestland is considered timberland, a statistic that has held constant since 2005 (FIA 2019). Timberland is forestland that is capable of producing 20 cubic feet of industrial wood per acre per year and is not withdrawn from timber utilization.

Table 1. Area by land cover class (National Land Cover Database 2016; Yang et al. 2018).

Land Cover Class	Acres	Land Cover Class	Acres
Deciduous Forest	454,800	Herbaceous	731,292
Evergreen Forest	5,833,871	Herbaceous Wetlands	3,263,693
Mixed Forest	639,814	Hay/Pasture	1,985,793
Forested Wetlands	6,333,914	Cultivated Crops	4,699,756
Barren Land	77,919	Developed	2,066,235
Shrub/Scrub	1,165,948	Open Water	2,931,989

Note: Land area estimates changed slightly over time due to improvements in measurement techniques and refinements in classification of small bodies of water and streams. Use caution when comparing land cover statistics to previous NLCD outputs.

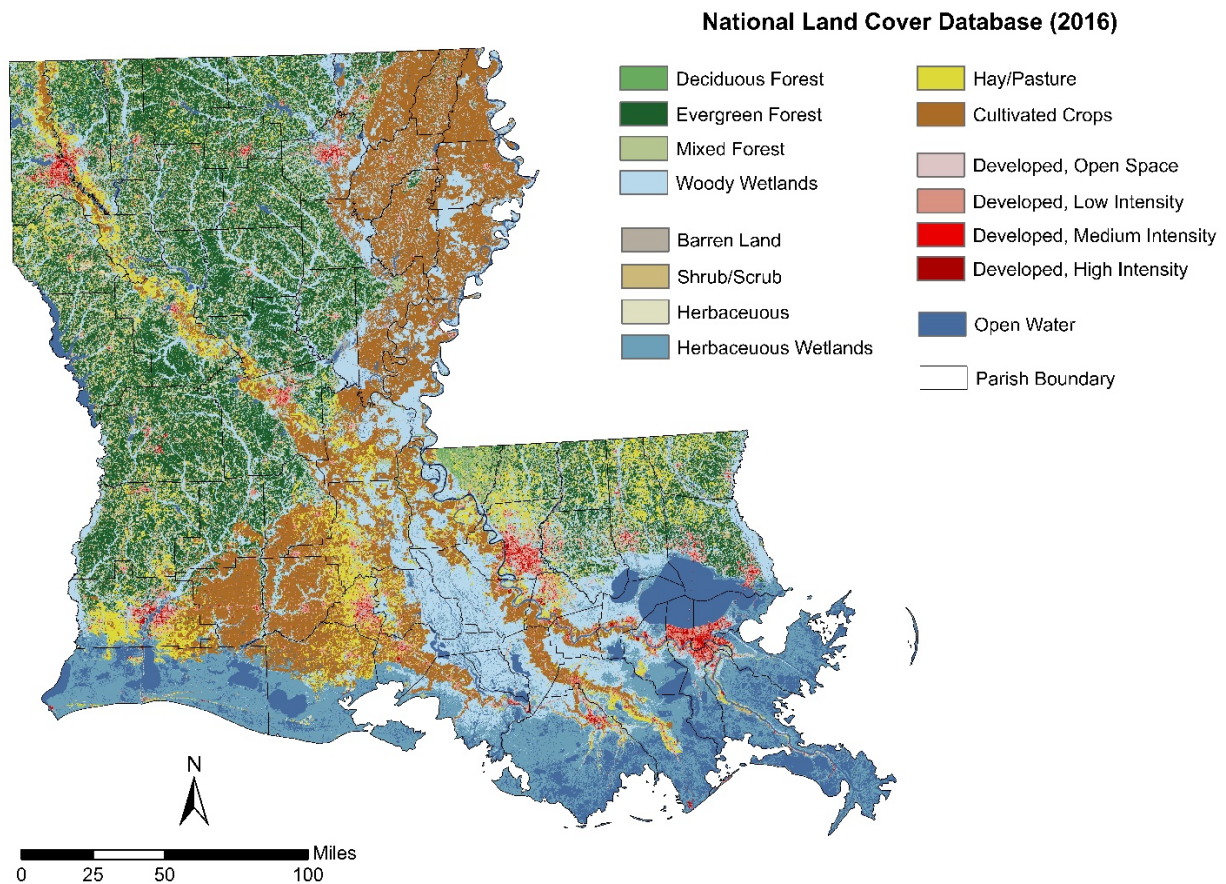


Figure 3. Land cover classes in Louisiana (National Land Cover Database; Yang et al. 2018).

Forest Distribution

The South Central Plains in northwestern Louisiana and Western Gulf Coastal Plain contain the most forested areas within the state. Of 64 Louisiana parishes, 22 are estimated to be > 50 percent forested with Winn Parish having the greatest forest cover at 71 percent (Figure 4). Nineteen parishes

are 25 to 50 percent forested. Twenty-three parishes are estimated to be < 25 percent forested and are mostly located in the Mississippi Alluvial Plain, where agricultural land use is dominant, and the Western Gulf Coastal Plain and coastline, characterized by complexes of emergent herbaceous wetlands.

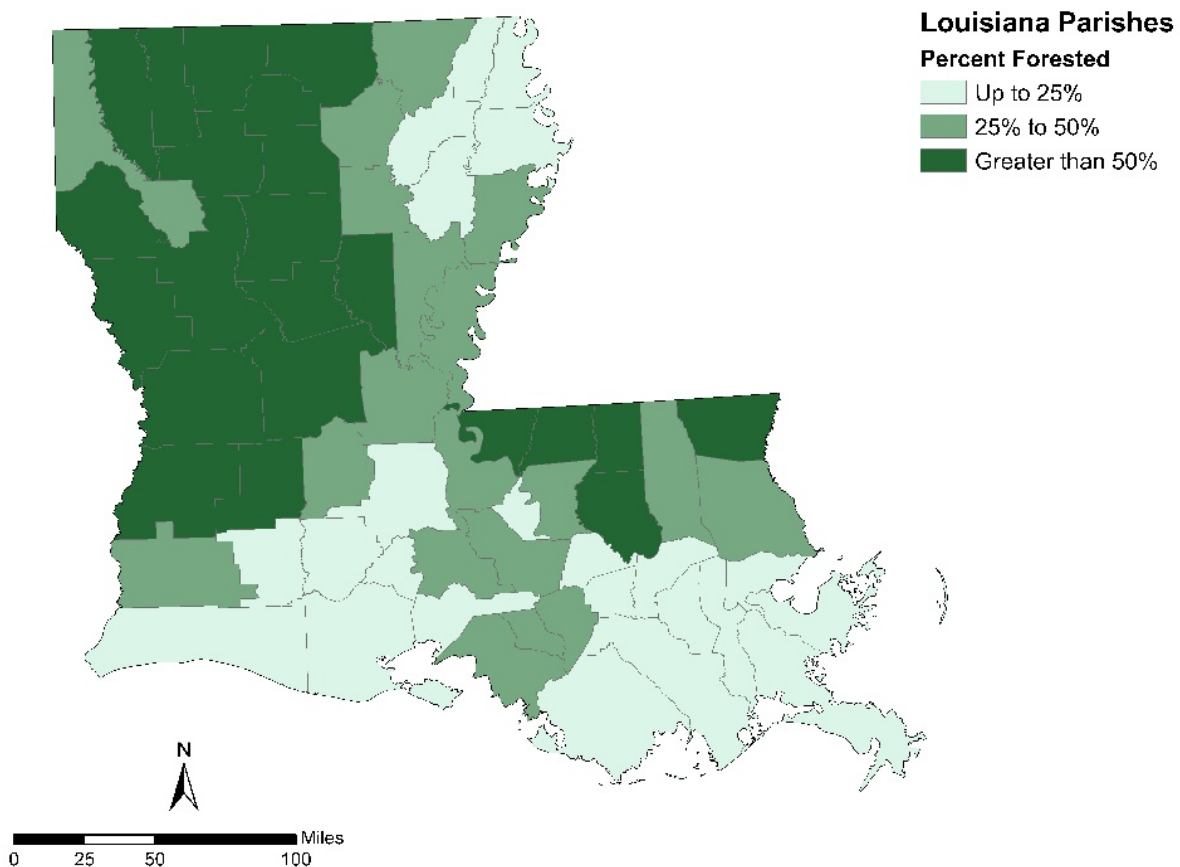


Figure 4. Percentage of surface area in forest by parish.

Forest Composition

Forest types are used to describe assemblages of trees that occur on the landscape. The most common forest type in Louisiana is loblolly-shortleaf pine followed by oak-gum-cypress, occupying 5.3 million and 4 million acres, respectively (Figure 5; FIA 2019). The longleaf-slash pine forest type has substantial presence in southwestern Louisiana between the Sabine River and Interstate-49. Additional pockets of longleaf-slash pine are present in the West Gulf Coastal Plain where gopher tortoise (*Gopherus polyphemus*) is a

federally threatened species being managed by LDWF with prescribed fire and heightened landowner engagement (Holcomb et al. 2015). Oak-hickory, elm-ash-cottonwood (*Ulmus-Fraxinus-Populus* spp.), and oak-pine forest types are also common. The most significant changes in forest types since 2005 have been increases in oak-gum-cypress, elm-ash-cottonwood, and loblolly-shortleaf pine forest types concurrent with a decline in the oak-hickory forest type (Figure 6). These changes are most likely due to plantings associated with mitigation banks and the Conservation Reserve Program.

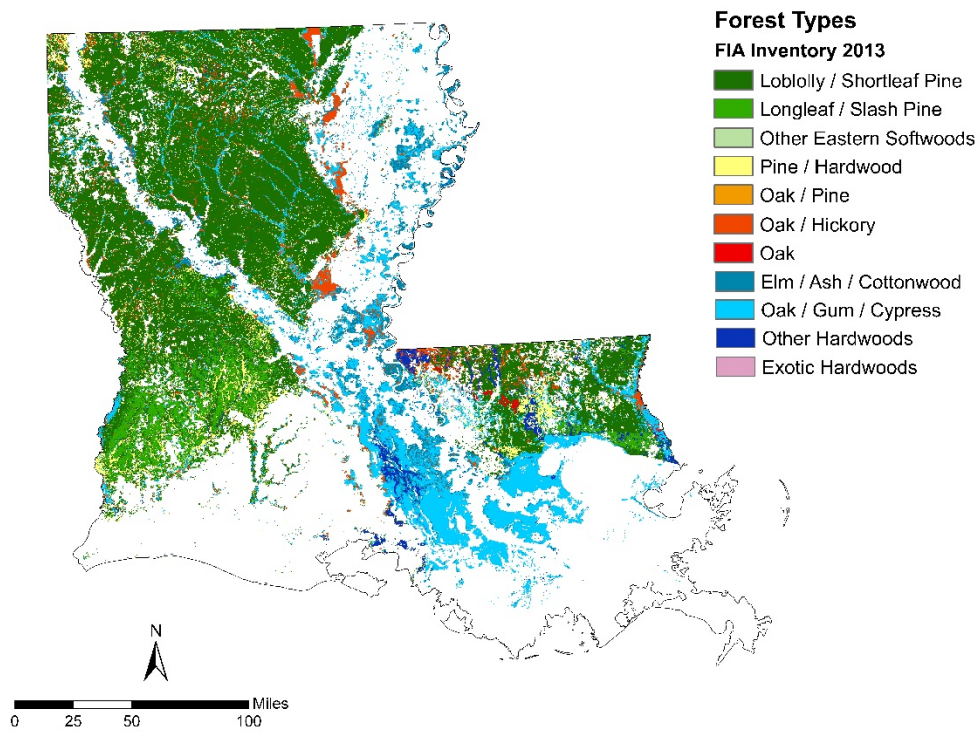


Figure 5. Forest type composition of forestland in Louisiana, 2013 (FIA 2019).

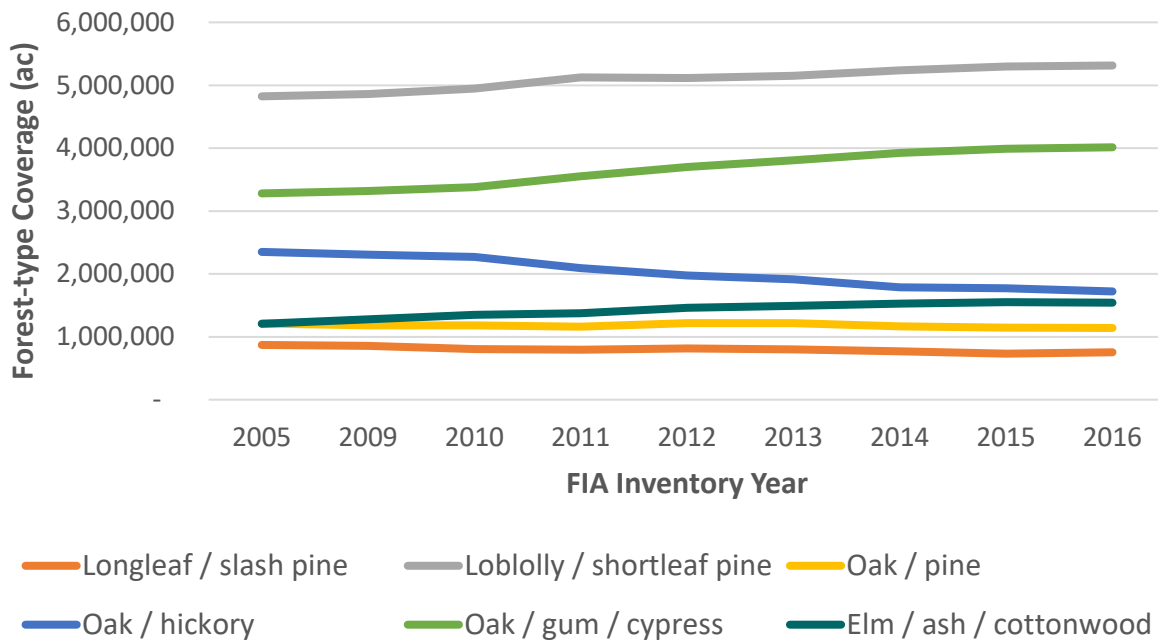


Figure 6. Change in forest type composition in Louisiana since Hurricane Katrina in August of 2005 (FIA 2019).

Growth, Removals, & Mortality

Average annual net growth slightly decreased from 1.19 billion cubic feet in 2009 to 1.02 billion cubic feet in 2012; this downward trend was then reversed and annual net growth rebounded to 1.10 billion cubic feet during the 2016 inventory (Figure 7). Concurrently, annual removals fell each year from 2009 to current inventory, resulting in a 21% decline in removals in the last decade. Trends in growth and removals are reflected further in growth-to-drain

ratios, which have increased from 1.3 in 2009 to 1.5 at present. Average annual mortality has held relatively constant. However, local outbreaks of southern pine beetle and other forest pests have led to increased mortality in some parishes, acting as a “reset button” on the successional process. For example, a southern pine beetle outbreak in the Homochitto National Forest in Mississippi spread southward into Louisiana’s Florida Parishes. This area of Mississippi and Louisiana remains a hotspot for southern pine beetle activity.

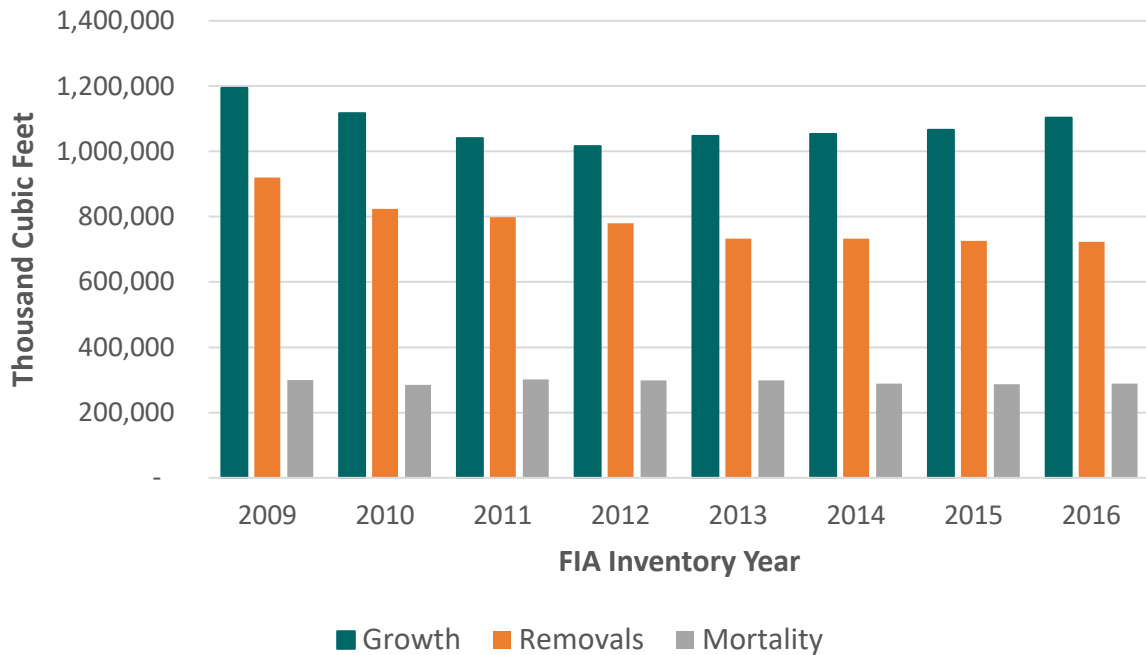


Figure 7. Average annual net growth, removals, and mortality on forestland in Louisiana, 2009-2016 (FIA 2019).

CHARACTERISTICS OF PRIVATE FORESTLAND OWNERSHIP

Landowner studies and surveys provide statistics and capture trends in landowner demographics, land characteristics, reasons for owning land, land ownership history, and landowner concerns. The U.S. Forest Service conducts a National Woodland Owner Survey at least once per decade as part of the Forest Inventory and Analysis program. Results from the National Woodland Owner Survey (Butler et al. 2016, Butler et al. 2020) suggest that about 87 percent of forestland and 88 percent of timberland in Louisiana are in private land holdings (families, partnerships, and forest industry). Nearly 49 percent of forestland is owned by corporate entities while families and individuals own 37 percent (Butler et al. 2016). Public lands account for 13 percent of forested area with 4 percent being managed by the U.S. Forest Service as National Forest and 9 percent held by state, local, and other federal agencies (FIA 2019). The following sections discuss privately owned forestland held in corporate and family forest ownerships, and is limited in scope to land holdings of at least 10 acres in size. Less than one percent of forestland in family forest ownership is in tract sizes of less than 10 acres (Butler et al. 2020).

Forestland in Family Forest Ownership

More than 48,000 family forest ownerships (individuals, family LLCs, trusts and estates) hold an estimated 5,178,000 acres in tracts of at least 10 acres (Butler et al. 2020). The size of forest and woodland holdings is unevenly distributed. Of landowners with at least 10

acres, 59 percent hold less than 50 acres, making up 12 percent of forestland. Forty-one percent of land holdings are at least 500 acres and held by only three percent of family forest landowners (Figure 8).

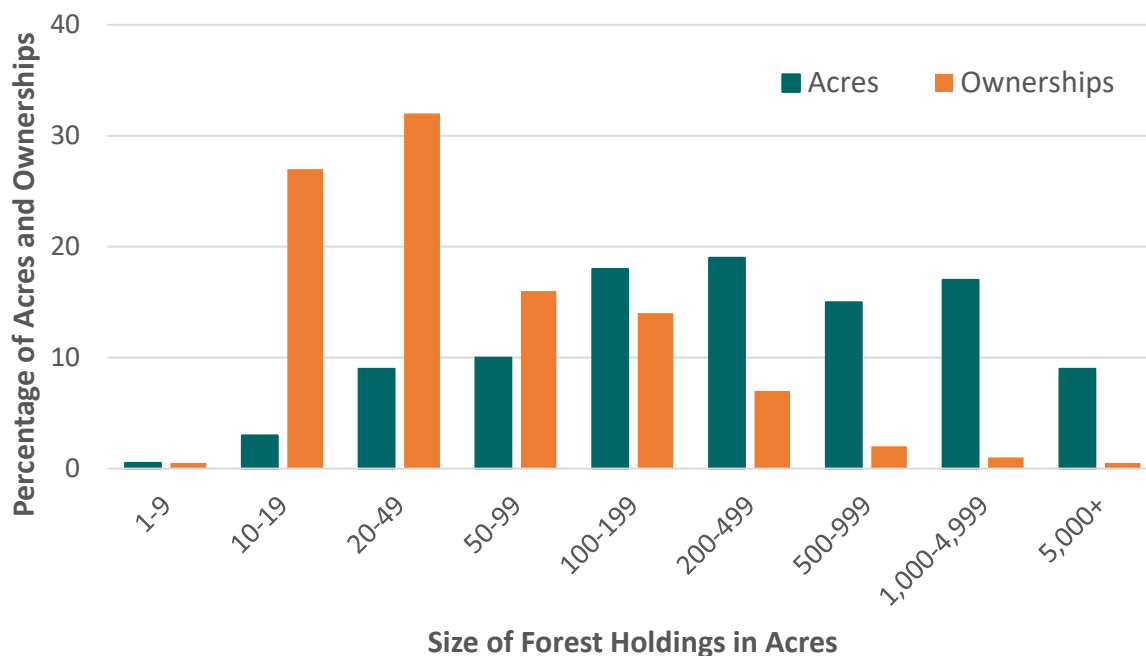


Figure 8. Percentage of acres and ownerships by size of forest holdings (Butler et al. 2020).

The majority (51%) of landowners indicated that their forestland was acquired through inheritance, albeit some “inherited” land is purchased at a steep discount or from other heirs, and inheritance accounted for 71 percent of family-owned forestland area. Seventy-eight percent of landowners have

owned their forestland for 10 to 49 years. Nineteen percent of landowners have acquired their property in the last 10 years. Louisiana’s family forest owners are aging (Figure 9), and issues related to land transfers, parcelization, and fragmentation are expected to increase in the next decade.

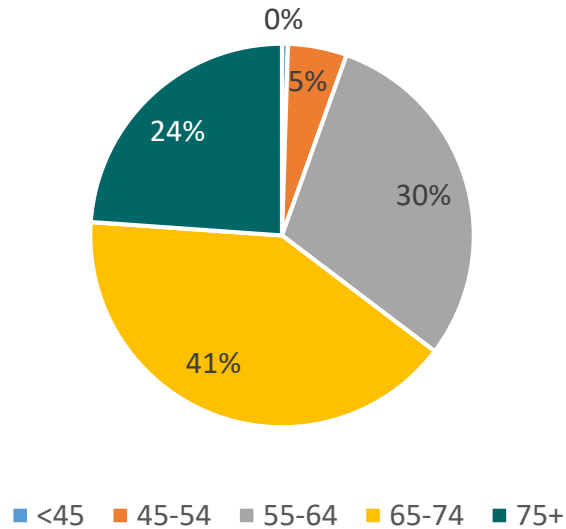


Figure 9. Percentage of ownerships by age of primary owner (Butler et al. 2020).

Only 8 percent of landowners, affecting 25 percent of family forestland, have a forest management plan. Of ownerships with forestland under a management plan, 53 percent claimed that they were “not at all familiar” with their plan (Butler et al. 2020). When seeking land management advice, landowners used consulting foresters more than all other sources (e.g., state, extension, family, other landowners) of information combined. Forty-seven percent of landowners indicated that timber had been harvested during their land tenure. Timber management, followed by land transfer, insects and diseases, and wildlife, was the most commonly selected topic for landowner

assistance (Figure 10). Nine percent of landowners indicated their use of property tax programs, seven percent have used conservation easements, and five percent have used cost-share programs. Thirty-seven percent of landowners, affecting 56 percent of family-owned forestland, have used leases to provide supplemental income with hunting leases being the most popular choice in terms of number of landowners and number of acres. When asked about their preferred assistance programs and policies, the most commonly selected answers were stronger timber markets and more favorable tax policies followed by cost-share programs. Family forest landowners expressed most

concern about trespassing and poaching followed by misuse of wooded land, keeping land intact, wildfire, high property taxes,

insects and diseases, water pollution, and government regulation (Butler et al. 2020).

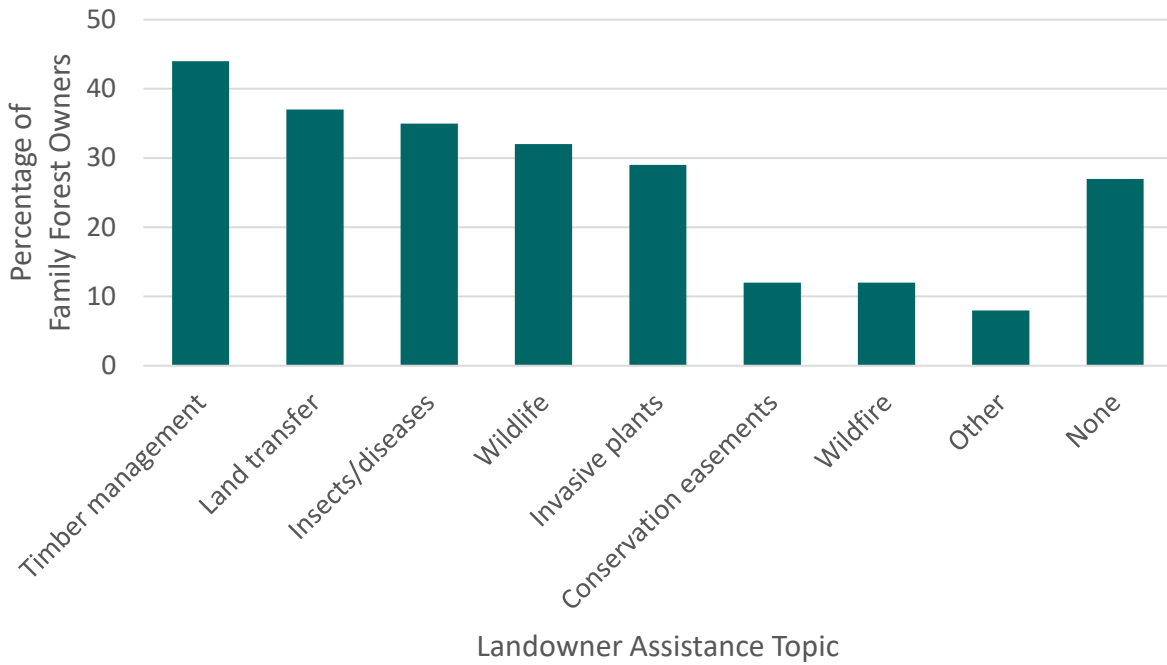


Figure 10. Percentage of family forest owners that were interested in a range of landowner assistance topics (Butler et al. 2020).

SUSTAINING FOREST RESOURCES: THREATS & STRATEGIES

The 2020 Forest Action Plan identifies three primary threats to Louisiana's forest resource:

- 1. Lack of active management on private lands,*
- 2. Challenges to forest health, and*
- 3. Challenges facing wildland fire management.*

These threats are decades in the making and deeply intertwined. For example, lack of sound forest management on private lands has led to a buildup of fuels that can increase the risk of wildfires more severe than the historic fire regime to which Louisiana's forests are adapted. Furthermore, unmanaged forests, especially closely spaced plantings, result in conditions more conducive to the spread of many forest insects and diseases including southern pine beetle. The following sections discuss the three primary threats to sustaining healthy forest resources and strategies for dealing with these ongoing challenges.

THREAT 1: LACK OF ACTIVE MANAGEMENT ON PRIVATE LANDS

Forests cover 44 percent, or approximately 13.26 million acres, of Louisiana's land area. Fifty-nine of Louisiana's 64 parishes contain land capable of producing sufficient timber to support forest industry activities as well as provide a range of wildlife habitat, recreation opportunity, scenic vistas, and other environmental benefits. Despite the available forest resource to support a robust timber market, many forest landowners have been discouraged from participating due to a lack of knowledge about current market conditions and difficulty in attracting and contracting logging crews. As fewer landowners engage in the forest products industry, private forestland becomes increasingly unmanaged, which compounds the difficulty in attracting logging crews and

increases risk of forest health issues and wildland fire.

Many of Louisiana's landowners remember the forest products industry's economic boom of the 1990s and early 2000s. Global economic growth and a high number of housing starts nationwide fueled the value of timber in the late 1990s. In 1999, forestry accounted for 69 percent of the total value of all plant commodities grown in Louisiana, and contributed 55 percent of the value of Louisiana's land-based industries, which includes all plants, animals, and freshwater and marine fisheries. The economic impact of forestry and wood-using industries was \$4.4 billion to the State economy. The combined industrial timber product output from roundwood and plant byproducts was 1.09 billion cubic feet with sawlogs and pulpwood taking the greatest shares of roundwood production (38 and 37 percent, respectively; Bentley et al. 2005). Forest

landowners received \$680 million from timber sales, which contributed \$20.8 million to the State in severance taxes. In 1999, private, non-industrial landowners held 62 percent of Louisiana's forest while the forest products industry owned 29 percent and the public held 9 percent.

Many changes have occurred in Louisiana's forest products industry and ownership patterns since 1999. At the time of the 2010 Forest Resources Assessment and Strategy, the economic impact of forestry on the State economy had declined to \$3.3 billion in 2008 and \$2.5 billion in 2009 as economic growth slowed and housing starts diminished (Louisiana Office of Forestry 2010). A wave of large-scale divestiture of land holdings by the forest products industry reconfigured land ownership. By 2010, private, non-industrial landowners held 81% of Louisiana's forestland—a 19 percent increase since 1999—with the forest products industry owning 10 percent and 9 percent held in public trust.

Louisiana's forest industry and ownership patterns have continued to change since the 2010 Assessment. In 2012, the economic impact of forestry and forest products industry in Louisiana was analyzed using IMpact Analysis for PLANning (IMPLAN), an input-output model that tracks the direct contributions of forestry as well as how forest products are used by other sectors of the economy to fuel economic growth (LSU AgCenter 2015). Forestry and forest products industry directly impacted nearly 20,000 jobs, providing \$1.433 billion in income (wages, salaries, and benefits), and generating \$6.969 billion of output value. When considering all direct and indirect effects of the forest economic sectors in

2012, a total of 45,661 jobs, \$2.67 billion of income, and \$10.86 billion of output had roots in Louisiana's timberlands.

In 2016, landowners harvested 879.8 million board feet of sawtimber and 6.5 million cords of pulp and chip-and-saw, representing a 32% decline in sawtimber harvest compared to 1999. Forest landowners received \$493.2 million in 2016, which was an improvement over the Recession years but still below 1999 income. The American Forest and Paper Association (2018) counted 19,294 direct employees and \$1.214 billion of income in the forestry sector, a slight decrease from the 2012 IMPLAN results.

In the face of these changes, many private landowners expect circa-1999 timber sales to yield economic benefit today. When their expectations of a "fair price" are not met, private landowners are discouraged from participating in timber markets, and the lack of economic incentive often precludes active forest management. Pine plantations that were established more than 15 years ago are due for a thinning or final harvest. As these activities are deferred, timber stands remain in closed canopy conditions at dense stocking, allowing a buildup of needle cast that can fuel wildland fires, limiting wildlife use, and increasing the risk of mortality due to insects and diseases.

A further strain on private forest landowners is the current lack of mills and shifting demand to smaller diameter size-classes. Many larger mills are owned and operated by companies that also own forestland, making them less reliant on private, non-industrial forestland. The USDA Forest Service reported 45 primary mills in the State in 2018 (USDA Forest Service 2020)

compared to 60 primary mills in 2002 (Bentley et al. 2005). Some mills have been refurbished to preferably process trees that are 12-14 inches in diameter. Pulpwood has overtaken saw logs as the foremost product, taking 53% of statewide roundwood production compared to saw logs' 22% and veneer logs' 14% (USDA Forest Service 2020).

Despite a shrinking of the forest products economy since 1999, timberlands remain a valuable asset to Louisiana's private forestland owners. Due to the number of changes in the last 20 years and fluctuating market prices, landowners need to be aware of current market conditions and recognize that the means of selling timber must be adjusted accordingly. Re-engaging private landowners is a necessary step in energizing active forest management to the benefit of future timber markets, forest health, and wildland fire management. Cost-share programs, technical assistance, and outreach forums are all practical steps that the Louisiana Office of Forestry can take to secure Louisiana's future working forests.

Strategies

Strategy 1: Increase Landowner Assistance with Timber Management

The Forest Productivity Program (FPP) provides financial assistance to eligible landowners for establishing and improving tree crops. Cost-share payments cover 75% of the total cost of implementing one or more approved forestry practices, not to exceed a maximum limit set for each individual practice. Eligible practices include

- Site preparation for natural regeneration;
- Planting or seeding pine or hardwood crop trees, including the cost of seedlings, seed, labor, and site preparation;
- Post-planting site preparation to reduce or control competing vegetation within the first growing season of crop tree establishment;
- Control of competing vegetation by chemical treatment, pre-commercial thinning, or burning; and
- Release of longleaf pine seedlings by burning.

The FPP is funded through severance tax levied on the value of timber harvests. Since 1998, LDAF has approved 9506 applications cover 526,664 acres for a total of \$52,318,164 assistance for reforestation activities.

Once a landowner enters into a FPP cooperative agreement with LDAF, the property must be maintained in forestry usage for at least 10 years, even if land is sold or conveyed prior to the end of the 10-year period. Landowners who own at least five contiguous acres suitable for growing

commercially valuable timber are eligible for FPP assistance. Eligible landowners may receive up to \$15,000 of FPP assistance each fiscal year.

Federal programs such as Conservation Reserve Program, Conservation Stewardship Program, and Environmental Quality Incentives Program (EQUIP) through the USDA Natural Resources Conservation Service are also administered through LDAF. These programs can subsidize management on timberlands while also enhancing wildlife habitat.

Strategy 2: Increase Landowner Assistance with Prescribed Fire

Prescribed fire is a cost-effective method of reducing competing vegetation, maintaining an easily-accessible timber stand, reducing fuel load and risk of wildfire, and increasing forage and visibility for many popular game species (e.g., white-tailed deer [*Odocoileus virginianus*] and wild turkey [*Meleagris gallopavo*]). The Certified Prescribed Burner program, a training seminar hosted by LDAF and Louisiana State University Agricultural Center, has certified 1,310 prescribed burners since its inception in 1994. The Certified Prescribed Burner program enables landowners to safely and effectively use fire on their properties for a range of benefits while complying with air quality standards and best management practices for smoke management. Certified Prescribed Burner training is typically available during four classes throughout the year spread across the state to maximize landowner access.

LDAF has developed two prescribed fire strike teams dedicated to application of fire

as a land management tool on private forestlands. In February 2019, LDAF and LDWF have discussed prioritizing activities by prescribed fire strike teams and landowner assistance programs in areas that LDWF have deemed highly important to pine woodland and savanna restoration (e.g., Florida Parishes) and on private forestlands with gopher tortoise populations. Continued coordination by the two agencies will be invaluable to increasing active management on lands with dense pine plantings and midstory encroachment, have historically been at risk of southern pine beetle infestation, and present a high risk of wildland fire due to fuel loading.

Strategy 3: Educate Landowners about Marketing and Selling Timber

Education and outreach are key to re-engaging landowners in active forest management and the forest products industry. Landowners need to be informed about mills in their vicinity, what mills are taking in terms of species and dimensional specifications, and trends in timber utilization. Landowners also need to understand transportation costs and how to make their property more attractive to logging crews. Some simple steps such as having clear road access for logging trucks into the property, marking property boundaries, and reducing competing vegetation with prescribed fire can make a timber tract more attractive to a logging outfit. LDAF can advise landowners about current market conditions, refer them to

outreach events, and offer technical assistance.

One of the strongest tools that LDAF has to implement this strategy for landowner education is its partnership with Louisiana State University Agricultural Center (LSU AgCenter). The LSU AgCenter hosts Forestry Forums each winter and spring in every region of the state. These Forestry Forums give landowners direct access to LDAF staff, LSU AgCenter extension agents, researchers, professors, market experts, tax attorneys, and local forestry associations. Forestry Forums typically run as half-day events with at least six topical sessions (Figure 11). Past topics have included timber utilization trends, federal cost-share programs, market opportunities, combating pests and disease, wildland fire protection, navigating land and severance taxes, and wildlife enhancement.

MARKETING AND SELLING TIMBER

- *Be aware of current market conditions. Make decisions based on today's markets, not what conditions were when trees were planted.*
- *Moderate expectations regarding bids and logging outfits. Competing offers are no longer common. Most logging outfits have a long list of properties to harvest and will prioritize based on mill demands, weather, and access.*
- *Maintain clear access to your property for log trucks.*
- *Clearly mark property boundaries.*
- *Install firebreaks and use prescribed burns to reduce competing vegetation and make the property more attractive to loggers.*
- *Use cost-share programs for site preparation, planting, and vegetation control.*
- *Keep informed of timber markets and non-timber sources of revenue (such as hunting leases) by joining parish landowner associations and attending Forestry Forums held each winter and spring through the Louisiana State University AgCenter.*



Forestry Forum 2019

Presented with
Ag Expo



FRIDAY, JANUARY 18, 2019

8 a.m. – 12 p.m.

**WEST MONROE CONVENTION CENTER
901 RIDGE AVE., WEST MONROE, LA 71291**

REGISTRATION 8:00 – 8:30 a.m.
Program begins at 8:30 a.m.

8:30am	Welcome – Dr. Michael Blazier, Hill Farm Research Station, LSU AgCenter; Luke Stamper, Area Wildlife & Forestry Agent, Northeast Region, LSU AgCenter	10:00am	BREAK
8:45am	Tax Topics for Timberland Owners – Paul D. Spillers, Board Certified Tax Attorney & Tree Farmer, Theus, Grisham, Davis and Leigh	10:15am	Forestry Update – Buck Vandersteen, Director of Louisiana Forestry Association
9:15am	Farm Bill – Kevin Norton, LA NRCS State Conservationist	10:45am	Tree Value, Harvesting, and Best Management Practices – Rick Williams, NRCS State Forester
9:35am	The Morehouse Project: A New Project to Enhance Health of Northeast Louisiana/Southeast Arkansas Forests – Dr. Michael Blazier, Hill Farm Research Station, LSU AgCenter	11:15am	Market Opportunities for Northeast Region – Dr. Shaun Tanger, Agriculture Economics, LSU AgCenter
9:50am	Activities of the Louisiana Feral Hog Management Advisory Task Force – Dr. Kim Tolson, Advisory Task Force Chair, Professor of Biology, ULM	11:45am	Wildlife Management in Louisiana – Ashley Long, Extension Wildlife Specialist, LSU AgCenter
		12:00pm	Adjourn

EARLY REGISTRATION FORM
* Due by Friday, January 11, 2019 *

Name(s): _____ # attending _____

Amount enclosed (\$15 per person) _____ Parish of residence _____

Fee includes 1 admission ticket to Ag Expo (Late Registration Fee – \$20.00 at the door)

E-mail address: _____

Yes, e-mail me forestry information and notices in the future.

Make checks payable to: CATAHOULA ANR (Please write Forestry Forum on memo line)

Mail payment and this detached form to: LSU AgCenter, P O Box 160, Harrisonburg, LA 71340

Figure 11. The agenda from Louisiana State University Agricultural Center’s Forestry Forum in northern Louisiana, January 2019.

SUSTAINING FOREST RESOURCES: THREATS & STRATEGIES

THREAT 2: CHALLENGES TO FOREST HEALTH

Challenges to forest health include native and non-native insects, diseases, and invasive plants. Louisiana's major insect and disease challenges often focus on a single tree species or small group of tree species that are dispersed throughout forested landscapes. The diffuse impacts of emerald ash borer, European gypsy moth, redbay ambrosia beetle, and laurel wilt can be difficult to detect at a landscape scale. Other pests and diseases, such as forest tent caterpillar, bald cypress leaf-roller, and southern pine beetle, can cause large-scale defoliation events that can be detected by aerial monitoring and satellite imagery. Likewise, invasive species may be diffuse or concentrated with cogongrass well-known for developing dense monocultures while tungoil tree is more likely to inhabit forest edges and linear disturbances in forest landscapes. Due to these and other differences, methods for detection and monitoring and recommendations for prevention and mitigation differ for each insect, disease, and invasive species.

Insects and Diseases

Louisiana has many threats to its pine and hardwood forests from both native and exotic invasive insects. Highways and waterways are potential pathways for pest introduction. Southern pine beetle is currently the single greatest forest health threat to Louisiana's forest industry.

LDAF conducts scheduled aerial monitoring surveys to detect outbreaks as early as possible and to reduce their potential to spread. LDAF informs landowners of infestations and offers technical assistance for any necessary harvesting or treatment. LDAF frequently assists urban, suburban, and rural landowners with small-scale inspections.

Emerald Ash Borer (EAB)

The emerald ash borer (EAB; *Agrilus planipennis*; Figure 12) is an invasive, wood-boring beetle that was first detected in southeast Michigan in 2002. In the ensuing years, EAB has killed 99 percent of ash trees greater than 1 inch in diameter at the site of its original introduction. All species of the North American ash genus are susceptible. Infested trees die in two to four years. Adult beetles move short distances during flight. The major mode of spread is transport of infested firewood, tree limbs, and untreated lumber and bark.

Louisiana's major ash species, green ash (*Fraxinus pennsylvanica*) and white ash (*F. americana*), are susceptible to EAB. This insect made its appearance in southern Arkansas in 2014, and was discovered in

Webster Parish, Louisiana in 2015. By 2016, EAB-infested ash trees had been detected in Bossier, Claiborne, Lincoln, and Union parishes. Bienville, Caddo, Jackson, Morehouse, and Ouachita parishes soon joined the ranks of EAB infestations. Quarantines on transporting firewood and timber, insecticide treatment, and other management for the ten affected parishes are all being used to slow the spread of EAB. The Office of Forestry locates potential sites for EAB infestation, contracts EAB trap installation, and provides funding for the traps. The Louisiana Office of Agricultural and Environmental Science is responsible for reporting results and establishing quarantines.



Figure 12. Adult emerald ash borer.

European Gypsy Moth

The European gypsy moth (*Lymantria dispar*) has caused heavy hardwood defoliation and mortality in northwestern Louisiana and is progressing southward. In cooperation with the Louisiana Office of Agricultural and Environmental Science, Office of Forestry employees distribute over 200 gypsy moth pheromone traps statewide. These traps are deployed each spring and checked periodically throughout the growing season.

Forest Tent Caterpillar (FTC) and Bald Cypress Leaf-roller (BCLR)

The defoliation of water tupelo (*Nyssa aquatica*) trees by FTC (*Malacosoma disstria*) is a recurring problem in and around the Atchafalaya Basin, near Lake Maurepas, and along the Pearl River. During the 2019 aerial detection surveys, more than 165,000 acres were recorded as defoliated by FTC (Figure 13). Outbreaks of the regular population cycles of FTC are extremely difficult to manipulate or control. Some loss of tree growth is experienced, but often no action is taken to treat the infestation due to the vastness of the areas affected, access issues in swamps, and cost-prohibitive treatments. Normally, the foliage recovers quickly after the outbreak, which is restricted to one generation per year. In close association to FTC is the bald cypress leaf-roller (BCLR; *Archips goyerana*) both in timing and locations of outbreaks. During the 2019 aerial detection surveys, more than 117,000 acres were recorded as defoliated by BCLR (Figure 13). BCLR is allowed to take its course for much the same reasons as FTC.

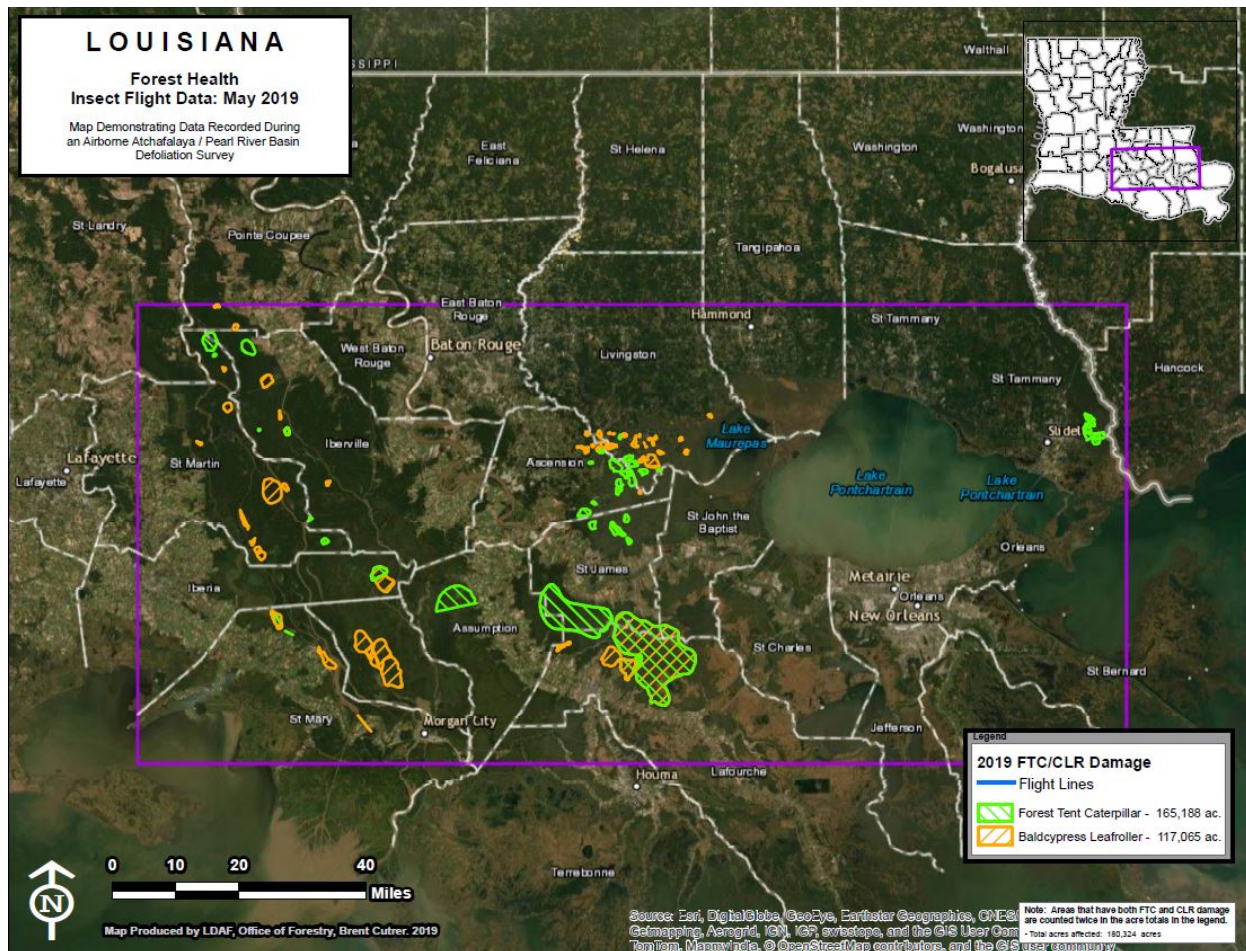


Figure 13. Infestations of forest tent caterpillar and bald cypress leaf-roller recorded during aerial detection surveys in the Atchafalaya/Pearl River Basin, 2019.

Currently, LDAF primarily uses Digital Aerial SketchMapping (DASM) to identify outbreaks of FTC and BCLR. This method consists of identifying features on the ground from an aircraft and recording features on map. DASM remains the preferred method for identifying pest outbreaks due to its reliability and relatively low cost (Schrader-Patton n.d.). Although distinct outlines of infestation areas can be somewhat subjective, trained observers can more accurately and quickly identify infestations than imagery-based mapping. The DASM utilized by LDAF was developed by USDA Forest Service Remote Sensing Applications Center and Forest

Health Technology Enterprise Team in cooperation with State Forestry personnel nationwide. A supplemental technique for detecting forest health problems is the satellite-based Moderate Resolution Imaging Spectrometer (MODIS). Images are produced which can then be used to compare vegetative surface reflectivity to detect rapid changes occurring in forest canopies. The USDA Forest Service Forest Health Protection relays maps with areas of concern to State Forestry agencies, who then verify imagery with ground checks. An FTC-defoliated area along Pearl River was detected using MODIS imagery.

Redbay Ambrosia Beetle and Laurel Wilt

Redbay ambrosia beetles (*Xyleborus glabratus*) carry fungi that serve as a food source for adults and larvae living under the bark of host trees and shrubs. While most species of fungi are harmless to the tree, the *Raffaelea lauricola* fungus (Figure 14) causes laurel wilt, which has swiftly decimated laurel trees in nine states since laurel wilt's identification in 2004.

According to Forest Inventory and Analysis data, as many as 300 million redbay (*Persea borbonia*) trees have already died, and many other trees in the laurel family, including sassafras (*Sassafras albidum*) are susceptible.

Laurel wilt spread rapidly through coastal plain forests of the southern U.S. In 2014, laurel wilt was discovered on sassafras trees in northern Louisiana, the first record of the disease west of the Mississippi River and outside the known range of *R. lauricola*'s primary host, the redbay (Fraedrich et al. 2015). Research is ongoing to better understand how laurel wilt spreads and explore mitigation options.



Figure 14. Redbay ambrosia beetles carry the fungus *Raffaelea lauricola* causing laurel wilt in redbay and sassafras trees. Photo: Jason Waguespack, LDAF.

Southern Pine Beetle (SPB)

Southern pine beetle (SPB; *Dendroctonus frontalis*) can rapidly spread to kill thousands of acres of pine trees within 2-3 growing seasons. Outbreaks of this insect tend to be cyclical in occurrence. Outbreaks have occurred on 6- to 12-year intervals and generally last 2-3 years in areas with a history of SPB. The most recent outbreak in Louisiana occurred in the Florida Parishes and seemingly stemmed from a recurring SPB presence on the Homochitto National Forest in Mississippi (Figure 15).

To monitor SPB activity, LDAF installs more than 30 SPB Lindgren traps each spring to monitor southern pine beetle activity. The survey is initiated when flowering dogwood (*Cornus florida*) begins to bloom or loblolly pine pollen appears. These physiological events coincide with the long-range dispersal of SPB. It is during this spring dispersal period that airborne populations of adult SPBs and associated insects can be monitored most effectively with pheromone-baited traps. Once all the traps are collected, SPB and



Figure 16. LDAF installs Lindgren traps each spring to monitor southern pine beetle activity. Photo courtesy of Brent Cutrer, LDAF.

Clerid beetles, a predator of SPB, are counted and used to model the probability and severity of an upcoming outbreak.



Figure 15. Most southern pine beetle spots are initiated in late spring or early summer. Photo: LDAF.

Diseases

Many tree disease problems occurring in Louisiana forests can be handled through sanitation thinning and site-appropriate forest management. However, control measures for diseases in urban and shade tree environments vary considerably. LDAF responds to many shade tree requests each year, advising landowners on treatment options. Louisiana State University, Louisiana Technical University, and USDA Forest Service Forest Health Program are often consulted by LDAF for technical information. Common diseases in Louisiana are discussed below.

- **Dutch elm disease:** A beetle-spread fungus native to Asia that weakens American elms. Due to their resistance to Dutch elm disease, Chinese elms (*Ulmus parvifolia*) and other resistant elm varieties are currently in use to re-establish elm trees in urban plantings. Resistant seedlings are included in urban planting packets, available through LDAF.
- **Fusiform rust:** In early spring, the fungus (*Cronartium quercuum*) forms bright orange fruiting bodies, releasing spores that infest loblolly and slash pine trees (Figure 17). Longleaf pine has a natural resistance. Fusiform-resistant loblolly pine genotypes have been developed, but do not eliminate susceptibility completely. Burning and sanitation thinning is often recommended to reduce the risk of fusiform rust spread.



Figure 17. Fusiform rust on a pine stem. Photo courtesy of Robert L. Anderson, USDA Forest Service, Bugwood.org.

- **Hypoxylon canker:** A very common fungus (*Entoleuca mammatum*) on oaks stressed by root damage, wounds, and soil compaction. In an urban setting, hypoxylon canker is most prevalent around oaks that have been damaged during construction and road paving activities. Removal of the tree is often necessary.
- **Needle casts and pine needle rust:** The various fungi that make up needle casts become more prevalent on the foliage of pines during wet, cool springs. Needles appear scorched as they die and turn brown. Pine needle rust is a fungus that develops unsightly, dense fruiting bodies. No practical control for either fungal disease is available. High-

value Christmas trees may benefit from the use of fungicides or herbicides to remove any nearby alternative hosts.

- **Annosus root rot:** A fungus (*Heterobasidion irregulare*) that infests loblolly and slash pine through wound openings and roots grafts. Signs of disease include conks near the base of pines. Once the majority of a pine stand is infected, LDAF recommends a clearcut. When thinning an uninfected stand, sprinkling borax on stumps is an effective means of preventing the fungus' establishment. Biocide *Phlebia gigantean*, containing an

antagonistic fungus, should be used on stump surfaces of infected stands.

- **Red heart:** *Echinodontium tinctorium* usually develops in the xylem of older pines, causing decay and structural weakening of the tree (Figure 18). Large, dark fruiting bodies may be the only visible indication of red heart. When adjacent to houses and other valuable structures, it is recommended that a licensed arborist safely remove the tree. Rotted openings within tree stems may serve as housing for cavity-nesting birds such as red-cockaded woodpecker (*Dryobates borealis*).



Figure 18. Red heart weakens the structural integrity of older pines, causing trees to split or break. Photo courtesy of David J. Moorhead, University of Georgia, Bugwood.org.

Invasive Species

Cogongrass

Cogongrass (*Imperata cylindrica*) is a warm-season, perennial grass originating from Asia. Cogongrass is a federally-listed noxious weed and is widely considered the worst invasive species threat in the southern U.S. Since its multiple introductions in the early 20th century, cogongrass has infested 1.2 million acres in the southeastern U.S., and annual spread rates are estimated in the thousands of acres (Prince et al. 2018; Figure 19). In Louisiana, cogongrass' distribution is concentrated in the Florida Parishes, between Baton Rouge and New Orleans, and in the Flatwoods Terrace (Kartesz 2015). Due to its ability to spread by seed and rhizomes, tolerance of shade, and resistance to drought,

cogongrass aggressively spreads through pasture, grasslands, and rights-of-way and penetrates interior forests. Although cogongrass will not tolerate continued soil disturbance, it is a rapid colonizer of recently disturbed soil, often inhabiting road construction sites, industrial lands, and mechanically site-prepared timberland. Cogongrass is fire-adapted; it thrives in places where fire is a regular occurrence. In contrast to the frequent, low-intensity fires that characterize southern pine systems, fires fueled by cogongrass burn with higher heat intensity, spread quickly, and often result in higher tree mortality.

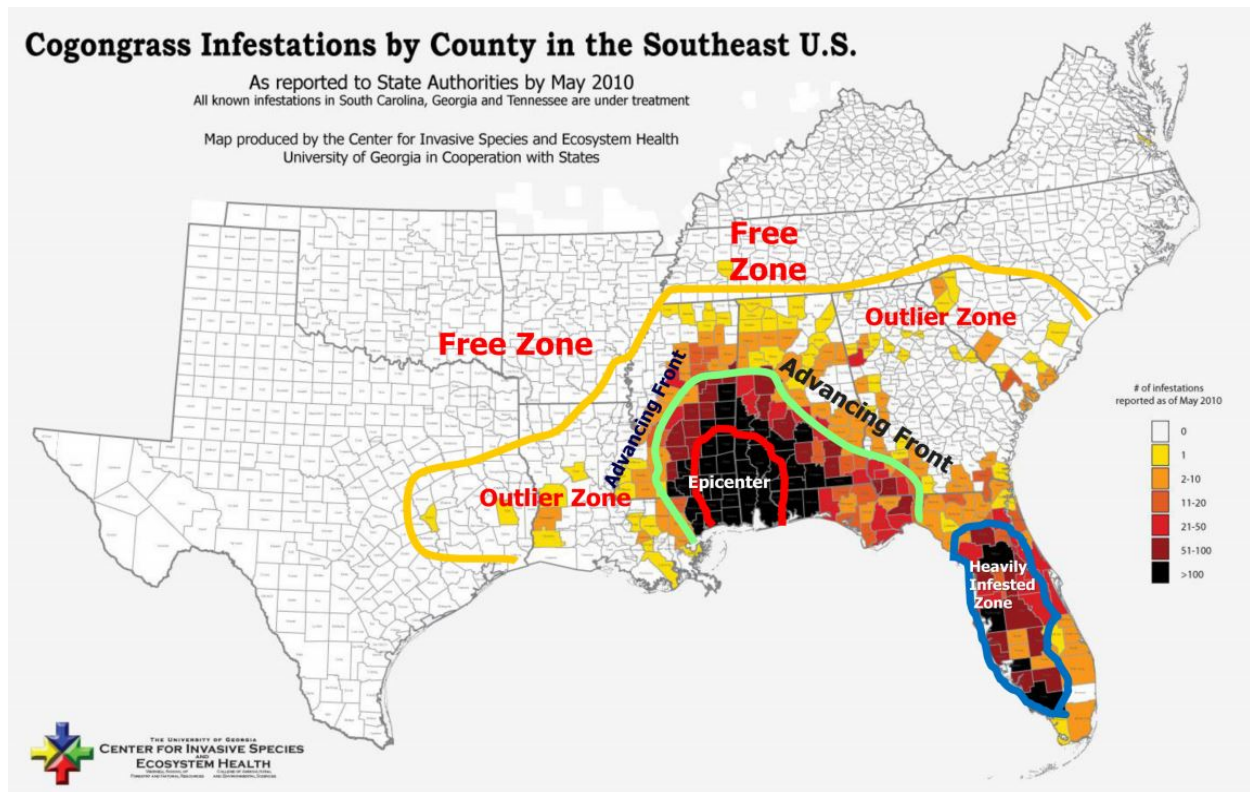


Figure 19. Cogongrass infestations by county in the southern U.S.

Long (12-30 inches) leaves are easily recognizable by their sharp edges and white midrib that is slightly off-center. Leaf margins are serrated and scabrous, and contain high concentrations of silica, rendering

cogongrass unusable as a forage crop.

The belowground root system is extensive, growing as a solid, dense mat of rhizomes that typically spread outward in a circular pattern. Rhizomes are white, segmented, and branched, mostly

inhabiting the upper eight inches of soil but can extend 48 inches below the soil surface. Cogongrass' sharply pointed rhizomes often pierce the roots of neighboring plants.

Cogongrass flowers earlier than most warm-season grasses. Fluffy, white, plumelike seedheads appear in early spring, but cogongrass can initiate flowering at other times in response to disturbance such

herbicide application, fire, mowing, or the first hard frost of autumn. Seedheads are typically two to eight inches in length and contain as many as 3,000 tiny seeds. Each seed has silky, white hairs that aid in wind dispersal. Seed viability is variable, and seed must land on bare ground for germination

The *Louisiana State Wildlife Action Plan* (Holcomb et al. 2015) identifies cogongrass as a Tier 1 invasive species. Cogongrass adversely alters eastern and western longleaf pine flatwoods savannas, eastern and western upland longleaf pine woodlands, and sandbars. Several Species of Greatest Conservation Need are impacted including the federally threatened gopher tortoise (*Gopherus polyphemus*) due to reductions in forage plants and suitable nesting sites.

RECOMMENDATIONS FOR COGONGRASS

- *Diligently clean equipment and machinery after use.* Cogongrass seeds can cling to mowing, logging, and landscaping equipment, hitching a ride from an infested site to an uninfested site. Even equipment that looks clean can transport cogongrass seeds hundreds of miles.
- *Take immediate action when new cogongrass plants are discovered.* Cogongrass is notoriously difficult to remove once it becomes established. Removing cogongrass as soon as it is discovered is the best chance of success.
- *When conducting a prescribed burn, survey the area for cogongrass plants that could colonize the newly burned site.*

Chinese Privet

Chinese privet (*Ligustrum sinense*) was introduced to the U.S. in 1852 as an ornamental shrub. It is still commonly used in landscaping for ornamentation and hedgerows. Chinese privet has become so common in the southern U.S. that it is naturalized, meaning that its reproduction is sufficient to maintain its population without human aid. Chinese privet occurs in every parish of Louisiana.

Chinese privet is a semi-evergreen shrub or small tree that can grow to 20 feet. As a shrub, Chinese privet can form dense thickets, particularly along riparian edges and fence rows, that shade out and exclude understory plant species and may reduce tree recruitment (Figure 20). Although Chinese privet prefers mesic soils, it is tolerant of some drier sites and a wide range of sunlight conditions.

Chinese privet produces abundant spherical fruits that persist through winter, supplying a consistent forage resource to birds and other wildlife.

Chinese privet is categorized as a Tier 1 invasive species in the *Louisiana State Wildlife Action Plan* (Holcomb et al. 2015) with affected communities including bottomland hardwood forest, coastal prairie, eastern and western upland longleaf pine woodland, hardwood slope forest, mixed hardwood-loblolly pine forest, small stream forest, and southern mesophytic hardwood forest.

RECOMMENDATIONS FOR CHINESE PRIVET

- *Remove colonies using mechanical removal, prescribed burning, and herbicide application, as appropriate. Refer to Evans et al. 2006 for guidance.*
- *Discourage use of Chinese privet as an ornamental plant.*

Figure 20.
Chinese privet thicket along a field edge.
Photo courtesy of Chris Evans, University of Illinois, Bugwood.org.



Chinese Tallow Tree

Chinese tallow tree (*Triadica sebifera*; Figure 21), also known as popcorn tree, is a pervasive invader of mesic and wet forests and grasslands and readily dominates disturbed vacant lots and abandoned agricultural land (Evans et al. 2006). Chinese tallow tree has tremendous reproductive potential due to early and long-lasting reproductive maturity, abundant annual seed production, and ability to resprout from stumps and roots. Once established, Chinese tallow tree is nearly impossible to remove. Seeds are dispersed by birds and by water, enabling colonization of undisturbed fields, forests, and riparian areas. Chinese tallow tree can be found in every Louisiana parish.

The USDA considers Chinese tallow tree a large-scale ecosystem modifier (Urbatsch 2000) and Louisiana Department of Wildlife and Fisheries (LDWF) lists it as a Tier 1 invasive species (Holcomb et al. 2015). The 2015 *Louisiana State Wildlife Action Plan* identifies Chinese tallow tree as a threat because it replaces native vegetation, reduces native species diversity, and negatively affects wildlife, particularly resident birds and neotropical migrants inhabiting coastal prairie (Bruce et al. 1995, Randall and Marinelli 1996, Holcomb et al. 2015). However, tallow tree flowers are favored by honeybees, and its fruits are considered a desirable food source for birds (Urbatsch 2000).

RECOMMENDATIONS FOR CHINESE TALLOW TREE

- **Manual & mechanical removal:** *Trees less than 3 feet tall may be removed by hand. Large trees can be felled, fruit removed from the area, and herbicide applied to stumps to discourage resprouting.*
- **Prescribed fire** *is often effective in removal on drier sites, pasture, and rangeland. If trees are not completely killed, then an additional burn, manual removal, and/or herbicide application is necessary to remove resprouting stems from roots.*
- **Herbicide applications** *as sprays and cut-surface treatments can be effective, but care must be taken to avoid non-target species. Refer to Evans et al. 2006 and Urbatsch 2000 for further guidance.*



Figure 21. The ripened fruit of Chinese tallow tree resembles popcorn, giving rise to an alternative common name—popcorn tree. Photo courtesy of Cheryl McCormick, University of Florida, Bugwood.org.

Tungoil Tree

Tungoil tree (*Vernicia fordii*) is a small, deciduous tree native to China where it is cultivated for its milky white sap for use in lacquer, varnish, and polish. Tungoil tree grows best in full sun but can tolerate shade as an understory plant. This species is most often found along forest edges, in rights-of-way, and in urban green spaces. Its range is currently restricted to southern states along the Gulf of Mexico due to an intolerance of cold climates. In Louisiana, tungoil tree is most prevalent in the Florida Parishes.

Tungoil tree can grow to more than 60 feet tall. This species is readily identified by its heart-shaped or three-lobed leaves and the presence of two red glands located on the petiole (leaf stalk) near the leaf blade. Tungoil tree produces abundant clusters of white flowers with pink centers (Figure 22).

All parts of this plant are toxic, especially the fruits and seeds.

Tungoil tree is classified as a Tier 1 invasive species in the *Louisiana State Wildlife Action Plan* (Holcomb et al. 2015). Impacted communities include eastern upland longleaf pine woodland, mixed hardwood-loblolly pine forest, shortleaf pine-oak-hickory woodland, southern mesophytic hardwood forest, and small stream forest.



Figure 22. Flower clusters of tungoil tree. Photo courtesy of James H. Miller, USDA Forest Service, Bugwood.org.

Strategies

Strategy 1: Reduce Impacts of Insects, Disease, & Invasives on Private Forestlands

Cost-share Programs. Several existing programs in LDAF assist landowners with technical advice, training, and cost-share mechanisms, foremost of these being Forest Productivity Program, Conservation Reserve Program, and Certified Prescribed Burner Program. The mechanical, chemical, and prescribed fire treatments available through the Forest Productivity Program have been successful in treating invasive species during site preparation and tree planting. Furthermore, Forest Productivity Program funds can be used after trees are established to remove invasive species such as Chinese tallow tree, privet, and yaupon that routinely compete with crop trees. LDAF will leverage the Forest Productivity Program (FPP) to provide financial assistance to eligible landowners for invasive pest management during site preparation and establishment of tree crops. Cost-share payments cover 75% of the total cost of implementing one or more approved forestry practices, not to exceed a maximum limit set for each individual practice. The FPP addresses invasive species twofold: by giving LDAF a platform with which to engage and educate landowners, and by directly funding invasive pest management. LDAF will target primarily Chinese tallow tree, Chinese privet, cogongrass, tungoil, and yaupon with FPP funds.

Cogongrass Treatment Program. LDAF will continue its Cogongrass Treatment Program to reduce spread and remove



Figure 14. Cogongrass infestation in an open field. Photo courtesy of Brent Cutrer, LDAF.

cogongrass on private, parish, state, and industry forestland. The Cogongrass Treatment Program is a three-year agreement provided at no cost to the landowner. The agreement details acceptable control options for chemical, mechanical, physical, and biological means and sets contractor qualifications. The current goal of the program is to achieve a 3-year negative inspection rate in 2022. During the last state fiscal year, nearly half of all landowner applications to the program were from Washington Parish. St. Tammany and Tangipahoa each captured about one-quarter of all landowner applications. The largest spot treatment was 19 acres. Partnerships are key to the success of this program: USDA



**COGONGRASS
TREATMENT PROGRAM**

Treatment Date _____
Re-Entry Date _____

FOR MORE INFO CALL
225-925-4500

Forest Service, Louisiana Department of Transportation and Development, Parish Forestry Associations, LSU AgCenter, Baton Rouge Green, and Louisiana National Guard.

Strategy 2: Monitor Insect and Disease Outbreaks

Forest health monitoring efforts are key to early detection and treatment of insects, diseases, and invasive species. The Office of Forestry will continue aerial detection and trapping efforts for bald cypress leaf-roller, emerald ash borer, forest tent caterpillar, gypsy moth, redbay ambrosia beetle, and southern pine beetle. LDAF uses ground check crews to verify results from aerial monitoring, especially for SPB. Ground crews are responsible for verifying the causal agent of defoliation, confirming or correcting the geographical location identified by the aerial observer, determine the potential of additional timber losses, identify the direction of expansion, establish a priority for treatment, identify the landowner, and mark a buffer strip in the case of cut-and-remove and cut-and-leave treatment options.

Currently, LDAF is exploring the expansion of forest health monitoring with USDA Forest Service through the Good Neighbor Authority in Shared Stewardship. LDAF will notify Slow the Spread Program, an integrated pest management strategy funded by USDA, of emerging trends in gypsy moth activity to advance rangewide monitoring and mitigation efforts.

Strategy 3: Educate Landowners & Loggers about Cleaning Equipment

LDAF will continue educating landowners and the logging community about the need to clean equipment after logging jobs and address invasive species immediately. Management and eradication of invasive species has a much higher rate of success when action is taken immediately and before the invasive pest becomes firmly established. The LSU AgCenter's Forestry Forums will play a key role in delivering this message.

SUSTAINING FOREST RESOURCES: THREATS & STRATEGIES

THREAT 3: CHALLENGES FACING WILDLAND FIRE MANAGEMENT

The original role of the Louisiana Department of Agriculture and Forestry—Office of Forestry, formerly the Louisiana Forestry Commission, was to provide forest fire detection and suppression. The Office of Forestry is mandated “to protect, conserve, and replenish the natural resources of the state” with the Protection Branch specifically tasked “to protect the citizens, infrastructure and woodlands of the state from destructive wildfires” (Revised Statute 3.4271). As the average cost of fire suppression services increases, providing and maintaining personnel and equipment necessary for forest fire protection strain the Office of Forestry’s budget, motivating the agency to find supplemental sources of funding through federal grant and assistance programs. The historic trends, issues, and strategies presented in this section address the legislative mandate and set the agenda for delivering effective wildfire protection and restoring a healthy, fire-adapted landscape in Louisiana.



Figure #. Prescribed fire. Photo: Gerald J. Lenhard, Louisiana State University, Bugwood.org.

Ecological Importance of Fire

Louisiana's pine-dominated savannas, woodlands, and forests are notoriously well-adapted to frequent fire. Historically, longleaf pine ecosystems burned every 6 months to 5 years; slash pine, shortleaf pine, and pine-oak woodlands burned on a slightly longer fire return interval. These frequent fires can be characterized as low-intensity and low-severity, rarely resulting in mortality of healthy trees, and served to prevent buildup of combustible fuels that facilitate high-intensity, stand-replacing fires.

Due to past nationwide fire suppression efforts, land fragmentation and parcelization, smoke management concerns, liability laws, and need for prescribed fire practitioners, the fire ecology of Louisiana has changed. Few places in Louisiana are managed in congruence with Louisiana's past fire ecology, and much of the state is no longer managed with fire. As a result, pine-dominated ecosystems have shifted from open-canopied woodlands to denser pine stands with midstory hardwood encroachment. Fuels on the forest floor have accumulated, and midstory shrubs and small trees act as ladders for fire to spread to tree crowns in the overstory. Today's wildfires are typically outside the ecological norm, having higher intensity, severity, and tree mortality than fires of centuries past. These wildfires are also more difficult and costly to suppress, occur at closer proximity to critical infrastructure and homes, and pose a threat to life, property, and timber resources.



Figure #. Frequent, low-intensity fires is an integral component of Louisiana's pine woodlands and savannas. Photo: Chuck Barger, University of Georgia, Bugwood.org.

Forest Protection Division: Detection, Suppression, & Prevention

The primary objectives of the Forest Protection Division are the detection, suppression, and prevention of wildfires on 18.9 million acres statewide. Louisiana's wildfire occurrence is high by regional and national standards. Without the effort and dedication of Office of Forestry personnel, the loss from wildfire could be catastrophic.

Detection

Fires are detected by fixed-wing aircraft and reported by the public. Agency personnel inspect and maintain all aircraft within strict Federal Aviation Administration standards. Agency personnel maintain a statewide radio system of mobile, base, and hand-held equipment which provides constant and instant communications, not only in forest fire detection but in civil defense communications as needed.

In the mid-1950s, a fire-weather forecasting program begun with the cooperation of the U.S. Weather Bureau. Daily weather reports are relayed to the districts so that fire crews can be alert to current fire dangers. Smoke management guidelines and forecasts are issued by the Protection Branch to protect air quality and aid with forest prescribed burning programs throughout the state.

Suppression

The Office of Forestry Forest Protection Branch currently involves more than 100 wildland firefighters equipped with trucks, tractor-plows, and two-way radios. These trained professional crews are employed year-round.

The Forest Protection Branch annually conducts training programs for the agency's fire crews, stressing safe and effective firefighting techniques. The agency also has the cooperation of the USDA Forest Service, whose crews may support the Office of Forestry's fire suppression crews during extreme fire conditions.

Prevention

The Office of Forestry has issued guidelines for homeowners, prescribed fire practitioners, and natural resource managers to prevent wildfire ignition. For homeowners, guidelines focus on safe disposal and burning of debris, creating a low-fuel and defensible space around the home, and using proper spark arrestors with machinery. The Certified Prescribed Burn Program instructs landowners and professionals on proper preparedness, ignition, and management of a planned burn in accordance with smoke management guidelines.

Recent Trends

Louisiana experiences approximately 5,000 wildfires per year. Approximately 34 percent are suppressed by Office of Forestry wildland firefighting personnel, and the remaining, particularly small (<1 acre) fires, are suppressed by local fire departments. Risk of ignition is particularly high in the Florida Parishes and in the Flatwoods Terrace of inland southwestern Louisiana (Figure 23),

and ten-year averages of fire occurrence is highest in these two areas (Figure 24). Northwestern Louisiana displays a consistent, moderately-high ignition risk and realized fire occurrence, albeit to a lesser degree compared to the Florida Parishes and Flatwoods Terrace. These fire patterns are congruous with the longleaf pine historic range in southern Louisiana and shortleaf pine-oak woodlands of northern and central Louisiana.

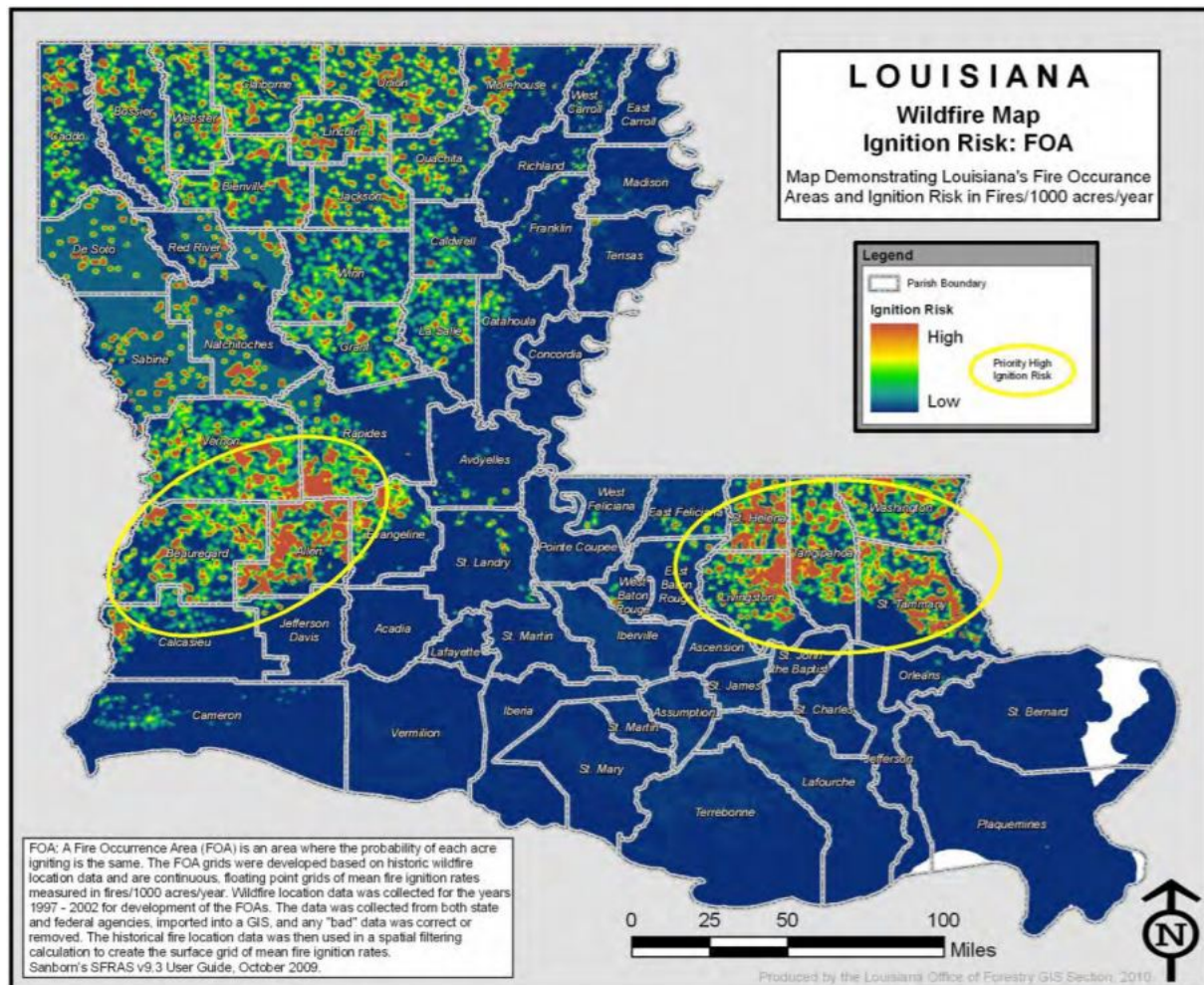


Figure 23. A map of Louisiana's ignition risk demonstrates the high potential for wildland fire activity in the Flatwoods Terrace of inland southwestern Louisiana, the Florida Parishes, and, to a lesser extent, northwestern Louisiana.

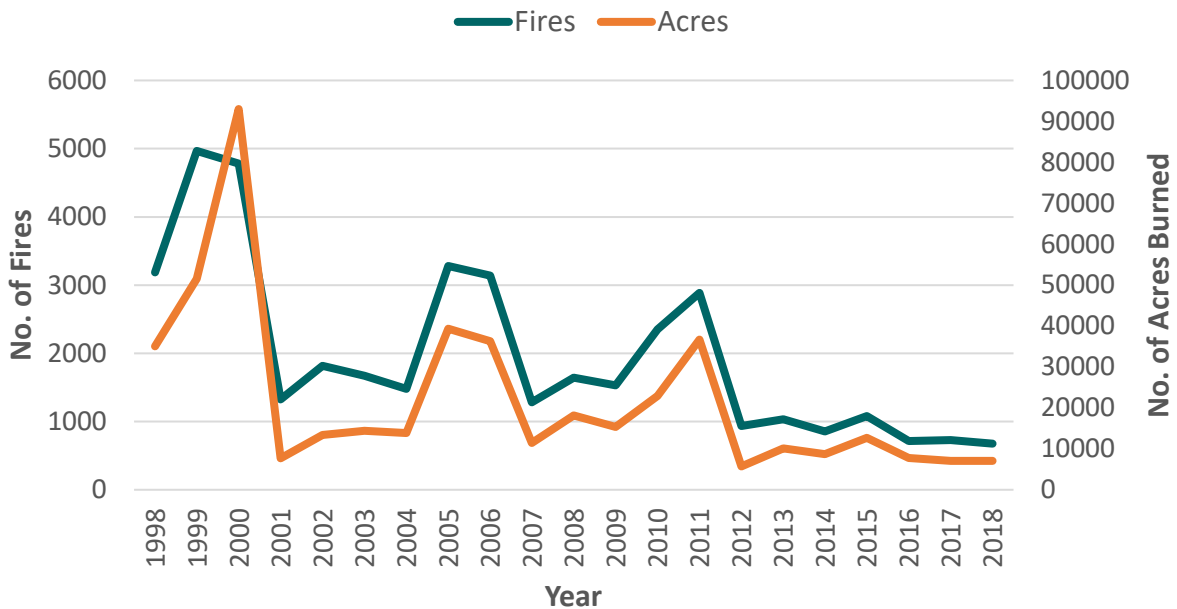


Figure 25. Number of fires and acres burned in Louisiana has decreased since 1998.

Fire occurrence and total acres burned in a fire seasons is correlated with drought conditions. History of drought conditions in Louisiana, obtained from U.S. Drought Monitor, demonstrate spikes in the state’s area in Moderate, Severe, Extreme, and Exceptional drought conditions for years 2000-2001, 2005-2007, and 2010-2012 (Figure 26). Correspondingly, periods of high fire activity occurred in 1998-2000, 2005-2006, and 2010-2012 (Figure 25). According to the U.S. Drought Monitor, the

longest duration of drought in Louisiana since 2000 lasted 107 weeks beginning on April 20, 2010 and ending on May 1, 2012. The most intense week of drought occurred during June when 65% of Louisiana was in the highest drought category (D4). During the 2010-2012 drought, the number of annual reported fires and acres burned doubled from previous years. Monitoring drought conditions is part of situational awareness for wildland fire management in the Office of Forestry’s Division of Forest Protection.

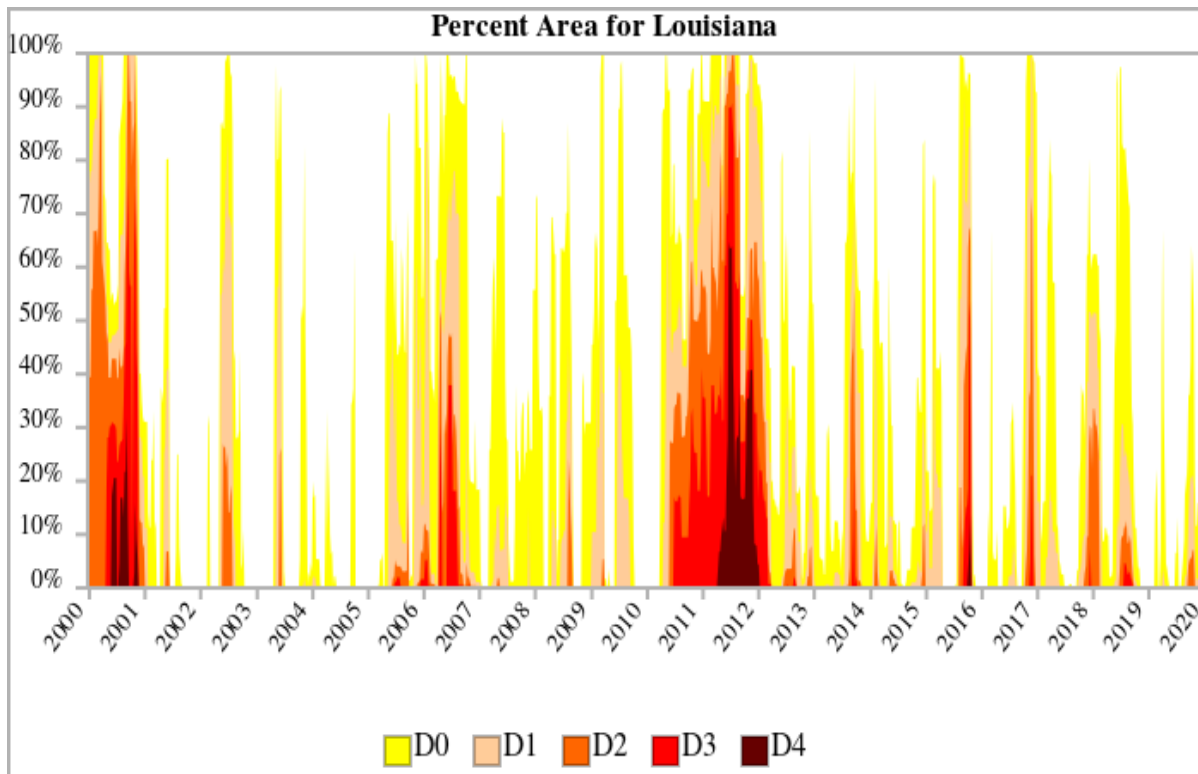


Figure 26. Recent history of drought in Louisiana as recorded by percent area in five drought categories: D0—Abnormally Dry, D1—Moderate Drought, D2—Severe Drought, D3—Extreme Drought, and D4—Exceptional Drought (U.S. Drought Monitor, accessed January 13, 2020).

Smoke Management

Smoke management has been and will continue to be an important issue. LDAF has worked with several government agencies (e.g., LDWF) and citizen-driven groups (e.g., Louisiana Prescribed Fire Council) to promote prescribed burning and proper smoke management.

Prescribed fire is an indispensable and common management tool due to its effectiveness, cost-efficiency, and ecological benefits. More than 300,000 acres are prescribed-burned annually on forestlands, rangelands, and agricultural lands, and this number is likely to increase as the number of prescribed fire practitioners increases. In order to lessen the impact of smoke generated

during prescribed burning on public health, LDAF and the Louisiana Forestry Association have jointly developed voluntary smoke management guidelines for the State of Louisiana under the state’s Smoke Management Program. Louisiana’s Smoke Management Program establishes a basic framework of procedures and requirements for managing smoke based on the EPA’s National Ambient Air Quality Standards (Louisiana Smoke Management Program 2012). The voluntary guidelines seek to minimize concentrations of smoke in sensitive areas (e.g., proximity to schools and hospitals) and maintain air quality standards while retaining fire as an ecological and economical land management option (LDAF & LFA 2014).

Strategies

To combat destructive wildfire, LDAF has enumerated and implemented several strategies that prevent and mitigate impact of future wildfires by increasing prescribed burning and returning pine-dominated systems to ecologically-appropriate fire management, educating the public about preventing wildfires and protecting their property, and increasing capacity of state and local wildfire response.

Strategy 1: Maintain Fire Suppression Preparedness within Office of Forestry

The Office of Forestry currently retains 102 bulldozers and transports equipped with fire plows, 22 off-road pumper trucks, and 12 Cessna 182 planes for aerial detection and ground support. The Office of Forestry is part of the South Central Interstate Forest Fire Protection Compact, which allows Louisiana and other member states to call for equipment and personnel assistance in wildland firefighting when in-state resources are insufficient.

Strategy 2: Increase and Standardize Fire Incident Reporting

In the past, the Office of Forestry has relied on local fire departments for incident reports to gauge statewide wildfire activity and assess fire suppression needs. The Office of Louisiana State Fire Marshall is currently establishing a reporting system to capture data from rural fire departments based on a reporting model utilized by the Texas Forest Service. This information is vital for calculating costs, tracking statewide wildfire occurrence, and reporting results.

Strategy 3: Reduce Fuel Loads through Management

The Office of Forestry encourages landowners to reduce fuel loads when possible to mitigate risk of property loss by wildfire. Effective means of reducing fuel loads include timber thinning, mechanical brush removal, and prescribed fire. Regardless of method, the key to successful fuel load reduction is the removal of ladder fuels, which connect ground vegetation to tree crowns, and dense understory brush that may become volatile during drought conditions (Figure 27).



Figure 27. Mechanical brush removal removes ladder and ground fuels to reduce risk of timber damage in a wildfire.

Prescribed fire is a cost-effective method of reducing fuel load that also promotes use by many game species. The Certified Prescribed Burner program, a training seminar hosted by

LDAF has also developed two prescribed fire strike teams operating out of ? and ?. These are dedicated prescribed fire crews, meaning their first priority is implementing prescribed fire on private forestlands rather than responding to wildland fires.

Strategy 4: Increase Capacity of State and Local Wildfire Response

The majority of volunteer fire departments (VFDs) are equipped and trained to fight structural fires. Many VFDs do not possess the necessary equipment for wildland firefighting nor are personnel trained in wildland firefighting tactics and response. The Office of Forestry has three means of increasing state and local wildfire response capacity: Forest Fire Protection Assessment, Federal Excess Personal Property program, and Volunteer Fire Assistance grant program.

Forest Fire Protection Assessment

The 1944 Louisiana legislature established Act 179: Forest Protection Acreage Assessment, which allows individual parishes to voluntarily levy a tax not to exceed two cents per acre on all forestland of the parish for the purpose of establishing forest fire protection. Landowners whose forest is classed as timberland are taxed at a rate of eight cents per acre. Non-forest land cover and use (e.g., cropland, pasture, coastal marsh, open water) are not eligible for the assessed fee. Funds from the Assessment are

LDAF and Louisiana State University Agricultural Center, has 1310 certified and 909 non-certified prescribed burners since its inception in 1994.

solely dedicated to the purchase and maintenance of equipment and supplies for wildfire suppression. Within a year of the Assessment's enactment, nine parishes representing 6.5 million acres adopted the Assessment. Today, x parishes representing x million acres have adopted the Tax, and total current tax assessment for these parishes is \$x.

Federal Excess Personal Property Program

The Office of Forestry, in cooperation with the USDA Forest Service, provides excess military equipment to rural VFDs for fire suppression activities. Current inventory in the program has provided approximately 161 pieces of equipment valued at \$4.5 million to VFDs. Equipment includes pickup trucks, ladder trucks, tanker trucks, and generators.

Participating VFDs overwhelmingly agree that FEPP is greatly beneficial for the protection of their communities. Most FEPP-provided equipment requires monetary investment to be ready for wildland firefighting service, and providing equipment as well as funding its refurbishment is critical to delivering effective wildfire suppression.

Volunteer Fire Assistance Grant Program

The Volunteer Fire Assistance (VFA) program, formerly known as the Rural Community Fire Protection program, is administered by State Forestry agencies in cooperation with USDA Forest Service. The VFA program allows applications for 50-50 cost-sharing grants that can be used to organize, train, and equip fire departments in rural areas, defined as having a population of no more than 10,000 persons. The Office of Forestry Protection Branch oversees the VFA program for the State of Louisiana. Over the last ten years, VFDs have been granted more than \$2.8 million (not including administration fees) with an average annual granting of \$281,090 to 55 VFDs. Individual application awards typically range from \$1,000 to \$7,000. The availability of these funds has greatly increased rural VFDs efficiency and participation in wildfire suppression efforts across the state.

Strategy 5: Increase Public Awareness and Community Preparedness

As Louisiana's population increasingly centers in urban and suburban areas, natural resource managers must adopt policies and operational standards to meet challenges inherent in the expansion of the wildland-urban interface (i.e., where the natural and built environments come together). The Office of Forestry increases public awareness to possible hazards through education campaigns in schools, demonstration areas, advocating for Community Wildfire Protection Plans, and introducing programs such as FireWise and Ready-Set-Go! LDAF makes a concerted effort in the month of November which is designated as Fire Prevention Month in Louisiana. The Office of Forestry runs an annual campaign in public schools to educate students on the importance of fire safety and preventing wildfire (Figure 28).



Figure 28. Smokey Bear at Olla Elementary School educates 224 students in kindergarten through third grade on the importance of preventing wildfires.

CREATING A COMMUNITY WILDFIRE PROTECTION PLAN

The minimum requirements as described in the Healthy Forests Restoration Act are

1. **Collaboration:** A CWPP must be collaboratively developed by local and state government representatives, in consultation with federal agencies and other interested parties.
2. **Prioritized Fuel Reduction:** A CWPP must identify and prioritize areas for hazardous fuel reduction treatments that will protect one or more at-risk communities and essential infrastructure.
3. **Treatment of Structural Ignitability:** A CWPP must recommend measures that homeowners and communities can take to reduce the ignitability of structures throughout the area addressed by the Plan.

See the Handbook for Wildland-Urban Interface Communities for more information (Society of American Foresters 2004).

FireWise & Ready-Set-Go!

FireWise, founded by the National Fire Protection Association, seeks to increase awareness and preparedness among homeowners so that they and their communities can proactively adapt to wildfire risk. FireWise is directed at homeowners and city councils in order to reduce the number of hazardous fuels immediately adjacent to valuable property and to develop exit strategies if an event necessitates evacuation. Louisiana does not yet have a certified FireWise site. Ready-Set-Go!, developed by Cal Fire, is an education campaign encouraging homeowners to 1) be ready—create and maintain a defensible space around a home, 2) get set—plan and prepare for possible evacuation routes, and 3) go!—take necessary evacuation steps when the need arises. Both FireWise and Ready-Set-Go! encourage homeowners and communities are to be proactive in reducing the risk of damage prior to a wildfire occurring and reducing risk to life by having a clear exit strategy. LDAF is committed to

encouraging individual landowners and communities to adopt FireWise and Ready-Set-Go! principles.

SUSTAINING FOREST RESOURCES: THREATS & STRATEGIES

RESOURCES NEEDED BY THE STATE FORESTER

The following table describes resources needed by the State Forester to address the identified threats and successfully implement strategies. The five resources needed are

- Partnerships with government and non-government organizations
- Financial assistance to private landowners
- Additional State dollars for program delivery
- Additional Federal dollars for program delivery
- Increased technology and analytical capacity

		Partnerships, Government & Non-government	Financial Assistance to Private Landowners	Additional State Dollars for Program Delivery	Additional Federal Dollars for Program Delivery	Increased Technology & Analytical Capacity
Lack of Active Management	S1: Increase Landowner Assistance, Timber Management	●	●	●	●	
	S2: Increase Landowner Assistance, Prescribed Fire	●	●	●	●	
	S3: Educate Landowners about Marketing & Selling Timber	●				
Challenges to Forest Health	S1: Reduce Impacts of Insects, Disease, & Invasives	●	●	●	●	
	S2: Monitor Insect & Disease Outbreaks	●		●	●	●
	S3: Educate Landowners & Loggers about Clean Equipment	●				
Challenges Facing Wildland Fire Management	S1: Maintain Preparedness within LDAF			●		
	S2: Increase & Standardize Fire Incident Reporting	●				●
	S3: Reduce Fuel Loads	●	●	●	●	
	S4: Increase State & Local Capacity	●			●	
	S5: Increase Public Awareness & Community Preparedness	●				

SUSTAINING FOREST RESOURCES: PRIORITIES

STATEWIDE & FOREST STEWARDSHIP PROGRAM PRIORITY AREAS

This Forest Action Plan identifies three overarching threats to Louisiana's forest resources and enumerates strategies for addressing these threats. LDAF has identified spatial priority areas for implementing strategies based on a balance of where need is greatest and likelihood of success is highest. LDAF's statewide spatial priorities address the identified threats as follows.

- ***Lack of Active Forest Management:*** *Statewide priority areas focus on private forestland dominated by pine species. Because pine remains Louisiana's most important species group for industry, landowners with planted or naturally regenerating pine stands have the greatest potential to engage in forest products markets. Furthermore, statewide spatial priorities are located proximal to many of industry's pine sawlog and pulp mills.*
- ***Challenges to Forest Health:*** *Statewide priority areas include parishes historically impacted by southern pine beetle and parishes currently affected by laurel wilt. Encouraging and funding active management on private forestlands within priority areas can address other forest pests and diseases, especially those that thrive in dense monocultures and crowded conditions.*
- ***Challenges Facing Wildland Fire Management:*** *Statewide priority areas include all parishes with moderate to high ignition risk and historic fire occurrence. Promoting active forest management, such as thinning and prescribed burning, on private forestlands within statewide priority areas can reduce hazardous fuel loads, increase firebreaks, and provide defensible space near structures and roads.*

To focus effort and resources as much as possible, statewide priority areas are identical to priorities identified for the Forest Stewardship Program (Figure 29). Approximately five million acres are given high priority, with almost all of this acreage occurring in the Flatwood Terraces, Florida Parishes, and northwestern Louisiana. A further 8.9 million acres are given low priority, and these low priority areas largely represent hardwood forests in private ownership. LDAF's Forest Legacy Areas, where the Forest Legacy Program funds can be administered, occur in areas of high priority and further consolidate LDAF's resources for maximum conservation impact.

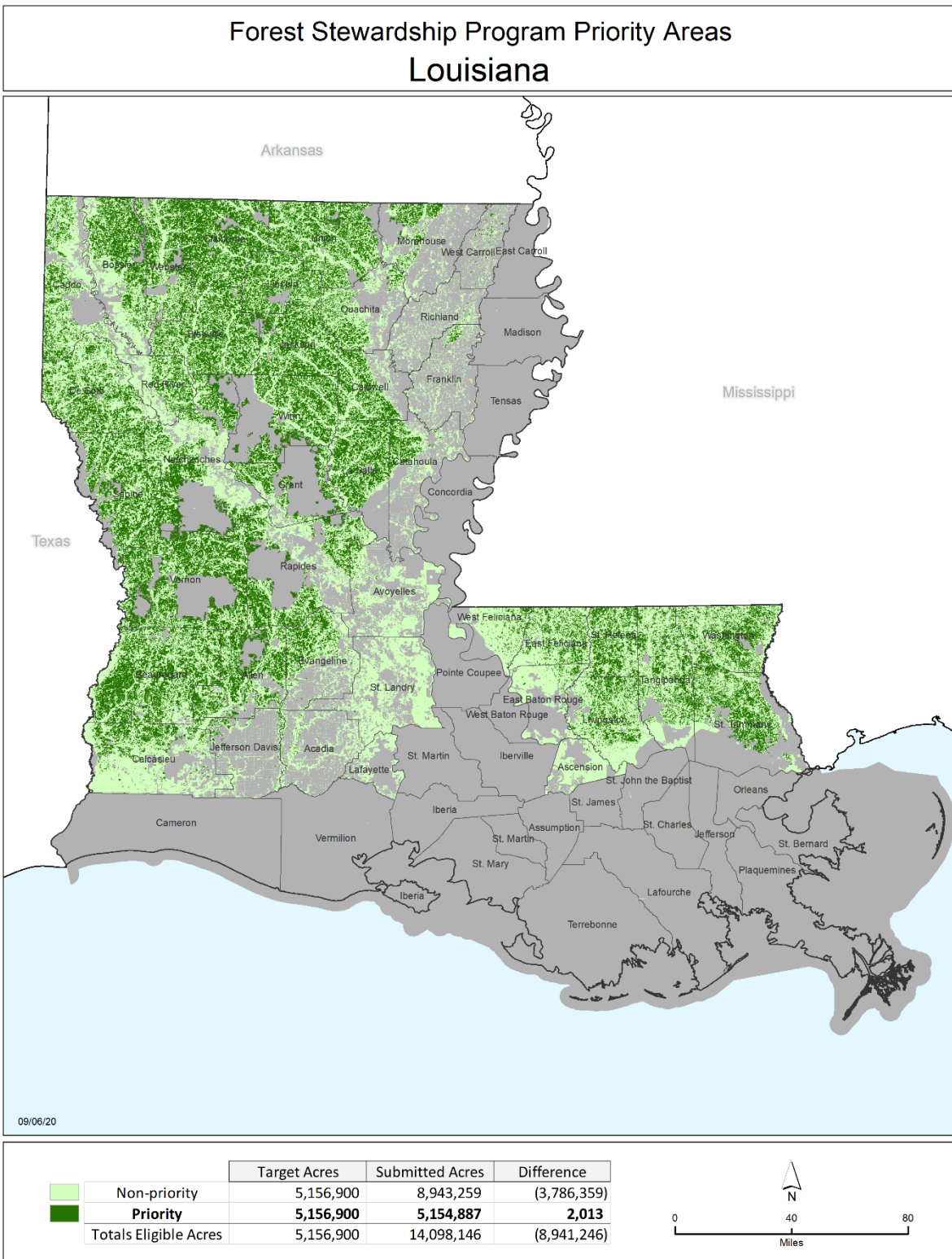


Figure 29. Louisiana’s statewide and Forest Stewardship Program priority areas focus on efforts in the Flatwood Terraces, Florida Parishes, and northwestern Louisiana.

ADDRESSING NATIONAL PRIORITIES FOR STATE & PRIVATE FORESTRY

National priorities for state and private forestry are captured in three themes: conserving working forest landscapes, protecting forests from harm, and enhancing public benefits from trees and forests. While

Louisiana’s 2020 Forest Action Plan addresses all national priorities in some capacity, the Plan directly and specifically targets the following national priorities.

NATIONAL PRIORITIES		
Conserve Working Forest Landscapes	Protect Forests from Harm	Enhance Public Benefits from Trees and Forests
<ul style="list-style-type: none"> ✓ High priority forest ecosystems and landscapes are identified and conserved. ✓ Forests are actively and sustainably managed. 	<ul style="list-style-type: none"> ✓ Fire-adapted lands are restored and risk of wildfire impacts is reduced. ✓ Threats to forest and ecosystem health are identified, managed and reduced. 	<ul style="list-style-type: none"> <input type="checkbox"/> Water quality or quantity is protected or enhanced. <input type="checkbox"/> Air quality is improved or energy is conserved. ✓ Communities plan for and reduce risks from wildfire. ✓ The economic benefits and values of trees and forests are maintained or enhanced. ✓ Wildlife or fish habitat are protected, conserved or enhanced. <input type="checkbox"/> People are connected to trees and forests and are engaged in environmental stewardship activities. <input type="checkbox"/> Trees and forests are managed and restored to help mitigate or adapt to changing conditions.

FOREST LEGACY PROGRAM

Development of the nation's forested areas poses an increasing threat to maintaining the integrity of our country's valuable forestlands. Intact forestlands supply timber products, wildlife habitat, soil and watershed protection, recreation opportunities, and appealing aesthetics. As forestlands are increasingly parcelized, fragmented, and converted to non-forest use, the benefits provided by forests also decline. While local governments commonly guide development away from some sensitive areas using zoning and performance standards, these measures are insufficient to protect forests as a foundational resource to Louisiana's communities.

The Forest Legacy Program (FLP) identifies and permanently protects ecologically important, privately owned forestlands that are threatened by conversion to non-forest uses, with emphasis often placed on working forests. The FLP is a voluntary program that encourages the protection of privately owned forestlands by focusing on the acquisition of conservation easements which legally transfer certain property rights without transferring property ownership. Conservation easements are negotiated with each landowner and often include restrictions on property divisions (i.e., parcelization), number of residences and their proximity to waterways, activities occurring in close proximity to waterways and riparian areas, and energy development activity. Benefits to landowners include lower property tax rates and assurance of a permanent forest legacy to pass to their heirs.

Authorized by the Farm Bill, the USDA Forest Service delivers FLP funding through the Forest Service Cooperative Forestry through which Louisiana and other U.S. states qualify and compete nationally for 75% of the grant funding on an annual basis. Since 2007, fee simple and permanent conservation easement purchases to-date total 7,348 acres valued at \$3.8 million. Fee simple forestland purchases total 182 acres at \$341,250. Conservation easements total 7,166 acres for \$3.5 million.

In 2007, the first FLP Assessment of Needs for Louisiana, developed with The Nature Conservancy, identified one Forest Legacy Area (FLA) in the southeastern corner of the state commonly known as the Florida Parishes. Having only a single FLA restricted LDAF in finding suitable tracts of land for consideration in FLP and hindered Louisiana from protecting significant natural resources located elsewhere in the state. In 2010, LDAF decided to designate additional FLAs based on four criteria:

1. Presence of large, contiguous blocks of productive forestland,
2. Importance to watershed protection,
3. Importance to wildlife habitat availability and connectivity, and
4. Risk of land use conversion due to development.

As a result, Louisiana amended its former FLP Assessment of Needs by adding two new FLAs in the state: the Northwestern Louisiana FLA and the Central Louisiana (CENLA) FLA.

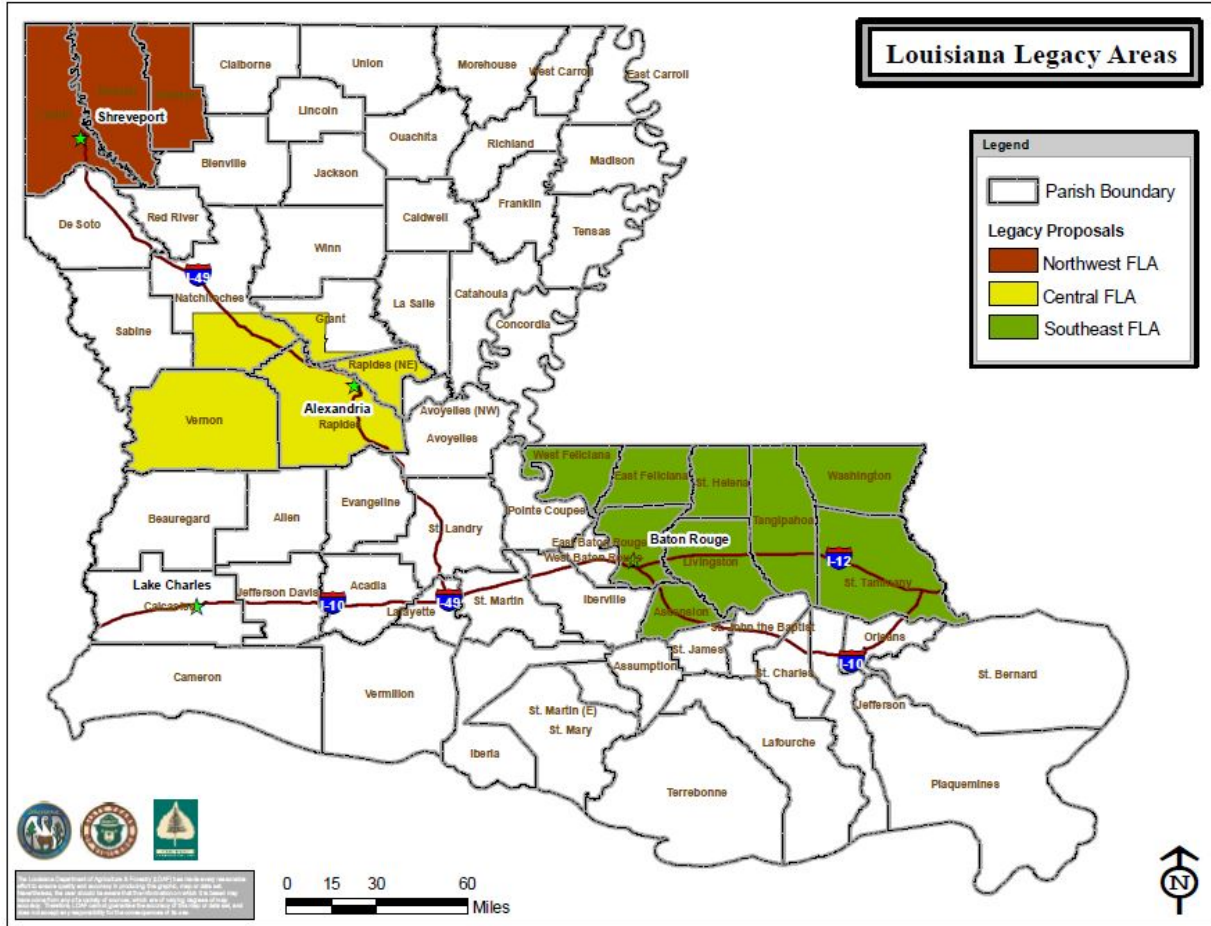


Figure 30. Forest Legacy Areas identified by Louisiana’s Stewardship Committee to receive funding through the USDA Forest Service-administered Forest Legacy Program for conservation of privately owned forestlands.

The state Forest Stewardship Committee reviewed and unanimously approved the Northwestern Louisiana and CENLA FLAs as additions to the FLP (Figure 30). These additions allow LDAF to expand opportunities for land acquisition and better meet the state’s goals in protecting and maintaining large tracts of land important to wildlife habitat and water resources that are at risk of fragmentation and land use conversion. Currently, FLAs capture parishes with the highest wildland fire ignition risk and historic fire occurrence, areas with greatest risk of southern pine

beetle, and dense pine plantations established in the aftermath of Hurricane Katrina.

For additional information on FLP requirements, refer to Appendix C.

Florida Parishes FLA

The Florida Parishes FLA encompasses nine parishes: West Feliciana, East Feliciana, East Baton Rouge, Ascension, St. Helena, Livingston, Tangipahoa, Washington, and St. Tammany. The Florida Parishes FLA is the epicenter of longleaf pine restoration in the State of Louisiana. Conservation efforts in this FLA are critical to conservation of federally-endangered red-cockaded woodpecker (*Dryobates borealis*), federally-threatened gopher tortoise (*Gopherus polyphemus*; Figure 31), Bachman's sparrow (*Peucaea aestivalis*), and Louisiana pine snake (*Pituophis ruthveni*). The Florida Parishes were hard-hit by Hurricane Katrina in August of 2005, leaving many forested tracts severely damaged by high-speed winds. While reforestation efforts have been successful, the once-diverse array of forest stand age- and class-size structure is homogenized, and at present, the number of properties with harvestable timber exceeds

demand by mills. This short-term, overabundance of timber has led many landowners to question the value of continuing forestry on smaller (<100 acres) parcels due to difficulty in luring loggers to cut and receiving acceptable compensation for timber. Increased development in the Baton Rouge area also presents a risk of land-use conversion to forestlands in East Baton Rouge parish.

Conservation efforts in the Florida Parishes FLA would concurrently address priorities identified by LDWF in the State Wildlife Action Plan, namely longleaf pine restoration and associated species of greatest concern need (Holcomb et al. 2015). LDWF is currently making a concerted effort to increase thinning, mechanical fuel reduction, and prescribed fire on private forestlands near populations of gopher tortoises, such as the Sandy Hollow Wildlife Management Area population.



Figure 31. Adult gopher tortoise. Photo: Dan Clark, U.S. Department of Interior, National Park Service, Bugwood.org.

CENLA FLA

The CENLA FLA encompasses 2.1 million acres in four parishes located in the West Gulf Coastal Plain. The city of Alexandria and surrounding areas have seen extensive growth and restructuring over the last five years due, in part, to Hurricane Katrina, and many forested areas are at risk of development and fragmentation. CENLA FLA is also critical to protecting the Red River watershed, which is the main source of drinking water for the city of Alexandria and surrounding communities. Long-term protection of this watershed is key to the health and security of the region's growing population.

CENLA FLA hosts some of the best remaining longleaf pine tracts in the southeast and is vital to maintaining habitat availability and connectivity for many species of greatest conservation need (Holcomb et al. 2015). The longleaf pine ecosystem has been extensively lost throughout the southeastern United States. The Mississippi Alluvial Plain separates the remnant longleaf pine patches of western Louisiana and eastern Texas from their eastern counterparts, resulting in the development of unique subspecies and differing associations and composition compared to eastern longleaf pine savanna and woodland. Flagship species of this region include the federally-endangered red-cockaded woodpecker; Bachman's sparrow; Louisiana pine snake; and the state-threatened and endemic Louisiana Pearlshell mussel (*Margaritifera hembeli*), found only in a few small sandy streams in central Louisiana.

Northwestern Louisiana FLA

The Northwestern Louisiana FLA encompasses 1.55 million acres in three parishes: Caddo, Bossier, and Webster. This region is part of the Upper West Gulf Coastal Plain and hosts much of the state's remaining shortleaf pine woodland. The Louisiana Natural Heritage program estimates that less than 10% of the historic extent of shortleaf pine-hardwood open woodland remains due to fragmentation and fire suppression efforts. The Northwestern Louisiana FLA also includes four distinct prairie types including the globally endangered morse clay calcareous prairie. Thirty species of plants found in this region are considered globally rare, threatened, or endangered, such as slender blazing star (*Liatris cylindracea*), Texas trillium (*Trillium texanum*), Louisiana bluestar (*Amsonia ludoviciana*), yellow lady's slipper orchid (*Cypripedium parviflorum*), and scarlet catchfly (*Silene subciliata*). Twenty-four species of fauna are considered globally rare, threatened, or endangered, including red-cockaded woodpecker, Bachman's sparrow, western sand darter (*Ammocrypta clara*), bluehead shiner (*Pteronotropis hubbsi*), and pink mucket mussel (*Lampsilis orbiculata*).

Although the Northwestern Louisiana FLA has historically maintained its forest cover, rapid growth of the Shreveport and Bossier City metropolitan areas with the presence of I-20 and I-49 transportation corridors place the Northwestern Louisiana FLA at risk of widespread land use conversion.

MULTI-STATE PRIORITIES AND PROJECTS

Wildfire Protection

Wildfire protection is a key forestry priority nationally and for state agencies in the southern U.S. Louisiana's Office of Forestry belongs to the South Central Interstate Forest Fire Protection Compact, which allows states within the compact to share equipment and personnel for out-of-state wildland firefighting assignments. The South Central Interstate Forest Fire Protection Compact includes Texas, Arkansas, Louisiana, Mississippi, and Oklahoma. The Compact's purpose is

to promote effective prevention and control of forest fires...by development of integrated forest fire plans, by the maintenance of adequate forest fire fighting services by the member States, by providing for mutual aid in fighting forest fires among the compacting States of the region and with States which are party to other Regional Forest Fire Protection compacts or agreements, and for more adequate forest development

(The South Central Interstate Forest Fire Protection Compact, Alliance Forest Fire Compact).

Louisiana has responded to requests within the South Central Compact with a total of 108 deployments in the last 10 years.

Pine Woodland and Savanna Restoration

Pine woodland and savanna restoration is a key priority for nearly every state forestry and wildlife agency in the southern U.S (Figure 26). Pine woodlands and savannas (also, "open pine") represent a diverse suite of longleaf, slash, and loblolly-shortleaf pine communities inhabiting a range of soil types and slopes. Longleaf pine historically inhabited dry sandy ridges, steep slopes, and soil types too dry or nutrient-poor to support loblolly or slash pine. Shortleaf pine often co-occurs with longleaf, loblolly, and slash pine in the coastal plains and with pitch pine in the Appalachian Mountains. Although pine woodlands and savannas are diverse, these ecosystems have several key features held in common: stands dominated by one or two species of pine in the overstory; sparse midstory trees and shrubs; and a well-developed and diverse ground layer, usually dominated by bunch grasses and flowering plants. These key features are a result of frequent fire which controls hardwood encroachment and maintains an open stand structure with high visibility.



Figure 26. Longleaf pine woodland. Photo: Chuck Barger, University of Georgia, Bugwood.org.

In Louisiana, restoration has focused on longleaf pine flatwoods and savanna in the Florida Parishes and longleaf pine rolling hill woodlands in central and north-central Louisiana. Both of these areas are captured in Louisiana's FLAs. Longleaf and loblolly-shortleaf woodland restoration efforts are eligible for funding through the FLP. Additionally, the Office of Forestry's Forest Productivity Program can assist landowners with expenses associated with planting, prescribed burning, and release of pine from competing vegetation. Longleaf pine restoration in the Florida Parishes is a key priority of LDWF due, in part, to the presence of federally-threatened gopher tortoises on Sandy Hollow WMA and surrounding private-owned properties (Holcomb et al. 2015, *pers. comm.* Sarabeth Klueh-Mundy).

Pine woodland and savanna restoration efforts in Louisiana advance concomitant conservation efforts in neighboring states by increasing regional habitat availability for at-risk species, increasing size of suitable habitat patches, and facilitating habitat connectivity for wildlife dispersal and movement. Localized efforts to promote longleaf pine restoration have been formalized through longleaf implementation teams (see <http://www.americaslongleaf.org/implementation/implementation-teams/>). Longleaf implementation teams that could potentially partner with LDAF and LDWF include the DeSoto-Camp Shelby Longleaf Implementation Team, West Central Louisiana Ecosystem Conservation Project, and Texas Longleaf Implementation Team. The DeSoto-Camp Shelby team recently

revised its priorities and is considering expansion along the Gulf of Mexico's coastal plain (*pers. comm.* East Gulf Coastal Plain Joint Venture). Launched in 2013, the Shortleaf Pine Initiative released a range-wide conservation plan in 2016 (Anderson et al. 2016). The Plan prioritizes shortleaf pine workshops and technical assistance to private landowners for shortleaf pine and shortleaf pine-oak woodlands in the West Gulf Coastal Plain.

In addition to America's Longleaf Restoration Initiative and Shortleaf Pine Initiative, several public-private partnerships have also prioritized pine woodland and savanna restoration. The East Gulf Coastal Plain Joint Venture (EGCPJV) and Lower Mississippi Valley Joint Venture (LMVJV), public-private partnerships under the U.S. Fish and Wildlife Service Migratory Bird Joint Ventures umbrella, have created conservation delivery tools to assist state agencies, non-profits, land managers, and others in restoring and maintaining appropriate ecological conditions for open pine systems. The LMVJV's Arkansas-Louisiana West Gulf Coastal Plain Conservation Delivery Network supported and provided input to the Morehouse Family Forests Initiative project (discussed below). The EGCPJV and LMVJV have each developed open pine decision support tools to assist prioritization and to assess risks to open pine systems (see www.lmvjv.com and www.egcpjv.org).

Morehouse Family Forests Initiative

The Morehouse Family Forests Initiative supports family forest landowners in northeastern Louisiana and southeastern Arkansas by providing tools and resources to

implement forest management best practices to increase commercial, recreational, and ecological value of their lands. Participating landowners receive technical assistance in development of site-specific land management plans. Drax Biomass Inc. and the American Forest Foundation recently announced a five-year, \$1.1 million project to invest in small family landowners surrounding Drax's Morehouse BioEnergy facility in northeastern Louisiana. Drax Biomass manufactures compressed wood pellets produced from sustainably managed working forests. Keeping family forests healthy and productive is vital to the continued supply of sustainably-produced wood pellets. The Morehouse Family Forests Initiative encourages habitat improvements, forest biodiversity, and certification through American Tree Farm, an internationally recognized certification program designed for family forest owners and administered through American Forest Foundation. Morehouse Family Forests Initiative supports the Southern Woods for At-Risk Wildlife Partnership, a recent partnership of American Forest Foundation and the National Fish and Wildlife Foundation seeking to protect sustainable wood production and at-risk wildlife.

Northeastern Louisiana and southeastern Arkansas have recently received conservation attention by the states' respective state wildlife agencies. The Initiative's geography is bordered by Upper Ouachita National Wildlife Refuge (NWR), Tensas River NWR, and Georgia Pacific Wildlife Management Area (WMA) in Louisiana. It also includes one of the largest Tier II Conservation Opportunity Areas identified by LDWF in the State Wildlife Action Plan (Holcomb et al. 2015). The

geography includes Overflow NWR in Arkansas. Arkansas Game and Fish Commission (2015) recently funded proposals to address priorities outlined in the Arkansas Wildlife Action Plan: West Gulf Coastal Plain pine woodland and savanna habitat restoration to benefit species of greatest conservation need (e.g., American

woodcock [*Scolopax minor*], Henslow's sparrow [*Centronyx henslowii*], northern bobwhite [*Colinus virginianus*], red-headed woodpecker [*Melanerpes erythrocephalus*]), and identification of alternative winter roosting habitat for tricolored bats (*Perimyotis subflavus*).

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APPENDIX A: STAKEHOLDER ENGAGEMENT

The Louisiana Office of Forestry's assessment preparers spent significant time deriving the threats, strategies, and priorities for the State. During preparation for assembling the Louisiana Statewide Assessment of Forest Resources, the Office of Forestry sought out authoritative documentation from and coordination with those agencies, associations, and committees with a vested interest in the welfare of the State's forest resources.

LOUISIANA FORESTRY COMMISSION

The Office of Forestry engaged the Louisiana Forestry Commission throughout the year-long Forest Action Plan process. The Louisiana Forestry Commission reviewed the final draft of the 2020 Forest Action Plan on December 7, 2020.

STEWARDSHIP COORDINATING COMMITTEE

Louisiana's Stewardship Coordinating Committee consists of representatives of NRCS, LDWF, LSU School of RNR, LFA, Soil and Water Conservation Districts, and The Nature Conservancy. The Stewardship Coordinating Committee reviewed the Forest Stewardship Program priorities during summer and fall of 2020. The Committee provided an updated map of priority areas on October 27, 2020.

LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES

The Louisiana Comprehensive Wildlife Conservation Strategy (State Wildlife Action Plan; SWAP), developed by the Louisiana Department of Wildlife and Fisheries (LDWF) in December 2005, was combed over and provided valuable source material and direction, saving our preparers a great deal of time in hunting down appropriate source material. The 2015 Louisiana SWAP had been used to confirm and corroborate information from other sources. The Louisiana Department of Wildlife and Fisheries (LDWF) and other agencies were provided with an initial draft of the Assessment for comment and feedback. A representative of LDWF sits on the Louisiana Forestry Commission and is regularly updated on the status and progress of the Office. Office of Forestry staff met with LDWF staff in February 2019 to discuss agency priorities and anticipated updates to the 2020 Forest Action Plan. The agencies discovered two areas of potential collaboration: prescribed fire and mechanical fuel reduction.

PARTNER AND PUBLIC ENGAGEMENT

The initial draft of the Assessment has been made available to and feedback encouraged from the following agencies: Louisiana State University (LSU), Louisiana Technical University, Louisiana Forestry Association (LFA), Louisiana Department of Wildlife and Fisheries (LDWF), USDA Forest Service, Kisatchie National Forest, Louisiana Office of Soil and Water Conservation, The Nature Conservancy (TNC), Louisiana Department of Natural Resources (LDNR), Louisiana Landowner's Association, and USDA Natural Resources Conservation Service (NRCS). During the preparation process, the Office of Forestry sought out public and professional comment by co-hosting two stakeholder meetings, one in Longleaf on date and the second one in Alexandria on date, with co-host. The stakeholder meetings included many of the organizations from which the Office requested comments following the initial draft as well as forest industry.

APPENDIX B: 2015 NATIONAL PRIORITIES REPORT ON ACCOMPLISHMENTS

CONSERVE AND MANAGE WORKING FOREST LANDSCAPES FOR MULTIPLE VALUES AND USES

Action: Promote Forest Stewardship

The Louisiana Office of Forestry has been challenged to promote the Forest Stewardship Program. With over 80% of Louisiana's forestland in private ownership, there exists a great opportunity to educate, encourage, and assist landowners in multi-use forestry practices. A large number of forest landowners have proven to be unaware of the option to manage their property as a whole rather than the sum of separate parts. State forestry personnel as well as private consulting foresters assist with creating functional management plans to include all land use types and landowner objectives.

Response

As a result of the increased effort, Louisiana's forest landowners are becoming better educated about forest stewardship. They are receiving information on the effects of management practices, fragmentation, wildlife corridors, and sustainability. Working relationships among State employees, private consultants, and landowners have been heightened. A uniform Stewardship Plan writing program has been customized and made available for use by

other State and Federal agencies to satisfy land management planning requirements. The end result of these efforts is that a comprehensive Forest Stewardship Plan is available to any landowner desiring one. Consequently, the number of Forest Stewardship Plans written annually in Louisiana continues to increase.

Action: Promote Prescribed Burning

Over the past few years, the use of fire as a forest management tool has become significantly more difficult. Issues from air quality to smoke danger have plagued prescribed burning. Liability costs have driven contractors out of business causing further difficulties with implementing burns. As a result, fewer acres are prescribed burned each year. This situation creates greater forest fuel loads and adversely impacts management practices resulting in greater fire danger and loss due to wildfire.

Response

Louisiana Office of Forestry participate in the Louisiana Prescribed Fire Council. This organization is comprised of Federal, State, private, and non-profit organizations. The purpose of the council is to educate the general public, offer information to resource professionals, and promote the use of

prescribed fire in forestry, agriculture, and marsh environments.

The Louisiana Certified Prescribed Burner Program was established to create consistency in the use of prescribed burning and provide training and certification to program participants. Louisiana Office of Forestry works collaboratively with State university representatives to develop and deliver the program.

As a result of these efforts, Louisiana has realized a decrease in the annual number of wildfires caused by improper prescribed burns, a reduced threat of wildfire in areas with prescribed burning, and increased knowledge, understanding, and skill of Louisiana's certified prescribed burners.

PROTECT FORESTS FROM THREATS

Action: Promote Wildfire Danger Awareness

As a member of the Southern Group of State Foresters (SGSF), Louisiana is included in the SGSF Wildfire Risk Assessment project. This data portal allows the user to simulate the risk to a given area by manipulating pertinent variables. Wildfire threats are increasing as are the values at risk in the fire-prone landscapes. Fragmentation of state forestland and urban development make fire management increasingly complex. Louisiana Office of Forestry works with fire department personnel, parish landowner association members, and secondary education professionals to disseminate information and resources designed to inform

the public about risks associated with wildfire.

Response

The SGSF Wildfire Risk Assessment application has been used to inform state legislators of the need for funding wildfire detection and suppression efforts in Louisiana. It has been made available to municipal planners for the purpose of developing emergency response plans.

Through programs such as FireWise, Louisiana's citizens are becoming better informed about ways to protect themselves and their homes from the threat of wildfire. As greater numbers of families move into forested areas, this effort becomes increasingly valuable in promoting public safety.

Action: Wildfire Detection and Suppression

Louisiana Office of Forestry utilizes fire patrol aircraft as a means of wildfire detection and tractor-plow units in suppression efforts. Equipment and personnel are staged at various locations across the state to provide timely response to wildfire.

Response

Key personnel review procedures and equipment placement regularly to ensure that the best possible service is available to the citizens of Louisiana. Scheduled maintenance and training are routine.

Action: Response to Insect and Disease Threats

Louisiana Office of Forestry monitors forestland for potential damage from insects and disease. In addition, information and education programs as well as public awareness efforts are utilized throughout the state. Program directors coordinate with counterparts from other states and with other Louisiana State agencies to provide the latest information, prevention measures, and response to insect and disease threats.

Response

Program staff from Louisiana Office of Forestry use several means of monitoring potential insect and disease problems. Aerial surveys, trapping, and imaging are all sources of monitoring. Training opportunities and coordinated response efforts allow specific areas of interest to be handled from a greater perspective. Theater spots, billboards, and printed documents are popular components of statewide informational campaigns.

ENHANCE PUBLIC BENEFITS FROM TREES AND FORESTS

Action: Promote Public Aware and Outreach Programs

Louisiana Office of Forestry interacts with the public in many ways with activities ranging from presentations to elementary school students to forest landowner field days. Topics range from tree identification to water quality. With over 48% of Louisiana's land area covered with some forest type, and trees being Louisiana #1 agricultural crop, it is vital for Louisiana citizens to know just how important trees and forests are to the State.

Response

Louisiana Office of Forestry has delivered information on sound forestry practices and how managed forests protect water quality, reduce stormwater runoff, conserve energy, and enhance economic development in urban areas.

APPENDIX C: FOREST LEGACY PROGRAM

FOREST LEGACY ASSESSMENT OF NEED

Amendment 1

In 2010, Louisiana amended its existing Forest Legacy Assessment of Need (AON) by adding two new Forest Legacy Areas to the existing Legacy Area in the Louisiana's Forest Legacy Program. These new areas are the Northwestern Louisiana Forest Legacy Area and the CENLA Forest Legacy Area. The original AON for Louisiana has only one Legacy area in the southeastern corner of the state and this has restricted us in finding suitable tracts of land for consideration into the Forest Legacy Program. Additionally, this has hindered Louisiana from protecting other important and significant natural resources within the state. Our state Forest

Stewardship Committee met and reviewed the new areas, unanimously agreeing that these areas should be added to the Program. The addition of these new areas will allow us to expand our opportunities for land acquisitions through the Forest Legacy Program and to better meet the state's goals in protecting and maintaining important tracts of land to address forest fragmentation, wildlife habitat, and water resources. Four criteria were used in determining the eligibility of these new Legacy areas: 1) large contiguous blocks of productive forest land, 2) watershed protection, 3) wildlife habitat protection, and 4) degree of threat from development. These are the same criteria as outlined in Louisiana's 2010 AON.

FOREST LEGACY PROGRAM REQUIREMENTS