MISSISSIPPI'S FOREST ACTION PLAN 2020

Mississippi's Forest Action Plan 2020 Update
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Maps

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The mission of the MFC is to provide active leadership in forest protection, forest management, forest inventory, and effective forest information distribution necessary for Mississippi's sustainable forest-based economy.

Mississippi's Forest Action Plan 2020
Executive Summary

Mississippi's Forest Action Plan (FAP) *2020* is an update of the inaugural *Forest Resource Assessment and Forest Resource Strategy* published in 2010 by the Mississippi Forestry Commission, the lead agency responsible for the protection, management and sustainability of the state's forest resources. Under the Farm Bill each state to develop a long-term, state-wide assessment and strategies for forest resources in order to receive funds under the amended Cooperative Forestry Assistance Act. MFC updated this FAP in collaboration with many stakeholders, partner agencies and organizations and with public input to provide a useful, science-based tool for effective stewardship and management of Mississippi's forest resources. This document reflects the national forest action plan themes to conserve working forest landscapes, to protect forest from harm and to enhance public benefits from trees and forests. The purposes of the *FAP* are to 1) provide an analysis of forest conditions and trends in the state; 2) to delineate priority rural and urban forest landscape areas; and 3) to provide general long-term strategies and plans for investing state, federal, and other resources to effectively stimulate or leverage desired action and engage multiple partners.

Mississippi's Forest Resource: Over 62 percent of the total land base is forested, totaling 19.1 million acres. Pine forests cover 7.8 million acres (41 percent of the forested area). Hardwood and oak-pine timber types occupy 10.3 million acres (over 53.11 percent of the state's timberland). According to data from the Forest Inventory and Analysis, since 2010 Mississippi has lost 328,040 forested acres, and 260,300 acres of forest land have been diverted to agricultural land use. While approximately 52,000 acres of non-forest reverts back to forest annually, nearly 80,000 forest acres are being converted to non-forest use.

In Mississippi, 89 percent of forest land is in private ownership, 8.7 percent in federal ownership and 3 percent in state/local ownership.

Forest-related industries contribute $13 billion to the state's economy and directly employ 61,794 people paying $1.1 billion in wages each year. In any year, timber will be among the three most valuable agricultural crops. In addition to economic benefits, human health, aesthetic, habitat, ecosystem service and recreational benefits of forests are also well-documented and recognized.

Key Forest Issues: Seven key issues were identified by the public and stakeholders as areas of primary concern regarding Mississippi's forest resources.

Issue 1: Forest Sustainability and Markets – Though forest lands have increased over the past four decades, since 2010 forest market conditions have become challenging and as a result Mississippi has seen a decrease of 328,040 acres in total forest area. Forest inventory data indicates that the state is growing 35-40 percent more timber than is being harvested due to changing global and domestic market conditions. Since 2015, Mississippi has also lost 14 percent of its mills. These difficult market conditions could have negative long-term impacts on forest health and may ultimately lead to landowners considering conversion as an alternative

choice. Timber sale revenue provides the incentive and opportunity for landowners to implement sustainable forest management practices such as prescribed burning, treatment of invasive species, and reforestation. Other areas of concern include transportation which is critical for the logging industry, decrease in the workforce of loggers and buyers, research funding cuts and restrictions on use of prescribed fire. Some of the best opportunities are in emerging markets such as the wood pellet industry and reinvestment in existing markets, certification and cost-share programs, and landowner education and urban forest management.

Issue 2: Landowner Trends – Most private forest lands in the state (80 percent) are family-owned, less than 100 acres and held for more than 10 years. Though Mississippi is still a rural state, forest ownership is increasingly being affected by changing land ownership values. Traditional forest management economic objectives are being replaced by non-traditional management goals, such as ecosystem goods/services and non-timber management objectives. Fragmentation, conversion to non-forest use and urbanization are major threats to the landowner's ability to manage these forests with prescribed fire, and/or to control disease and invasive species. For some landowners, a tax burden is created when family land passes to the next generation. Heirs often sell property to eliminate the tax burden or have no interest in owning the property. Or real estate value exceeds timber and agricultural revenue potential. Education and outreach programs, new landowner incentive programs through USDA and improvements to the forest markets are opportunities to assist new and existing landowners.

Issue 3: Forest Health – Healthy, diverse forests provide multiple public benefits including timber, recreation, aesthetics, soil, air and water quality protection, and wildlife habitat. Southern pine beetle and non-native invasive plants (e.g. cogongrass, kudzu, Chinese tallow tree, Chinese privet and Japanese climbing fern) have caused adverse impacts on the value, productivity, functionality and ecosystem services of forest communities in the state. Maintaining forest health is especially challenging on private, nonindustrial lands. Landowner incentive programs, education focused on stewardship and proper timber management, and assistance through cooperative efforts with other agencies are opportunities to fight and control invasives and improve forest health conditions.

Issue 4: Stewardship – Promoting the proper management and responsible use and protection of natural resources helps minimize the harmful effects of wildfires, insects, diseases, invasive species, climate changes and storms and will improve the health and productivity of forest communities. One-on-one and in person education programs are effective delivery methods for forest stewardship education. However, funding reductions for education programs within resource agencies threaten the delivery of traditional education methods and programs. To adapt, MFC will offer more web-based education and outreach programs to reach a wider audience. Access to web-based information, technical guidance and educational programs is an efficient way to reach more people who cannot attend programs in person and will allow MFC and other agencies to meet demands with fewer personnel. Funding reductions may necessitate the focus of limited resources and personnel on key forest issues described in this FAP. Increased emphasis by congress and federal agencies on services and resource education to underserved landowners will result in improved conditions for private forest lands.

Issue 5: Wildland Fire – Fire is critical for forest health. Human development around forested areas continues to increase the potential for catastrophic impacts from wildfires. Reducing or eliminating fuels from the forest structure is integral for the protection of forest resources and the safety and protection of people and property. To decrease the threat of wildland fire to communities and the forested landscape in Mississippi, more fuel reduction treatments should be performed by prescribed burning, mechanical treatment or other means. Increasing the number of counties with County Wildfire Protection Plans (currently 34 counties have them) and increasing the number of Certified Prescribed Burners in the state will help address the threat of wildland fires to communities and forests.

Issue 6: Climate Change – Locally, forests provide shade, reduce air temperatures and can create cooler microclimates under the canopy and in bodies of water. Globally, forest ecosystems help regulate the earth's climate and patterns of precipitation through the carbon cycle. Forests are major repositories of carbon. Healthy forests have a higher carbon storage potential than any other land use in the state. Conversion to non-forest uses and degradation of forests reduce the size of vegetative carbon sinks. Maintaining existing forest cover and reforestation of agricultural lands will increase the carbon storage potential across Mississippi's landscape. More pilot programs and local examples are needed to demonstrate the effectiveness of purchasing carbon offsets. Private landowner participation in sustainable forest certification programs should be encouraged and developed at the state level. Participation in existing programs that provide incentives for afforestation, forest conservation and management on private lands (e.g. USDA Agricultural Land Easement Program, Wetland Reserve Easement Program, Healthy Forest Reserve Program, Forest Legacy Program, and private conservation easements) and regional efforts such as those devoted to restoration and management of longleaf pine in its natural range (e.g. America's Longleaf) should be encouraged.

Issue 7: Wildlife – Forested communities in Mississippi provide essential habitat for many common and declining resident and migratory fish and wildlife species. Conversion and/or changes in structure and composition of natural forest communities have spurred the decline of species of concern indigenous to the state (e.g. black pine snake, gopher tortoise, red cockaded woodpecker, Louisiana black bear and Mississippi Sandhill crane). Maintaining, protecting, and restoring natural forest communities is key to the survival and recovery of these species. Wildlife provides important natural benefits to forests as pollination, seed dispersal and soil and nutrient recycling and control of other populations. They also support abundant recreational activities and human enjoyment such as hunting and fishing, wildlife viewing and nature photography. Incentive and education programs for private landowners to manage and protect forest habitat for wildlife and to develop forest stewardship plans should be promoted and increased.

Priority Landscapes: Many of the focal geographies in the state identified for the seven forest key issues overlap. Three priority regions where Mississippi has the greatest opportunity or need to collaborate with other states in the region include:

1. Multi-state priorities for afforestation such as agriculture and pasture lands identified by federal Farm Bill, private forest land incentive programs such as the Wetlands Reserve Program (WREP), Conservation Reserve Program (CRP) and others such as watersheds prioritized through the Gulf Coast Restoration (RESTORE) Council.
2. The target area for longleaf pine restoration and management within its historic range.
3. Priority areas for certain non-native, invasive plants and pest suppression and eradication.

MFC is committed to working with partners and stakeholders to implement the recommended strategies in this 2020 Forest Action Plan over the next 10 years.

Chapter I.
Introduction to Mississippi's Forest Action Plan

The Mississippi Forestry Commission (MFC) is the lead agency for development of *Mississippi's Forest Action Plan 2020*.

This document was prepared in response to the Food, Conservation and Energy Act of 2008 (the Farm Bill) that required each state to develop a *Statewide Forest Resource Assessment (Assessment)* and a long-term S*tatewide Forest Resource Strategy* (Strategy) by June 2010 in order to receive funds under the amended Cooperative Forestry Assistance Act (CFAA). The 2008 Farm Bill, under Title VIII - Forestry, amends the Cooperative Forestry Act of 1978 to include the requirement that each state develop a long-term, state-wide assessment and strategies for forest resources.

These state-wide assessments and strategies must include three national priorities (themes) and specific objectives:

National Themes and Objectives:

1. Conserve Working Forest Landscapes
    - 1.1. Identify and conserve high priority forest ecosystems and landscapes
    - 1.2. Actively and sustainably manage forests
2. Protect Forests from Harm
    - 2.1. Restore fire-adapted lands and reduce risk of wildfire impacts
    - 2.2. Identify, manage, and reduce threats to forest and ecosystem health
3. Enhance Public Benefits from Trees and Forests
    - 3.1. Protect and enhance water quality and quantity
    - 3.2. Improve air quality and conserve energy
    - 3.3. Assist communities in planning for and reducing wildfire risks
    - 3.4. Maintain and enhance the economic benefits and values of trees and forests
    - 3.5. Protect, conserve, and enhance wildlife and fish habitat
    - 3.6. Connect people to trees and forests, and engage them in environmental stewardship activities
    - 3.7. Manage and restore trees and forests to mitigate and adapt to global climate change

The assessment provides an analysis of forest conditions and trends in the state and delineates priority rural and urban forest landscape areas. The strategy provides general long-term plans for investing state, federal, and other resources to effectively stimulate or leverage desired actions and engage multiple partners.

This document, entitled *Mississippi's Forest Action Plan (FAP) 2020*, is the 10-year update of *Mississippi's Assessment of Forest Resources and Forest Resource Strategy* (2010).

The amended CFAA refers to the process of “redesigning” how federal funding is provided to state forestry agencies carrying out particular forestry programs on privately owned forestland. The MFC utilizes these funds, through the U.S. Department of Agriculture Forest Service’s (USFS) State and Private Forestry (S&PF) programs, to support a number of local forestry programs, including technical forestry assistance to rural and urban landowners, enhancing wildfire protection efforts, and supporting forest health programs that address insects, diseases and non-native invasive species that are affecting the health and productivity of Mississippi’s forestland.

The purpose of a “redesigned” S&PF is to shape and influence forestland use on a scale and in a way that optimizes public benefits from trees and forests for both current and future generations. In 2008, the USFS began implementing the Redesign effort in response to the combined pressures on the nation’s forests and a decrease in resource funds as well as the need for better partnerships on projects and better program integration. State assessments and resource strategies (now called *Forest Action Plans*) are integral to S&PF Redesign and required as an amendment to the CFAA, as enacted in the 2008 Farm Bill.

The following is a list of required elements in the FAP and the location of those in this document.

Assessment of Forest Resources

The state forest resource *assessment* should provide a comprehensive analysis of the forest-related conditions, trends, threats, and opportunities within the state. Assessments must include:

- An analysis of present and future forest conditions, trends, and threats on all ownerships in the state using publicly available information (Chapter II).
- Forest related threats, benefits, and services consistent with the S&PF Redesign national themes (Chapters II and III).
- Priority rural and urban forest landscape areas to be addressed by the state resource strategy. States can also identify linkages between terrestrial and aquatic habitats, as appropriate. (Chapters III and IV).
- Multi-state areas that are a regional priority (Chapter IV).
- Existing statewide plans including State Wildlife Action Plans, Community Wildfire Protection Plans, and address existing S&PF program planning requirements (Appendix C).

Forest Resource Strategy

The forest resource strategies outlined in this document will provide a long-term, comprehensive, coordinated strategy for investing state, federal, and leveraged partner resources to address the management and landscape priorities identified in the assessment. The strategy should incorporate existing statewide forest and resource management plans and provide the basis for future program, agency, and partner coordination.

The strategy must include:

- An outline of long-term strategies for addressing priority landscapes identified in the assessment and the national themes and associated management objectives (See the strategic issues matrix for each key issue).
- Description of how the state proposes to invest federal funding, along with other resources, to address state, regional, and national forest management priorities (Chapter III).
- A long-term timeline for project and program implementation.
- Identification of partner and stakeholder involvement (Chapter III, Appendix B).
- Strategies for monitoring outcomes within priority forest landscape areas and how action will be revised when needed (Chapter III)
- Description of how the state's proposed activities will accomplish national S&PF program objectives and respond to specified performance measures and indicators (Chapter III).
- How S&PF programs will be used to address priority landscape and management objectives (Chapters III, V).
- Existing statewide plans including wildlife action plans, community wildfire protection plans and address existing S&PF program planning requirements (Chapter V, Appendix C).

Chapter III includes a discussion of key issues and forest resource strategies for Mississippi. This document includes both the statewide assessment of Mississippi's forest resources and the broad strategy components required by the enabling legislation in the 2008 Farm Bill.

Annual Report on Use of Funds

Each year, MFC must submit an annual report based on the updated FAP that describes how Mississippi used all of the S&PF program funds throughout the fiscal year. The report will also describe specific actions taken throughout the year to address the state assessment and resource strategy and will include a comprehensive budget with contributions from all federal, state, and non-governmental partners.

An annual report will continue to be developed by MFC each year following the approval of this 10 year updated FAP. The annual report will include a detailed annual action plan with specific goals, objectives and strategies for each program area and key issues.

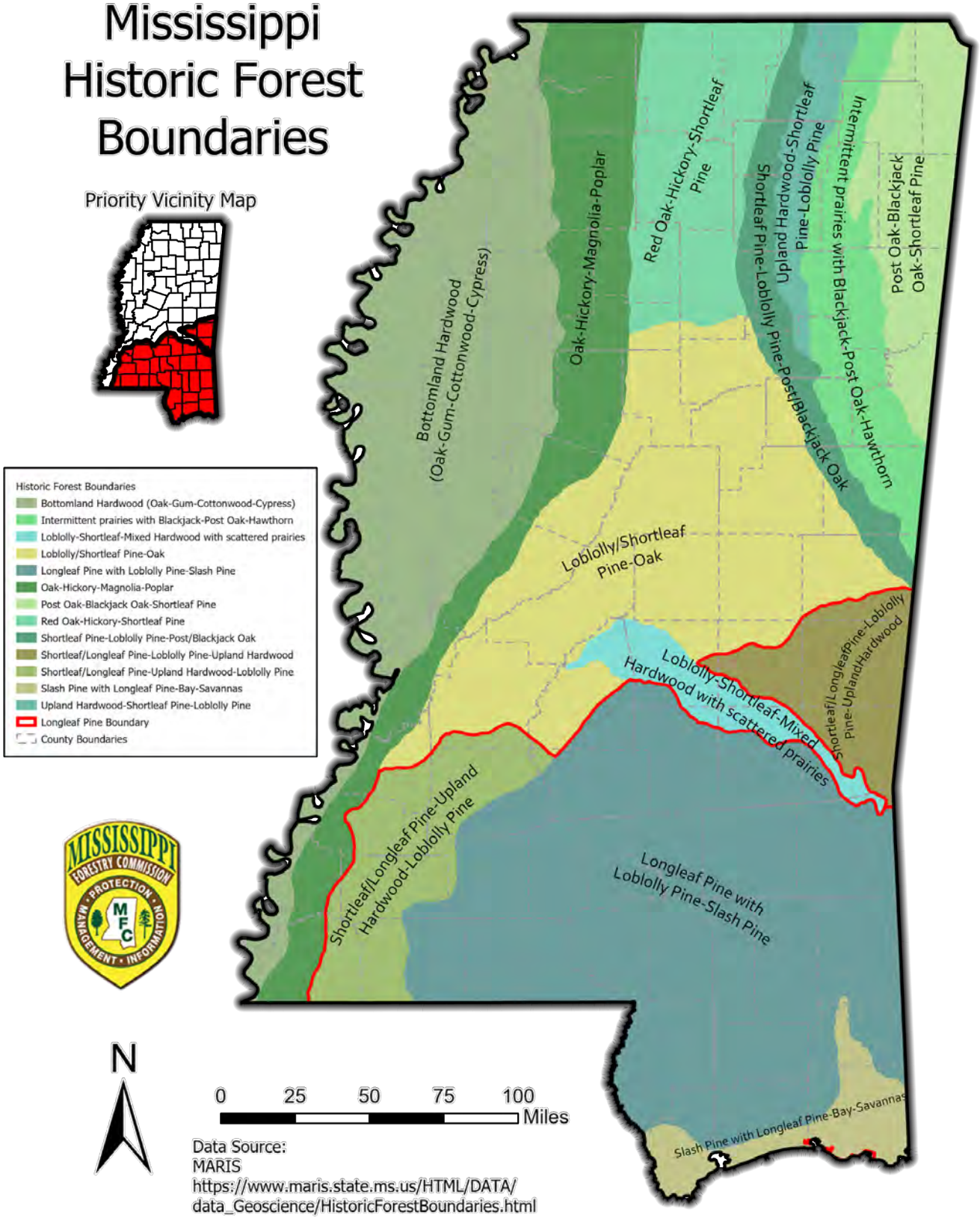
Chapter II.
Mississippi's Forest Resources:
Conditions, Public Benefits and Threats

The purpose of the Mississippi's forest inventory program, Forest Inventory Analysis (FIA), is to survey and report on timber volume and forest resources in Mississippi through a continuous, statewide forest resource inventory necessary for the sustainable forest based economy and to effectively distribute and manage forest inventory based information for economic and public policy development. The MFC participates in FIA via a nationwide program of the Forest Service through its Southern Research Station in Knoxville, Tennessee that summarizes the inventory of forest on public and private lands and includes information on forest health, ecological values, socioeconomic benefits and biological diversity as well as standard tree inventory data.

The following description and assessment of Mississippi's forest resource conditions is based on data garnered from the FIA program. Mississippi's forest inventory is completed on a five-year cycle. Descriptions of natural forest communities are adapted from the natural community and habitat descriptions in the updated *Mississippi State Wildlife Action Plan (2015)*.

Additional details about forest conditions as well as a description of the public benefits of forests and threats to forest resources are also included in the description of major forest issues of concern in Chapter III – *Key Issues and Resource Strategies*.

Mississippi Historic Forest Boundaries



Data Source:
MARIS
https://www.maris.state.ms.us/HTML/DATA/data_Geoscience/HistoricForestBoundaries.html

History of Forest Resources

To appreciate the current condition of Mississippi's forest lands, it is important to understand their history and the result of anthropogenic (originating in human activity) influence over time. The history of Mississippi's forests mirrors that of the Southeastern U.S. Though Europeans began to explore and settle the Southeast by the mid- and late 16th century, their impact on the native plant communities of the region was limited largely to coastal plain, savanna and bottomland forests. Earliest settlements in the Southeast U.S. were established in coastal areas and on old river terraces accessible by boat and barge, thus limiting the European settlers' impact on natural plant communities. These areas were often cleared to make way for agriculture. The quantity of timber taken during this time was limited both by technology and local demand. Consequently, large areas of upland forest in the South were untouched until the 19th century.

Improved agricultural efficiency, a growing population, and better access to European markets by the end of the 18th century provided both the motivation and the capital necessary to expand the conversion of native vegetation to agriculture. People began to move westward into the interior of the South and proceeded to clear increasingly large tracts of land. In this era of increased trade, additional non-native plant and animal species were introduced to the South.

In the early 18th century botanists from the Northeast such as John and William Bartram made several trips to the Southeast for botanical exploration and collection and published accounts of the natural history of the areas that they visited. In 1775, William Bartram traveled in the Pearl River basin in Mississippi. The Bartrams' books and accounts are full of details of soil conditions in various places, lists of species encountered, and in some cases detailed descriptions of particular species and broad community types, including forests, savannas, glades, and swamps. William Bartram also noted large areas of longleaf pine and "expansive ancient Indian fields."

Although the Native American population had declined significantly by this time, these people were sufficiently common in the early 18th century to exert a continued impact on wide areas of the southern landscape through their agriculture and, more importantly, their use of fire as a means of manipulating vegetation. The aboriginal practice of burning the forests was adopted by European settlers soon after permanent settlements were established.

During the early 19th century, settlers moved across the region in search of quality farmland to clear for agriculture. The Natchez area along the Mississippi River bluff in southwest Mississippi was favored as a place to settle and farm due to the fertile lands and expansive forests. Europeans selected and exploited other areas on the basis of their strategic value for military outposts or their proximity to mineral resources. These areas were less common but usually had equally significant impacts on the local vegetation.

Lumber was needed for development during this period, and the supply was considered "inexhaustible." Small mills sprang up in localized areas. Timber harvest was relatively light due to the primitive logging and milling methods that depended on animals and water for transportation and water flow for running primitive sawmills.

In the mid-1800s, the piney woods of southeast Mississippi were considered to be infertile lands for farming and were inhabited primarily by cattlemen and hunters. In those days, any land occupied by pines was considered to be unfit for the growth of cotton and corn. In 1860, Mississippi's 16 most southeastern counties were the most sparsely populated region in the state, except for the Mississippi-Yazoo River basin or "Delta". One writer correctly predicted that the tremendous pine forests would one day be the center of the lumber trade for the nation.

The timber industry that moved to the South in the late 1800s exploited the vast expanses of pine and hardwood forest land. The steam engine and the use of railroads made it possible for lumbermen to move rapidly through the Mississippi forests. Northern lumbermen and a few from the South purchased huge land holdings, erected sawmills and built railroads to get the logs into the mills. The logging practices of the day were destructive and often left a treeless and fire-ravaged landscape. Some landowners were farsighted and began to practice selective and seed tree harvests and conserved timber for the future. Most of them, however, operated until their timber supplies were exhausted and then relocated. During this period, mills could operate efficiently only when adequate supplies were available next to the rail spurs.

In the mid-19th century, clearcutting was the primary logging method employed. Modern forestry would not become commonplace in North America until the early 20th century. Extensive areas of forest were leveled to create pastureland. In many places the native forest has never recovered. Forested areas surrounding major river ports were cut to fuel steamboats. Vast acreages of wetlands and river terraces were drained or plowed by the mid-19th century, causing significant losses to local biodiversity in some areas, hydrologic modifications and fragmentation of forests. By the 1880s, a broad sector of Americans, mostly in the Northeast and West, were becoming concerned about the unbridled exploitation of the Nation's forest and wetland resources.

The evolution of forest protection laws and the establishment of national forests in the South parallel the development of the modern conservation movement in the U.S. The federal government began setting aside tracts of land as forest reserves when Congress passed the Forest Reserve Act of 1891. Since then, national forestlands have been critical refuges of functional native plant communities in the South.

At the turn of the 20th century, the logging industry in the South was producing lumber at its historical peak. So much forest land had been logged that timber companies were finding it difficult to access merchantable trees and were beginning to close mills and move to the newly opened virgin timberlands of the Northwest. Although World War I caused a short-lived resurgence in the demand for timber and naval stores, the conversion of the shipbuilding industry from wood to steel by 1920 caused demand for southern timber and naval stores to

fall drastically. By 1930 the majority of the longleaf pine communities had been essentially cut over, as had the interior shortleaf pines. Upland hardwood forests fared somewhat better in some places.

The Great Depression in the 1930s was exceptionally difficult for the people living in the South, but it helped the native plant communities of the region. The Civilian Conservation Corps (CCC), established in 1933, did significant reforestation in the South. The formal teaching of forest sciences in the U.S. matured by the 1920s and 1930s so that an abundance of well-trained foresters working for the U.S. Forest Service (USFS), state forestry agencies and the CCC were available to supervise and direct the work. The fledgling USFS was working to control unauthorized timber cutting on federal land. Unfortunately, this was also the time in which widespread fire suppression activities began. Although this practice was well-intentioned at the time, it eventually led to significant declines in native plant communities throughout most of the Southeast.

The timber industry in the South remained depressed until the outbreak of World War II. At about the same time, serious scientific research was started at government and university labs to increase the productivity of forest land. Much of this work focused on the development of "improved" tree selections and cultivation practices. One of the innovations that arose was the growing of pines in plantations. Large tracts of cutover land, especially in the Coastal Plain and Piedmont regions, would eventually be converted to pine plantations. This method focused timber production on developed sites. Although those sites were forever altered, this intensive form of silviculture saved many acres of native forest from more traditional timber harvesting.

During the 1950s and 1960s the South began to see significant increases in immigration and urbanization. Land was developed, and large tracts were fragmented. These trends led to rapid increases in demand for building materials, electricity and additional agricultural production. Improvements in technology and mechanization (especially in agriculture) and decreasing federal commodity price supports led to significant consolidations in the timber and farm industries. In the 1940s, 42 percent of the population in the South lived on farms. By the 1950s, only 15 percent of southerners lived on farms.

After the end of World War II, pine forests in the South, including those on state and federal land, were predominantly managed for timber production. The birth of the modern conservation movement in the 1960s came, in part, as a reaction to concerns about public land management priorities and the lax enforcement of environmental laws.

Forested acres in Mississippi increased by 2.44 million acres from 1977 to 2016, spurred by investments in cost share programs such as USDA's Conservation Reserve Program (CRP) directed toward reforesting farmland, state cost share programs allocated over $100 million to regeneration, and forest markets remained strong through 2010. During that period ownership of non-industrial private forest land increased 33 percent, and collaborations among non-profit organizations, universities, public agencies and private landowners increased. The number of

County Forestry Associations increased to 60 local affiliates of the Mississippi Forestry Association.

However, from 2016 - 2020, Mississippi began to see a decline in forested acres, due to urbanization and development. From the high in 2016 of 19.1 million acres, the state has lost 468,415 acres reflecting a 2.4 percent decline.

As of this report, the forest growth to drain (dividing the annual average growth of forest by the volume removed) ratio is 3 to 1. Since 1990 pine sawtimber prices have declined by 60%, and pine pulpwood prices by 50%. The number of pulp mills in Mississippi dropped from nine to five. The last paper mill was constructed in Grenada in 1989.

Over the same period from 1990 to 2020, the Mississippi Forestry Commission experienced significant changes as well, driven by state budget constraints, several reductions in staffing and the implementation of new technologies. The agency improved services to landowners by creating a centralized wildfire dispatch system, centralized its operations and managing and utilized the web and social media to better serve forest landowners and conservation partners. Investment in an agency Geographic Information System (GIS) and GIS staff helps to tract, monitor and report forest conservation and management work being accomplished across the state, and across MFC's core programs: forest management, health, urban forestry, wildfire response, and grants. The Forest Inventory and Analysis (FIA) now surveys 20 percent of the state's forest annually. Since 2010 the agency has implemented an aggressive Cogongrass Control Program that treats 6,000 annually on over 34,000 spots across the state. MFC regularly collaborates with a variety of partners on fire, forest conservation, invasive species, longleaf pine restoration and forest stewardship.

Current Uses/Public Benefits

Timber and Forest Products

Today Mississippi's forests and the industries they support contribute $13 billion to the state's economy and directly employ 61,794 people paying $1.1 billion in wages each year. Timber is an important agricultural crop in the local economy of virtually every county outside the Mississippi Delta. In any year, timber will be among the three most valuable agricultural crops in 65 to 70 of the 82 counties in the state.

Mississippi's forest products industry consists of four major sectors:

- Solid wood products which include pine and hardwood lumber, plywood, poles, oriented strand board and other "composite" forest products.
- Pulp and paper which includes fine writing papers, "liner-board" used for cardboard boxes, tissue and absorbent papers, and market pulp.
- Wood furniture and related products which consist mostly of upholstered wood furniture such as couches, loveseats and recliners.
- Timber harvesting which includes the harvesting and transportation sector.

Public and private forestlands not only provide significant timber resources for forest products, they also support recreational and tourism opportunities, provide aesthetic and open space value, wildlife habitat, water quality protection and other ecosystem services, social and economic benefits. These benefits are discussed in more detail in Chapter III by each key forest resource issue.

The vast majority of Mississippi's private forestlands are still maintained for economic returns from the sale of timber as a primary or secondary objective. Other objectives increasingly cited by landowners include management for nature-based recreational purposes such as hunting, fishing, for wildlife viewing and aesthetics. Most Mississippi forest landowners do not have an established, formal management plan such as a Forest Stewardship Plan for their property. While they often do not consider the need for a management plan until they decide to harvest timber, a growing number of Mississippi landowners have varied management objectives and actively seek technical assistance from state or federal agencies, private consultants or non-government organizations.

Recreation

Because of its abundance of forests, grasslands, rivers and streams, lakes, coastal waters and marshes and estuaries, Mississippi is a popular destination for Mississippians and non-residents seeking outdoor recreation opportunities. Tourism, nature-based and forest-based recreation constitute a substantial segment of Mississippi's economy. According to the most recent *National Survey of Fishing, Hunting and Wildlife-Associated Recreation* report issued in 2011 Mississippi residents aged 16 and above that participated in wildlife recreation (hunting, fishing, wildlife viewing) in 2011 spent $2.6 billion.

Public lands in Mississippi include 14 national wildlife refuges, six national forests, seven national parks, 25 state parks, and over 50 state wildlife management areas, one national estuarine research reserve (NERR), over 72,000 acres of coastal preserves and thousands of acres of lands managed by the U.S. Army Corps of Engineers and military installations that support and serve the growing tourism and recreation industry. Although not all revenues reported for tourism and outdoor recreation are the result of forest-based activities, the natural beauty of Mississippi's forests, combined with the state's diverse topography, make it an increasingly popular vacation destination. The most popular forest-based outdoor recreation activities on public lands include hunting and fishing, hiking, horseback riding, wildlife viewing, photography, paddling/boating, camping and enjoyment of nature.

Most forest industries that own land in Mississippi recognize the opportunity for nature-based recreation on their lands and some make their properties available for hunting, hiking and other recreation activities by lease or permit. In a recent study of 800 properties conducted Mississippi State University scientists in conjunction with the Federal Land Bank of Mississippi and Mossy Oak Properties found that individuals purchased property in the state specifically for wildlife-related recreation. One-third of the dollar value of rural lands ($634 per acre, on average) was due to outdoor recreational potential.
Of course, recreational use on non-industrial private forest lands is much more limited than on public lands. Fewer landowners are willing to allow the full public access to their lands, but a growing number lease their lands, primarily for hunting, to users who also help protect and manage forest resources.

Aesthetics
The aesthetic values that forests provide also play an increasingly important role in the economic and social well-being of people. The beauty and serenity of open forested spaces in urban and rural landscapes have a positive impact on tourism, land values and economic development. Forests adjacent to urban areas and communities can result in increased property values. They soften the glare and hard lines of developed areas, reduce noise and pollution and act as sound barriers or screens.

Health
The health benefits of living close to nature and spending time outside in open spaces and forests are being increasingly studied by scientists in the medical and mental health fields. A 2018 report from the University of East Anglia's Norwich Medical School revealed that exposure to greenspaces reduces the risk of type II diabetes, cardiovascular disease, premature death, preterm birth, stress and high blood pressure. The research team studied data from 20 countries and 140 other studies that involved 290 million people.

Ecosystem Services
Other non-timber benefits of forest resources that are becoming increasingly recognized for their inherent value to humans and wildlife are ecosystem services such as carbon storage, storm hazard mitigation, water quality protection (including drinking water supplies and groundwater) and soil stabilization (erosion and sediment control). While these are still

challenging to quantify in economic terms, they provide critically-important protective public benefits.

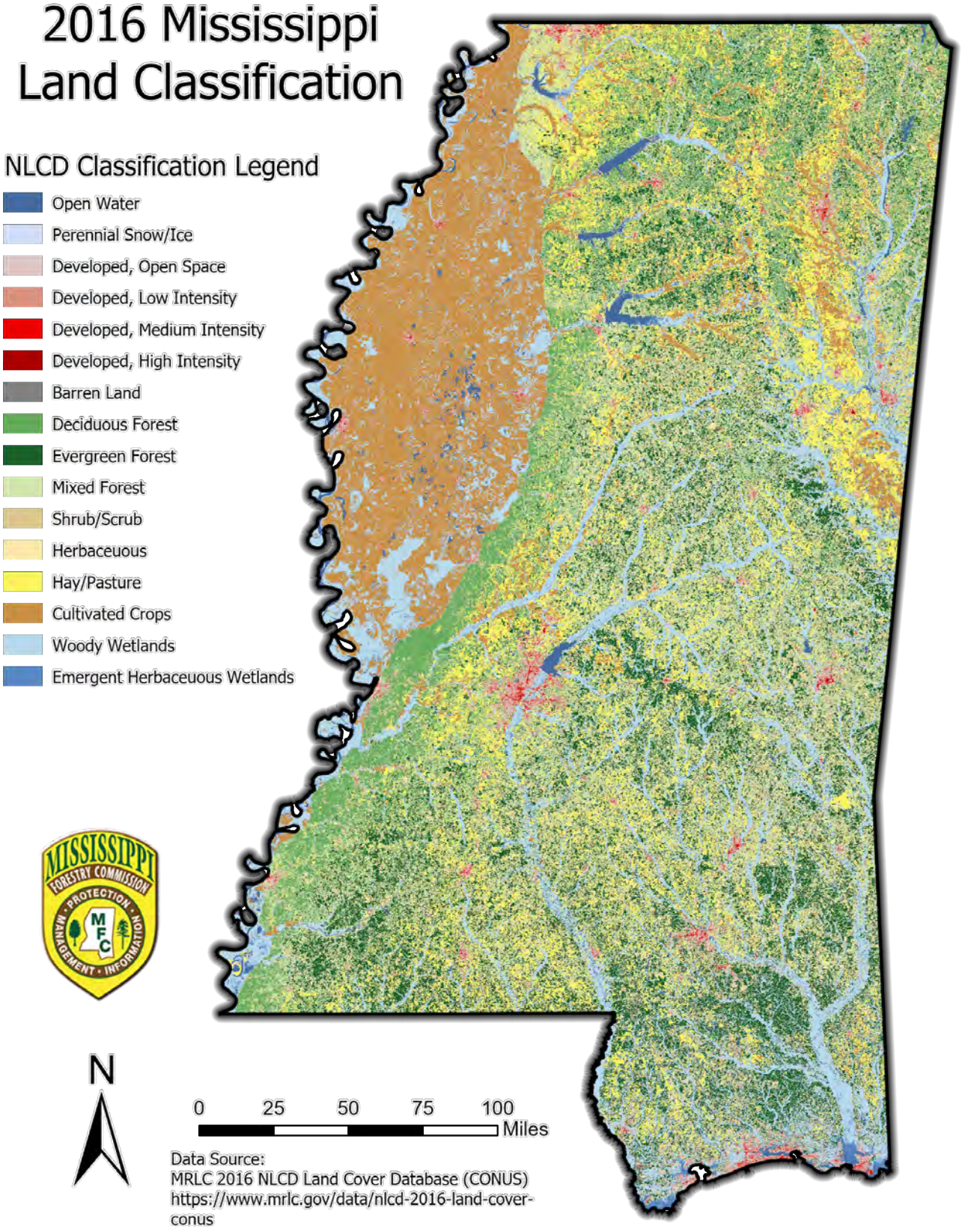
Distribution and Abundance of Forests in Mississippi

Mississippi is one of the most heavily forested states in the nation. Approximately 62 percent of the total land base is forested, totaling 19.1 million acres. With the exception of the Mississippi River alluvial plain (delta region), forestry is the predominant land use. The total productive land area of Mississippi is 30,521,018 acres. Pine forests cover 7.8 million acres or 41 percent of the forested area. Hardwood and oak-pine timber types combine to occupy over 53.11 percent of the state's timberland or 10.3 million acres.

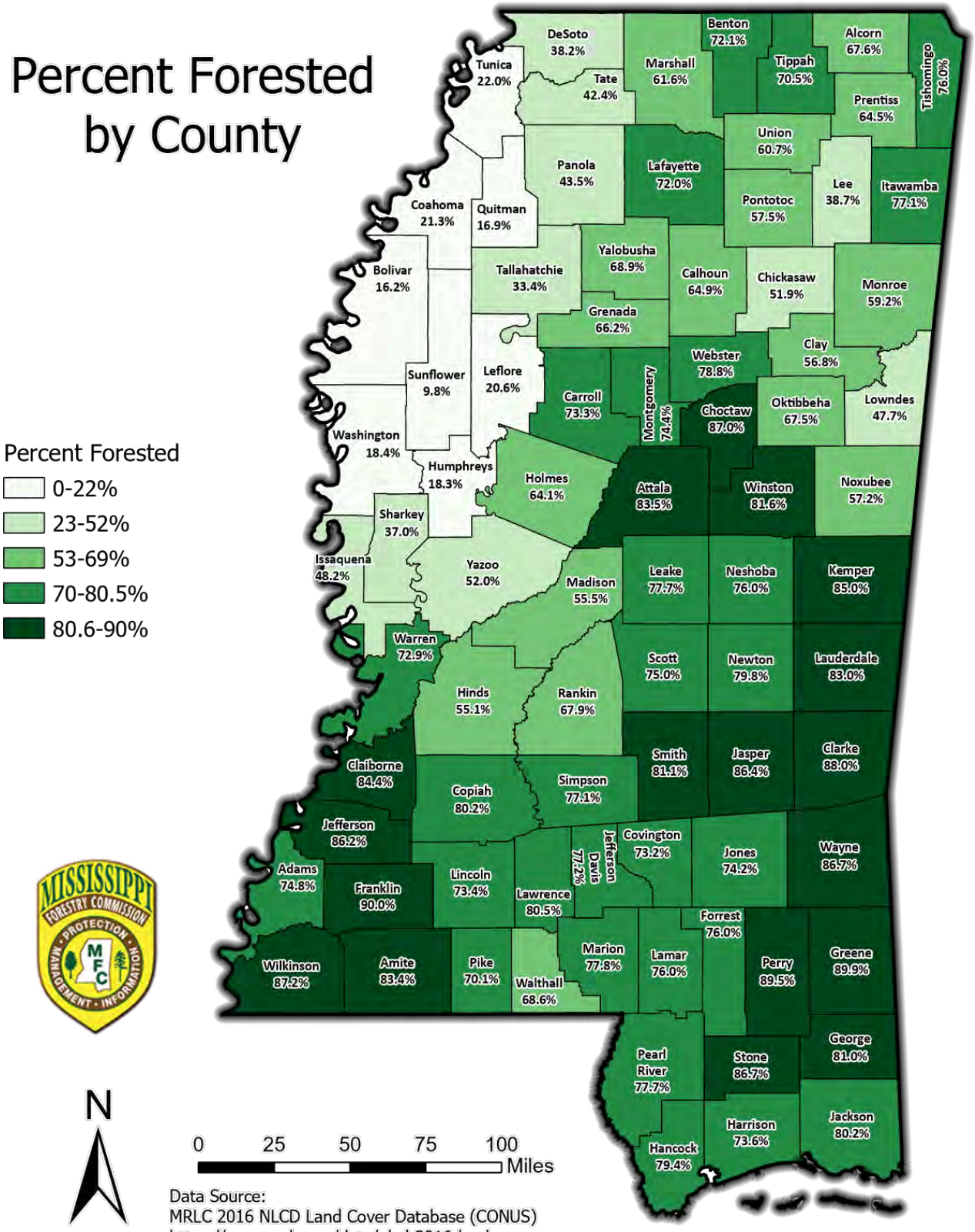
Forests are located statewide, but the type of forest cover varies dramatically across the state. According to FIA data, since 2010 Mississippi has lost 328,040 forested acres, and 260,300 acres of forest land have been diverted to agricultural land use. While approximately 52,000 acres of non-forest reverts back to forest annually, nearly 80,000 forest acres are being converted to non-forest use. The following is a map of general land cover of Mississippi and a map of forested acres by county.

Mississippi is one of the most heavily forested states in the nation. Approximately 62 percent of the total land base is forested, totaling 19.1 million acres. With the exception of the Mississippi River alluvial plain (delta region), forestry is the predominant land use. The total productive land area of Mississippi is 30,521,018 acres. Pine forests cover 7.8 million acres or 41 percent of the forested area. Hardwood and oak-pine timber types combine to occupy over 53.11 percent of the state's timberland or 10.3 million acres.

Forests are located statewide, but the type of forest cover varies dramatically across the state. According to FIA data, since 2010 Mississippi has lost 328,040 forested acres, and 260,300 acres of forest land have been diverted to agricultural land use. While approximately 52,000 acres of non-forest reverts back to forest annually, nearly 80,000 forest acres are being converted to non-forest use. The following is a map of general land cover of Mississippi and a map of forested acres by county.


2016 Mississippi
Land Classification
NLCD Classification Legend
Open Water
Perennial Snow/Ice
Developed, Open Space
Developed, Low Intensity
Developed, Medium Intensity
Developed, High Intensity
Barren Land
Deciduous Forest
Evergreen Forest
Mixed Forest
Shrub/Scrub
Herbaceuous
Hay/Pasture
Cultivated Crops
Woody Wetlands
Emergent Herbaceuous Wetlands
MISSISSIPPI
FORESTRY COMMISSION
PROTECTION
MANAGEMENT
INFORMATION
MFC
N
0
25
50
75
100
Miles
Data Source:
MRLC 2016 NLCD Land Cover Database (CONUS)
https://www.mrlc.gov/data/nlcd-2016-land-cover-conus

Percent Forested by County



Data Source:
MRLC 2016 NLCD Land Cover Database (CONUS)
https://www.mrlc.gov/data/nlcd-2016-land-cover-conus

Forest Communities of Mississippi

A natural community is collectively, all of the organisms inhabiting a common environment and interacting with each other. The Mississippi Natural Heritage Program (NHP) housed at the Mississippi Department of Wildlife, Fisheries and Parks (MDWFP) has identified at least 159 natural, semi-natural, managed, weedy and probable community types in Mississippi. Those community types have been assigned priority conservation ranks indicating their relative endangerment or abundance.

In 2015, the NHP updated the *State Wildlife Action Plan* (SWAP) as part of a nationwide effort to identify habitats and species of concern and to improve biodiversity of wildlife species across the country. The SWAP consolidated the 159 natural and semi-natural community types in Mississippi identified by NHP into 15 broad habitat types and 63 sub-types with a description of each community, the wildlife and fish species of concern associated with each type, and identified the major threats and potential conservation actions needed to abate those threats. The community types were also ranked for the purposes of prioritizing the community types that need immediate conservation action. Seventeen of the 63 subtypes are predominantly forested and fall into nine major forest communities or habitats as follows:

Major Forest Communities in Mississippi*

Xeric-Mesic Upland Forest/Woodlands
Mesic Upland Forests
Bottomland Hardwoods
Swamp Forests
Riverfront Forests
Wet Pine Savannas/Flatwoods
Cedar Glades (within Prairies)
Upland Maritime Woodlands
Pine Plantation

**Adapted from the Mississippi State Wildlife Action Plan (2015).*

These forest community types are organized by the four ecoregions in the state:

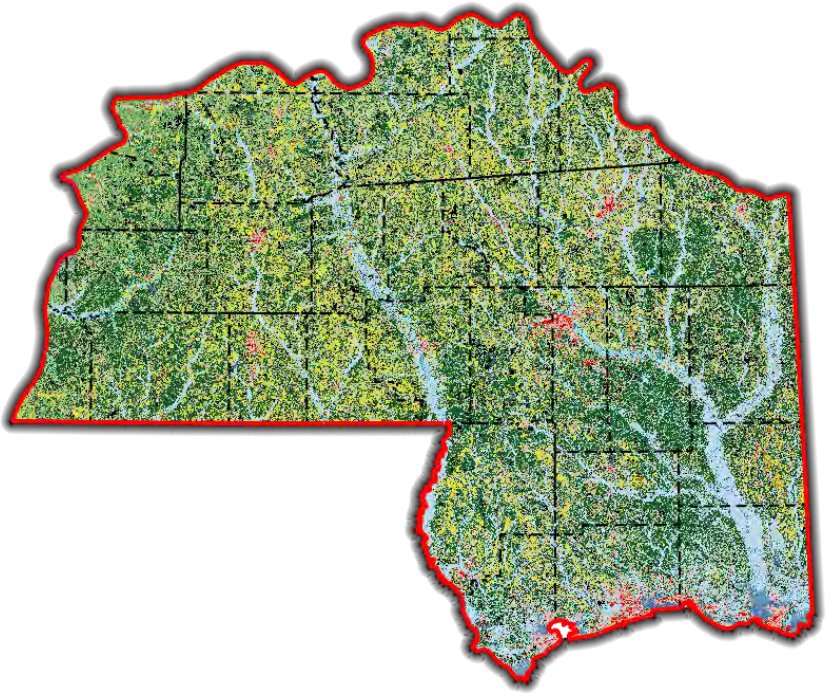
Upper East Gulf Coastal Plain (UEGCP)
East Gulf Coastal Plain (EGCP)
Mississippi River Alluvial Plain (MSRAP)
Northern Gulf of Mexico (NGM)

Ecoregions are commonly considered to be large areas distinguished from surrounding regions by differing biotic and environmental factors and/or ecological processes. Factors that are generally used to distinguish these large regions from one another include differences in climate, physical geography, soils, species or communities

East Gulf Coastal Plain Ecoregion

NLCD Land Cover Classification Legend

- Open Water
- Perennial Ice/ Snow
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren Land (Rock/Sand/Clay)
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Dwarf Scrub*
- Shrub/Scrub
- Grassland/Herbaceous
- Sedge/Herbaceous*
- Lichens*
- Moss*
- Pasture/Hay
- Cultivated Crops
- Woody Wetlands
- Emergent Herbaceous Wetlands



Land Class	Acres
Agriculture	1,214,396
Water	98,050
Evergreen	3,167,148
Mixed	1,404,171
Deciduous	323,583
Herbaceuous	494,578
Woody Wetlands	1,732,280
Shrub/Scrub	654,668
Developed	614,029
Emergent Herbaceuous	118,184
Barren Land	27,291
Total	9,848,378

N

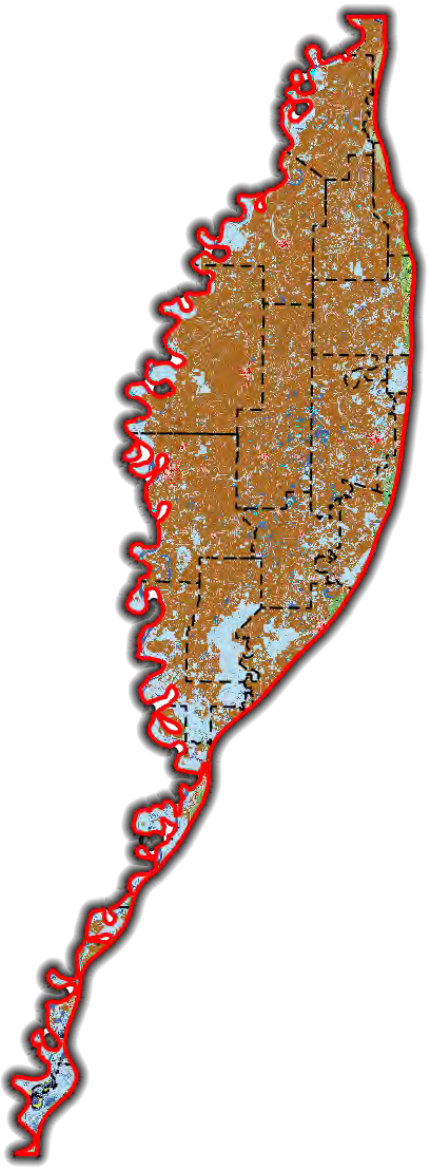
0 25 50 75 100 Miles

Mississippi River Alluvial Plain Ecoregion

NLCD Land Cover Classification Legend

- Open Water
- Perennial Ice/ Snow
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren Land (Rock/Sand/Clay)
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Dwarf Scrub*
- Shrub/Scrub
- Grassland/Herbaceous
- Sedge/Herbaceous*
- Lichens*
- Moss*
- Pasture/Hay
- Cultivated Crops
- Woody Wetlands
- Emergent Herbaceous Wetlands

Land Class	Acres
Agriculture	3,163,129
Water	287,225
Evergreen	5,949
Mixed	38,516
Deciduous	63,664
Herbaceuous	8,535
Woody Wetlands	1,151,690
Shrub/Scrub	5,544
Developed	216,885
Emergent Herbaceuous	59,719
Barren Land	15,941
Total	5,016,797



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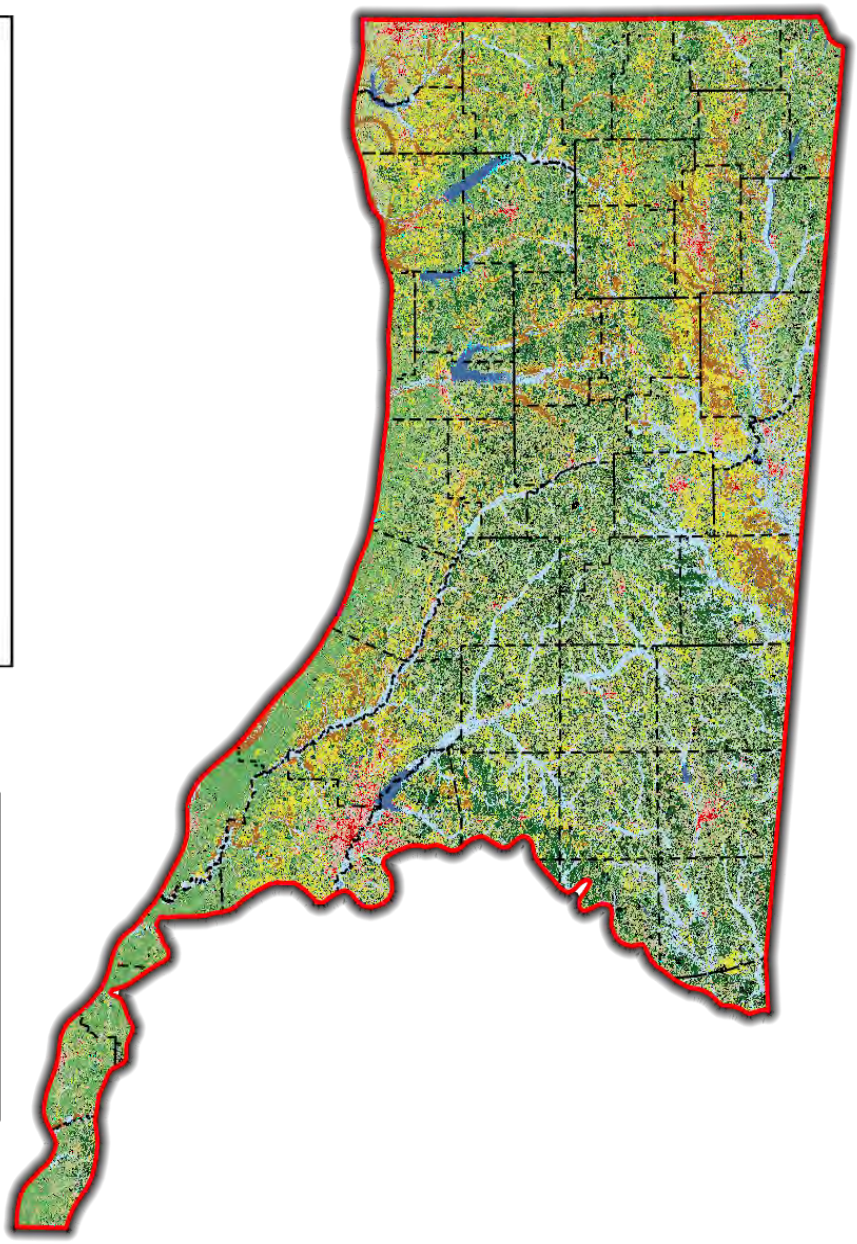
0 25 50 75 100 Miles

Upper East Gulf Coastal Plain Ecoregion

NLCD Land Cover Classification Legend

- Open Water
- Perennial Ice/ Snow
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren Land (Rock/Sand/Clay)
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Dwarf Scrub*
- Shrub/Scrub
- Grassland/Herbaceous
- Sedge/Herbaceous*
- Lichens*
- Moss*
- Pasture/Hay
- Cultivated Crops
- Woody Wetlands
- Emergent Herbaceous Wetlands

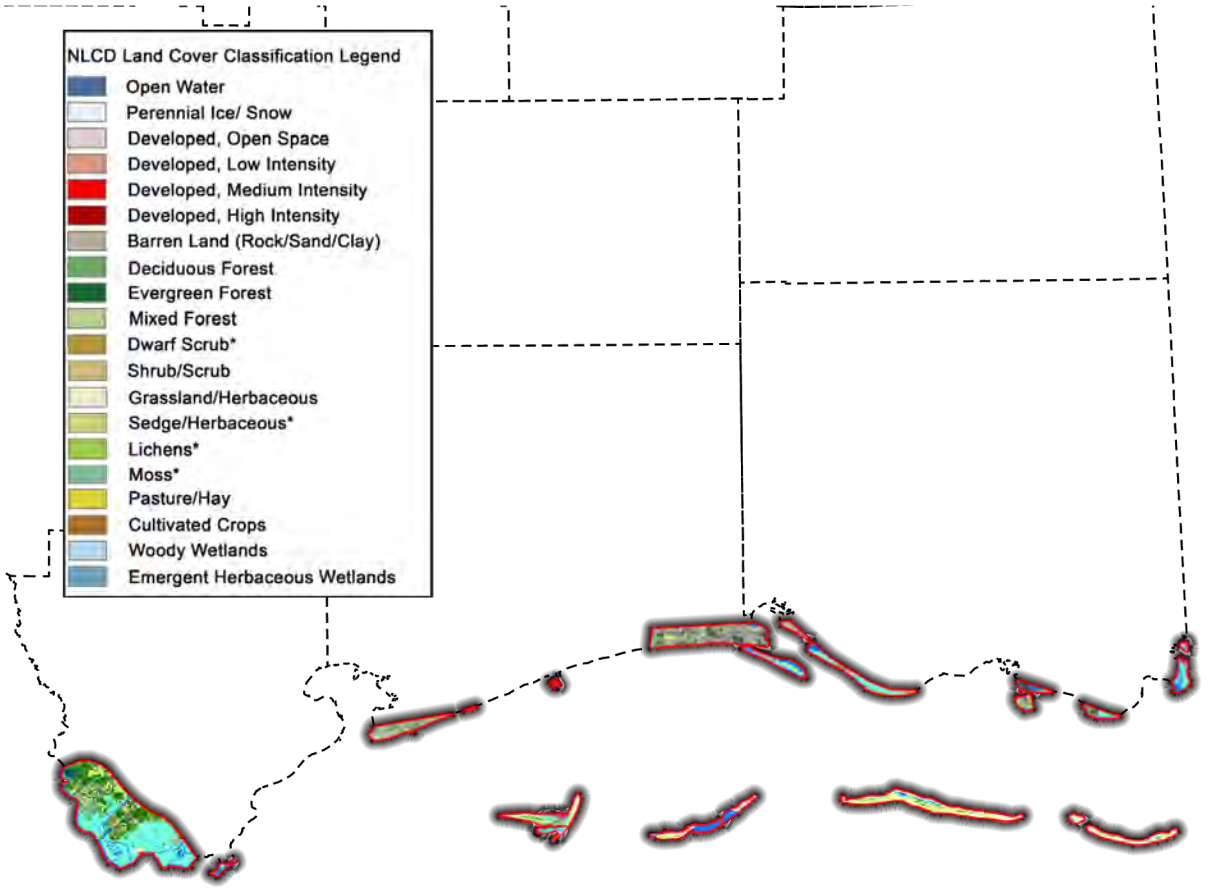


Land Class	Acres
Agriculture	3,565,402
Water	275,872
Evergreen	2,644,328
Mixed	2,498,849
Deciduous	2,417,733
Herbaceuous	453,601
Woody Wetlands	1,883,325
Shrub/Scrub	677,981
Developed	969,619
Emergent Herbaceuous	188,843
Barren Land	23,316
Total	15,598,869

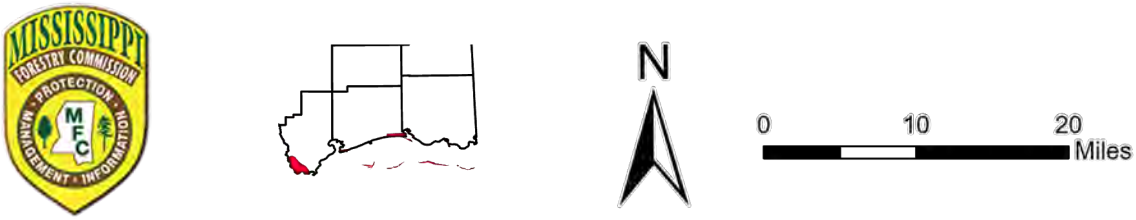
N

0 25 50 75 100 Miles

Northern Gulf of Mexico Ecoregion



Land Class	Acres
Agriculture	144
Water	3,974
Evergreen	2,166
Mixed	26
Deciduous	4
Herbaceuous	364
Woody Wetlands	4,497
Shrub/Scrub	684
Developed	9,207
Emergent Herbaceuous	15,047
Barren Land	2,924
Total	39,037



Forest Community Descriptions

Each major forest community type and subtype that occurs in the state is described on the following pages as excerpted from the *Mississippi State Wildlife Action Plan* (2015). For more detailed descriptions of each type and subtype, geographic location, size, condition, conservation status, threats and recommended conservation actions and their general locations within each ecoregion go to the full SWAP at https://bit.ly/2wYy6iA.

Table 1: Forest Community Types/Subtypes by Ecoregion and Conservation Status*

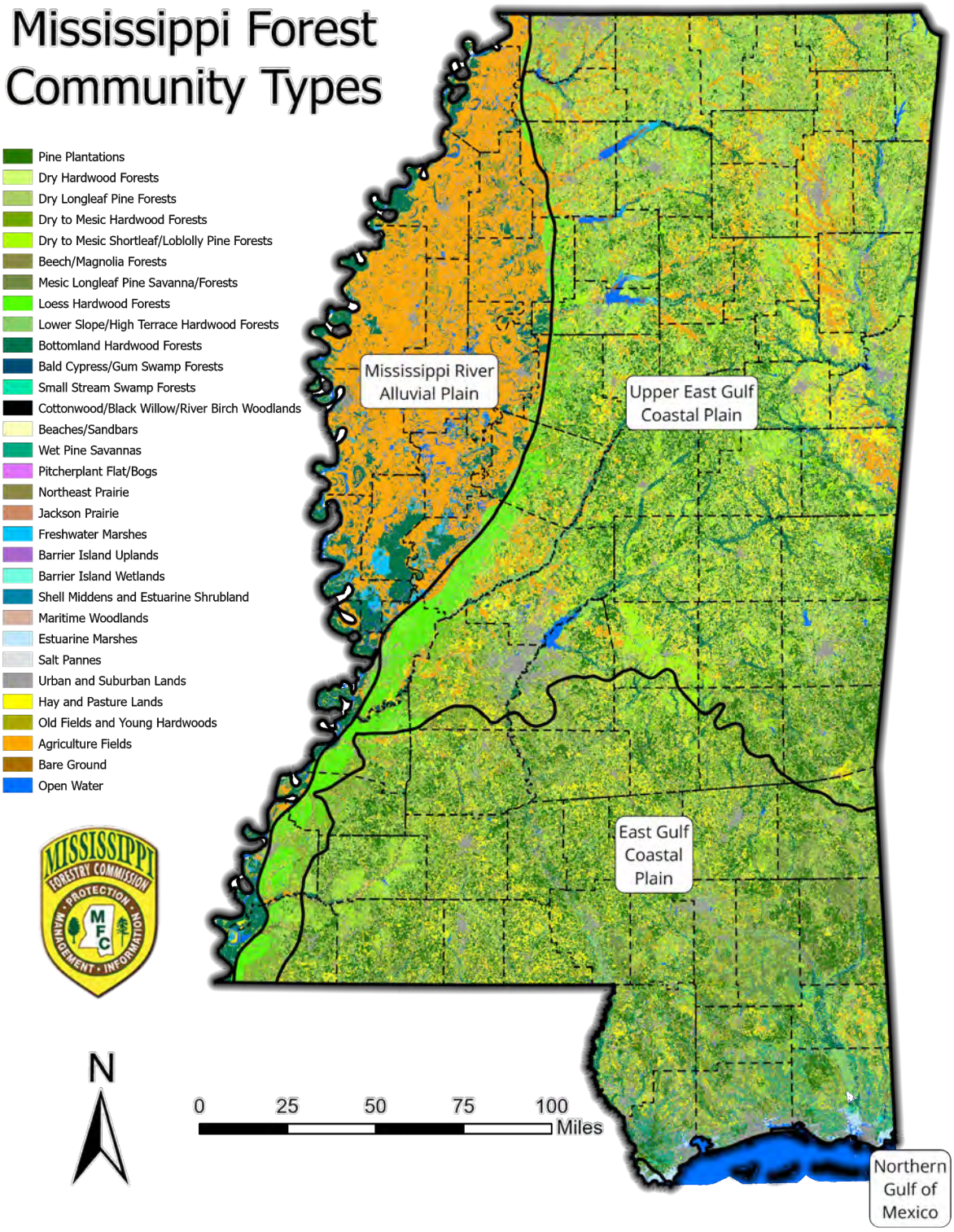
HABITAT TYPE/SUBTYPE NAME	ECOREGIONS*			
	NGM	EGCP	UEGCP	MSRAP
1. Xeric-Mesic Upland Forests/Woodlands		X	X	
Xeric Hardwood Forests		Imperiled	Imperiled	
Xeric Longleaf Pine Forests		Critically imperiled		
Xeric-Mesic Hardwood Forests		Vulnerable	Vulnerable	
Xeric-Mesic Shortleaf/Loblolly Pine Forests		Secure	Secure	
2. Mesic Upland Forests		X	X	
Southern Mixed Hardwood Forests		Critically imperiled	Imperiled	
Mesic Longleaf Pine Savanna/Forests		Imperiled		
Loess Hardwood Forests			Imperiled	
Lower Slope/High Terrace Hardwood Forests		Vulnerable	Vulnerable	

3. Bottomland Hardwood Forests		**X**	**X**	**X**
Bottomland Hardwood Forests		Vulnerable	Vulnerable	Vulnerable
4. Swamp Forests		**X**	**X**	**X**
Bald Cypress/Gum Swamp Forests		Vulnerable	Vulnerable	Vulnerable
Small Stream Swamp Forests		Vulnerable to Critically Imperiled	Vulnerable	
5. Riverfront Forests		**X**	**X**	**X**
Cottonwood/Black Willow/River Birch Woodlands		Vulnerable	Vulnerable	Vulnerable
6. Wet Pine Savannas/Flatwoods		**X**		
Wet Pine Savannas		Critically imperiled		
Slash Pine Flatwoods		Vulnerable		
7. Prairies			**X**	
Northeast Prairie/Cedar Glades			Prairie is critically imperiled. Cedar glades are present when fire is excluded.	
8. Upland Maritime and Estuarine Fringe Habitats	**X**			
Maritime Woodlands	Critically Imperiled			
Barrier Island Uplands (Live Oak Woodlands and Slash Pine Woodlands)	Imperiled			

9. Artificial Habitats		**X**	**X**	
Pine Plantations		Secure	Secure	

***** *Source: Adapted from the **Mississippi State Wildlife Action Plan** (2015) and Mississippi Natural Heritage Program/Mississippi Museum of Natural Science and the Mississippi Department of Wildlife, Fisheries and Parks*

Upper East Gulf Coastal Plain (UEGCP)
East Gulf Coastal Plain (EGCP)
Mississippi River Alluvial Plain (MSRAP)
Northern Gulf of Mexico (NGM)


Mississippi Forest Community Types
Pine Plantations
Dry Hardwood Forests
Dry Longleaf Pine Forests
Dry to Mesic Hardwood Forests
Dry to Mesic Shortleaf/Loblolly Pine Forests
Beech/Magnolia Forests
Mesic Longleaf Pine Savanna/Forests
Loess Hardwood Forests
Lower Slope/High Terrace Hardwood Forests
Bottomland Hardwood Forests
Bald Cypress/Gum Swamp Forests
Small Stream Swamp Forests
Cottonwood/Black Willow/River Birch Woodlands
Beaches/Sandbars
Wet Pine Savannas
Pitcherplant Flat/Bogs
Northeast Prairie
Jackson Prairie
Freshwater Marshes
Barrier Island Uplands
Barrier Island Wetlands
Shell Middens and Estuarine Shrubland
Maritime Woodlands
Estuarine Marshes
Salt Pannes
Urban and Suburban Lands
Hay and Pasture Lands
Old Fields and Young Hardwoods
Agriculture Fields
Bare Ground
Open Water
Mississippi River Alluvial Plain
Upper East Gulf Coastal Plain
East Gulf Coastal Plain
Northern Gulf of Mexico
MISSISSIPPI FORESTRY COMMISSION
PROTECTION • MANAGEMENT • INFORMATION
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0 25 50 75 100
Miles

1. Xeric to Mesic (Dry to Moderately Moist) Upland Forests/Woodlands

Xeric to mesic forests are often found on excessive to somewhat excessively well-drained soils, and include hardwood and pine forest associations. Mixed pine-hardwood forests are classified by the more abundant canopy tree type. Fire played an important role in maintaining these habitats by reducing densities of young saplings, recycling nutrients and oxidizing ground litter.

This forest type includes four subtypes:
Xeric Hardwood Forests
Xeric Longleaf Pine Forests
Xeric-Mesic Hardwood Forests
Xeric-Mesic Shortleaf/Loblolly Pine Forests.

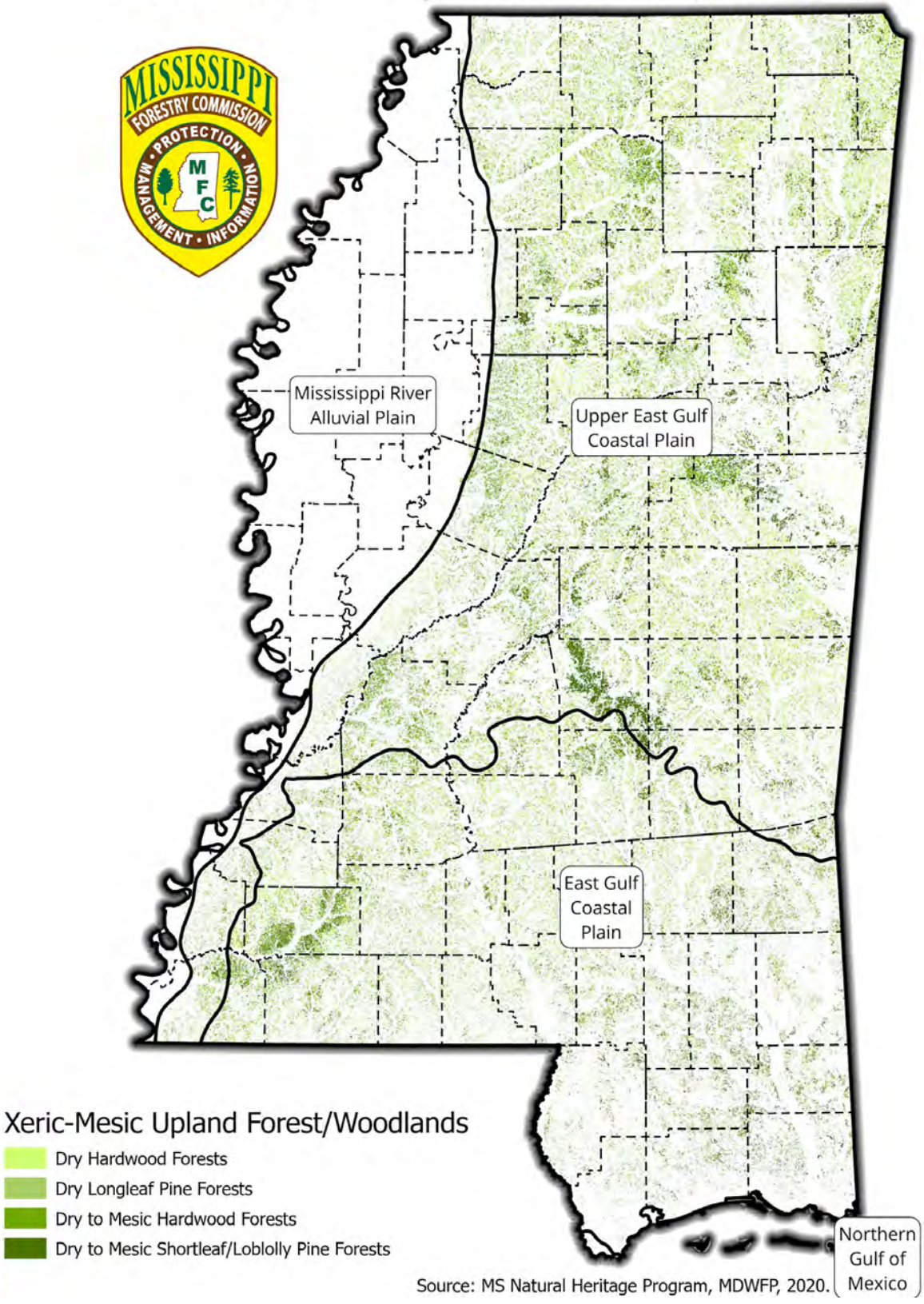
Although there are no estimates of the losses of Xeric to Mesic Forests/Woodlands in Mississippi, it is possible to envision their overall condition by understanding the extent of development pressure generated on these habitats. Historically, large areas of upland hardwood and pine forests were converted to agricultural croplands and pasture. The tracts were selected from the areas containing the most productive landforms and soils. Most landforms of the coastal plain are not excessively steep or isolated and are therefore accessible to either timber management or agricultural usage.

Due to a history of pine monoculture and fire suppression, typical upland forests lack a diverse understory and exhibit very high stem densities. Upland forests of Mississippi benefit from prescribed burning. However, timberlands and protected forestlands, such as national wildlife refuges and lands adjacent to the US Army Corps of Engineers' reservoirs, are somewhat degraded due to limited exposure to fire, though continued efforts to increase application of prescribed burning on national forest lands may result in improved conditions.

Timing of prescribed burning is an important issue. To most closely approximate the condition of the historic forests, burns should occur in late spring and early summer, when natural ignitions are most likely and when litter moisture is low enough to facilitate fire propagation.

With an increased interest in conservation, through sustainable forestry practices such as the single tree select cut system of timber harvesting, and a renewed interest in forest restoration on private and public lands, conditions of these forests may improve.

Xeric-Mesic Upland Forest/Woodlands



Source: MS Natural Heritage Program, MDWFP, 2020.

1. Mesic (Moderately Moist) Upland Forests

Mesic upland forests are supported by soils that have higher moisture holding capacities than those of xeric to sub-xeric forest categories. Plant communities of mesic habitats include beech/magnolia forests, longleaf pine savannas, and lower slope/high terrace hardwoods. Hardwood forests in this type are often found on moist portions of upland habitats protected from fire (by slope) and high terraces or ridges of floodplains.

This type includes four subtypes:
Southern Mixed Hardwood Forests
Mesic Longleaf Pine/Savanna Forests
Loess Hardwood Forests
Lower Slope/High Terrace Hardwood Forests.

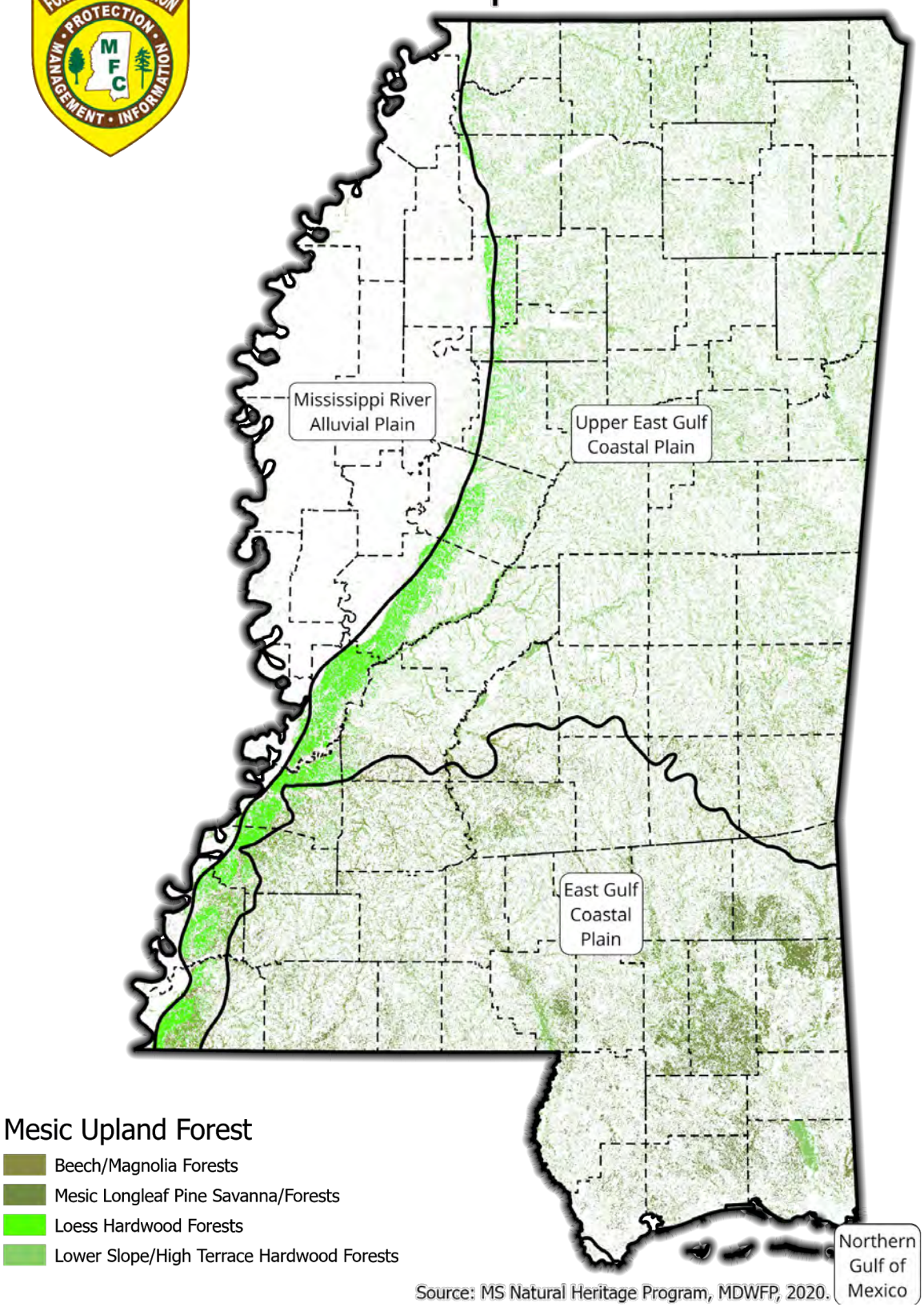
Small seepage slopes or springs are found within mesic forests. Springs form when groundwater resurfaces after flowing laterally over less permeable substrates, which place the water table above the spring. Cracks or sloping impermeable strata tend to direct the flow towards the spring head. Springs were important watering points for early settlers but also have ecological importance, especially by providing a moist environment for amphibians. Spring seeps often contain rare plants and may be the only wetlands available to local animal populations during droughts. Larger spring-fed wetlands are associated with swamps, bogs or other wetland categories. Spring seeps occur throughout the state and are categorized into hardwood or pine seeps.

The diversity of the hardwood and pine forest communities have decreased due to land clearing, overcutting, introduction of invasive species (especially Chinese privet), erosion, and the suppression of fire over long periods. Being situated on gently sloping landscapes with relatively deep and fertile soil, mesic forest types have been prone to agriculture conversion in the past.

Mesic longleaf forests once formed an extensive blanket across the uplands of the piney woods region of south Mississippi but were logged during the last two centuries. Second growth forests, many of which were converted to other pines, now occupy the undulating hills and plains of the region. Because of the current emphasis on timber production, many existing longleaf pine stands are even-aged and have much higher stocking densities. Although significant land conversion has occurred, longleaf pine forests are common on national forest lands and some private holdings in the piney woods region.

Forest management practices (best management practices) that prevent logging in streamside zones are designed to help improve water quality of streams and ultimately help conserve lower slope/high terrace hardwood forests. The expansion of terrace hardwoods onto slopes of the longleaf pine region is a modern condition resulting from the suppression of fire. Conditions described for xeric to sub-xeric hardwood forests also apply to these forest communities.

Mesic Upland Forest



Source: MS Natural Heritage Program, MDWFP, 2020.

2. Bottomland Hardwood Forests

Bottomland hardwood forests occur in river floodplains that receive periodic inundation from rivers during heavy rainfall events. Bottomland terraces are irregularly flooded for durations of several days to a month or more. On these lowland sites, the water table remains elevated during the winter and spring seasons and soils remain moist through much of the growing season. Their soils are less acidic and are enriched by the influx of nutrients and sediments during floods. Bottomland forests are considered palustrine. Palustrine communities are composed of hydrophytic plants that grow and persist despite periodic low oxygen conditions in the soil.

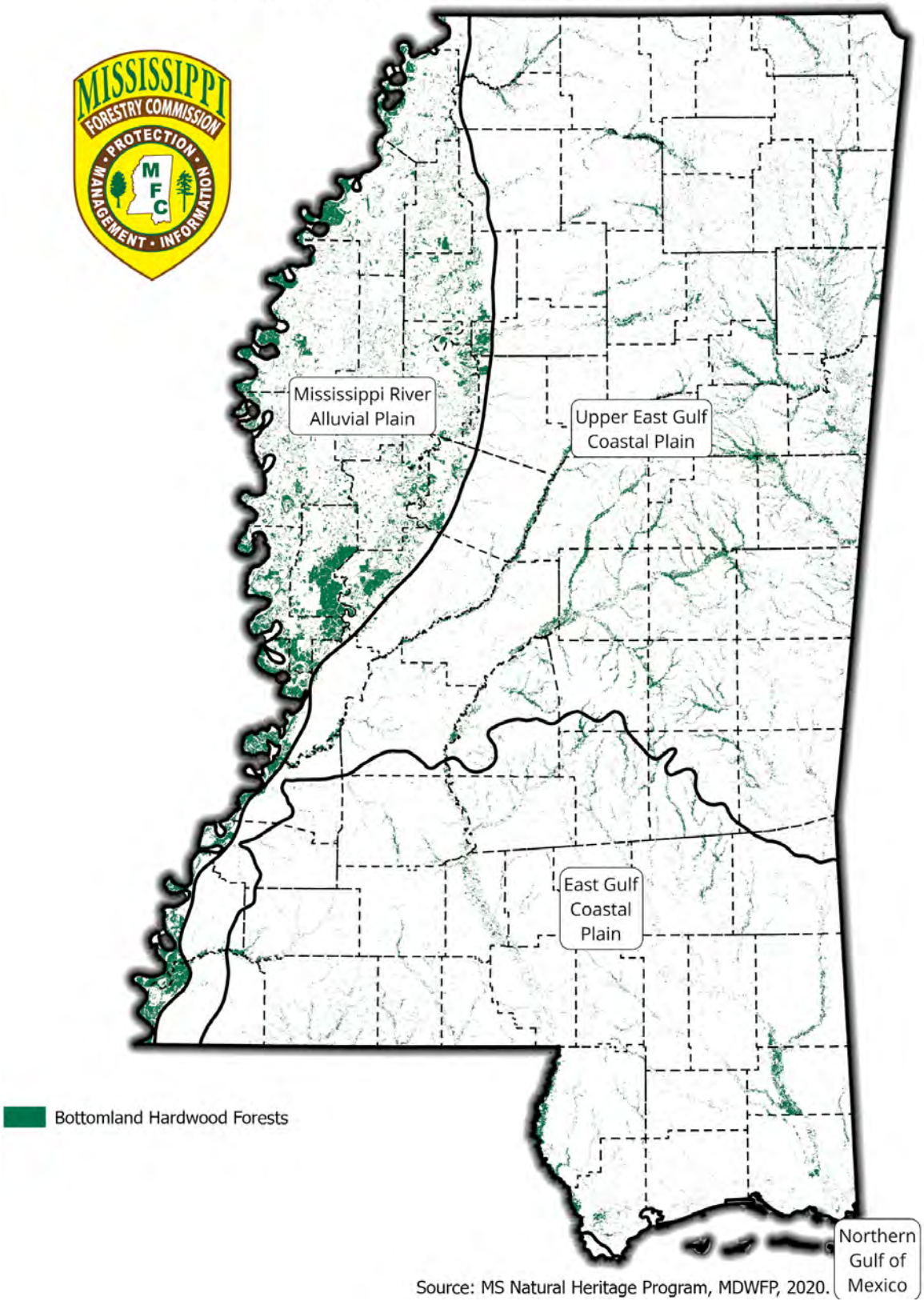
Bottomland hardwood forests and swamps were once common in the Southeast. During the 20th century, the most dramatic wetland loss in the entire nation occurred in forested wetlands of the Lower MSRAP. Of an estimated 24 million acres of the original bottomland hardwood forests, only 5.2 million acres (22 percent) remained in 1978. Fifty-six percent of southern bottomland hardwood and bald cypress forests were lost between 1900 and 1978.

The primary cause of bottomland hardwood losses has been conversion of these lands to agricultural production. Additional losses have been caused by construction and operation of flood control structures and reservoirs, surface mining, and urban development. Many existing bottomland hardwood forests have been highly degraded due to improper timber management resulting in altered species composition and forest structure. The moderately wet forest types are increasingly fragmented due to improved road access, increased agriculture usage (i.e., pastures and fencing) and closer proximity to development. The wetter tracts are less fragmented but also have lost many of their original functions. They are somewhat less vulnerable to disturbances because moisture conditions prevented access to these lands. Human activities along streams have had, and continue to have, a negative impact in this habitat.

The Bottomland Hardwood Forests subtype occurs in linear patches on floodplains along creeks and rivers. Collectively, bottomland hardwood forests make up almost seven percent of the state's land area (about two million acres).

Bottomland hardwood forests are vulnerable in the state due to widespread conversion in the past. Other factors that contribute to fragmentation and reduce function could lead to further declines.

Bottomland Hardwood Forests



Source: MS Natural Heritage Program, MDWFP, 2020.

3. Swamp Forests

There are roughly 600,000 acres of swamp habitat across Mississippi, equivalent to about two percent of the state land area. Low floodplain terraces, bottomland flats, backwater areas or spring heads are common areas to find swamp forest vegetation. The soils of swales or depressions are seasonally to semi-permanently flooded and remain saturated for long periods throughout the year.

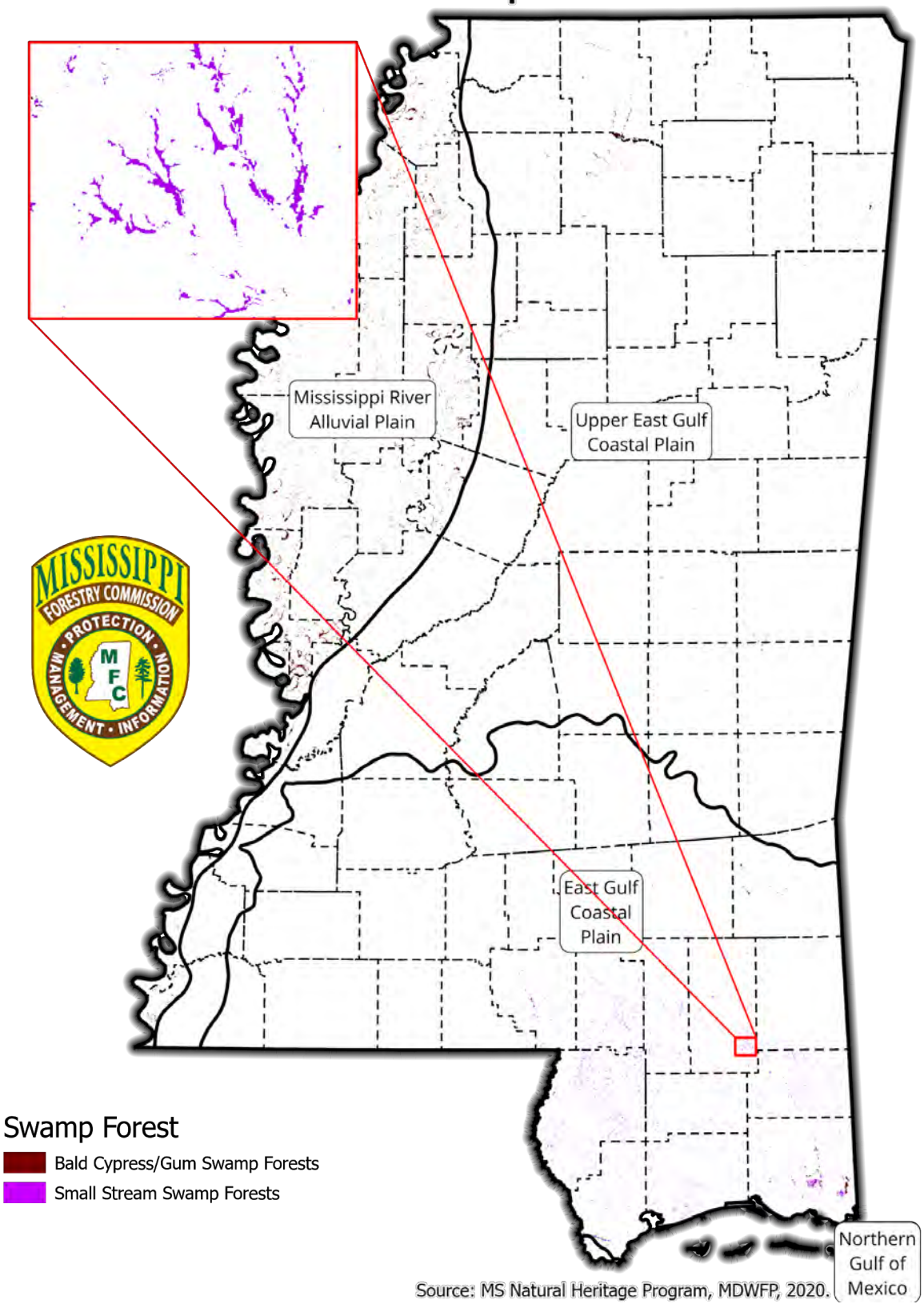
Two swamp forest subtypes occur in Mississippi: Bald cypress/blackgum/water tupelo swamps (found in depressions associated with riverine floodplains) and small stream swamp forests (includes wet pond cypress depressions, white cedar swamps and bay swamp forests).

The state was once covered with mostly unbroken forest, but centuries of land clearing and development have seriously impacted southern swamplands. Fifteen percent of the land surface area of the southeastern United States was once wetland as compared to five percent nationwide. The Southeast accounted for about 47 percent of the total wetland area and 65 percent of the forested wetland area of the coterminous United States. Despite dramatic losses, such as those documented in the previous bottomland forest section, the Southeast accounts for about 36 percent of all wetlands and 60 percent to 65 percent of all forested wetlands. Although loss rates have declined recently, most wetland acreage lost every year in the United States is still from southern forested wetlands. Estimates of one million acres of cypress-tupelo swamp remain in the lower Mississippi River valley, within Louisiana, Arkansas and Mississippi.

In the past, wetlands have been regarded as a menace and a hindrance to land development and were considered wastelands, made valuable only if drained. During the mid-19th century, Congress passed the Swamp Lands Acts of 1849, 1850, and 1860, granting swamp and periodically flooded bottomlands to the states. Five southern states received 40 million acres for draining. Most wetlands were drained for conversion to agriculture. Large-scale federal navigation, flood-control, and drainage projects have played a large role in these conversions by making previously flood-prone lands dry enough for planting crops. The increase in the population of the South also accelerated the rate of wetland losses. Conditions around the state range from losses of around 80 percent in the Mississippi River alluvial plain to more natural conditions in parts of the Pascagoula River watershed. The Pascagoula is the largest unimpeded main stem river in the lower 48 states surrounded largely by bottomland hardwoods and coastal marsh.

Bald cypress/gum swamp forests are considered vulnerable in the state due to historic widespread declines and recent losses caused by a wide range of developments that result in destruction of some forests and create additional isolation and fragmentation in remnants. Small stream swamp forests are also considered vulnerable to further decline due to a lack of seasonally appropriate prescribed fires and encroachment and fragmentation caused by urbanization.

Swamp Forests



Source: MS Natural Heritage Program, MDWFP, 2020.

4. Riverfront Forests: Cottonwood/Black Willow/River Birch Woodlands

Riverfront soils are lower in organic matter and have higher pH than soils of other bottomland hardwoods. New soils in accretion zones range from fine clay to coarse sand, depending on flow velocities at the time of sediment deposition. Backwater areas contain finer textured substrates and point bars are sandier. The moisture level of riverfront substrates depends on river stage, which is usually high in the spring, causing saturation or flooding, and low in the fall, bringing drier conditions.
Flooding along the riverfront areas reworks sediments from river banks, sandbars and point bars to form new channels, submerging some areas and building new lands elsewhere. Wet exposed mineral soils provide open habitats for cottonwood and willow to germinate. The dominant trees of these areas germinate best in exposed mineral soil, grow rapidly once river levels fall and must tolerate submersion and sediment accumulation. Sedimentation degrades aquatic habitats and kills aquatic organisms, including fish.

Riverfront forests, which control shoreline erosion and intercept eroded soil from upland areas, effectively reduce the amount of sediment reaching rivers and streams.

Dams, channelization, man-made levees and other modifications have restricted the extent of riverfront forests. The modified river environment has inhibited riverfront cottonwood and willow community regeneration. Bank erosion-accretion process has been slowed or eliminated along leveed and stabilized portions of the Mississippi River. The modified river environment has inhibited riverfront cottonwood and willow community regeneration.

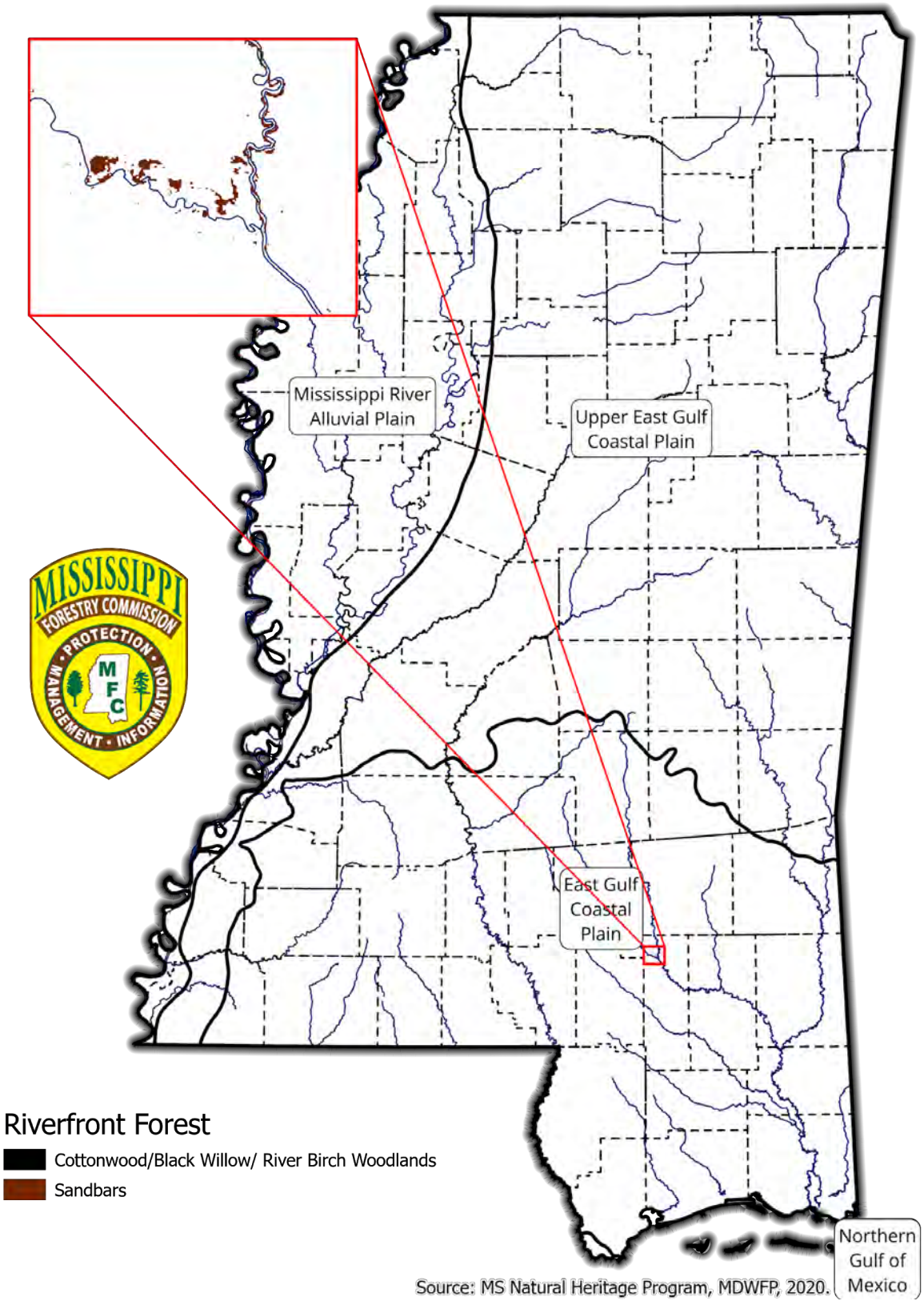
Although much diminished after river diking, dredging, revetment and channelization projects, the lands between the Mississippi River and its levees still contain the long swaths of riverfront forests.

Riverfront forests occur in smaller patches along rivers of the state. The acreage is unknown. It flourishes along channels where nutrient poor mineral soils are exposed after flooding. The woodlands are replaced by bottomland hardwood forests as the distance increases from the main channel.

This community type has declined in some areas because of flood control projects which have altered the natural flow regimen of southern river systems. Loss of the scouring action of streams subsequent to impoundment reduces the hydrologic forces that rework the channel, and which expose the mineral soils necessary for the germination and establishment of cottonwood and black willow trees. However, various channelization projects have destabilized other drainage systems, resulting in loss of bare mineral soil available for colonization by these species.

The cottonwood/black willow/river birch forest is vulnerable in the state due to modification of hydrology which can reduce bare surfaces for colonization.

Riverfront Forests



5. Wet Pine Savannas/Flatwoods

Coastal areas with very poor internal drainage form wet pine savannas and flatwoods. Wet pine savannas receive moisture through precipitation and are not subject to riverine flooding. Soils are composed of highly weathered, acidic, infertile substrates. The high precipitation and low evapotranspiration rates during the winter and spring season along the Gulf Coast create a surplus of moisture that gradually percolates through the soil profile. Nutrient-deficient soils develop on these wet flats because nutrients released by weathering are insufficient to replace those removed by leaching. Savannas are areas dominated by graminoids with scattered trees. The term flatwoods has been used to describe many different communities in the coastal plain. For this classification, flatwoods are coastal terrace forests of slash and longleaf pine with very little local topographic relief. This community is successional and can go many directions depending on fire, moisture conditions and man's activities. The canopy of these communities tends to be more closed than that of the wet pine savanna.

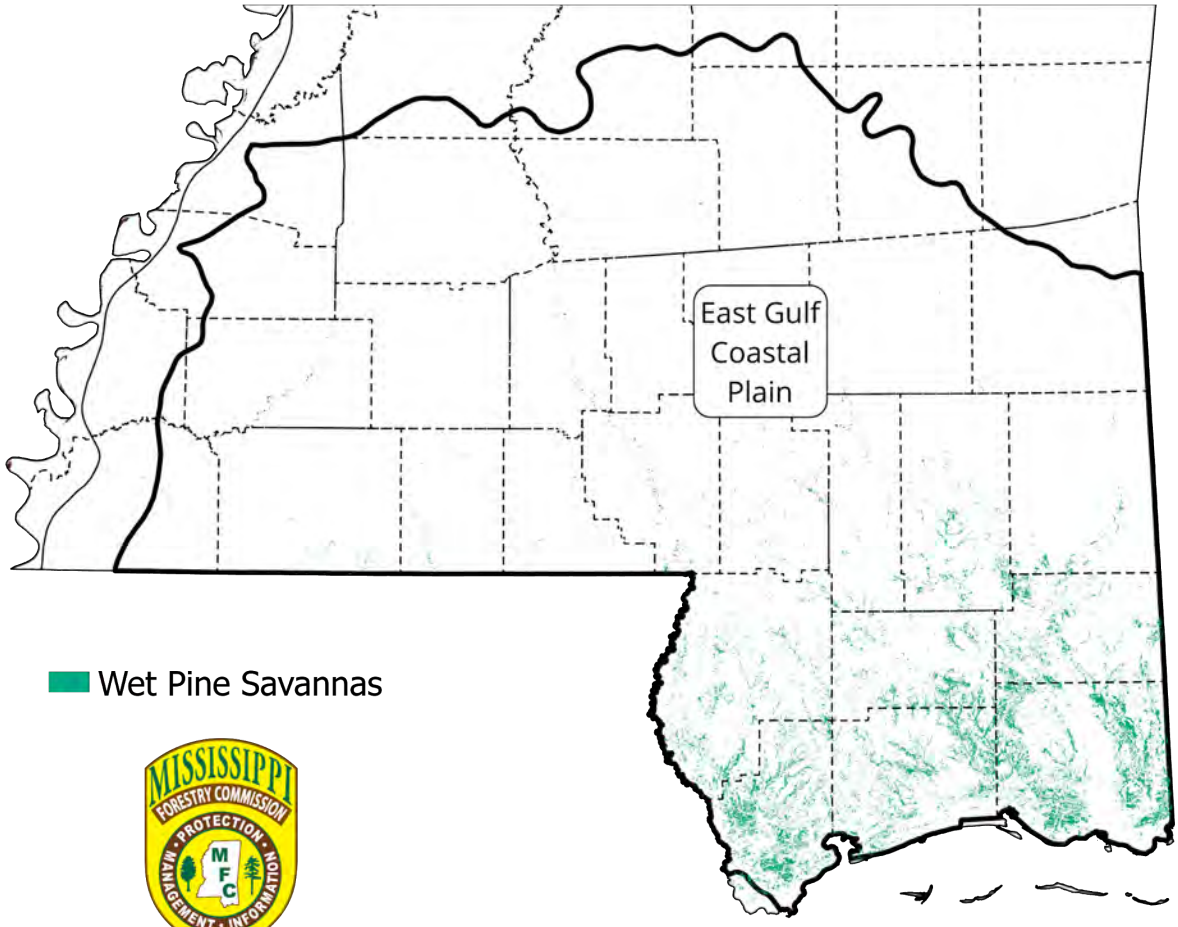
Wet savannas are found on wide flats or gentle slopes usually near the coast. They are ombrotrophic, or precipitation-fed, are larger and may include some uplands. Exposure to fire and prolonged soil saturation influence the amount of shrub cover in bogs.

This type includes two forested subtypes:
Wet Pine Savannas
Slash Pine Flatwoods

Less than five percent of the original acreage of wet pine savanna habitat remains in the Atlantic/Gulf Coastal Plain making it one of the most endangered ecosystems in the country. The lack of prescribed burns has had a dramatic negative impact on the size and distribution of wet pine savannas. Fire suppression allowed pines and shrubs to invade and out-compete the native savanna plants. In the 1960s and 1970s, much of the remaining open savanna was converted to pine plantation by planting and ditching (bedding); the latter disrupted the natural water regime. Additional urbanization in the three coastal counties of Mississippi caused significant losses of this habitat. The savannas of Mississippi Sandhill Crane National Wildlife Refuge in Jackson County are considered the last remaining large patches of this diverse community.

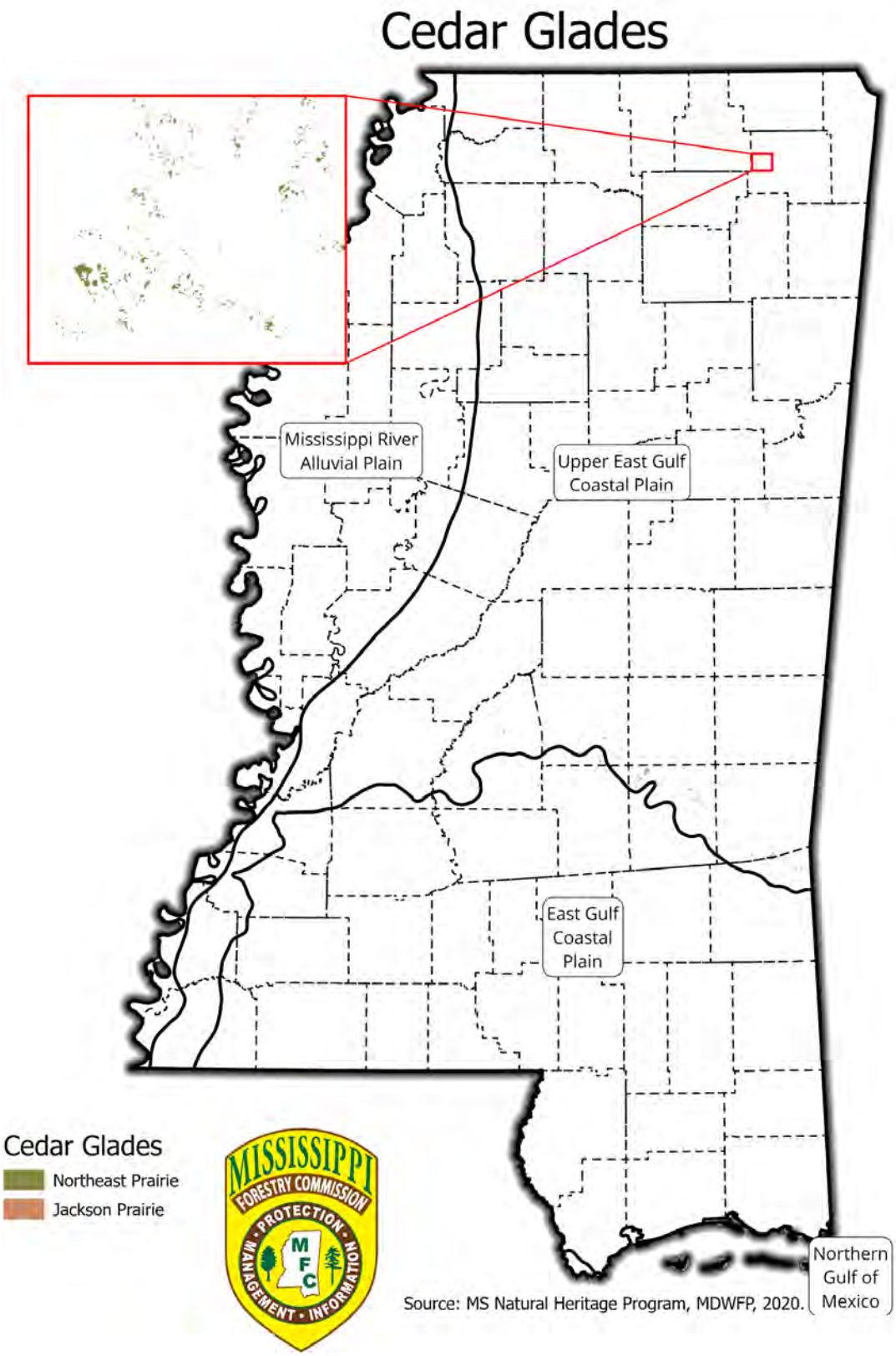
Slash pine flatwoods have also been adversely impacted by timber harvest, clear-cutting and plantation monoculture. If fire is excluded, the open, herbaceous character of pine flatwoods ground cover is lost, while evergreen shrubs increase in dominance. Contributing to these factors is the dry mat of acidic pine needles which inhibit the growth of most herbaceous species.

Wet Pine Savannas/Flatwoods



6. Cedar Glades (Associated with Blackbelt Prairie)

Cedar glades/barrens are areas dominated by Eastern redcedar. Switchgrass and yellow Indiangrass dominate the groundcover. This community replaces Black Belt prairies when fires are excluded from the environment. An example of both types of Black Belt prairie may be seen at Osborn Prairie near Starkville. Cedar glades/ barrens can be seen along the Natchez Trace Parkway in Lee County.


Cedar Glades
Mississippi River Alluvial Plain
Upper East Gulf Coastal Plain
East Gulf Coastal Plain
Northern Gulf of Mexico
Cedar Glades
Northeast Prairie
Jackson Prairie
MISSISSIPPI FORESTRY COMMISSION
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Source: MS Natural Heritage Program, MDWFP, 2020.

7. Maritime Woodlands

Maritime woodlands are found on the barrier islands and the mainland coastline of Mississippi. Many of the barrier islands, parts of which are considered wilderness, remained in good condition prior to Hurricane Katrina which made landfall in August, 2005. This hurricane caused overwash and additional destabilization of the fragile dune systems. The barrier islands are gradually diminishing in size by wave erosion and reduced sand accretion. Exotic weeds, which have gained footholds on the mainland in pine flatwoods and savannas, live oak woodlands and shell middens, as well as on the islands, will continue to reduce the condition of these landscapes.

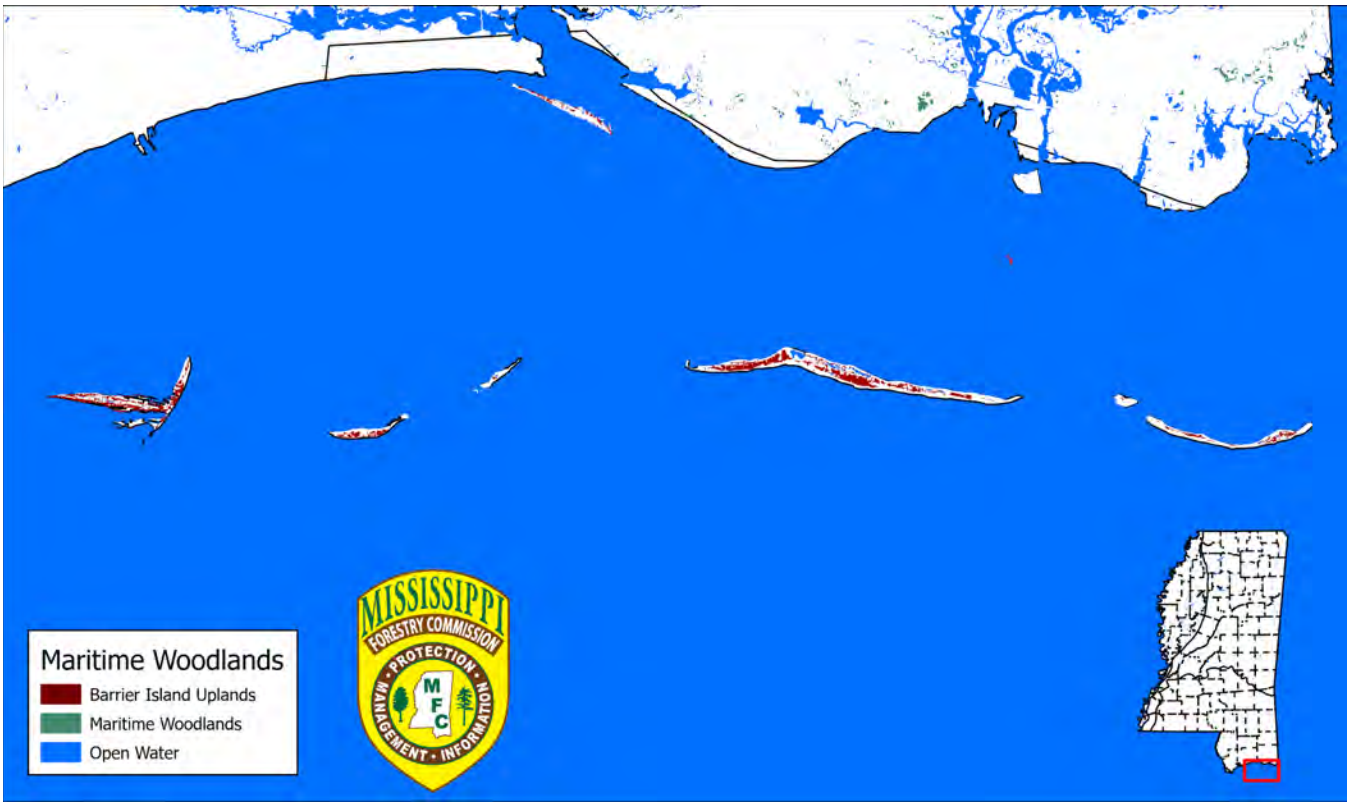
The maritime slash pine flatwood/savannas community marks a scenic backdrop to the intertidal marshes along Mississippi's coastline. This community occupies ancient low shoreline beach ridges and low flats situated immediately inland from the tidal marshes. It is also found on the terrace levees of many tidal creeks, occasionally extending into the midst of sprawling black needlerush marshes. In accompaniment with the pine flatwoods, are coastal live oak woodlands situated on prominent coastal cheniers and ancient beach ridges that straddle the coast line. The live oak woodlands are comprised of native live and upland laurel oaks and contain an understory often dominated by saw palmetto. Most of the coastal upland habitat has been urbanized. Thus maritime live oak forest is one of the rarest communities found in Mississippi.

This natural forest community is fire dependent and can become brushy and inaccessible to pedestrian traffic during long intervals between burns. Maritime woodlands provide essential points for neotropical migrants staging their trans-gulf journey in the fall and recuperating upon their return in the spring.

Situated in highly urbanized coastal areas, maritime woodlands have been significantly impacted by widespread development. Areas of this subtype are usually less than 100 acres but may extend in a narrow band along the shoreline for several miles. Approximately 2,000 acres of this habitat exists in Mississippi. Some of the wettest areas near the Hancock County marsh and within the Grand Bay National Estuarine Research Reserve in Jackson County remain intact and provide prime examples of this subtype. The live oak woodlands have been extensively developed, but a few pockets remain on some large private holdings.

Extensive areas of maritime woodlands have been developed for other uses. Woodlands found on private lands are vulnerable to commercial development or intensive forest management. Much of the remaining areas are under public ownership. Cogongrass is rampant across the range of this community and has invaded much of the roadsides and woodlands in the vicinity. Its increased presence makes the maritime woodlands especially vulnerable to new infestations of cogongrass.

This forest community type is critically imperiled in the state due to its extreme rarity and because of the threats of urbanization and exotic weeds that contribute to further declines.


Maritime Woodlands
Barrier Island Uplands
Maritime Woodlands
Open Water
MISSISSIPPI
FORESTRY COMMISSION
PROTECTION
MANAGEMENT
INFORMATION
MFC

9. Pine Plantations

Pine plantations occupy a wide range of topographic positions and soil types. Establishment of pine plantations is generally practiced in moderately well-drained, acidic to neutral soils and is often unsuccessful on sites where pine species are naturally absent or exhibit poor growth due to insufficient drainage, though techniques such as bedding have been used to overcome drainage limitations on some sites. Establishment can also be difficult on sites with excessively well drained soils. Most plantations in Mississippi are established in loblolly or slash pines. Shortleaf pine is also adapted to many sites and may increase in acreage established on suitable sites due to greater resistance to ice damage, higher value timber products (e.g. poles) and potential for mitigation of complete stand loss from fire in young plantations.

Pine plantations are typically established by planting seedlings grown in nurseries on a uniform spacing within and between rows of trees. Seedling density at planting is controlled by spacing which may vary depending on objectives. Much research and development has gone into producing “improved” loblolly and slash pine seedling stocks through various plant breeding or selection methods that favor timber production characteristics such as fast growth, desirable stem form, disease resistance, and site adaptability. Pine plantations are frequently planted for production of timber products or where a quickly established forest cover is desired (e.g. visual screening, soil stabilization, windbreaks, and other conservation-oriented uses), or for development into a more diverse, future forest type, or some combination of these and other objectives. Much of the acreage established in pine plantations is found on industrial and non-industrial private lands, although many publicly owned lands also establish pine plantations to meet various land use objectives.

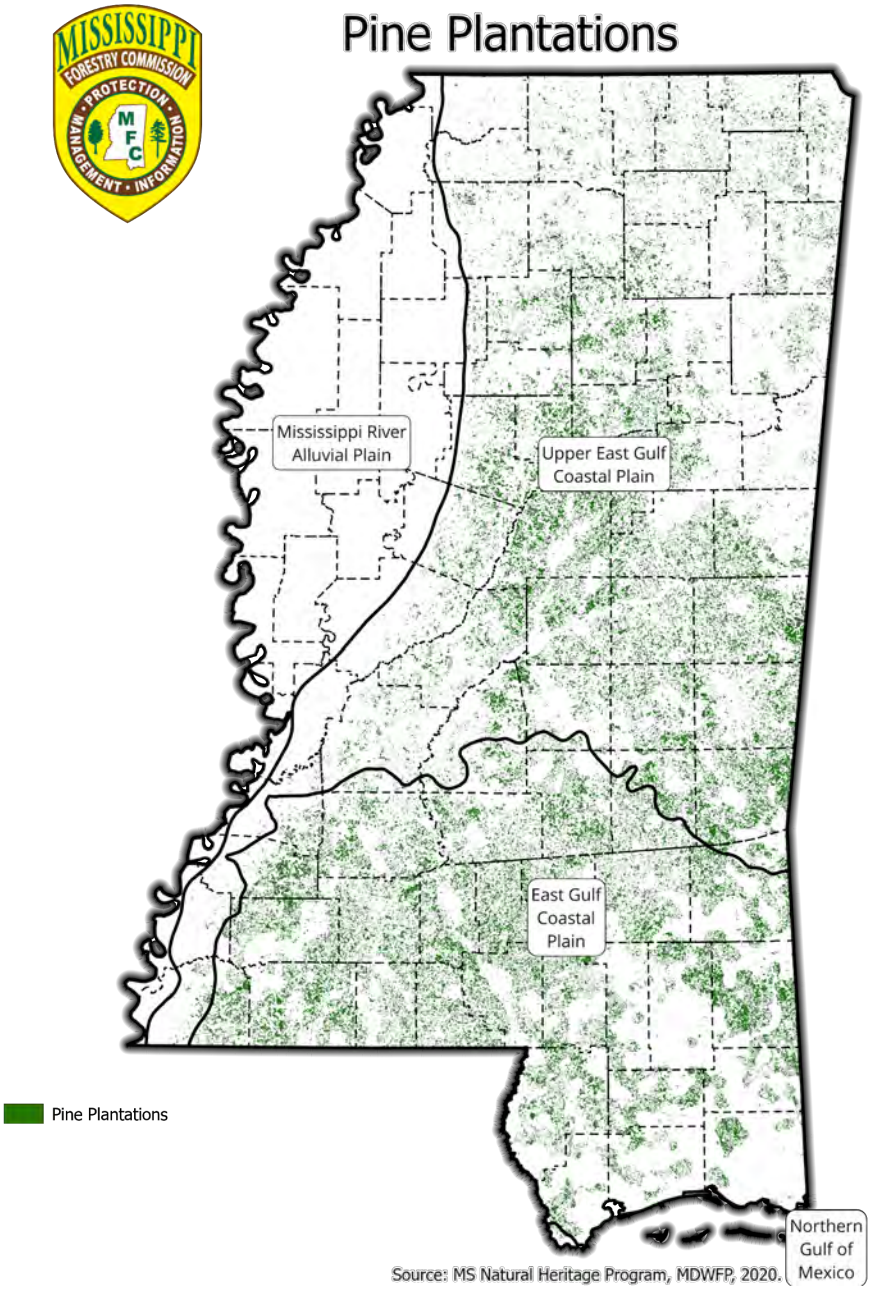
Plantations are generally viewed as monotypic forests that lack structural (e.g. varied canopy layers) and compositional (e.g. variety of plants) habitat diversity; but, the extent to which it provides wildlife habitat value depends on its age, structure, composition, and management. These characteristics are largely a function of tree age; silvicultural/other manipulative treatments; weather effects (e.g. storm damage); natural mortality caused by competition, insects, or diseases; and site-specific growing conditions (e.g. soil fertility, moisture, and site preparation prior to planting).

In all upland regions of the state except the Mississippi River alluvial plain, parts of the loess hills and the Black Belt regions, there has been significant conversion of forest and agricultural lands to pine plantations. Parcels sizes range widely but can reach several thousand acres in extent on the most suitable areas. Blocks of plantations are interspersed with natural regeneration forests, shrub lands, agricultural lands, urban/suburban areas, and many other habitat types. Most of these are planted in loblolly pine. A small portion may be established in shortleaf pine, and may increase as a result of conservation programs (e.g. Shortleaf Pine Initiative), site and climate adaptations, and landowner objectives that favor shortleaf pine establishment.

Pine species may or may not be considered an off-site species for a given site. Pine may be suitable to the site, but establishing or converting other forest types to predominately monoculture forest stands simplifies habitats. Practices such as bedding to favor pine growth on

wet sites negatively affect natural site hydrology. Also off-site pine species may be more susceptible to losses from disease or insect pests and extreme weather events (e.g. flooding, ice storms, and drought).

Pine plantations are a secure subtype as they are common, widespread, and abundant in the state.

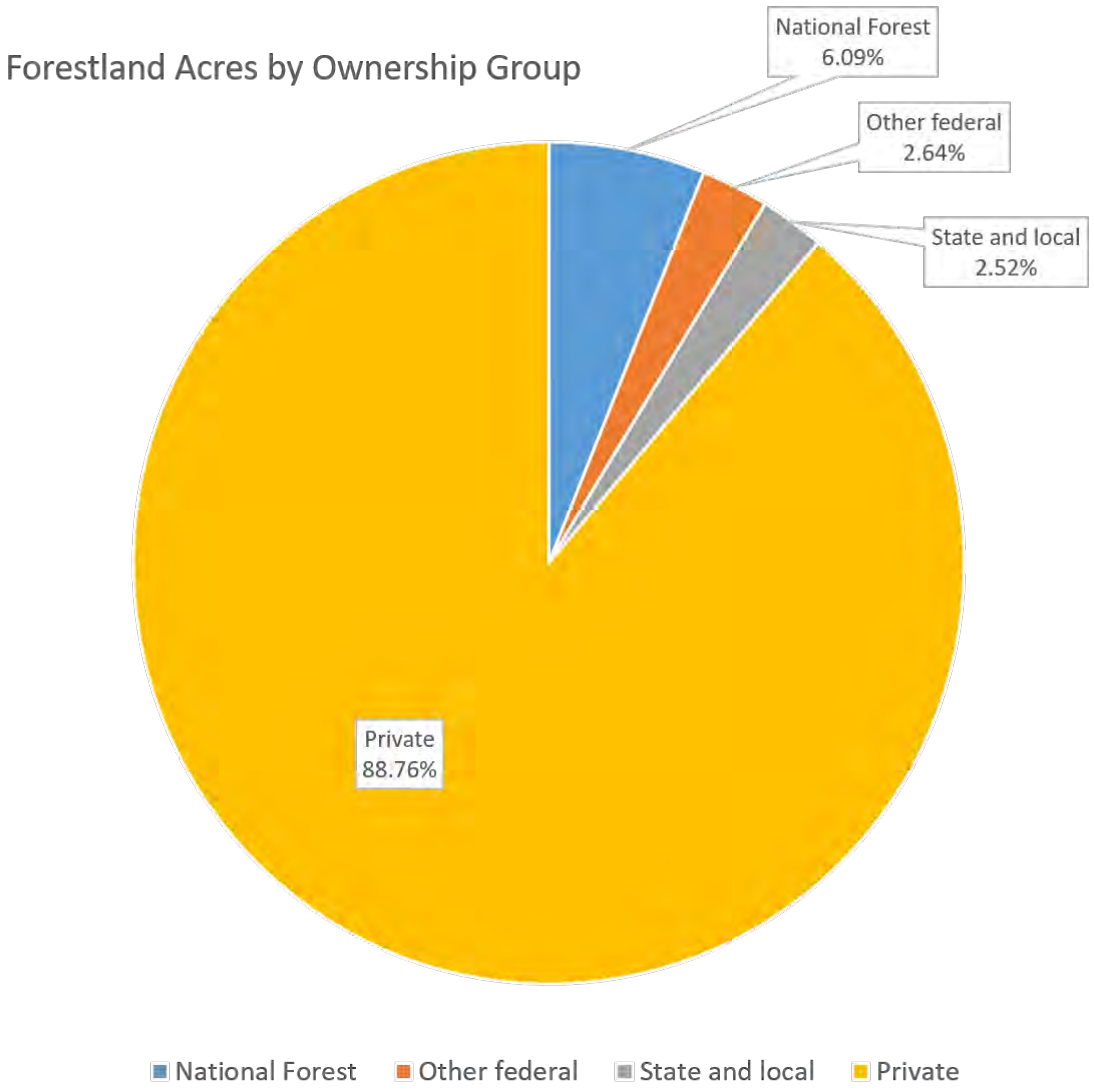


Forest Ownership in Mississippi

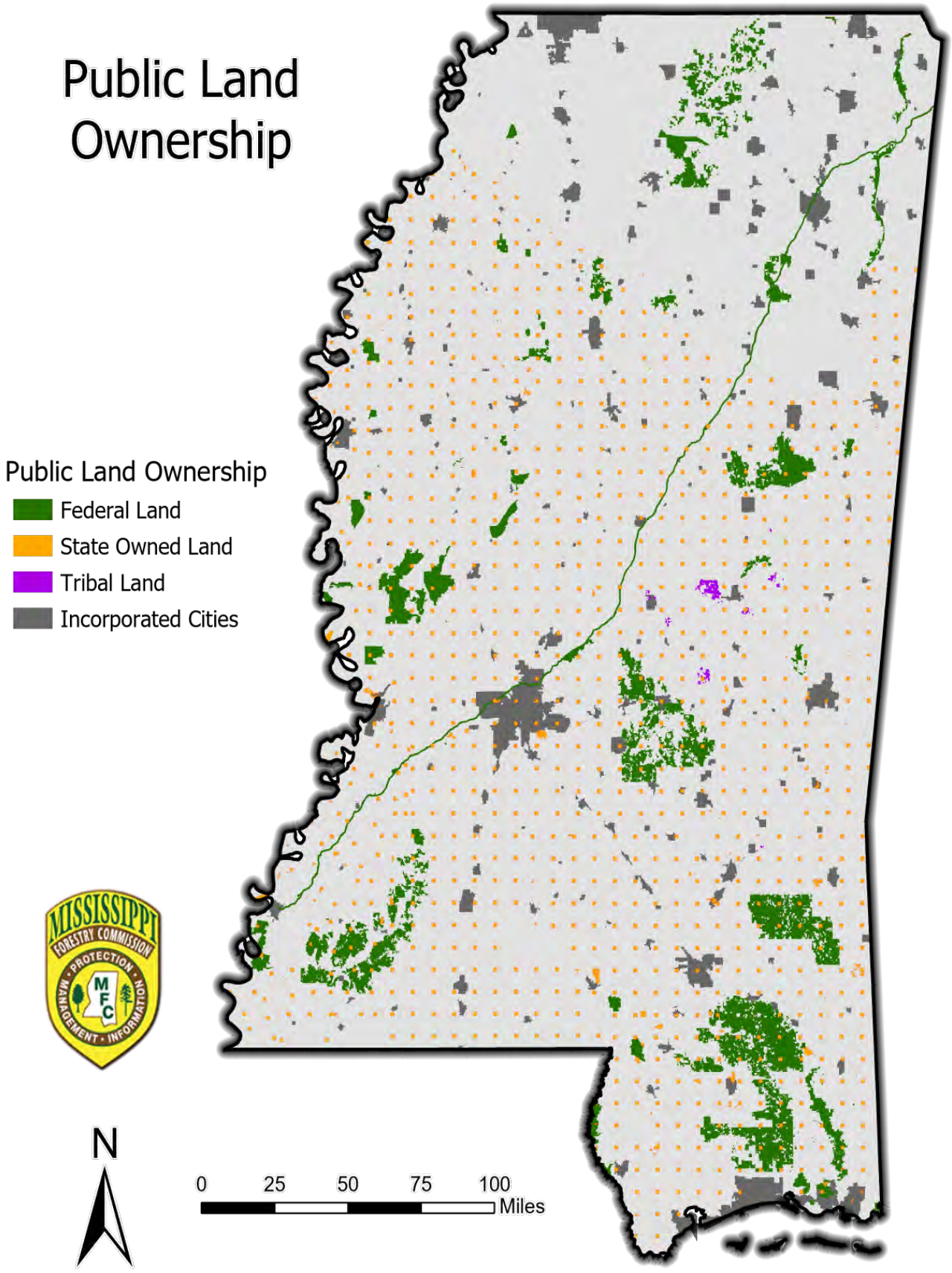
According to the USFS Forest Inventory Analysis (FIA) Program, forest ownership for land in Mississippi is primarily (88.75 percent) by private landowners, frequently families with multiple owners. Traditionally families tend to subdivide large holdings into smaller parcels when land is passed on to heirs. Families acknowledge the legal distinction in ownership of the land but often continue to manage the parcels as contiguous properties.

The following chart, based on 2018 FIA data, indicates percentages of forestland acres by ownership group.

Figure 1: Forestland Acres by Ownership in Mississippi



Public Land Ownership



Most of Mississippi's non-industrial private forest lands (NIPF) are maintained for economic returns from the sale of timber as a primary or secondary objective. Other major uses include recreation and management for hunting of game species such as white-tailed deer, wild turkey, waterfowl, squirrels, quail and other game or for wildlife viewing and aesthetics.

Most Mississippi forest landowners do not have a formal management plan for their property. While they usually do not consider the need for a written management plan until they decide to harvest timber, an increasing number of Mississippi landowners have varied management objectives and actively seek technical assistance from state or federal agencies, private consultants or conservation organizations.

Threats to Forest Resources

A threat is the activity or processes that have caused or may be causing the "destruction, degradation, and/or impairment" of an ecosystem. Direct threats are sources of stress. Stresses are some attribute of an ecosystem that is impaired either directly or indirectly by humans.

For consistency across planning documents, this 2020 update of the *Mississippi Forest Action Plan* has adopted the same categories of threats identified in the *Mississippi State Wildlife Action Plan* (2015) as having an adverse impact on forest habitats and ecosystems. The definitions and hierarchy of threats are taken from the Salafsky et al. (2008) paper entitled *A Standard Lexicon for Biodiversity Conservation: Unified Classifications of Threats and Actions*. The following are 11 types and subtypes of threats specific to Mississippi's forest resources adapted from the standardized list in the *Mississippi State Wildlife Action Plan (*2015). Note, only those sub-types relative to forest resources are included in this list.

Threats, trends and contributing factors are described and discussed in more detail by each key issue area in Chapter III.

1. **Residential and Commercial Development -** Threats from human settlements or other non-agricultural land uses with a substantial footprint

1.1. Housing and Urban Areas - Human cities, towns, and settlements including non-housing development typically integrated with housing

1.2. Commercial and Industrial Areas - Factories and other commercial centers

1.3. Tourism and Recreation Areas - Tourism and recreation sites with a substantial footprint

2. Agriculture and Aquaculture - Threats from farming and ranching as a result of agricultural expansion and intensification, including silviculture, mariculture and aquaculture

2.1. Annual and Perennial Non-Timber Crops - Crops planted for food, fodder, fiber, fuel, and other uses

2.2. Wood and Pulp Plantations - Stands of trees planted for timber or fiber outside of natural forests, often with non-native (or off-site) species

2.3. Livestock Farming and Ranching - Domestic terrestrial animals raised in one location on farmed or non-local resources (farming); also domestic or semi-domesticated animals allowed to roam in the wild and supported by natural habitats (ranching)

3. Energy Production and Mining - Threats from production of non-biological resources

3.1. Oil and Gas Drilling - Exploring for, developing, and producing petroleum and other liquid hydrocarbons

3.2. Mining and Quarrying - Exploring for, developing, and producing minerals and rocks

3.3. Renewable Energy - Exploring, developing, and producing renewable energy

4. Transportation and Service Corridors - Threats from long narrow tr ansport corridors and the vehicles that use them including associated wildlife mortality

4.1. Road and Railroads - Surface transportation on roadways and dedicated tracks

4.2. Utility and Service Lines - Transport of energy and resources

5. Biological Resource Use - Threats from consumptive use of “wild” biological resources including both deliberate and unintentional harvesting effects; also persecution or control of specific species

5.1. Gathering Terrestrial Plants - Harvesting plants, fungi, and other non-timber/non-animal products for commercial, recreation, subsistence, research or cultural purposes, or for control reasons

5.2. Logging and Wood Harvesting - Harvesting trees and other woody vegetation for timber, fiber, or fuel

6. Human Intrusions and Disturbance - Threats from human activities that alter, destroy, and disturb habitats and species associated with non-consumptive uses of biological resources

6.1. Recreational Activities - People spending time in nature or traveling in vehicles outside of established transport corridors, usually for recreational reasons

6.2. War, Civil Unrest and Military Exercises - Actions by formal or paramilitary forces without a permanent footprint

6.3. Work and Other Activities - People spending time in or traveling in natural environments for reasons other than recreation, military activities, or research

7. **Natural Systems Modifications -** Threats from actions that convert or degrade habitat in service of “managing” natural or semi-natural systems, often to improve human welfare

7.1. Fire and Fire Suppression - Suppression or increase in fire frequency and/or intensity outside of its natural range of variation

7.2. Dams and Water Management/Use - Changing water flow patterns from their natural range of variation either deliberately or as a result of other activities

7.3. Other Ecosystem Modifications - Other actions that convert or degrade habitat in service of “managing” natural systems to improve human welfare

8. **Invasive and Other Problematic Species and Genes -** Threats from non-native and native plants, animals, pathogens/microbes, or genetic materials that have or are predicted to have harmful effects on biodiversity following their introduction, spread, and/or increase in abundance

8.1. Invasive Non-Native/Alien Species - Harmful plants, animals, pathogens and other microbes not originally found within the ecosystem(s) in question and directly or indirectly introduced and spread into it by human activities

8.2. Problematic Native Species - Harmful plants, animals, or pathogens and other microbes that are originally found within the ecosystem(s) in question, but have become out-of-balance or released directly or indirectly due to human activities

8.3. Introduced Genetic Material - Human altered or transported organisms or genes

9. Pollution - Threats from introduction of exotic and/or excess materials or energy from point and nonpoint source

9.1 Household Sewage and Urban Waste Water - Water-borne sewage and nonpoint runoff from housing and urban areas that include nutrients, toxic chemicals and/or sediments

9.2 Industrial and Military Effluents - Water-borne pollutants from industrial and military sources including mining, energy production, and other resource extraction industries that include nutrients, toxic chemicals and/or sediments

9.3 Agriculture and Forestry Effluents - Water-borne pollutants from agricultural, silvicultural, and aquaculture systems that include nutrients, toxic chemicals and/or sediments, including the effects of these pollutants on the site where they are applied

9.4 Garbage and Solid Wastes - Rubbish and other solid materials including those that entangle wildlife

9.5 Air-borne Pollutants - Atmospheric pollutants from point and nonpoint sources

9.6 Excess Energy - Inputs of heat, sound, or light that disturb wildlife or ecosystems

10. Geologic Events - Threats from catastrophic geological events

11. Climate Change and Severe Weather - Long-term climatic changes and other severe climatic or weather events outside the natural range of variation that could negatively affect a vulnerable species or habitat

11.1 Habitat Shifting and Alteration - Major changes in habitat composition and location

11.2 Droughts - Periods in which rainfall falls below the normal range of variation

11.3 Temperature Extremes - Periods in which temperatures exceed or go below the normal range of variation

11.4 Storms and Flooding - Extreme precipitation and/or wind events or major shifts in seasonality of storms

In addition to the standardized list of threats above, stakeholders in Mississippi have also listed the following as threats to forest resources:

12. Loss of operational mills in the state

13. Changing markets for forest products

Chapter III.
Key Forest Issues and Resource Strategies in Mississippi

Seven key issues were identified by the public and stakeholders as areas of primary concern regarding Mississippi's forest resources.

Issue 1: Forest Sustainability and Markets
Issue 2: Landowner Trends
Issue 3: Forest Health
Issue 4: Stewardship
Issue 5: Wildland Fire
Issue 6: Climate Change
Issue 7: Wildlife

These key issues were initially identified through the use of surveys and stakeholder (agencies, organizations, businesses and individuals) meetings coordinated by MFC staff and validated by the public surveys conducted by the MFC in the development of the original *Forest Action Plan* (FAP) in 2010, and were re-evaluated and revised in 2019. These seven distinct issues also emerged from the reports, public surveys, literature and stakeholder input as the most important to Mississippians. Priority geographic areas are identified for each issue and illustrated geospatially, where possible. Overall strategies to address each key issue are defined in the Strategic Issues matrices for each key issue.

A description of how the FAP ten-year update was developed, including public and stakeholder input, is in *Appendix B - Public Involvement.*

Major program documents to be incorporated into this plan by reference are in *Appendix C - Integration of Other Plans and Assessments.*

Components of Each Key Issue Discussion

1. Key Issue Definition

- Forest Resource - What specific physical forest resource is the source of public benefits that are at issue here?
- Public Benefit - What benefit from this resource makes this important to the public?
- Key Conditions or Attributes - What key conditions or attributes of the forest resource are critical for producing the public benefits?
- Threats and Contributing Factors - What factors directly affect key attributes or conditions in a way that is threatening public benefits? What factors are contributing to making direct threats strong and difficult to manage?
- Opportunities - What opportunities are available for directly improving key conditions or attributes?

2. **Potential Partners** - Who are potential partners in addressing this key issue? Note that this is not an exhaustive list of potential partners, but rather a suggested list identified by stakeholders and MFC of possible collaborators who are or should be involved in addressing key issues.
3. **Priority Landscapes** - What are the priority areas of the state for this issue? Maps of priority areas were developed by MFC with partner input for each key issue, where relevant.
4. **Resource Strategies** - In order to receive funds under the Cooperative Forestry Assistance Act (CFAA) the state FAP must include a broad set of recommended strategies to respond to each key issue identified by stakeholders. These strategies have been refined and updated for this 10-year Plan update. The strategies are broad, long-term approaches and plans for investing state, federal, and other resources to effectively stimulate or leverage desired action and engage multiple partners. The strategies incorporate existing statewide forest and resource management plans and create the basis for future program, agency and partner coordination.
5. **Key Issues Matrix** - Overall strategies are identified for each of the seven key issues. These strategies are presented in a matrix with the following information:
    1. Strategies - statements of major approaches or methods for attaining goals and resolving specific issues
    2. Priority landscape areas to be targeted (where relevant)
    3. Secondary key forest issues that would also be addressed.
    4. Program areas (S&PF and other forestry programs) that could contribute to implementing the strategy
    5. Key stakeholders
    6. Resources available or needed to implement the strategy
    7. Existing or potential partners that can help implement each recommended strategy.
    8. Measures of success
    9. National S&PF themes and objectives that the strategy supports (referenced by numbers that correspond to the list below).

Chapter V: Forestry Programs and Resources includes a short description or link to the major forest and land conservation programs in the state that may be used to implement recommended strategies and accomplish objectives. S&PF programs are emphasized, but other state, federal and non-government programs are listed as well.

The FAP will serve as a guide and foundation for MFC and its partners to develop its detailed annual action plans including specific measurable goals, objectives and action steps to implement each strategy over the next ten years.

Key Issue 1: Forest Sustainability and Markets

Optimizing Mississippi's abundant forest and water-related resources requires the development and enhancement of diverse markets for natural resource products, including, but not limited to, markets for wood fiber, habitat for wildlife and outdoor recreation, and natural benefits (also called ecosystem services) such as carbon sequestration and water quality protection. If resource markets are not developed sustainably, negative impacts may include degradation of forest resources, conversion to non-forest, and accelerated fragmentation.

Primary threats to resource markets fall into three categories: social, economic (job loss, landowner income loss) and environmental.

Sustainable development of forest resources balances protecting forests from fragmentation, invasive species, fires, insects and disease while encouraging economic growth, financial return, cultural stability, recreational opportunities and environmental values such as soil and water. The federal definition of "sustainable" from the 2010 *National Report on Sustainable Forests* means to create and maintain conditions, under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic and other requirements of present and future generations of Americans. Today, the "triple bottom-line" concept, which refers to the need to measure progress on three interrelated aspects of a system (environment, economy and society) is used as a shorthand way to describe agency commitment to sustainability.

Forest Resource

Forests dominate much of Mississippi, covering 62 percent of Mississippi's landscape. Forest land area in Mississippi totals 19.1 million acres, a decline of 2.4 percent since 2006. Forest land use change is due primarily to diversions to urban or developed land uses and agriculture. Based on the Forest Inventory Analysis (FIA), 260,300 acres of forest land was diverted to agricultural land use. While approximately 52,000 acres of non-forest revert back to forest annually, nearly 80,000 forest acres are converted to non-forest.

Forest land ownership is predominantly private ownership, 89 percent, with 8.7 percent in federal ownership and 3 percent in state and local ownership. Although the vast majority of forest land is in private ownership, Mississippi also has six national forests totaling 1.2 million acres.

Private forest lands are essential to sustaining both the forest products industry and a healthy environment (clean air and water, soil conservation, species biodiversity). Mississippi has very little remote forest area. Ninety-nine percent of forest land in Mississippi is within one mile of a road.

Hardwood forest-type groups combined make up the plurality of forest land in Mississippi, at 10.3 million acres (53 percent). Oak-hickory accounts for 44 percent of hardwood forest land, most of which is naturally regenerated. Although hardwood forest-types comprise most of the forest land acres when considered together, loblolly-shortleaf pine covers more acres as a

single forest-type. Loblolly-shortleaf pine represents 41 percent, or 7.8 million forest acres in the state. In contrast with the hardwood forest-types, 64 percent of loblolly-shortleaf pine acres originated from planting and accounts for 82 percent of all planted acres in the state. Hardwood artificial regeneration accounts for 747,900 acres or approximately 4 percent.

Figure 2: Forest land area by forest type grouping

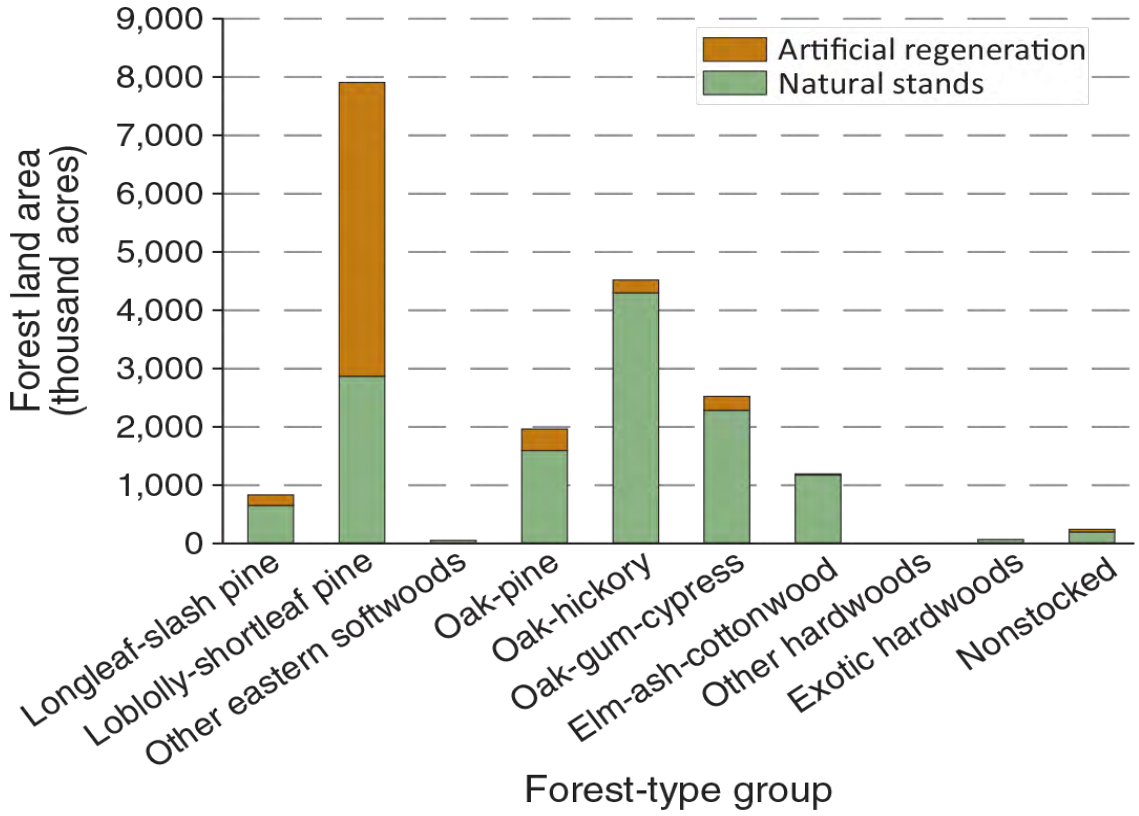


Figure 6—Area of forest land by forest-type group and stand origin, Mississippi, 2017.

Public Benefits

Productive and healthy forests provide many economic, social and environmental goods and services. Forest lands that are sustainably managed are a significant source of revenue for forest landowners, employment opportunities, and contribute to the tax base for counties and the state while providing for a variety of wood products available for consumption. According to the Mississippi State University Extension Service (MSU ES), 2019 marked the 26th straight year Mississippi's timber production value exceeded $1.0 billion, making timber the second most valuable agricultural commodity in the state. Logging, forestry and wood processing employ approximately 61,794 people, and in 2019 the Mississippi forestry industry generated $13 billion in total output, generating $2.67 billion in wages.

Severance tax collections on forest products were $3,780,670 in 2018, which is 2.7 percent lower than 2017. Twenty percent of severance tax collections, or about $735,931, is returned to counties where the timber was harvested. Eighty percent, or about $3,024,560, is allocated to the Forest Resource Development Program (FRDP) to provide cost share funds to nonindustrial private forest landowners for reforestation and other forest management activities.

Nearly all (99 percent) of forest land in Mississippi is considered available for timber production. The remaining forest land area is either unproductive forest land or reserved forest land where timber removals are prohibited by law.

Non-timber forest products include nature-based recreation, water, wildlife and aesthetic and tourism values that also contribute immensely to the state's economy, real estate values, quality of life and well-being of the population. The US Fish and Wildlife Service (USFWS) conducts the *National Survey of Fishing, Hunting and Wildlife-Associated Recreation* every five years to examine spending for hunting, fishing and wildlife-watching in the country. The most recent (2011) Survey found that 1.4 million Mississippi residents and nonresidents 16 years old and older fished, hunted, or wildlife watched in Mississippi. The overall economic impact to Mississippi from outdoor recreation totals $2.15 billion annually. The survey reported that 483,000 residents and visitors spent a total of $914 million on hunting in Mississippi. These direct expenditures translate to an estimated $1.3 billion in economic impact to the state. About 651,000 residents and nonresidents spent $527 million on fishing in the state, producing an estimated $745 million in economic impact. Approximately 781,000 individuals spent $342 million on wildlife watching, accounting for $853 million in economic impact to the state.

Forests clearly influence the market value of real property, particularly with recreation potential. Outdoor recreation is a powerful economic engine that accounted for 2.2 percent ($412 billion) of U.S. gross domestic product (GDP) in 2016. The U.S. Endowment for Forestry and Communities reports that Americans spend more on outdoor recreation than on education, gas, or utilities.

A 2003 - 2008 analysis by Mississippi State University’s (MSU) Department of Wildlife, Fisheries and Aquaculture of 800 sales of forested (recreational) properties revealed a $654/acre increase in sales price because of the recreation value of forest lands. This represents a 52 percent increase in sale value from sales of lands without wildlife recreation potential. Mature hardwood and mixed hardwood forests were primary influential variables in increases in sale value of lands sold for outdoor recreation. “Study findings revealed that buyers were interested and paid more for selective cover types or habitats that supported wildlife game species, including deer, turkey, waterfowl, and mourning dove when sold for wildlife-related recreation use. Regression analysis showed that property buyers in Mississippi were selecting lands to purchase with certain cover types (e.g., bottomland hardwood forests, mixed pine-hardwood forests, pastures/fallow areas, and agricultural lands) and with amenities for enjoyment of wildlife-related recreational activities. These property features influenced amounts paid for rural lands for recreation in Mississippi. Forests, specifically bottomland hardwood and mixed pine-

hardwood forests, dominated land cover types of properties sold, representing 35% of total land area sold".

Landowner objectives for ecosystem goods/services (natural benefits) are to establish a market value for services such as clean water and clean air. Ecosystem services refer to services that are valued economically but rarely bought or sold, such as cleansing water and air, regulating climate, providing beauty and inspiration. Ecosystem goods refer to items with monetary value in the marketplace, such as wood and food products, medicinal plants, tourism, and recreation. Water quantity and water quality are major criteria for measuring the effects of forest management practices. Water quantity refers to the timing and total yield of water from a watershed, while water quality refers to the suitability of drinking water, recreational uses, and as a habitat for aquatic organisms and other wildlife.

Healthy, managed forests provide the cleanest water of any land use, and help keep drinking water safe, reliable and affordable. In 2010, Americans used about 355 billion gallons of water per day. Water withdrawals peaked in 1975–1980, remained fairly stable from 1985 through 2005, and dropped 13 percent in 2010, despite the increase in U.S. population. Forests provide almost 60 percent of the nation's drinking water, supplying more than 200 million people in 68,000 communities. The Southern Group of State Foresters report that in the Southern U.S. state and private forests provide 44.3 percent of the total water supply (97.8 trillion gallons). In Mississippi approximately 89 percent of the freshwater supplies originate on private lands, while approximately 11 percent originate on federal lands (U.S. Endowment for Forestry and Communities). Mississippi's forests also sequester (capture) significant carbon from the atmosphere. A pine plantation can sequester one to four metric tons per acre per year.

Key Attributes

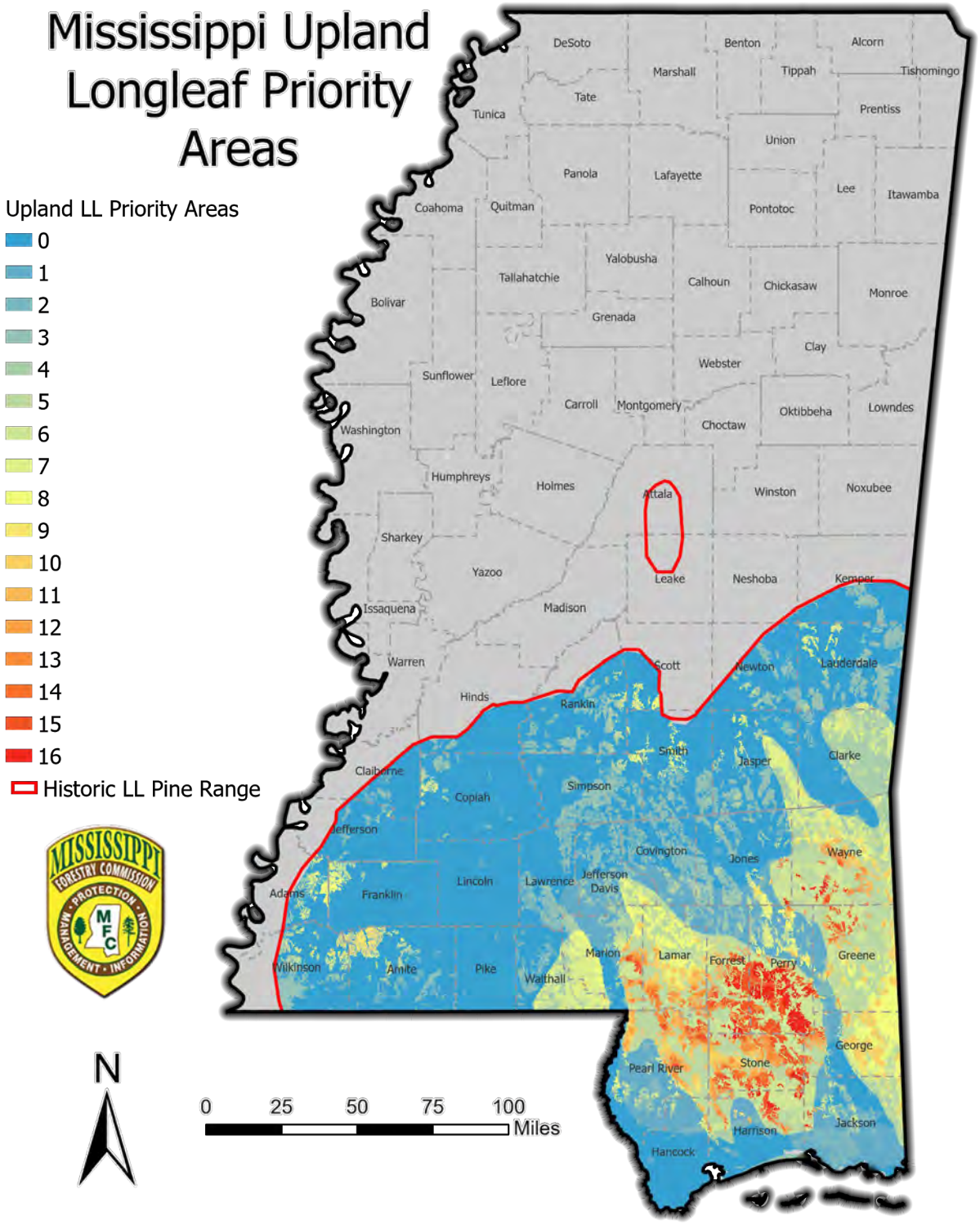
Approximately 46 percent of Mississippi forest land in the softwood sawtimber product classification, 27 percent in pulpwood and 27 percent in regeneration. According to Forest Inventory and Analysis (FIA) data, 32 percent of Mississippi's southern pine forest stands are artificially regenerated. This reflects the economic impact of pine plantations in the state. Bottomland hardwood forest land area, while still predominantly occupied by stands of large average diameter, appears to be experiencing an increase in regeneration. The area of bottomland hardwood forests in the sapling-seedling size class increased by 93 percent to 884,956 acres. This may be the result of reforestation and afforestation efforts occurring in the Mississippi River Alluvial Plain (delta) region over the past decade through Farm Bill incentive programs and other reforestation efforts. However, 68 percent of Mississippi forest stands are naturally regenerated.

While approximately 52,000 acres of non-forest revert back to forest annually, nearly 80,000 forest acres are reverting to non-forest. From 2010 - 2015, Mississippi saw a decrease of 328,040 acres in total forest acres. Forest management practices such as thinning, harvest, and reforestation are completed annually on approximately 508,000 acres of forest land (3 percent of total forest lands) according to FIA data.

Natural forest communities support native fauna and flora that serve as indicator species for ecosystem health, support recreational activities and are valued for aesthetics, cultural heritage and natural benefits. Remnants of the once-vast longleaf pine forests are still some of the most biologically diverse ecosystems outside of the tropics. There are 2,186,254 acres of loblolly pine plantations in Mississippi. Although longleaf acreage has decreased almost 90-percent from an estimated 2.1 million acres in 1935, the establishment of new longleaf plantations has increased by 42,428 acres since 2013. As of 2019 there were approximately 838,740 acres of longleaf pine in Mississippi. In this same time frame, there have been over 700,000 acres of prescribed burning completed as part of the forest management of these longleaf pine ecosystems. Perry, Forrest, and Lamar Counties contain the highest longleaf pine in Mississippi, accounting for almost half of the longleaf acres in the state.

Compared to other longleaf-producing states, Mississippi has the greatest percentage of longleaf pine sites classified as "superior quality," which is attributable to suitable climate, topography, and soils. Superior sites are capable of producing at least 85 cubic feet per year when fully stocked. More than 75 percent of Mississippi's longleaf pine sites are superior quality, whereas only 15 percent of longleaf sites outside the state are considered superior (MSU ES).

Longleaf pine's primary economic advantage is that its tall, straight, knot-free form is ideal for producing high-valued poles, which are worth 30 to 40 percent more than sawtimber. Longleaf pine stands usually produce a much greater percentage of poles than other pine species. An additional benefit of longleaf pine is that more landowners are interested in planting species native to the site, and for most upland sites in south Mississippi, longleaf pine is the native species. Also, longleaf is more resistant than loblolly or slash pine to insects such as the southern pine beetle (SPB) and diseases such as annosus root rot and fusiform rust and is less susceptible to damage from hurricanes than other southern pines, particularly loblolly pine. Landowners now have access to knowledge and techniques (machine planted bare root, hand planted container seedlings, herbicides to control competition, use of fire) to largely overcome factors that limit initial reforestation efforts with longleaf pine.


Mississippi Upland Longleaf Priority Areas
Upland LL Priority Areas
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12
13
14
15
16
Historic LL Pine Range
DeSoto
Benton
Alcorn
Marshall
Tippah
Tishomingo
Tate
Tunica
Prentiss
Union
Panola
Lafayette
Lee
Itawamba
Coahoma
Quitman
Pontotoc
Yalobusha
Tallahatchie
Calhoun
Chickasaw
Monroe
Bolivar
Grenada
Clay
Webster
Sunflower
Leflore
Carroll
Montgomery
Oktibbeha
Lowndes
Choctaw
Washington
Humphreys
Holmes
Attala
Winston
Noxubee
Sharkey
Yazoo
Leake
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Kemper
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Madison
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Lauderdale
Hinds
Rankin
Smith
Jasper
Clarke
Claiborne
Simpson
Copiah
Jefferson
Covington
Jones
Wayne
Adams
Franklin
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Lawrence
Jefferson Davis
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Lamar
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Long-term sustainability involves educating the public on the requirements to maintain a healthy forest and the potential problems of an unhealthy forest. Increasing efforts to reach landowners and the public through a variety of methods to encourage stewardship and communicate the value of productive, well-managed forests, opportunities for managing ecosystem goods and services (such as water quality and carbon storage), forest health issues resulting from non-management and estate planning are examples of targeted education that improve sustainability.

Ecosystem services or natural benefits of healthy forests that have market values or potential values include: flood abatement and amelioration that reduces property and resource damage; preventing soil erosion; protection of water quality through filtration of sediment and pollution; water quantity through flood pulse, aquifer recharge and water supplies; improved air quality through carbon sequestration and natural pollution filtration processes; and habitat for native pollinators (which is estimated at $57 billion annually in U.S.).

Direct Threats and Contributing Factors

Forest Markets - Over the past four decades Mississippi forest lands increased from 16.9 million acres to a high of 19.8 million forested acres. As a result of strong forest markets and landowners seeking to place idle, unproductive farmland into production, Mississippi gained 3-million forested acres of highly productive forest lands. These new forested acres also saw increased production through improved forest genetics and forest landowners that were eager to more intensively manage these forested for increased revenue potential. Since 2010 forest market conditions have become more challenging and Mississippi has seen a decrease of 328,040 acres in total forest acres.

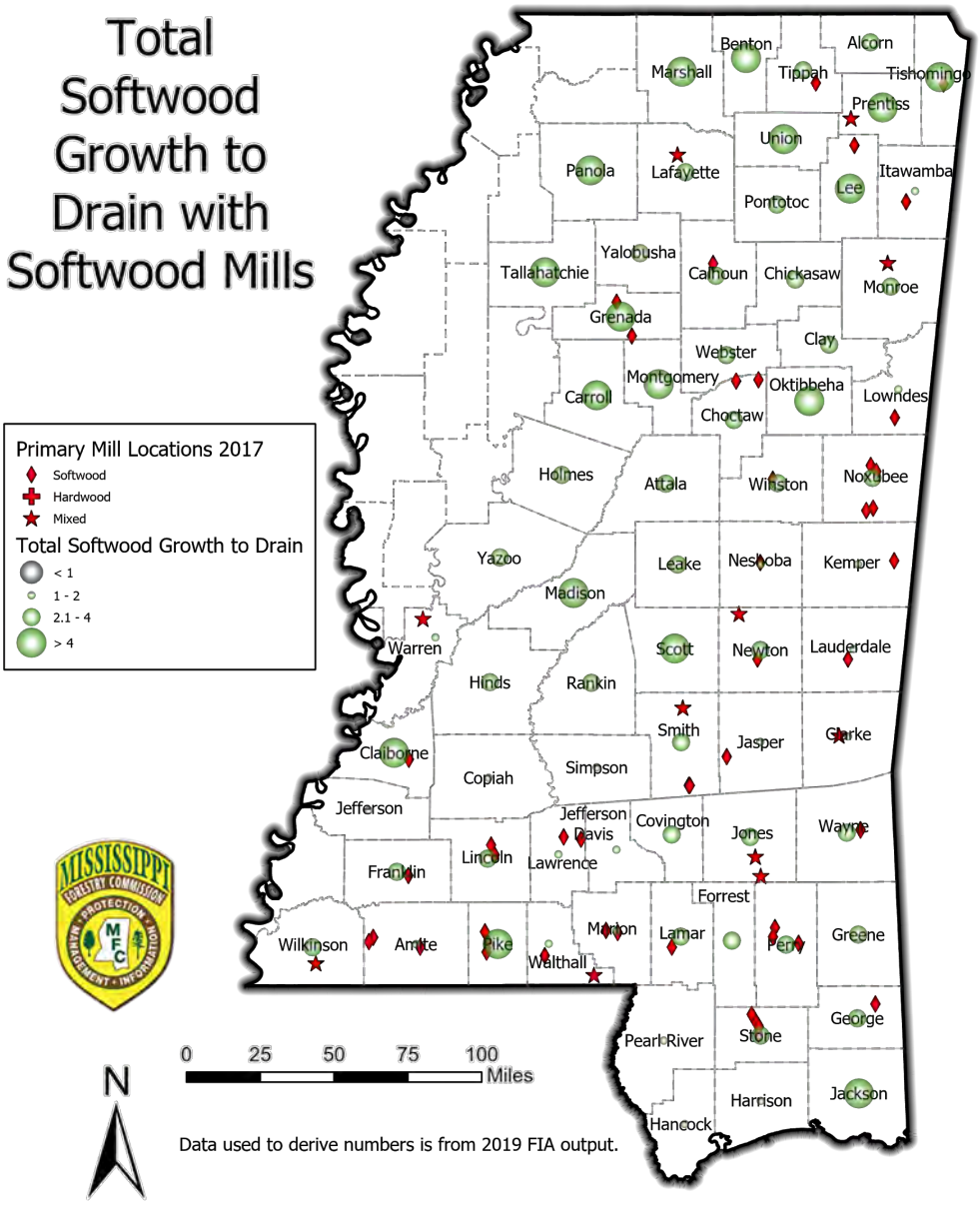
In their report, *The State of America's Forests*, the US Endowment for Forestry and Communities states the overall decline within the U.S. share of global production had several causes:

1. The growth of industrial roundwood production in other countries, such as Russia, China, Brazil and New Zealand.
2. The 2007-2009 recession, led by strong contraction of the housing market, brought roundwood consumption in the U.S. to its lowest level since the early 1960s.
3. The offshoring of the U.S. furniture sector, mostly to China, and expansion of the furniture sector in other Asian countries and Brazil.
4. The decline in domestic use of paper by the manufacturing sector, the media, and consumers, with the shift to electronic media.

Maintaining strong forest markets are essential for long term sustainability of these forest lands. Strong forest markets provide a natural incentive to forest landowners to maintain and actively manage these forestlands. Strong forest markets are also essential to forest landowners who depend on timber sale revenue of forest products as a means to reinvest into forest stewardship

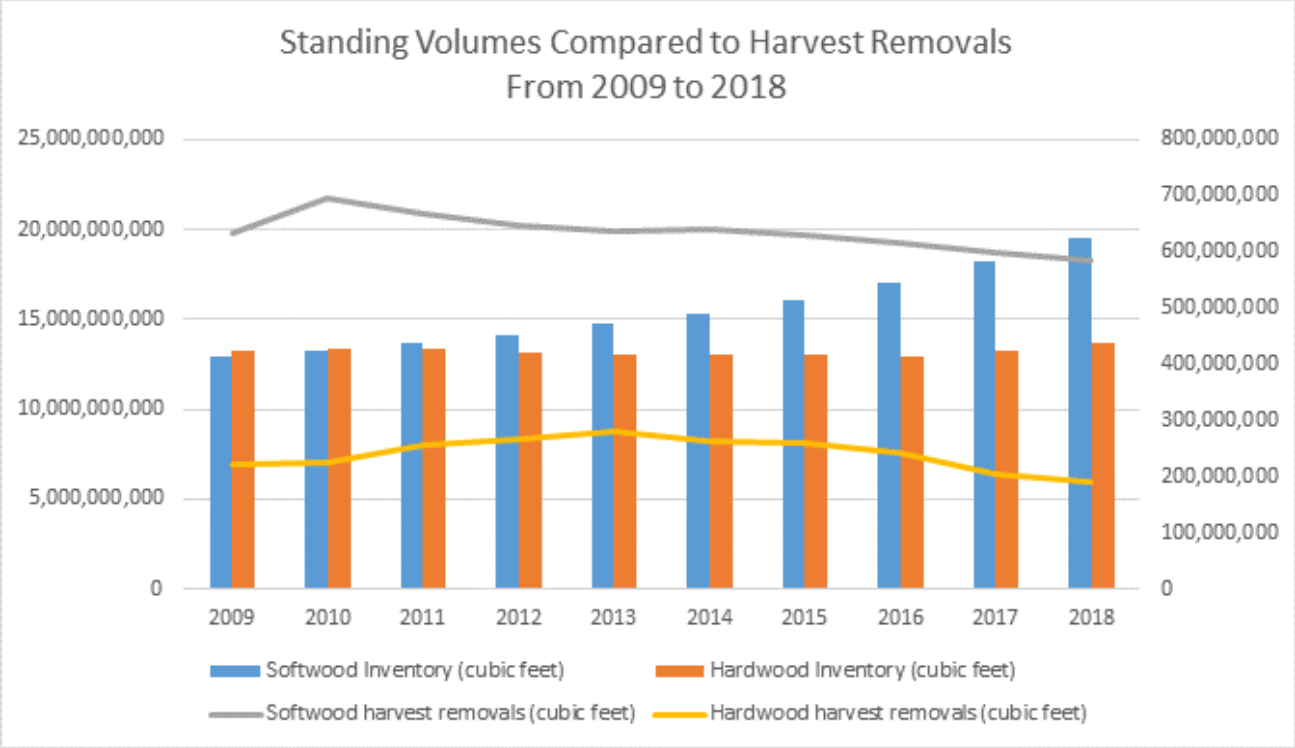
for future generations. Without healthy forest markets there exists a risk of conversion of forest lands to non-forest use or limited forest management.

Healthy forest conditions, a balance of age classes, products and species are critical to timber production and other forest markets. Currently Mississippi is growing more timber than it is consuming (growth to drain). Forest inventory data indicates that Mississippi's is growing 35-40 percent more timber than is being harvested.



Changing market conditions have heavily impacted the growth to harvest ratios on softwood. The net annual softwood growth exceeds removals by 58 percent and net annual hardwood growth exceeds removals by 56 percent. A comparison of harvest products by category for 2009 -2018 reveals that harvest of pine sawlogs decreased by 7 percent and its value decreased by 31 percent. Pine pulpwood volumes decreased by 10 percent and value decreased by 14 percent. Hardwood sawlog volume decreased by 27 percent while value increased by 25 percent. Hardwood pulpwood harvest volumes were reduced by 13 percent while value increased by 6 percent.

Figure 3: Standing Volumes of Softwood and Hardwood Timber Compared to Harvests (2009-2018)



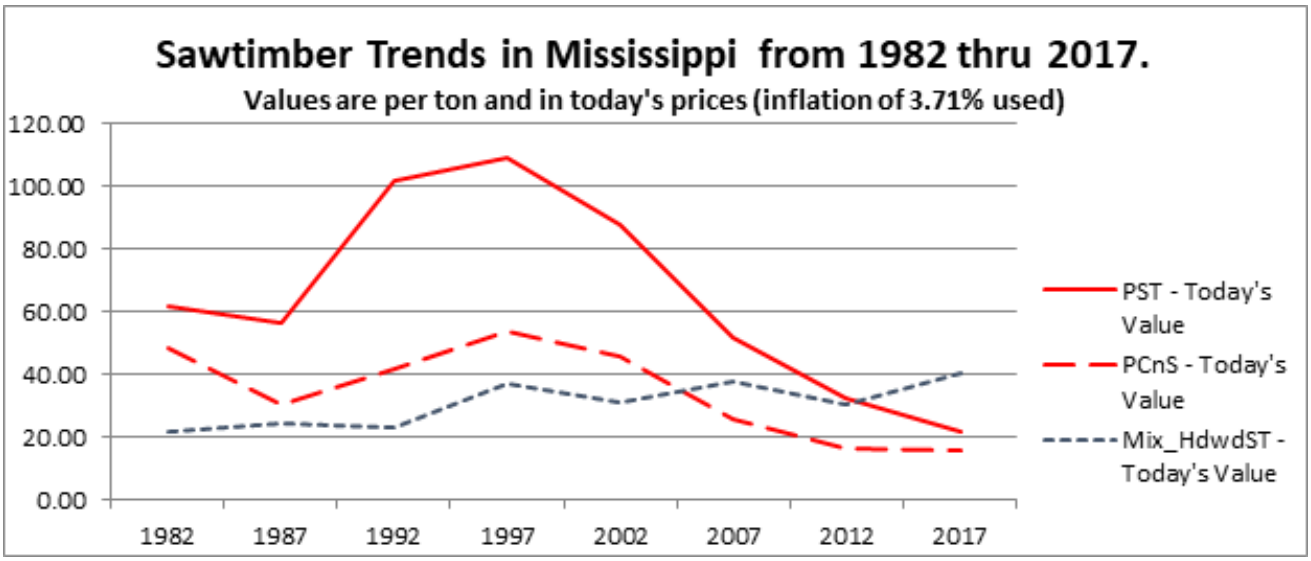
“Housing starts are a major driver of production value because of the construction industry’s demand for sawtimber. Since the housing collapse and recession of 2008, housing starts have struggled to reach pre-2009 levels. The timber value harvested and delivered in 2009, right after the housing collapse and recession, was only $864 million. Mississippi bounced back in 2010 up to $1.042 billion and peaked in 2015 with a value of $1.67 billion,” (MSU ES).

Forisk Consulting analyzes and publishes research on forest supplies, wood demand and timber prices for North America. They noted the impact of the recession on timber markets. “The post-recession currently features unresponsive timber prices, despite increases in housing and lumber production. While trends associated with industry consolidation and efficiency play a role, accumulating pine timber supplies on the stump drive this story. The forest profile in the South changed during and following the recession. Sawtimber inventories grew from the

equivalent of 15 years of removals on the stump (relative to annual demand) to over 25 years of removals on the stump. Prior to the recession, sawtimber prices responded directly to demand shifts. However, over the past six years increasing lumber production and wood demand barely moved prices."

Another major factor affecting timber markets over the past 10 years has been the loss of operational mills both in the state adjoining states. Since 2015, Mississippi has lost 14 percent of its mills, while some mills are not running at full capacity. Over the same time frame forest landowners saw a reduction in timber product values, especially for softwood sawtimber by 31 percent and pulpwood by 14 percent.

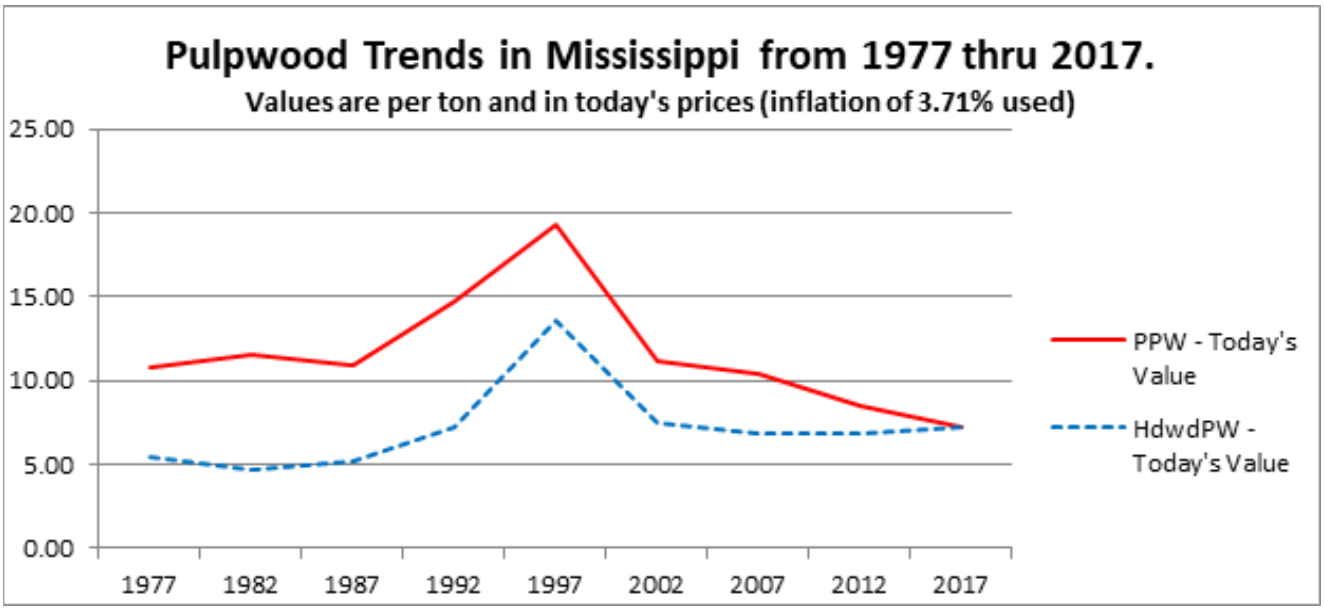
Figure 4: Sawtimber Trends in Mississippi from 1982 -2017



Traditional pulp mills, which process young or lesser quality timber, have disappeared in north Mississippi and other areas of the state as overseas markets with less expensive labor have taken on the production of pulp and paper. Mill closures over the past 20 years include paper mills in Moss Point and Natchez, sawmills in Morton, Philadelphia, Hattiesburg, Roxie, New Augusta, Quitman, Wiggins and the plywood plant at Gloster.

Loss of traditional pulp mills in adjoining states has also impacted Mississippi, since the wood basket for these mills can extend into Mississippi. Loss of these mills has further limited the Mississippi forest landowners' options to conduct timely thinning in pine plantations. Recently south Mississippi has acquired two new wood pellet facilities that utilize mostly pine and hardwood pulpwood. FIA data points to additional opportunities for potential wood pellet facilities in south and north Mississippi. To compete for new forest industries such as wood pellets, there is a critical need to identify sites that are ready for development and to improve transportation infrastructure such as roads and bridges. Cost-effective transportation options to transport wood from north Mississippi to deep water ports need improvement as well.

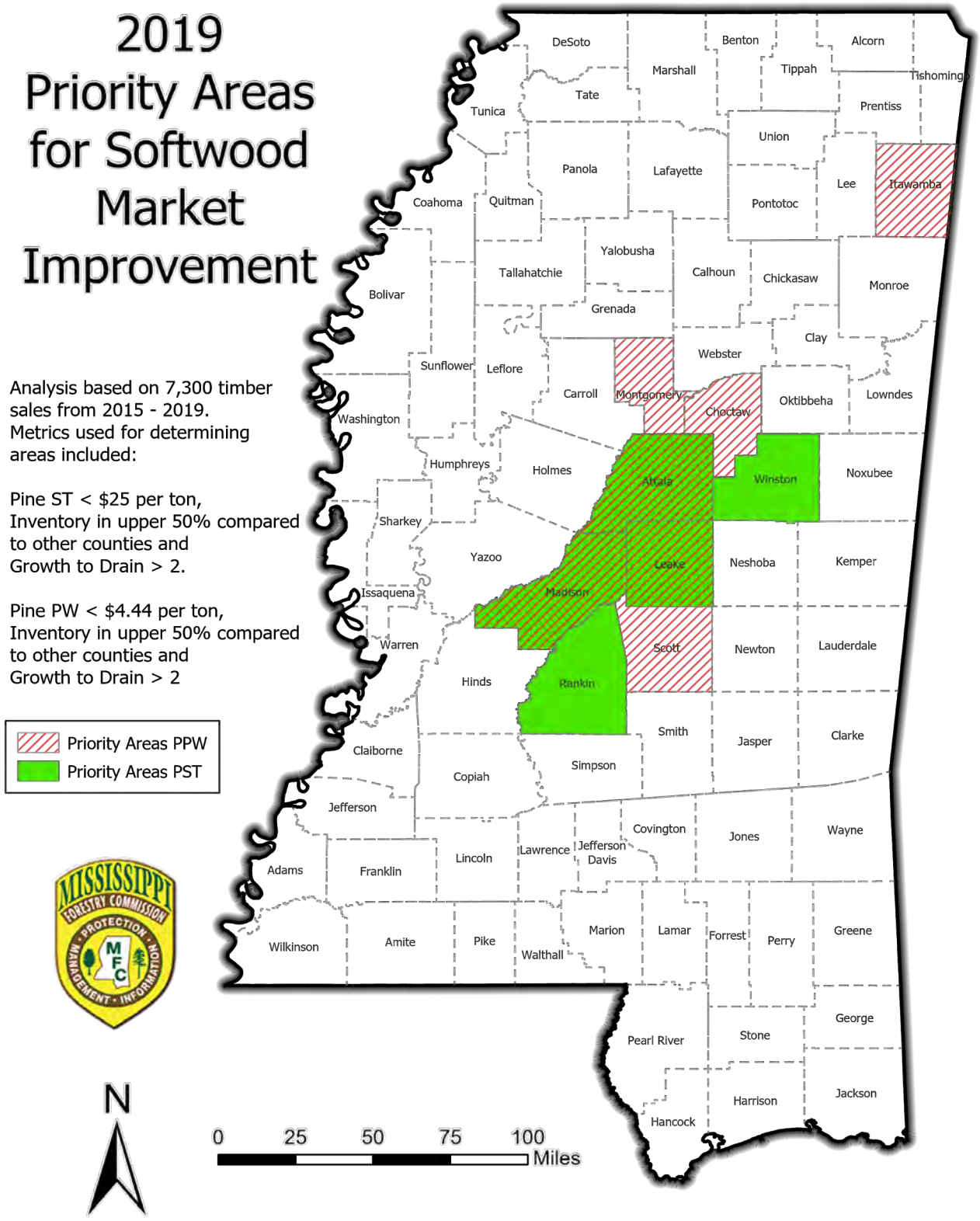
Figure 5: Pulpwood Trends in Mississippi from 1977 - 2017



Data from *Forest2Market,* experts in global wood and fiber timber pricing, cost benchmarks and analytics for wood raw materials supply chains was used to identify a forest market priority area for the state. Timber sale data involving over 7,000 timber sales from 2015-2019 was analyzed. The resulting priority area includes nine Mississippi counties and covers 2.6 million forested acres. In this priority area forest landowners are faced with increased challenges in marketing timber, especially timely thinning of pine plantations. This challenge is even greater for forest landowners with smaller tracts. Several key factors contributing to the difficult market conditions include transportation distances to wood using facilities, unfavorable road bonds, costly routing of log trucks, and the imminent need for infrastructure improvements such as roads and bridges.

Long term these difficult market conditions could have negative effects on forest health and may ultimately lead to landowners considering conversion as an alternative choice. Since 2010 Mississippi has lost 328,040 acres of forest land to alternative uses. Timber sale revenue provides the incentive and opportunity for forest landowners to implement sustainable forest management practices such as prescribed burning, treatment of invasive species, and reforestation.

2019 Priority Areas for Softwood Market Improvement



Analysis based on 7,300 timber sales from 2015 - 2019. Metrics used for determining areas included:

Pine ST < $25 per ton, Inventory in upper 50% compared to other counties and Growth to Drain > 2.

Pine PW < $4.44 per ton, Inventory in upper 50% compared to other counties and Growth to Drain > 2

Transportation - Transportation and improved infrastructure are vital to the health of the forest products industry. Mississippi's logging industry is critical to the sustainable forest market in Mississippi. This industry faces challenges including increased road bond limits, costly routing of log trucks, and restrictions on road use. The challenges have complicated the process of moving forest products in a cost efficient manner.

Mississippi's infrastructure to move logs from the woods to the mill has issues. At the time of this report, the Mississippi Department of Transportation's (MDOT) website, https://bit.ly/2XjKPqW, showed 257 closed or posted state-owned bridges that are restricted for hauling normal weight loads of logs. The map indicates the potential impact this can have on some rural communities. This map does not include the 10,612 rural county road bridges, https://bit.ly/3aRZNIh, of which 1,856 are posted for weight restrictions that limit for hauling normal weight loads of logs." There are 339 county bridges that are currently closed according to the Mississippi County and Local Bridge Inspection/Inventory Data.

Additionally, the system of county government and the powers that the county governing body has over roads can create a negative environment for transporting logs in some counties. For example, the most direct route to haul timber to a high weight highway using county roads capable of handling the load weights is not always possible if it is necessary to cross county lines.

These combined challenges to the logging industry have created unfavorable conditions that contribute to the difficulty private forest landowners face in merchandising their timber. The State of Mississippi is also in the process of identifying bridges that may not have sufficient weight limit to permit loaded log trucks to pass safely. In some cases, these bridges are not easily identified on rural county roads. Another growing issue that Mississippi loggers face is the challenge to find insurance coverage for transportation of forest products.

The forest industry depends on a strong infrastructure within the state to allow for cost-effective transportation of forest products. Transportation costs are a significant component in both paper and wood products industries. Product shipment costs and the distance between production and consumption can create a competitive disadvantage for Mississippi. As potential new forest industries consider locating to Mississippi, there are several key issues such as site readiness, available workforce, and transportation options.

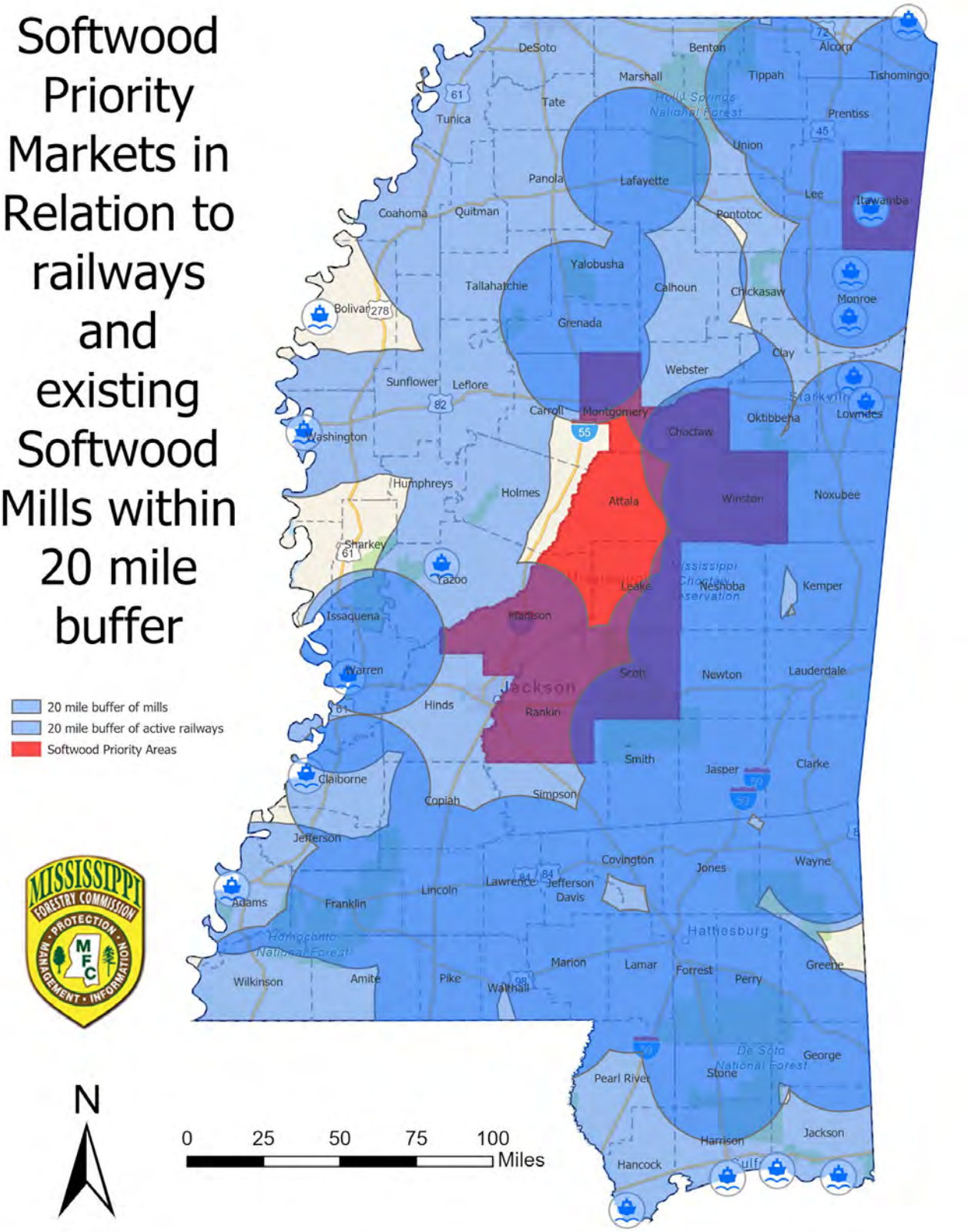
Transportation remains one of Mississippi's key challenges in seeking to be competitive with other states for new forest industries. Mississippi must identify cost-effective transportation options for forest products to reach growing markets areas both regionally and globally. The state lacks significant alternative transportation modes such as railroads, which in some locations could provide more cost-effective transportation of wood products while reducing pressure on the highway system. Lack of railways in key areas and switching fees limit the use of railways for transportation of forest products.

Mississippi has limited deep water ports facilities for forest products. This particularly impacts the wood pellet industry which requires shipping to meet global demand. Increasing

transportation options to deep water ports can enhance the state's ability to meet increasing global demand for timber products. The State of Mississippi controls 2 of the 16 ports, and the remaining 14 ports are locally owned and operated. Creating cost-effective transportation from northern Mississippi to coastal deep water ports would benefit the recruitment of wood pellet industries that are seeking to meet global demand.

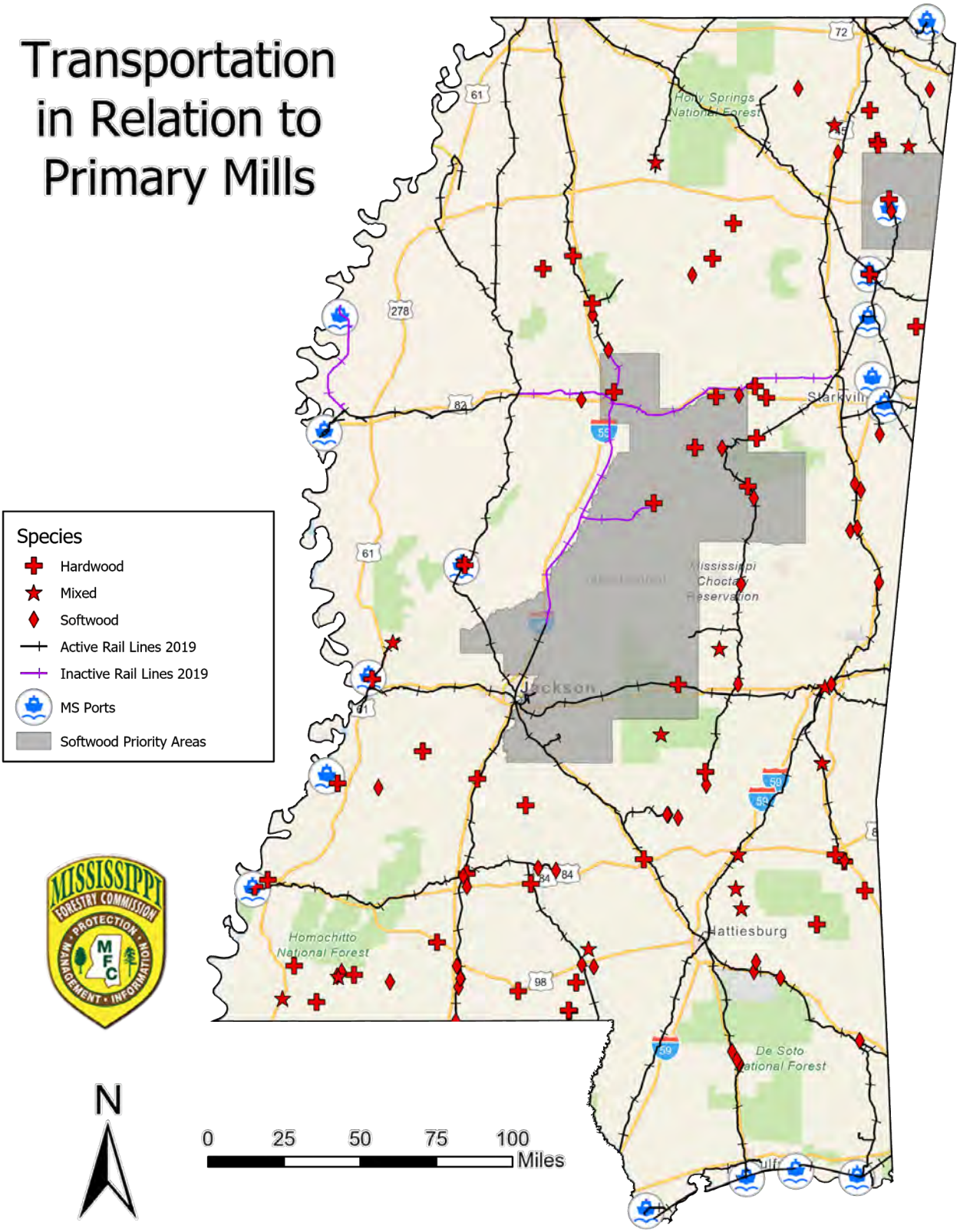
During 2019 - 2020 the US Forest Service funded a multi-state Landscape Scale Restoration (LSR) grant to Mississippi to explore whether the state transportation system provides advantages or disadvantages in attracting wood industries compared to the competitor states Alabama and Georgia. Literature gathered from multiple sources about wood industry site selection and 29 recent investments in the wood industry in Alabama and Georgia were analyzed to understand the factors considered by wood companies when selecting new investment sites. The study found that transportation is a significant factor in site selection for wood companies, and three potential challenges for Mississippi's transportation system may negatively impact the state's wood products. Those challenges are "frequently posted bridges on routes, less dense national highways and less dense freight railways." For the full report and recommendations on addressing transportation challenges, see: http://www.mfc.ms.gov/wp-content/uploads/2020/11/Transportation-Study-for-Wood-Industry-in-Mississippi.pdf

Softwood Priority Markets in Relation to railways and existing Softwood Mills within 20 mile buffer



Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Transportation in Relation to Primary Mills



Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Forest Mills - The reduction in forest markets due to the economic recession makes sustainability difficult to attain. Since 2010 Mississippi has lost 14 percent of its traditional forest mills as reported by the Primary Forest Products Network of the Southern Group of State Foresters. There are currently 112 forest mills in Mississippi. No new pulp mills have been built in Mississippi since the construction of the Bowater Plant in Grenada in 1989. Mississippi has an aging mill infrastructure that could lead to more mill closures. Losing facilities both in state and in adjoining states has amplified the growth to drain issue which indicates that the state is growing 35-40 percent more volume than it is consuming. New emerging industries such as wood pellets are providing some new opportunities, primarily in south Mississippi. With new pulp mills being unlikely to be constructed, wood pellet mills are a viable option.

Logging Force - The workforce (loggers and buyers) that supports the timber harvesting industry has decreased dramatically in recent years in response to the changing markets and economic slump. Since 2008, Mississippi has lost 1,595 loggers, a 64 percent decrease; but, due to increased efficiencies, loggers have increased total tons transported by 11.6 percent. In 2008 loggers averaged 442 loads per year, and in 2018 loggers averaged 1,403 loads per year. Still there is a growing concern that, as economic recovery occurs, there may not be a sufficient skilled workforce to meet the new demand for timber resources and the financing that was once available to provide capital to loggers for what is considered a volatile business.

Funding Research New Technology - Funding cuts at universities and state agencies have reduced research focused on forestry. However, the need for research and the transfer of technology is ongoing, particularly for new markets such as bio-fuels. It is imperative that Mississippi continue to maintain and update its current forest inventory information to facilitate and encourage investment in Mississippi's forest products community and industry. Mississippi FIA operates on a five-year cycle.

Prescribed Fire - Large reduction in acres of prescribed burning due to litigation threats, public concerns about air quality, higher costs, burning parameters that limit the number of legal burning days and fewer contractors that supply the service threaten the viability of resource markets for both timber and recreation. *Mississippi's State Wildlife Action Plan* 2015 - 2025 (SWAP) developed by the Mississippi Department of Wildlife, Fisheries and Parks (MDWFP) emphasizes the detrimental effects that loss of prescribed fire has had on certain natural forest communities, particularly longleaf pine in south Mississippi and have consequently exacerbated the spread of certain invasive plant species such as Japanese privet.

Forest Stewardship Plans - Only five percent of Mississippi landowners have a written forest stewardship management plan. Many landowners do not understand the opportunities that proper forest management presents such as increasing revenue potential by managing for multiple uses such as timber, recreation, wildlife habitat and the potential for other emerging markets such as carbon sequestration. When landowners harvest timber they seldom seek the advice of consulting foresters or the MFC.

Opportunities

The retention of existing industries and the development and attraction of new forest industry is critical to the long term sustainability of forestry in Mississippi. With new markets and emerging technologies, such as bio-energy and carbon sequestration, Mississippi is situated to promote the abundance of forest resources in the state to potential investors. Opportunities exist to build stronger working relationships within the economic development sector to help showcase Mississippi's forest resources domestically and abroad.

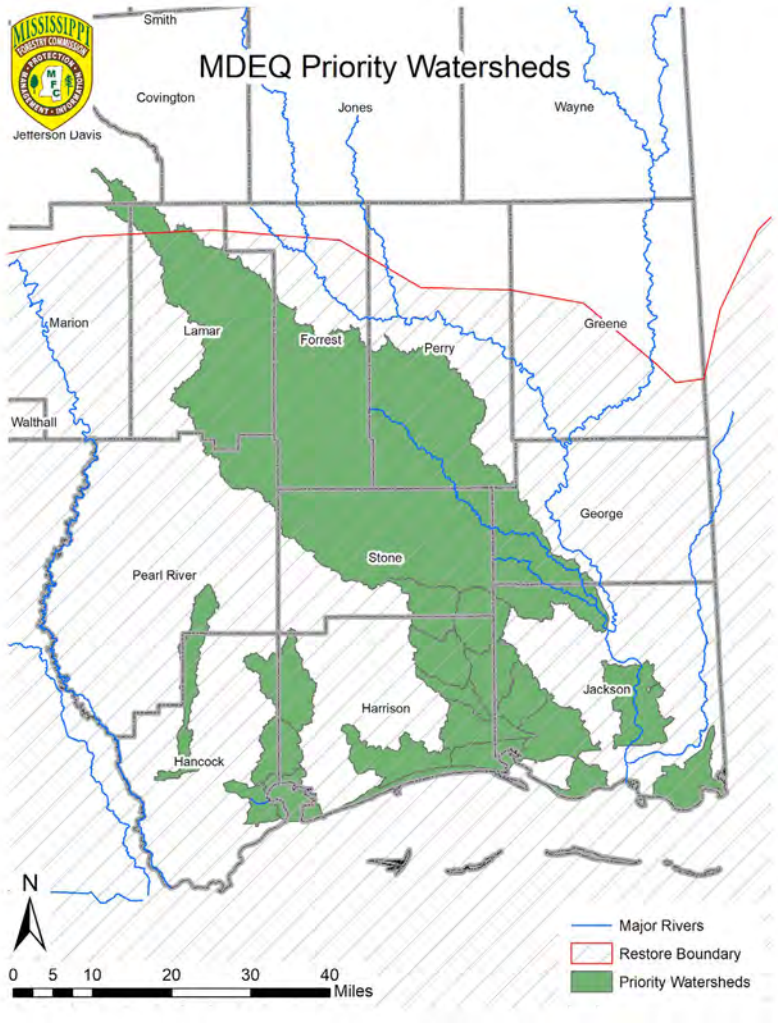
Forest Inventory and Analysis - One of the key tools required will be to maintain a strong Forest Inventory Analysis (FIA) Program. The data acquired through this program will provide data that show trends associated with Mississippi forest lands. Timely and accurate forest inventory data is critical to the forest industry.

Farm Bill Programs -The increase in funding for expansion of certain forest conservation programs funded through the Farm Bill, particularly through USDA's Natural Resources Conservation Service (NRCS) and Farm Services Agency (FSA), also present opportunities to implement sustainable forest management on private lands in target areas identified through those programs. This can help encourage private forest landowners to remain active with forest management by cost-sharing some of the management expenses.

Best Management Practices - Water Quality - MFC serves as the lead organization on the Statewide Forestry Water Quality Protection Project which evaluates the implementation and use of voluntary forestry best management practices (BMPs) throughout the state https://bit.ly/2RQXdLt. Through this program, the MFC is able to document the success of voluntary BMPs. Since 2003 Mississippi, by monitoring voluntary BMPs on a continuous cycle, has shown a high success rate averaging 95 percent. The MFC is working with other forestry-related groups to protect water quality and is evaluating practices in areas of streamside management zones (SMZs), woodlands trails and roads, forest harvesting, site preparation, tree planting, landings, wetlands, fire line construction and revegetation of disturbed forest sites. Some type of forest activity occurs on nearly 850,000 acres annually in Mississippi (approximately five percent of the state's forest land). If BMPs are not followed on these acres, the sites will be more prone to sedimentation, increased water temperature and nutrient loading, thus impacting critical ecosystem services.

Enhancing Gulf Waters through Forested Watershed Restoration - As a result of the 2010 Deepwater Horizon (DWH) oil disaster in the Gulf of Mexico, ecosystem recovery funds have been established to provide for priority areas along the Mississippi Gulf Coast. Mississippi will participate in a multi-state forest restoration initiative with Florida and Alabama called *Enhancing Gulf Waters through Forested Watershed Restoration.* The focus is on protecting and restoring forests, including urban forests, in priority watersheds of impaired water bodies in Alabama, Florida and Mississippi where the need is great, and partners stand ready to assist and leverage investments. The logic model for this program rests on the fact that a healthy Gulf stems from healthy estuaries and healthy estuaries depend on healthy watersheds. Healthy watersheds are

dependent on healthy forests which are dependent on engaged landowners. Shared stewardship is the key to success.



Market Improvements - Opportunities for improving forest markets and forest management fall into four main categories:

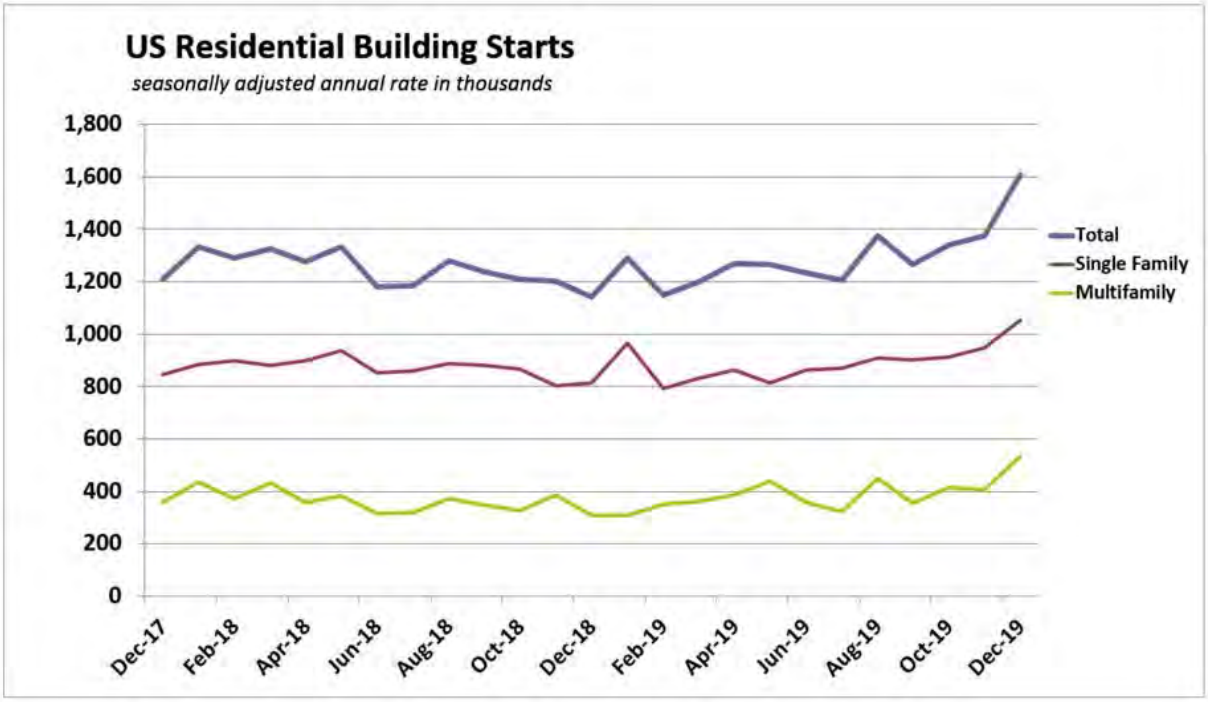
- Existing and emerging economic opportunities
- Certification programs
- Cost-share programs and
- Landowner education and urban forest management.

These are discussed in detail on the following pages.

<u>Economic Opportunities for Forest Management and Markets</u> **-** Mississippi's traditional forest markets will continue to be strong assets for the state. Logging, forestry and wood processing employees approximately represent 54,000 people who provide $1.1 billion in income. Landowners received more than $10.8 billion for their standing timber between 1995-2006, or

nearly $899 million annually. Forest, logging, primary wood processing and furniture manufacturing contribute $13 billion to the state's economy. Logging, forestry and wood processing employ approximately 61,794 people and in 2019 Mississippi forestry industry generated $2.67 billion in wages. Housing starts in the U.S. have steadily improved since 2015 to a seasonally adjusted annual rate of 1.345 million units as of December 2019, the highest level since December 2006. This represents a 17 percent increase since 2015.

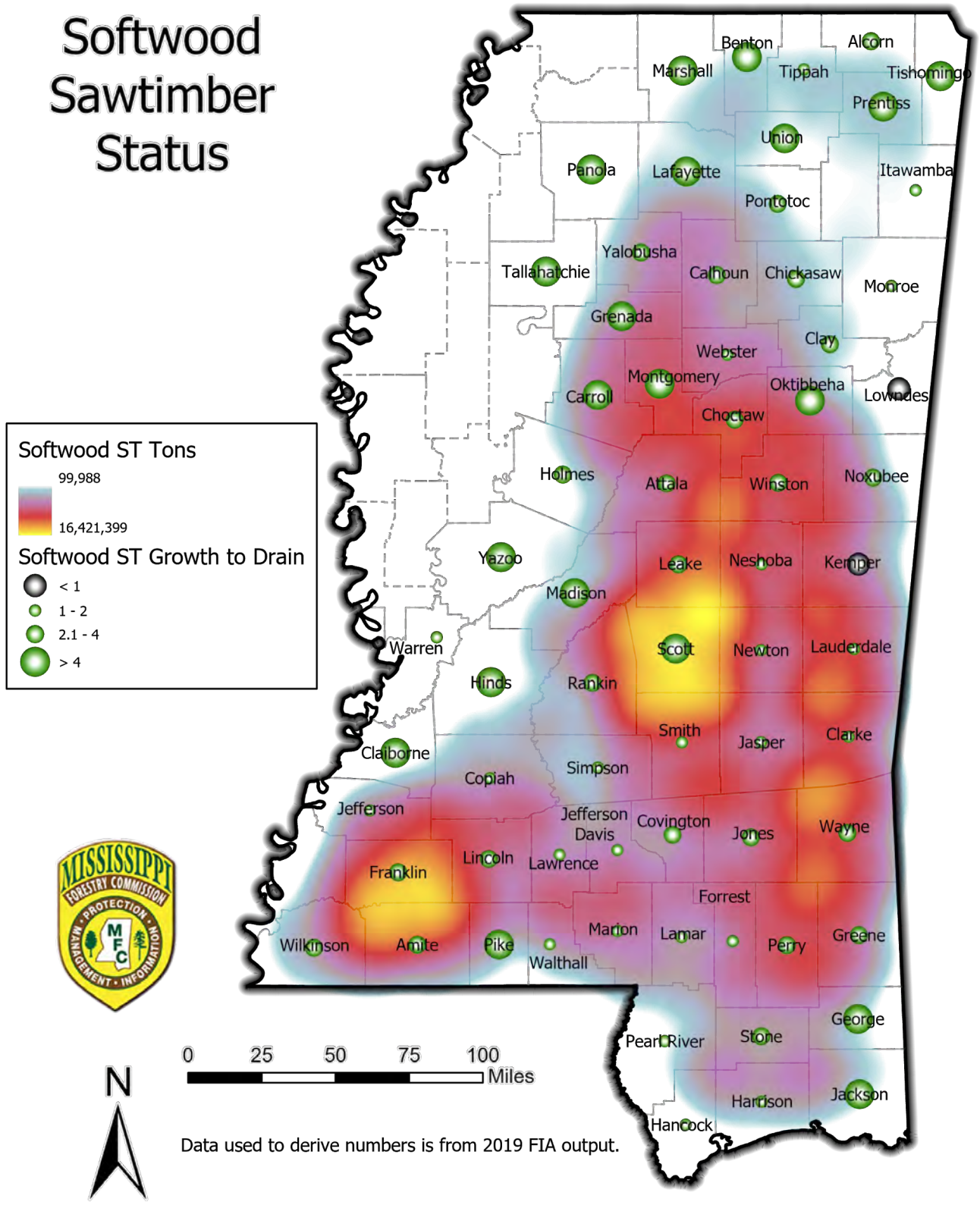
Figure 6: U.S. Residential Building Starts from 2017 - 2019



Although Mississippi has an abundant supply of pine sawtimber, the inventories have grown from the equivalent of 15 years of removals on the stump (relative to annual demand) to over 25 years of removals on the stump. Forisk reports, “Prior to the recession in 2009, sawtimber prices responded directly to demand shifts. However, over the past six years, increasing lumber production and wood demand has barely moved prices.”

New forest products such as Cross Laminated Timbers (CLT) could provide additional opportunities in the future. Some research indicates CLT is cost-effective alternative building material. According to a study by Waugh Thistleton, the architects of the first tall CLT building in the world, the overall savings gained from using CLT in lieu of conventional building materials is in the 15 percent range.

Softwood Sawtimber Status

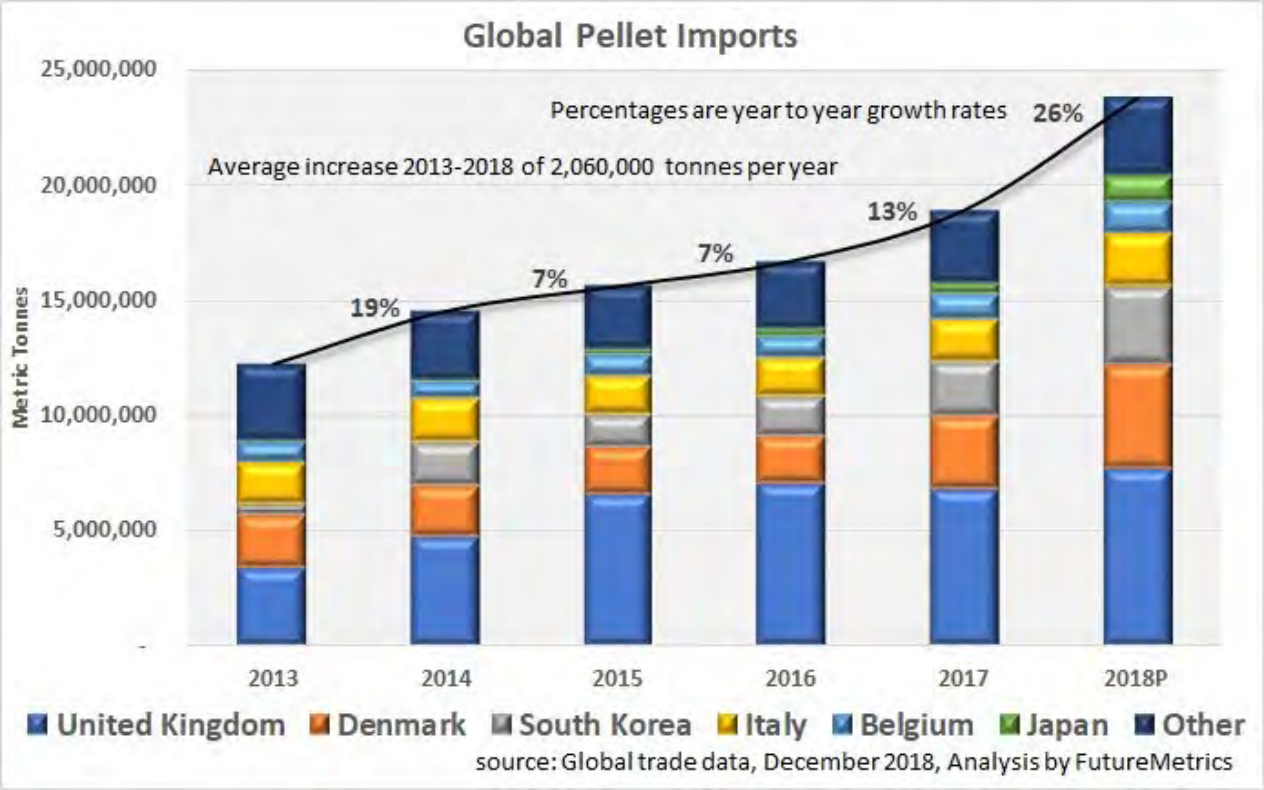


Data used to derive numbers is from 2019 FIA output.

Mississippi's abundant pulpwood inventories in the southern portion of the state have attracted several new wood pellet facilities that have offered new opportunities for forest landowners to merchandise pine and hardwood pulpwood. Overall, wood pellet trade in 2018 is estimated at 23.8 million tons, a 26 percent increase from 18.9 million tons in 2017. North American pellet exports will have increased to an all-time high in 2018. FutureMetrics projects that U.S. exports will increase to 8.5 million tons by 2023. With pricing and demand growth strong in industrial wood pellet markets, it is expected to see new major industrial pellet mills to be developed in the Southern U.S. after several years of measured growth. While industrial pellet markets get the bulk of market analysts' attention, heating markets make up a significant amount of total global demand and FutureMetrics forecasts continued strong growth over the next five years. The U.S. has one of the largest pellet heating markets in the world. Annual demand in 2018 is estimated at 2.5 to 3.0 million tons. (https://bit.ly/2VJUzYT)

Wood pellets products are an abundant renewable resource that can be stored in various forms and is available throughout the state. It is an attractive form of renewable energy for the developing biofuel market. The federal renewable fuels standard calls for producing 30 percent of the nation's energy from biomass by the year 2030.

Figure 7: Average Metric Tons of Pellet Imports by County

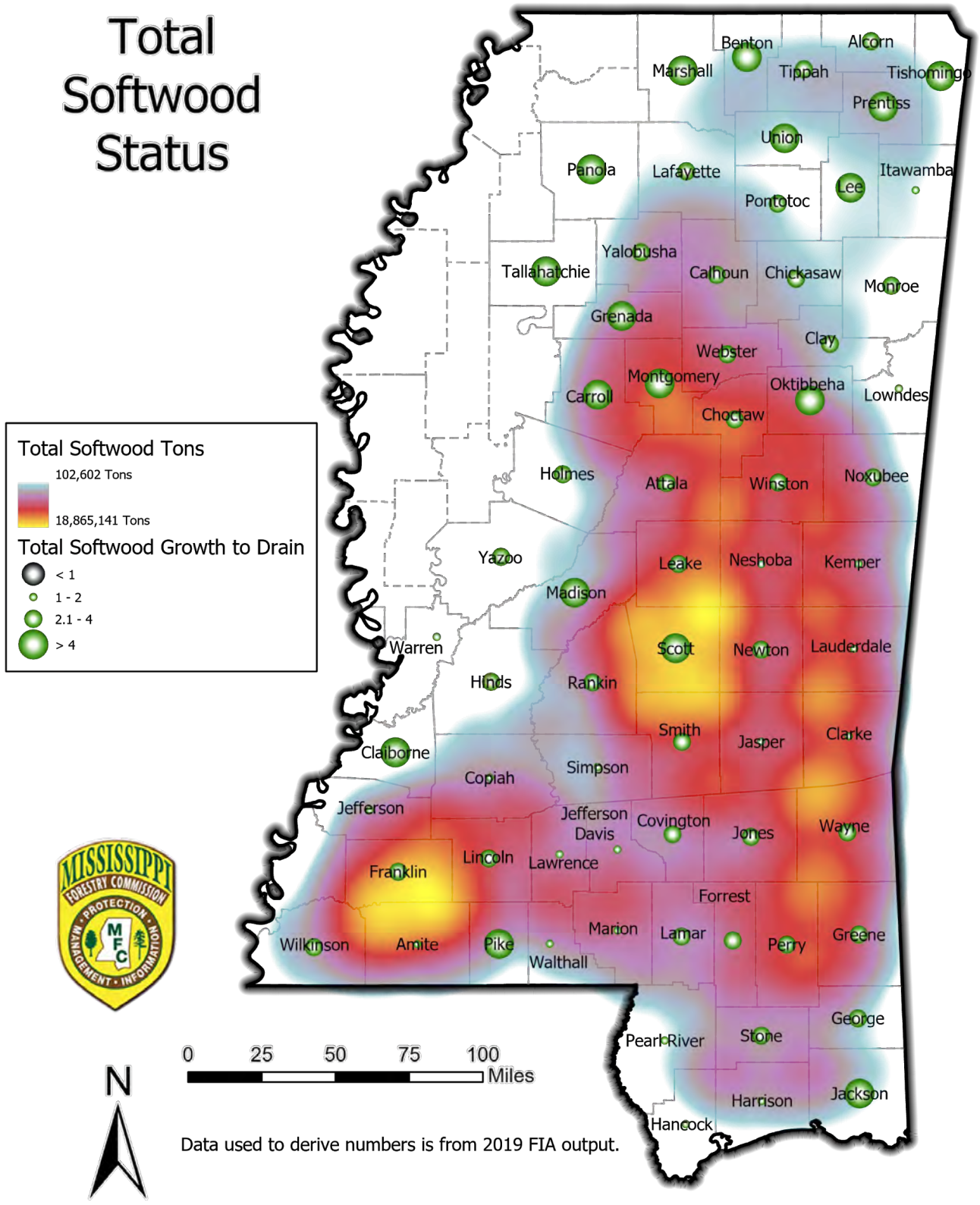


This industry highlights the need to maintain a strong forest inventory which enables the state to speak to the availability and sustainability of its forest resources as new mills consider locating to Mississippi.

Among the 50 U.S. states, forestland only accounts for approximately 22 percent of the average state's land base. In contrast, forestland dominates the landscape in Mississippi, covering approximately 65 percent of the state; of Mississippi's total forestland, 99.9 percent is classified as timberland, meaning it is both available for and capable of producing meaningful wood volumes for industrial uses.

Timber is not the only woody biomass resource in Mississippi. On average, 71 percent of a given tree is used for other purposes, whether for lumber or other wood products. This leaves 29 percent of the average tree – typically its limbs, tops, foliage, saplings and above-ground stumps – often unused and left in the forest by the logging industry. Unused portions of the tree, known as logging residue, offer tremendous potential as a feedstock for bioenergy or biochemical businesses. Logging residue is a widely available but unused resource. Volumes are large, and demand for them has been minimal. Mississippi generates approximately 4.9 million dry tons of logging residues annually, of which 2.9 million is available. The Mississippi Development Authority promotes biomass as offering significant opportunities for Mississippi's future. The state produces or has the capability to produce sufficient feed stock for building and sustaining markets for energy, fuel, and other products. Wood products are the principal source of biomass in the state and currently are being used to make paper, wood products, mulch and as a fuel to generate steam and electricity.

Total Softwood Status



Data used to derive numbers is from 2019 FIA output.

Mississippi is developing a strong ecosystem market that includes both consumptive and non-consumptive uses and has an estimated total economic impact for Mississippi of $2.7 billion in 2008 dollars. Although prices on carbon contracts are fairly low at present, there is potential for them to increase as power plants and heavy industries need to offset their generation of carbon dioxide through sequestration programs. Landowners, on average, can expect $10 -20 per acre in revenue from the sale of carbon credits in the future.

Certification Programs - The American Tree Farm System® (ATFS) certifies land management to the American Forest Foundation's Standards of Sustainability. Under these standards, private forest landowners must develop a management plan and pass an inspection by an ATFS volunteer forester. ATFS has certified 20.5 million acres of privately-owned forest land managed by over 74,000 family forest landowners, making it the largest private forest conservation program in the U.S. In Mississippi, 2,719 landowners with 756,652 acres participate in the ATFS as of 2019. Additionally, there are approximately 480,000 acres of certified public lands within the ATFS. Membership to the ATFS is free. There are 756,652 acres of ATFS certified tree farms owned by 1,873 non-industrial private individuals or organizations.

The Sustainable Forestry Initiative® (SFI) Inc. is a non-profit organization dedicated to promoting sustainable forest management. SFI works with conservation groups, local communities, resource professionals, landowners, and many other organizations and individuals who share its passion for responsible forest management. The SFI forest certification standard is based on principles that promote sustainable forest management, including measures to protect water quality, biodiversity, wildlife habitat, species at risk, and forests with exceptional conservation value. The standard is used widely across North America, and has strong acceptance in the global marketplace, resulting in a steady supply of third-party certified wood from well-managed forests. This is especially important because of the growing demand for green building and responsible paper purchasing at a time when only ten percent of the world's forests are certified.

The Forest Stewardship Council (FSC) is a non-profit organization devoted to encouraging the responsible management of the world's forests. FSC sets high standards that ensure forestry is practiced in an environmentally responsible, socially beneficial, and economically viable way. Landowners and companies that sell timber or forest products seek certification as a way to verify to consumers that they have practiced forestry consistent with FSC standards. Independent certification organizations are accredited by FSC to carry out assessments of forest management to determine if standards have been met. These certifiers also verify that companies claiming to sell FSC certified products have tracked their supply back to FSC certified sources. This chain of custody certification assures that consumers can trust the FSC label.

FSC's model of certification allows products that flow from certified forests to enter the marketplace with a credential that is unique. Any FSC-labeled product can be traced back to a certified source. This aspect of the system is the basis for any credible certification system and is the link between consumer preference and responsible, on-the-ground forest management.

Note that although SFI and FSC present opportunities for certification, they are cost prohibitive to the majority of landowners.

Cost-Share Programs for Forest Management Practices **-** A variety of federal and state cost-share programs are available in Mississippi to help landowners finance the implementation of forest management practices for timber production, recreation, wildlife habitat, soil and water quality protection and aesthetics. The following table lists some of the more common federal programs and funding sources. It is important to note that funding and authorization of the programs may change with legislative changes such as the federal Farm Bill. A description of additional cost-share programs available in Mississippi is included in *Chapter V: Forestry Programs and Resources.*

Table 2: Examples of Federal Forest Management Programs

Federal Program	Agency	Agreement period	Curbing Water Erosion	Conserving Soil and Water Resources	Establish / Restore/ Protect Wildlife Habitat
Environmental Quality Incentives EQIP	USDA NRCS	More than 1 year, but less than 10 years	✔	✔	✔
Conservation Reserve Program (CRP)	USDA FSA	10-15 Years	✔	✔	✔
Conservation Stewardship Program (CSP)	USDA NRCS	5 Years	✔	✔	✔
Forest Legacy Program	USDA FS	Permanent		✔	
Healthy Forest Reserve Program (HFRP)	USDA NRCS	10 year restoration, 30 year and permanent easements			✔
Wetlands Reserve Program (WREP)	USDA NRCS	Permanent or 30 year easements			✔

State Cost-Share Opportunities - The Forest Resource Development Program (FRDP) is a state program funded by severance tax. Landowners are approved on a first-come, first-served basis. Funds can be used for a variety of silvicultural practices such as reforestation of pine and hardwood, prescribed burning, invasive species control, and various herbicide treatments. The program requires a forest management plan, usually written by an MFC forester. Severance tax

collections on forest products were $3,780,670 in 2018. Twenty percent of severance tax collections, or about $735,931, is returned to counties where the timber was harvested. Eighty percent, or about $3,024,560, is allocated to the FRDP to provide cost share funds to nonindustrial private forest landowners for reforestation and other forest management activities.

In 1999, the Mississippi Reforestation Tax Credit (RTC) was implemented. RTC allows a Mississippi taxpayer who reforested Mississippi land to claim a 50 percent tax credit against approved costs. The maximum amount of tax credit that could be taken during his or her lifetime is $75,000 per taxpayer, $10,000 limit per year. The credit is claimed against the lesser of actual cost or average cost as established by the MFC. The RTC can be used by private individuals, groups and associations, including trust property and estates. It cannot be used by corporations that manufacture products or their subsidiaries, or by public utilities or their subsidiaries. A written reforestation prescription prepared by a graduate forester of a Society of American Foresters (SAF)- accredited institution or by a forester registered under the Mississippi Foresters Registration Law of 1977 is required for the use of the Mississippi RTC. While the Mississippi RTC is an enticing incentive for reforestation, it does not negate the use of the federal tax recovery provisions.

Landowner Education **-** Education opportunities are vital to encouraging more active management of private forest lands for multiple uses. Existing MFC efforts that offer the most potential for improving forest management and expanding resource markets are:

Minority outreach efforts such as the Underserved Landowner Outreach program provide assistance to underserved landowners in Mississippi. This program has three primary goals: 1) to provide outreach support and technical assistance to underserved landowners; 2) to encourage young people to seek careers in forestry; and 3) to work with Alcorn State University (ASU) to develop and/or enhance projects of mutual forestry interest.

Environmental Field Days are held every fall and spring. These events are sponsored jointly by the NRCS, MFC and MDWFP to target reaching 5th grade students. They focus on the significance of stewardship of forests, soil and water and present a long-term effort to improve public understanding and appreciation of the benefits of natural resources and forest and natural resource management.

The MSU and the Alcorn State University (ASU) Extension Services host a variety of training classes for both landowners and resource managers. Topics include how to thin trees, forestry taxation, carbon credit markets, and invasive species control and others. The MSU ES also hosts the weekly *Farm and Family Radio* show dedicated to forestry issues and current events.

MFC conducts a significant amount of educational work in conjunction with the Mississippi Forestry Association and the MFA's County Forestry Association affiliates. This network of local associations is fairly unique to Mississippi and allows for a significant number of educational opportunities as well as direct contacts with the state's landowners.

The Mississippi Professional Logger Training Program was established in 1996 to assist logging business owners and loggers in their profession. Logging is an ever-changing industry which brings a high demand for new training on logging practices. This professional program and those of other associations provide the most up-to-date logger education needed to become certified in the state of Mississippi and will be essential as certification programs evolve. This educational programming is currently centered on the Sustainable Forestry Initiative.

See C*hapter V. Forestry Resources and Programs* for more information on outreach programs.

Forest Sustainability and Resource Priority Landscapes

- Urban Change Map
- Mill allocation Map by type including new wood pellet mills
- Softwood Growth to Drain in Relation to Mills Map
- Forest Market Priority Map
- Longleaf Priority Area Map
- Transportation in Relation to Softwood Mills Map
- Railways to Softwood Mills and Deep Water Ports Map
- Forest Legacy Areas

Mississippi Key Issue 1: Forest Sustainability and Markets								
Long-term Strategy	**Priority Areas**	**Secondary Issues addressed**	**Program Areas that Contribute**	**Key Stakeholders**	**Resources available/ Required to Implement**	**Key Partners and Potential Partners**	**Measure of Success**	**Supports National Objective**
1.1 Promote traditional forest markets and industry	Statewide	Forest Health, Wildlife, Wildland Fire	FIA, Stewardship, Forest Health, and USFS Grants	MFC, MDA, MDAC, MFA, MSU, MEC, USM	State Forest Inventory, Resource Analysis, Forest Economic Analysis and Current Mill Inventory	FIA, MDA, MSU, USM, MEC, MFA , MFC, MAOCS	Maintain and grow the number of traditional mills in Mississippi; seek opportunities for new emerging forest industries	1.2, 3.4, 3.5, 3.6, 3.8
1.2 Promote reforestation and afforestation of longleaf pine on appropriate sites within its natural range	Mississippi Longleaf Implemetation Defined Priority Area, Multi-State Priority	Stewardship, Forest Health, Wildlife, Wildland Fire	FRDP, EQIP, EFCRP, ECP, State and Private USFS grants, Other non-USFS Programs	Landowners, Forestry Vendors, Consultants, Public/Private entities which provide funds for implementing reforestation.	Vendors, Reliable Seedling Sources, Mississippi Longleaf Implementation Team, Educational Services and Promotional materials, Consultant Foresters, CFA, NRCS, FSA, Longleaf Alliance	USDA FSA, USDA NRCS, MFC, USFS, Longleaf Alliance, MSU, Pole Industry, DOD, TNC, MFC, MLIT	Acres planted, acres managed, acres burned	1.1, 1.2, 2.1, 3.4, 3.5, 3.6, 3.7
1.3 Increase use of prescribed burning for timber stand improvement and wildlife habitat development	Wildfire fuel reduction priority areas, Longleaf Priority Area	Stewardship, Forest Health, Wildlife, Wildland Fire, Landowner Trends	FRDP, Stewardship Grant, Mitigation Grants, Proximity Grants, EQIP, Fire on the Forty	Communities at risk, landowners, hunters	Vendors, Consultant Foresters,National Forests, State Agencies with Forest Land Holdings, Natural Resource Managers	MPFC, MFC, USFS, ATFS, Forest Stewards, MDWFP, MDEQ	Increase number of private vendors, increase number acres prescribed burn	1.1, 1.2, 2.1, 2.2, 3.3, 3.4, 3.5, 3.6, 3.7
1.4 Increase stewardship management planning and technical assistance to forestlandowners; through utilization of the Tree Farm Program, certification programs, other state, federal and private programs as well as consulting foresters	Mississippi Forest Stewardship Priority Area	Stewardship, Forest Health, Wildland Fire, Wildlife	FRDP, American Tree Farm System, Stewardship Grant, LSR Grants, Federal Cost-Assistance Programs	Land Owners, Wood-using facilities, Forestry Vendors	NRCS, FSA, MFC, State and Private Forestry, USFS, Consulting Foresters MDWFP	NRCS, FSA, MFC, MFA, Tree Farm of America, Private Consultants	Increase number of Forest Stewardship Plans by 20%	1.1, 1.2, 3.4, 3.5 and 3.6
1.5 Encourage and improve agriculture/forestry/watershed land-use planningand BMPs to address nonpoint pollution,erosion and water quality issues	Priority watersheds identified by MDEQ	Landowner Trends, Stewardship, Wildlife	Forest Stewardship	MDEQ, MFC, MDWFP, MDAC, SWCD, MLA, MFA, SFI Mississippi Implementation Committee	Forest stewardship, MSUES, ASUES	MDEQ, MFC, MDWFP, MDAC, SWCD, MLA, MFA, SFI Mississippi Implementation Committee	Longterm improvements in water quality	1.2,3.1, and 3.5
1.6 Develop and maintain wood using directory of timber products outputs and consumption and trends	Statewide	Forest Health, Wildland Fire, Wildlife	Forest Inventory and Analysis	Landowners, Industry, Economic Developers, Loggers, Entities involved with buying or selling in domestic	SUM Task Force, SRS - TPO Studies, Economic Development, MFC FIA Program	MFC, SUM Task Force, FIA, Economic Development, Industry	Directory and annual update.	1.2, 2.2, 3.4 , 3.7

				markets or internationally				
1.7 Evaluate potential opportunities to utilize state's abundant forest resources including traditional wood product markets and non-traditional markets such as carbon and biomass markets, recreation and ecosystem services.	Mississippi Difficult Market Area	Stewardship, Forest Health, Wildlife, Wildland Fire	Stewardship, FIA, LSR Grants, USFS Programs	MDA, MSU, MFA, MFC, MEDC	Economic Development	FIA, MDA, MEC, EPAs, MFA , MFC, MAOS	Publication of findings	1.2, 3.4, 3.5, 3.6, 3.7
1.8 Improve the health, management and utilization of our forest resources and to help forest industry better compete in existing and emerging markets	Mississippi Difficult Market Area	Stewardship, Forest Health, Wildlife, Wildland Fire	Stewardship, FIA, LSR Grants, USFS Programs	MDA, MSU, USM, MFA, MFC, MEDC	Economic Development, Health Grants, Stewardship Grants	FIA, MDA, MSU, USM, MEC, EPAs, MFA , MFC, MAOS	Identify key issues, development of technical group, educational and other resources for educational, outreach and other efforts	1.2, 3.4, 3.5, 3.6, 3.8
1.9 Identify and maintain list of site ready locations in Mississippi suitable for new forest industries	Statewide	Stewardship, Forest Health	FIA, Stewardship, and USFS Grants	MDA, MSU, USM, MFA, MFC, MEDC	State Forest Inventory, Resource Analysis, Forest Economic Analysis and Current Mill Inventory	FIA, MDA, MSU, USM, MEC, MFA , MFC, MAOS	Development of list of site-ready locations for potential new forest industries considering Mississippi for new mills	1.2, 3.4, 3.5, 3.6, 3.8
1.10 Develop additional opportunities for forest landowners to have their forest lands meet forest certification standards	Statewide	Stewardship, Forest Health, Wildlife	Stewardship, FRDP, and NRCS Programs	NRCS, MFC, MFA, FSA, ATFS, Private Natural Resource Professionals	LSR Grants, FIA Forest Stewardship Grants	NRCS, MFC, MFA, FSA, ATFS, Private Natural Resource Consultants	Create landscape-scale Forest Management Plan in key areas of state	1.1, 1.2, 2.2, 3.1, 3.4, 3.5, 3.6, 3.7
1.11 Evaluate transportation issues, seek opportunities to improve, as it relates to the transportation of forest and wood products. This includes state, county roads, ports, and railways that are linked to forest products transportation	Statewide	Stewardship, Forest Health, Wildlife	None available at this time	Private forest landowners, Forest Industry, Loggers, and Economic Development	GIS Applications, Financial Assistance, Data Development	MLA, MDOT, MAOCS, MFA, MFC, CFA, MSU, ASU, and MDA	Complete a SWOT analysis for the forest transportation sector	1.1, 1.2, 2.2, 3.1, 3.4, 3.5, 3.6, 3.7

Key Issue 2: Landowner Trends

Because most of Mississippi's forest land is in private, nonindustrial ownership, maintaining a productive and sustainable future for Mississippi's forests and other natural resources is dependent on the development of natural resource policies that promote and support private ownership of forest land. Without actively managed private forest lands, the availability of raw material needed to support the forest products industry decreases. If incentives are not in place to retain privately-owned forest land, property ownership changes along with land management objectives. Increasing property taxes and urban expansion are significantly threatening productive private forest land ownership in Mississippi.

Developing natural resource policies that reflect a wide variety of forest land management objectives is challenging due to diversity of landowners in the state who have a broad array of management goals such as producing traditional forest products, managing fire, managing and conserving wildlife, and enhancing recreation and aesthetics and protecting water quality and water resources.

Forest Resource

The majority of Mississippi's private forest lands (80 percent) are family forests. According to the 2018 N*ational Woodland Owner Survey*, there are 121,000 family forest landowners in Mississippi and 69 percent of those are at least 75 percent forested. Most family forest landowners in the state have relatively small holdings (less than 100 acres), which they have held for more than 10 years.

Public Benefits

Forest landowners maintain ownership for a variety of reasons. Some utilize their forest land for economic pursuits such as timber production. Others use their forest land for recreational enjoyment, ranging from the traditional outdoor recreation such as hunting, fishing and camping, to aesthetics, wildlife watching and hiking. Many Mississippi forest landowners have a deep-rooted conservation land ethic that supports quality of life issues. In addition, these landowners strongly defend private property rights.

Key Conditions or Attributes

Societal pressures are creating significant challenges to maintaining traditional forest management objectives. Although Mississippi is largely a rural state, forest ownership is increasingly being affected by changing land ownership objectives and values. Traditional forest management economic objectives are being replaced by non-traditional management objectives, such as ecosystem goods/services and other non-timber management objectives. The pressure on landowners to maintain forest land use and ownership increases in areas affected by urban expansion.

For some landowners, a tax burden is created when family forest land passes to the next generation (intergenerational transfer). Each time property is transferred due to intergenerational transfer, the number of absentee landowners increases. The heirs often sell all

or part of the property for a variety of reasons, such as eliminating the tax burden, or have no interest in owning the property. Or the real estate value exceeds timber and agricultural revenue potential.

Globalization of the timber industry, loss of wood products manufacturing facilities and increasing property values are factors that can adversely impact the economic feasibility of maintaining forest ownership for private, nonindustrial landowners. Recent forest inventories in Mississippi reveal that 30 percent more timber is available for harvesting without affecting the sustainability of the forest resource. One reason for this growing surplus of merchantable timber is the lack of new and expanded forest product industries.

The sustainability of forest-based revenue produced by both consumptive and non-consumptive products on privately owned forest land is dependent on traditional and non-traditional markets. Obviously, if private forest landowners do not have a market for their timber, there is no financial incentive to continue making long-term investments in the management of their forests. This can lead to changing land management objectives, changes in land use or outright sale of property. For non-consumptive products such as ecosystem services, more research is needed to establish acceptable market values. Without a market value, there is no financial incentive for private landowners to manage for these benefits either.

Threats and Contributing Factors

Fragmentation and Parcelization - Changes in forest cover and forest types due to the influence of parcelization, fragmentation and urbanization can significantly impact forest quality and a forest's ability to provide timber, wildlife habitat, recreation, and environmental amenities. These influences can change a landowner's forest management objectives and can lead to the landowner selling or changing the land use of the property.

Fragmentation refers to physical isolation of forest tracts from one another. It generally results from parcelization of ownership, but can also be caused by introducing infrastructure (roads, power lines, etc.) into the forest or even forest management activities that have the same effect. Fragmented forest land is most prominent in areas experiencing urban expansion. Fragmentation is accelerated in the wildland/ urban interface (WUI) because of the construction of buildings, roads, and parking lots.

Fragmented forests cannot provide the same ecological and economic values as forests in rural areas. As fragmentation of forest land increases, the number of large forested tracts decreases. Forest fragmentation and parcelization has an extremely adverse impact on ecosystem processes and biodiversity as well as the ability to manage and harvest timber. According to the 2020 *National Woodland Owners Survey* (NWOS) conducted by the USDA Forest Service 40 percent of Mississippi's forest land is in parcels of 20 acres or less and 80 percent are in parcels of 100 acres or less. Privately owned tracts are trending toward smaller parcels which have unintended consequences such as the decreased profitability of harvesting. Highly mechanized systems require tract sizes of at least 40 to 50 acres. With a smaller tract size, opportunities for harvesting diminish to a point that is not considered viable for commercial harvest.

Parcelization in the context of forestry generally refers to division of ownerships that result in smaller holdings. This can result from inheritance of forests by multiple heirs, subdividing large blocks into smaller forest parcels, or sale of large holdings to multiple buyers or to single purchasers who in turn subdivide the land at some future date. Absentee ownership tends to increase correspondingly. As the number of landowners increases, the average tract size decreases.

Forest fragmentation and/or forest parcelization, insect and disease problems, invasive species, wind events such as hurricanes and tornadoes, and wildfires constitute major threats to sustainability. Increasing parcelization and fragmentation of forest land have negative impacts on:

- Economic contributions of forests and forest products
- Clean water production
- Forest-based recreation
- Hunting and non-consumptive wildlife enjoyment
- Biological diversity
- Air quality improvement
- Aesthetics
- Other “quality of life” values

According to the NWOS data collected from 2011 to 2013, the majority of privately-owned nonindustrial forest land over 10 acres in size (a total of 11.6 million acres) are considered “family forests” owned by individuals. Family forest landowners comprise an aging demographic, with 52 percent of acres under the tenure of landowners age 65 and up, and only 2 percent of acres owned by individuals younger than 44.

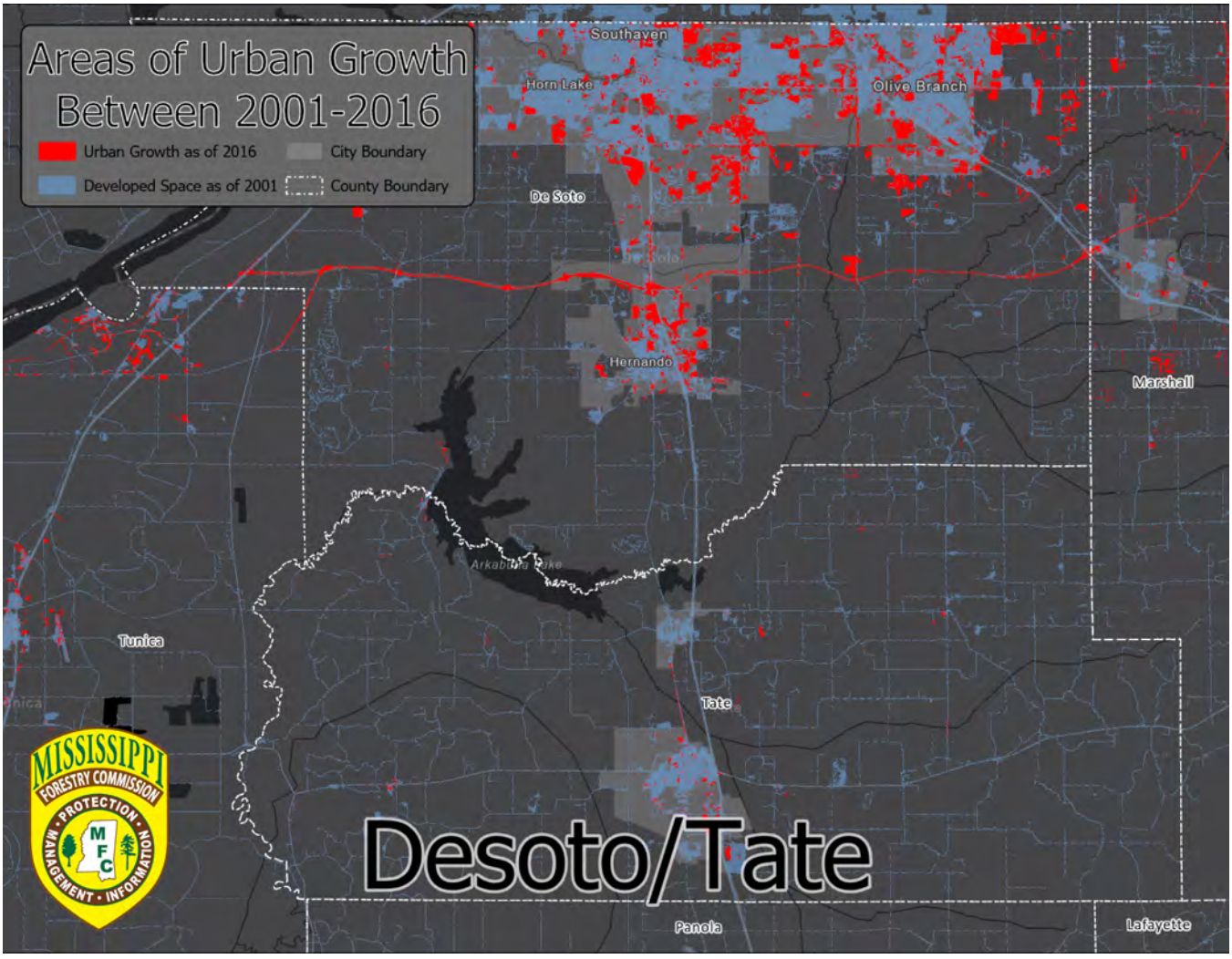
Conversion to Non-Forest and Urbanization - According to the USDA Forest Service Southern Research Station, timber land area, for which we have the longest record, experienced an increase between 1977 and 2006 as some agricultural areas were allowed to revert to forest. Since 2006, all forest land area has experienced a 2.6 percent decline while non-forest land has increased by 2.7 percent

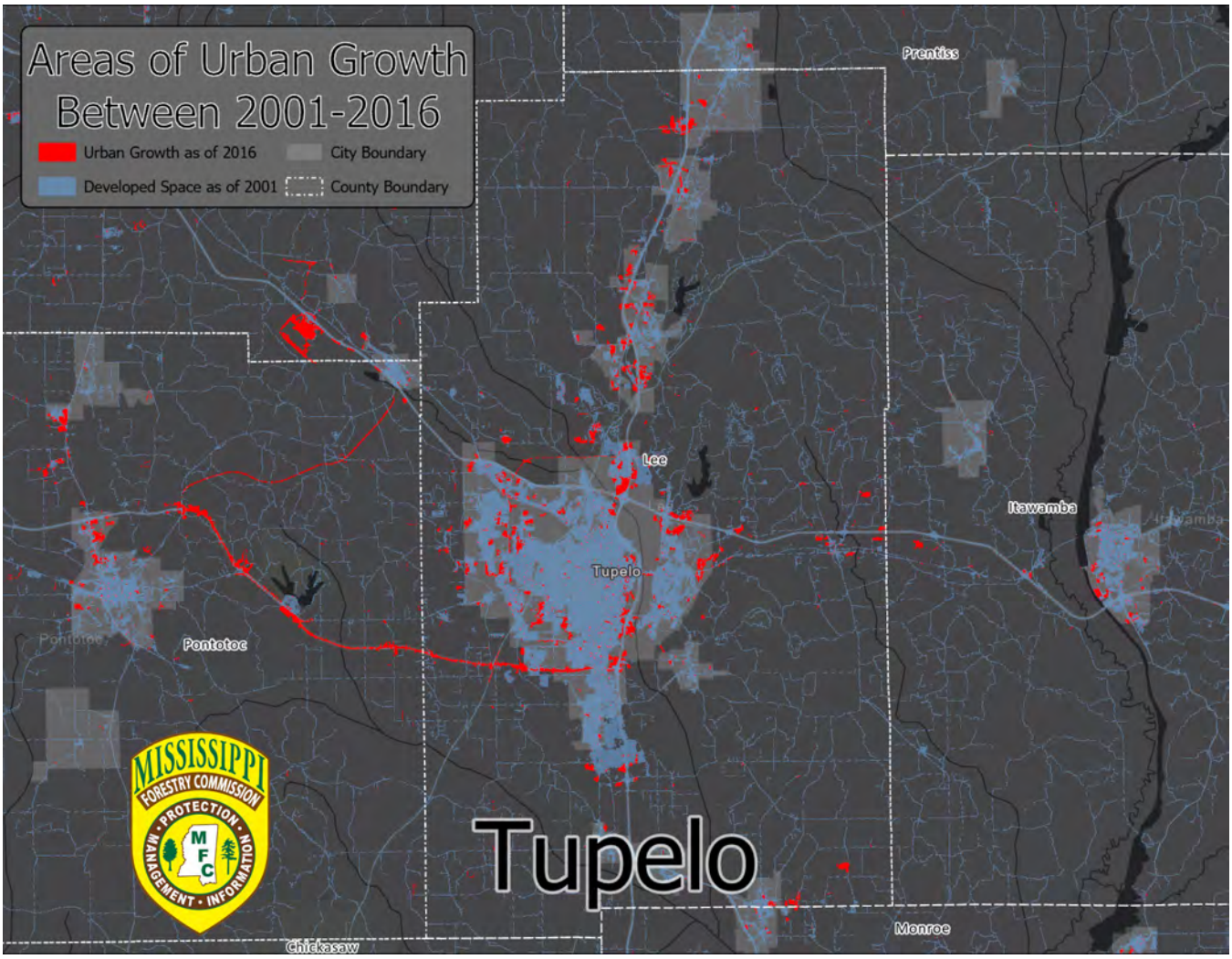
The small change in forest land in Mississippi can be attributed to both agriculture and development, as forest landowners look for alternative uses for their land. Based on forest inventory data, 260,300 acres of forest land was converted to agricultural land use, while 266,600 acres of forest land were converted to urban or developed land use. In contrast, agricultural land does revert to forest land if economic conditions change. In Mississippi, 300,000 acres reverted from agriculture to forest, whereas only 124,000 acres of urban/ developed land reverted to forest.

Urbanization pressures (e.g., land value increases near population and recreation centers, increased regulations are not conducive to forest management, etc.) significantly influence forest landowners to sell property or convert their property to another land use. Urbanization will continue to expand, resulting in an increasingly fragmented forest land base. Urban expansion results in the permanent removal of natural forest cover for new residential, commercial,

industrial, and governmental developments. Once the forest cover is removed for urban development, it is rarely, if ever, re-established to forest cover. Subsequently, the benefits provided by forest cover are substantially reduced (i.e. quality of life, aesthetics, open space, water filtering and storage, other ecosystem goods/services) or completely lost.

The following maps depict areas of urban growth in Mississippi from 2001 - 2016 for the major metropolitan areas (Desoto/Tate, Tupelo, Jackson, Hattiesburg, Coastal Cities).




Areas of Urban Growth Between 2001-2016
Urban Growth as of 2016
City Boundary
Developed Space as of 2001
County Boundary
Prentiss
Lee
Itawamba
Tupelo
Pontotoc
Chickasaw
Monroe
MISSISSIPPI FORESTRY COMMISSION
PROTECTION • MANAGEMENT • INFORMATION
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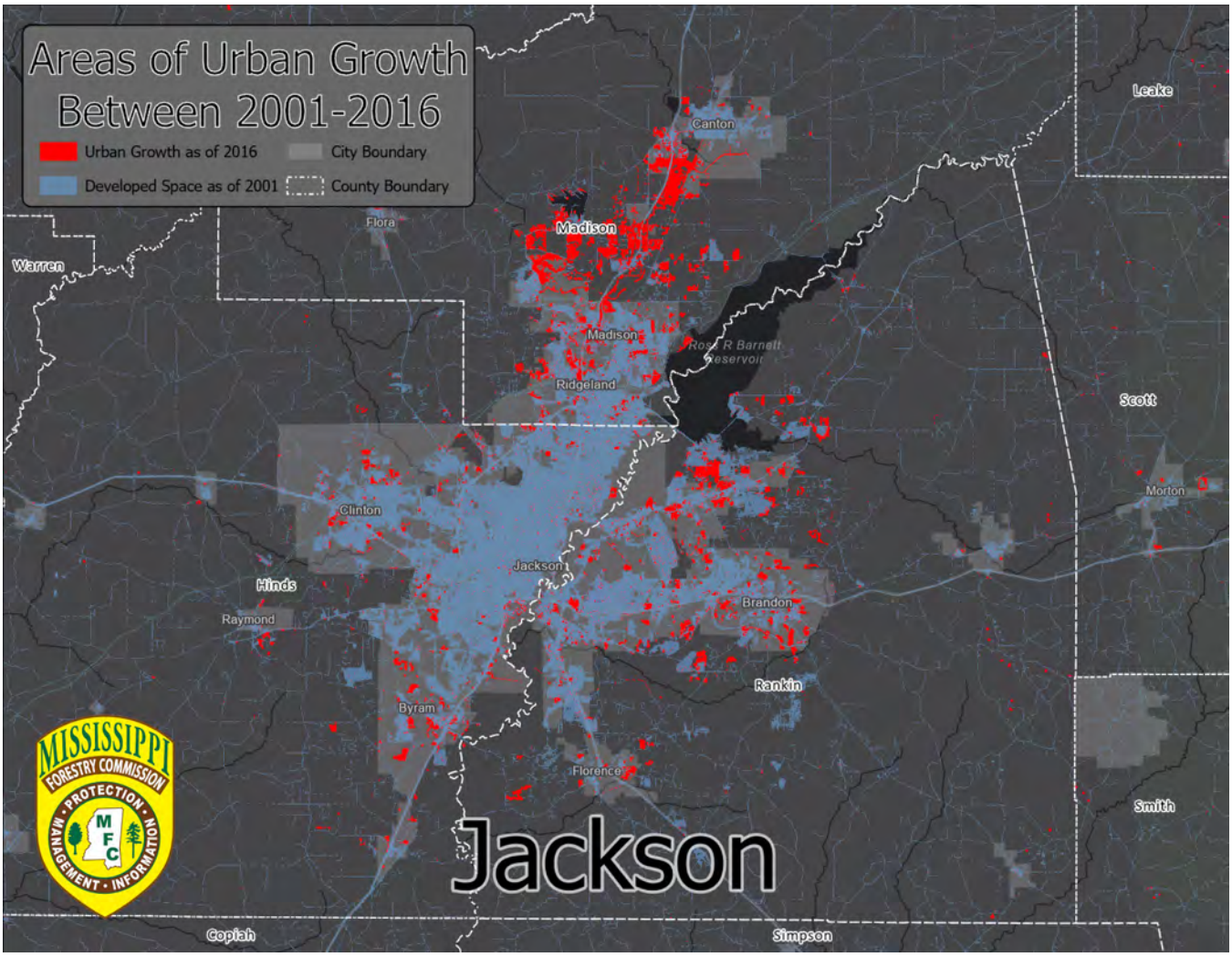
Tupelo


Areas of Urban Growth Between 2001-2016
Urban Growth as of 2016
City Boundary
Developed Space as of 2001
County Boundary
Canton
Leake
Flora
Madison
Warren
Madison
Ridgeland
Scott
Morton
Clinton
Jackson
Hinds
Brandon
Raymond
Rankin
Byram
Florence
Smith
Jackson
Copiah
Simpson
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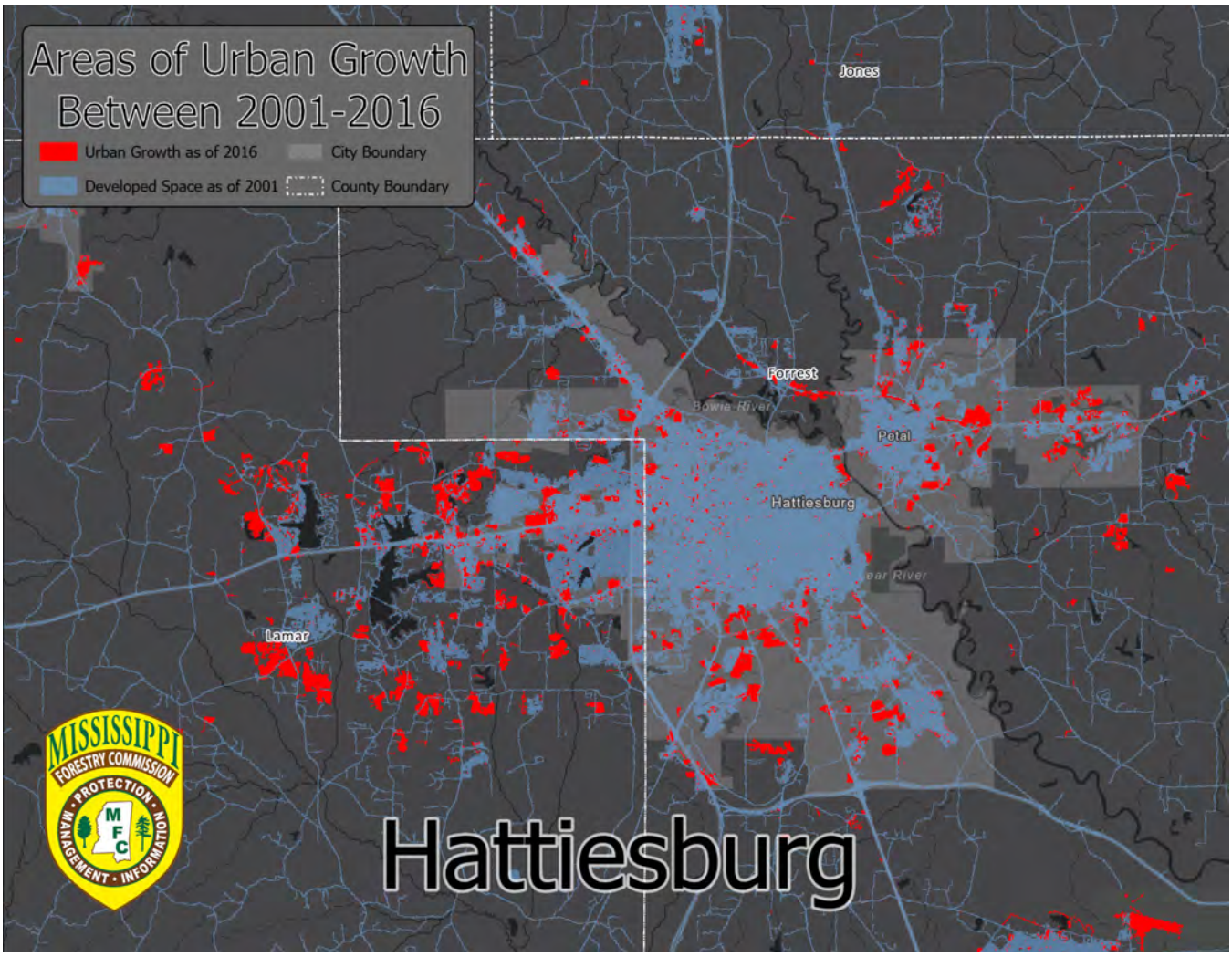
Areas of Urban Growth Between 2001-2016
Urban Growth as of 2016
City Boundary
Developed Space as of 2001
County Boundary
Jones
Forrest
Bowie River
Petal
Hattiesburg
Lamar
MISSISSIPPI FORESTRY COMMISSION
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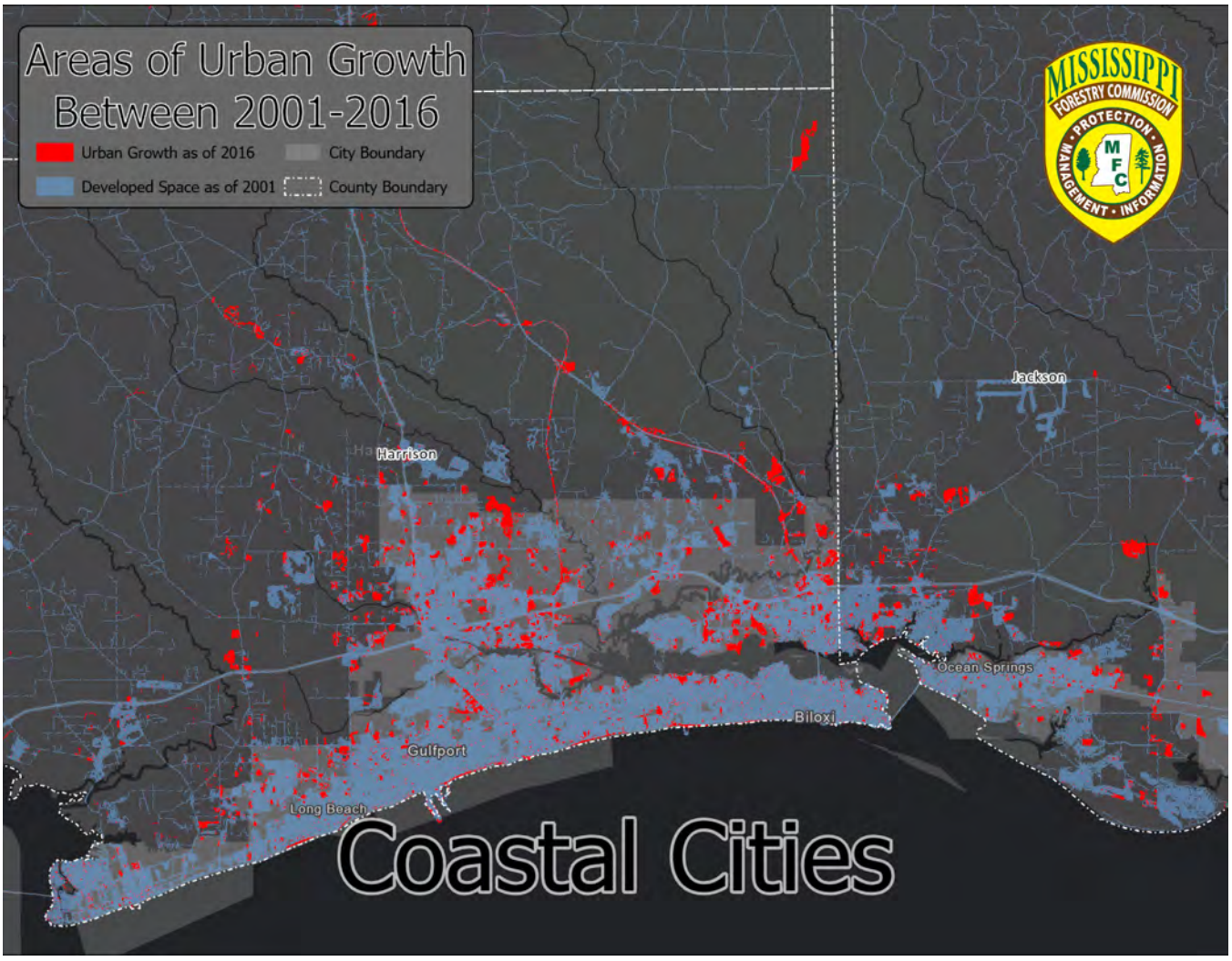
MFC
Hattiesburg


Areas of Urban Growth Between 2001-2016
Urban Growth as of 2016
City Boundary
Developed Space as of 2001
County Boundary
MISSISSIPPI FORESTRY COMMISSION
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M F C
Jackson
Harrison
Ocean Springs
Biloxi
Gulfport
Long Beach
Coastal Cities

When landowners with an urban influence and background acquire forest land in rural areas, their management objectives sometimes differ from traditional forest management objectives. These landowners can have significant influence on legislative and local land use regulations and ordinances, which can adversely impact traditional forest management practices (e.g., prescribed burning, timber harvesting, use of chemicals for forest management, etc.). These differences in perspectives and management objectives are most notable in the area of urban expansion called the wildland/urban interface or WUI.

Forest landowners sell all or part of their property for many reasons: to offset increase in property tax, because they cannot afford inherited property, to pay off debts or other financial obligations, and/or when the value of the property has greatly increased due to encroaching real estate and commercial development. Changes in land use regulations that do not support active forest management objectives can also influence some landowners to sell their property.

When individuals are searching for forested property to purchase, they are often motivated by factors such as investment opportunity (land value speculation, timber revenue, etc.), outdoor recreation (traditional and non-traditional), to own/build a “place in the woods,” privacy and to build an estate to pass along to children or other heirs.

Opportunities

Any approach to addressing land ownership policies in the future requires an understanding of the different categories of forest landowners and consideration of their respective land management objectives. Four categories of landowners are:

1. Active landowners with economic and traditional forest management objectives.
2. Active landowners with ecosystem management objectives.
3. Passive landowners with no forest management objectives.
4. Underserved landowners with no access to or assistance from natural resource government agencies.

Education and Outreach - Natural resource agencies, organizations, and individuals working with private landowners will need to develop new approaches to providing advice and assistance to the myriad of forest landowners with different and sometimes opposing land management objectives. Tools that are available or are evolving include changing land use and resource policies being developed at the local, state and national levels, new information and education programs targeted to diverse types of forest landowners and new and revised landowner incentive programs offered by the state and federal agencies.

Strengthen Forest Economy - The reduction in forest markets due to the economic recession makes sustainability difficult to attain. Maintaining strong forest markets are essential for long term sustainability of these forest lands. Strong forest markets provide a natural incentive to forest landowners to actively manage their forestlands and are essential to landowners who depend on timber sale revenue as a means to reinvest into forest stewardship for future

generations. Without healthy forest markets the risk of conversion to non-forest uses such as agriculture or urban development is higher.

Priority Landscapes for Landowner Trends

- Increasing urbanization and (Wildland Urban Interface) WUI areas
    - DeSoto/Tate Counties
    - Tupelo
    - Jackson Metro
    - Meridian
    - Hattiesburg/Laurel
    - Gulf Coast
- Mississippi Forest Legacy Areas
- Priority forest communities ranked in the *Mississippi State Wildlife Action Plan (2015)*
- Rural forested areas of the state – by watershed
- Statewide, all property owners

Mississippi Key Issue 2: Landowner Trends								
Long-term Strategy	**Priority Areas**	**Secondary Issues addressed**	**Program Areas that Contribute**	**Key Stakeholders**	**Resources available/ Required to Implement**	**Key Partners and Potential Partners**	**Measure of Success**	**Supports National Objective**
2.1 Encourage public policy designed to maintain, improve and protect favorable tax policies in regard to forestry and land ownership (including capital gains, inheritance tax, severance tax, etc)	Statewide	Forest Sustainability and Markets	N/A	Active landowner with economic and traditional forest management objectives, Loggers, Private natural resource professionals	Legislative support; Constituent groups are engaged (e.g., MFA Govt. Affairs Committee, MS Farm Bureau, CFA members, etc.)	MFC, MSUES, ASUES, MFA, MDWFP, MDA, MDEQ, MSWCC, MAC, MDE, NRCS, RC&D, USFS	New policy developed Landowner awareness campaign developed No negative setbacks to good policy measures are experienced	1.2, 3.1, 3.4, 3.5
2.2 Encourage policy/law that facilitates the improvement of roads and bridges (remove impacts to traditional logging)	Rural forested areas of the state where bridge/road improvements needed; priorities to be determined	Forest Sustainability and Markets	N/A	Active landowner with economic and traditional forest management objectives, Loggers - specifically MS Loggers Association, Consultant foresters, County Boards of Supervisors	Legislative support; MFA Govt. Affairs Committee, MS Farm Bureau, CFA members; MDOT; State and federal funding acquired for making improvements	MFC, MSUES, ASUES, MFA, MDWFP, MDA, MDEQ, MSWCC, MAC, MDE, NRCS, RC&D, USFS, County Boards of Supervisors , MLA	New policy developed Improvements to roads and bridges are made Legislation enacted to improve roads and bridges	1.2, 2.2, 3.4
2.3 Encourage policy/law at the state level that standardizes county road use, removing restrictive barriers to logging	Mississippi Difficult Market areas and rural forested areas of the state.	Forest Sustainability and Markets	N/A	Active landowner with economic and traditional forest management objectives, Loggers, MLA, Consultant foresters, County Boards of Supervisors	Legislative support; MFA Govt. Affairs Committee, Forest Industry, County Boards of Supervisors, CFA members; MDOT	MFC, MSUES, ASUES, MFA, MDWFP, MDA, MDEQ, MSWCC, MAC, MDE, NRCS, RC&D, USFS, County Boards of Supervisors, MLA	A standardized statewide policy/law is established that addresses road use at the county level	1.2, 3.4
2.4 Protect the “right to practice forestry” law and private property rights	Statewide	Forest Sustainability and Markets, Forest Health, Wildland Fire, Climate Change and Wildlife	N/A	Active landowner with economic and traditional forest management objectives	Legislative support; Constituent groups are engaged (e.g., MFA Govt. Affairs Committee, MS Farm Bureau, CFA members, etc.)	MFC, MSUES, ASUES, MFA, MDWFP, MDA, MDEQ, MSWCC, MAC, MDE, NRCS, RC&D, USFS	Effective monitoring of potential threats to abolish or change current law	1.2, 3.4, 3.5, 3.6, 3.7
2.5 Encourage law/policy that creates new programs or modifies existing programs to enable assistance to ecosystem goods/services and/or non-traditional management objectives	Statewide	Forest Sustainability and Markets, Forest Health, Stewardship, Wildland Fire, Wildlife, Climate Change	Forest Stewardship, Water Quality, MSU, Natural Resource Enterprises, NGO programs (TNC, Wildlife Mississippi), FSA and NRCS programs	Active landowner with ecosystem goods/services and/or non-traditional management objectives	Legislative support; Constituent groups; Strong lobbying efforts; Support from NGOs with aligned focus on management objectives	MFC, MSUES, ASUES, MFA, MDWFP, MDA, MDEQ, MSWCC, MAC, MDE, NRCS, RC&D, USFS	New law or policy is established; significant grassroots support is evident	1.1, 1.2, 2.1, 2.2, 3.1, 3.2, 3.4, 3.5, 3.7
2.6 Establish statewide awareness of forest fragmentation and its threat to Mississippi	Statewide	Forest Sustainability and Markets, Forest Health, Stewardship, Wildland Fire Wildlife	Forest Stewardship, Water Quality, USFS programs, NRCS programs	Underserved Forest Landowners, Private forest industry, Vendors	LSR Grants, Stewardship grant funding, FIA data	MFC, MSUES, ASUES, USFS, landowners group representing underserved forest landowners, MFA	Publication and educational materials and programs to assist private forest landowners including underserved forest landowners	1.1, 1.2, 2.2, 3.1, 3.4, 3.5, 3.6, 3.7

2.7 Improve forestland through professional forest management programs	Statewide	Forest Sustainability and Markets, Forest Health, Stewardship, Wildland Fire Wildlife	FRDP, NRCS Programs, Forest Stewardship, FSA programs, MS Reforestation Tax Credit	Private forest landowners, Underserved forest landowners, Private natural resource professionals	FRDP, EQIP, EFCRP, ECP, State and Private USFS grants, Other non-USFS Programs	MFC, MDWFP, Private natural resource professionals, USFS, NRCS, FSA	Increase acres under active forest management by 5 percent	1.1, 1.2, 2.2, 3.1, 3.4, 3.5, 3.6, 3.7

Key Issue 3: Forest Health

Forest health refers to the capacity of a forest community across the landscape for renewal, for recovery from a wide range of disturbances and for retention of its ecological resilience, while meeting current and future needs of people for desired levels of values, uses, products, and services.

Forest Resource

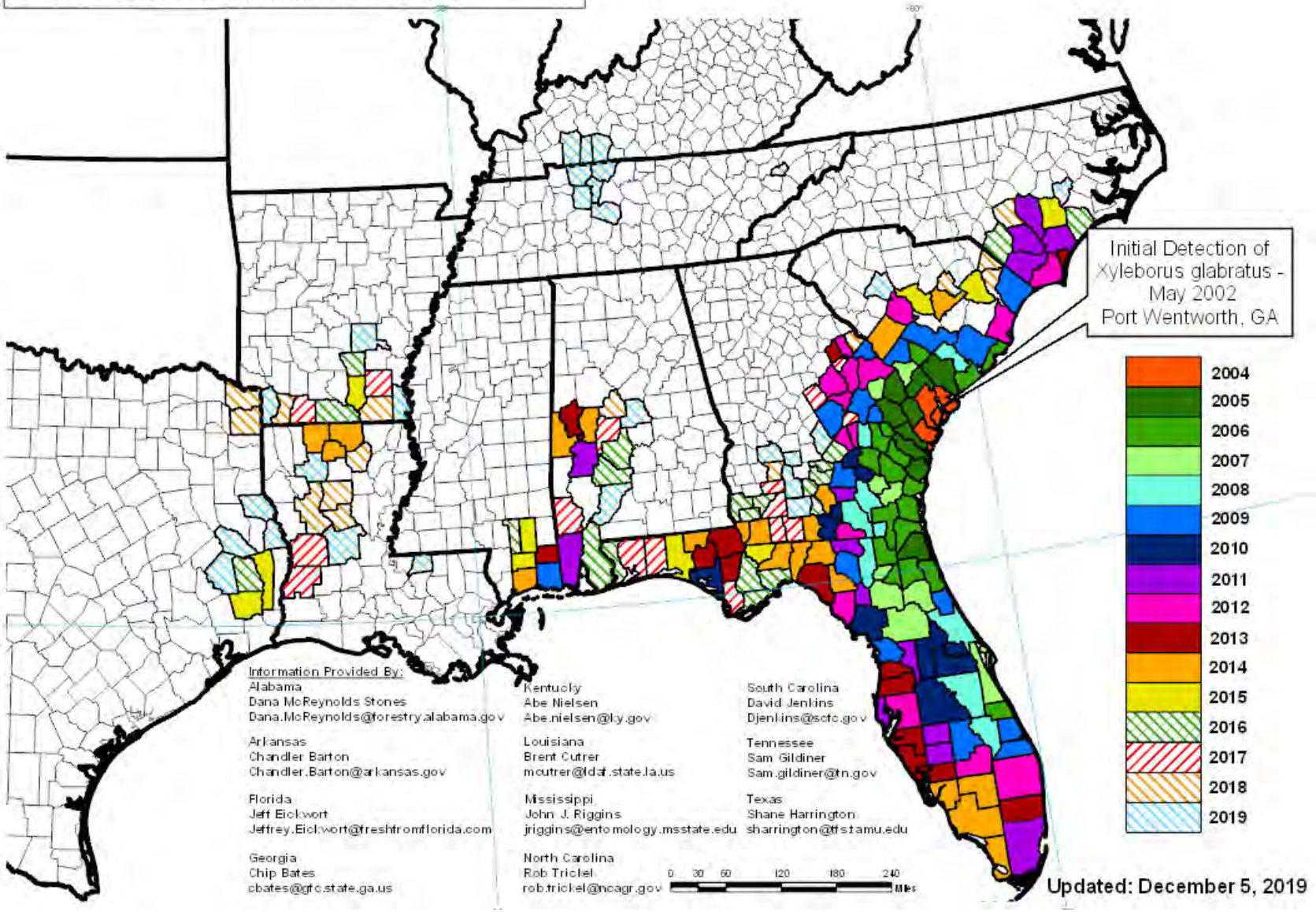
Across Mississippi, native and non-native invasive flora and fauna have caused adverse impacts on the value, productivity, functionality and ecosystem services of forest communities on both public and private lands. Maintaining forest health is especially challenging on private, nonindustrial lands which constitute the majority of forest lands in the state. According to the most recent state forest inventory, 53 percent of private forests are in tracts less than 20 acres, limiting landowners ability to actively manage properties, to successfully control invasive flora and fauna, to manage for diversity or to effectively manage their forest land at all.

Native species such as the southern pine beetle (SPB), which exhibits periodic outbreaks causing rapid and widespread tree mortality, pose a greater threat than ever due to the increased abundance, distribution and susceptibility of its preferred hosts, loblolly and shortleaf pine. Non-native invasives such as redbay ambrosia beetle and associated laurel wilt disease have the potential to virtually wipe out redbay and sassafras in Mississippi and other nearby states and may significantly impact other native plants in the *Lauraceae* family. Threats by other non-native species already established and spreading within the U.S. include the emerald ash borer, Asian longhorned beetle, Eurasian woodwasp, sudden oak death and thousand cankers disease (TCD) of black walnut. These threats pose great challenges in keeping these and other potential new pests out of state borders, and in mitigating their impacts if and when they should arrive.

Non-native invasive plant species such as cogongrass, kudzu, Chinese tallow tree and others have exhibited escalating impacts. Infestations have grown and spread virtually unabated throughout the state for years and even decades, until some recent efforts in the last decade. Other issues of concern regarding forest health involve lack of forest structure (the complexity of the vertical and horizontal forest), and age and species diversity in some areas.

Distribution of Counties with Laurel Wilt Disease* by year of Initial Detection

* Laurel Wilt Disease is a destructive disease of redbay(Persea borbonia), and other species within the laurel family(Lauraceae) caused by a vascular wilt fungus (Raffaelea lauricola) that is vectored by the redbay ambrosia beetle (Xyleborus glabratus). The pathogen has been confirmed through laboratory analysis of host samples collected in the counties highlighted.



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Healthy, diverse forests provide multiple public benefits including timber, recreation, aesthetics, soil, air and water quality protection, and wildlife habitat. When the health of the forest is threatened or compromised, so are organisms that depend on it, including humans. Invasive plants displace native plant species, compete with native vegetation, alter the physical and chemical properties of the soil and can result in decreased tree regeneration by shading the forest floor which can significantly impact the economic value of timber as well as the ecological functions of the forests to support wildlife species, filter pollutants from water, and prevent soil erosion. Diseases and insect damage can also diminish or destroy natural forest communities, and can be devastating to timber values, recreation, aesthetic values and property values. Diversity and structure of forest stands provides more abundant and diverse habitats and food sources for wildlife species.

Key Conditions or Attributes

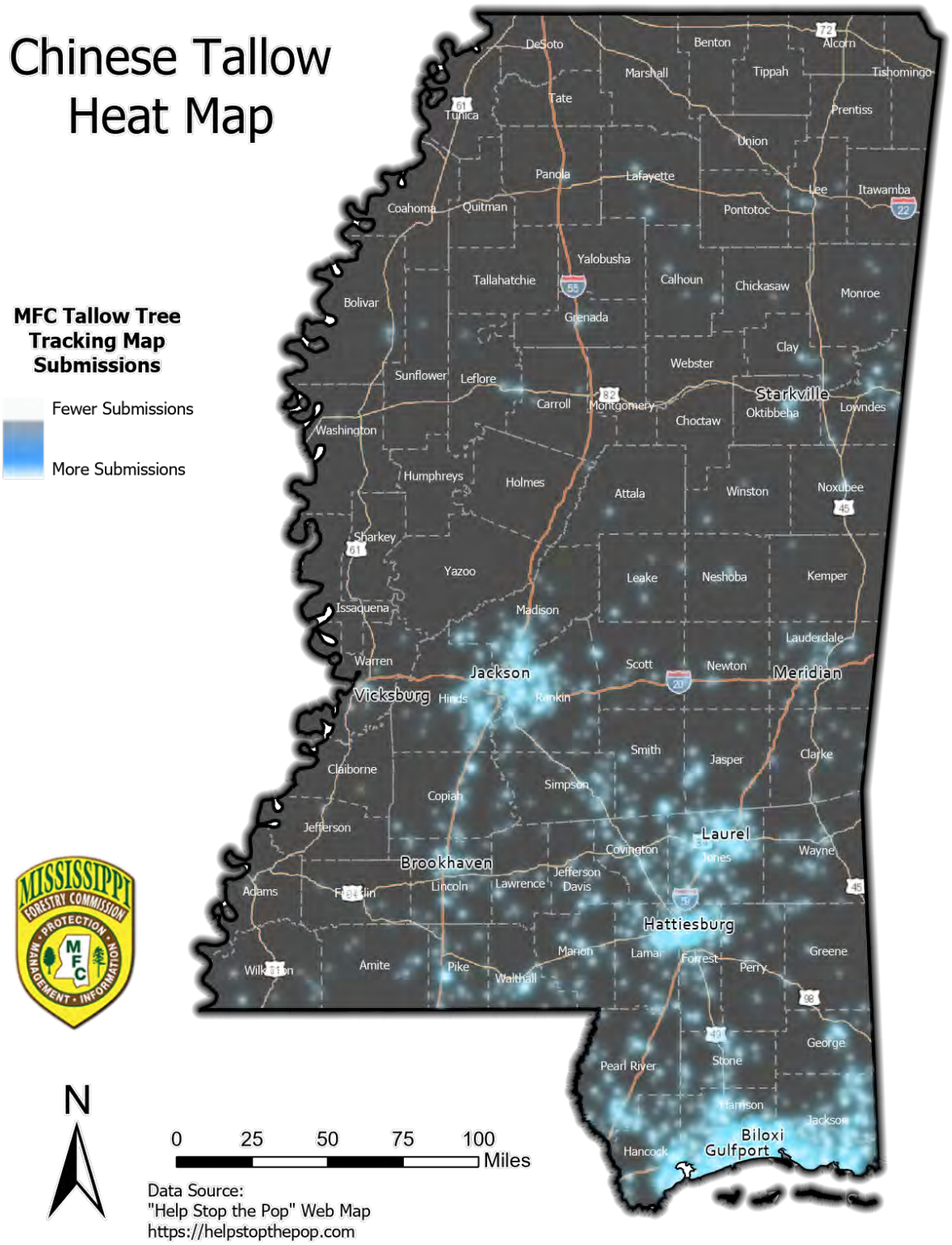
Native tree species, diversity, varied age classes and structural stages are key conditions for healthy forests. Mississippi's forest communities include all of the organisms inhabiting a common environment and interacting with each other (plants, birds, mammals, reptiles, amphibians, invertebrates, microorganisms and other wildlife). Natural forest communities are adapted to local conditions and those that have not been impacted by non-native, invasive species, disease or insects or removal of trees are more stable and functional. Maintaining native forest communities by limiting the growth of invasive species and spread of insects and disease and ensuring the adequate structure, diversity and ages of forest stands is critical to forest health. Protecting forest health requires active planning and forest management on public and private forest lands in rural and urban areas.

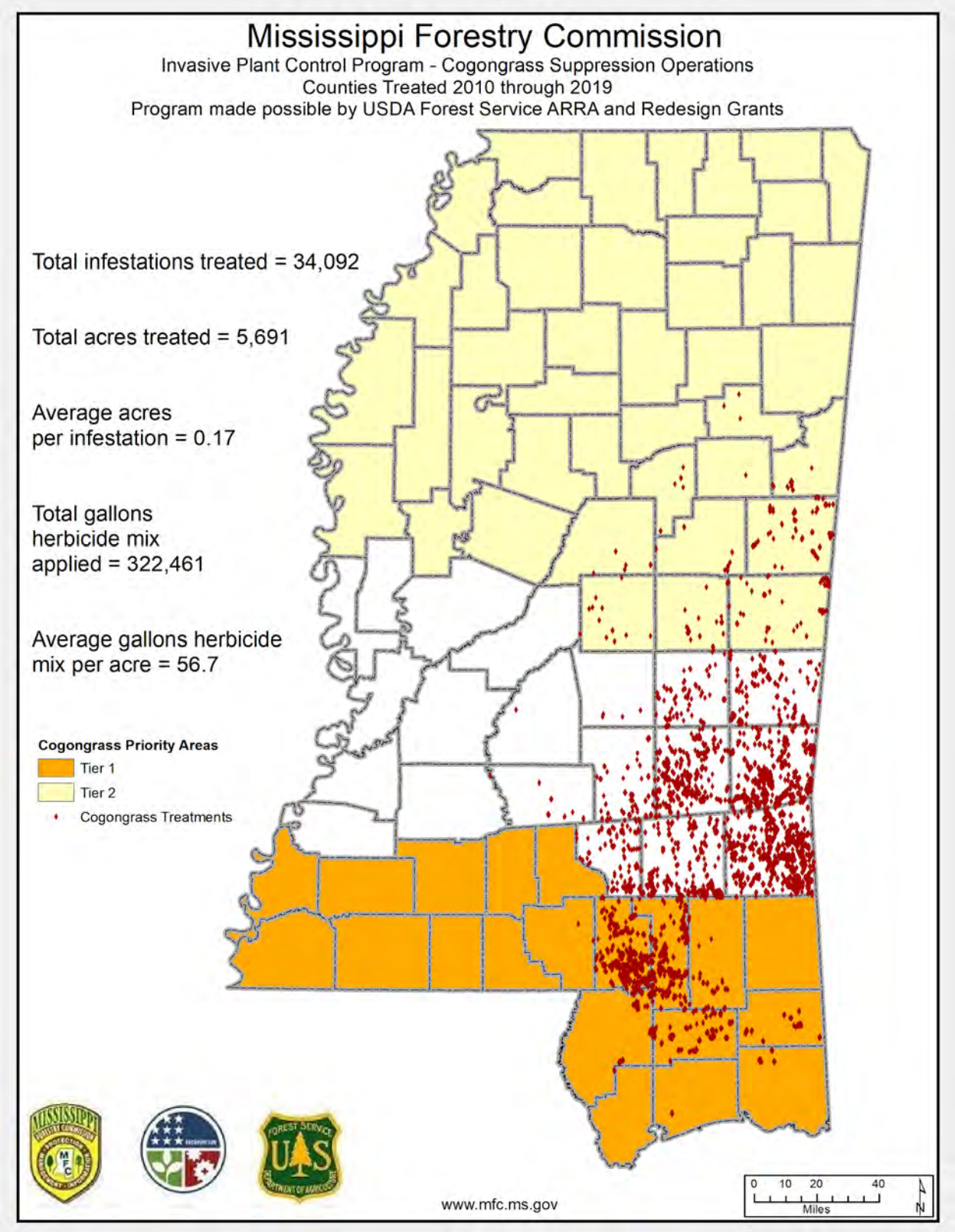
Threats and Contributing Factors

Invasive Plants - In recent years, public attention has focused on invasive plants in Mississippi due to increased efforts to control the spread of cogongrass. Cogongrass, kudzu, Chinese tallow tree, Chinese privet and Japanese climbing fern are the five most damaging plants to the overall health of Mississippi forests. The spread of these invasive plant species is increasing in Mississippi. Agriculture equipment, forestry logging equipment, fire suppression equipment, highway mowing equipment and construction equipment (primarily dirt moving) have all contributed to the increased distribution of these plants. Most forest landowners lack awareness about these problematic plants and how to identify, avoid or control them. The impact to farmers and landowners of Mississippi is immense.

Species such as cogongrass lower production, limit the options of management for the forest landowner for regeneration, create fire hazards and outcompete the native vegetation. Cogongrass also produces a toxin that prevents any other grass species from growing, thus eliminating native species from certain sites and altering ecosystems. Due to the high cost of treatment and the long-term commitment required to eradicate kudzu, many landowners do not attempt to eliminate this pest from their property. The use of Chinese tallow trees in the urban landscape has accelerated the spread of this species across the state.

Chinese Tallow Heat Map





Insects - Invasive, non-native pests first gained attention in Mississippi in 2009 with the discovery of the redbay ambrosia beetle and the associated disease, laurel wilt in Jackson

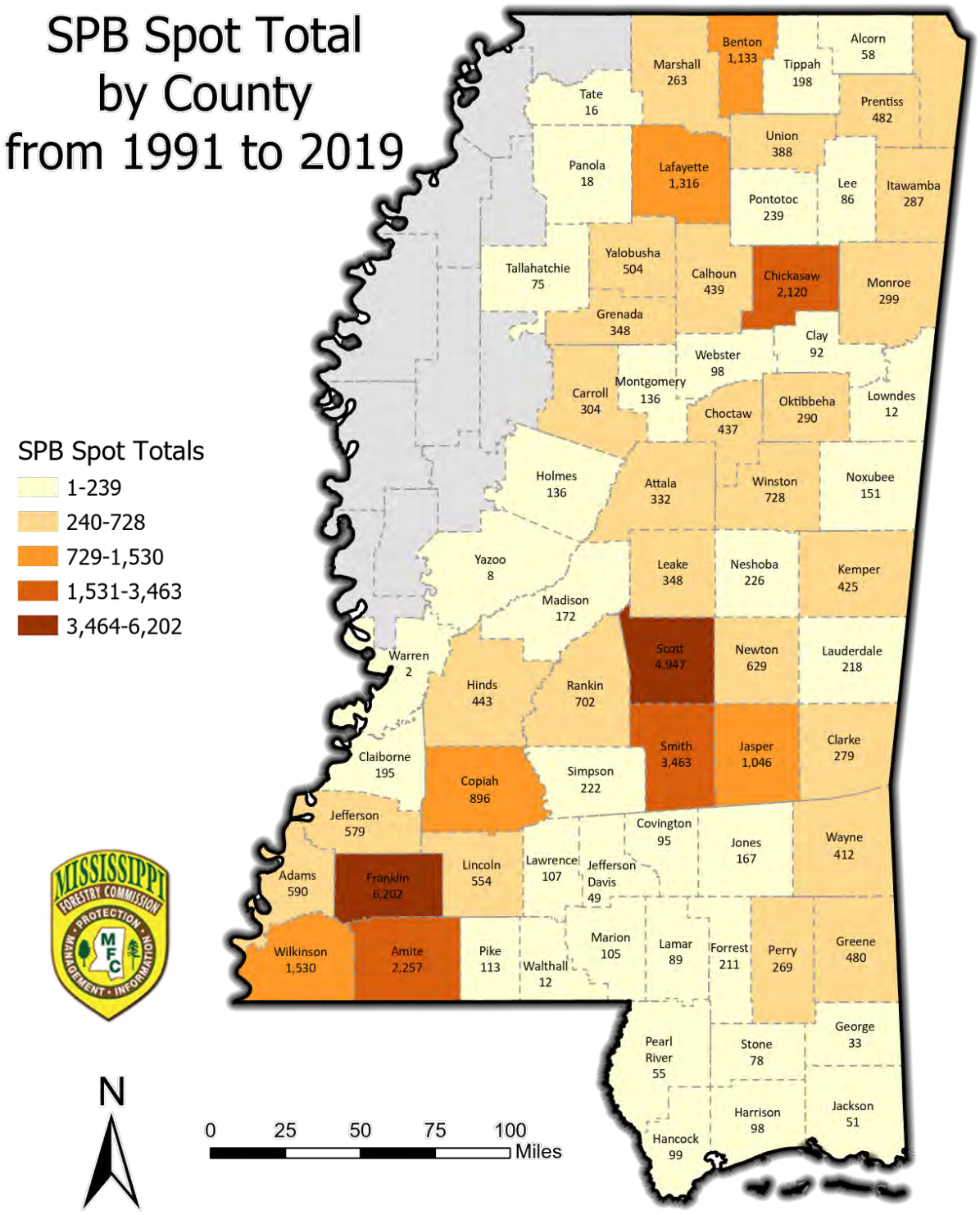
County, Mississippi, and the emerald ash borer (EAB) in Missouri and Kentucky. Laurel Wilt is a relatively new threat to the state, with spots being located in Jackson, Harrison, Stone, George, Forrest, Perry and Jones counties. No new avenues of response have been discovered for this pest, however it has been identified in both sassafras as well as redbay in Mississippi, and has the potential to render both species extinct from the state's landscape. As of 2019 EAB has not been observed in Mississippi, but has been documented in all surrounding states. Movement of firewood from one infested location to another location has been the main avenue for this insect to move across county and state lines.

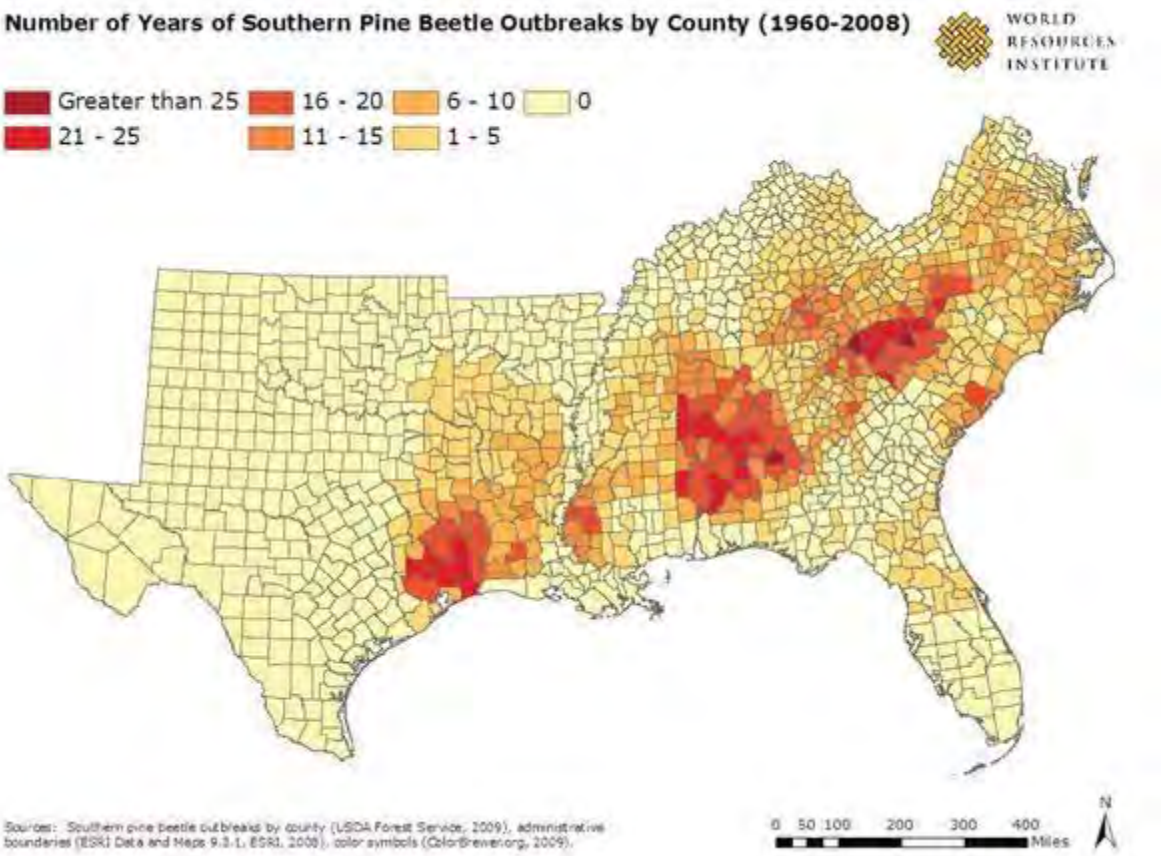
The Southern Pine Beetle (SPB) has been the most destructive insect killer of pines in the Southeastern U.S. This native bark beetle attacks and kills southern pines in an area roughly approximating the geographical range of loblolly pine. The SPB population periodically increases to epidemic proportions. When this occurs, the area suffers severe timber losses. Since Mississippi started keeping records in 1971 on beetle outbreaks, there were several years where the losses approached $15 million dollars and higher. Most recent outbreaks in 2012-2019 were located on and in close proximity to the Homochitto, Bienville and Tombigbee National Forests.

Many areas in Mississippi are at a moderate to high hazard for SPB attacks. National Forests in Mississippi are particularly susceptible to SPB due to the large acreages of preferred host type (i.e., loblolly pine) and limited capacity to implement a backlog of preventative thinning and other harvesting treatments to convert stands to desired future conditions and more appropriate forest types.

Mississippi was a "battleground" for the fight against the SPB until 1996. For many years afterward, there were no major outbreaks, and the 2009 flight surveys indicated no active beetle spots anywhere in the state. Establishing pine plantations on idle pasturelands and converting upland hardwood areas to pine plantations was a continuing trend on private lands. These cover type conversion trends did not help reduce the risk of Mississippi timberlands to the SPB. Numbers skyrocketed on Mississippi national forests during 2012-2019 and infestations spread to nearby privately owned forests. While SPB spots were found in other areas of the state during the spring and fall forest health flights, the majority of the spots on state and private lands were located adjacent to the national forests.

SPB Spot Total by County from 1991 to 2019





Forest Structure and Diversity - Mississippi forests are composed of a variety of age classes and successional stages. During the 2006 state inventory, 137 tree species were measured. Most forest land is occupied by southern pine forest consisting of young stands (1 to 20 years old), while a large percentage of bottomland hardwood forest and upland pine/mixed hardwood forest are in stands older than 20 years. While high diversity and structure provide benefits to wildlife and often enhance recreational experiences and values, mature, even-aged, younger forest stands are sometimes more desirable when timber management is a priority. For instance, most mills in the state cannot cut timber over 24" in diameter at breast height (DBH), thus making older trees less preferable for timber production. The use of more fabricated lumber created from fiber technology or chips that can be produced from smaller trees has resulted in fewer markets for landowners with stands of large timber size classes. These recent market trends create challenges as well as opportunities for private landowners and can impact forest health. Mill closings affect timber prices offered to landowners, which in turn may discourage any active forest management on some private lands.

Economic trends affect diversity in some forest stands. For example, during 2008, the harvest volume of pine sawlogs in Mississippi decreased 11.1 percent, pine pulpwood volume increased 0.2 percent, hardwood sawlog volume decreased 4.9 percent and hardwood pulpwood volume decreased by 1 percent. The primary reason for these decreases was the troubled residential construction sector and the record-setting fuel prices during 2008. If it is not economically feasible to thin a pine stand or harvest trees on a planned schedule, some landowners abandon or delay harvest that promotes healthy forest stands.

Some consider the USDA's Conservation Reserve Program (CRP) administered by the FSA peak signup years during the mid-1980s and 1990s as a "scourge of monoculture" that resulted in establishment of many pine plantations on former agricultural lands in Mississippi. While plantation pines lack structure and diversity compared to natural forest stands, they do provide certain benefits such as carbon sequestration and habitat for some wildlife species while also providing revenue for landowners and fiber for local mills.

It is critical to recognize that the landowner objectives play a large part in the diversity of his or her forest land. For those managing pine plantations for timber production, biodiversity will be much lower than if the owner's objective is to enhance mast production for game species and hunting. Other factors such as the long-term return on investments for a hardwood stand versus a pine stand also influence a landowner's management and reforestation decisions.

Site-specific species play an important role in diversity. Some soils and areas of the state support high species diversity (e.g. upland hardwoods in north Mississippi), while other areas may naturally support less diversity (e.g. some wetlands dominated by Tupelo gum, baldcypress and black willow)

Opportunities

Invasive Plants - The fight to manage and control the spread invasive plants should continue to be a joint effort among several partner agencies to implement education/awareness programs and on-the ground control and eradication measures. Continued funding of existing programs through the USFS is critical while additional, complementary funding sources should be sought.

Insects - The Mississippi Department of Agriculture and Commerce (MDAC) is actively trapping across the state for pests that may enter the state and notifies appropriate agencies of their findings. Also, inspections of nursery stock by MDAC are vital to detections that may be discovered during their visits. These agencies are well-positioned to collaborate on new landowner education/awareness efforts.

The lack of markets for pulpwood in north Mississippi continues to be an obstacle for landowners hoping to maintain a healthy forest. Landowners postpone thinning hoping future market conditions will be more favorable. Furthermore, many landowners who are willing to harvest timber even during a down market are unable to get loggers, yet another result of poor market conditions. These overcrowded stands are stressed and make the perfect environment for SPB or other forest health problems. A USFS-funded program in Mississippi currently

incentivizes landowners to thin high hazard plantations threatened by SPB. This incentive helps offset any low pulpwood prices that may discourage a landowner from not thinning their plantations at the appropriate time and should receive support to continue.

Increased education efforts emphasizing good forest stewardship and proper timber management should be a natural fit for the existing SPB programs. These education efforts should be focused on private landowners and local school boards. The MFC will continue to work with the USFS in conducting annual detection flights and spring trapping surveys to monitor for any potential buildup of SPB populations.

Forest Structure and Diversity - Education efforts focused on private landowners about proper timber management and stewardship must continue. Emphasis should be on helping the landowner meet their personal goals while emphasizing the importance of diversity.

Priority Landscapes for Forest Health

- Invasive plants - species specific distributions (with emphasis on eradication north of I-20 and suppression south of I-20)
- Pests - southeast MS, Jackson County and I-10 corridor
- High hazard areas based on Southern Pine Beetle Hazard Rating
- Longleaf pine historic distribution in east central and south MS

Mississippi Key Issue 3: Forest Health								
Long-term Strategy	**Priority Areas**	**Secondary Issues addressed**	**Program Areas that Contribute**	**Key Stakeholders**	**Resources available/ Required to Implement**	**Key Partners and Potential Partners**	**Measure of Success**	**Supports National Objective**
3.1. Protect and conserve natural forest communities/ecosystems from non-native, invasive plants through elimination/ suppression of invasives (plants)	North of Interstate 20 eliminate and South of Interstate suppress (species specific)	Wildland Fire, Wildlife, Forest Sustainability and Markets	USFS Cooperative Forestry Assistance Program	Landowners, Communities, Wood Using Industry, State Governments	To continue the fight against nonnative invasive plants, there will need to be special emphasis put forth from Congress. Funding will need to flow through either existing programs from the USFS or new ones with APHIS, FSA or NRCS.	USFS, USDA, RC&D, MDOT, MDWFP, NWTF, USFWS, AFC, GFC, LDAF, MFA/CFAs, MLA, MSU, MSUES, MSCWMA, MDAC-BPI	Acres treated per county and statewide, and costs per unit treatment ($$/acre) will provide annual performance measures to monitor accomplishments. Over time, a reduction in acres infested and percent change will also reflect accomplishments and provide a useful performance measure.	1.1, 1.2, 2.1, 2.2, 3.3, 3.5
3.2 Collaboratively develop statewide action plans with partners and stakeholders for non-native, invasive pests already established and spreading elsewhere in the US, and which pose a threat to Mississippi's forest and shade tree resources (pests)	Southeast Mississippi, with special emphasis on Jackson County and the Interstate 10 corridor	Wildland Fire, Wildlife, Forest Sustainability and Markets, Stewardship	USFS Cooperative Forestry Assistance Program, APHIS, MDA-BPI.	All landowners, Tree Farmers, Forest Stewards, Loggers, Vendors	Funding is provided through the Cooperative Forestry Assistance program. Partnerships through Cooperative Weed Management Area and MS Farm Bureau. Need to continue to identify other funding sources. Federal appropriations, additional partnerships.	USFS, USDA, APHIS, RC&D, MDOT, MDWFP, NWTF, USFWS, MFA/CFAs, MLA, MSU, MSU CES, MUFC, GFC, AFC, MDA-BPI	Annually report the number of educational outreach programs, printed brochures distributed, advertisements in papers, radio and TV spots/programs. performance will also be measured by the area (e.g., acres, miles, etc) surveyed and impacted as detected from aerial, and ground observations, as well as trapping or other survey methods. Spots, trees or acres treated, the unit costs associated with such, and the success or failure of treatments will also reflect accomplishments and performance.	1.1, 1.2, 2.2, 3.2, 3.4, 3.5, 3.6, 3.7
3.3 Promote thinning and other forest management practices that encourage sustainable and healthy forest conditions so that high hazard stands are less than 5% of the total susceptible host type acreage in the state; Encourage removal of off-site pine whenever possible and restoration of longleaf pines on sites where appropriate, such that longleaf pine is restored to at least 25% of its historical range in the state. (SPB)	Priority areas based on high hazard areas based on Southern Pine Beetle Hazard Rating	Wildland Fire, Wildlife, Forest Sustainability and Markets, Stewardship	Southern Pine Beetle Prevention Program; Cooperative Forestry Assistance Program, Forest Health Monitoring Program through USFS; ARRA federal stimulus funding. Regional longleaf restoration funding will need to be obtained to develop a program for longleaf restoration in MS.	All landowners, Tree Farmers, Forest Stewards, Loggers, Vendors	Currently, annual funding for the SPB prevention program is available through the Cooperative Forestry Assistance program.	USFS, USDA, RC&D, MDOT, MDWFP, NWTF, USFWS, local CFA, MFA, MLA, MSU, MSUES	Number of annual beetle flights, acreage flown, spots detected, number ground checked, insects detected, number of SPB detected in traps, number of acres of pine plantations thinned, number of landowners assisted, acres assisted, and number of workshops hosted, number of acres converted back to native longleaf pine	1.1, 1.2, 2.2, 3.2, 3.3, 3.4, 3.5, 3.7
3.4 Educate landowners on the benefits of maintaining diverse, healthy, and vigorous forest resources using sound	Southwest MS emphasis; develop target	Stewardship, Forest Sustainability	Cooperative Forestry Assistance Program through USFS,	All landowners, Tree Farmers, Forest Stewards,	Funding through the USFS Forest Stewardship program	USFS, USDA, RC&D, MDOT, MDWFP,	Number of educational programs presented to different organizations; promotional items	1.2, 2.2, 3.4

forestry, wildlife, and water quality practices	areas for education outreach and align with species-specific target areas.	and Markets, Wildlife, Wildland Fire, Climate Change	Regional longleaf restoration through USFS	Loggers, Vendors, Wood using industry, Forest product markets both domestic and foreign,	will need to continue to implement this strategy.	NWTF, USFWS, local CFA, MFA, MLA, MSU, MSU CES, MDA, MFC	delivered; number of TV, newspaper and/or radio spots; number of landowners contacted; number of stewardship plans written statewide. Acres thinned or regenerated after a landowner contact by the MFC.Acres converted back to native longleaf pine	
3.5.Emphasize establishing and managing longleaf on soils that are appropriate for the species.	Historic range of Longleaf Pine	Stewardship, Forest Sustainability and Markets, Wildlife, Wildland Fire	Cooperative Forestry Assistance Program through USFS, Regional longleaf restoration through USFS; America's Longleaf Initiative	Pole and Piling industry, Tree Farmers, Forest Stewards, All landowners, Other wood using industry, forest product markets both domestic and foreign	Funding trough the USFS stewardship program will need to continue to implement this strategy.	USFS, USDA, RC&D, MDOT, MDWFP, NWTF, USFWS, local CFA, MFA, MLA, MSU, MDA, MSUES	Number of programs presented to different organizations; promotional items delivered; number of TV, newspaper and/or radio spots; number of landowners contacted; number of stewardship plans written statewide. Acres restored to native longleaf pines.	1.2, 2.2, 3.4

Key Issue 4: Stewardship

Stewardship education means informing and educating Mississippi's landowners, youth and the public about the proper stewardship of our forest resources.

Forest Resource

By promoting the proper management and responsible use and protection of the state's natural resources, the harmful effects of wildfires, insects, diseases, invasive species, climate changes and storms can be minimized while improving, enhancing and restoring the health and productivity of all forest communities in Mississippi, whether urban or rural, or public or private.

Public Benefits

Providing effective natural resource education is vital to raising the level of environmental awareness in both youth and adults. At a young age, learning the importance of the forest and related natural resources can lead to the pursuit of a career in natural resources. Also, a better understanding of the wise use and stewardship of natural resources by the public, policymakers and landowners results in better, more informed decisions regarding resource management and public policy issues affecting the economic and ecological values of all of Mississippi's forest resources.

Key Conditions or Attributes

All entities (agencies, organizations, professional societies, universities and colleges, public and private schools) involved in stewardship education in the state must work together to promote a unified message of the importance of and stewardship of Mississippi's natural resources: stable and fertile soil, productive and sustainable forests, clean air and water, abundant fish and wildlife, climate resilience and a public educated about sustainable, responsible use and appreciation and value of these natural resources.

Threats and Contributing Factors

Natural resource education is more important now than ever before. Like the rest of the Southeast U.S., Mississippi is quickly transitioning from a rural, agricultural-based society to a more urban, media-connected society with an ever-widening disconnect to the land and natural resources. Instead of the hands-on experiences gained by growing up on the farm, exploring forests and fields, hunting, fishing and other nature-based recreation activities, children's and young adults' experiences with nature are very limited and information and learning is achieved primarily from classroom, television, internet and other social media outlets. Public opinion is increasingly shaped by these virtual experiences as opposed to actual field experiences.

In the past, forest stewardship education efforts in the state have been broad and varied in scope and have focused on the small group setting for both youth and adults. These efforts have been delivered primarily by natural resource agencies and college personnel, and oftentimes programs have not been coordinated among various providers (agencies, organizations, educational institutions) by one entity.

Natural resource organizations and agencies, through their outreach programs, currently offer a variety of educational experiences through varied traditional methods to include forestry field days, workshops, short courses, conservation clubs in the classroom, summer camps, and many other talks and programs with conservation-minded audiences, in small group settings. Topics and programs are broad and include: landowner education on technical issues such as forestry practices, management plan development, estate planning, taxation, marketing, best management practices, and wildlife management to working with youth groups of different ages in conservation carnivals and clubs, 4-H, Future Farmers of America (FFA), Envirothons, and many other resource education programs. While these outreach efforts have been effective with small groups, the numbers of people reached is relatively small, compared to the state's population.

Most educational outreach personnel agree that one-on-one and classroom approaches are the most meaningful ways to educate. However, recent funding reductions and the possibility of future reductions for education programs within resource agencies and organizations threaten the delivery of these education methods and programs (which are already limited by lower funding and personnel). Further personnel reductions will adversely affect the effectiveness of the traditional methods and the development of any new methods for delivering key messages about forest stewardship.

Opportunities

Traditional programs and methods of delivery are needed; however, more web-based education and outreach programs should be developed and used to reach a wider audience. Access to information, technical guidance and educational programs via the internet is an efficient method to reach more people who cannot attend programs in person and will allow agencies and organizations to meet demands with fewer personnel.

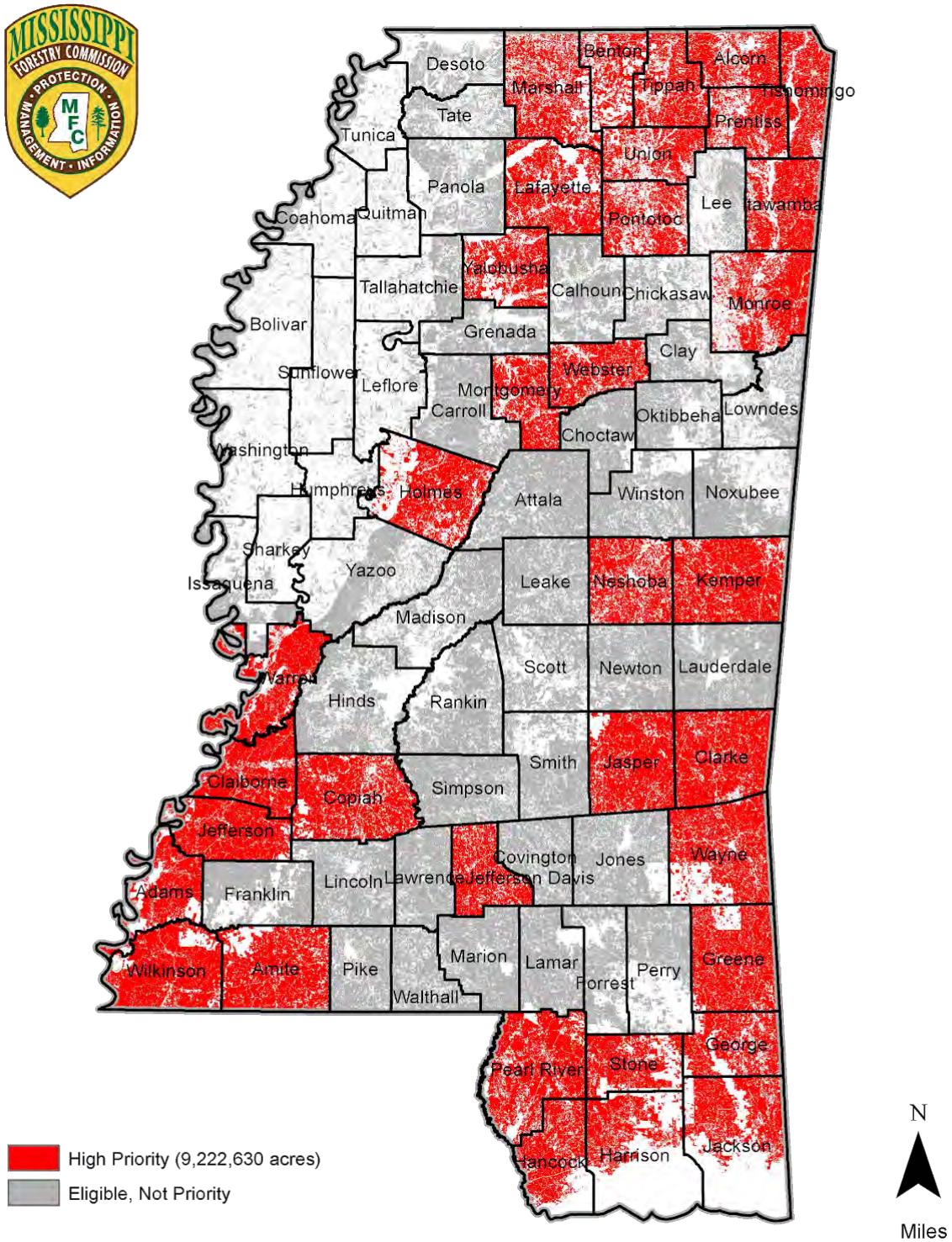
Funding reductions may have some beneficial effects. It may ultimately force more coordination of stewardship education efforts in the state among the traditional forest stewardship educators and programs. Decreased budgets will also necessitate the focus of limited resources and personnel on highest priority forest issues such as those described in this FAP: forest sustainability and resource markets, land ownership trends, forest health, wildland fire, climate change and wildlife conservation.

Increased emphasis by congress and federal agencies on providing services and resource education to underserved landowners will ultimately result in improved conditions for private forest lands.

Priority Landscapes for Forest Stewardship

Note: Stewardship education should be targeted to priority geographic areas defined for other key issues discussed in this document.

- Statewide for general stewardship education
- Priority areas of Mississippi identified in other key issue areas and State and Private Forestry programs
- Urban expansion areas within Mississippi's Forest Legacy Areas
- Underserved populations by county



Forest Stewardship Priority Areas

Mississippi Key Issue 4: Stewardship								
Long-term Strategy	**Priority Areas**	**Secondary Issues addressed**	**Program Areas that Contribute**	**Key Stakeholders**	**Resources available/ Required to Implement**	**Key Partners and Potential Partners**	**Measure of Success**	**Supports National Objective**
4.1 Coordinate with partners to continue the delivery of current Stewardship education efforts with emphasis on the delivery of issue specific information in priority areas for key issues.	Statewide	Forest Sustainability and Markets, Landowner Trends, Forest Health, Wildland Fire, Wildlife, Climate Change	MFC Outreach Program, Stewardship and Rural Forestry Assistance, Forest Legacy, Forest Health, Forest Protection, Fire Wise, Project Learning Tree, Underserved Outreach Programs, Urban and Community Forestry, Extension Education Programs, 4-H, FFA, Wood Magic, Teach Conservation Workshop, CFA, Tree Farm Program, FRDP, RTC, MDWFP Landowner Assistance Programs, Museum of Natural Science work shops, BMP workshops and other MDEQ grants, Conservation Districts Conservation Carnivals, Envirothons, Small Farmer's Conference, CRP, Wetland Reserve Program, Wildlife Habitat Improvement Program, EQIP	Private forest landowners, statewide	Current funding and personnel levels are needed to continue this strategy	MFC, MSU ES, ASU ES, MFA, MDWFP, MDA, MDEQ, MSSWCC, MAOC, MDE, NRCS, RC&D, USFS, MUFC	A combined accounting from all partners of individuals reached with current Stewardship education efforts with emphasis on individuals reached in issue priority areas. This effort could be made with current funding and personnel levels.	All objectives; particularly 3.6
4.2 Secure S & PF Redesign or other additional grant funding to focus stewardship education and outreach efforts in priority issue areas of the state of Mississippi and multi-state areas where these priority areas are shared. This additional grant funding would contribute to increasing efforts for priority issue areas.	Statewide	Forest Sustainability and Markets, Landowner Trends, Forest Health, Wildland Fire, Wildlife, Climate Change	MFC Outreach Program, Stewardship and Rural Forestry Assistance, Forest Legacy, Forest Health, Forest Protection, Fire Wise, Project Learning Tree, Underserved Outreach Programs, Urban and Community Forestry, Extension Education Programs, 4-H, FFA, Wood Magic, Teach Conservation Workshop, CFA, Tree Farm Program, FRDP, RTC, MDWFP Landowner Assistance Programs, Museum of Natural Science work shops, BMP workshops and other MDEQ grants, Conservation Districts Conservation Carnivals, Envirothons, Small Farmer's Conference, CRP, Wetland Reserve Program,	Private landowners in priority areas for other key issues.	Additional grant funding will be needed to implement this strategy	MFC, MSU Forestry Extension, ASU Extension, Private Natural Resource Professionals (Forestry Consultants), MFA, MDWFP, MDA, MDEQ, MSWCC, MAOC, MDE, NRCS, RC&D, USFS	Success would depend on level of additional grant funding received and resulting individuals and landowners reached in issue priority areas.	All objectives; particularly 3.6

			Wildlife Habitat Improvement Program, EQIP					
4.3 Improve methods and delivery of Stewardship education and assistance to underserved landowners.	Statewide	Forest Sustainability and Markets, Landowner Trends, Forest Health, Wildland Fire, Wildlife, Climate Change	MFC Outreach Program, Stewardship and Rural Forestry Assistance, Forest Legacy, Forest Health, Forest Protection, Fire Wise, Project Learning Tree, Underserved Outreach Programs, Urban and Community Forestry, Extension Education Programs, 4-H, FFA, Wood Magic, Teach Conservation Workshop, CFA, Tree Farm Program, FRDP, RTC, MDWFP Landowner Assistance Programs, Museum of Natural Science work shops, BMP workshops and other MDEQ grants, Conservation Districts Conservation Carnivals, Envirothons, Small Farmer's Conference, CRP, Wetland Reserve Program, Wildlife Habitat Improvement Program, EQIP	Underserved landowners	Additional funding and working with partners is needed to implement this strategy.	MFC, MSU ES, ASU ES, Private Natural Resource Professionals (Forestry Consultants), MFA, MDWFP, MDA, MDEQ, MSSWCC, MAOC, MDE, NRCS, RC&D, USFS, MUFC	Number of underserved landowners assisted. Number and acres of written Forest Stewardship plans with periodic monitoring for practice implementation in issue priority areas.	All objectives; particularly 3.6
4.4 Secure additional grant funding to improve delivery and outsourcing of Forest Stewardship Management planning for landowners in these priority issue areas including underserved ownerships. These plans would focus on specific recommendations and practices that would directly address the landowner's objectives and trends and threats associated with these priority issue areas. Depending on funding levels, plan development would be incentivized and outsourced to forestry consultants and other natural resource professionals in these priority issue areas.	Statewide	Forest Sustainability and Markets, Landowner Trends, Forest Health, Wildland Fire, Wildlife, Climate Change	MFC Outreach Program, Stewardship and Rural Forestry Assistance, Forest Legacy, Forest Health, Forest Protection, CRP, Wetland Reserve Program, Wildlife Habitat Improvement Program, EQIP	Underserved landowners	Additional grant funding will be needed to improve delivery and outsourcing and incentivizing of Forest Stewardship Management planning for landowners in these priority issue areas including underserved ownerships of less than ten acres.	MFC, MSU Forestry Extension, ASU Extension, Private Natural Resource Professionals (Forestry Consultants), MFA, MDWFP, MDA, MDEQ, MSWCC, MAOC, MDE, NRCS, RC&D, USFS	Success would depend on level of additional grant funding received and resulting landowners reached in issue priority areas. Number and acres of written Forest Stewardship plans with periodic monitoring for practice implementation in issue priority areas.	All objectives; particularly 3.6
4.5 Seek additional funding to improve web-based social media efforts in Forest Stewardship education. Improving the interactivity of natural resource education websites would provide a more appealing, and informative	Statewide	Forest Sustainability and Markets, Landowner Trends, Forest Health, Wildland Fire, Wildlife, Climate Change	MFC Outreach Program, Stewardship and Rural Forestry Assistance, Forest Legacy, Forest Health, Forest Protection, Fire Wise, Project Learning Tree, Underserved Outreach Programs, Urban	Students; private forest landowners in priority areas.	Current budgets and additional grant funding would be needed to improve and enhance existing web sites.	MFC, MSU Forestry Extension, ASU Extension, Private Natural Resource Professionals (Forestry Consultants), MFA,	Success would depend on level of additional grant funding received	All objectives; particularly 3.6

experience. Emphasis should be placed on integrating and organizing web based information to meet the needs of the priority issue areas.			and Community Forestry, Extension Education Programs, 4-H, FFA, Wood Magic, Teach Conservation Workshop, CFA, Tree Farm Program, FRDP, RTC, MDWFP Landowner Assistance Programs, Museum of Natural Science work shops, BMP workshops and other MDEQ grants, Conservation Districts Conservation Carnivals, Envirothons, Small Farmer's Conference, CRP, Wetland Reserve Program, Wildlife Habitat Improvement Program, EQIP			MDWFP, MDA, MDEQ, MSWCC, MAOC, MDE, NRCS, RC&D, USFS		
4.6 Develop with partners, informational materials and displays promoting the conditions and management needs of these specific issue priority areas.	Statewide	Forest Sustainability and Markets, Landowner Trends, Forest Health, Wildland Fire, Wildlife, Climate Change	MFC, MSU Forestry Extension, ASU Extension, Private Natural Resource Professionals (Forestry Consultants), MFA, MDWFP, MDA, MDEQ, MSWCC, MAOC, MDE, NRCS, RC&D, USFS, MUFC	Education/Outreach partners (agencies and organizations).	Current and additional grant funding to develop and purchase informational materials and displays.	MFC, MSU ES, ASU ES, Private Natural Resource Professionals (Forestry Consultants), MFA, MDWFP, MDA, MDEQ, MSSWCC, MAOC, MDE, NRCS, RC&D, USFS, MMNS, MUFC	Develop, produce and distribute informational materials and set up displays at museums and other events promoting the conditions and management needs of these specific issue priority areas. Success may be determined from the depletion of materials and use of displays	All objectives; particularly 3.6

Key Issue 5: Wildland Fire

Development around forested areas continues to increase the potential for catastrophic impacts from wildfires. Reducing or eliminating various fuels from the forest structure in cost-effective ways is integral for the protection of Mississippi's forest resources and the safety and protection of persons and property. To decrease the threat of wildland fire to communities and the forested landscape, more fuel reduction treatments need to be performed by prescribed burning, mechanical treatment or other means. With Mississippi's long growing season, re-treating these areas every few years will be key.

Forest Resource
Fire is critical for forest health, and all forest resources in the state are impacted by fire.

Public Benefit
Use of prescribed burning and other means of reducing fuel loading decreases the threat of wildland fires around the wildland urban interface (WUI) and rural communities. The *Southern Wildfire Risk Assessment* (SWRA) shows those Communities at Risk (CAR) are statewide www.southernwildfirerisk.com

Key Attributes
Reducing fuel loading means less intense wildland fires. Certified Prescribed Burn Managers (CPBM) use their skills with prescribed fire to address fuel loadings as well as forest health and proper forest management for a variety of landowner objectives such as wildlife habitat and timber. Fire is also an essential tool in the management of habitat for wildlife species of concern that use fire-dependent communities like longleaf pine.

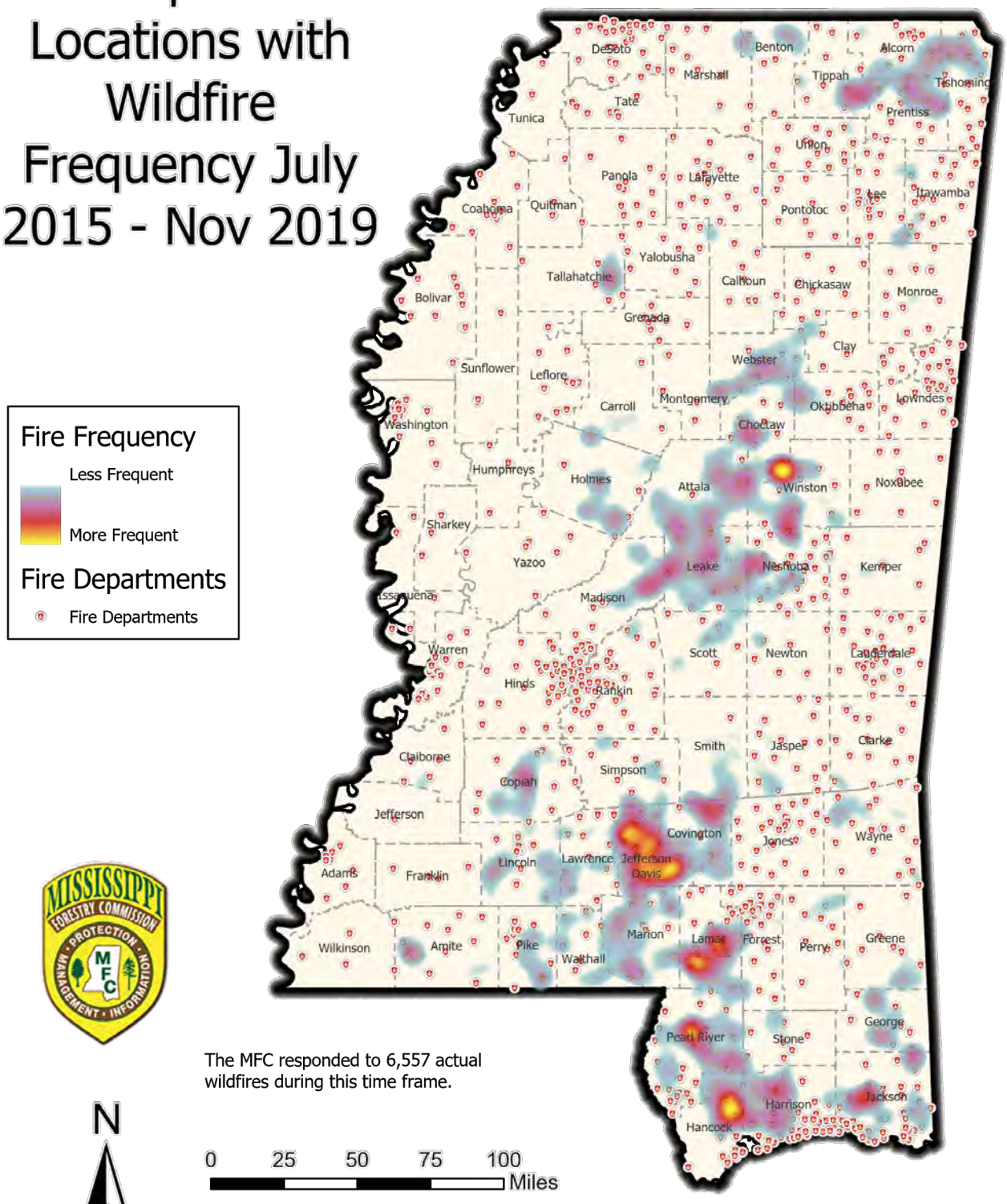
Direct Threats and Contributing Factors
Increased urbanization creates greater liability threats from escaped fires and smoke hazards along with a negative public opinion and/or poor understanding of the needs and benefits of prescribed fire. One of the barriers to applying fire to the landscape is smoke management. As urban and suburban areas and infrastructure encroach into natural areas, resource managers must constantly monitor weather and adjust burn areas to minimize the impacts of smoke on highways and communities. Air quality regulations in expanding WUIs limit the opportunity to use prescribed fire by reducing the number of burn days.

Also, small acreages in the WUI limit the ability and willingness of treating those areas by prescribed burning, mechanical treatments or other means due to elevated cost to perform the work. There are a limited number of certified prescribed burners to perform this work. The liability involved when doing a prescribed burn is a major limiting factor here.
Spread and migration of invasive, fire-adapted exotic species (e.g. cogongrass, eastern baccharis, Chinese tallow tree, etc.) has enlarged the threat of wildfire by increasing fuel loading and fire intensity.

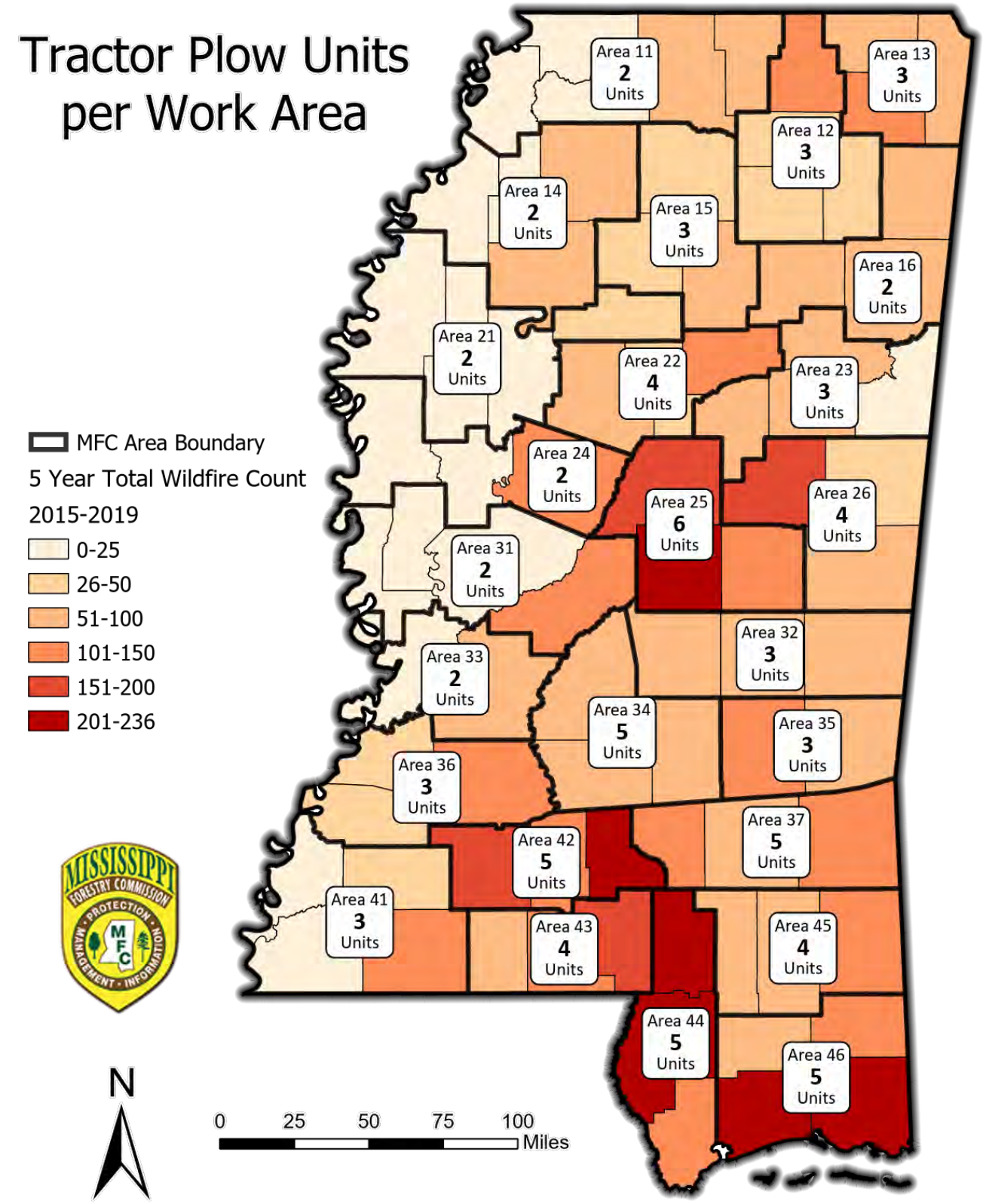
There are a limited number of fire suppression resources in the state. The MFC has downsized over the years due to budget restraints resulting in fewer tractor/plow units. Along with this there has been an increase in the number of Volunteer Fire Departments (VFD), but with the changing economy, there are fewer volunteers who respond to fires. Though these VFDs may be equipped, they have a high turnover and manpower shortage in many areas of the state. Consequently, as MFC tractor/plow units and personnel decreased, the average fire size has crept up slightly. To compensate, MFC is investing in a new dispatching program that geotracks all resources to reduce response time. This will allow MFC to send the closest fire unit to the fire.

In the past MFC had many cooperators around the state. Industrial forest landowners had tractor/plow units and would assist MFC crews with fire suppression in the past. However, in recent years, these companies have sold much of their timberland and no longer have fire suppression units. The timberland is still there, and the MFC still has responsibility to suppress those fires that occur on that land. Investment companies or private individuals now own some of these forest lands, but do not have the means of suppressing wildland fires. Also these lands are often not being managed as intensively as they were in the past. Therefore, the frequency of prescribed burning is not being accomplished and fuel loadings have increased as a result.

Fire Department Locations with Wildfire Frequency July 2015 - Nov 2019



The MFC responded to 6,557 actual wildfires during this time frame.


Tractor Plow Units per Work Area
MFC Area Boundary
5 Year Total Wildfire Count
2015-2019
0-25
26-50
51-100
101-150
151-200
201-236
Area 11 2 Units
Area 12 3 Units
Area 13 3 Units
Area 14 2 Units
Area 15 3 Units
Area 16 2 Units
Area 21 2 Units
Area 22 4 Units
Area 23 3 Units
Area 24 2 Units
Area 25 6 Units
Area 26 4 Units
Area 31 2 Units
Area 32 3 Units
Area 33 2 Units
Area 34 5 Units
Area 35 3 Units
Area 36 3 Units
Area 37 5 Units
Area 41 3 Units
Area 42 5 Units
Area 43 4 Units
Area 44 5 Units
Area 45 4 Units
Area 46 5 Units
MISSISSIPPI FORESTRY COMMISSION PROTECTION MANAGEMENT INFORMATION MFC
N
0 25 50 75 100 Miles

Opportunities

The County Wildfire Protection Plans (CWPPs) depict those areas most threatened by wildland fire and serve as an aid to county fire coordinators by identifying high risk areas to identify fuel reduction grant opportunities. Currently, there are 34 counties with CWPPs. Plans should be revised where needed. CWPPs should be developed in the remaining counties as WUI increases due to population growth and movement.

The Prescribed Burn Short Course is offered by the MFC three times a year. This training has the potential of increasing the number of Certified Prescribed Burners in the state.

Priority Landscapes

- Southern Wildfire Risk Assessment (SWRA) – Identifies Community at Risk (CAR), high fire occurrence areas, location of MFC tractor/plow units and VFDs
- County Wildfire Protection Plan (CWPP) – Currently 34 counties have these plans. The plans identify areas at risk to wildland fires. This includes public infrastructure and other important areas in the county.
- Invasive Species Areas – Target areas for suppression and elimination of non-native invasive species identified in Forest Health section

Mississippi Key Issue 5: Wildland Fire								
Long-term Strategy	**Priority Areas**	**Secondary Issues addressed**	**Program Areas that Contribute**	**Key Stakeholders**	**Resources available/ Required to Implement**	**Key Partners and Potential Partners**	**Measure of Success**	**Supports National Objective**
5.1 Increase the Number of Certified Prescribed Burn Managers (CPBM)	Set Priority Areas based on location of CPB Managers	Stewardship, Wildlife, Forest Health, Forest Sustainability and Markets	NA	Communities at risk, landowners forest and non-forest, property owners in WUI, TIMOS	MFC, MSU Extension, USFS National Forests	USFS National Forests in Mississippi, USFWS, MDWFP, TNC, MID State Fire Marshall , Private natural resource professionals, All state agencies with land holdings, MPFC, MFC	Increase by 28 annually	1.2, 2.1, 3.3
5.2 Increase the acres prescribed burned annually in high risk areas	Priority landscape determined by number of annual wildfires by county	Stewardship, Wildlife, Forest Health, Forest Sustainability and Markets	FRDP, Consolidated Stewardship Grants, Hazard Mitigation and Community Protection Grants	Communities at risk, landowners forest and non-forest, property owners in WUI, TIMOS, USFS National Forests, other Federal landowners, non-profits, state agencies and wildlife agencies	MFC, Private natural resource professionals, Vendors, National Forest Crews	USFS National Forests in Mississippi, USFWS, MDWFP, TNC, MID State Fire Marshall , Private natural resource professionals, All state agencies with forest land holdings, MDEQ, ASU, MSU, MPFC, MFC	Increase aceage and shift focus areas as priority areas change with population growth	1.2, 2.1, 3.3
5.3 Increase the use of prescribe burning using current landowners assistance programs to reduce fuel loading from native plants and non-native invasive species plants	Counties with high wildfire occurance ratings, high fuel loading, and WUI areas	Stewardship, Wildlife, Forest Health, Forest Sustainability and Markets	FRDP, USFS Stewardship Grant, Forest Health Grant, Preparedness Grants, Hazard Mitigation and Community Protection Grants	Communities at risk, landowners forest and non-forest, property owners in WUI, TIMOS, USFS National Forests, other Federal landowners, non-profits, state agencies and wildlife agencies	MFC, USFS, MDWFP	USFS National Forests in Mississippi, USFWS, MDWFP, TNC, MID State Fire Marshall, MPFC, MFC	As funding is available to increase the number of acres treated each year by 5%.	1.2, 2.1, 3.3
5.4 Identify high fire risk areas throughout the state.	High risk areas based on fire occurrence.	Stewardship, Wildlife, Forest Health, Forest Sustainability and Markets	Consolidated Grant - USFS	Property owners located in communities at risk and the WUI, state and federal agencies, counties	Southern Wildfire Risk Assessment, FIRES 9.3., fiResponse program	USFS National Forests in Mississippi, USFWS, MDWFP, TNC, MID State Fire Marshall, MPFC, MFC	Annual Assessment and Update	1.2, 2.1, 3.3
5.5 Promote the implementation of mitigation burning in high risk areas identified as Communities at Risk (CAR) and in the 34 County Wildfire Protection Plans (CWPP). Continue to provide funding to revise existing and promote completing CWPP's in remaining counties.	34 Counties with CWPPs for mitigation burning	Stewardship, Wildlife, Forest Health, Forest Sustainability	Hazard Mitigation Program	Property owners located in communities at risk and the WUI, state and federal agencies, counties	Counties, Vendors	USFS National Forests in Mississippi, USFWS, MDWFP , TNC, MID State Fire Marshall, MPFC, MFC	Perform Mitigation Burns on high risk areas in 5 counties per year. Continue work on updating and implementing CWPP's.	1.2, 2.1, 3.3
5.6 Provide equipment to VFD for the use in controlling non-forest fires both within the WUI and outside the WUI	High risk fire areas	Stewardship, Wildlife, Forest Health, Forest Sustainability and Markets	FEPP, FFP, VFA Grants, NFP/SFA Grant	Property owners located in communities at risk and the WUI, state and federal agencies, non-profit ownership, TIMOs.	MFC, USFS, VFD	USFS National Forests in Mississippi, USFWS, MDWFP, TNC, MID State Fire Marshall, MPFC, MFC	Goals are to obtain approximately 150 pieces of equipment/year, and fund 45 VFD's through the VFA grant program.	1.2, 2.1, 3.3

Key Issue 6: Climate Change

Climate change is defined as the actual or theoretical changes in global climate systems occurring in response to physical or chemical feedback, resulting from human or naturally induced changes in planetary terrestrial, atmospheric, and ecosystems. According to the U.S. Environmental Protection Agency (EPA), there is potential for both beneficial and adverse effects on forests due to elevated concentrations of carbon dioxide and increasing temperatures. Potential adverse effects stem from changing precipitation patterns, increased insects and diseases, and more and frequent weather events. The adverse effects are less certain, more variable and include serious impacts such as increased wildfire, drought and major losses from insects and disease.

Forest Resource

Changes in plant species composition in response to global climate change may cause some forest types to expand, such as oak-hickory, while others may contract such as maple-beech-birch. Species conditioned to warmer climates, such as sweetgum and longleaf pine, may expand their range north. The area of suitable conditions for other species such as yellow poplar may decline. Coastal forests, such as low-lying baldcypress swamps, may decline in extent and health due to an increase in inundation and saltwater intrusion as sea levels rise.

These changes in plant composition can also increase ecosystem vulnerability to other disturbances such as wildfire and biological invasion. Disturbances can dramatically change forest ecosystem structure and species composition, can cause short-term productivity and carbon storage loss and improve opportunities for invasive species to become established.

Public Benefit

Forest ecosystems help regulate the earth's climate over the long term and patterns of precipitation through the carbon cycle. The carbon cycle influences climate because atmospheric carbon, in the form of carbon dioxide, is the main greenhouse gas. These greenhouse gases trap heat leaving the earth's surface and create a "blanket" that warms the earth's atmosphere. The concentration and buildup of greenhouse gases contribute to abnormal long-term climatic changes.

Forests are major repositories of carbon, also called "sinks." Trees absorb carbon dioxide during photosynthesis, and some of the carbon becomes "sequestered" in branches, trunks and roots while some is in soils when leaves and other tree parts decay. A standing forest, by sequestering carbon, removes carbon dioxide from the atmosphere and helps prevent the buildup of greenhouse gases. It is estimated that forests in the South, which comprise 29 percent of U.S. forest cover, account for approximately one-third of the annual carbon sequestered in the U.S.

On a local and regional level, forests provide shade, reduce air temperatures and can create cooler microclimates under the forest canopy as well as in bodies of water. Cooler water holds

more oxygen, which supports beneficial habitat for plant and animal life. Forest canopies in urban areas block sunlight and can reduce energy costs.

Potential beneficial effects of elevated levels of carbon dioxide and increased temperature, such as increased photosynthesis, nitrogen deposition and warmer soils which may accelerate forest growth, are limited to certain areas of the country and particular forest community types. Adverse effects (drought, storms, insect outbreaks and wildfire) are as important to ecosystem function as changes in temperature, precipitation, atmospheric carbon dioxide, nitrogen deposition and ozone pollution. The positive impact on forest growth in some parts of the country from climate change is offset by the more significant and serious adverse effects from increases in wildfires, and the decreases in growth and productivity caused by pests and disease.

The U.S. EPA Administrator, in its *EPA Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act* found that the total scientific record "provides compelling support for finding that greenhouse gas air pollution leads to predominantly negative consequences for biodiversity and the provisioning of ecosystem goods and services for ecosystems and wildlife important for public welfare in the U.S., both for current and future generations. The severity of risks and impacts may only increase over time with accumulating greenhouse gas concentrations and associated temperature increases and precipitation changes."

Key Conditions or Attributes

Healthy forests have a higher carbon storage potential than any other land use in the state. Conversion of forest to non-forest uses and degradation of forests reduce the size of vegetative carbon sinks. Maintaining existing forest cover and reforestation of converted areas, such as agricultural lands, will increase the carbon storage potential across Mississippi's landscape. The same basic silvicultural guidelines for maintaining forest health in Mississippi apply to maintaining healthy forests under changing climatic conditions such as planting site appropriate species (native species adapted to soil and site conditions), minimizing stand disturbances that stress trees, removing diseased trees, and planting at appropriate spacing and densities.

Threats and Contributing Factors

Precipitation and weather extremes are key to many forestry impacts from climate change. Some areas in the Southeast are likely to experience increases in precipitation (western portions of the Southeast), that can lead to increased forest productivity while others in the eastern portion may experience more drought, which leads to reduced forest productivity. More prevalent wildfire disturbances and droughts (along with other extreme weather events such as tornadoes and hurricanes) can cause forest damage, and pose the largest threat to forest ecosystems over time, especially where conversion to off-site species has occurred.
The effects of climate change require more management resources and public attention as well. For instance, the ability of protected areas such as national forests, parks, wildlife management areas and green spaces to serve as refuges for some plants and animals or buffers for storms may decline with shifts in extent, range and distribution of some forest types.

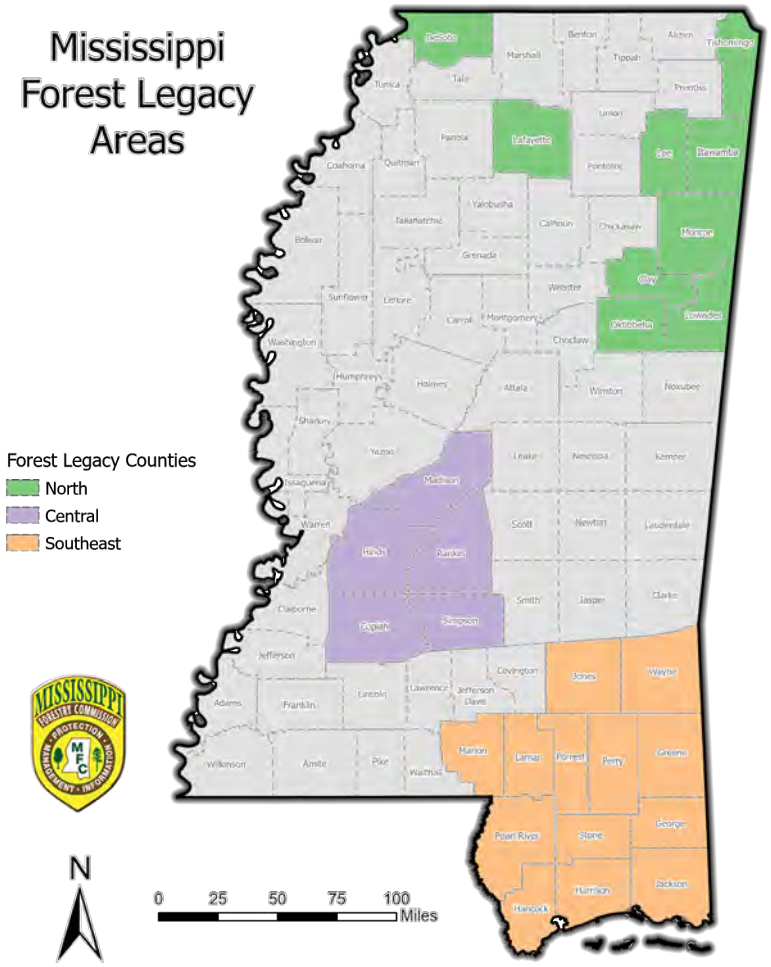
Though expansion of forest cover can play a large role in addressing climate change, the carbon market in the U.S. and in Mississippi is still not well-developed as discussed under *Key Issue 1: Forest Sustainability and Markets.* Unlike foreign carbon markets, the U.S. market has no mandatory cap policy, carbon sequestration programs are voluntary with industries, and states are forming their own policies, making a coordinated regional and national effort to reduce greenhouse gas difficult.

Opportunities

Various measures (incentives, markets and practices) can help ensure Mississippi's forest lands supply ecosystem services (natural benefits) that are needed to help offset the effects of climate change. Expansion of existing protected forest areas in public ownership, particularly bottomland hardwood forests and coastal wetland forests will continue to be important, but the amount of public forest land is not likely to increase substantially in the coming years and decades. Preservation of moist, mature forests on both public lands and adjacent private lands through conservation easements, acquisition and long-term forest protection and incentive programs will help prevent large amounts of carbon from reaching the atmosphere if these areas are logged and will also provide habitat protection for wildlife species that depend on mature forest ecosystems. Increasing resilience of existing forests on public and private lands by restoring natural fire regimes and natural hydrology will increase their resistance to climate change.

Existing forest programs that provide incentives for afforestation, forest conservation and management on private lands should be continued and promoted (e.g. USDA Agricultural Land Easement Program, Wetland Reserve Easement Program, Healthy Forest Reserve Program, Forest Legacy Program, and private conservation easements) as well as regional efforts such as those devoted to restoration and management of longleaf pine in its natural range (e.g. America's Longleaf). Emerging and maturing U.S. markets and payment systems for ecosystem services such as carbon sequestration represents a potential new revenue stream that may provide private landowners additional income and motivation to keep land in forest cover and to reforest land in agriculture or open fields.

More pilot programs and local examples are needed to demonstrate the effectiveness of purchasing carbon offsets and raising awareness. Private landowner participation in sustainable forest certification programs should also be encouraged and developed at the state level. A critical component of all emerging and existing opportunities for addressing climate change in the state should be coordinated with other regional, national and global efforts and must include a significant public outreach and education component.



Priority Landscapes for Climate Change

- Priority areas for Wetland Reserve Easement Program (MS River Alluvial Plain ecoregion)
- Priority areas for Agricultural Land Easement Program (state wide)
- Open land (agriculture, pasture, open fields) adjacent to public lands
- Mature forests on public lands and adjacent private lands
- Mississippi Forest Legacy Areas
- Priority areas for range-wide longleaf restoration
- Riparian zones
- Urban areas
- Northern Gulf of Mexico and East Gulf Coastal Plain Ecoregions

Mississippi Key Issue 6: Climate Change								
Long-term Strategy	**Priority Areas**	**Secondary Issues addressed**	**Program Areas that Contribute**	**Key Stakeholders**	**Resources available/ Required to Implement**	**Key Partners and Potential Partners**	**Measure of Success**	**Supports National Objective**
6.1 Encourage afforestation of agriculture, pasture and open fields.	Target areas for WRE and USDA NRCS programs, open land (agriculture, pasture, open fields) adjacent to public lands. Conservation Opportunity Areas (COAS) identified in State Wildlife Action Plan (SWAP).	Forest Sustainability and Markets, Wildlife	FRDP, Forest Stewardship	Landowners with large potential afforestation areas (in row crops, pasture, open fields)	WRE, ACEP/ALE, HFRP	MFC, NRCS, FSA, MFC, ASU, MSU, MDWFP, MFA, DOD, Conservation Organizations	Acres enrolled and planted.	1.1, 3.2. 3.7
6.2 Support education outreach and awareness efforts in state on how landowners can participate in carbon market programs.	Target areas for WRE and USDA NRCS programs, open land (agriculture, pasture, open fields) adjacent to public lands and COAS identified in SWAP.	Forest Sustainability and Markets, Wildlife, Stewardship	FRDP, Forest Stewardship	Landowners with large potential afforestation areas (in row crops, pasture, open fields)	WRE, ACEP/ALE, HFRP	MFC, NRCS, FSA, MFC, ASU, MSU, SFI, MFA, The Carbon Fund	Number of new education programs; participation in education/outreach efforts.	1.1, 3.2. 3.7
6.3 Encourage participation in forestry certification programs.	Statewide on private lands.	Forest Sustainability and Markets, Landowner Trends, Wildlife	FRDP, Forest Stewardship	Private non-industrial forest landowners with young forests.	SFI, FSC, other certification pro-grams	SFI, MFC, FSC, MSU, ASU, MFA, MFC	Number of participants, acres enrolled.	1.1, 3.2. 3.7
6.4 Conserve/protect existing forests with highest carbon stores (moist, mature forest-lands) in large blocks on public lands and adjacent private lands.	Mature forests in protected public areas and adjacent private lands. Forest Legacy Areas and COAS identified in SWAP.	Forest Health, Forest Sustainability and Markets, Wildlife	Forest Legacy, other private land easement and acquisition programs.	Public land managers, private landowners adjacent to public or protected forested areas.	Conservation easements and land protection programs on private and public lands	MDWFP, USFS, USFWS, MDMR, MFC, land trusts, NPS, DOD, MFC, MDEQ	Acres protected through easements, conservation programs.	1.1, 1.2, 3.2. 3.5, 3.7,

Key Issue 7: Wildlife

Forested communities in Mississippi provide essential habitat for many common resident and migratory fish and wildlife species as well as species of concern. The conversion and/ or changes in structure and composition of Mississippi's natural forest communities have spurred the decline of many species of concern indigenous to the state including the black pine snake, gopher tortoise, red cockaded woodpecker, Louisiana black bear and Mississippi Sandhill crane. Maintaining, protecting, enhancing and restoring, where possible, natural forest communities with appropriate structure and composition and of sufficient tract or patch size is key to the survival and recovery of these species. While forests on public lands are critically important in the conservation of many wildlife species of concern, most of Mississippi's forestlands are in private ownership. Private lands offer significant opportunities for management, protection and restoration of habitat for forest-dependent species.

Forest Resource

The Mississippi Natural Heritage Program (MNHP) maintains a database of 1,500 known species of animals that occur in the state. The *Mississippi State Wildlife Action Plan* 2015 (SWAP) identifies and describes the location and condition of 106 habitat types and their importance to the conservation of 310 fish and wildlife species of greatest conservation need (SGCN) in the state including 18 amphibians, 70 birds, 34 crustaceans, 74 fish, 17 mammals, 49 mussels and 35 reptiles. The majority of these SGCN as well as common species depend on natural forest communities for at least part of their life cycle (breeding, nesting, foraging, overwintering, cover, and roosting). Trees provide food such as berries, nuts, seeds, buds, young stems, leaves, bark and nectar which also offers a bound or free source of water for some species. Forest cover for wildlife includes young hardwoods and pines, flooded hardwoods, mixed stands, edges, tree tops, open woodlands and thickets. Tree cavities, leaf nests, forest floor and canopies offer reproductive areas.

Longleaf pine forests are one of the most imperiled ecosystems in the world, and restoration is a focal area for Mississippi and other states in the historic longleaf pine range. More than 140 species of vascular plants can be found in a 1000 square meter, with as many as 40 to 50 plants in a square meter of healthy longleaf pine forests. Nearly 900 endemic plant species – species found nowhere else – are found in longleaf pine ecosystems across the Southeast U.S. Of the 290 reptiles and amphibians occurring in the Southeast, 170 are found in these systems including 30 reptile and amphibian species that are specialists to longleaf systems and are listed as federally threatened or endangered.

The SWAP classifies Mississippi forest communities (which encompass both public, private non-industrial and industrial forest lands) into nine major forest types (below) and 19 sub-types described in detail in Chapter 1. Refer to the Mississippi SWAP for more detailed information on forest communities and wildlife species that depend on them. State Wildlife Action Plan

Major Forest Communities in Mississippi

1. Xeric-Mesic Upland Forest/Woodlands
2. Mesic Upland Forests
3. Bottomland Hardwoods
4. Swamp Forests
5. Riverfront Forests
6. Wet Pine Savannas/Flatwoods
7. Cedar Glades (within Prairies)
8. Upland Maritime Woodlands
9. Pine Plantation

Public Benefit

Fish and wildlife species support abundant recreational activities and enjoyment such as hunting and fishing, wildlife viewing and nature photography. Fish and wildlife, as intrinsic components of the forest communities, also provide important natural benefits as pollination, seed dispersal and soil and nutrient recycling as well as control of other populations (insects, plant species). These ecosystem services are directly attributable to wildlife species living within the forest ecosystem. Presence of wildlife species such as birds, mammals, reptiles, crustaceans and amphibians can be good indicators of environmental conditions such as water and air quality.

Key Conditions or Attributes

Healthy, functioning and diverse forest ecosystems are critical to providing habitat for SGCN as well as common fish and wildlife species. Natural forest communities are adapted to local conditions and those that have not been impacted by non-native, invasive species, fire suppression, disease or insects, fragmentation, air pollution, or removal of trees are more stable and functional. Large patches of forest communities that are interconnected, healthy and have diversity in structure, plant species and ages will provide higher quality habitat for more wildlife species. Maintaining native forest communities and connectivity among forested patches on private and public lands through active planning and coordinated management is essential to ensuring habitat for common species and SGCN in Mississippi in rural and urban areas.

Fire is an important ecological process that maintains many types of forest communities statewide in Mississippi and use of prescribed fire should be emphasized for its substantial benefits for wildlife habitat. For example, fruit and seed production is stimulated after a fire-adapted forest communities. Yield and quality increases occur in herbs, legumes, and browse from hardwood sprouts. Openings are created for feeding, travel, and dusting. Selecting the proper size, frequency, and timing of burns is crucial to the successful use of fire to improve wildlife habitat. Prescriptions should recognize the biological requirements (such as nesting times) of the target wildlife species and should consider the vegetative condition of the stand and the changes fire will produce in understory structure and species composition.

Threats and Contributing Factors

Mississippi's SWAP identified major threats to forested habitats used by SGCN by habitat type and within each ecoregion based on Salafsky's classification of threats discussed in Chapter 1. Major threats to fish and wildlife that depend on forest communities that were ranked as "High" or "Moderate" in the SWAP are:

High to moderate threats to SGCN associated with forest communities in Mississippi

- *Residential and Commercial Development*
    - Housing and Urban Areas - Human cities, towns and settlements including non-housing development typically integrated with housing
- *Natural System Modification*
    - Fire Suppression - Suppression or increase in fire frequency and/or intensity outside of its natural range of variation.
    - Dams and Water Management / Use - Changing water flow patterns from their natural range of variation deliberately or as a result of other activities
- *Invasive and other problematic species*
    - Invasive non-native/alien species - Harmful plants, animals, pathogens and other microbes within the ecosystem directly or indirectly introduced and spread into it by human activities
- *Agriculture and Aquaculture*
    - Wood and Pulp Plantations - planted for timber or fiber outside natural forests, with offsite species
    - Annual and Perennial Non-Timber Crops - planted for food, fiber
- *Biological Resource Use*
    - Logging and Wood Harvesting - Harvesting trees and other woody vegetation for timber, fiber or fuel

Because the vast majority of forest land in the state is in private ownership, and is not actively managed by the landowner, implementation of practices that may address the threats to fish and wildlife resources, such as prescribed burns and invasive species control, are very challenging. On properties where timber production is the sole or primary use of forest land, there can be conflicts between the goals of the landowner and the needs of wildlife species. Also, in most communities in Mississippi (at the county and city level), little to no landscape level planning occurs that considers forest conservation and habitat protection when those political subdivisions develop long-range master plans for their communities. This often results in road, subdivision and utility development that furthers fragmentation of habitat.

Opportunities

Conservation programs are available in the state to encourage conservation actions and practices that will improve or protect forest habitat for wildlife species of concern as well as to keep common wildlife species common, as recommended in Mississippi's SWAP and the *Mississippi Forest Legacy Program Plan*. Federal programs such as USDA's Agricultural Land Easement Program, the Wetland Reserve Easement Program, the Healthy Forest Reserve Program (HFRP), the USFWS Partners for Fish and Wildlife (PFW), and the Landowners

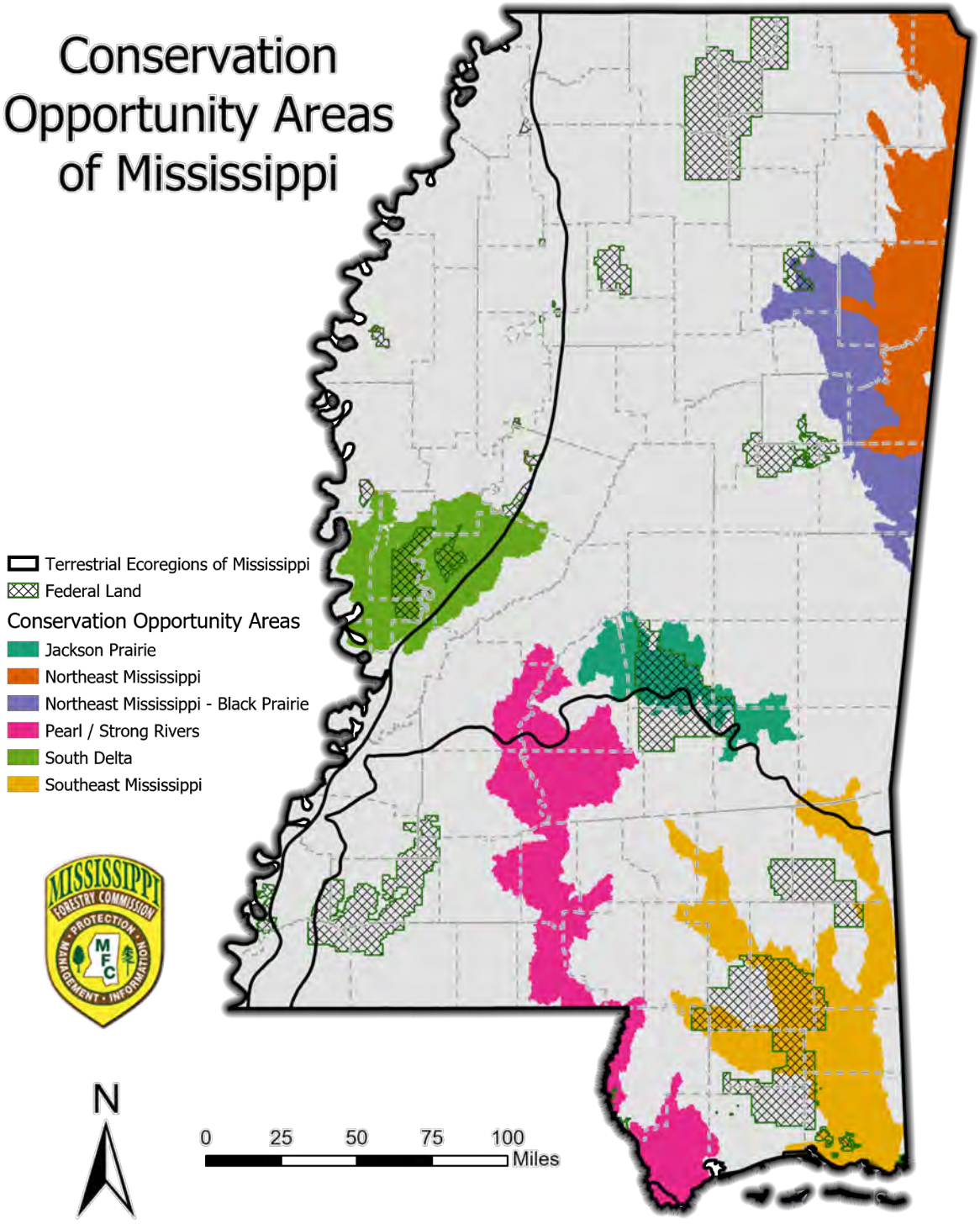
Incentive Program (LIP) through the MDWFP, and efforts by the Mississippi Longleaf Implementation Team (MLIT) are just some of the key forest conservation efforts that support restoration, conservation and management of high priority natural forest communities such as longleaf pine, forested wetlands, riparian areas, and habitat for threatened and endangered forest species in conservation priority areas identified in each program's guidance document. MFC's Forest Legacy Program provides competitive grant funds to protect and restore natural forest communities threatened by conversion to non-forest use. Mississippi's Forest Stewardship Program provides planning support for forest landowners who desire to manage for wildlife and recreational purposes such as hunting and wildlife viewing.

Because wildlife benefits from prescribed burning are substantial, programs that encourage or provide assistance with prescribed burning on private lands present one of the greatest opportunities to improve habitat for wildlife particularly where loblolly, shortleaf, longleaf, or slash pine is the primary overstory species. Periodic fire tends to favor understory species that require a more open habitat. A mosaic of burned and unburned areas maximizes "edge effect" which promotes a large and varied wildlife population. Deer, dove, quail, and turkeys are game species that benefit from prescribed burns. Habitat for SGCN such as gopher tortoise, indigo snake, black pine snake, and red cockaded woodpecker are also enhanced by burning.

One of the most significant emerging opportunities for forest conservation on a regional scale is through America's Longleaf – A Restoration Initiative for the Southern Longleaf Pine Forest. This Initiative published a 15-year range-wide conservation plan in 2009 with a goal to increase longleaf acreage in its historic range from 3.4 to 8.0 million acres. MFC is taking the lead role in coordinating Mississippi's participation in this effort with several state, federal and private partners through the Mississippi Longleaf Implementation Team (MLIT) and have identified priority areas and restoration opportunities in the state that will support this regional effort as discussed earlier in this FAP.

Priority Landscapes for Wildlife

- Conservation Opportunity Areas and high ranking natural forest communities identified in MS SWAP
- Mississippi Forest Legacy Areas
- Natural Areas identified by MS Natural Heritage Program (forested)
- Conservation Priorities identified through the USDA State Technical Committee for Farm Bill programs such as Agricultural Land Easement Program, Wetland Reserve Easement Program, Healthy Forest Reserve Program, Conservation Reserve Program
- Priority areas identified in the USFWS Partners for Fish and Wildlife Program and the Landowner Incentive Program
- Priority areas identified in the Range-wide Conservation Plan for Longleaf Pine and the Mississippi Longleaf Implementation Team
- High priority drainages identified by SWAP (Tombigbee, Northeast Hills/ TN River, Pascagoula River, Lower Coastal Plain/Pearl River)



Source: Mississippi Department of Wildlife, Fisheries and Parks, Mississippi State Wildlife Action Plan 2015.

Mississippi Key Issue 7: Wildlife								
Long-term Strategy	**Priority Areas and Landscapes**	**Secondary Issues addressed**	**Program Areas that Contribute**	**Key Stakeholders**	**Resources available/ Required to Implement**	**Key Partners and Potential Partners**	**Measure of Success**	**Supports National Objective**
7.1 Encourage and improve management of forested habitat by controlled burning at necessary frequencies and seasons.	Forest Legacy Areas (FLAs), East Gulf Coastal Plain	Stewardship, Climate Change, Wildland Fire	Forest Health, Forest Protection	Private landowners	MFC, Fire programs, MSUES, MFA, USDA	MFC, MFA, MDWFP, USDA, MSPFC, TNC, USFS, private landowners, MSU, ASU, DOD, Community Colleges, VFD, Veteran's Fire Crews	Acres burned.	1.1, 1.2, 2.1, 2.2, 3.5, 3.7
7.2 Encourage restoration and improved management of altered/degraded forest habitat when possible.	FLAs, Statewide, Conservation Opportunity Areas (COAs) defined in MS SWAP	Forest Sustainability and Markets, Stewardship, Climate change	Forest Stewardship	MFC, MFA, MDWFP, MMNS, Conservation Organizations, NRCS, FSA	America's Longleaf, NRCS and FSA, MFC	MFC, MDWFP, MMNS, MDEQ, Conservation Organizations, NRCS, FSA, DOD, Community Colleges, Longleaf Alliance, MLIT	Acres improved/ restored/ enhanced.	1.1, 1.2, 2.2, 3.5, 3.7
7.3 Discourage incompatible forestry practices such as bedding as a method of site preparation and planting extremely high stocking densities.	Upper East Gulf Coastal Plain, East Gulf Coastal Plain ecoregions	Forest Sustainability and Markets, Stewardship	Forest Stewardship	Loggers, non-industrial and industrial landowners, consultant foresters	ASUES, MSUES	MFC, MFA, MLA, MSUES, ASUEES, MDEQ, TNC, MDWFP, Private Natural Resource Professionals		1.2, 2.2,3.5
7.4 Encourage buffers and improve land use practices adjacent to streams (Streamside Management Zones) and other aquatic/wetland habitats.	High priority drainages identified by SWAP-Tombigbee, Northeast Hills/TN River, Ephemeral Ponds, Pascagoula River, Lower Coastal Plain/Pearl River.	Forest Sustainability and Markets, Stewardship, Climate Change	Forest Stewardship	Landowners adjacent to aquatic areas (streams, lakes, reservoirs), Loggers	MDEQ, MFC, USDA	MFC, MFA, MSU CES, ASU CES, MDEQ, TNC, MLA, MDWFP, DOD, Community Colleges	Increase in SMZs, water quality changes in streams, increase in forested riparian areas.	1.1, 2.2, 3.1,3.5,3.7
7.5 Provide public education and conservation of Species of Greatest Conservation Need (SGCN) that depend on forests and their habitat needs.	Statewide	Stewardship	Forest Stewardship	MFC, MMNS, MDWFP, USFWS, USFS, Conservation Organizations	MMNS, State wildlife grants	MFC, MMNS, MDWFP, USFWS, USFS, Conservation Organizations	Number of outreach programs provided; number of participants; new programs.	3.6
7.6 Promote and support landowner incentive and assistance programs for conservation of SGCN using forested habitats.	Conservation Priority areas identified through WRE, CRP, PFW, HFRP, FLP and LIP.	Landowner Trends, Stewardship	Forest Legacy	USDA NRCS, FSA, USDA State Technical Committee, MDWFP, MFC	State Wildlife Action Plan, USFWS, MDWFP, MMNS	NRCS, FSA, USDA STC, MDWFP, LIP, MFC, MMNS, Land trusts, Conservation organizations	Number of participants in programs; number of new programs.	1.1,3.5,3.6
7.7 Encourage retention, preservation, and conservation of remaining natural habitat and habitat corridors between protected forested blocks through purchase, conservation easements and MOAs.	FLAs, COAs identified in SWAP, Areas adjacent to public lands, priority areas for WRE, ACEP/ALE, HFRP, Partners for Fish and Wildlife, LIP, Coastal Preserves, Riparian corridors between large forested blocks (public lands)	Forest Sustainability and Markets, Landowner Trends, Climate Change	Forest Legacy, Forest Health	Private landowners adjacent to public lands and waterways, land trusts	Conservation and sportsmen organizations, Conservation easements, Forest Legacy, ACUB, MSU Foundation, ACEP/ALE, DWH Gulf Restoration Funds	Land trusts, Conservation organizations, Sportsmen's organizations, MFC, USFS, NRCS, FSA, USFWS, MDWFP, MDMR, MSSOS, DOD, MDEQ	Acres protected through CEs, MOAs, land acqusitions within identifed forested blocks.	1.1, 3.4, 3.5, 3.6, 3.7

7.8 Develop wildlife manual/guide for incorporating species-specific wildlife recommendations into Stewardship Management Plans developed by MFC foresters. Update Plan writer and SIMS Map to include those recommendations and practices.	Statewide	Stewardship, Forest Sustainability and Markets, Forest Health, Wildland Fire	Tree Farms, Consolidated Stewardship Grant, Redesign, Federal Cost Assistance Programs	Landowners and land managers, Wildlife agencies, MFC Private Land Foresters	ASUES, MSUES, USFWS, MDWFP, Longleaf Alliance, MFA, CFA, USFS	MSU DWFA, MDWFP, Longleaf Alliance, USFS, MFC	Complete Guide/Manual and update Planwriter and SIMS Map to incorporate recommendations contained within the Manual	1.1, 1.2, 3.4, 3.5 and 3.6

Chapter IV.
Overall Priority Areas

Priority landscapes or areas in Mississippi were defined for each key issue discussed in *Chapter III: Key Issues and Resource Strategies* and listed in the matrix for each key issue. Not all areas are illustrated, and there may be other priority landscapes identified through future planning and development of MFC's annual FAP update. Many priority geographic areas overlap for key issues. For instance, high priority areas for wildland fire fuel reduction are also key areas targeted for longleaf pine restoration and non-native invasive plant control.

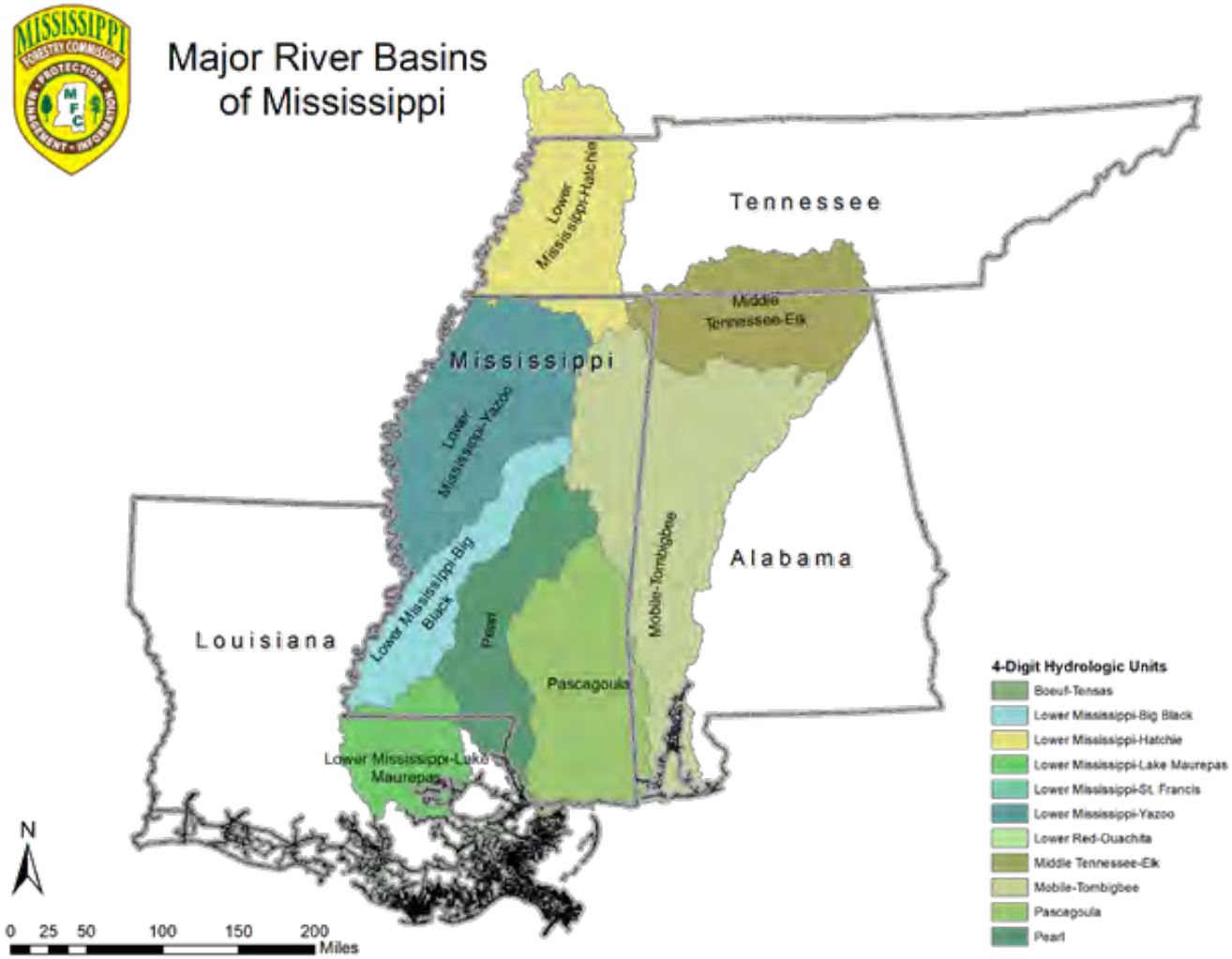
Geographic areas where Mississippi has the greatest opportunity or need to collaborate with other states in the region include:

1. Multi-state priorities for afforestation such as agriculture and pasture lands identified by federal Farm Bill, private forest land incentive programs such as the Wetlands Reserve Program (WREP), Conservation Reserve Program (CRP) and others such as watersheds prioritized through the Gulf Coast Restoration (RESTORE) Council.
2. The target area for longleaf pine restoration and management within its historic range.
3. Priority areas for suppression and eradication of certain non-native, invasive plants and pests.

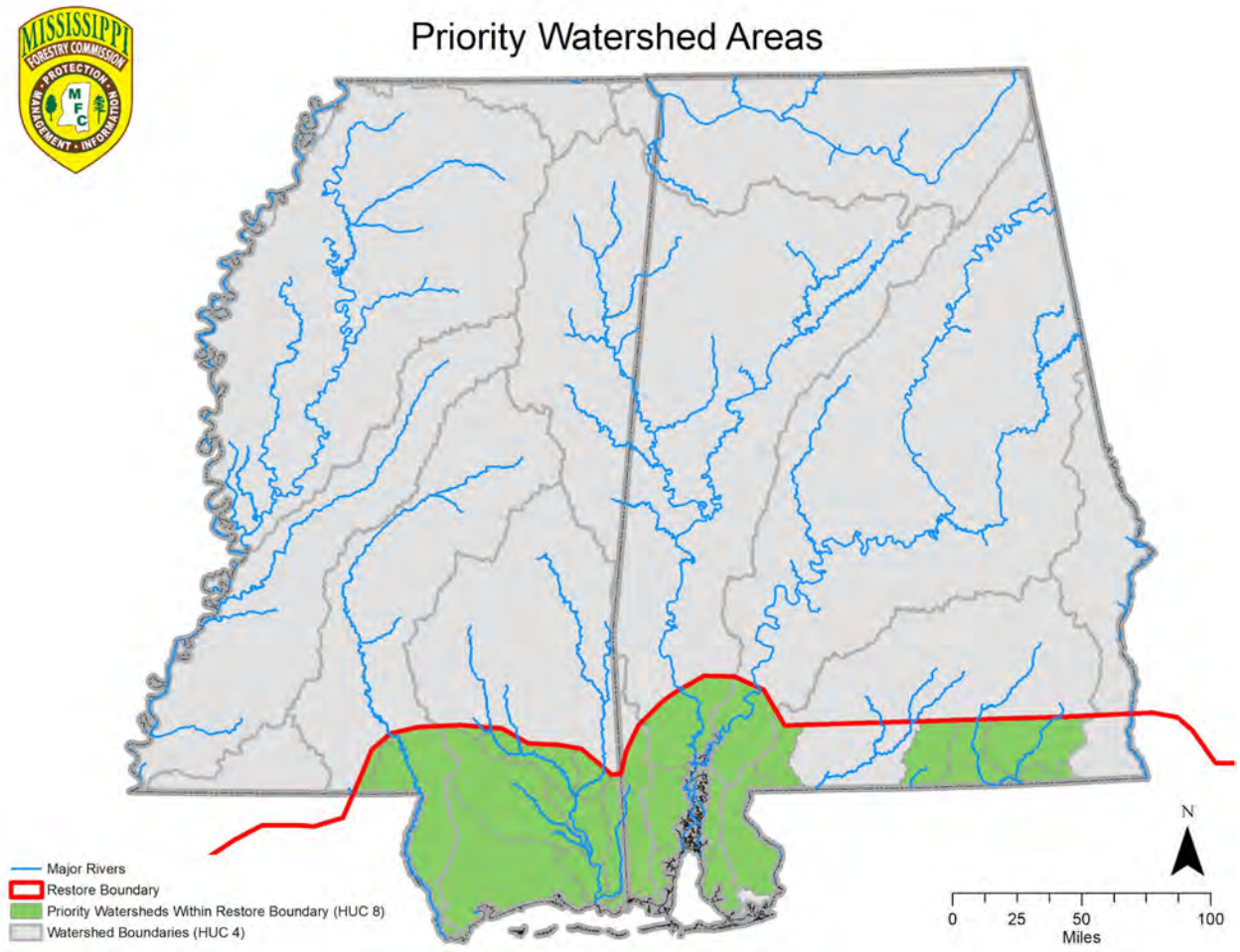
Multi-State Areas of Regional Priority

The concurrent update of each state's FAP provides a great opportunity to identify shared areas of concern or priority among neighboring states and to seek collaborative means to address them across state boundaries. Based on the updated assessment of forest resource threats and stakeholder input, Mississippi has identified three priority areas of concern that provide an opportunity to work with other southern states to address forest threats or priorities. A short description and maps of multi-state priorities for watershed and water quality protection, longleaf pine restoration, and cogongrass control are on the following pages.

Water Quality and Forests - Mississippi enjoys abundant water resources which makes it one of the most valuable natural resources. States in the Gulf Region are dominated by forest cover. In Mississippi, Alabama, and Florida alone there are more than 23 million acres of forest and 66 percent of those forests are privately owned. Seven major drainage basins in Mississippi have linkages to three other states: Alabama, Louisiana, and Tennessee. Decades of research show that forests provide the cleanest and most stable water supply compared to other land uses. Healthy watersheds are dependent on healthy forests which are dependent on engaged landowners. Shared stewardship is the key to success. Mississippi will focus on areas that are priorities for afforestation such as agriculture and pasture lands identified by the federal Farm bill.

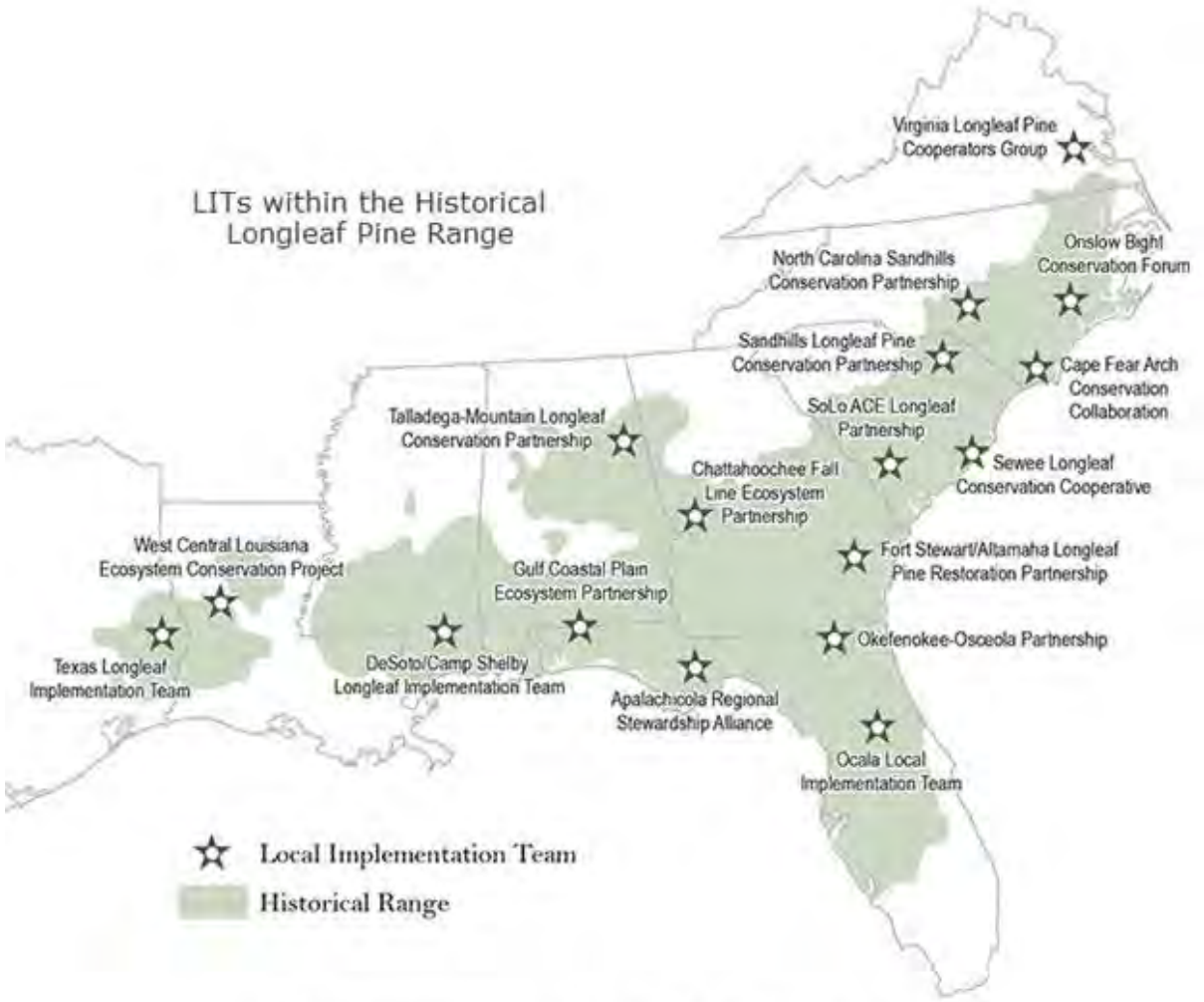


Efforts to sustain forested watersheds are vital to maintaining water quality. This will become even more critical as the demand for more clean and dependable water increases. Funding via the Gulf Coast RESTORE Council from the Deepwater Horizon oil disaster settlement will provide opportunities to work collaboratively in coastal watersheds (see RESTORE priority watershed map below) with surrounding states over the next several years.



Longleaf Pine - Longleaf pine (*Pinus palustris*) once covered approximately 90 million acres across its range and was both commercially valuable and ecologically important to the ecosystem. The historic range of longleaf spanned most Southeastern U.S. states including; Texas, Louisiana, Mississippi, Alabama, Florida, Georgia, South Carolina, North Carolina and Virginia. Intensive harvesting during the late 19th and 20th centuries, followed by the replanting with other pine species, shrank the natural range of extent of longleaf forests to just three percent of its original range. Today only 4.3 million acres of longleaf pine remain. This reduction in the extent of longleaf forests has produced fragmented longleaf stands, resulting in lowered populations of wildlife dependent upon the longleaf pine ecosystem, and increased forest management cost of replacement of this critical pine species.

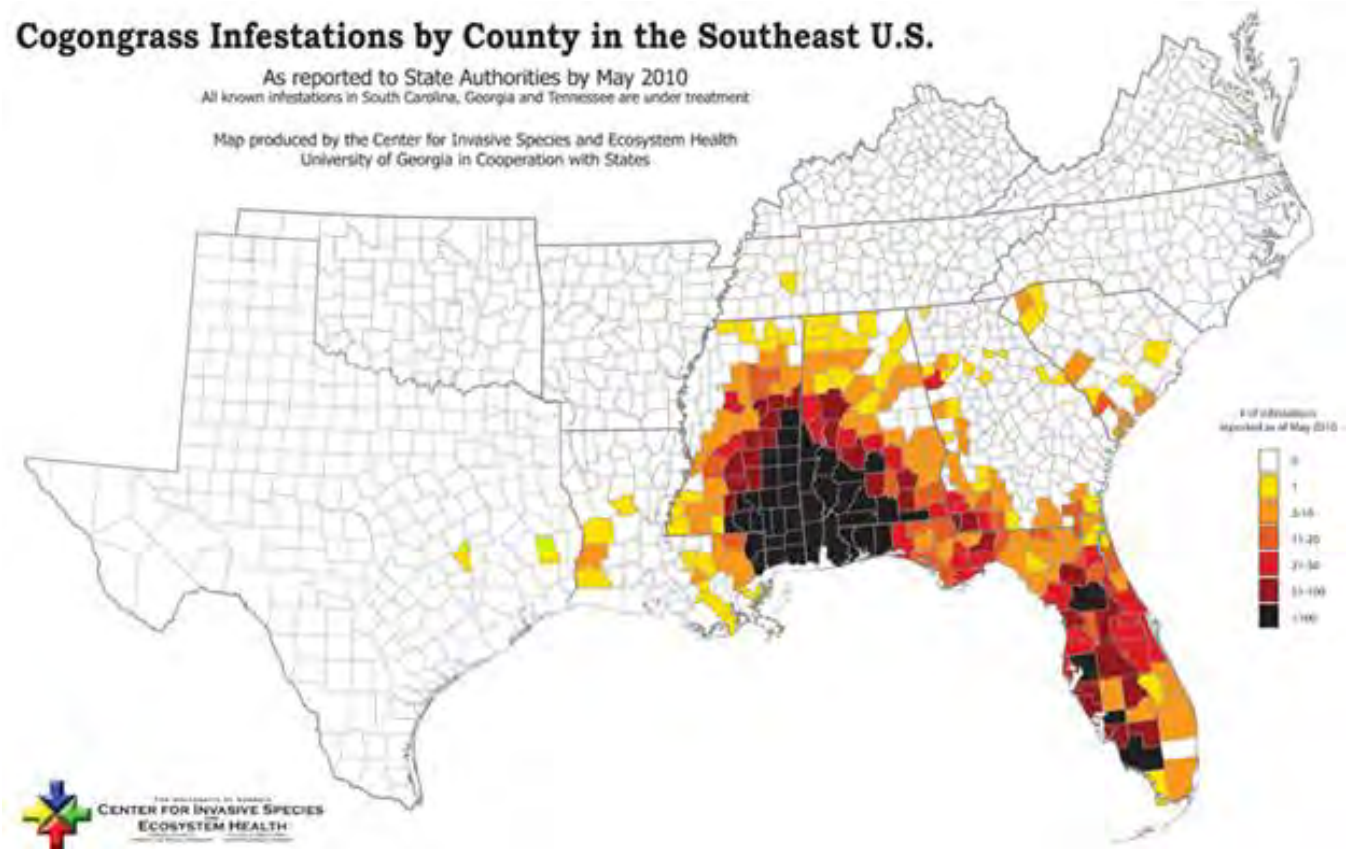
Mississippi will continue to participate with other partners in the restoration of longleaf pine to priority sites in its historic range throughout the Southeast U.S.



* Map courtesy America's Longleaf Restoration Initiative

Invasive Species - Cogongrass (*Imperata cylindrica*) is a warm-season perennial grass that originates from Asia. The first occurrences in America in the early 1900's in Mobile. Since entering the U.S. it has spread throughout many of the Southeastern states including: Texas, Louisiana, Mississippi, Alabama, Florida, Georgia, South Carolina, and Tennessee. Cogongrass is considered one of the 10 worst weeds in the world. This highly invasive grass species crowds out and alters native plant and animal habitat and is associated with increased fire frequency and intensity.

Cogongrass control measures are costly and require multiple treatments in order to eradicate it from the landscape. It is commonly found along utility rights-of-way and roads and is easily spread even to forested understories and riparian areas. Although spread can occur naturally, the seed is often spread by mechanical means such as mowing. Because it is found in so many of the Southeastern states and is continuing to spread northward, there is a need for a large-scale, multi-state coordinated effort to effectively control this invasive species.



cogongrass (*Imperata cylindrica*)

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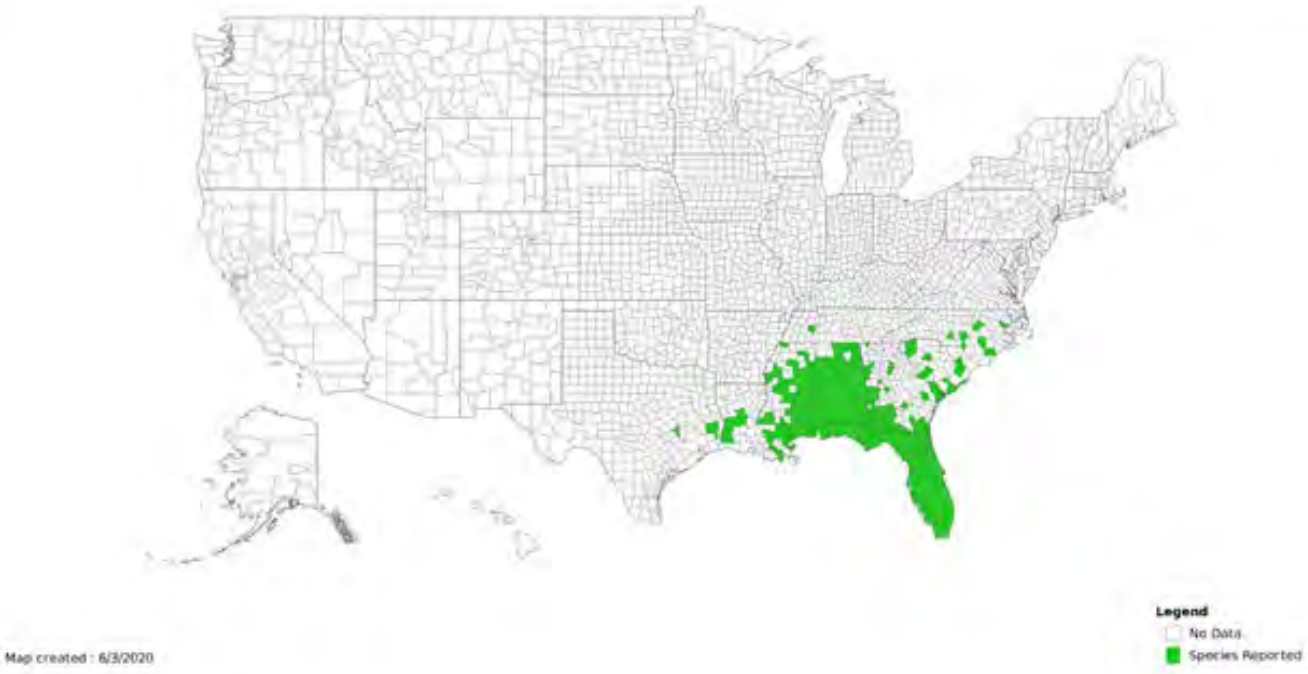

Map created : 6/3/2020

Chapter V.
Forestry Programs and Resources

The Farm Bill provides funding for landowner assistance to qualifying owners of forested property or woodlands if future plans or goals for their property include:

- Conserving soil and water resources
- Establishing wildlife habitat
- Sustaining woodlands
- Implementing a forest management plan
- Restoring wetlands

The Farm Bill also establishes the USDA's authority over financial incentive programs administered by various agencies. MFC partners with the USDA's State and Private Forestry (S&PF) division to deliver forest management assistance and expertise to a diverse group of landowners, including small woodlot, tribal, state, and federal, through a cost-effective, non-regulatory partnership. S&PF is the federal leader in providing technical and financial assistance to landowners and resource managers to help sustain the nation's forests and protect communities and the environment from wildland fires. State S&PF funding is allocated to the state in both non-competitive and competitive methods based on program regulations and regional priorities. These S&PF cooperative programs are administered and implemented through a partnership between the State of Mississippi (through MFC), the USFS and many other private and government entities. These programs promote health and productivity and forest land and rural economies and are the primary, but not sole, delivery mechanism for implementing major strategies recommended in this document.

Emphasis for S&PF programs focuses on forest sustainability and the production of commodity and amenity values such as wildlife, water quality and environmental services. The goal is to maintain and improve the health of urban and rural forests and related economies. These programs increase cost-effectiveness through the use of partnerships in delivery, increase values through sustained productivity of forests, are voluntary, and use non-regulatory approaches.

MFC PROGRAMS

The following is a description of all major forestry programs in the state. Other agency programs that MFC coordinates are listed as well as other federal, state and non-government forest conservation programs that can be leveraged to implement proposed forest resource strategies listed Chapter III.

Private Landowner Programs

Forest Resource Development Program (FRDP)

The FRDP provides financial assistance to eligible landowners for establishing and improving a crop of trees. The program helps offset landowners' expenses by sharing the cost of implementing specific forestry practices designed to produce timber and enhance wildlife development. Cost-share payments cover up to 75 percent (depending on the practice) of the total cost of implementing one or more forestry practices, at the flat rate established for each individual practice. Eligible landowners can receive up to $7,000 of FRDP assistance each year. In turn, the landowner agrees to protect the area receiving FRDP assistance from fire and grazing, and to properly manage the area for a minimum of ten years.
https://www.mfc.ms.gov/programs/private-landowner-services/forest-resource-development/

Forest Stewardship Program

The Mississippi Forest Stewardship Program promotes the active and informed participation of private, nonindustrial forest landowners in the management and use of all natural resources in their care. The USDA Forest Service, through the Cooperative Forestry Assistance Act, provides funding to state forestry agencies for implementing a program with the following stewardship objectives:

- To help private forest landowners more actively manage their forestland and related resources.
- To maintain these lands in a productive and healthy condition for present and future owners.
- To increase the economic and environmental benefits of these lands.
  https://www.mfc.ms.gov/programs/private-landowner-services/forest-stewardship/

Reforestation Tax Credit

The Mississippi Reforestation Tax Credit provides a Mississippi income tax credit up to 50 percent of the cost of approved hardwood and pine reforestation practices on non-industrial private forestland. Landowners must have a reforestation plan prepared by a registered forester. The work must be verified by a registered forester on Mississippi tax form 80-315 and submitted to the Mississippi Department of Revenue by the landowner to qualify. The cost of planting orchards, Christmas trees, or ornamental trees does not qualify. Forest acreage already

enrolled in a state or federal incentive program is not eligible for the tax credit. However, certain landowners may be eligible for the tax credit in addition to incentive payments.
https://www.mfc.ms.gov/programs/private-landowner-services/reforestation-tax-credit/

Forest Legacy Program

The Forest Legacy Program (FLP) is a USDA Forest Service competitive grant program in partnership with Mississippi that will help support local efforts to protect environmentally sensitive, privately owned forest lands threatened by conversion to non-forest use through land acquisition and conservation easements. *The Forest Legacy Program Plan* identifies three Forest Legacy areas (North, Central, and Southeast Mississippi) where important natural forest communities exist on private lands that are threatened by conversion from urban and suburban growth, or other threats.
https://www.mfc.ms.gov/programs/private-landowner-services/forest-legacy-program/

Urban and Community Forestry (U&CF)

The Urban and Community Forestry (U&CF) Program provides technical assistance to support U&CF planning, training, and continuing education, demonstration projects, and assistance in developing viable and continuing U&CF programs.

- Municipalities and Communities – The U&CF Program provides assistance and training for urban areas in developing community forestry programs and components, such as tree ordinances, street tree inventories, and urban forest management plans.
- Developers and Building Contractors – The MFC helps developers and building contractors with technical advice on tree preservation during site planning and construction.
- Homeowners and Residents – The MFC assists homeowners with advice on insects, diseases, and other tree care problems.
- Professionals and Volunteers – The MFC supports outreach, training, and continuing education opportunities for certified arborists and tree care professionals, as well as U&CF volunteers across the state.

https://www.mfc.ms.gov/programs/urban-community-forestry/

Community Grant Programs

Community Forest Program

The Community Forest Program (CFP) is a competitive national grant program offered by the U.S. Forest Service that provides financial assistance to tribal entities, local governments, and qualified conservation non-profit organizations to acquire and establish community forests. https://www.mfc.ms.gov/programs/urban-community-forestry/community-forest-program/

Urban and Community Forestry Grants

The U&CF Program helps aid in the development of long-term, self-sustaining urban and community forestry programs. The program's goal is to inspire or enhance local or statewide urban and community forestry programs with an emphasis on increasing local capacity, volunteer involvement, planning, training, and continuing education. https://www.mfc.ms.gov/programs/urban-community-forestry/urban-and-community-forestry-program/

Rural Fire Assistance Programs

The Mississippi Forestry Commission offers two grant programs designed to help our state's volunteer fire departments obtain equipment and supplies needed to fight wildland fires. https://www.mfc.ms.gov/programs/grants/rural-fire-assistance/

Firefighter Property Program - This program provides rural volunteer fire departments with excess equipment that is no longer needed by the Department of Defense (DoD). https://www.mfc.ms.gov/programs/grants/rural-fire-assistance/firefighter-property-program/

Volunteer Fire Assistance Program - Through this program eligible rural volunteer fire departments are reimbursed for funds spent on approved wildland firefighting equipment and communication equipment. https://www.mfc.ms.gov/programs/grants/rural-fire-assistance/volunteer-fire-assistance-program

Invasive Species Programs

MFC is involved in several programs to help combat invasive species that threaten the health of Mississippi forests including Chinese tallow tree, Southern pine beetle and cogongrass. https://www.mfc.ms.gov/programs/invasive-species-programs/

Public Lands Programs

Non-Federal Public Forestlands

The Mississippi Forestry Commission provides management assistance to boards, agencies, and other entities having jurisdiction over the non-federal public forestlands in Mississippi, including the management of state forests (Kurtz, Camden, and Jamie L. Whitten, Three Rivers).

School Trust Lands (16th Section Lands)

The MFC is charged by state law to manage forested Mississippi School Trust Land located in 67 counties throughout the state. In addition to timber production, management considerations also include wildlife, soil and water quality, aesthetics and other appropriate benefits of forestlands.

The MFC ensures that proper care is taken to manage school trust lands sustainably and that BMPs are utilized during the forest management process. Local school districts are the primary recipients of this timber-generated revenue, which directly benefits students and schools in the area where the revenue is earned.

Mississippi's 16th Section School Trust Forestland is certified by the American Tree Farm System (ATFS), because of the sustainable management practices performed on these lands. The certification is the result of an innovative pilot project involving a partnership between the MFC and the ATFS. This certification ensures that these lands are being properly and sustainably managed and that Mississippi will remain a strong competitor in the growing global need of certified wood. https://www.mfc.ms.gov/programs/public-lands-programs/

Educational Workshops and Public Outreach

The MFC in conjunction with other agencies and non-government organizations such as county forestry associations (CFAs) offers educational workshops and public outreach programs that help educate Mississippians of all ages on best management practices, fire prevention, and forest stewardship. Educational workshops are offered for individuals, students, communities, and community groups to educate the public on topics such as the importance of Mississippi's forest resources, MFC information, and wildfire prevention.
https://www.mfc.ms.gov/programs/educational-workshops/

Education and outreach programs and efforts include:

Firewise
Prescribed Burning Short Courses
Wildfire prevention education
Arbor Day Tree giveaways and sales
Underserved Landowner Outreach
Water Quality and Forestry Best Management Practices
Downloadable publications for landowners, educators and others

OTHER PUBLIC FORESTRY PROGRAMS

Several other state and federal programs have been developed to provide incentives and technical assistance to landowners to encourage reforestation, protection and management of existing forests.

USDA Conservation Programs

Agricultural Conservation Easement Program (ACEP) - ACEP helps landowners, land trusts, and other entities protect, restore, and enhance wetlands, grasslands, and working farms and ranches through conservation easements. Under the Agricultural Land Easements (ALE) component, NRCS helps American Indian tribes, state and local governments and non-governmental organizations protect working agricultural lands and limit non-agricultural uses of the land. Under the Wetlands Reserve Easements component, NRCS helps to restore, protect and enhance enrolled wetlands.
https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/acep/

Conservation Reserve Program (CRP) - USDA Farm Service Agency's (FSA) CRP is a voluntary program that contracts with agricultural producers so that environmentally sensitive agricultural land is not farmed or ranched, but instead devoted to conservation benefits. CRP participants establish long-term, resource-conserving plant species, such as approved grasses or trees to control soil erosion, improve water quality and develop wildlife habitat. In return, FSA provides participants with rental payments and cost-share assistance. Contract duration is between 10 and 15 years.
https://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-program/index

Conservation Stewardship Program (CSP) – USDA assists with tree stand improvement, weed suppressions, wildlife habitat development and custom plans. Through NRCS, landowners receive free technical assistance and may receive financial assistance, if eligible for agroforestry practices, pest management, wildlife habitat enhancements and livestock management.
https://www.nrcs.usda.gov/wps/portal/nrcs/detail/ms/programs/financial/csp/?cid=nrcs142p2_017129

Environmental Quality Incentives Program (EQIP) – EQIP national priorities focus on assisting landowners with practices to reduce nonpoint source pollution, conserving ground and surface water, reducing emissions, reducing soil erosion and sedimentation, promoting at-risk species habitat conservation, conserving energy and supporting biological carbon storage and sequestration. For details and signup information,
https://www.nrcs.usda.gov/wps/portal/nrcs/main/ms/programs/financial/eqip/

Emergency Watershed Protection Program (EWPP) - The program's primary emphasis is to retire frequently-flooded bottomland from agriculture uses, allowing the unimpeded reach and

flows off floodwaters. It also eliminates the need for future disaster payments on frequently flooded cropland. Floodplain easements restore, protect, maintain, and enhance the functions of the floodplain; conserve natural values including fish and wildlife habitat, water quality, flood water retention, groundwater recharge, and open space; reduce long-term federal disaster assistance; and safeguard lives and property from floods, drought, and products of erosion. https://www.nrcs.usda.gov/wps/portal/nrcs/main/ms/programs/financial/ewp/

Healthy Forest Reserve Program (HFRP) - HFRP helps landowners restore, enhance and protect forestland resources on private lands through easements and financial assistance. HRFP aids the recovery of endangered and threatened species under the Endangered Species Act, improves plant and animal biodiversity and enhances carbon sequestration. HFRP provides landowners with 10-year restoration agreements and 30-year or permanent easements for specific conservation actions. For acreage owned by an American Indian tribe, there is an additional enrollment option of a 30-year contract. Some landowners may avoid regulatory restrictions under the Endangered Species Act by restoring or improving habitat on their land for a specified period of time.
https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/forests/

Mississippi Department of Wildlife, Fisheries and Parks Programs

Private Lands Program (PLP) offers a variety of services to help private landowners achieve their wildlife management objectives. Initiatives include Fire on the Forty and the Longleaf Pine Initiative. Through the Private Land Habitat Program landowners and leaseholders receive technical assistance from MDWFP wildlife biologists on wildlife management needs.
https://www.mdwfp.com/wildlife-hunting/private-lands-program/private-lands-program/

Fire on the Forty workshops provide an opportunity for landowners to learn about prescribed fire in a classroom setting, followed by a field exercise where landowners are given the opportunity to participate in an actual prescribed burn, weather permitting. Workshops are organized by multiple partners and may be hosted at state owned facilities, such as Wildlife Management Areas, State Parks, and State Lakes, or even on private lands where possible. The Fire on the Forty steering committee works with the Mississippi Prescribed Fire Council to focus workshops within focal areas. However, workshops are also conducted outside of focal areas where landowner interest is high or logistics for conducting workshops are highly favorable.
http://www.mdwfp.com/wildlife-hunting/private-lands-program/fof_workshops.aspx

The Mississippi Scenic Streams Stewardship Program (SSSP) was established in 1999 by the Legislature to encourage voluntary private conservation efforts by riparian (streamside) landowners. Once a public waterway in Mississippi is designated by legislative action as scenic, MDWFP as the lead agency through its Mississippi Museum of Natural Science (MMNS) and its Advisory Council, develop a cooperative, voluntary stewardship plan for the stream. Individual landowner agreements can provide a connected patchwork of protected stream banks along the

length of a stream. The goal is to maintain good water quality for recreation and fish and wildlife habitat through use of Forestry BMPs (water quality improvement practices that will maintain the health of streams by keeping stream banks in good condition and preventing harmful sedimentation). In 2003, the Legislature enacted a law to allow a Mississippi income tax credit on 50 percent of allowable transaction costs (appraisals, baseline surveys, engineering and surveying fees, legal fees, title review and insurance, etc.) up to a limit of $10,000 for landowners placing lands adjacent to scenic streams in conservation easements. https://www.mdwfp.com/fishing-boating/public-waters-program/scenic-streams-program/

The State and Tribal Wildlife Grants Program (SWG) was established by Congress in 2001 and administered by the MDWFP through the MMNS to direct federal funding to the states for cost-effective conservation aimed at preventing wildlife from becoming endangered. Projects are aimed at protecting priority habitat for Species of Greatest Conservation Need (SGCN) identified through the State Wildlife Action Plan (SWAP) and can be used for an array of protection and restoration efforts on public and private lands. Funding is contingent on the approval of the state's SWAP by the USFWS every ten years. https://www.mdwfp.com/museum/seek-study/state-wildlife-action-plan/

The **Mississippi Natural Heritage Program**, housed within the MMNS, has four major areas of activity:
1. To obtain information on the status and location of rare biota and other entities of conservation interest.
2. To maintain distributional and status information on rare biota, exemplary natural communities, and other natural features of conservation interest in the Biotics Database.
3. To use information in the database to facilitate conservation of these entities during the environmental review process. Avoidance of impacts is encouraged, where possible, if necessary to maintain the existence of a population, integrity of a community or natural feature, and when there is potential for negative impacts to legally protected species. Best management practices are also encouraged on state, federal, and private lands.
4. To manage and promote the Natural Areas Registry and the Scenic Streams Stewardship Program. Both programs encourage landowners to voluntarily protect special habitats and streamside areas either through non-binding conservation agreements or long-term conservation easements. State and Federal income tax incentives exist for landowners who protect these areas through the creation of conservation easements.

US Fish and Wildlife Service (USFWS) Programs

Mississippi Partners for Fish and Wildlife Program (MPFW) is a voluntary program administered by the USFWS with several other federal, state, corporate and non--profit partners to provide technical and financial assistance to landowners who want to restore, improve and protect fish and wildlife habitats on their property. In Mississippi, the Partners Program works with interested private landowners to restore longleaf pine forests, bottomland hardwood forests, and wetland hydrology. The Partners Program informs landowners about invasive exotics, endangered species, habitat restoration and wildlife management through written

materials, on the National Partners Program website and at seminars or workshops. https://www.fws.gov/MississippiES/partners3.html

The USFWS's **Safe Harbor** program for landowners with endangered species on their property. Landowners enter into a voluntary cooperative agreement with the Service or a state agency to improve or manage habitat for existing populations of endangered species. In exchange for actions that contribute to the recovery of listed species on non-federal lands, participating property owners receive formal assurances from the USFWS that if they fulfill the conditions of the SHA, the USFWS will not require any additional or different management activities by the participants without their consent. At the end of the agreement period, participants may return the enrolled property to the baseline conditions that existed at the beginning of the SHA. https://www.fws.gov/endangered/landowners/safe-harbor-agreements.html

NON-GOVERNMENT FOREST CONSERVATION PROGRAMS

Non-profit Land Trusts and Conservancies

Land trusts are non-profit organizations created and sustained to preserve green spaces and protect environmentally and/or historically significant areas through direct land protection. They use tools such as conservation easements, estate planning, donations of property and bargain sales. Several local, state and national organizations are active in protecting environmentally important lands in Mississippi with a focus on conservation easements and land acquisition. Land trusts are potential partners for forest land conservation and restoration. The Land Trust Alliance maintains a list of land trusts operating in each state. For more information on land trusts that operate in Mississippi, visit https://bit.ly/2RSlpNf.

Corporations

Forest products companies such as pulp and paper companies own and/or control management on significant amounts of forestland in Mississippi, many of which include unique resources and opportunities for public use and benefit. Resource protection programs consist of two types: those industries that initiate voluntarily by company policy and those that involve cooperative agreements with government agencies and conservation organizations.

The **Sustainable Forestry Initiative (SFI)** program is a standard of environmental principles, objectives and performance measures that integrate the perpetual growing and harvesting of trees with the protection of wildlife, plants, soil and water quality with a wide range of other conservation goals. SFI Inc. is governed by an independent three-chamber board of directors that sets SFI's strategic direction and is responsible for overseeing and improving the internationally recognized SFI Program and SFI standards. https://www.sfiprogram.org/aboutus/

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FutureMetrics. www.futuremetrics.info

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Acronyms

AFC	Alabama Forestry Commission
ACUB	Army Compatible Use Buffer Program
ACEP	Agricultural Conservation Easement Program (USDA)
AFPA	American Forest & Paper Association
AI&DCR	Annual Insect & Disease Conditions Reporting Process
ALE	Agricultural Land Easement Program (USDA)
ALB	Asian Longhorned Beetle
ANC	Alaska Native Corporations
AON	Assessment of Need
ASU	Alcorn State University
ASU ES	Alcorn State University Extension Service
ATFS	American Tree Farm System®
AWSR	Annual Wildfire Summary Report
BMP	Best Management Practice
BTU	British Thermal Unit
CARS	Communities at Risk
ccf	Hundred cubic feet
CE	Conservation Easement
CEA	Cooperative Equipment Agreement
CFA	County Forestry Association
CFAA	Cooperative Forestry Assistance Act
CFC	County Fire Coordinator
CFHP	Cooperative Forest Health Program
CFPF	Community Fire Protection Funds
CFPM	Cooperative Fire Program Manager
CFPP	Cooperative Fire Protection Program
CFS	Certified Forest Stewards
CPA	Conservation Priority Area
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program
CWCS	Comprehensive Wildlife Conservation Strategy
CWM	Cooperative Weed Management Program
CWPP	Community Wildfire Protection Plan
DoD	Department of Defense
DWH	Deepwater Horizon (oil disaster)
EAB	Emerald Ash Borer
EDRR	Early Detection and Rapid Response
EOY	End-of-Year Accomplishment Reports
EQIP	Environmental Quality Incentives Program
ES	Extension Service
ESA	Endangered Species Act
EPAs	Electric Power Associations
FACTA	Food, Agriculture, Conservation and Trade Act
FACTS	Forest Activity Computerized Tracking System
FAP	Forest Action Plan
FC/USA	Firewise Community/USA Communities Parks
FEMA	Federal Emergency Management Agency
FEPP	Federal Excess Personal Property
FFP	Firefighter Program
FHM	Forest Health Monitoring
FHP	Forest Health Protection

FIA	Forest Inventory and Analysis
FLA	Forest Legacy Area
FLIS	Forest Legacy Information System
FLP	Forest Legacy Program
FRDP	Forest Resource Development Program
FSA	Farm Services Agency
FSC	Forest Stewardship Council
FSCC	Forest Stewardship Coordinating Committee
FSMP	Forest Stewardship Management Plan
FSP	Forest Stewardship Program
GIS	Geographic Information System
GSA	General Services Administration
HFRP	Healthy Forest Reserve Program
HMGP	Hazard Mitigation Grant Program
HMT's	Hazard Mitigation Technicians
HUC	Hydrologic Unit Code
HWA	Hemlock Woolly Adelgid
IAFC	International Association of Fire Chiefs
IMT	Incident Management Teams
ISM	Invasive Species Management
LIP	Landowner Incentive Program
LLA	Longleaf Alliance
LRFP	Limited Resource Farmer Program
LTMCP	Land Trust for the Mississippi Coastal Plain
LDAF	Louisiana Department of Agriculture and Forestry
MAOC	Mississippi Association of Cooperatives
MAOCS	Mississippi Association of County Supervisors
MAPDD	Mississippi Association of Planning and Development Districts
MARIS	Mississippi Automated Resource Information System
MCF	thousand cubic feet
MCWMA	Mississippi Cooperative Weed Management Area
MDA	Mississippi Development Authority
MDAC	Mississippi Department of Agriculture and Commerce
MDEQ	Mississippi Department of Environmental Quality
MDOE	Mississippi Department of Education
MDOT	Mississippi Department of Transportation
MDWFP	Mississippi Department of Wildlife, Fisheries and Parks
MFA	Mississippi Forestry Association
MFC	Mississippi Forestry Commission
MFSC	Mississippi Forest Stewardship Committee
MFSP	Mississippi Forest Stewardship Program
MGD	million gallons per day
MID	Mississippi Insurance Department
MIFI	Mississippi Institute for Forest Inventory
MLIT	Mississippi Longleaf Implementation Team
MLA	Mississippi Loggers Association
MLT	Mississippi Land Trust
MMNS	Mississippi Museum of Natural Science
MNHP	Mississippi Natural Heritage Program
MPFW	Mississippi Partners for Fish and Wildlife Program
MPFC	Mississippi Prescribed Fire Council
MRT	Mississippi River Trust
MRTC	Mississippi Reforestation Tax Credit
MRV	Mississippi River Valley

MSOS	Mississippi Secretary of State
MSPLT	Mississippi Project Learning Tree
MSSSP	Mississippi Scenic Streams Stewardship Program
MSU	Mississippi State University
MSU ES	Mississippi State University Extension Service
MSU CFR	Mississippi State University College of Forest Resources
MSU FWRC	Mississippi State University Forest and Wildlife Research Center
MSWCC	Mississippi Soil and Water Conservation Commission
MUFC	Mississippi Urban Forest Council
NASF	National Association of State Foresters
NASFM	National Association of State Fire Marshals
NEMA	National Emergency Management Association
NEPA	National Environmental Policy Act
NFHPM	National Forest Health Program Managers
NFPA	National Fire Protection Association
NFPORS	National Fire Plan Operations and Reporting System
NFP-SFA	National Fire Plan, State Fire Assistance Program
NFP-VFA	National Fire Plan Volunteer Fire Assistance Grant
NGO	Non-governmental organization
NIPF	Nonindustrial Private Forest
NMKC	North Mississippi Kudzu Coalition
NNI	Non-native invasive
NNIP	Non-native invasive plants
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NTFP	Non-timber forest products
NWTF	National Wild Turkey Federation
PFW	Partners for Fish and Wildlife
PMAS	Performance Management Accountability System
PPE	Personal Protection Equipment
RAWS	Remote Automated Weather Station
RC&D	Resource Conservation and Development
RCFP	Rural Community Fire Protection Program
RCW	Red-Cockaded Woodpeckers
REC	Roscommon Equipment Center
RFA	Rural Forestry Assistance
S&PF	State and Private Forestry
SBA	Small Business Administration
SFA	State Fire Assistance
SFI	Sustainable Forest Initiative®
SFM	Sustainable forest management
SFSCC	State Forest Stewardship Coordinating Committee
SFSP	State Forest Stewardship Plan
SGCN	Species of Greatest Conservation Need
SGSF	Southern Group of State Foresters
SMZ	Streamside Management Zones
SOD	Sudden oak death
SPB	Southern Pine Beetle
SWG	State Wildlife Grants Program
SWRA	Southern Wildfire Risk Assessment
TCF	The Carbon Fund
TCD	Thousand canker disease
TFP	Tree Farm Program
TNC	The Nature Conservancy

UCF	Urban and Community Forestry
ULP	Underserved Landowner Program
USDA	United States Department of Agriculture
USDA FSA	United States Department of Agriculture Farm Services Agency
USDA NRCS	United States Department of Agriculture Natural Resources Conservation Service
USDA RC&D	United States Department of Agriculture Resource Conservation and Development
USDA STC	United States Department of Agriculture State Technical Committee
USDOI	United States Department of the Interior
USEPA	United States Environmental Protection Agency
USFA	United States Fire Administration
USFS	United States Department of Agriculture Forest Service
USFWS	United States Fish and Wildlife Service
VFA	Volunteer Fire Assistance Program
VFD	Volunteer Fire Departments
WAT	Wetlands America Trust
WFHF	Wildland Fire, Hazardous Fuels
WFI	Wildland Fire Investigators
WHDP	Wildlife Habitat Development Plan
WMA	Wildlife Management Area
WRC	Wolf River Conservancy
WREP	Wetlands Reserve Easement Program
WRPO	Wetlands Reserve Plan of Operations
WSFM	Western States Fire Managers
WUI	Wildland-Urban Interface
WUIWT	Wildland/Urban Interface Working Team

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Mississippi Land Trust
Mississippi Natural Heritage Program
Mississippi Wildlife Federation
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US Fish and Wildlife Service
USDA Farm Service Agency
USDA Forest Service
USDA Natural Resources Conservation Service
USDA State Technical Committee
Weyerhaeuser
Wildlife Mississippi

Appendix

Appendix A: Program Guidance and Plans
Appendix B: Public Involvement
Appendix C: Integration of Other Plans and Assessments
Appendix D: Mississippi Forest Legacy Program Plan Update

Appendix A: Program Guidance and Plans

Detailed Program Guidance
The following are links to current guidance documents and plans that include additional detail and recommendations on implementation of strategies for specific programs and issue areas discussed in *Mississippi's Forest Action Plan* 2020.

1. USDA Forest Service Forest Action Plan Guidance - In the 2008 Farm Bill, Congress tasked the states and territories with assessing all the forests within their boundaries and developing strategies to improve the health, resiliency, and productivity of those forests. Assessing forest resources and engaging in strategic planning for those resources were not new activities for most states and territories. For others, the 2008 Farm Bill presented an opportunity to revise their usual agency planning process. Each state has been tasked with completing comprehensive revisions of their Forest Action Plans by the close of December 2020. Below are links to guidance on developing and updating FAPs.
https://www.stateforesters.org/wp-content/uploads/2018/10/NMSFA-NA-StateForestActionPlan-Guide-20180831-1-1.pdf

https://www.stateforesters.org/forest-action-plans/

2. Enabling Legislation, Cooperative Forestry Assistance Act Authority
https://www.law.cornell.edu/uscode/text/16/chapter-41

3. Forest Protection – Southern Wildfire Risk Assessment
https://bit.ly/2RTXxsF

4. Mississippi Forest Legacy Program – Program Plan
https://bit.ly/2XUQsfh

5. Mississippi Forest Stewardship Program https://www.mfc.ms.gov/programs/private-landowner-services/forest-stewardship/

6. Urban and Community Forestry – Mississippi Urban and Community Forestry Program
https://www.mfc.ms.gov/programs/urban-community-forestry/urban-and-community-forestry-program/

7. Mississippi State Wildlife Action Plan (2015-2025) https://www.mdwfp.com/museum/seek-study/state-wildlife-action-plan/

Appendix B: Public Involvement

Mississippi Forest Assessment Public Survey and Stakeholder Meeting Results

During the development of the 2010 *Mississippi's Assessment of Forest Resources and Forest Resource Strategy*, the forerunner to this 2020 *Mississippi Forest Action Plan (FAP)*, the MFC conducted two statewide surveys to solicit input on key issues related to forest resources. During the development of the FAP update, MFC again utilized an online public and paper survey during 2019 to gain insight on additional key issues and emerging concerns, as well as ideas for approaching issues specific to Mississippi's unique forest land ownership, markets and resource conditions. Online survey participants were asked to evaluate the key issues identified in the original plan for importance and relevance to Mississippi's forest resources in the current context.

In addition to the public survey, a day-long stakeholder meeting in conjunction with Mississippi Forest Stewardship Coordinating Committee was held on October 23, 2019 to review and affirm the key issues identified by the public and those from the 2010 plan. During that facilitated discussion stakeholders identified new threats to forest resources, emerging trends for inclusion in the updated FAP, data sources and to additional strategies. The results of the public survey and the stakeholder meeting are included in this Appendix.

In January 2020, the Mississippi state forester also reported on the progress of the FAP update at the annual USDA State Technical Committee meeting and invited input and encouraged participating in the comment process to be held later in the year.

Based on public and stakeholder input, the key issues were reduced from eight to seven. *Forest Sustainability and Resource Markets* were merged into one key issue area. The FAP was rearranged to make it more user-friendly and additional maps were added to better illustrate priority areas in the state. New strategies were added.

The draft FAP was distributed electronically to the USDA Forest Service, the USDA State Technical Committee and to stakeholders and interested partners for review and input in October 2020. Comments and input where appropriate were incorporated into the final plan.

About the survey participants

Survey participants provided demographic information including annual income, property ownership size, education, and state/county location. A total of 232 people participated in the online survey from 65 Mississippi counties. Participants from each survey were summarized by three ownership classes: traditional, underserved, and those who own no forestland. The traditional ownership class includes those whose income is greater than $40,000 annually and own more than ten acres. This group has long been eligible and able to participate in State and Federal cost-share assistance. Underserved landowners are those whose incomes are less than $40,000 and/or own less than ten acres of forestland. This group has historically been ineligible due to size of ownership or unable due to lack of capital. The third group was made up

of those who own no forestland. The data was summarized for each ownership class group by survey and expressed as a percent of number of responses.

Survey Results

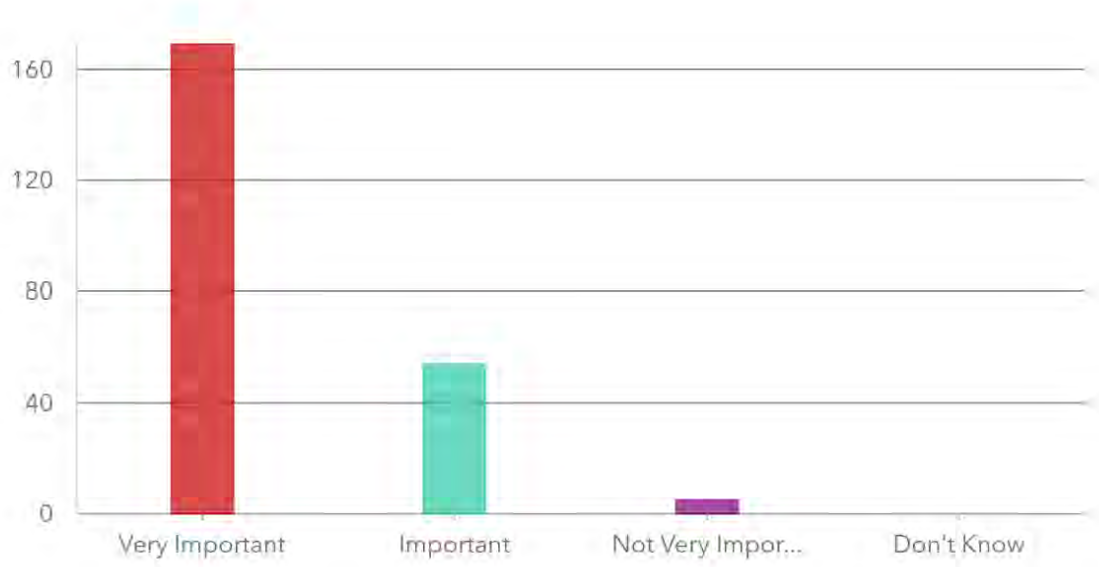
Ninety-percent of the participants believe that each key issue in the assessment was important or very important. The responses for the Other Issue category varied between surveys. In the online survey prescribed burning was the issue which had the highest percentage for each ownership class followed by Stewardship from traditional owners, and Wildfire by underserved and no ownership classes. Climate issue was very close in all ownership classes.

There were more variations in the paper survey. Wildfire and stewardship received the highest percentage followed by underserved landowners. Traditional landowners viewed prescribed burning, wildfire and stewardship as priorities. The Climate Change issue received the same percentage by all ownership classes.

The following are summaries of the public survey and stakeholder survey results.

1. Sustainable Development

Sustaining Mississippi's natural resources, while balancing economic development with quality of life, poses huge challenges to resource managers and economic developers. Critical resource decisions revolve around sustainability of forest products industries, water quality and quantity, urban development, landscape planning, and the desired states of Mississippi's forests and wildlife. How important to you is this issue in regard to Mississippi's forests and related natural resources?

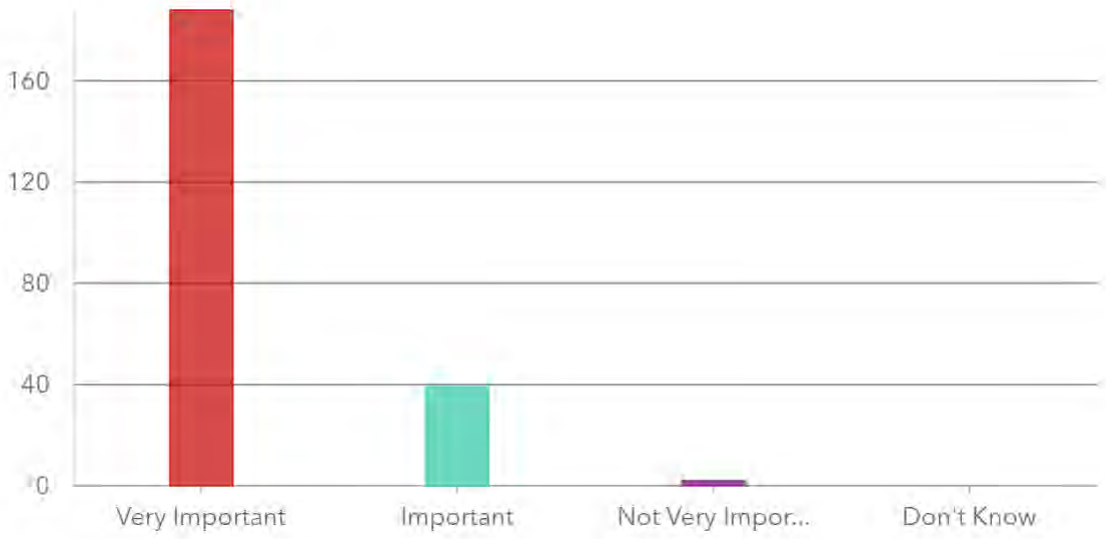


Answers	Count	Percentage
Very Important	169	72.84%
Important	54	23.28%
Not Very Important	5	2.16%
Don't Know	0	0%

Answered: 228 Skipped: 4

2. Resource Utilization

Fully utilizing Mississippi's abundant forest resource will require the development of new and diverse markets for forest products, in addition to expanding existing markets for wood fiber, wildlife and outdoor recreation, ecosystem services, carbon sequestration, and all other natural resource products. How important to you is this issue in regard to Mississippi's forests and related natural resources?

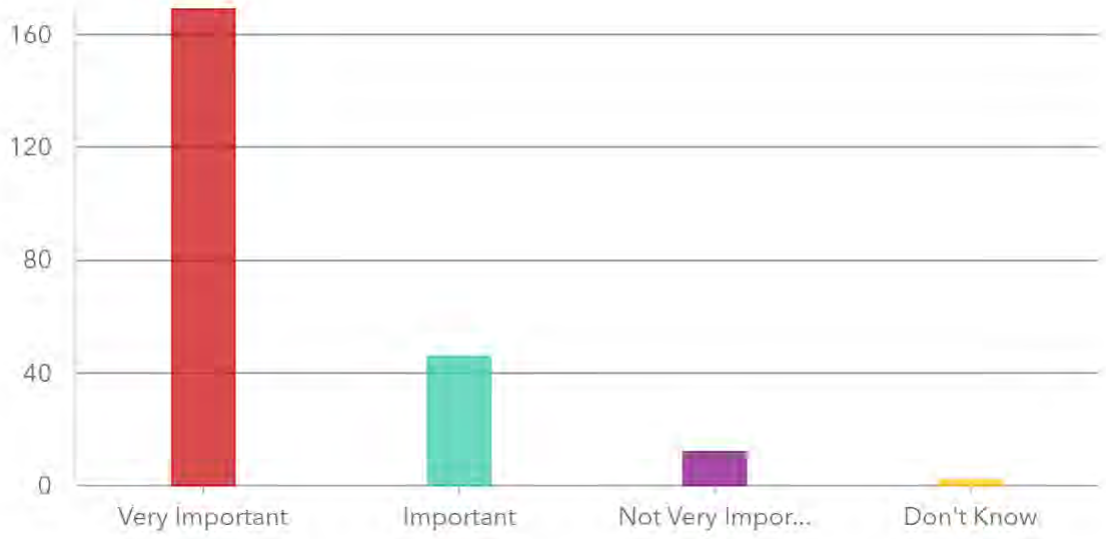


Answers	Count	Percentage
Very Important	188	81.03%
Important	39	16.81%
Not Very Important	2	0.86%
Don't Know	0	0%

Answered: 229 Skipped: 3

3. Land Ownership Policies

Seventy-six percent of Mississippi's forestland is in private ownership. Maintaining a productive and sustainable future for Mississippi's forests and other natural resources may very well be dependent on the development of a natural resource policy structured to promote and maintain private ownership. How important to you is this issue in regard to Mississippi's forests and related natural resources?

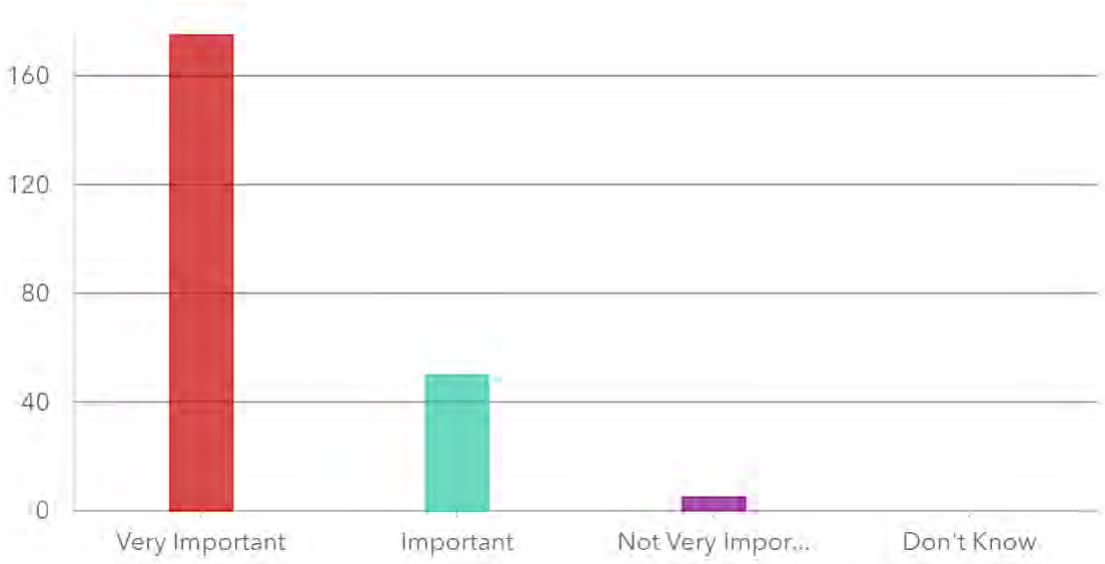


Answers	Count	Percentage
Very Important	169	72.84%
Important	46	19.83%
Not Very Important	12	5.17%
Don't Know	2	0.86%

Answered: 229 Skipped: 3

4. Invasive Species

The spread of non-native invasive species greatly impacts the productivity of the forest resource and creates significant challenges for the natural resource manager and landowner. Invasive species and tree damaging insects and pathogens pose a serious threat to the overall health of Mississippi's forest resource. How important to you is this issue in regard to Mississippi's forests and related natural resources?

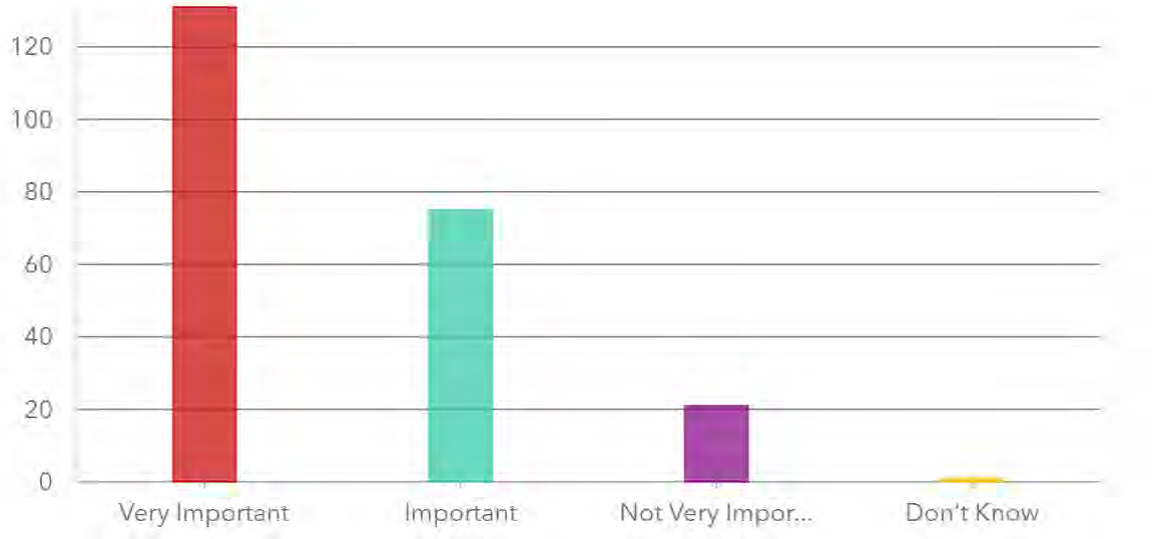


Answers	Count	Percentage
Very Important	175	75.43%
Important	50	21.55%
Not Very Important	5	2.16%
Don't Know	0	0%

Answered: 230 Skipped: 2

5. Renewable Energy

With an abundance of readily available biomass material, there is great potential for the development of energy from renewable natural resources in Mississippi. Effective utilization of the biomass resource and continued advancement in biofuel technology will help Mississippi address present and future energy challenges. How important to you is this issue in regard to Mississippi's forests and related natural resources?

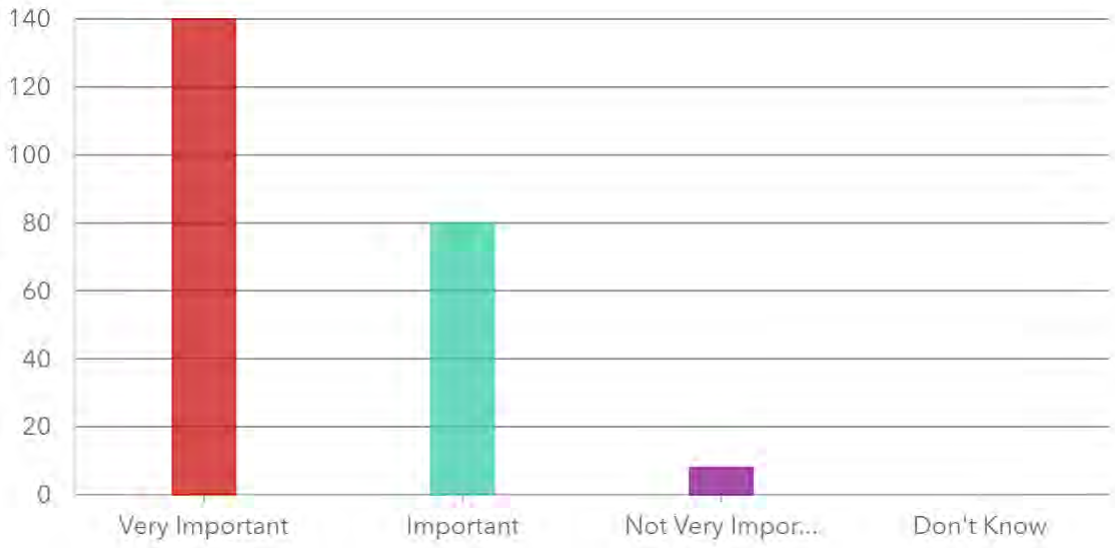


Answers	Count	Percentage
Very Important	131	56.47%
Important	75	32.33%
Not Very Important	21	9.05%
Don't Know	1	0.43%

Answered: 228 Skipped: 4

6. Stewardship Education

Providing effective natural resource education is vital to raising the level of environmental awareness in both youth and adults. At a young age, learning the importance of the forest and related natural resources can lead to the pursuit of a career in natural resources. Also, a better understanding of the wise use and stewardship of natural resources leads to policy makers and other individuals making sound, informed decisions in regard to natural resource public policy issues affecting the economic and ecological values of Mississippi's forest resource. How important to you is this issue in regard to Mississippi's forests and related natural resources?

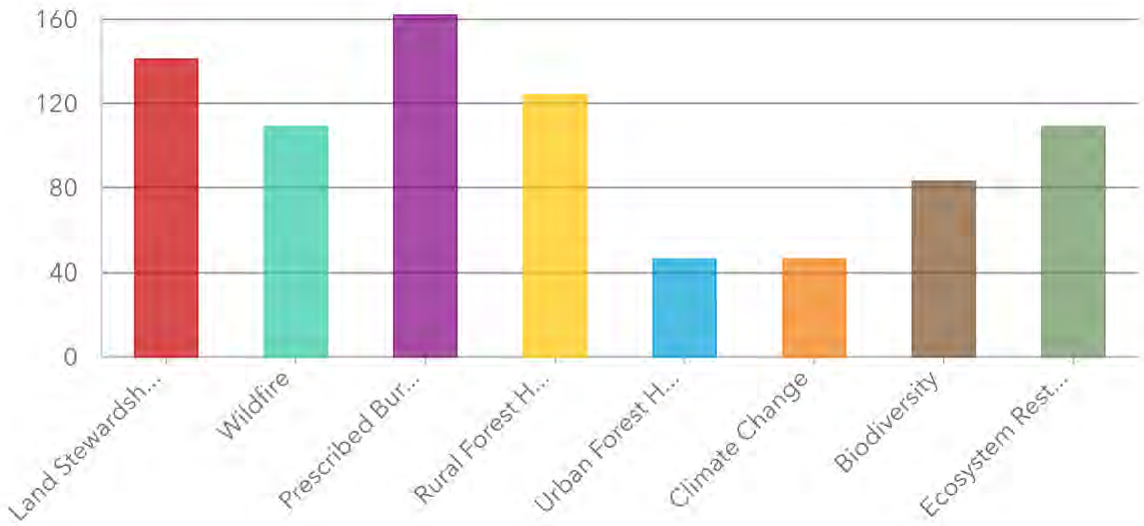


Answers	Count	Percentage
Very Important	140	60.34%
Important	80	34.48%
Not Very Important	8	3.45%
Don't Know	0	0%

Answered: 228 Skipped: 4

7. Other Issues

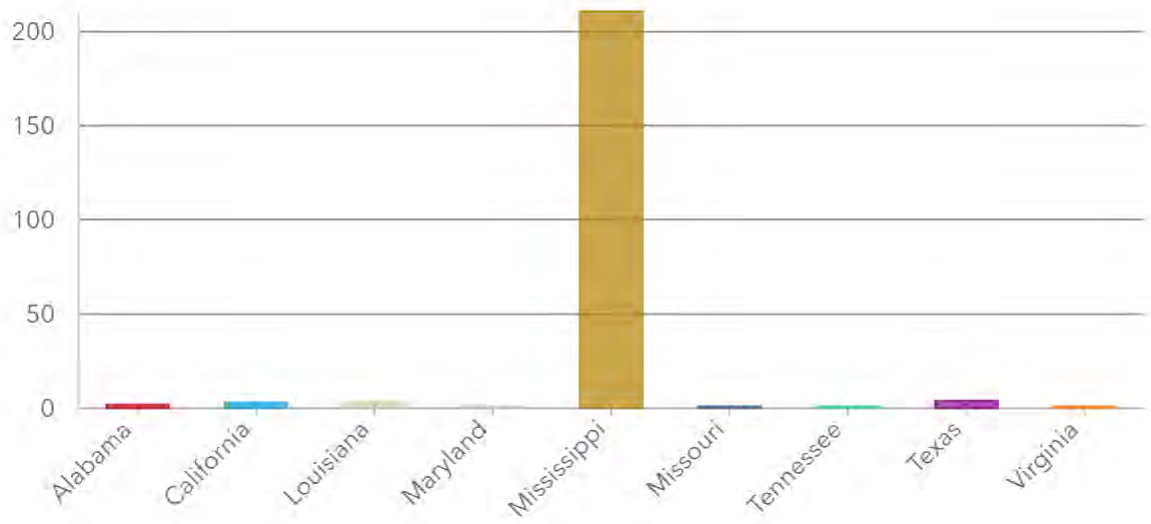
In addition to the issues presented in this survey, there may be other issues you believe are important to the forests and natural resources of Mississippi. Please review the additional issues listed below and identify any other issues you think should be addressed in the Mississippi Forest Assessment and Resource Strategy. (Select all that apply)



Answers	Count	Percentage
Land Stewardship	141	60.78%
Wildfire	109	46.98%
Prescribed Burning	162	69.83%
Rural Forest Health	124	53.45%
Urban Forest Health	46	19.83%
Climate Change	46	19.83%
Biodiversity	83	35.78%
Ecosystem Restoration/Rehabilitation	109	46.98%

Answered: 226 Skipped: 6

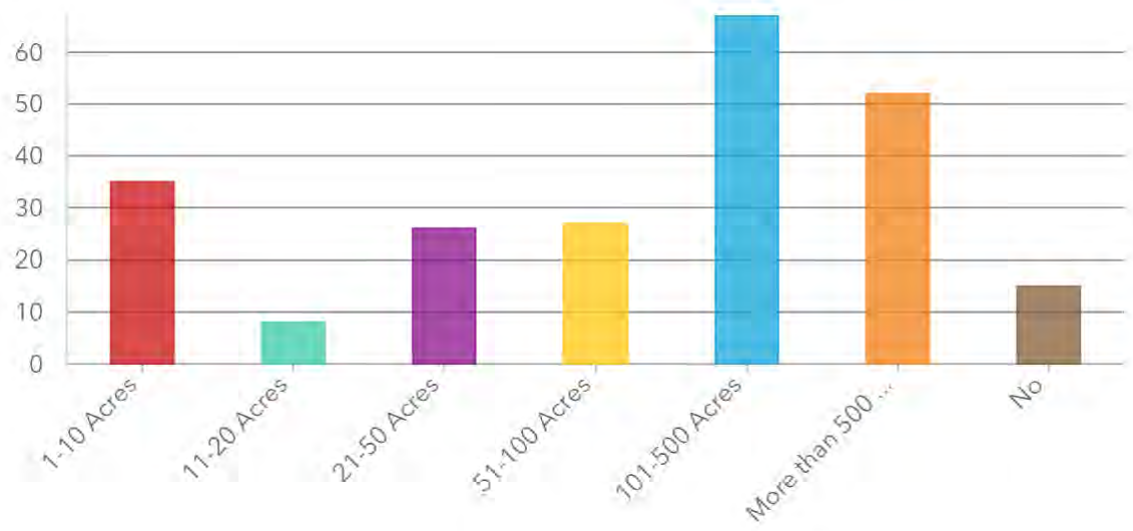
8. In which state do you currently live?



Answers	Count	Percentage
Alabama	2	0.86%
California	3	1.29%
Louisiana	3	1.29%
Maryland	1	0.43%
Mississippi	211	90.95%
Missouri	1	0.43%
Tennessee	1	0.43%
Texas	4	1.72%
Virginia	1	0.43%

Answered: 227 Skipped: 5

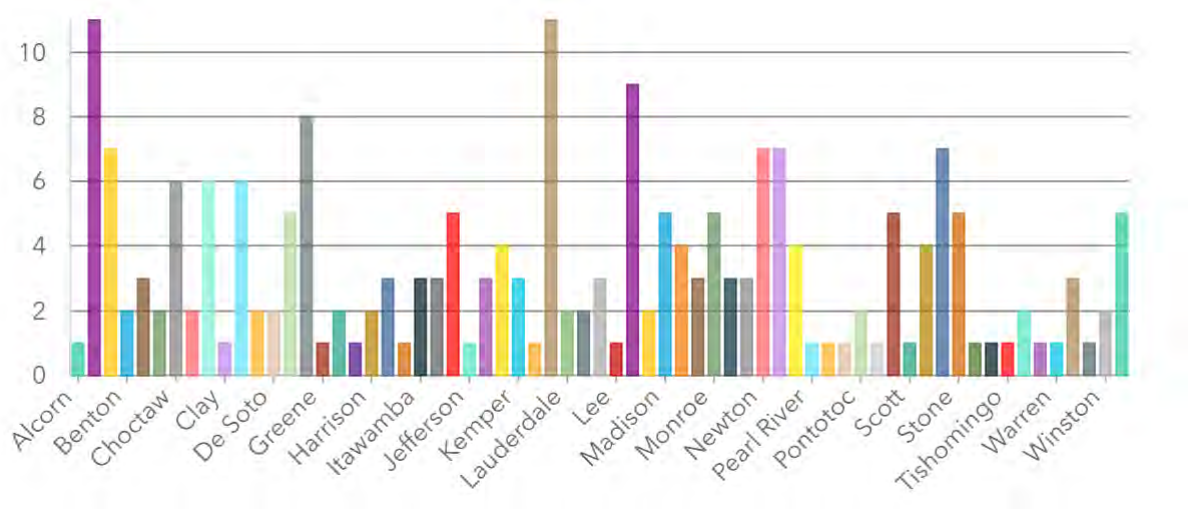
9. Do you own land in Mississippi?



Answers	Count	Percentage
1-10 Acres	35	15.09%
11-20 Acres	8	3.45%
21-50 Acres	26	11.21%
51-100 Acres	27	11.64%
101-500 Acres	67	28.88%
More than 500 Acres	52	22.41%
No	15	6.47%

Answered: 230 Skipped: 2

10. The majority of your land ownership is in which county?

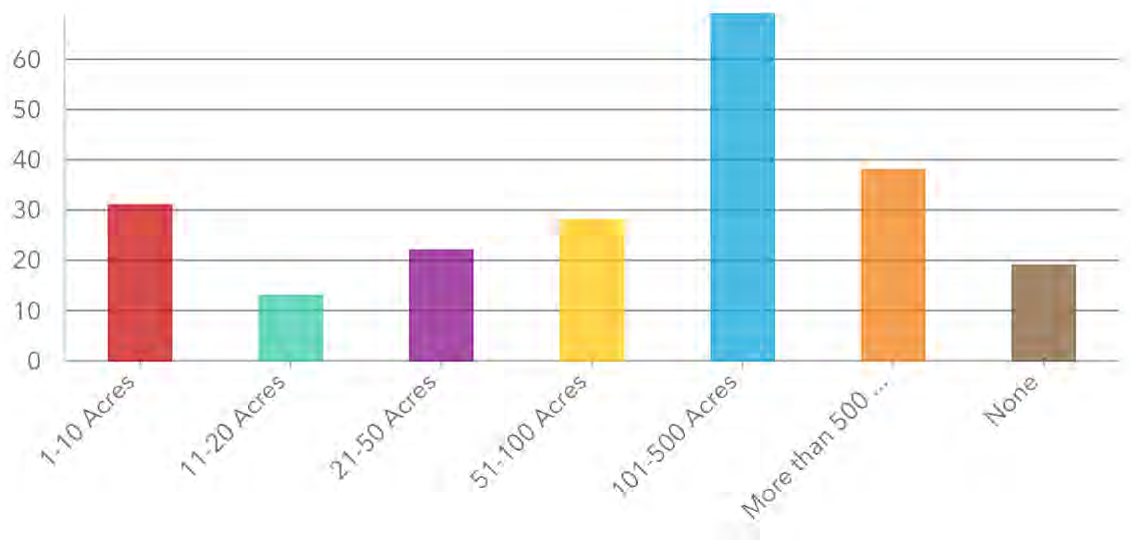


Answers	Count	Percentage
Alcorn	1	0.43%
Amite	11	4.74%
Attala	7	3.02%
Benton	2	0.86%
Calhoun	3	1.29%
Carroll	2	0.86%
Choctaw	6	2.59%
Claiborne	2	0.86%
Clarke	6	2.59%
Clay	1	0.43%
Copiah	6	2.59%
Covington	2	0.86%
De Soto	2	0.86%
Forrest	5	2.16%
Franklin	8	3.45%
Greene	1	0.43%

Grenada	2	0.86%
Hancock	1	0.43%
Harrison	2	0.86%
Hinds	3	1.29%
Holmes	1	0.43%
Itawamba	3	1.29%
Jackson	3	1.29%
Jasper	5	2.16%
Jefferson	1	0.43%
Jefferson Davis	3	1.29%
Jones	4	1.72%
Kemper	3	1.29%
Lafayette	1	0.43%
Lamar	11	4.74%
Lauderdale	2	0.86%
Lawrence	2	0.86%
Leake	3	1.29%
Lee	1	0.43%
Lincoln	9	3.88%
Lowndes	2	0.86%
Madison	5	2.16%
Marion	4	1.72%
Marshall	3	1.29%
Monroe	5	2.16%
Montgomery	3	1.29%
Neshoba	3	1.29%
Newton	7	3.02%

Oktibbeha	7	3.02%
Panola	4	1.72%
Pearl River	1	0.43%
Perry	1	0.43%
Pike	1	0.43%
Pontotoc	2	0.86%
Quitman	1	0.43%
Rankin	5	2.16%
Scott	1	0.43%
Simpson	4	1.72%
Smith	7	3.02%
Stone	5	2.16%
Tallahatchie	1	0.43%
Tate	1	0.43%
Tishomingo	1	0.43%
Tunica	2	0.86%
Union	1	0.43%
Warren	1	0.43%
Wayne	3	1.29%
Wilkinson	1	0.43%
Winston	2	0.86%
Yazoo	5	2.16%

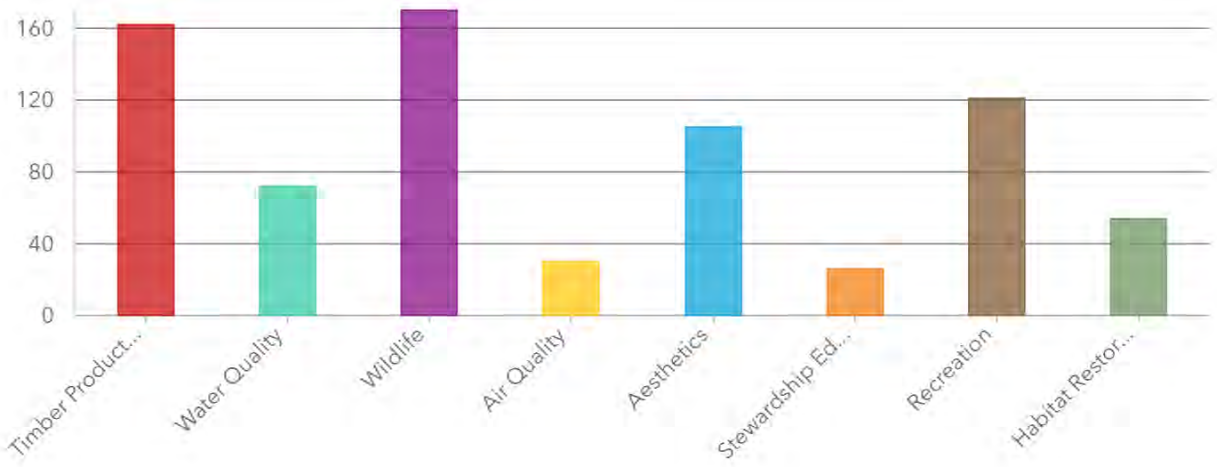
11. How much of your land is forested?



Answers	Count	Percentage
1-10 Acres	31	13.36%
11-20 Acres	13	5.6%
21-50 Acres	22	9.48%
51-100 Acres	28	12.07%
101-500 Acres	69	29.74%
More than 500 Acres	38	16.38%
None	19	8.19%

Answered: 220 Skipped: 12

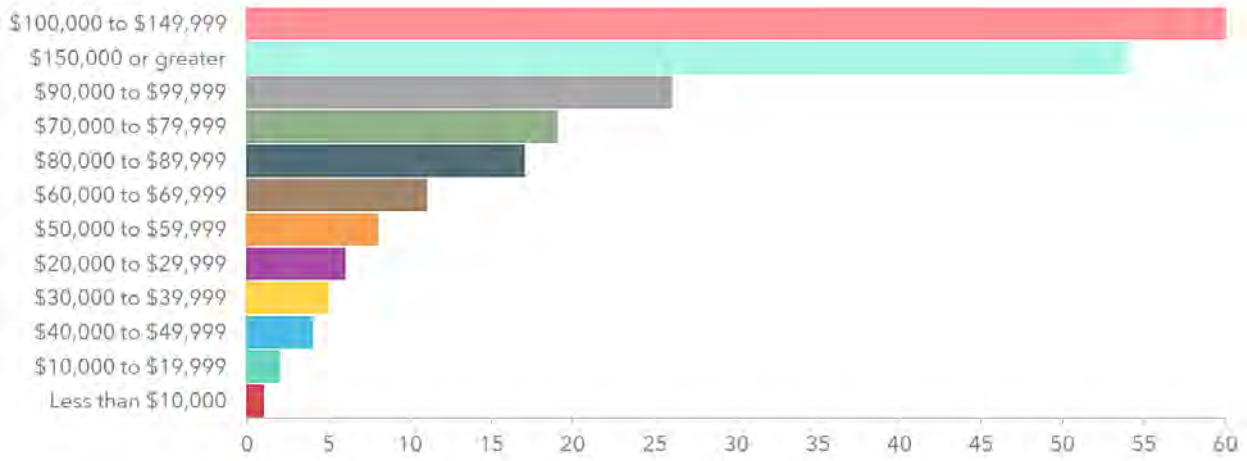
12. Do you actively manage your forestland for any of the following? (Select all that apply)



Answers	Count	Percentage
Timber Production	162	69.83%
Water Quality	72	31.03%
Wildlife	170	73.28%
Air Quality	30	12.93%
Aesthetics	105	45.26%
Stewardship Education	26	11.21%
Recreation	121	52.16%
Habitat Restoration	54	23.28%

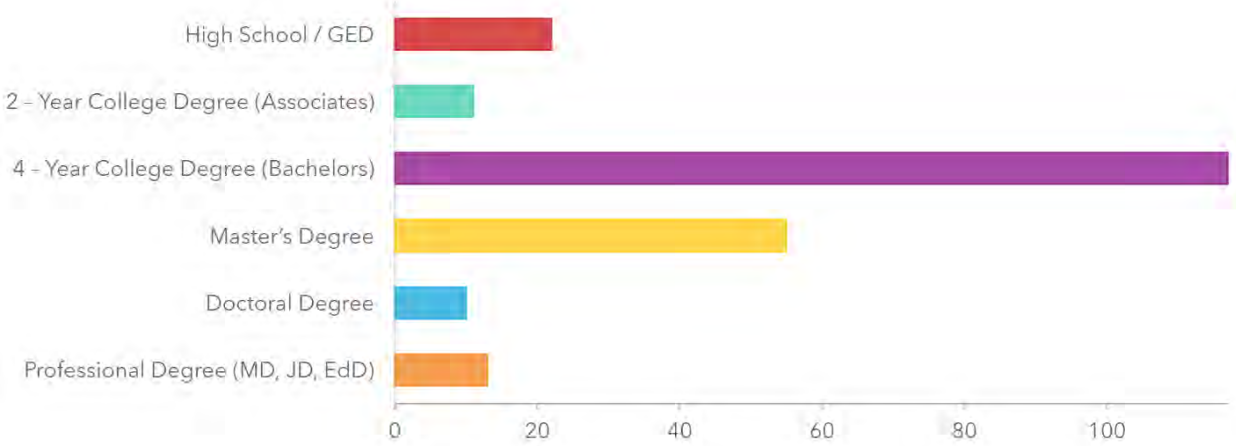
Answered: 201 Skipped: 31

13. What is your total annual household income, including all earners in your household?



Answers	Count	Percentage
$100,000 to $149,999	60	25.86%
$150,000 or greater	54	23.28%
$90,000 to $99,999	26	11.21%
$70,000 to $79,999	19	8.19%
$80,000 to $89,999	17	7.33%
$60,000 to $69,999	11	4.74%
$50,000 to $59,999	8	3.45%
$20,000 to $29,999	6	2.59%
$30,000 to $39,999	5	2.16%
$40,000 to $49,999	4	1.72%
$10,000 to $19,999	2	0.86%
Less than $10,000	1	0.43%

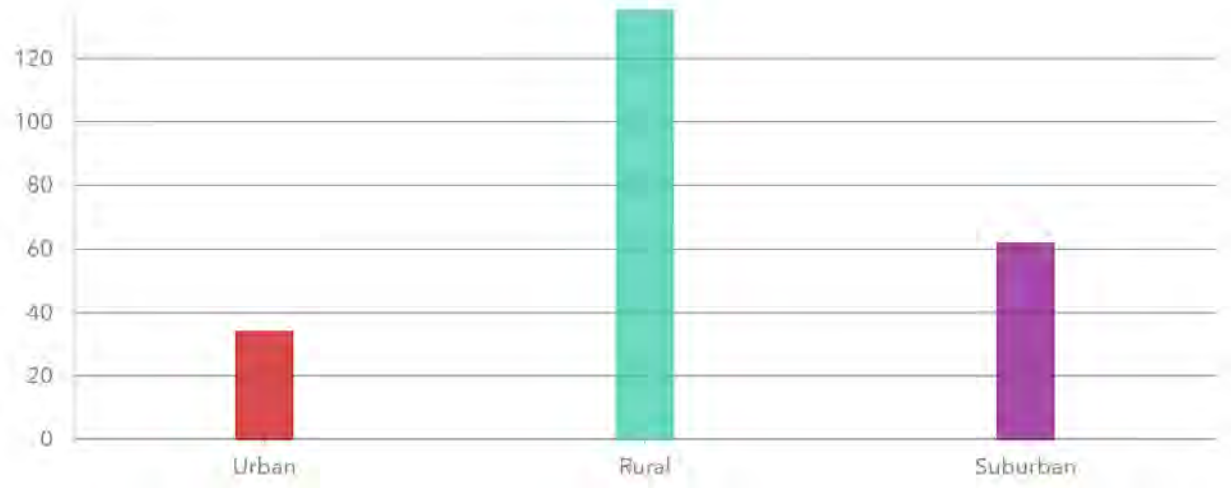
14. What is the highest level of education you have completed?



Answers	Count	Percentage
High School / GED	22	9.48%
2 - Year College Degree (Associates)	11	4.74%
4 - Year College Degree (Bachelors)	117	50.43%
Master's Degree	55	23.71%
Doctoral Degree	10	4.31%
Professional Degree (MD, JD, EdD)	13	5.6%

Answered: 228 Skipped: 4

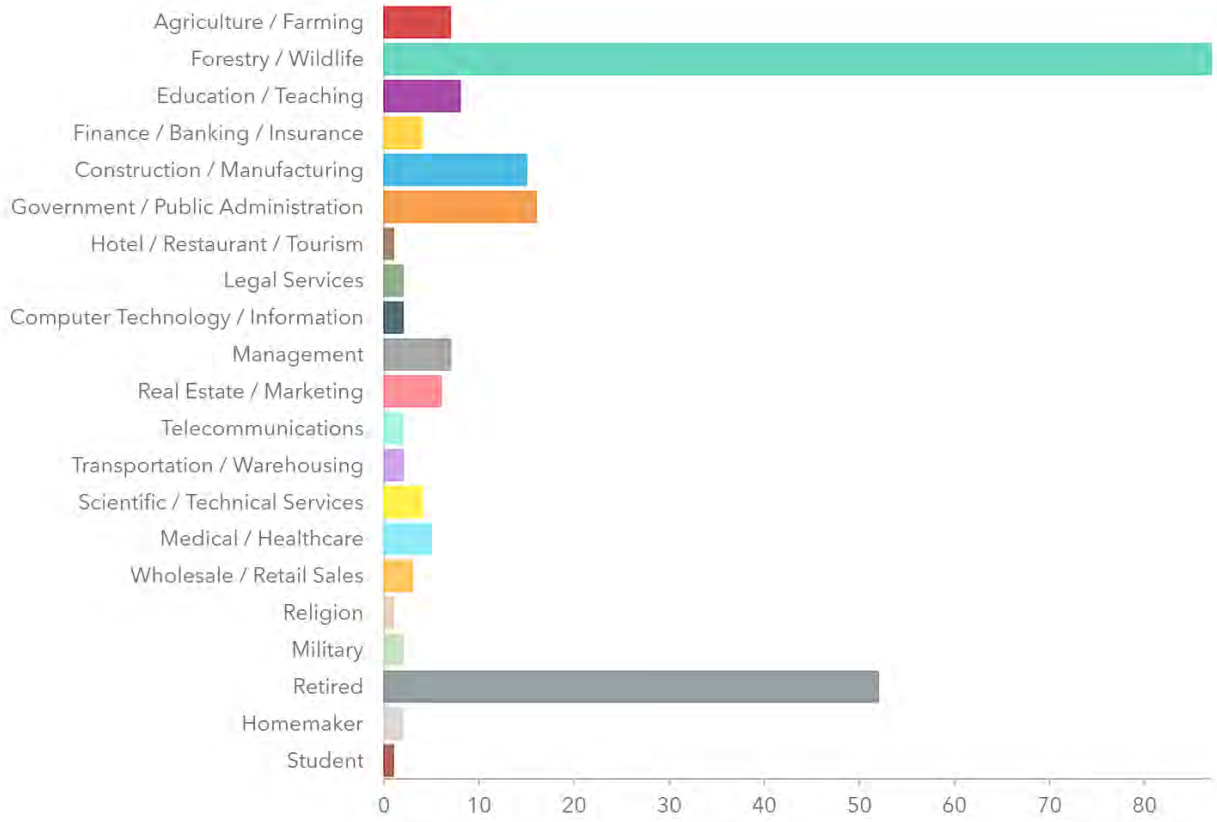
15. Do you live in an Urban or Rural Area?



Answers	Count	Percentage
Urban	34	14.66%
Rural	135	58.19%
Suburban	62	26.72%

Answered: 231 Skipped: 1

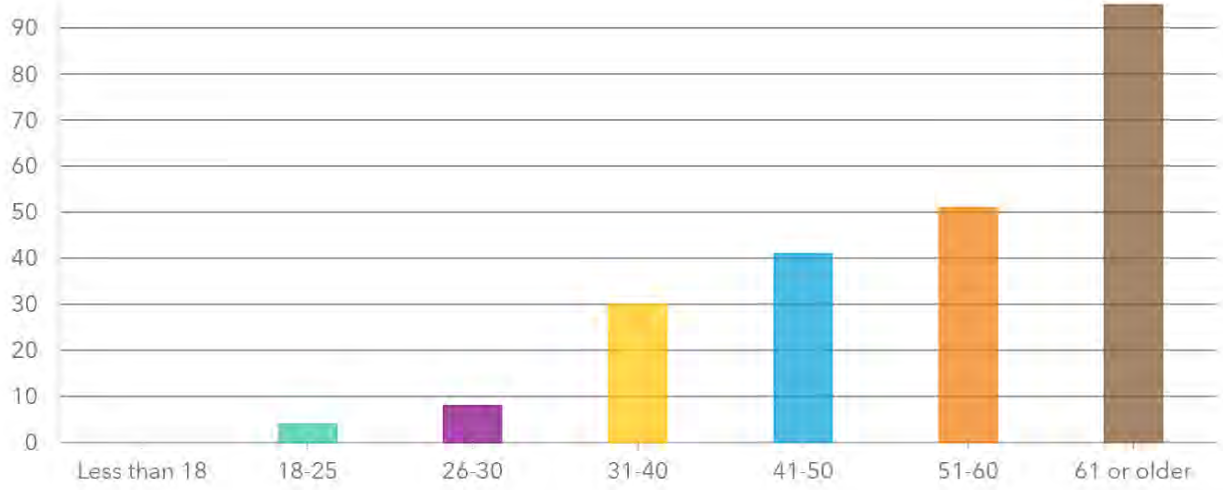
16. Which of the following best describes your primary area of employment?



Answers	Count	Percentage
Agriculture / Farming	7	3.02%
Forestry / Wildlife	87	37.50%
Education / Teaching	8	3.45%
Finance / Banking / Insurance	4	1.72%
Construction / Manufacturing	15	6.47%
Government / Public Administration	16	6.90%
Hotel / Restaurant / Tourism	1	0.43%
Legal Services	2	0.86%
Computer Technology / Information	2	0.86%
Management	7	3.02%
Real Estate / Marketing	6	2.59%

Telecommunications	2	0.86%
Transportation / Warehousing	2	0.86%
Scientific / Technical Services	4	1.72%
Medical / Healthcare	5	2.16%
Wholesale / Retail Sales	3	1.29%
Religion	1	0.43%
Military	2	0.86%
Retired	52	22.41%
Homemaker	2	0.86%
Student	1	0.43%

17. What is your age?



Answers	Count	Percentage
Less than 18	0	0%
18-25	4	1.72%
26-30	8	3.45%
31-40	30	12.93%
41-50	41	17.67%
51-60	51	21.98%
61 or older	95	40.95%

Answered: 229 Skipped: 3

Appendix C: Integration of Other Plans and Assessments

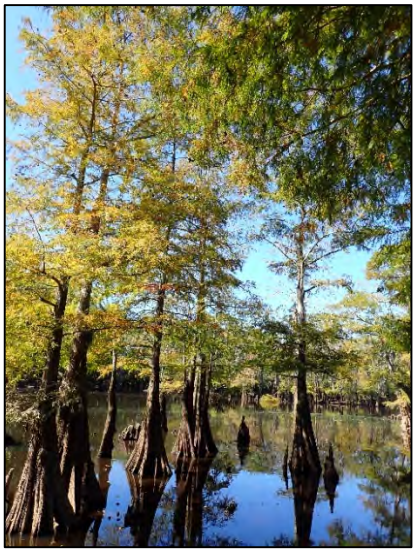
Community Wildfire Protection Plans: Mississippi has 32 county-wide plans completed at the time of this report.
https://www.mfc.ms.gov/wildfires/county-wildfire-prevention-plans/

Mississippi State Wildlife Action Plan: The description of all forest community types in this updated FAP are based on those found in the *Mississippi State Wildlife Action Plan* (2015). A link to the full MS SWAP is included. Recommendations for conservation actions in the Wildlife Key Issue Section are also based on those cited in the MS SWAP. For the complete *Mississippi State Wildlife Action Plan* (2015-2025)
https://bit.ly/2KmxGWm

Forest Legacy Program Plan Update: During the development of the 2020 *Forest Action Plan* update, MFC has also developed, with stakeholder input, an updated *Forest Legacy Program Plan* that is incorporated into the FAP as Appendix D.

Mississippi's Forest Legacy Program Plan

2020 Update



December 2020

Mississippi Forest Legacy Program Plan
Update 2020

Russell Bozeman, Mississippi State Forester
Richard McInnis, Assistant State Forester and Forest Legacy Program Coordinator
Elizabeth Rooks-Barber, Barber and Mann, Inc., Forest Legacy Program Contractor

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Cover photos: Courtesy of Elizabeth Barber, Barber and Mann, Inc. and Robert Smith, Photobiologist

Mississippi Forest Legacy Program Plan 2020
Table of Contents

Introduction and Purpose of the Forest Legacy Program

About the Forest Legacy Program

The Forest Legacy Program (FLP) is a conservation program administered by the USDA Forest Service in partnership with state agencies such as the Mississippi Forestry Commission (MFC) to encourage the protection of privately-owned forest lands *through the use of conservation easements or land purchases.* Protecting forest through FLP provides numerous public benefits including:

- Opportunities to hunt, fish, and camp
- Clean and abundant drinking water
- Habitat for fish and wildlife
- Timber, fuel wood, and other forest products.

The FLP was established in 1990 through an amendment to the Cooperative Forestry Assistance Act (CFAA) of 1978 (16 USC 2101 et seq.) to promote the long-term integrity of forestlands. Since its creation, FLP has conserved over 2.8 million acres of forest land and expanded across the country to 53 states and territories. These "working forests" protect water quality and provide wildlife habitat, forest products, nature-based recreation and other public benefits.

Loss of forested areas poses an increasing threat to the integrity of the nation's natural resources. When forested areas become fragmented and disappear, the benefits they provide are also diminished or lost. By providing economic incentives to landowners to keep their forests as forests, we can encourage sustainable forest management and support strong markets for forest products.

The purpose of the FLP is to identify and protect environmentally important forest areas that are threatened by conversion to non-forest uses and to promote forestland protection and other conservation opportunities. Desired program outcomes include the protection of important scenic, cultural, fish, wildlife, and recreational resources, riparian areas, and other ecological values. Traditional forest uses, including timber management, as well as hunting, fishing, hiking, and similar recreational uses are consistent with purposes of the FLP.

The FLP works with private landowners to acquire perpetual conservation easements that permanently limit property interests and uses to protect forest values. The FLP also purchases and accepts forested lands as donations. The FLP only works with willing sellers or donors. Lands purchased in fee title with FLP grant funds remain in ownership by a local, state or federal agency for conservation. Tracts nominated for the FLP must be within a designated Forest Legacy Areas (FLAs) and must meet the state and national program objectives described in this plan. Federal funds via a competitive grant to the State of Mississippi may fund up to 75 percent of FLP project costs. The remaining 25 percent (cost share) must come from non-federal coming from private, state or local sources.

Forest Legacy Program Success in Mississippi

From 2008 to 2020, MFC and public and private partners worked together to fund and protect 6,776 acres of forest lands in Mississippi threatened by conversion (5,511 in public lands and 1,265 acres of conservation easements on private lands).

Almost 600 acres of riparian forests have been protected along the Escatawpa River through the MS FLP.

Over 6,200 acres of natural forests have been conserved along and near the Pascagoula River and its tributaries.

Forest Legacy Program Plan Update 2020

Since the creation of the FLP in the 1990 Farm Bill, states interested in participating in the FLP have been required to demonstrate eligibility through development of an *Assessment of Need* (AON) that is approved by the U.S. Secretary of Agriculture through the Forest Service. Mississippi's first *AON* was approved in 2007. The 2008 Farm Bill amended the CFAA to require each state to complete a *State Forest Action Plan* in order to receive funds under the CFAA. The 2008 Farm Bill also states that, once approved, the *State Forest Action Plans* "shall be deemed to be sufficient to satisfy all relevant state planning and assessment requirements" under the Act. As a result, the previous FLP planning requirements that were manifested in the AON must now be incorporated into the *State Forest Action Plan*. Therefore, *Mississippi's Forest Action Plan 2020* incorporates this updated *Mississippi Forest Legacy Program Plan* (formerly called *Assessment of Need*) as an appendix.

In the future, the *MS FLP Plan* will be revised as needed every 10 years simultaneously with the update of the *State Forest Action Plan* and submitted to the USDA Forest Service for approval. Minor updates and corrections may be made in the interim, with Forest Service approval.

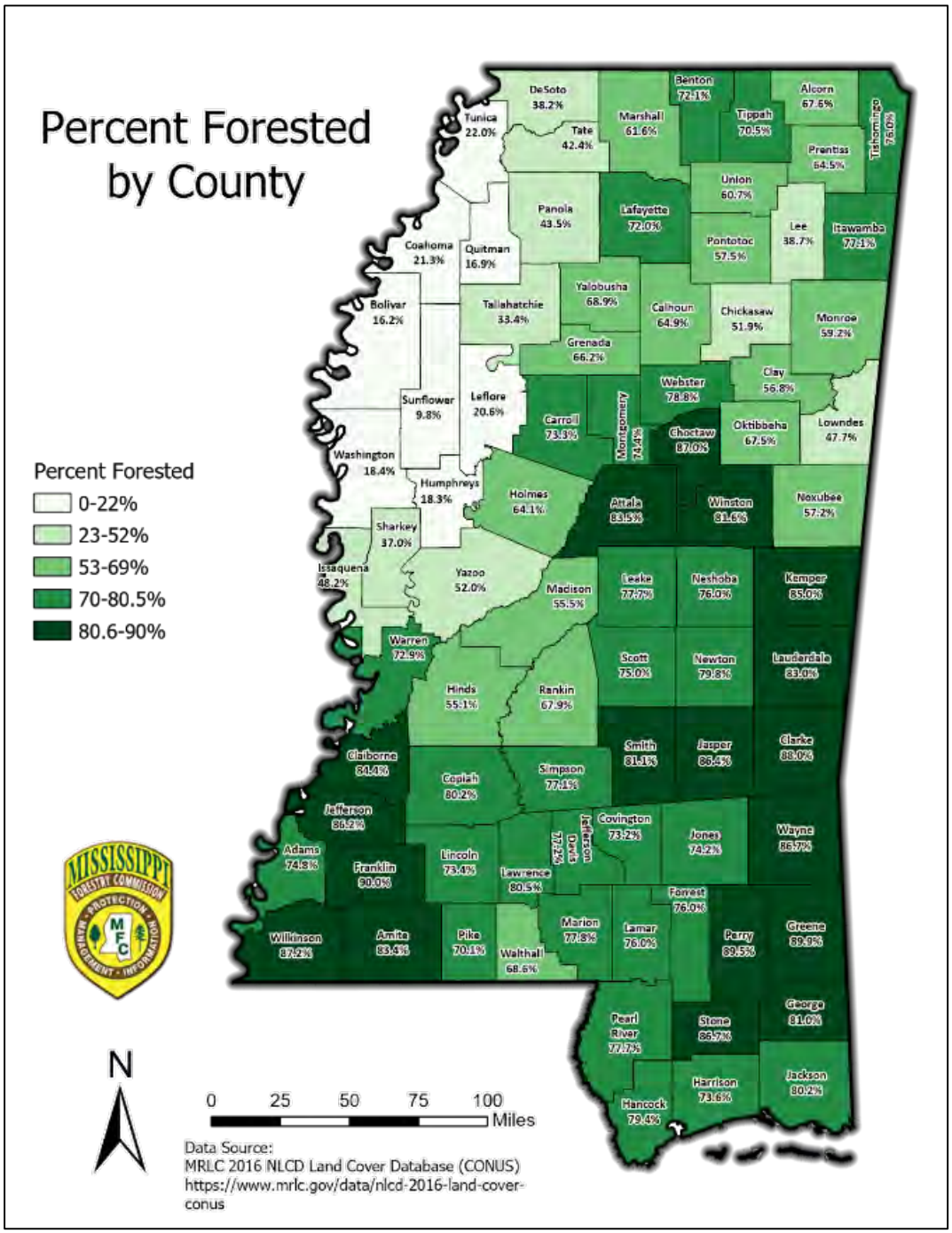
For the purposes of the FLP, this *Plan* must:

- define eligibility criteria that Mississippi will use to identify and delineate important forest areas as Forest Legacy Areas (FLAs);
- identify goals for each FLA;
- outline the state's project evaluation and prioritization procedures.

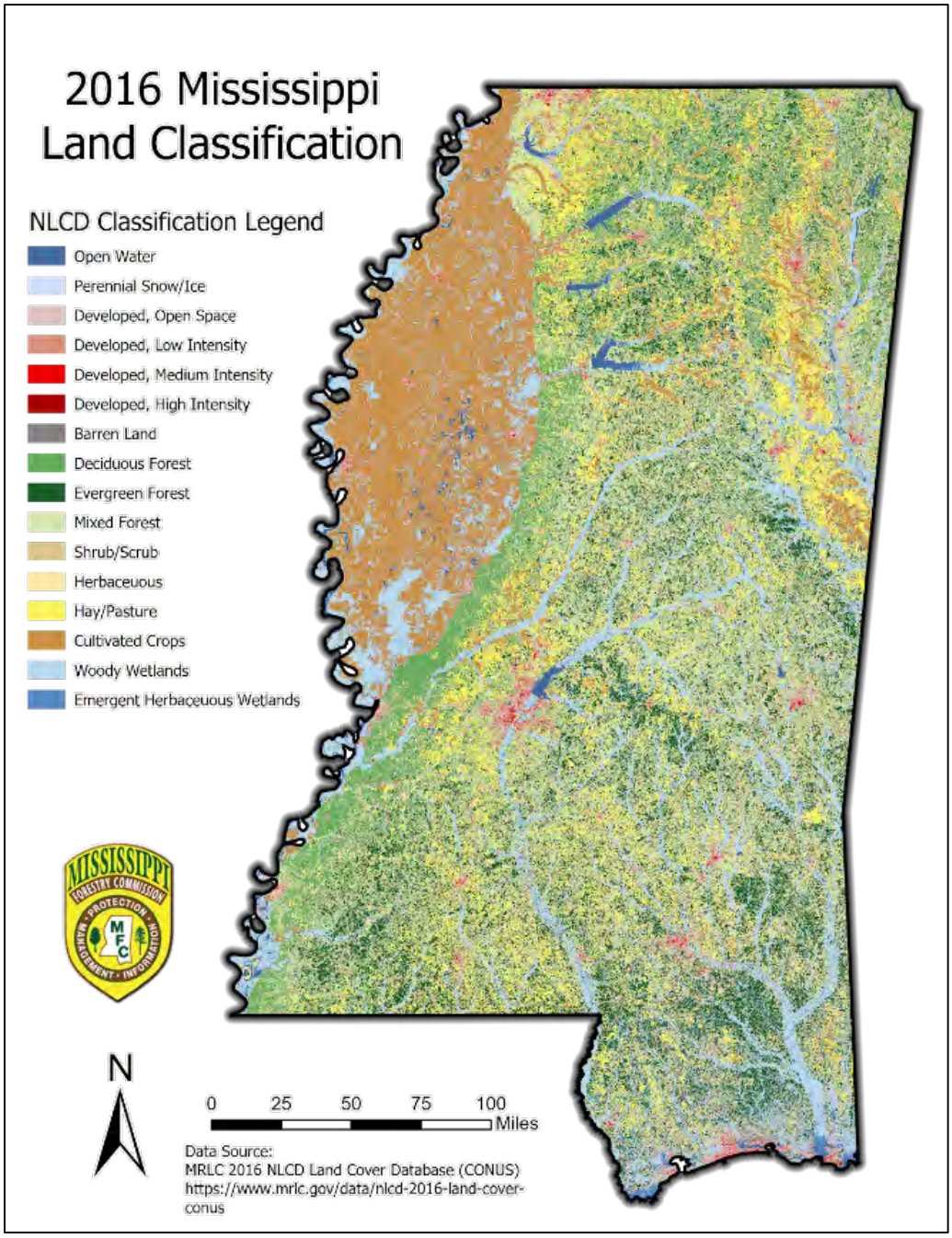
Those eligibility criteria, goals and evaluation procedures are described on the following pages.

MISSISSIPPI'S FOREST RESOURCES

Mississippi is rich in diverse natural forest communities. Approximately 62 percent of the land base of Mississippi is forested, totaling 19.1 million acres. Forests are located statewide, but the type of forest cover varies dramatically across the state. Over 89 percent of the state's forest lands are in in private ownership, 8.7 percent are in federal ownership and 3 percent are in state/local ownership. Forest-related industries contribute $13 billion to the state's economy and directly employ 61,794 people paying $1.1 billion in wages each year.



In any year, timber is ranked among the three most valuable agricultural crops in the state. In addition to economic benefits, human health, aesthetic, fish and wildlife habitat, ecosystem service and recreational benefits of forests are also well-documented and recognized. **Though the amount of forest cover increased from 1970 to 2010 due to conversion of agricultural lands to pine plantation, Mississippi lost 328,040 acres from 2010 to 2015 as forest land reverted back to agriculture or was cleared for development.**



For more on the history, current uses, ownership trends, public benefits, and threats to forest resources and existing forest conservation programs, see Chapters I-V of the *Mississippi's Forest Action Plan 2020.*

FOREST COMMUNITIES OF MISSISSIPPI

Longleaf Pine.
Photo credit: MS Natural Heritage Program

The Mississippi Department of Wildlife, Fisheries and Parks (MDWFP) Mississippi Natural Heritage Program (NHP) classifies15 natural/semi-natural plant community types and 63 subtypes that occur in Mississippi in its 2015 *Mississippi State Wildlife Action Plan* (MSSWAP). The MSSWAP provides a detailed description of each natural plant community, the wildlife and fish species of concern associated with each type and identifies the major threats and potential conservation actions needed to abate those threats. The Mississippi FLP has adopted the forest community types defined in the 2015 MSSWAP for the purposes of this updated *MS FLP Plan*. The nine (9) forest communities occuring in the state as described in the MSSWAP are:

Forest Communities in Mississippi*

Xeric-Mesic Upland Forest/Woodlands
Mesic Upland Forests
Bottomland Hardwoods
Swamp Forests
Riverfront Forests
Wet Pine Savannas/Flatwoods
Cedar Glades (within Prairies)
Upland Maritime Woodlands
Pine Plantation

**Adapted from the 2015 Mississippi State Wildlife Action Plan*

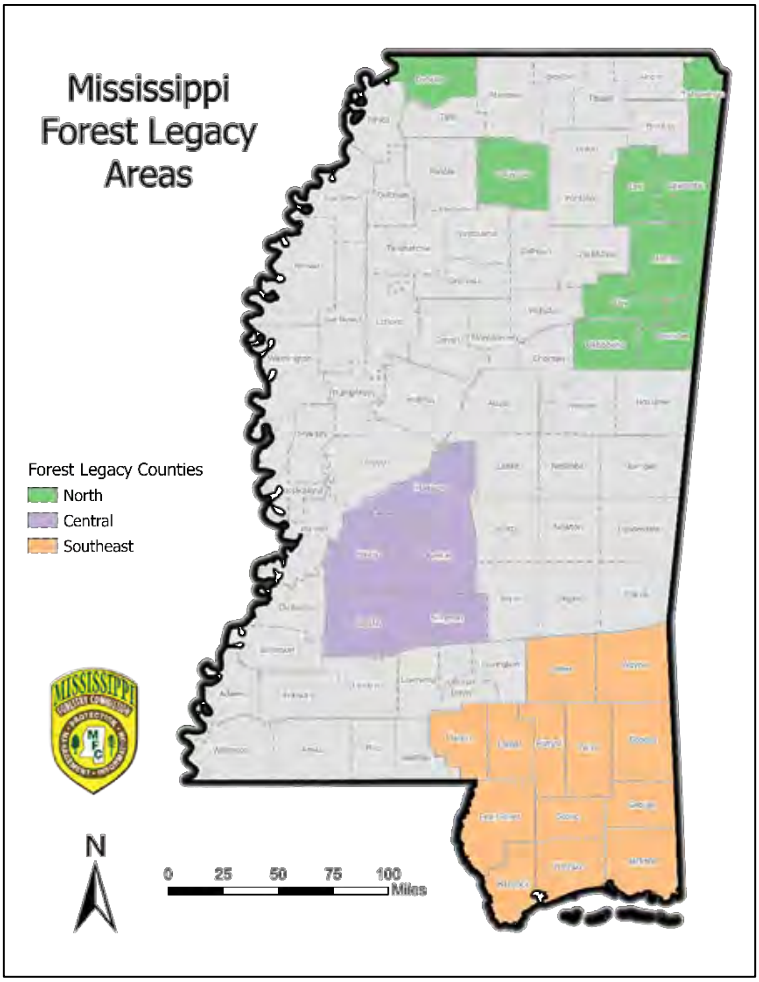
A full description of the extent, location, condition of all forest community types can be found in the MSSWAP along with a list of fish and wildlife species of concern associated with each forest community and the threats and recommended conservation actions for those natural communities. An abbreviated description of the forest community types is also included in the *Mississippi Forest Action Plan 2020.*

Link to the *2015 Mississippi State Wildlife Action Plan*
https://www.mdwfp.com/museum/seek-study/state-wildlife-action-plan/

SELECTION OF MISSISSIPPI'S FOREST LEGACY AREAS

The plan for implementing the FLP in Mississippi was described in the original *Mississippi Forest Legacy Program Assessment of Need* (AON) and approved by the USDA Forest Service in 2007. At the beginning of the FLP implementation in Mississippi, the MFC identified three Forest Legacy Areas (FLAs) based on input from the public and stakeholders with guidance from the State Forest Stewardship Coordinating Committee (SFSCC). All tracts proposed to the Mississippi FLP must be in a designated FLA. The FLAs are delineated based on many factors including habitat diversity, types of natural forest communities in each area, significant past and projected increases in human population and recent conversion of forestland to other uses.

During the development of the 2020 update of Mississippi's *Forest Action Plan,* MFC incorporated this updated *Mississippi Forest Legacy Program Plan* in its Appendix. After stakeholder input received in 2019 - 2020 and through analysis of geospatial and population data MFC decided to extend the boundaries of FLAs to include additional counties where the threat of conversion to forest communities is likely. Census and human population growth data and projections, and updated information from the Mississippi Natural Heritage Program on forested areas of high biodiversity were analyzed to help inform our decisions on adding counties to the existing FLAs. We also received input from land trusts and sister resource agencies in reviewing the extent of FLAs. As a result, we added three counties to the North Mississippi FLA, and expanded the Central FLA to include whole counties versus watershed boundaries. The Southeast FLA remains unchanged.



Updated maps and descriptions of the Southeast, Central and North Forest Legacy Areas are on the following pages. Tables indicating population statistics, forest cover and county totals of fish and wildlife species of greatest conservation need are included for each FLA in addition to descriptions of:

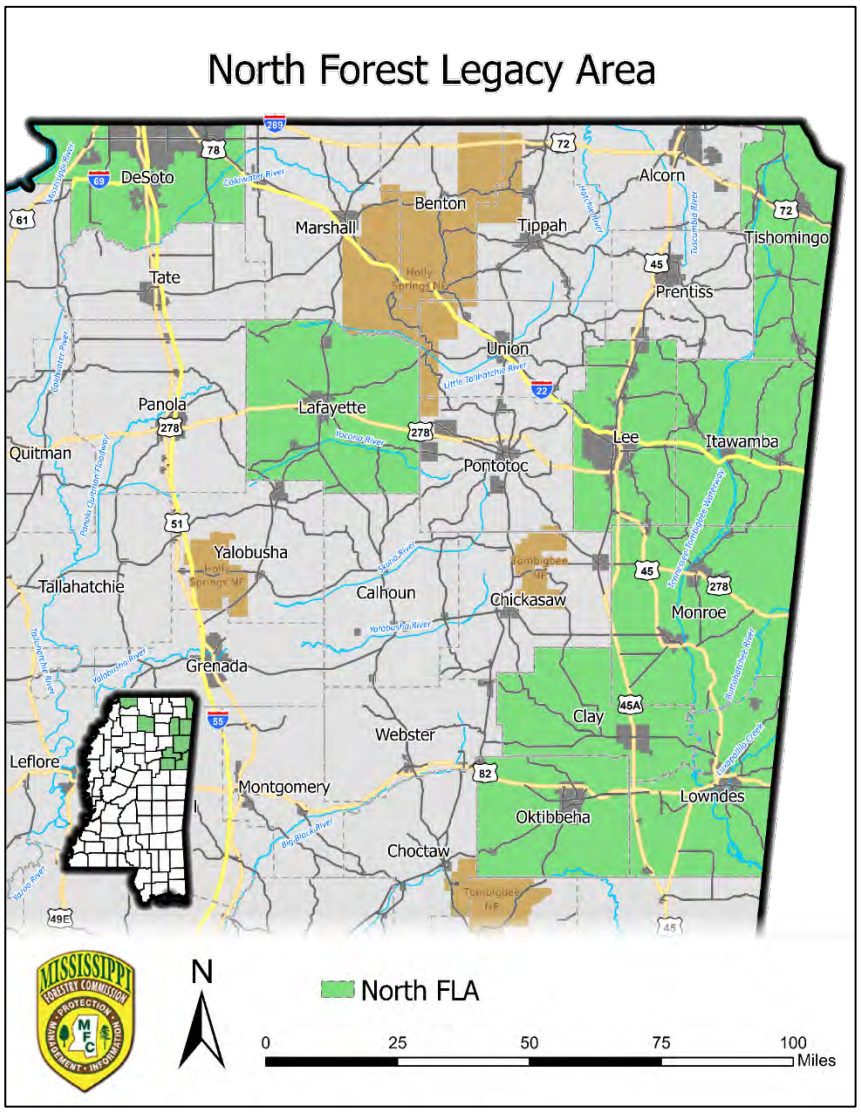
1. General characteristics, important conservation areas and environmental values at risk.
2. Threats to those values.
3. Geographic boundaries (counties) within which priorities may be considered for the program.

Nominations of potential FLP tracts must be within the North, Central or Southeast FLA.

North Mississippi Forest Legacy Area

Ecoregions: Upper East Gulf Coastal Plain and Mississippi River Alluvial Plain

Counties: Clay, Desoto, Itawamba, Lafayette, Lee, Lowndes, Monroe, Oktibbeha, Tishomingo



Important Forest Types in the North FLA: Bottomland hardwoods, lower slope/high terrace hardwood forests, dry hardwood forests, dry to mesic hardwood forests, baldcypress/gum swamp forests

Conservation Values and Priorities in the North FLA: Tombigbee drainage, Northeast Hills/ Tennessee River drainage, Buttahatchie River, Mississippi River, Coldwater River, Yocona River, Little Tallahatchie River, Tennessee-Tombigbee River, Bear Creek, Natchez Trace corridor, Sardis Lake, Arkabutla Lake, Horn Lake, scenic streams, riparian corridors and forested wetlands along ecoregional priority river/stream reaches, wildlife crossings and migration corridors, areas adjacent to public lands managed for conservation and mitigation banks, scenic roads, existing private conservation lands, 16th Section lands and military installations, areas adjacent to private preserves and conservation easements

Important Public Lands in the North FLA: Tennessee-Tombigbee Waterway, Holly Springs National Forest, Tombigbee National Forest, Noxubee National Wildlife Refuge, Divide Section WMA, John Bell Williams WMA, Canal Section WMA, Black Prairie WMA, Upper Sardis WMA, Trim Cane WMA, John Starr WMA, Sardis Waterfowl Area, Graham Waterfowl Area, J.P. Coleman State Park, Tishomingo State Park, Tombigbee State Park, Lake Lowndes State Park, Columbus AFB, 16th Section Lands, Lake Monroe, Elvis Presley Lake, Lake Lamar Bruce

Threats to natural forest communities in the North FLA: Urban sprawl, fragmentation/parcelization, invasive species, second home/ vacation home development, conversion of natural forest communities to pine plantations, channel modification, sand and gravel mining

Table 1: Forested Area, Human Population Projections and Wildlife Species of Concern in the North Mississippi Forest Legacy Area*

Mississippi County	County Acres – GIS	Forest land Acres	2018 Total Population (ESRI)	2023 Total Population Estimate (ESRI)	2018 Population Density Per Square Mile (ESRI)	2023 Population Density Estimate Per Square Mile (ESRI)	2018-2023 Population: Annual Growth Rate (ESRI)	Species of Greatest Conservation Need (MS NHP)
Clay	266,217	161,910	19,980	19,483	48.7	47.5	-0.5	104
DeSoto	317,834	115,326	181,116	196,147	380.4	411.9	1.6	38
Itawamba	345,894	292,512	23,998	24,212	45.0	45.4	0.2	72
Lafayette	434,603	272,663	56,405	61,785	89.3	97.8	1.8	78
Lee	289,985	91,524	86,039	87,604	191.2	194.7	0.4	52
Lowndes	330,538	135,575	60,602	61,253	119.9	121.2	0.2	118
Monroe	494,117	293,965	36,744	36,724	48.0	48.0	0.0	119
Oktibbeha	295,570	241,138	50,893	52,876	111.1	115.4	0.8	121
Tishomingo	284,545	192,553	19,971	20,178	47.1	47.6	0.2	239
Grand Total	**3,059,303**	**1,797,166**	**535,748**	**560,262**				

**Source for acreages and population statistics is ESRI. The Mississippi Natural Heritage Program provided county totals for species of greatest conservation need from the 2015 Mississippi State Wildlife Action Plan*

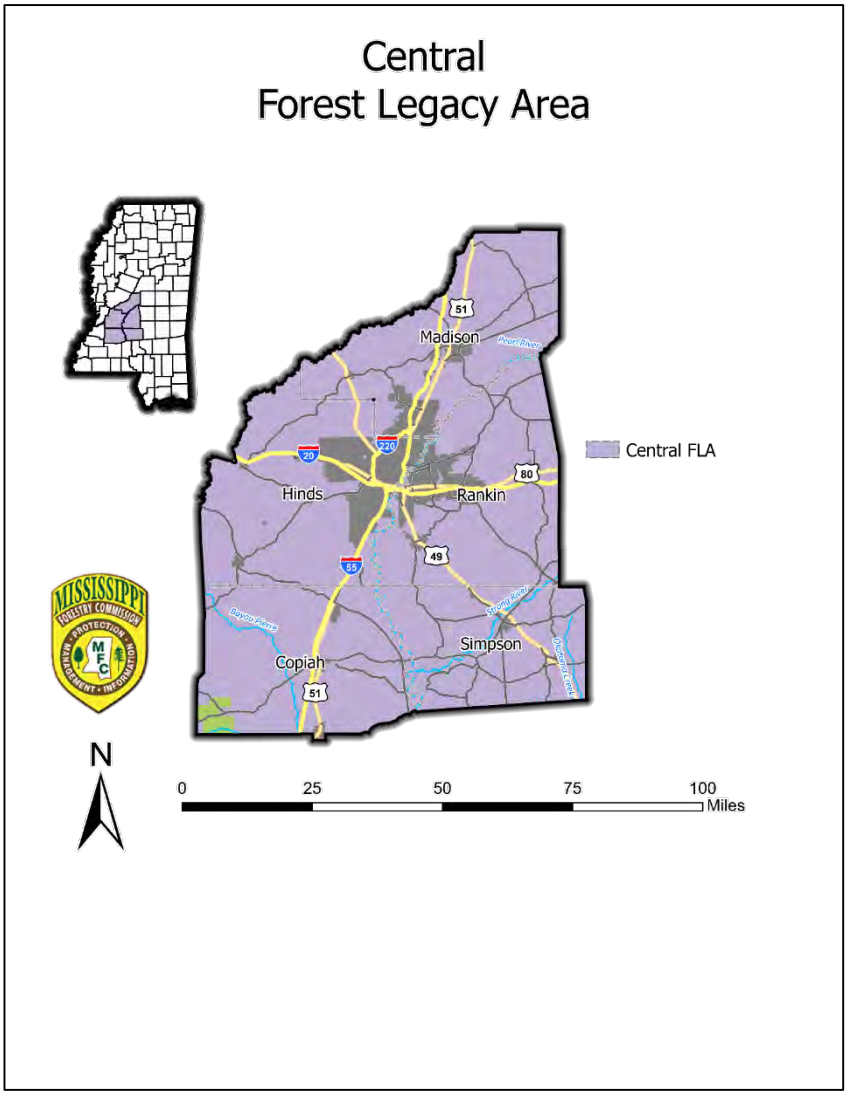
Central Mississippi Forest Legacy Area

Ecoregion: Upper East Gulf Coastal Plain

Counties: Copiah, Hinds, Madison, Rankin, and Simpson

Important Forest Types in the Central FLA: Bottomland hardwoods, baldcypress/gum swamp forests, lower slope/high terrace hardwood forests

Conservation Values and Priorities in the Central FLA: Big Black River drainage, Upper and Lower Pearl River drainage, Bayou Pierre, Okatoma Creek, Ross Barnett Reservoir, Natchez Trace corridor, wildlife crossings/migratory corridors, riparian corridors and forested wetlands along ecoregional priority river/stream reaches, areas adjacent to public lands managed for conservation and mitigation, existing private conservation lands and 16th Section lands, areas adjacent to private preserves and conservation easements



Important Public Lands in the Central FLA: Natchez Trace National Park, Ross Barnett Reservoir, Pearl River WMA, Copiah County WMA, LeFleur's Bluff State Park, 16th Section lands, Simpson County Lake, Calling Panther Lake

Threats to natural forest communities in the Central FLA: Metro area sprawl, significant suburban and exurban development, fragmentation/parcelization, flood control/channel modification, road, parkway and infrastructure construction, sand and gravel mining, conversion of natural forest communities to pine plantation

Table 2: Forested Area, Human Population Projections and Wildlife Species of Concern in the Central Mississippi Forest Legacy Area *

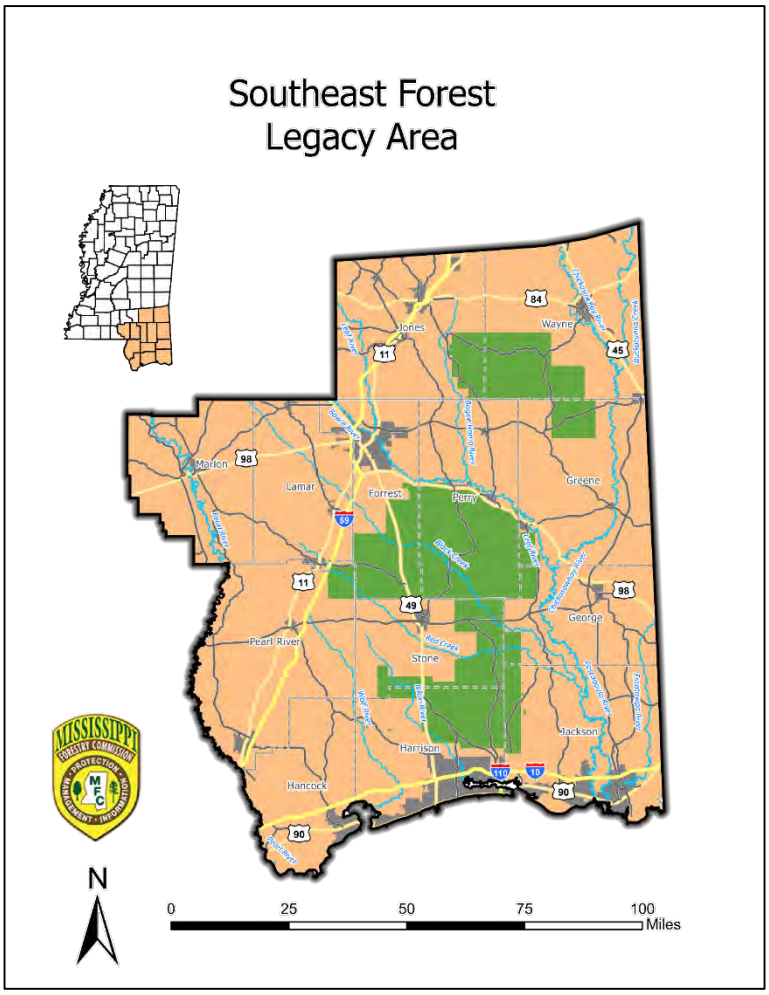
Mississippi County	County Acres - GIS	Forestland Acres	2018 Total Population (ESRI)	2023 Total Population Estimate (ESRI)	2018 Population Density Per Square Mile (ESRI)	2023 Population Density Estimate Per Square Mile (Esri)	2018-2023 Population: Annual Growth Rate (Esri)	Wildlife Species of Greatest Conservation Need (MS NHP)
Copiah	498,700	414,408	29,217	28,775	37.6	37.0	-0.3	45
Hinds	561,337	255,300	241,686	235,914	277.9	271.2	-0.5	76
Madison	474,720	259,852	110,172	120,132	154.2	168.1	1.8	60
Rankin	515,786	320,171	152,523	160,721	196.7	207.3	1.1	61
Simpson	377,819	264,714	27,211	26,731	46.2	45.4	-0.4	44
Grand Total	**2,428,362**	**1,514,445**	**560,809**	**572,273**				

**Source for acreages and population statistics is ESRI. The Mississippi Natural Heritage Program provided county totals for species of greatest conservation need from the 2015 Mississippi State Wildlife Action Plan.*

Southeast Mississippi Forest Legacy Area

Ecoregions: East Gulf Coastal Plain, Northern Gulf of Mexico

Counties: Forrest, George, Greene, Hancock, Harrison, Jackson, Jones, Lamar, Marion, Pearl River, Perry, Stone, Wayne



Important Forest Types in the Southeast FLA: Wet pine savannas/ slash pine flatwoods, mesic longleaf pine forests, dry longleaf pine forests, bottomland hardwoods, small stream swamp forests, maritime forests, beech/magnolia forests, pine seeps

Values and Priorities for Southeast FLA: Pascagoula River drainage, Lower Pearl River drainage, Black Creek, Leaf River, Okatoma Creek, Ragland Hills, Leaf River, scenic streams, barrier islands, fallout habitat for neotropical migratory songbirds, Black bear, gopher tortoise, gopher frog, pitcher plant habitat, riparian corridors and forested wetlands along ecoregional priority river/stream reaches, wildlife crossings and migration corridors, areas adjacent to public lands managed for conservation and mitigation banks, existing private conservation lands, 16th Section lands and military installations, areas adjacent to private preserves and conservation easements

Important Public Lands in the Southeast FLA: DeSoto National Forest, Chickasawhay Ranger District, Stennis Space Center, Camp Shelby, Red Creek WMA, Pascagoula River WMA, Wolf River WMA, Leaf River WMA, Old River WMA, Little Biloxi WMA, Red Creek WMA, Ward Bayou WMA, Chickasawhay WMA, Mississippi Sandhill Crane NWR, Grand Bay NWR and National Estuarine Research Reserve, Mississippi Department of Marine Resources Coastal Preserves, Gulf Island National Seashore, Paul B. Johnson State Park, Buccaneer State Park, Shepard State Park,16th Section Lands

Threats to natural forest communities the Southeast FLA: Significant urban and exurban sprawl from coastal development and Hattiesburg, population shifts within the region generated by storm hazards, hurricanes, sea level rise and more frequent flooding, recent timber losses from hurricanes and strong storms, second home/vacation home development, decades of fire exclusion in fire-dependent forest communities, sale of industry lands to individuals, invasive species, road and infrastructure construction, conversion of natural stands to pine plantations and sand and gravel mining, fragmentation/parcelization

Table 3: Forested Area, Human Population Projections and Wildlife Species of Concern in the Southeast Mississippi Forest Legacy Area*

Mississippi County	County Acres - GIS	Forestland Acres	2018 Total Population (ESRI)	2023 Total Population Estimate (ESRI)	2018 Population Density Per Square Mile (ESRI)	2023 Population Density Estimate Per Square Mile (ESRI)	2018-2023 Population: Annual Growth Rate (ESRI)	Species of Greatest Conservation Need (MS NHP)
Forrest	300,830	208,525	75,838	75,547	162.6	162.0	-0.1	133
George	309,512	212,040	23,952	24,894	50.0	52.0	0.8	129
Greene	459,941	402,065	13,703	13,424	19.2	18.8	-0.4	97
Hancock	353,514	203,507	49,209	51,982	103.9	109.7	1.1	172
Harrison	624,593	275,305	206,287	217,254	359.4	378.5	1.0	196
Jackson	667,700	330,989	144,740	148,245	200.3	205.1	0.5	291
Jones	447,716	297,912	68,332	68,034	98.3	97.9	-0.1	53
Lamar	320,214	222,939	59,391	62,365	119.5	125.5	1.0	75
Marion	350,979	266,414	25,925	24,924	47.8	46.0	-0.8	64
Pearl River	523,953	355,951	56,971	58,076	70.3	71.6	0.4	133
Perry	416,046	356,662	12,423	12,586	19.2	19.4	0.3	158
Stone	286,704	241,973	18,248	18,579	41.0	41.7	0.4	129
Wayne	520,605	404,519	20,937	21,101	25.8	26.0	0.2	106
Grand Total	**5,582,307**	**3,778,801**	**775,956**	**797,011**				

**Source for acreages and population statistics is ESRI. The Mississippi Natural Heritage Program provided county totals for species of greatest conservation need from the 2015 Mississippi State Wildlife Action Plan.*

Forest Legacy Program Implementation in Mississippi

Program Goal and Objectives

The FLP mandate in the enabling CFAA legislation (Appendix II) is to ***ascertain and protect environmentally important forest areas that are threatened by conversion to non-forest uses*** and to ***promote forest land protection and other conservation opportunities***, including the protection of important scenic, cultural, fish, wildlife, and recreational resources, riparian areas and other ecological values. Within this framework, Mississippi's FLP objectives below were derived from input from the State Forest Stewardship Coordinating Committee, other natural resource agencies and from stakeholder and public input. The objectives are used to determine eligible tracts for nomination and are aimed at protecting forest resource values that stakeholders and the public consider of greatest concern.

Mississippi's Forest Legacy Program Goal: *To protect environmentally important forests in Mississippi threatened by conversion to non-forest uses.*

Mississippi Forest Legacy Program Objectives:

- To sustain native or rare and unique forest ecosystems
- To protect water quality
- To prevent development along lakes, rivers and protected lands
- To protect wildlife habitat
- To maintain traditional forest uses, including hunting and fishing
- To sustain productive forests
- To provide public recreation opportunities

Applying to the Forest Legacy Program

Through FLP grants from the USDA Forest Service, the State of Mississippi may acquire conservation easements or fee acquisitions from willing landowners that meet the state and federal FLP goal and objectives. Properties acquired will be protected in perpetuity through a conservation easement deed or through fee acquisition for public ownership as a wildlife area, state forest, park, coastal preserve, university land or other public natural area.

Eligible landowners interested in nominating their property for consideration for FLP must submit a completed application with all supporting documentation to the Mississippi Forest Legacy Coordinator by the annual deadline of August 15 using the FLP application form contained in Appendix III. The application may also be downloaded from the MFC website at www.mfc.ms.gov.

Prior to completing the application, landowners are strongly encouraged to review the state and federal eligibility requirements and FLP guidance in this document. Only tracts that are located in one of the three designated Mississippi FLAs will be considered and nominated tracts must meet the national and state criteria and must have a completed application submitted by the deadline**.** Note that all conservation easements and interests in land acquired through the

program are conveyed in perpetuity and must contain such covenants and language to insure perpetuity of FLP easements. Participation in the program is strictly voluntary.

Applications will be reviewed and ranked by MFC and then submitted to the USDA Forest Service for consideration. Tracts that meet the national and state guidelines have the best chance of being nominated and funded. The FLP is a nationally-competitive grant program to the states, so funding is not guaranteed for any application.

Selection Procedure for FLP Applications

Mississippi's FLP Coordinator and MFC staff will review and evaluate completed applications received by the August 15 deadline each year, will inspect nominated properties and then make recommendations to the Mississippi Forest Stewardship Coordinating Committee (FSCC) and the State Forester on tracts deemed eligible for the FLP program. Because the national FLP is a highly competitive grant program, only those tracts that are located in a FLA, meet multiple program objectives and have potential to compete nationally for funding will be submitted by the State Forester to the USDA Forest Service for funding consideration. The list of approved tracts will be prioritized by the MFC staff based on how well they meet state and federal program objectives and based on securing the 25 percent non-federal cost share required to match the 75 percent federal funding, if awarded. The MFC is responsible for submitting nominated tracts for consideration to the USDA Forest Service through the online Forest Legacy Information System (FLIS) before federal deadline.

The USDA Forest Service assembles a national panel each year to review and rank nominated tracts from each state that best meet the goal and objectives of the FLP. Once the federal list of recommended FLP projects is approved by Congress, the USDA Forest Service will provide a grant award to the states whose proposed FLP tracts were approved for federal funding. The time from nominating a tract at the state level to the state receiving a federal grant award may be several months to over a year. Competition for FLP dollars is fierce across the nation and funding is limited. States may not receive funding every year. Not all nominated tracts receive FLP funds.

Lands and conservation easements acquired with FLP funds may only be acquired on a willing seller/willing buyer basis. Conservation easements may be held either by an eligible state or local government entity such as MFC and the landowner must agree to manage the land for FLP purposes. As the lead state agency for FLP, the MFC will follow the procedures set forth in the national *Forest Legacy Program Implementation Guidelines.* The following section on eligibility criteria is excerpted from the national guidelines.

Eligibility Criteria

National Guidelines - According to the Federal legislation (Appendix II), Forest Legacy Areas "shall have significant environmental values or shall be threatened by present or future conversion to non-forest uses". In accordance with the law "priority shall be given to lands that can be effectively protected and managed, and which have important scenic or recreational values; riparian areas; fish and wildlife values, including threatened and endangered species; or other ecological values". Further, the Forest Service's *Forest Legacy Program Implementation Guidelines* (May 2017) and *Project Scoring Guidance* (see Appendix IV) for regional and federal funding emphasize **four core national criteria** (Important, Strategic, Threatened and Readiness) below that will be applied to score and rank FLP projects during the national review.

Core National FLP Criteria

1. Importance – This criterion focuses on the environmental, social, and economic public benefits gained from the protection and management of the property. More points will be given to projects that demonstrate multiple public benefits at the national or multi-state scale. This criterion reflects the ecological assets and the economic and social values conserved by the project and its level of significance. Attributes that will be considered in evaluating projects nationally for *Importance* include:

- **Economic Benefits from Timber and Potential Forest Productivity** – Landowner should demonstrate sustainable forest management in accordance with a management plan. Additional points may be given to land that is third party certified. Do forestry activities contribute to the resource-based economy for a community or region? Does the property contain characteristics such as highly productive soils to sustain a productive forest?
- **Economic Benefits from Non-timber Products** – Provides non-timber revenue to the local or regional economy through activities such as hunting leases, ranching, non-timber forest products (e.g. pine straw raking), guided tours (wildlife viewing), and recreation and tourism (lodging, rentals, bikes, boats, outdoor gear).
- **Threatened or Endangered Species Habitat** – Property has documented threatened or endangered plants and animals or designated habitat. Federally-listed species receive more consideration than state-only listed species.
- **Fish, Wildlife, Plants and Unique Forest Communities** – Site contains unique forest communities and/or important fish or wildlife habitat as documented by a formal assessment or wildlife conservation plan or strategy.
- **Water Supply, Aquatic Habitat and Watershed Protection** – Property has a direct relationship with protecting the water supply or watershed, such as providing a buffer to public drinking water supply, containing an aquifer recharge area, or protecting and ecologically important aquatic or marine area. Or the property contains important riparian areas, wetlands, shorelines, river systems, or sensitive watershed lands. The scope and scale of the property, and the magnitude and intensity of the resulting benefits are important.
- **Public Access** – Protection of the property will maintain or establish access by the public for recreation; however, restrictions on specific use and location of recreational activities may exist.
- **Scenic** – Located within a viewshed of a government designated scenic feature or area (trail, scenic stream or river, highway, scenic byway, parkway).
- **Historic/Cultural/Tribal** – The site contains features of historical, cultural and/or tribal significance, formally documented by a government or a non-governmental organization.

2. Threatened - This criterion estimates likelihood of forest conversion. More points will be given to projects that demonstrate multiple conditions; however, a project need not have all the conditions listed to receive maximum points. If the property has been acquired by a third party with the support of the state, threatened status will be evaluated based on the situation prior to the third party acquisition. Attributes that will be considered in evaluating projects nationally for *Threats* include:

- **Lack of Protection** – The lack of temporary or permanent protections (e.g. current zoning, temporary or permanent easements, moratoriums, and encumbrances that limit subdivision or conversion) that currently exist on the property and the likelihood of threat of conversion.
- **Land and Landowners Circumstances** – Property held in an estate, aging landowner, future of property by heirs is uncertain, property is for sale or has a sale pending, landowner anticipates owning property for a short duration, landowner has received purchase offers, land has an approved subdivision, landowner has sold subdivisions of the property.
- **Adjacent Land Use** – Characteristics such as existing land status, rate of development growth and conversion, rate of population growth (percent change), rate of change in ownership.
- **Ability to Develop** – Physical attributes of the property that will facilitate conversion, such as access, buildable ground, zoning, slope, water/sewer, electricity, etc.

3. Strategic – This criterion reflects the project's relevance or relationship to conservation efforts on a broader perspective. When evaluating strategic criteria, four consideration should be made:

1) the scale of the conservation initiative, strategy, or plan;
2) the scale of the proposal's contribution to that initiative, strategy or plan;
3) the placement of the parcel within the area of the initiative, strategy or plan;
4) how the project complements protected lands.

4. Project Readiness – This is the degree of due diligence completed. The FLP reviewers want to know that there is local support for the proposal, that it can be completed, and the state and partners have the means and capacity to complete the acquisition or easement in a predictable timeline. Readiness attributes they will consider include:

- Completed appraisal and appraisal review that meets federal appraisal standards (Yellowbook).
- Landowner and easement holder have a general agreement on easement or fee acquisition conditions.
- Cost share commitment has been obtained from a specified source.
- Signed option or purchase and sales agreement held by the state or at the request of the state OR at the request of the state, conservation easement or fee title is held by a third party.
- Completed title search.
- Minerals determination.
- Completed Forest Stewardship or Multi-resource Management Plan (for conservation easement properties).

Other Considerations

Other Considerations

Percent forested area: Proposed tracts do not have to be completely forested. However, priority will generally be given to tracts that are currently forested or are identified as forested in the landowner's Forest Stewardship Plan or multi-resource management plan. Non-forest uses are those that may be compatible with forest uses as part of an undeveloped landscape including cultivated farmland, pasture, grassland, shrubland, open water and wetlands. Non-forest uses should be less than 25 percent of the total area. Non-compatible uses are those inconsistent with maintaining forest cover, including, but not limited to, activities that result in extensive surface disturbance such as residential and commercial development and surface mining. These uses will be excluded from FLP conservation easements or land purchases in Mississippi.

For more details, see the national ***Forest Legacy Program Implementation Guidelines*** (May 2017). https://www.fs.usda.gov/sites/default/files/fs_media/fs_document/15541-forest-service-legacy-program-508.pdf

Mississippi Forest Legacy Criteria

The state eligibility criteria and objectives below complement the federal criteria and national *FLP Implementation Guidelines*. To be eligible for consideration in the Mississippi's FLP, a completed application and all required information must be submitted to MFC by the annual August 15 deadline and the proposed FLP property must:

1. Be **threatened by conversion** to non-forest uses.
2. Be owned by landowners that are **willing** and interested in donating or selling conservation easements, reserved interest deeds or fee title through the FLP.
3. **Contribute to multiple objectives** of Mississippi's FLP:

    - Sustain native or rare and unique forest ecosystems
    - Protect water quality
    - Prevent development along lakes, rivers and protected lands
    - Protect wildlife habitat
    - Maintain traditional forest uses, including hunting and fishing
    - Sustain productive forests
    - Provide public recreation opportunities

4. **Possess environmental values that can be protected and managed** effectively through conservation easements or fee simple acquisition at a reasonable cost. When judging whether a tract has environmental values that can be protected and managed efficiently the MFC will consider:

    - The nature of environmental values proposed for protection and whether they can be monitored effectively and economically.
    - Whether the tract is likely to become isolated from other areas maintained for important forest resources by development on adjacent tracts.
    - Whether the landowner's management objectives are compatible with the protection of resources they propose.
    - Whether a land trust, conservancy, public agency or other appropriate

organization has expressed an interest in working with MFC and the landowner to establish and monitor the easement.
- Whether other sources of funding for tract acquisition, easement closing, monitoring and other associated costs are available.

Owners of forestlands within one of the three designated FLAs that meet the criteria and application requirements described herein are eligible to submit a FLP application.

Use of Forest Legacy Program Funds

Federal project funds are those granted to MFC by the USDA Forest Service to directly purchase lands or conservation easements from landowners. Project funds may be used to cover transaction costs including appraisals and appraisal review, land surveys, closing costs, baseline documentation reports, title work, purchase of title insurance, conservation easement drafting, or other real estate transaction expenses for FLP tracts. Project funds may also be expended to facilitate donations of land or interests in lands to a qualified and willing donee for FLP purposes, by paying expenses directly related to the donation, including, but not limited to, land surveys, conservation easement drafting, title work and establishing baseline information. For an outright donation of a conservation easement, FLP program funds may not be used to pay for an appraisal. In the case of a partial donation of a conservation easement or land, an appraisal meeting Federal appraisal standards is required to determine the value of the property. FLP funds may be used for appraisals on these partial donations.

Non-Federal Cost Share Requirements

The maximum federal contribution for total program costs may not exceed 75 percent. Thus, a minimum non-federal contribution of 25 percent that meets FLP purposes is required. The non-federal cost share may consist of:

- the value of land, or interest in land, dedicated to FLP that is not paid for by the federal government.
- non-federal costs associated with program implementation
- other non-federal costs associated with a grant or other agreement that meets FLP purpose.

Non-federal cost-share, including donations of land or conservation easement, must be documented. Cost share donations may occur at any phase of the FLP grant period.

Application Deadlines and Submission Address

Because the FLP is federally funded, it is subject to annual appropriations. In order to assess the need for FLP dollars, Congress asks for a list of potential Forest Legacy projects a year in advance of the next fiscal year which begins each October 1.

Applications must be received in hand by August 15 by the close of business by:

Forest Legacy Coordinator
Mississippi Forestry Commission

660 North Street, Suite 300
Jackson, MS 39202
Main Phone: (601) 359-1386
Fax: (601) 359-1349
www.mfc.ms.gov

Links and Supporting Documents

Mississippi Department of Wildlife, Fisheries and Parks. *Mississippi State Wildlife Action Plan, 2015-2020.* https://www.mdwfp.com/museum/seek-study/state-wildlife-action-plan/

USDA Forest Service. *Forest Legacy Program Implementation Guidelines.* May 2017. https://www.fs.usda.gov/sites/default/files/fs_media/fs_document/15541-forest-service-legacy-program-508.pdf

USDA Forest Service. Forest Legacy Program. https://www.fs.usda.gov/managing-land/private-land/forest-legacy

Acknowledgements

This updated *Forest Legacy Program Plan* builds on and replaces the original *Mississippi Forest Legacy Program Assessment of Need* (2007-2012) that was is the result of many meetings, research and input by numerous individuals, agencies and organizations.

Special thanks to the land trusts and sister agencies in Mississippi who have supported and participated in the Mississippi Forest Legacy Program and in advising us on this 10-year update including:

Land Trust for the Mississippi Coastal Plain
Mississippi Department of Environmental Quality
Mississippi Department of Wildlife, Fisheries and Parks
Mississippi Land Trust
Mississippi Natural Heritage Program
Mississippi Secretary of State
National Fish and Wildlife Foundation
The Nature Conservancy, Mississippi
The Trust for Public Land
The Partnership for Gulf Coast Land Conservation
And many Mississippi landowners and partners

We also wish to thank Russell Bozeman, State Forester, and the staff of the Mississippi Forestry Commission for their hard work, cooperation and patience in this development process and to Mike Murphy (USDA Forest Service-retired), Jack McGee and Susan Granbery, USDA Forest Service for their guidance and advice throughout. Sincere thanks to the members of Mississippi's Forest Stewardship Coordinating Committee for their support and assistance. We appreciate MFC staff Clayton Cooley and Brian Mitchell for updating the Forest Legacy Area maps.

We are grateful for the Mississippi Department of Wildlife, Fisheries and Park's Natural Heritage Program and the Museum of Natural Science staff for sharing their data, photographs and input on the updated Forest Legacy Areas.

This document was compiled and written by Elizabeth Rooks-Barber, Barber and Mann, Inc and Richard McInnis, Assistant State Forester and Forest Legacy Program Coordinator.

Appendix

I. Letters of Authorization to the State of Mississippi

II. Forest Legacy Statute

III. Forest Legacy Program Application

IV. Federal Forest Legacy Program Scoring Guidance

APPENDIX

APPENDIX I - LETTERS OF AUTHORIZATION

United States Department of Agriculture | Forest Service | Washington Office | 1400 Independence Avenue, SW Washington, DC 20250

File Code: 3200
Date: March 30, 2005

The Honorable Haley Barbour
Governor
State of Mississippi
P.O. Box 139
Jackson, MS 39205

Dear Governor Barbour:

I am writing to you on behalf of USDA Forest Service Chief, Dale Bosworth. Thank you for your letter of March 7, 2005, indicating interest in the Forest Legacy Program and naming the Mississippi Forestry Commission as the lead agency to implement the program. We look forward to working with the Mississippi Forestry Commission over the coming months to develop an Assessment of Need (AON). The AON provides an evaluation of forests and forest uses, an assessment of forces that are converting forests to non-forest uses, and guides implementation of the program in the State. Subject to availability of funds in fiscal year 2005, the USDA Forest Service hopes to provide funding to assist with the development of the AON. We are also ready to provide technical assistance as needed.

We appreciate the opportunity to collaborate with you on the Forest Legacy Program. The Program Coordinator for the Southern Region, which includes Mississippi, is Elizabeth Crane, who can be contacted at (404) 347-5214. Thank you for your interest in and support of the Forest Legacy Program.

Sincerely,

Larry Payne

LARRY PAYNE
Director, Cooperative Forestry

HALEY BARBOUR
GOVERNOR

STATE OF MISSISSIPPI
OFFICE OF THE GOVERNOR

March 7, 2005

Mr. Dale Bosworth
Chief, USDA Forest Service
201 14th St, SW at
14th and Independence Ave, SW
Washington, DC 20250

Dear Chief Bosworth,

As Governor of the State of Mississippi, I am pleased to inform you that Mississippi desires to participate in the Forest Legacy Program. With this letter, I would like to formally delegate the Mississippi Forestry Commission as Mississippi's lead agency in coordinating the program. The Commission is headed by interim State Forester Everard Baker who will serve as the principal contact for the USDA Forest Service in establishing the Forest Legacy Program in Mississippi.

Forestry is very important to Mississippi, and I look forward to implementing this valuable program in our State.

Sincerely,

Haley Barbour
Governor

HB/jwr

CC: Ms. Elizabeth S. Crane, USFS
Mr. Everard Baker, MS Forestry Commission
Dr. Sam Polles, MS Dept. Wildlife, Fisheries, and Parks

APPENDIX II : FOREST LEGACY STATUTE

Excerpt from Title XII – State and Private Forestry Forest Stewardship Act of 1990
Section 1217 – Forest Legacy Program

SEC. 1217 FOREST LEGACY PROGRAM.

The Act (16 U.S.C. 2101 et seq.) is amended by inserting after section 6 (as added by section 1216 of this Act) the following new section:

SEC. 7. FOREST LEGACY PROGRAM.

(a) ESTABLISHMENT AND PURPOSE- The Secretary shall establish a program, to be known as the Forest Legacy Program, in cooperation with appropriate State, regional, and other units of government for the purposes of ascertaining and protecting environmentally important forest areas that are threatened by conversion to nonforest uses and, through the use of conservation easements and other mechanisms, for promoting forest land protection and other conservation opportunities. Such purposes shall also include the protection of important scenic, cultural, fish, wildlife, and recreational resources, riparian areas, and other ecological values.

(b) STATE AND REGIONAL FOREST LEGACY PROGRAMS- The Secretary shall exercise the authority under subsection (a) in conjunction with State or regional programs that the Secretary deems consistent with this section.

(c) INTERESTS IN LAND- In addition to the authorities granted under section 6 of the Act of March 1, 1911 (16 U.S.C. 515), and section 11(a) of the Department of Agriculture Organic Act of 1956 (7 U.S.C. 428a(a)), the Secretary may acquire from willing landowners lands and interests therein, including conservation easements and rights of public access, for Forest Legacy Program purposes. The Secretary shall not acquire conservation easements with title held in common ownership with any other entity.

(d) IMPLEMENTATION-

(1) IN GENERAL- Lands and interests therein acquired under subsection (c) may be held in perpetuity for program and easement administration purposes as the Secretary may provide. In administering lands and interests therein under the program, the Secretary shall identify the environmental values to be protected by entry of the lands into the program, management activities which are planned and the manner in which they may affect the values identified, and obtain from the landowner other information determined appropriate for administration and management purposes.

(2) INITIAL PROGRAMS- Not later than 1 year after the date of enactment of this section, the Secretary shall establish a regional program in furtherance of the Northern Forest Lands Study in the States of New York, New Hampshire, Vermont, and Maine under Public Law 100-446. The Secretary shall establish additional programs in each of the Northeast, Midwest, South, and Western regions of the United States, and the Pacific Northwest (including the State of Washington), on the preparation of an assessment of the need for such programs.

(e) ELIGIBILITY- Within 1 year from the date of enactment of this section and in consultation with State Forest Stewardship Advisory Committees established under section 15(b) and similar regional organizations, the Secretary shall establish eligibility criteria for the designation of forest areas from which lands may be entered into the Forest Legacy Program and subsequently select such appropriate areas. To be eligible, such areas shall have significant environmental values or shall be threatened by present or future conversion to nonforest uses. Of land proposed to be included in the Forest Legacy Program, the Secretary shall give priority to lands which can be effectively protected and managed, and which have important scenic or recreational values; riparian areas; fish and wildlife values, including threatened and endangered species; or other ecological values.

(f) APPLICATION- For areas included in the Forest Legacy Program, an owner of lands or interests in lands who wishes to participate may prepare and submit an application at such time in such form and containing such information as the Secretary may prescribe. The Secretary shall give reasonable advance notice for the

submission of all applications to the State forester, equivalent State official, or other appropriate State or regional natural resource management agency. If applications exceed the ability of the Secretary to fund them, priority shall be given to those forest areas having the greatest need for protection pursuant to the criteria described in subsection (d).

(g) STATE CONSENT- Where a State has not approved the acquisition of land under section 6 of the Act of March 1, 1911 (16 U.S.C. 515), the Secretary shall not acquire lands or interests therein under authority granted by this section outside an area of that State designated as a part of a program established under subsection (b).

(h) FOREST MANAGEMENT ACTIVITIES-

(1) IN GENERAL- Conservation easements or deed reservations acquired or reserved pursuant to this section may allow forest management activities, including timber management, on areas entered in the Forest Legacy Program insofar as the Secretary deems such activities consistent with the purposes of this section.

(2) ASSIGNMENT OF RESPONSIBILITIES- For Forest Legacy Program areas, the Secretary may delegate or assign management and enforcement responsibilities over federally owned lands and interests in lands only to another governmental entity.

(i) DUTIES OF OWNERS- Under the terms of a conservation easement or other property interest acquired under subsection (b), the landowner shall be required to manage property in a manner that is consistent with the purposes for which the land was entered in the Forest Legacy Program and shall not convert such property to other uses. Hunting, fishing, hiking, and similar recreational uses shall not be considered inconsistent with the purposes of this program.

(j) COMPENSATION AND COST SHARING-

(1) COMPENSATION- The Secretary shall pay the fair market value of any property interest acquired under this section. Payments under this section shall be in accordance with Federal appraisal and acquisition standards and procedures.

(2) COST SHARING- In accordance with terms and conditions that the Secretary shall prescribe, costs for the acquisition of lands or interests therein or project costs shall be shared among participating entities including regional organizations, State and other governmental units, landowners, corporations, or private organizations. Such costs may include, but are not limited to, those associated with planning, administration, property acquisition, and property management. To the extent practicable, the Federal share of total program costs shall not exceed 75 percent, including any in-kind contribution.

(k) EASEMENTS-

(1) RESERVED INTEREST DEEDS- As used in this section, the term `conservation easement' includes an easement utilizing a reserved interest deed where the grantee acquires all rights, title, and interests in a property, except those rights, title, and interests that may run with the land that are expressly reserved by a grantor.

(2) PROHIBITIONS ON LIMITATIONS- Notwithstanding any provision of State law, no conservation easement held by the United States or its successors or assigns under this section shall be limited in duration or scope or be defensible by--

(A) the conservation easement being in gross or appurtenant;

(B) the management of the conservation easement having been delegated or assigned to a non-Federal entity;

(C) any requirement under State law for re-recordation or renewal of the easement; or

(D) any future disestablishment of a Forest Legacy Program area or other Federal project for which the conservation easement was originally acquired.

(3) CONSTRUCTION- Notwithstanding any provision of State law, conservation easements shall be construed to effect the Federal purposes for which they were acquired and, in interpreting their terms, there shall be no presumption favoring the conservation easement holder or fee owner.

(l) APPROPRIATION- There are authorized to be appropriated such sums as may be necessary to carry out this section.

Sec. 374 Optional State Grants for Forest Legacy Program

Section 7 of the Cooperative Forestry Assistance Act of 1978 (16 U.S.C. 2103c) is amended

(1) by redesignation subsection (l) as subsection (m); and
(2) by inserting after subsection (k) the following:

(l) OPTIONAL STATE GRANTS.-

(1) IN GENERAL. – The Secretary shall, at the request of a participating State, provide a grant to the State to carry out the Forest Legacy program in the State.

(2) ADMINISTRATION. – If a State elects to receive a grant under this subsection-

(A) the Secretary shall use a portion of the funds made available under subsection (m), as determined by the Secretary, to provide a grant to the State; and

(B) the State shall use the grant to carry our the Forest Legacy Program in the State, including the acquisition by the State of lands and interests in lands.

The new subsection (m), formerly subsection (l), reads as follows:

(m) APPROPRIATIONS. – There are authorized to be appropriated such sums as may be necessary to carry out this section.

APPENDIX III: MISSISSIPPI FOREST LEGACY PROGRAM APPLICATION

MS Forest Legacy Program Application

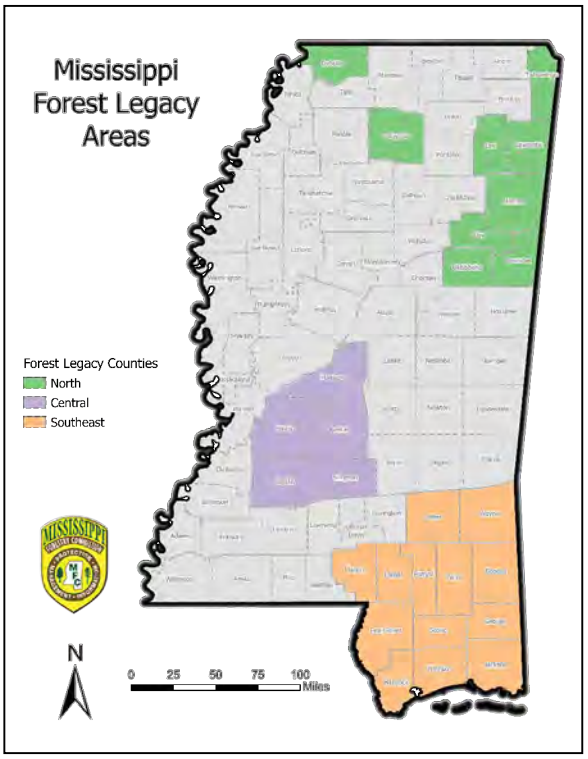
Application Deadline August 15

See last page for application address and MFC contact information.

ABOUT THE FOREST LEGACY PROGRAM

The purpose of the Mississippi Forest Legacy Program (FLP) is to identify and protect environmentally important forest areas threatened by conversion to non-forest uses and to promote forestland protection and other conservation opportunities. The U.S. Forest Service provides up to 75% of the funds through a nationally competitive grant program to the state, and the program is managed locally by the Mississippi Forestry Commission. The FLP works with private landowners to acquire perpetual conservation easements that permanently limit property interests and uses to protect forest values. In some cases, FLP also purchases and accepts donations of forestland in full fee. The FLP only works with willing sellers or donors.

Designated Mississippi Forest Legacy Areas (FLAs) are:
North - Clay, Desoto, Itawamba, Lafayette, Lee, Lowndes, Monroe, Oktibbeha, Tishomingo
Central - Copiah, Hinds, Madison, Rankin, Simpson
Southeast - Forrest, George, Greene, Hancock, Harrison, Jackson, Jones, Lamar, Marion, Pearl River, Perry, Stone, Wayne



Prior to completing this application, you are strongly encouraged to review the *Mississippi Forest Legacy Program Plan* (https://www.mfc.ms.gov/programs/private-landowner-services/forest-legacy-program/) for eligibility requirements and program guidance. Only properties located in one of the designated Mississippi FLAs will be considered and must meet the national and state criteria and must have a completed application submitted by August 15th**.** All easements and interests in land acquired through the program are conveyed in perpetuity and must contain such covenants and language to insure perpetuity of Forest Legacy Program easements. **Participation in Mississippi's Forest Legacy Program is strictly voluntary. For applications to be considered for federal fiscal year 2023, the deadline for application submittal is August 15.**

All materials submitted with this application become the property of the State of Mississippi and are non-returnable. Disclosure of this information is voluntary. However, failure to provide all of the requested information will substantially decrease the ability of designated persons to properly review and rank your application and property for participation in the program.

The Mississippi Forestry Commission provides equal employment opportunity and services to all individuals regardless of disability, race, age, religion, color, gender, creed, national origin, or political affiliation.

INSTRUCTIONS TO FLP APPLICANT

1. Download this Microsoft Word™ document; answer all questions completely and save it to submit with attachments. Please submit the application as a Word™ document in 12-point font, single spaced.

2. Answer all questions in all sections completely.

3. Attach all applicable supporting documents, photos, maps, deeds, etc. to this application.

4. **Submit this completed application and all attachments to the Mississippi Forestry Commission no later than 5 p.m. on August 15 via mail, hand delivery or electronically.** No faxes will be accepted

5. **For assistance, and address to submit your application and attachments:**

   Mississippi Forestry Commission
   Attn: **Forest Legacy Coordinator**
   660 North Street, Suite 300
   Jackson, MS 39202
   (601)927-8484
   rmcinnis@mfc.ms.gov

6. **Attach one (1) clean copy the following items to this application for each contiguous parcel nominated:**
   a. Application: Completed application.
   b. Owners: Name(s), address(es), phone number and email of all owner(s) of record for this tract(s) and the exact listing(s) of ownership name.
   c. Location: Central latitude and longitude, County, and map indicating location of property in the county or counties where located.
   d. Copy of plat or survey map (if available) showing property boundary and boundary of nominated parcel(s). (You may email a GIS shape file as well).
   e. Aerial photo with boundaries of nominated parcel(s) marked (if available).
   f. Deed(s): Copy of all deed(s).
   g. Improvements: List of existing permanent improvements on the tract, including houses, barns, lakes, ponds, dams, wells, roads and other structures and the total number of acres occupied by improvements.
   h. Map identifying any dams, dumps, or waste disposal sites on the property (if any).
   i. Forest management plan: (Multiple-resource or Forest Stewardship Plan) if available.

SECTION I. APPLICANT INFORMATION

1. **LANDOWNER'S FULL NAME:** _____

2. **FULL MAILING ADDRESS (STREET OR P.O. BOX, CITY, STATE, ZIP):**

   _____

   _____

3. **DAYTIME PHONE:** _____

4. **CELL PHONE:** _____

5. **FAX NUMBER:** _____

6. **E-MAIL ADDRESS:** _____

7. **LIST ALL CO-OWNERS OF THE PROPERTY (AND THEIR ADDRESS, EMAIL, AND PHONE NUMBER OR ATTACH A LIST):**

   _____

   _____

   _____

   _____

   _____

   _____

   _____

   _____

   _____

8. **AUTHORIZED REPRESENTATIVE (IF DIFFERENT THAN THE LANDOWNER):** *If applicable, please list name, full mailing address, phone, e-mail for persons authorized to represent you on this application.*

   _____

   _____

   _____

   _____

   _____

   _____

   _____

   _____

   _____

SECTION II. PROPERTY INFORMATION

1. **LOCATION OF PROPOSED PARCEL OR PARCELS**
   County(ies): _____
   Central GPS Point(s) (latitude and longitude): _____
   Township: Range: Section(s): _____
   Tax Parcel #s _____
2. **SIZE:**
   Total property acres of nominated parcel(s): _____
   Total forested acres of nominated parcel(s): _____
   How much of the total acres above are you nominating to the Forest Legacy Program in this application? _____

3. **ARE YOU INTERESTED IN BEING CONSIDERED FOR:** *(mark one or both)*
   _____ a conservation easement, or
   _____ Selling all or a portion of the property.
   ____ Unsure

4. **IS ANY OF THIS ACREAGE ENROLLED IN THE AMERICAN TREE FARM SYSTEM, A THIRD-PARTY FOREST CERTIFICATION OR OTHER FOREST MANAGEMENT PROGRAM***? If so, please list the program(s) and acres covered.*

   _____
   _____
   _____
   _____
   _____
   _____
   _____
   _____

5. **DO YOU HAVE A WRITTEN FOREST MANAGEMENT PLAN OR FOREST STEWARDSHIP PLAN?** *If so, please attach a copy of it.*
   _____ Yes
   _____ No

6. **HAVE YOU BEEN WORKING WITH A FORESTER, LAND MANAGER OR BIOLOGIST WHO COULD PROVIDE TECHNICAL INFORMATION ABOUT YOUR PROPERTY?** *If so, may we contact him/her? Please provide the full name and a daytime phone number and e-mail.*

   _____
   _____
   _____
   _____

SECTION III. LANDOWNER GOALS AND OBJECTIVES:

1. **DESCRIBE IN THE SPACE BELOW YOUR LONG-TERM GOALS AND OBJECTIVES FOR THE NOMINATED PROPERTY**. *Please share with us why the property important to you. What would you like to see happen to this property in the future?*

2. **LANDOWNER SELF EVALUATION:** *Please help us understand the uniqueness of your property. Prioritize in order the following reasons why your property should be enrolled in the Forest Legacy Program (1-most important to 10-least important).*

_____ Prevent conversion/development/fragmentation of an important forest resource
_____ Protection of scenic resources
_____ Protect/enhance a watershed or important drinking water supply
_____ Protect/enhance an important riparian/hydrologic area
_____ Provide linkage between public properties, protected areas and greenways
_____ Protect/enhance/restore fish and/or wildlife habitat
_____ Protect/enhance/restore habitat of rare, threatened, and/or endangered species, plant and/or animals
_____ Provide for the continuation of traditional forest uses
_____ Provide historical/cultural uniqueness or protection
_____ Other:

_____

SECTION IV. HOW YOUR PROPERTY FITS INTO THE NATIONAL FLP CORE CRITERIA

Nominated properties must compete nationally for FLP funds. They will be scored using three (3) national core criteria (Importance, Threatened and Strategic) AND must demonstration that they are "Ready" to be part of the Forest Legacy Program. These criteria are listed below – please describe how your property relates to each by answering each question below in as much detail as necessary.

1. **WHAT IS THE IMPORTANCE OF YOUR PROPERTY AS IT RELATES TO ANY ENVIRONMENTAL, SOCIAL OR ECONOMIC PUBLIC BENEFITS THAT WOULD BE GAINED BY PROTECTING AND MANAGING IT?**
   Helpful hints – *Describe in detail any attributes that are applicable to your property. More points will be given to projects that demonstrate multiple public benefits with national significance. For instance, explain if your property demonstrates sustainable forest management, contributes to the resource-based economy of the region, or has highly productive soils. Is it important habitat for documented threatened or endangered animals or rare plants or species or natural communities of concern? Does it contain unique forest communities or habitat documented by a formal conservation plan? Does it provide important watershed or riparian values, or is it in a scenic viewshed, or bordering a federal wild and scenic river or state scenic stream? Does it have formally designated cultural or historic features or does it provide public access. Does it provide non-timber revenue to the local or regional economy through activities such as hunt leases, ranching, non-timber forest products, guided tours (fishing, hunting, bird watching), and recreational rentals (bikes, boats, outdoor gear).*

2. **EXPLAIN HOW YOUR PROPERTY IS THREATENED BY DEVELOPMENT OF CONVERSION TO OTHER USES.**
   Helpful Hints: *This criterion estimates the likelihood for conversion and considers the following:*
   - *Legal Protection - Are there any legal protections that currently exist on the property (such as current zoning or existing easements)? If so, do these protections remove the threat of conversion, and to what extent?*
   - *Land and Landowners Circumstances – For example: property held in an estate, aging landowner, future use of property by heirs is uncertain, property is up for sale or has a sale pending, landowner has received purchase offers, land has an approved subdivision plan, landowner has sold subdivisions of the property, good land steward interested in conserving land, etc.*

- *Adjacent Land Uses - Status of adjacent properties, rate of development growth and conversion in area, rate of population growth, rate of change in ownership, etc.*
- *Ability to Develop - Physical attributes of the property that will facilitate conversion, such as access, slope, water/sewer, electricity, etc.*

3. **How Is The Property Strategically Linked To Other Protected Areas Nearby***?*
   Helpful Hints: *Does the property fall within a priority area designated by a conservation plan, strategy or initiative by a government or non-government entity? Will protection of your property enhance, expand or buffer already protected lands such as other FLP tracts, state, federal or non-government lands, conservation easements, or other protected or conserved lands, designated scenic areas or byways?*

4. **Is The Property "Ready" To Be A Part Of The Forest Legacy Program?** ***Helpful Hint:*** *These items are not required for the application to be considered, but any of these items that show the amount of due diligence that has already been completed will strengthen the application. To demonstrate readiness to go forward, describe and/or attach any of the items you have to this application or indicate if they have been completed such as: a cost estimate (market analysis or preliminary appraisal of the property); a signed agreement by the landowner to the easement or fee acquisition conditions; a commitment to cost share from partners – list any potential partners (we must have at least 25% non-federal cost share); a signed option or purchase and sales agreement; survey; title search; minerals determination or remoteness letter by a geologist; forest stewardship plan or multiple use plan.*

SECTION V. OTHER COMMENTS

ADD ANY OTHER COMMENTS ABOUT YOUR FOREST LEGACY APPLICATION OR THE UNIQUENESS OF YOUR PROPERTY.

SECTION VI. Confidential Financial Information and Ownership Information

The following financial, deed and lien information shall remain confidential until such time as: 1) the application has been approved and all transactions are concluded, or 2) all title holders give written permission to release the information.

1. FINANCIAL INFORMATION

The following estimates are for preliminary use only. Any final offer for conservation easement or fee simple purchase cannot exceed fair market value, as determined by an appraisal meeting the 2016 Uniform Appraisal Standards for Federal Land Acquisition (known as Yellowbook Standards).

a. **What is the estimated total value of this property?** $ _____

b. **How was this value determined:** *(e.g.: landowner's personal estimate, licensed appraiser, Realtor, written legal appraisal -please provide a copy with this application if available).* _____

c. **Are you willing to donate part or all of the appraised value?** *(Applies to either conservation easement or fee simple title).*

_____ Yes _____ No _____ Not sure

If yes, what percent value would you be willing to donate? _____%

d. **State the value of any other contribution you or a partner may make to help make this project successful, either in donated value of in-kind services or financial**. *For example: appraisal, survey, title work, minerals remoteness letter, survey, or the value any potential partners may make (please list partner and contribution). Note: Donations may constitute a charitable contribution for income tax purposes, depending on applicable Internal Revenue Service guidelines and regulations.*

_____

_____

2. LIENS AND ENCUMBRANCES

Please list any and all liens and encumbrances on the property proposed for enrollment in the Mississippi Forest Legacy Program. ***Examples: Mortgages, conservation easements, utility easements, public rights of way, water flow or water use restrictions, septic systems or water easements, deed restrictions or covenants, mineral extraction rights (gas, oil, coal, sand and gravel, stone, etc.), tax liens, dump sites, underground fuel tanks, other environmental hazards, enrollment in government programs (such as USDA conservation programs), etc.***

_____

_____

3. DO YOU OWN THE MINERAL RIGHTS ON THIS PARCEL? *If you have a mineral deed, or other evidence of mineral ownership, please attach to this application.*

_____ Yes

_____ No

_____ Unsure

SECTION VII. PRELIMINARY IDENTIFICATION OF RIGHTS TO BE RETAINED AND SOLD

CAREFULLY AND FULLY COMPLETE IF YOU WANT TO BE CONSIDERED FOR A CONSERVATION EASEMENT. IF YOU ARE OFFERING YOUR PROPERTY FOR FEE TITLE ACQUISITION, SKIP THIS SECTION VII. *The information you provide will directly affect the desirability of your property for this program. If you are considering a conservation easement, indicate which uses, rights or interests you may wish to* ***keep (K)*** *and which uses or interests you may wish to* ***sell (S)*** *as part of the conservation easement. If you are unsure, mark* ***U*** *and if not applicable, mark* ***NA****. Note: Checking* ***sell*** *or* ***keep*** *does not commit you to anything at this time, it merely assists the Mississippi Forestry Commission when inspecting, prioritizing and evaluating your parcel.*

K = Keep, S = Sell, U = Unsure, NA = Not applicable to your property

_____ Commercial, residential or industrial development
_____ The right to manage and harvest timber
_____ The right to subdivide the property
_____ The right to hunt, fish or trap (commercial).
_____ The right to hunt, fish or trap (non-commercial/private only).
_____ Mining for sand/gravel (or other minerals)*
_____ Right to limit or control public access to your property
_____ The right to graze open areas (acres _____)
_____ The right to farm open areas for profit (acres _____)
_____ The right to build or rebuild roads (other than forest management/protection roads)
_____ Ownership of existing buildings and other improvements.
_____ Other recreational activities such as camping, hiking, cycling, horseback riding.
_____ Motorized access
_____ Expansion of existing improvements (buildings).
_____ Others? Please specify:

_____
_____
_____
_____
_____
_____

* *Retention of unrestricted mineral or oil/gas rights will exclude that portion or all of your property from consideration in the Mississippi FLP.*

SECTION VIII. LANDOWNER TESTIMONY AND PERMISSION

Please read, sign and date before submitting this application.

The information in this application is true to the best of my knowledge and belief. I, as the landowner or landowner's authorized representative (proof of authorization must accompany the application), agree to allow any needed inspection, appraisal and survey of the property being offered for consideration under the Mississippi Forest Legacy Program. I agree to allow members of the Mississippi Forestry Commission, the Mississippi Forest Legacy committee or their designee to inspect my property at any reasonable time for the purposes of this application. I understand I shall be notified in advance of all inspection visits.

I also understand that the resource values identified by me in this application for protection will be used by the Mississippi Forestry Commission to rank the project. Therefore, future protection and management of these resources are implied in the application and will be required in the easement (if applicable) and subsequent management plans. Substantial modifications of the intent set forth in this application by me or my representative will necessitate a review of the project and may jeopardize its selection and possible funding. I also understand that this property (i.e. conservation easement or fee simple title) will not be purchased if negotiations do not reach an amicable agreement, or if the property does not meet the needs or qualifications of the Mississippi Forest Legacy Program or if funding is unavailable. I understand that conservation easements or fee simple title will only be purchased from willing sellers.

I have read through the application and understand that all Forest Legacy projects will be reviewed by the MFC for their suitability to the Mississippi Forest Legacy Program. Furthermore, that the Forest Legacy agreement is voluntary and subject to the availability of funds and the willingness of the State of Mississippi to accept the easement as negotiated.

Print name of each title holder	**Signature**	**Date**

Mail completed application by August 15 to:

Mississippi Forestry Commission
Attn: **Forest Legacy Coordinator**
Richard McInnis
660 North Street, Suite 300
Jackson, MS 39202
(601)927-8484
rmcinnis@mfc.ms.gov

http://www.mfc.ms.gov/forest-legacy

FOREST LEGACY PROGRAM
PROJECT SCORING GUIDANCE

Introduction:

This document provides guidance to the National Review Panel on how to score individual Forest Legacy Program (FLP) projects, including additional clarification on the core national criteria, project readiness, and other evaluation considerations used in this process. The outcome from the National Review Panel will be a ranked and prioritized list of FLP projects for submission to the Office of Management and Budget for consideration in the President's Budget. Its objectives are to:

- Provide a clear and defensible ranking process that can be easily articulated to program participants and partners; and
- Ensure fair, equitable, and thorough review of all projects by the National Review Panel.

National Project Selection:

- A multi-tract project should be scored based on how all the tracts fit within the criteria. For example, if only one tract meets the highest point criteria, the project will not likely obtain the highest points.

Region/Area/IITF Role:

- Work with States to produce highly competitive FLP projects;
- Work with States to produce projects that are "Ready";
- Work with States to assure that all pertinent project information is in the Forest Legacy Information System (FLIS), including prioritizing tracts if the States choose to do so;
- Learn and understand project details;
- Assure that projects are consistent with the goals of the State Forest Action Plan (Statewide Assessment and Resource Strategy, including Assessments of Need incorporated by reference);
- Confirm that projects have been reviewed and evaluated by the State Forest Stewardship Coordinating Committee;
- Assure that projects comply with the June 30, 2003, FLP Implementation Guidelines, as amended;
- Work with States to identify which projects can be phased and the funding threshold.

Washington Office Role:

- Work with Regions/Area/IITF (R/A/I) to produce highly competitive FLP submissions; and
- Ensure that project selections meet congressional direction and national program goals.

National Review Panel Role:

- Score projects using the national core criteria (Importance, Threatened, and Strategic);
- Develop a National List of ranked projects.

National Core Criteria:

Importance - This criterion focuses on the attributes of the property and the environmental, social, and economic public benefits gained from the protection and management of the property and its resources. This criterion reflects the ecological assets as well as the economic and social values conserved by the project and its level of significance.

National significance of a project is demonstrated in two ways:

1. A project that solidly represents a majority of the attributes outlined is viewed as nationally significant because of its strong alignment with the purposes and Strategic Direction of the Forest Legacy Program.
2. A project that supports Federal laws (such as Endangered Species Act, Safe Drinking Water Act, and Clean Water Act) contributes to Federal initiatives or contains or enhances Federal designations (such as Wild and Scenic Rivers, National Scenic Byways, National Recreation Trails, and cultural resources of national importance). When determining Federal importance, interstate/international resources (such as migratory species, or trail and waterways that cross state or international boundaries) should also be considered.

Scoring consists of evaluating a project for the attributes below and identifying a point score. More points will be given to projects that demonstrate multiple public benefits of significance. Significance of attributes is demonstrated by the quality and scope of the attributes. More points will be given to projects that exemplify a particular attribute or combination of attributes.

A project need not have all the attributes listed to receive maximum points for this category, but projects that contain more attributes should receive a higher score. For a project to receive the maximum point score, it must contain a majority of the attributes and must significantly address one or more of the Federal laws or initiatives noted above. A project brief that discusses the majority or all the attributes, but demonstrates only limited importance for each attribute, should not receive maximum or perhaps even medium ranking.

- *High importance* (21-30 points) - The project contains a majority of the attributes and those attributes are very significant and of high-quality.
- *Medium* (11-20 points) - The project contains a majority of attributes, several of which are very significant and of high-quality.
- *Low* (0-10 points) - The project contains only a few attributes or it could contain all of them, but does so in a limited, marginal, or tertiary way.

**Please note: Discussion about how the project fits within a landscape conservation initiative should be included under the "strategic" category and not in this section.

Attributes to consider: The descriptions listed below represent the ideal project for each attribute. *Note that the attributes are not listed in priority order.*

Economic Benefits from Timber and Potential Forest Productivity - This category includes three independent components: (1) Landowner demonstrates sustainable forest management in accordance with a management plan. Additional points should be given to land that is third party certified (such as Sustainable Forestry Initiative, Forest Stewardship Council, and American Tree Farm System). (2) Forestry activities contribute to the resource-based economy for a community or region. (3) The property contains characteristics (such as highly productive soils) to sustain a productive forest. (Strategic Direction Goal 2.3)

Economic Benefits from Non-timber Products - Provides non-timber revenue to the local or regional economy through activities such as hunting leases, ranching, non-timber forest products (maple syrup, pine straw, ginseng collection, etc.), guided tours (fishing, hunting, birdwatching, etc.), and recreation and tourism (lodging, rentals, bikes, boats, outdoor gear, etc.).

Threatened or Endangered Species Habitat - The site has documented threatened or endangered plants and animals or designated habitat. Documented occurrence and use of the property should be given more consideration in point allocation than if it is habitat without documented occurrence or use. Federally listed species should be given more consideration than state-only listed species when evaluating the significance of this attribute. (Strategic Direction Goal 2.3)

Fish, Wildlife, Plants, and Unique Forest Communities - The site contains unique forest communities and/or important fish or wildlife habitat as documented by a formal assessment or wildlife conservation plan or strategy developed by a government or a non-governmental organization. The importance of habitat to an international initiative to support and sustain migratory species can be viewed as national importance if conserving the property will make a significant contribution. The mere occasional use of the property or a modest contribution to an international initiative does not raise the property to national importance. (Strategic Direction Goal 2.3)

Water Supply, Aquatic Habitat, and Watershed Protection - (1) Property has a direct relationship with protecting the water supply or watershed, such as providing a buffer to public drinking water supply, containing an aquifer recharge area, or protecting an ecologically important aquatic or marine area, and/or (2) the property contains important riparian area, wetlands, shorelines, river systems, or sensitive watershed lands. When allocating points consider the importance of the resource, the scope and scale of the property, and the magnitude and intensity of the benefits that will result from protection of the property. Merely being located within an aquifer recharge area or in a water supply area should not be given the same consideration as a property that makes a significant conservation contribution to water, riparian, and aquatic resources and habitats. (Strategic Direction Goal 2.1)

Public Access - Protection of the property will maintain or establish access by the public for recreation; however, restrictions on specific use and location of recreational activities may exist. (Strategic Direction Goal 2.3)

Scenic - The site is located within a viewshed of a government designated scenic feature or area (such as a trail, river, or highway). Federal designation should be given more consideration than state-only designations when evaluating the significance of this attribute.

Historic/Cultural/Tribal - The site contains features of historical, cultural, and/or tribal significance, formally documented by a government or a non-governmental organization. A Federal designation should receive greater consideration.

Threatened - This criterion estimates the likelihood for conversion. More points will be given to projects that demonstrate multiple conditions; however, a project need not have all the conditions listed to receive maximum points for this category.

During the evaluation of a threat, a landowner interested in conserving their land should not be penalized in allocating points because they are not marketing their land, have not subdivided their land, or sought approval for a subdivision plan. Also, a property with an approved subdivision plan should not, without question, receive a high score in the Threatened section. The attributes outlined below must be considered to determine if the conditions exist to make conversion of a property likely and points should be allocated accordingly.

If the property has been acquired by a third party with the support of the State, threatened will be evaluated based on the situation prior to the third party acquisition.

- *Likely* (11-20 points) - Multiple conditions exist that make conversion to non-forest uses likely;
- *Possible* (1-10 points) - A few conditions exist that make conversion to non-forest uses possible; or
- *Unlikely* (0 points) - Current conditions exist that make conversion to non-forest uses unlikely.

**Please note: Discussion about what project attributes will be threatened if the project is converted should be included under the "importance" category and not in this section.

Attributes to consider: The descriptions listed below represent the ideal project for each attribute. *Note that the attributes are not listed in priority order.*

Lack of Protection - The lack of temporary or permanent protections (e.g. current zoning, temporary or permanent easements, moratoriums, and encumbrances that limit subdivision or conversion) that currently exists on the property and the likelihood of the threat of conversion.

Land and Landowners Circumstances - Land and landowner circumstances such as property held in an estate, aging landowner, future property by heirs is uncertain, property is for sale or has a sale pending, landowner anticipates owning property for a short duration, landowner has received purchase offers, land has an approved subdivision plan, landowner has sold subdivisions of the property, etc.

Adjacent Land Use - Adjacent land use characteristics such as existing land status, rate of development growth and conversion, rate of population growth (percent change), rate of change in ownership, etc.

Ability to Develop - Physical attributes of the property that will facilitate conversion, such as access, buildable ground, zoning, slope, water/sewer, electricity, etc.

Strategic - This criterion reflects the project's relevance or relationship to conservation efforts on a broader perspective. When evaluating strategic, four considerations should be made: 1) the scale of a conservation initiative, strategy, or plan; 2) the scale of the project's contribution to that initiative, strategy, or plan; 3) the placement of the parcel within the area of the initiative, strategy, or plan; and 4) how the project complements protected lands. (FLP Strategic Direction 1.1, 1.2, and 1.3)

- *High* (21-30 points) - The property significantly advances a conservation initiative, strategy, or plan and complements protected lands.
- *Average* (11-20 points) - The property makes a modest contribution to a conservation initiative, strategy, or plan and is near already protected lands.
- *Low* (0-10 points) - The property is not part of a conservation initiative, strategy, or plan or near already protected lands, but will lead to locally-focused conservation effort.

**Please note: The submitted project map should support this category and it is important to make sure the text and map are consistent.

Attributes to consider: The descriptions listed represent the ideal project for each attribute. *Note that the attributes are not listed in priority order.*

Conservation Initiative, Strategy, or Plan - How the project fits within a larger conservation plan, strategy, or initiative as designated by either a government or non-governmental entity.

Complement Protected Lands - How the project is strategically linked to enhance already protected lands including past FLP projects, already protected Federal, State, or non-governmental organization lands, or other Federal land protection programs (NRCS, NOAA, etc).

Additional Considerations:

Prior to developing the Regional project list, each State should be evaluated by the R/A/I regarding its fulfillment of the FLP core program requirements listed below:

1. Baseline reports for all closed conservation easement tracts (FLP Guidelines, page 18);
2. Forest stewardship plan or multi-resource management plan for all closed conservation easement tracts (FLP Guidelines, page 18);
3. Annual monitoring conducted for all closed conservation easements tracts (FLP Guidelines, page 20);
4. Addresses significant conservation easement violations and/or has a conservation easement violation plan (FLP Guidelines, page 20);
5. Implements a record keeping protocol for all FLP tracts (FLP Guidelines, page 37);

6. Developed and implemented an action plan to address recommendations in a Quality Assurance Inspection
   (Quality Assurance Plan for Forest Legacy Program Appraisals. September 2006);
7. The amount of unspent funds a State has in outstanding grants; and
8. Up-to-date on grant reporting requirements.

For the majority of States, we expect that all requirements will be met. In the rare case that persistent deficiencies in a State's performance are identified and cannot be remedied, the State can either not submit projects for consideration or submit projects with the understanding that they will not be reviewed and ranked by the National Review Panel. The projects will still be part of the National list, but will be added to the bottom below the reviewed and ranked projects. We expect that the R/A/I will have been working closely with the State during the year to address all deficiencies.

Prior to the due date, Forest Service WO and R/A/I FLP program staff will discuss deficiencies to ensure consistent treatment of States' projects and will share the outcome with the State.

The following items will be considered by the National Review Panel when developing the final list of ranked projects and associated funding levels, and not by the individual panel members when scoring projects:

1. The National Review Panel is not bound by a State's priority ranking of projects. If the National Review Panel ranks projects out of a State's priority order, then the panel will call that State to discuss the situation. However, the panel will not move a lower ranked project up the list to maintain the State's priority ranking.
2. The National Review Panel will give additional attention to projects from States that have not recently received funds as well as from States that are competing for the first time.
3. The National Review Panel will consider the following information when breaking ties, determining recommended funding levels for projects, or evaluating second and third projects for a State: (a) the amount of unspent funds each State has in outstanding grants; (b) amount of funds leveraged for the proposed project; (c) average time to close projects within the past five years; (d) average funds leveraged within the past five years; and (e) project readiness.

   Project Readiness is defined as the degree of due diligence completed. To demonstrate project readiness, completed items need to be specified (including completion date) in FLIS and credit will only be given to those items completed (One tally for each completed item, with a maximum tally of 7. Projects with multiple tracts will need to have the majority of their tracts have the task completed before a tally is given.):
   1. Documented support for the cost estimate, such as completed market analysis or preliminary appraisal.
   2. Landowner and State have general agreement on conservation easement or fee acquisition conditions.

3. Cost Share commitment has been obtained from a specified source.
4. A signed option or purchase and sales agreement is held by the State or at the request of the State **OR** At the request of the State, conservation easement or fee title is held by a third party.
5. Title search is completed, including identifying any temporary or permanent protections.
6. Minerals determination is completed.
7. For conservation easement properties, a stewardship plan or multi-resource management plan is completed.

The Mississippi Forestry Commission has provided forest protection, management and information to Mississippi landowners since 1926.

Learn more at www.mfc.ms.gov.

The Mississippi Forestry Commission provides equal employment opportunity and services to all individuals regardless of disability, race, age, religion, color, gender, creed, national origin, or political affiliation.

In accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its Agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.