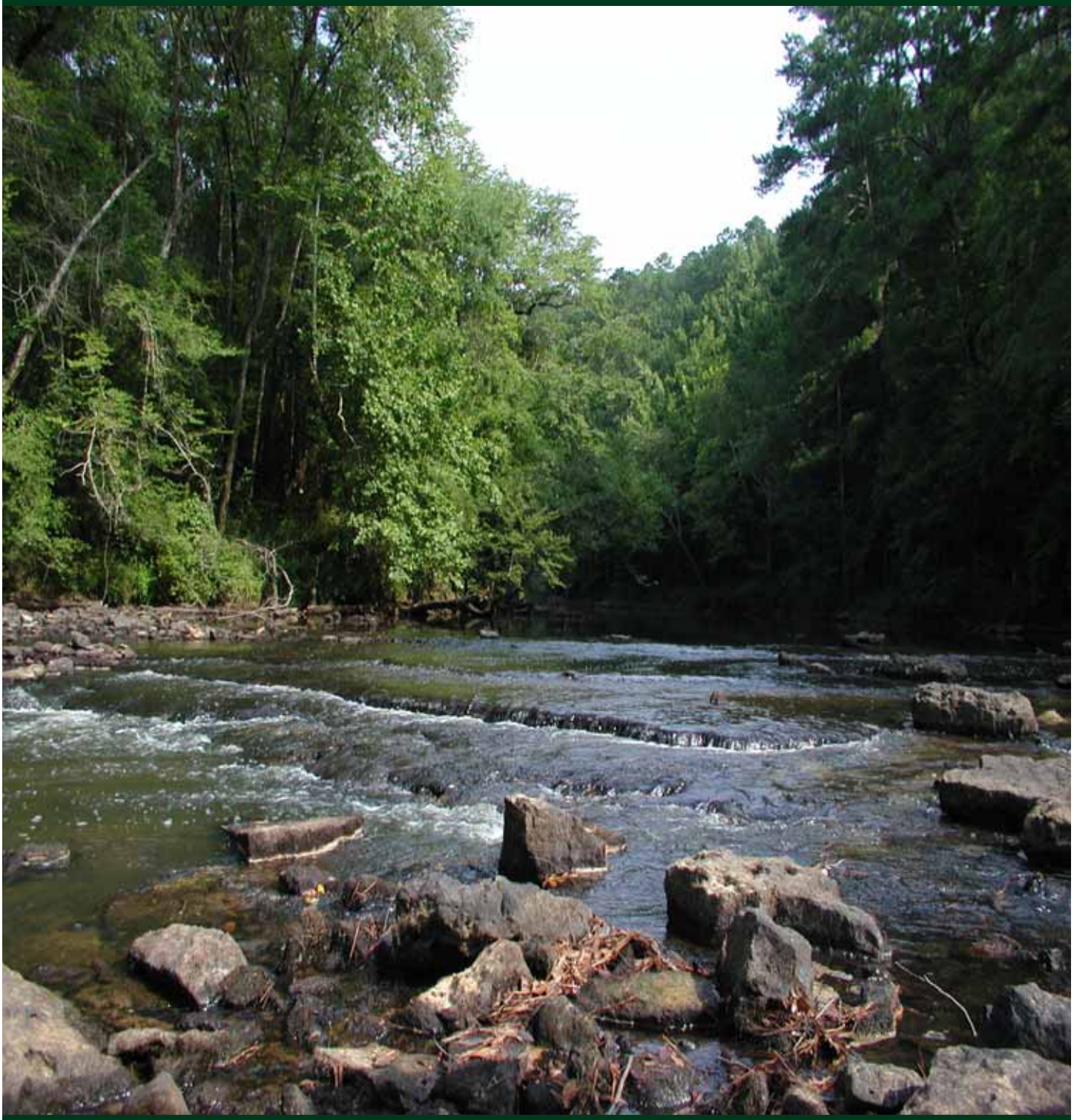
North Mississippi Forest Inventory



MIFi
MISSISSIPPI INSTITUTE FOR FOREST INVENTORY

MISSISSIPPI FORESTRY COMMISSION · PROTECTION · MANAGEMENT · INFORMATION · MFC

State of Mississippi
North District
Forest Inventory
2008

Acknowledgments

The Mississippi Institute for Forest Inventory acknowledges the College of Forest Resources and the Forest and Wildlife Research Center at Mississippi State University for continued assistance and support with development of the timber inventory methodology and software. The inventory would not be possible without the cooperation of public agencies such as the Mississippi Forestry Commission and their efforts in providing MIFI an operational platform and dramatically increasing the public's awareness; and, the Mississippi Automated Resource Information System (MARIS) for providing auxiliary data. Finally, MIFI extends a sincere debt of gratitude to private landowners in providing access to measurement plots.

Mississippi Institute for Forest Inventory Personnel

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Executive Summary

The 2007-2008 inventory season as well as the 2008 calendar year presented significant challenges and opportunities for the Mississippi Institute for Forest Inventory. A veritable explosion of interest in the development of alternative energy sources for both domestic and foreign markets was the mainstay of activity throughout the year. MIFI received over 30 requests resource analyses with their primary interest focused on the establishment of cellulosic ethanol conversion facilities.

In addition to completion of the North District Inventory, MIFI started collaborations with the Stennis Space Center to provide a portal for hurricane damage imagery for assessment, the MSU College of Forest Resrouces for assessing the impacts of biomass utilization on the forest industry landscape in Mississippi, and MSU Department of GeoSciences to develop a risk mapping system for hurricane damage. Although, ethanol is a fast-growing interest it is not the only energy market emerging in the landscape. Serious exploration of the resource availability is being conducted investigating the possibilities of producing fuel pellets. Also, the generation of electrical energy from biomass is being investigated.

After the incorporation of MIFI into the Mississippi Forestry Commission, under the direction of the new State Forester, Charlie Morgan, MIFI experienced a realignment of responsibilities. The Executive Director's role was expanded to include oversight of the combined Forest Management and MIFI Division. The Director of Operations' role was expanded to strengthen the geo-spatial and inventory components of the MFC. MIFI's contribution to the MFC mission was expanded to development of a Spatial Technology Unit that directs the acquisition and deployment of GPS and GIS technology within MFC. MIFI was also tasked with the development of an integrated Harvest Scheduling protocol for public lands under the management jurisdiction of MFC.

MIFI continues to exceed expectations in fostering cooperation with other agencies. As part of the joint mission of MIFI and MFC, Mississippi has renewed participation in the USDA-Forest Service Forest Inventory and Analysis (FIA) program. Joint efforts are being developed to survey and report on forest volumes and timber utilization. This will strengthen the understanding of how Mississippi's forest resources are being utilized not only for timber products but also for ecosystem services that are not typically associated with forest inventory efforts. Anticipating recent initiatives promoting alternative fuel development and biomass utilization, such as 25x'25, MIFI is now capable of reporting biomass metrics as well as the traditional volume metrics associated with timber production.

The inventory fore each district is delivered both in writing and via the World Wide Web. MIFI's website has undergone significant renovation and is now considered to be the first stop for understanding the forest resources of the state. Our Web site is the primary tool for retrieving inventory information for prospective economic development clients. Our interface allows the user to analyze inventory results and query specific geographic locations. To learn more about MIFI or access the inventory interface, visit our Web site at www.mifi.ms.gov.

Respectfully,
Mississippi Institute for Forest Inventory

Additional information about any aspect of this survey may be obtained from:
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Remote Sensing

MIFI represents an advancement of forest inventory philosophy, the first production scale integration of satellite remote sensing and forest inventory. Neither of the technologies can separately answer the two most important questions posed with forest resource assessment: 1) How much volume is present? and 2) Where is that volume located? These two technologies are brought together through the use of a Geographical Information System (GIS). By combining spatial data as derived from satellite imagery through classification, and Global Positioning System (GPS) linked attribute data obtained from ground measurements; the GIS answers the questions associated with the forest resource assessment.

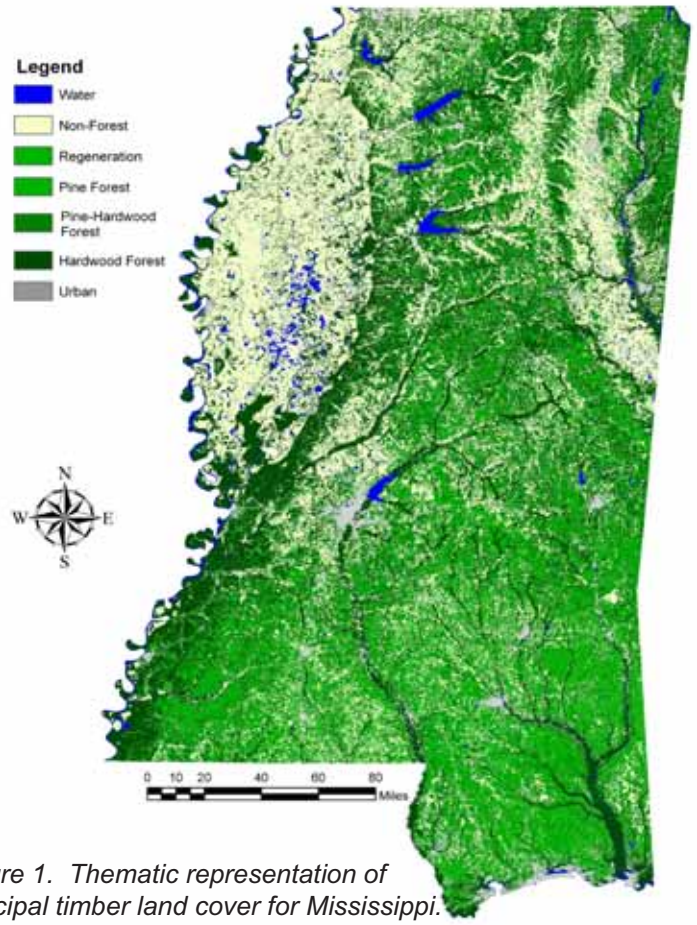

Figure 1. Thematic representation of principal timber land cover for Mississippi.

Area

The total productive land area of Mississippi is 30,521,018 acres. In 2003, the area of forestland totaled 19.79 million acres or 64.85% of the land area in MS. Pine forests cover 6.62 million acres or 33.45% of the forested area. Hardwood and oak-pine timber types combine to occupy over 53.11% of the state's timberland or 10.5 million acres. Land that is regenerating as forest area but is yet unclassified is 2.66 million acres or 13.45% of the current forested area.

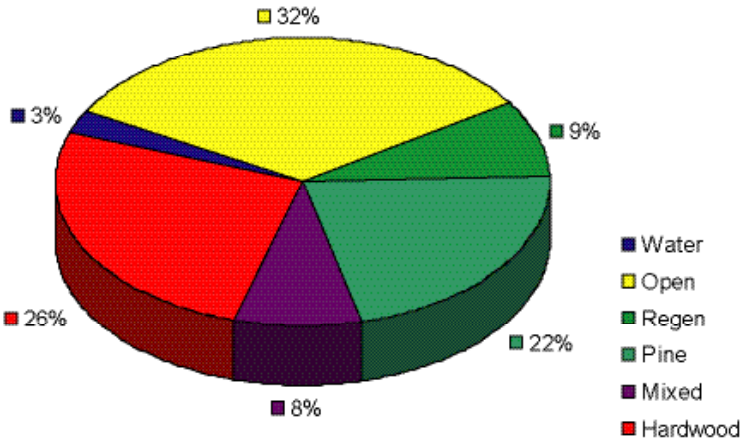

Figure 2. Mississippi land cover classification.

Ownership

Parcel ownership for land in Mississippi is predominated by family. Traditional family legacy subdivides large holdings into smaller parcels. Families acknowledge the legal distinction in ownership of the land but continue to manage the parcels as contiguous properties.

Mississippi has only recently begun transitioning to a digital format for property records. However, corporate and governmental ownership records are available in geo-referenced digital formats and MIFI has focused on the use of these records to create ownership descriptions. By process of elimination, the non-industrial private land ownership patterns can be discerned.

- Corporate timberland currently accounts for 3.1 million acres.
- Publicly owned federal timberland currently accounts for 2.2 million acres.
- Publicly owned state timberland currently accounts for approximately 1 million acres.
- Native American timberland in Mississippi amounts to approximately 25,000 acres.
- Almost 80% of the timberland in Mississippi is owned by private citizens.

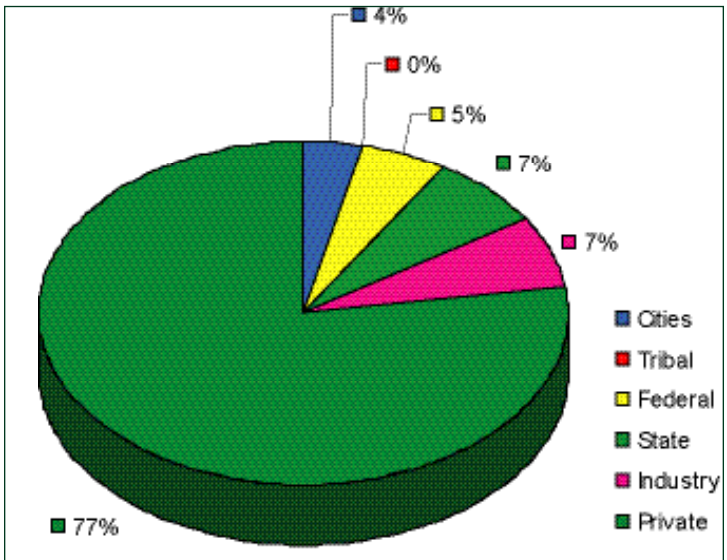

Figure 3. Mississippi land ownership patterns.

Growth

Sustainability of the forest resource is necessary to foster economic viability. Archival satellite imagery is used to assess the trend in resource utilization. The trend analysis utilizes satellite imagery that is classified into a forest/non-forest map of the state on an approximate 5-year cycle dating from 1973 to present.

Timber growth rates represent a return on investment realized as the increase in volume over a given length of time and reported as an annualized percentage rate. The ability to quickly and repeatedly determine growth rates in the market mandate the prevalence of softwood growth rates. This is not to say that hardwood growth rates are of less importance, but, the requirements to measure hardwood annual growth in the field are prohibitive thereby restricting the data collection efforts to the hardwood species that have the greatest economic value.

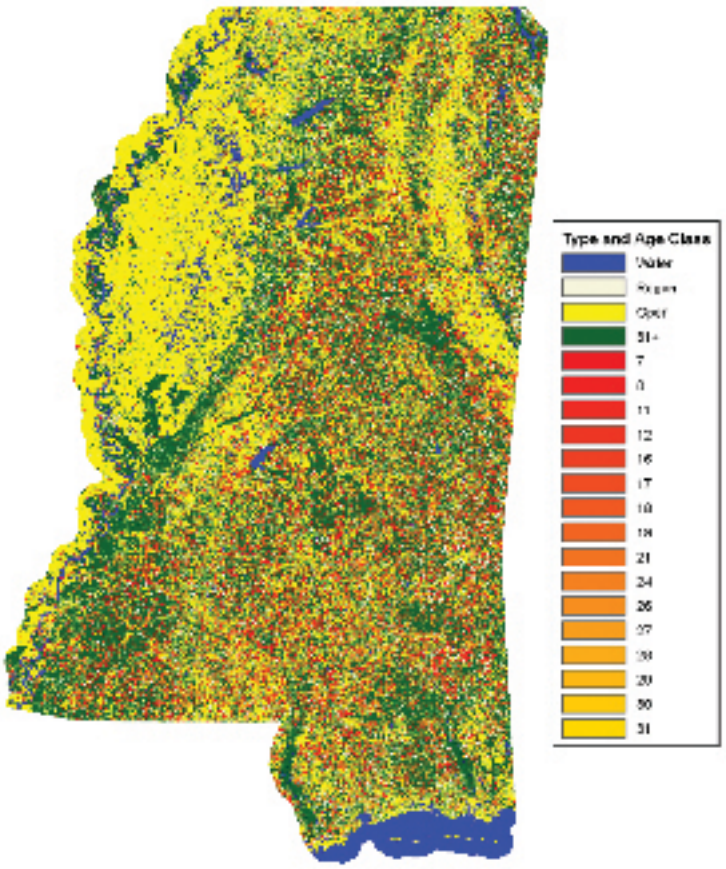

Figure 4. Type and ages of Mississippi forests.

- Softwood growth rate for the North MIFI District is 7.50%.

- Hardwood growth rate for the North MIFI District is 2.00%.

These growth rates can be compared to the interest rate paid upon a savings account and provide useful tools for investment analysis. The average current rate for a 5-year IRA CD is 4.00%. Pine timber production that is twice as profitable when compared to a savings account represents a competitive alternative for investors.

Figure 4 demonstrates the age distribution of Mississippi's forests. It also depicts the focus of harvesting activity throughout the years. The majority of harvesting occurs in a band in the center of the state from North to South and in the lower portion of the state below the I-20 corridor.

Economic Impact

Roundwood production is the mainstay of Mississippi's forest-based economy. Hardwood and softwood production supply the markets for everything from furniture and flooring raw material to construction grade solid wood products.

- Forestry, logging, primary wood products, and furniture manufacturing contribute between $11 and $14 billion annually to the State's economy.
- Approximately 54,000 individuals are directly employed in logging, forestry and other wood-processing industries with a combined income of $ 1.1 billion.
- Approximately 66,000 individuals are indirectly employed in secondary value added and materials handling related positions.

Available information pertaining to growth rates, harvest volumes, regeneration practices was collected to develop a growth to drain ratio. This measure of sustainability is a way of determining if the forest is being utilized to its maximum potential without creating conditions that will result in the total loss of forest resources in the future. The growth to drain ratio for North Mississippi is 1.4. This number means that this region of the state is producing approximately 40% more volume than is being utilized.

Forces of Change

Mississippi's forestland is dynamic and constantly changing. The primary driving force in change is the human element. Population centers are expanding and the resulting landscape is a mixture of forest and urban land cover often within close proximity to each other.

Natural forces typically do not result in loss of forestland. Insects and disease are always present and often influence stand structure throughout all stages of development. Other natural events can reshape the State's forest in a matter of hours. Fortunately, the 2007 hurricane season spared Mississippi the extensive damage incurred by neighboring states. Tornadic activity, though severe, is restricted to small areas and does not impact the forest at the landscape level.

Whether natural or human induced, long-term or short-term, permanent or temporary, Mississippi's forestlands are changing constantly. These changes are reflected in the current condition of the State's forests as evidenced by trends in land use; stand composition; estimates of wood volume; and rates of net annual growth, removals, and mortality. The effects extend to overall forest health, as well as water quality, recreation potential, future timber availability and other aspects of forestland use and condition.

A Brief History of Mississippi Forests

From the earliest occupation of Mississippi by Native Americans, the forests have been the primary livelihood. Wood products were used to manufacture dwellings and wildlife in the forest represented both a source of food and trade goods. If by definition a "virgin forest" is a forest that has been uninfluenced by humans, then virgin forests have not existed in Mississippi since the pre-Colombian era.

Agriculture was the major force that shaped early Mississippi landscapes. The practice of slash and burn agriculture practiced by early settlers resulted in a highly fragmented landscape of forests that exhibited all the stages of secession. At the beginning of the 20th century, large lumbering firms of the Northeast and Great Lakes regions were looking for new resources as the large growth timber of those regions became exhausted. The presence of rail networks and largely untapped reserves of timber in the Southeast attracted their attention. Thus, mechanized timber production began in Mississippi.

Until the late 1930's, the primary focus on forestry was the production of timber with little regard for scientific-based management. Professional foresters began to foster the concept of actively managing pine forestland that could meet the demand for timber related products. As environmental awareness increased, management of forestland began to take a multi-use approach. Aesthetics, recreation, and water quality are principles that professional foresters are now trained to incorporate into their management practices.

The Continuing Role of Pine Plantations

A little more than 40 years ago, planted pine stands occupied less than 2 million acres in the South. By the late 1990s pine plantations accounted for nearly half of all pine stands. The dramatic increase in pine plantations has become one of the defining issues in southern forest management and is an issue in Mississippi as well.

Pine stands are often mechanically regenerated after harvest to ensure the site remains in production as a pine forest type. Since the inception of the Conservation Reserve Program (CRP) in 1985, combined with the Forest Resource Development Program (FRDP) and the Forest Incentive Program (FIP) for cost sharing, establishment of plantations in Mississippi has totaled 2,146,254 acres.

This represents 11% of the total timberland area and nearly a third of the pine timber area in Mississippi. When well managed, planted pines have substantially lower mortality rates and higher rates of net annual growth, averaging nearly 128 cubic feet of wood growth per acre per year, compared to 76 cubic feet for natural pine stands.

Inventory Methods

The Mississippi Institute for Forest Inventory began the inventory in 2004. The sampling scheme is significantly different than traditional forest surveys, which produced estimates for an entire state. This type of analysis prohibits the estimates of areas equivalent to the size of a county. MIFI directs sampling in a two stage process: analysis of satellite-based remote sensing with statistical validation for depicting the land cover types and subsequent change through time; and intensive ground measurement of the forest timber for a region or district of the state. This information provides statistical precision for county level estimates that can be used for economic development.

The remote sensing effort utilizes the spectral reflectance of vegetation captured in 6 or 7 spectral bands by the LandSat satellite during both active and dormant seasons. Through a combination of band analyses and mathematical modeling, primary classifications of water, non-forest, pine, hardwood, and mixed pine-hardwood classes are obtained. Additional imagery from previous surveys is analyzed and then layered to represent the change in land cover over time. This stacking effect creates another classification, immature forest vegetation, which lacks maturity to allow for assignment in one of the dominant forestland cover classifications.

The ground-based measurements were implemented on a one-fifth acre fixed radius plot located randomly from the forest cover classification of the remotely sensed data. Saw timber, pole and veneer volume were sampled and characteristics associated with stand dynamics were measured. A one-tenth acre plot was incorporated to measure the volume of products classes used to produce fiber for the pulp industry. Finally, a one-twentieth acre plot was inventoried to measure non-merchantable stems that range from 1.0 to 4.5 inches in diameter at breast height.

In the event there was no merchantable material located on a plot, such as following a harvest, a one-hundredth acre plot was established to measure reproduction material that will develop into a future timber stand. A representative sample of the current forest conditions was obtained at each sample location for all timber species, from the smallest seedling to the largest tree encountered on any of the plots. Individual tree attributes measured include species, product, observable damage, diameter at breast height, total height, height to absolute diameter limits for pulpwood and saw timber volume, crown length, bark thickness, 5- and 10-year radial growth, and age. Stand level attributes recorded include slope, size class, apparent stand level damages, over story composition with reference to the remote sensing products, logging operability, physiographic position, Society of American Foresters forest cover type designation, litter depth, and USFS fuel model designation.

To avoid statistical confounding, plots were located within a strictly homogenous stand condition. In the event an operational or management activity has disrupted the proposed plot site (e.g. the establishment of a right-of-way, property thinning, etc.), the plot was shifted a specified distance to the stand that exhibited the higher heterogeneity in volume. Estimates of timber volume and forest classifications were derived from tree measurements and classifications made at these locations. Volumes for individual tally trees were computed using profile equations for each of the 60 major species in Mississippi.

Reliability of Data

The measure of reliability of inventory statistics is provided by sampling errors. MIFI inventories supported by all the allocated sample plots are designed to achieve reliable statistical precision (± 15% at 95% confidence) at the county level for total cubic foot volume outside bark. However, users should note that sampling error increases at the same level of confidence, as the number of plots is lowered by reducing the area. Sampling errors are often unacceptably high for small components of the total resource. The opposite occurs when estimates are derived from larger areas. Sampling errors and confidence limits mean that the chances are 95 times out of 100 that the true population value is within the limits indicated by the range of the sampling error.

Disclaimer: Although portions of this information are derived from MIFI sampling estimation techniques the presumed precision of ±15% sampling error with 95% confidence, it is a statistical estimation and not a 100% census of the forest resources within the inventory region. These estimates are subject to change reflecting changes to the analysis procedures or the data. These estimates are also temporally static and events and circumstances occurring within the inventory region that physically alter the forest resource will not be reflected.

District Volume

Mississippi was divided into five districts based on geography, physiography, economic and political characteristics. The North Region if the fourth region to be inventoried. This region was the primary source for the furniture manufacturing industry until the recent economic downturn. Other industries that utilize this region are hardwood sawmills and veneer mills as well as industries that produce cask and barrel staves.

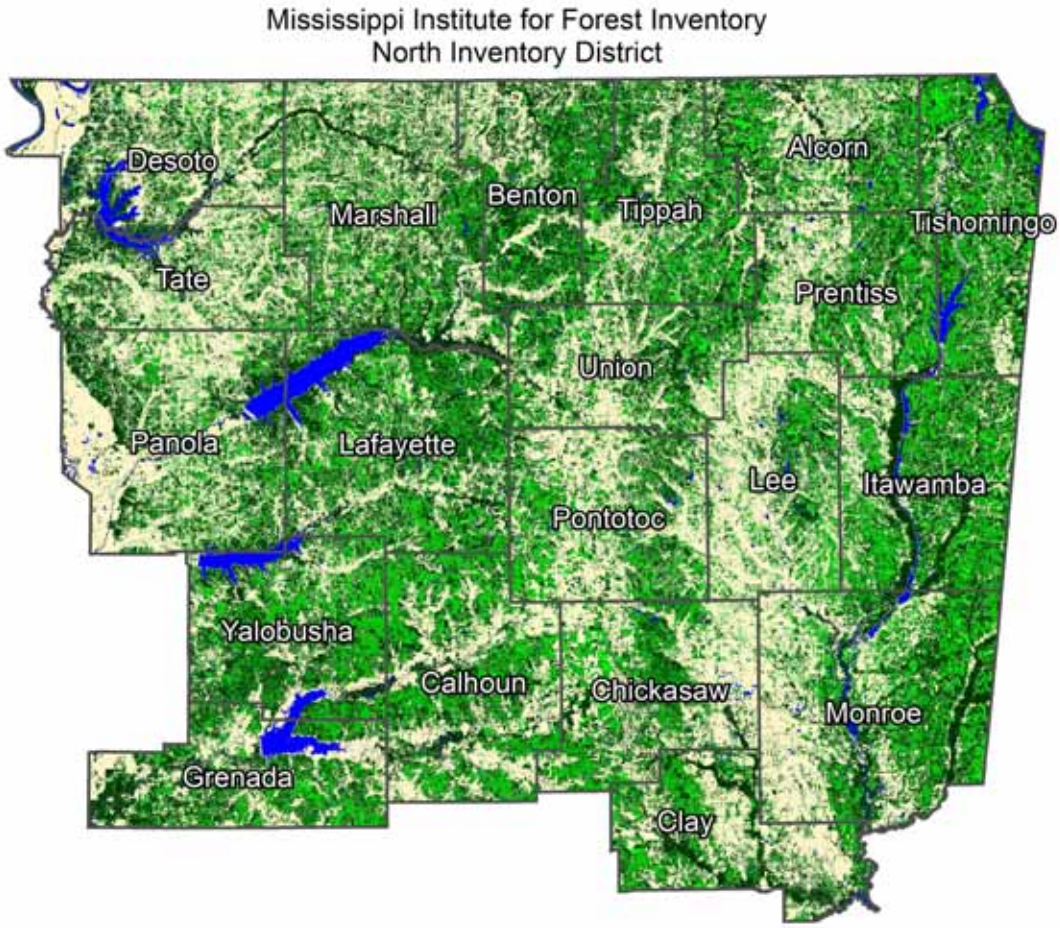

Figure 5. MIFI North Inventory District depicting the forest cover and counties inventoried.

The following tables report the forest cover types, volumes, and sampling errors associated with the 20 counties of the North MIFI district. Also included are the estimates for pine growth and non-commercial forest regeneration that will provide the future timber supply.

Table 1. Major stratification land cover acreages for MIFI North Inventory District.

Strata	Acres
Non-Forest	2,463,801
Reproduction	619,744
Pine	854,671
Mixed Pine-Hardwood	401,469
Hardwood	2,051,463
Total Forested	3,927,347
Total	6,573,835

Table 2. Corrected forested strata acreage estimates with associated sampling errors.

			Sampling Error		
Strata	Acres	Std. Error	97.5	95	90
Pine	631,858	11,385	4.1	3.5	3.0
Mixed Pine-Hardwood	201,796	7,489	8.4	7.3	6.1
Hardwood	1,830,275	26,930	3.3	2.9	2.4
Total	2,663,928	30,182	2.5	2.2	1.9

Table 3. Strata level per acre and total area estimates of pulpwood and sawtimber volumes[1] for pine and hardwood species groups with sampling errors.

	Per Acre		Total[2]			
	Pulpwood	Sawtimber	Pulpwood	Error %	Sawtimber	Error %
Pine	1,081.6	959.2	1,115,056.9	6.0	174,447.7	11.0
Mixed Pine-Hardwood	1,038.9	1,369.9	394,945.8	12.3	91,130.1	19.0
Hardwood	1,026.4	1,242.4	3,383,580.6	3.7	2768,873.6	5.4

1 Volumes are expressed in cubic feet outside bark.

District Biomass

Biomass is the term applied to any organic structure naturally produced on a site. In forestry, biomass typically refers to the trees and their component parts: main stem, branches, and foliage. The importance of estimating biomass relates to the future markets that are being developed for alternative fuel compounds and the current trade markets established for carbon credits. These markets, though common in European countries are just beginning to emerge in the US and Mississippi possesses a sizeable resource base positioned to fully utilize these markets to the economic benefit of its residents.

Table 4. Strata level per acre and total are estimates of stem, branch and foliage weight.[1]

	Per Acre			Total[2]		
Covertype	Stem	Branch	Foliage	Stem	Branch	Foliage
Pine	138,299	25,129	9,879	43,692	7,938	3,121
Mixed Pine-Hardwood	167,235	35,809	8,001	16,873	3,613	366
Hardwood	158,646	44,471	7,776	145,182	40,697	2,981

1 Weights are expressed as green pounds outside bark per acre and green tons outside bark for total.
2 Totals are expressed in 1,000s.

Individual County Volume

Table 5. Individual county volume estimates by species group and product class.

Alcorn County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	91,418			
Reproduction	28,484			
Pine	35,188	156,071	107,802	23.3%
Mixed Pine-Hardwood	15,317	26,349	110,026	86.3%
Hardwood	86,489	380,158	874,165	19.1%
Forested	165,479	562,579	874,165	17.3%

Benton County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	77,776			
Reproduction	23,581			
Pine	33,326	185,876	340,864	25.3%
Mixed Pine-Hardwood	18,566	34,104	192,495	40.3%
Hardwood	108,223	662,709	2,133,233	12.6%
Forested	183,695	882,689	2,666,592	11.2%

Calhoun County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	136,801			
Reproduction	26,938			
Pine	76,720	578,193	620,913	32.2%
Mixed Pine-Hardwood	29,141	72,535	73,103	80.1%
Hardwood	106,590	924,860	488,396	31.0%
Forested	239,390	1,575,587	1,182,413	21.9%

Chickasaw County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	154,523			
Reproduction	24,403			
Pine	47,533	511,332	547,709	39.2%
Mixed Pine-Hardwood	19,238	99,458	136,857	53.3%
Hardwood	76,979	558,178	798,287	22.4%
Forested	168,153	1,168,967	1,482,853	19.5%

Volume is reported in hundreds (100's) of cubic feet outside bark.

Clay County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	110,684			
Reproduction	18,647			
Pine	33,765	356,736	296,944	21.7%
Mixed Pine-Hardwood	13,804	86,973	34,435	43.8%
Hardwood	89,318	852,552	617,430	13.4%
Forested	155,534	1,296,262	948,808	18.9%

DeSoto County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	181,543			
Reproduction	32,353			
Pine	6,474	32,673	20,616	24.3%
Mixed Pine-Hardwood	90,312	47,889	90,530	46.8%
Hardwood	136,293	890,500	697,479	18.1%
Forested	136,293	971,062	808,625	15.6%

Grenada County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	109,532			
Reproduction	25,802			
Pine	35,857	447,204	150,583	61.4%
Mixed Pine-Hardwood	16,575	104,534	28,469	136%
Hardwood	99,745	1,088,015	820,624	28.7%
Forested	177,979	1,639,753	999,676	25.8%

Itawamba County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	80,490			
Reproduction	40,532			
Pine	66,394	470,174	457,502	36.8%
Mixed Pine-Hardwood	32,773	175,904	151,175	62.7%
Hardwood	125,706	1,584,772	1,778,431	28.0%
Forested	265,406	2,230,851	2,387,108	23.0%

Volume is reported in hundreds (100's) of cubic feet outside bark.

Lafayette County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	133,067			
Reproduction	37,668			
Pine	70,844	789,701	547,217	44.6%
Mixed Pine-Hardwood	37,323	203,715	567,510	61.2%
Hardwood	155,703	2,150,211	2,863,701	18.5%
Forested	301,538	3,143,627	3,978,428	17.3%

Lee County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	169,131			
Reproduction	30,281			
Pine	26,467	265,232	119,395	49.0%
Mixed Pine-Hardwood	9,859	131,474	207,543	46.1%
Hardwood	54,249	606,855	654,008	21.1%
Forested	120,855	1,003,560	980,946	18.4%

Marshall County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	179,962			
Reproduction	51,361			
Pine	36,354	293,629	143,726	88.9%
Mixed Pine-Hardwood	24,006	361,372	133,358	112%
Hardwood	162,455	1,839,325	1,566,653	23.1%
Forested	274,175	2,493,966	1,843,737	22.8%

Monroe County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	195,248			
Reproduction	46,182			
Pine	67,196	614,895	548,827	45.0%
Mixed Pine-Hardwood	31,814	136,287	149,146	98.8%
Hardwood	153,678	1,525,972	1,699,049	23.2%
Forested	298,870	2,277,154	2,397,023	20.9%

Volume is reported in hundreds (100's) of cubic feet outside bark.

Panola County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	250,018			
Reproduction	41,948			
Pine	23,019	191,630	164,304	70.4%
Mixed Pine-Hardwood	13,587	30,001	23,630	131%
Hardwood	122,570	1,123,135	945,053	23.7%
Forested	201,124	1,344,766	1,132,987	22.5%

Pontotoc County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	153,241			
Reproduction	31,016			
Pine	42,975	227,943	313,102	33.1%
Mixed Pine-Hardwood	15,770	59,655	86,690	46.5%
Hardwood	77,568	354,888	934,009	18.4%
Forested	167,329	642,496	1,333,800	15.6%

Prentiss County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	101,625			
Reproduction	26,380			
Pine	42,820	232,639	233,999	44.0%
Mixed Pine-Hardwood	19,285	131,528	142,195	45.7%
Hardwood	77,563	648,869	852,837	27.7%
Forested	166,048	1,013,037	1,229,031	21.6%

Tate County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	145,929			
Reproduction	28,066			
Pine	9,117	72,086	31,911	45.3%
Mixed Pine-Hardwood	7,120	12,413	3,166	136%
Hardwood	72,696	525,574	444,694	22.3%
Forested	116,998	610,073	479,771	21.5%

Volume is reported in hundreds (100's) of cubic feet outside bark.

Tippah County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	95,184			
Reproduction	31,836			
Pine	44,079	232,234	303,268	45.4%
Mixed Pine-Hardwood	20,802	64,623	187,503	49.4%
Hardwood	102,428	581,472	1,514,130	17.0%
Forested	199,146	878,328	2,004,901	15.4%

Tishomingo County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	67,453			
Reproduction	28,275			
Pine	62,383	321,711	297,395	57.8%
Mixed Pine-Hardwood	26,069	91,616	139,563	66.7%
Hardwood	100,366	1,072,578	1,014,252	23.8%
Forested	217,093	1,515,904	1,451,211	21.7%

Volume is reported in hundreds (100's) of cubic feet outside bark.

Union County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	113,014			
Reproduction	23,048			
Pine	34,093	193,864	410,414	41.3%
Mixed Pine-Hardwood	15,421	24,634	37,149	112%
Hardwood	81,169	442,442	1,317,668	18.1%
Forested	153,730	660,941	1,765,230	17.0%

Yalobusha County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	99,209			
Reproduction	22,722			
Pine	59,093	660,629	404,452	51.2%
Mixed Pine-Hardwood	28,306	171,331	269,823	63.5%
Hardwood	107,368	970,426	939,352	28.5%
Forested	217,490	1,802,385	1,613,628	23.6%

Volume is reported in hundreds (100's) of cubic feet outside bark.

Volume is reported in hundreds (100's) of cubic feet outside bark.

Table 5. Estimates of pre-commercial stem counts for all species and projected pine productivity.

	Number of Stems Diameter Class				5-yr Projected Pine Volume		Annual Growth Rate	
County	1-inch	2-inch	3-inch	4-inch	Pulpwood	Sawtimber	Pulpwood	Sawtimber
Alcorn	13,942	11,538	5,144	3,667	268,846	609,770	6.83%	17.56%
Benton	12,309	8,518	9,604	7,525	327,053	1,001,856	7.36%	12.06%
Calhoun	16,836	8,416	5,014	7,869	911,634	1,516,911	10.61%	17.26%
Chickasaw	15,665	6,227	6,249	5,607	637,467	1,479,726	4.08%	16.98%
Clay	11,399	6,785	3,829	1,880	296,373	837,658	-2.24%	21.82%
DeSoto	7,295	7,327	5,329	3,212	183,113	263,046	8.24%	11.45%
Grenada	12,433	6,615	5,003	6,564	463,173	1,192,687	-2.23%	26.00%
Itawamba	39,938	33,275	17,305	10,558	805,468	1,410,967	8.26%	20.12%
Lafayette	43,727	20,080	16,570	16,818	1,114,008	2,352,935	6.03%	15.00%
Lee	13,067	6,616	4,813	4,824	297,456	669,472	2.69%	15.75%
Marshall	36,235	21,764	11,315	9,176	566,390	1,226,633	-1.63%	28.09%
Monroe	35,618	14,073	16,601	12,534	754,717	1,447,643	5.51%	20.91%
Panola	13,798	12,837	6,261	4,454	295,036	867,314	-3.47%	21.86%
Pontotoc	15,885	8,680	6,097	6,649	729,937	968,245	18.75%	21.95%
Prentiss	43,426	34,028	18,226	11,440	802,611	817,795	21.48%	17.57%
Tate	8,211	6,449	3,234	1,881	153,368	279,947	4.83%	25.97%
Tippah	21,518	15,691	15,302	10,260	949,557	1,150,545	21.96%	16.42%
Tishomingo	42,130	21,158	12,364	8,019	812,051	1,170,966	13.87%	17.86%
Union	13,226	6,090	5,197	5,476	406,985	935,994	10.29%	14.17%
Yalobusha	30,374	16,274	11,551	8,903	1,165,762	2,277,324	4.94%	21.23%

Number of stems is reported in thousands (1,000's).
Volume is reported in hundreds (100's) of cubic feet outside bark.

Delta District

The Delta district presents some difficulties in inventory applications because of the nature of the forests following sloughs and stream courses. Although this district has the fewest number of acres of forest, the linear nature of these forests will cause the sampling layout to be modified.

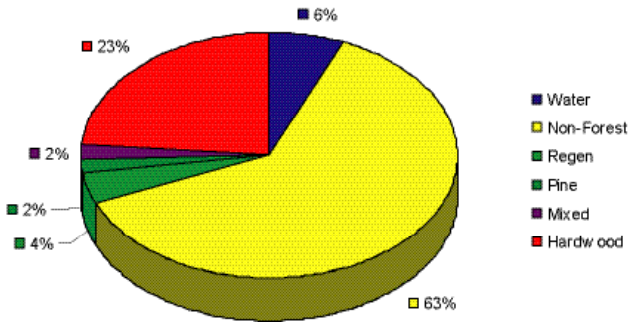

Figure 6. Delta Mississippi land cover classification.

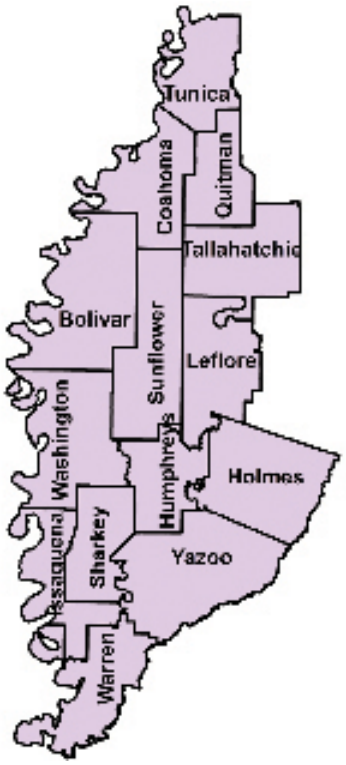

Figure 7. MIFI Delta Inventory District.

Obtaining Additional Information

To obtain additional assistance with the Dynamic Reporter software, the MIFI web site or to obtain a copy of the Dynamic Reporter Installation on Compact Disc then use the following information to contact the Director of Operations at the Mississippi Institute for Forest Inventory;

Director of Operations
MIFI
301 North Lamar Street, Suite 300
Jackson, Mississippi 39201-1404
(601) 359-2808
e-mail: pglass@mifi.state.ms.us

Glossary of Terms

All terms and phrases utilized on the Dynamic Reporter Interface are explained in the Technical specifications located on the MIFI web site at the following link: www.mifi.ms.gov/Documents/Inventory_Guidelines.pdf

Basal area. The area in square feet of the cross section at breast height of a single tree or of all the trees in a stand, usually expressed in square feet per acre.

Commercial species. Tree species currently or potentially suitable for industrial wood products.

CRP. The Conservation Reserve Program, a major Federal afforestation program authorized by the 1985 Farm Bill.

D.b.h. Tree diameter in inches (outside bark) at breast height (4.5 feet aboveground).

Diameter Class. A classification of trees based on tree d.b.h. One-inch diameter classes are commonly used. For example, the 6-inch class includes trees 5.6 through 6.5 inches d.b.h.

D.o.b. (diameter outside bark) Stem diameter including bark.

Forest Land. Land at least 10 percent stocked by forest trees of any size, or formerly having had such tree cover and not currently developed for nonforest use. The minimum area considered for classification is 1 acre.

Forest management type. A classification of timberland based on forest type and stand origin.

Forest type. A classification of forest land based on the species forming a plurality of live-tree stocking. Major Mississippi forest-type groups are:

Longleaf-slash pine. Forests in which longleaf or slash pine, singly or in combination, constitute a plurality of the stocking. (Common associates include oak, hickory, and gum).

Loblolly-shortleaf pine. Forests in which loblolly pine, shortleaf pine, or other southern yellow pines, except longleaf or slash pine, singly or in combination, constitute a plurality of

the stocking. (Common associates include oak, hickory and gum).

Oak-pine. Forests in which hardwoods (usually upland oaks) constitute a plurality of the stocking but in which pines account for 25 to 50 percent of the stocking. (Common associates include gum, hickory, and yellow-poplar).

Oak-hickory. Forests in which upland oaks or hickory, singly or in combination, constitutes a plurality of the stocking, except where pines account for 25 to 50 percent, in which case the stand would be classified oak-pine. (Common associates include yellow-poplar elm, maple, and black walnut).

Oak-gum-cypress. Bottom-land forests in which tupelo, blackgum, sweetgum, oaks, or southern cypress, singly or in combination, constitutes a plurality of the stocking, except where pines account for 25 to 50 percent, in which case the stand would be classified oak-pine. (Common associates include cottonwood, willow, ash, elm, hackberry, and maple).

Elm-ash-cottonwood. Forests in which elm, ash, or cottonwood, singly or in combination, constitutes a plurality of the stocking. (Common associates include willow, sycamore, beech, and maple).

Maple-beech-birch. Forests in which maple, beech, or yellow birch, singly or in combination, constitute a plurality of the stocking. (Common associates include hemlock, elm, basswood, and white pine).

Nonstocked stands. Stands less than 10 percent stocked with live trees.
Pine plantation. Stands that (a) have been artificially regenerated by planting or direct seeding, (b) are classed as a pine or other softwood forest type, and (c) have at least 10 percent stocking.

Natural pine. Stands that (a) have not been artificially regenerated, (b) are classed as a pine or other softwood forest type, and (c) have at least 10 percent stocking.

Oak-pine. Stands that (a) have at least 10 percent stocking and classed as a forest type of oak-pine.

Upland hardwood. Stands that have at least 10 percent stocking and classed as an oak-hickory or maple-beech-birch forest type.

Lowland hardwood. Stands that have at least 10 percent stocking with a forest type of oak-gum-cypress, elm-ash-cottonwood, palm, or other tropical.

Nonstocked stand. Stands less than 10 percent stocked with live trees.

GIS - Geographical Information System. Combines traditional mapping skills with spatially referenced data in a computer to provide advanced maps.

Hardwoods. Dicotyledonous trees, usually broadleaf and deciduous.

Hard hardwoods. Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maples, hickories, and beech.

Soft hardwoods. Hardwood species with an average specific gravity of .50 or less, such as gums, yellow poplar, cottonwoods, red maple, basswoods, and willows.

Industrial wood. All roundwood products except fuelwood.

Land area. The area of dry land and land temporarily or partly covered by water,

such as marshes, swamps, and river floodplains (omitting tidal flats below mean high tide), streams sloughs, estuaries, and canals less than 200 feet wide, and lakes, reservoirs, and ponds less than 4.5 acres in area.

Live trees. All living trees, all size classes, all tree classes, and both commercial and noncommercial species are included.

Log Grade. A classification of logs based on external characteristics indicating quality or value.

Logging residues. The unused merchantable portion of growing-stock trees cut or destroyed during logging operations.

Noncommercial species. Tree species of typically small size, poor form, or inferior quality that normally do not develop into trees suitable for industrial wood products.

Nonforest land. Land that has never supported forests and land formerly forested where timber production is precluded by development for other uses.

Nonstocked stands. Stands less than 10 percent stocked with live trees.

Ownership. The property owned by one ownership unit, including all parcels of land in the United States.

National forest land. Forest land that has been legally designated as national forests or purchase units, and other land under the administration of the Forest Service, including experimental areas and Bank head-Jones Title III land.

Forest industry land. Land owned by companies or individuals operating primary wood-using plants.

Nonindustrial private forest (NIPF) land. Privately owned land excluding forest industry land or forest industry-leased land. Corporate. Owned by corporations, including incorporated farm ownerships.

State, county, and municipal land. Land owned by States, counties, and local public agencies or municipalities or land leased to these governmental units for 50 years or more.

Primary wood-using plants. Industries receiving roundwood or chips from roundwood for the manufacture of products, such as veneer, pulp, and lumber.

Reforestation. Area of land previously classified as forest that is regenerated by planting trees or natural regeneration.

Remote Sensing. The use of aircraft or satellite imagery to identify and describe the land cover and land use.

Roundwood (roundwood logs). Logs, bolts, or other round sections cut from trees for industrial or consumer uses.

Roundwood chipped. Any timber cut primarily for pulpwood, delivered to non-pulp mills, chipped, and then sold to pulp mills as residues, including chipped tops, jump sections, whole trees, and pulpwood sticks.

Roundwood products. Any primary product such as lumber, poles, pilings, pulp, or fuelwood, that is produced from roundwood.

Saw Log. A log meeting minimum standards of diameter, length, and defect, including logs at least 8 feet long, sound and straight, with a minimum diameter inside bark for softwoods of six inches (8 inches for hardwoods).

Saw log portion. The part of the bole of sawtimber trees between a 1-foot stump and the saw-log top.

Saw-log top. The point on the bole of sawtimber trees above which a conventional saw log cannot be produced. The minimum saw-log top is 7.0 inches d.o.b. for softwoods and 9.0 inches d.o.b for hardwoods.

Sawtimber-size trees. Softwoods 8.0 inches d.b.h and larger and hardwoods 11.0 inches d.b.h. and larger.

Sawtimber volume. Growing-stock volume in the sawlog portion of sawtimber-size trees in board feet.

Seedlings. Trees less than 1.0 inch d.b.h. and greater than 1 foot tall for hardwoods, greater than 6 inches tall for softwood, and greater than .5 inch in diameter at ground level for longleaf pine.

Select red oaks. A group of several red oak species composed of cherrybark, Shumard, and northern red oaks. Other red oak species are included in the "other red oaks" group.

Select white oaks. A group of several white oak species composed of white, swamp chestnut, swamp white, chinkapin, Durand, and bur oaks. Other white oak species are included in the "other white oaks@" group.

Site class. A classification of forest land in terms of potential capacity to grow crops of industrial wood based on fully stocked natural stands.

Softwoods. Coniferous trees, usually evergreen, having leaves that are needles or scalelike.

Yellow pines. Loblolly, longleaf, slash, pond, shortleaf pitch, Virginia, sand, spruce, and Table Mountain pines.

Other softwoods. Cypress, eastern red-cedar, white-cedar, eastern white pine, eastern hemlock, spruce and fir.

Spectral reflectance. Sunlight reflected from the ground or canopy of the forest that is recorded by the sensor in the satellite or aircraft that is separated into small classes (bands).

Stand age. The average age of dominant and co-dominant trees in the stand.

Stand origin. A classification of forest stands describing their means of origin.

Planted. Planted or artificially seeded.

Natural. No evidence of artificial regeneration.

Stand-size class. A classification of forest land based on the diameter class distribution of live trees in the stand.

Statistical Precision. The ability to achieve the same results with repeated measurements.

Sawtimber stands. Stands at least 10 percent stocked with live trees, with half or more of total stocking in sawtimber and poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Stocking. The degree of occupancy of land by trees, measured by basal area or the number of trees in a stand and spacing in the stand, compared with a minimum standard, depending on tree size, required to fully utilize the growth potential of the land.

Thematic map. Displays complex map data using classes that combine similar data.

Timberland. Forest land capable of producing 20 cubic feet of industrial wood per acre per year and not withdrawn from timber utilization.

Timber products. Roundwood products and byproducts.

Tree. Woody plants having one erect perennial stem or trunk at least 3-inches d.b.h. a more or less definitely formed crown for foliage and a height of at least 13 feet (at maturity).

Tree Grade. A classification of the saw-log portion of sawtimber trees based on: (1) the grade of the butt log or (2) the ability to produce at least one 12-foot or two 8-foot logs in the upper section of the saw-log portion. Tree grade is an indicator of quality; grade 1 is the best quality.

Upper-stem portion. The part of the main stem or fork of sawtimber trees above the saw-log top to minimum top diameter 4.0 inches outside bark or to the point where the main stem or fork breaks into limbs.

Volume of live trees. The cubic-foot volume of sound wood in live trees at least 4.6 inches d.b.h from a 1-foot stump to a minimum 3.0 inch top d.o.b of the central stem for softwood and 4.0 inches for hardwoods.

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