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Midsouth Forest Area Trends

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INTRODUCTION

The Forest Inventory and Analysis Unit of the Southern Forest Experiment Station (Forest Survey) conducts periodic inventories at approximately 10-year intervals of the forest resources of the Midsouth States (fig. 1). This report contains a summary of forest acreage estimates made between 1950 and 1985. The statistics are based on published Forest Survey reports and survey archives. Because each state is inventoried successively in a continuous cycle, area estimates were adjusted to common years through interpolation between actual survey dates, and extrapolation to earlier or later years. Minor adjustments were made for definitional or procedural changes that have occurred in the survey process. Area estimates by ownership classes were adjusted to conform with enumerated data on public landholdings in each state. Forest Service planting records and long-range ownership trends were used to provide cross-tabulations by owner and forest classes for some of the earlier surveys.

Area estimates for 1985 were based on past trends, planting records, and statistical reviews by individual State study teams. Preliminary estimates from ongoing surveys and various midcycle survey updates were also used. This compilation was part of a review of the Southern timber supply situation.

No estimates of statistical reliability have been made due to the extensive use of interpolation and non-statistical data sources. The reader may refer to a companion Resource Bulletin to obtain an estimate of data reliability for each state and for the Midsouth as computed from recent survey data (McWilliams and Birdsey 1985).

FOREST AREA TRENDS

One of the most significant trends in the Midsouth has been the steady increase in the acreage of planted pine (fig. 2). Between 1955 and 1962, the Soil Bank years, many acres of idle farmland held by nonindustrial private owners were planted to pine (fig. 3). Since 1965, the forest industry has been increasing the harvest of natural pine and oak-pine, and replacing these stands with planted pine. Forest industry now owns more pine plantation acreage than any other forest class (fig. 4), and owns 64 percent of all planted pine in the Midsouth (fig. 5).

Currently 9 percent of all Midsouth timberland is planted pine, up from 6 percent just 8 years ago. The estimates of pine plantation area do not include stands that were planted but are classified oak-pine or hardwood because hardwoods comprise the majority of stocking (table I). Most of this acreage represents partially successful plantations and plantations with intensive hardwood competition. The situation is very common in young stands where planted pines have not yet attained dominance over natural hardwood regeneration, or where hardwood control measures have not yet been applied.

Natural pine accounts for 20 percent of all Midsouth timberland, down from 28 percent in 1952. Nonindustrial private owners, holding 58 percent of the total, are the principal landholders of this forest class (fig. 6).

Another significant trend in the Midsouth has been the decline in bottomland hardwood acreage. Landclearing in the Mississippi River delta and other bottomland areas has claimed 4 million acres since 1962. Most of the clearing has occurred on land held by nonindustrial

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private owners who still control the majority of the bottomland forest acreage (fig. 7).

Nonindustrial private owners hold 78 percent of all upland hardwood acreage, and this share continues to climb (figs. 8, 9). The increase coincides with a decline in natural pine and oak-pine, which is caused by selective harvests of pine timber and clearcutting without adequate pine regeneration. Additions to upland hardwood acreage also occur when pasture or cropland is taken out of production. One-half of all agricultural land that reverts to forest is dominated by hardwoods (fig. 10).

The long-term trends indicated by these data show that natural pine is declining at the fastest rate of any forest class in the Midsouth, roughly 300 thousand acres annually since 1952 (fig. 11). This overall downward trend occurs despite a slight increase between 1952 and 1962. The decline since 1970 has averaged 490 thousand acres per year. If this rate were to continue unabated, the Midsouth would lose all of its natural pine by the year 2025.

It is more likely, however, that an equilibrium will be reached before 2025. Land clearing and type conversion rates respond to economic and social pressures which vary over time. For example, the rate of bottomland forest clearing was much higher between 1962 and 1970 than between 1970 and the present. Furthermore, these statistics represent net changes, while in fact there is a constant shifting among forest types of a magnitude much greater than the net shift (Birdsey and others 1981). A forthcoming Forest Service analysis of the Southern timber supply situation will present the current "best estimates" of future timberland trends.

DEFINITION OF TERMS

Timberland.--Land at least 16.7 percent stocked by forest trees of any size or formerly having such tree cover, and capable of producing crops of industrial wood. Land that is currently developed for nonforest use or withdrawn from timber utilization through statute or administrative regulation is exluded.

Forest Class

A classification of Forest Survey plots according to forest type (based on the plurality of all live trees tallied) and stand origin.

Pine plantations.--Forests in which pines comprise the plurality of stocking and that originated from either planting or direct seeding.

Natural pine.--Forests in which pines comprise the plurality of stocking with no evidence of artificial regeneration (includes stands established by seed trees).

Mixed pine-hardwoods.--Forests in which hardwoods comprise the plurality of stocking, but in which pines comprise 25 to 50 percent of the stocking.

Upland hardwoods.--Forests in which upland hardwood species, singly or in combination, comprise the plurality of stocking, except where pines comprise 25 to 50 percent of the stocking, in which case the plot would be classified as mixed pine-hardwoods.

Bottomland hardwoods.--Includes forest in which bottomland hardwood species, singly or in combination, comprise a plurality of stocking except where pines comprise 25 to 50 percent, in which case the plot would be classified mixed pine-hardwoods.

Ownership Classes

National forest.--Federal lands which have been legally designated as National forests or purchase units, and other lands under the administration of the Forest Service.

Other public.--Land owned by federal (excluding National forest land), state, county, or municipal governments.

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

Other private.--Privately owned land excluding land owned by forest industry.

LITERATURE CITED

Birdsey, R. A.; Van Hees, W. W. S.; Beltz, R. C. Pine regeneration in Southwest Arkansas. Res. Pap. SO-165. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station; 1981. 10 p.

McWilliams, W. H.; Birdsey, R. A. Midsouth timber statistics. Resour. Bull. SO-108. Starkville, MS: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station; 1986.

Table I.--*Area of plantations with a forest class of mixed pine-hardwoods or hardwoods by state and forest type, 1985*

State	Forest class		Total
	Mixed pine-hardwoods	Hardwoods 1/	
	- - - - - - - - - - thousand acres - - - - - - - - - - -		
Alabama	447	218	665
Arkansas	307	194	501
Louisiana	237	280	517
Mississippi	381	286	667
Oklahoma	176	131	307
Tennessee	52	78	130
Texas	142	139	281
Midsouth	1,742	1,326	3,068

1/ Includes upland hardwoods and bottomland hardwoods.

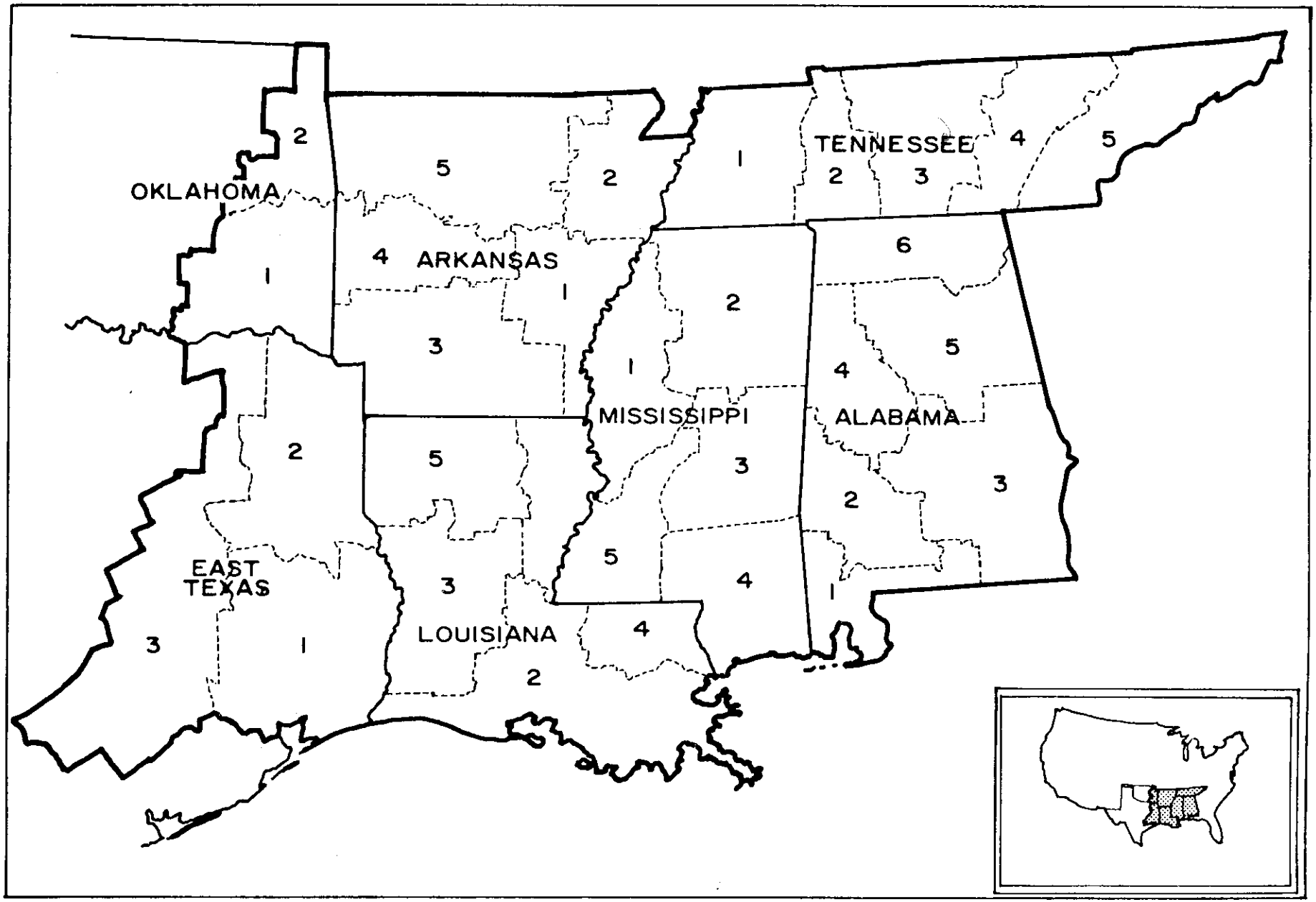

Figure 1.--*States and survey regions of the Midsouth.*

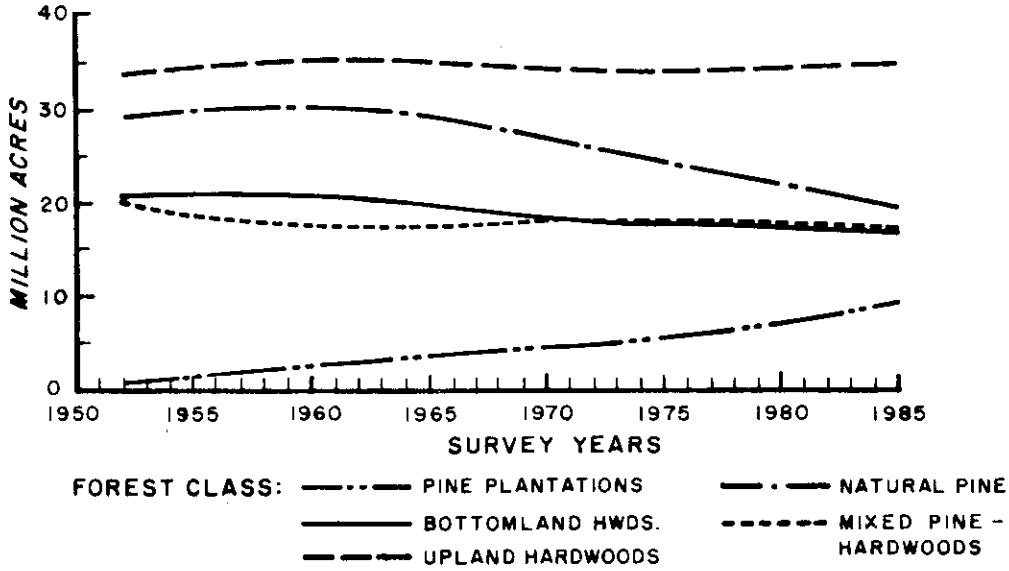

Figure 2.--*Timberland area by forest class for all owners in the Midsouth, 1952-1985.*

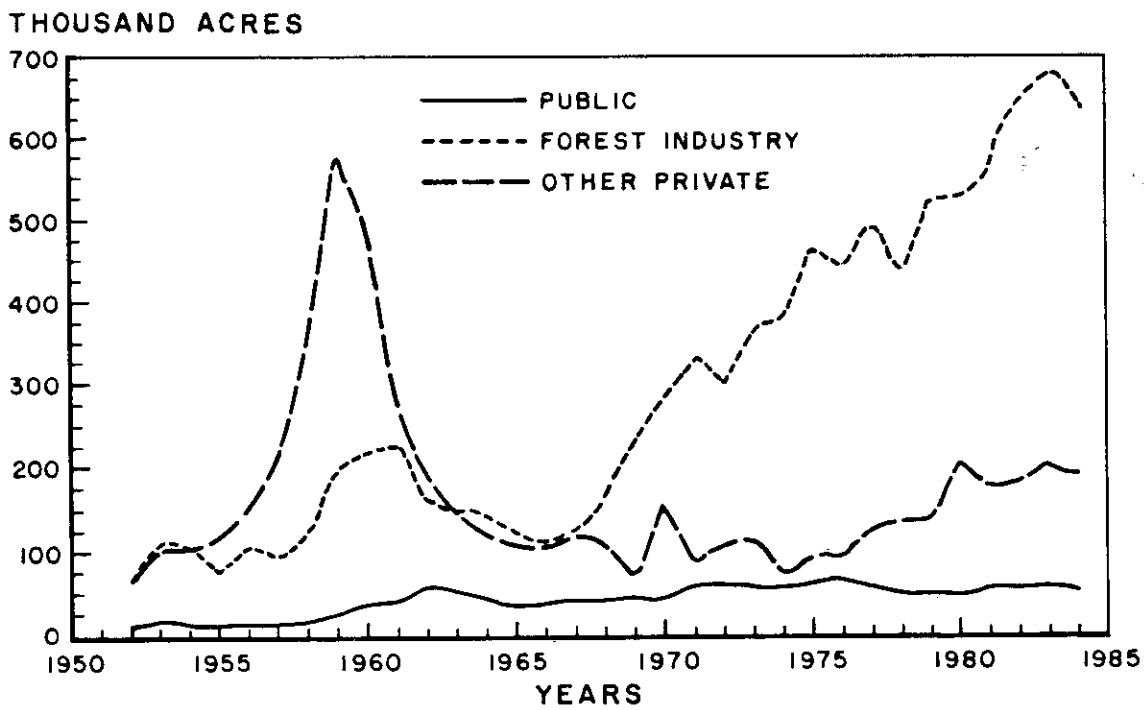

Figure 3.--*History of tree planting in the Midsouth by ownership class and year.*

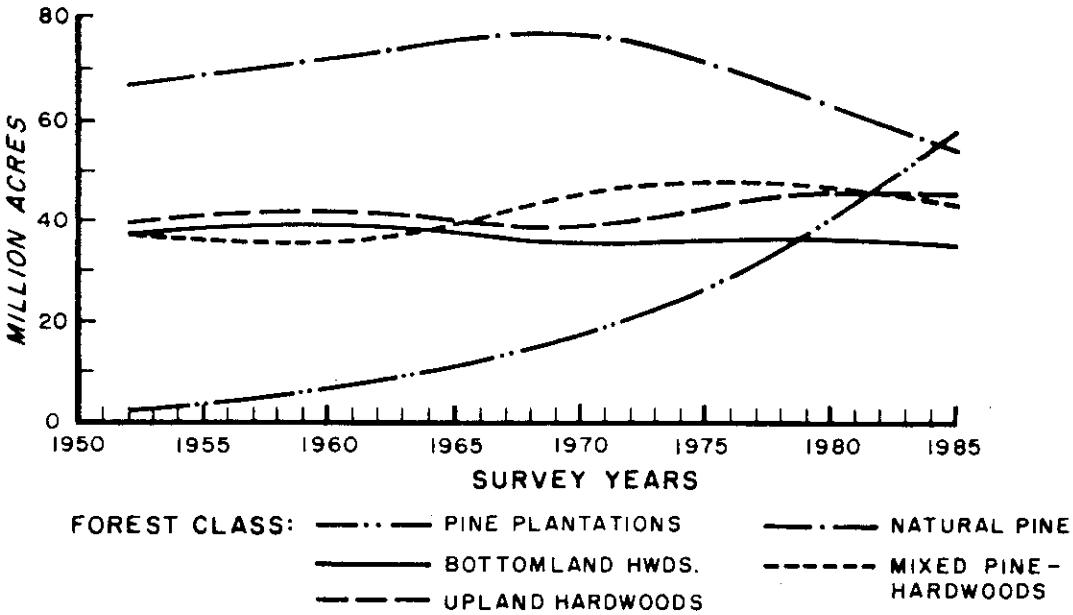

Figure 4.--*Timberland area by forest class for forest industry owners in the Midsouth, 1952-1985.*

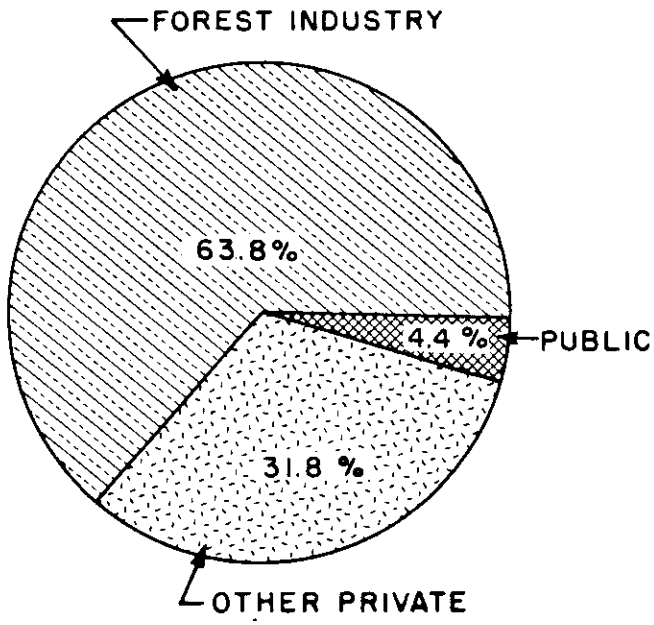

Figure 5.--*Proportion of planted pine by ownership class in the Midsouth, 1985.*

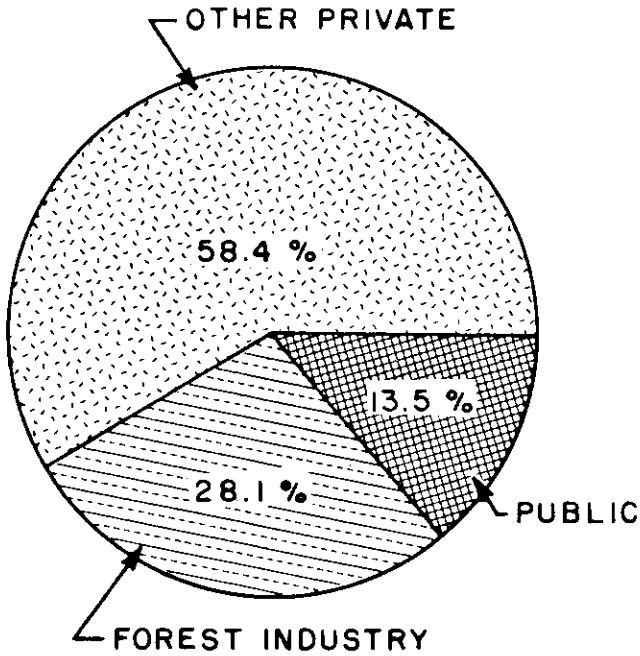

Figure 6.--*Proportion of natural pine by ownership class in the Midsouth, 1985.*

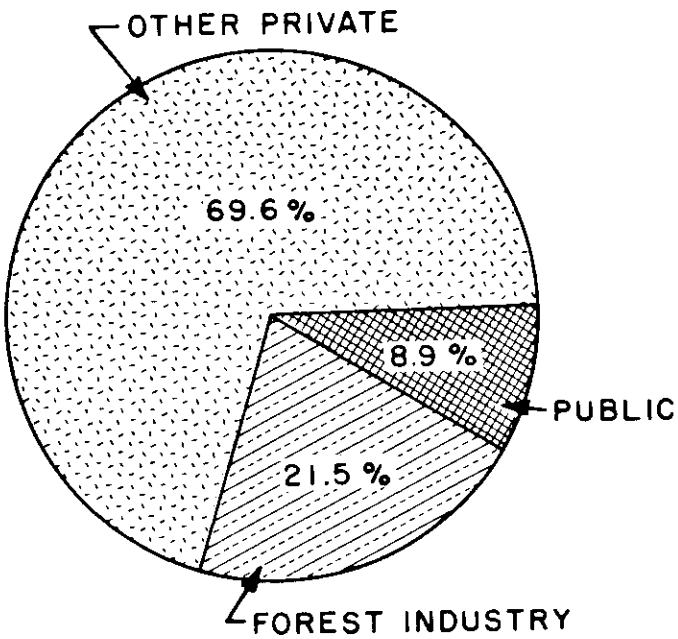

Figure 7.--*Proportion of bottomland hardwoods by ownership class in the Midsouth, 1985.*

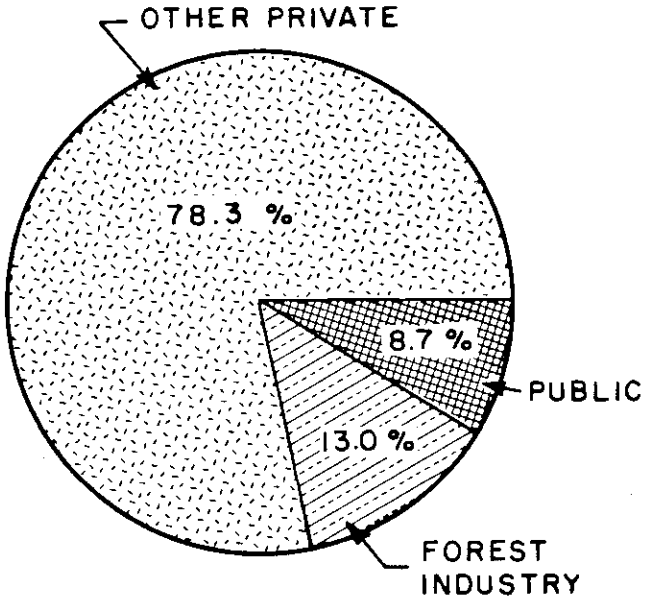

Figure 8.--*Proportion of upland hardwoods by ownership class in the Mid south, 1985.*

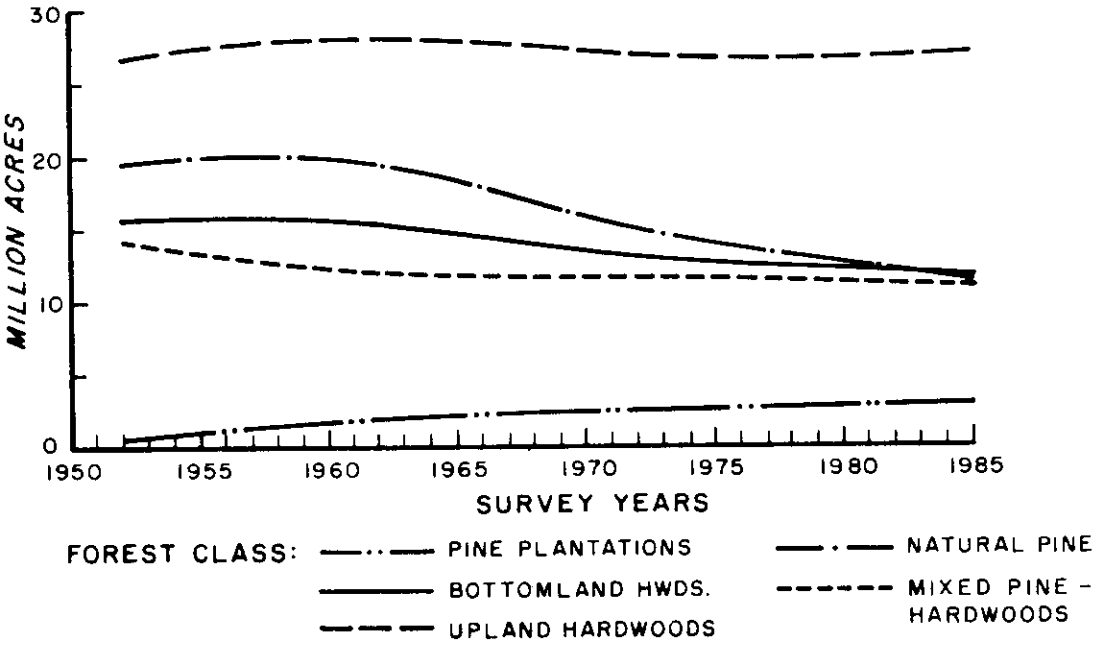

Figure 9.--*Timberland area by forest class for nonindustrial private forest owners in the Midsouth, 1952-1985.*

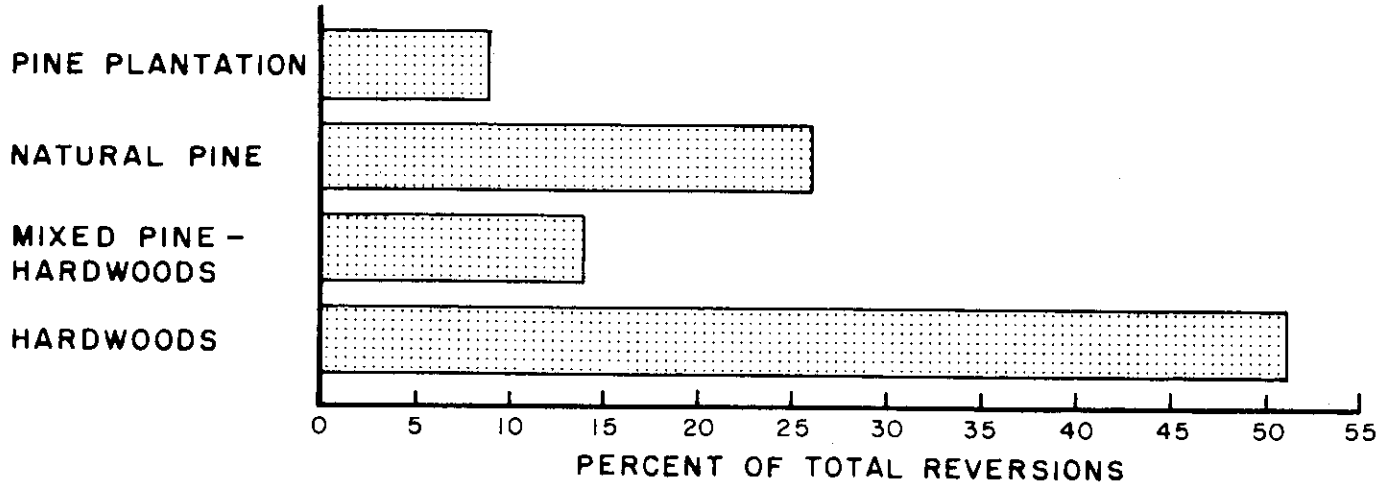

Figure 10.--*Reversions of agricultural land to timberland by forest class.*

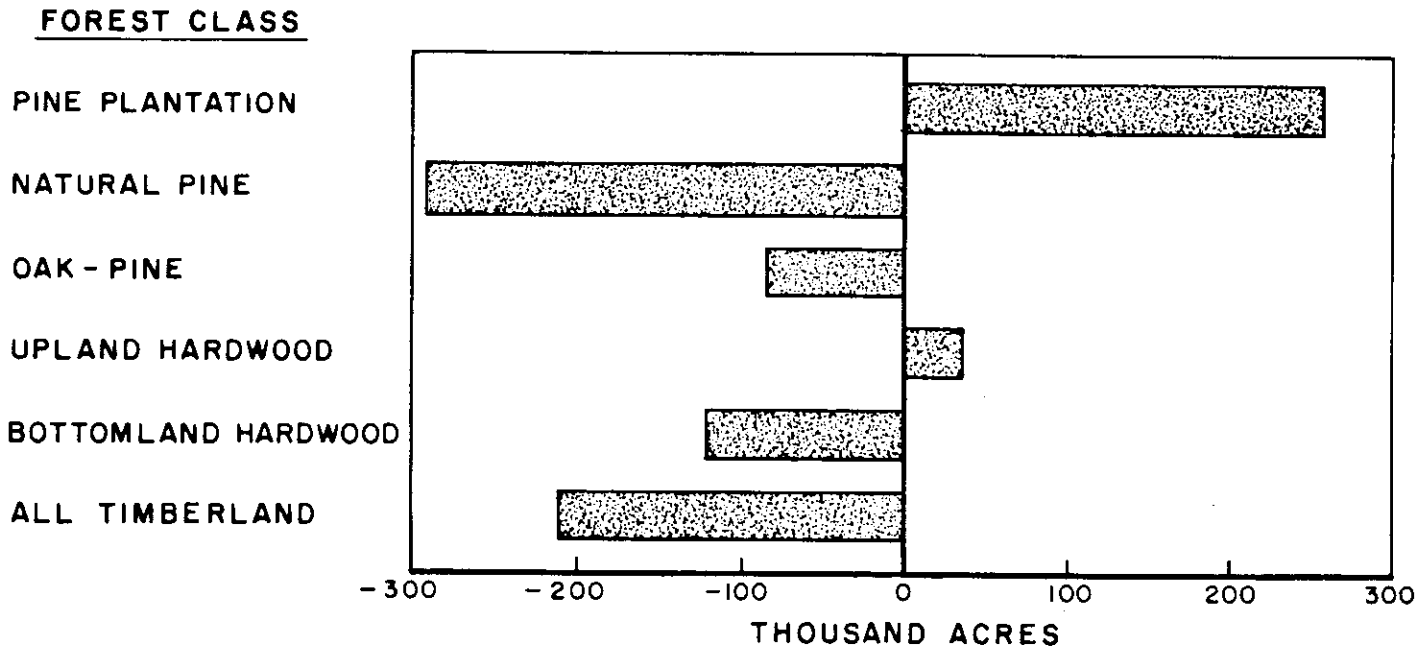

Figure 11.--*Average annual change in timberland acreage by forest class in the Midsouth, 1952-1985.*

APPENDIX TABLES

Table 3.--*Area of timberland in Arkansas, by ownership and forest class, selected years 1952-1985*

Ownership and forest class	Year				
	1952	1962	1970	1977	1985
	thousand acres				
National Forest					
Pine plantations	8	24	10	17	26
Natural pine	816	863	826	759	734
Mixed pine-hardwoods	351	427	479	458	500
Upland hardwoods	1,102	1,056	1,048	1,110	1,098
Bottomland hardwoods	15	15	15	6	6
Total	2,292	2,385	2,378	2,350	2,364
Other public					
Pine plantations	2	5	2	5	7
Natural pine	26	16	16	28	26
Mixed pine-hardwoods	77	41	56	37	39
Upland hardwoods	225	115	193	169	163
Bottomland hardwoods	294	294	294	329	332
Total	624	471	561	568	567
Forest industry					
Pine plantations	21	57	110	186	681
Natural pine	1,693	1,631	1,554	1,613	1,392
Mixed pine-hardwoods	617	650	912	912	909
Upland hardwoods	1,114	951	609	667	603
Bottomland hardwoods	733	733	800	784	780
Total	4,178	4,022	3,985	4,162	4,365
Other private					
Pine plantations	24	75	134	207	276
Natural pine	1,946	2,180	1,784	1,482	1,225
Mixed pine-hardwoods	1,136	1,549	1,423	1,549	1,478
Upland hardwoods	6,059	6,229	5,929	4,745	4,106
Bottomland hardwoods	3,368	3,060	1,838	1,730	1,569
Total	12,533	13,093	11,108	9,713	8,654
Total, all ownerships					
Pine plantations	55	161	256	415	990
Natural pine	4,481	4,690	4,180	3,882	3,377
Mixed pine-hardwoods	2,181	2,667	2,870	2,956	2,926
Upland hardwoods	8,500	8,351	7,779	6,691	5,970
Bottomland hardwoods	4,410	4,102	2,947	2,849	2,687
Total	19,627	19,971	18,032	16,793	15,950

Table 4.--*Area of timberland in Louisiana, by ownership and forest class, selected years 1952-1985*

Ownership and forest class	Year				
	1952	1962	1970	1977	1985
	thousand acres				
National Forest					
Pine plantations	59	87	48	60	80
Natural pine	159	301	330	306	251
Mixed pine-hardwoods	107	91	108	120	101
Upland hardwoods	68	36	38	42	58
Bottomland hardwoods	142	60	55	53	53
Total	535	575	579	581	543
Other public					
Pine plantations	3	10	4	5	6
Natural pine	27	20	104	96	97
Mixed pine-hardwoods	33	49	38	43	45
Upland hardwoods	40	19	9	10	24
Bottomland hardwoods	210	210	288	289	422
Total	313	308	443	443	594
Forest industry					
Pine plantations	10	190	641	785	898
Natural pine	1,085	1,012	1,300	1,290	1,145
Mixed pine-hardwoods	612	500	645	692	727
Upland hardwoods	474	415	488	583	799
Bottomland hardwoods	1,533	1,489	1,017	1,056	756
Total	3,714	3,606	4,091	4,406	4,325
Other private					
Pine plantations	31	606	555	574	491
Natural pine	3,354	3,242	2,314	1,944	1,990
Mixed pine-hardwoods	1,892	1,602	1,408	1,276	1,018
Upland hardwoods	1,464	1,330	1,199	1,210	1,332
Bottomland hardwoods	4,736	4,767	4,541	3,858	3,504
Total	11,477	11,547	10,017	8,862	8,335
Total, all ownerships					
Pine plantations	103	893	1,248	1,424	1,475
Natural pine	4,625	4,575	4,048	3,636	3,483
Mixed pine-hardwoods	2,644	2,242	2,199	2,131	1,891
Upland hardwoods	2,046	1,800	1,734	1,845	2,213
Bottomland hardwoods	6,621	6,526	5,901	5,256	4,735
Total	16,039	16,036	15,130	14,292	13,797

Table 5.--*Area of timberland in Mississippi, by ownership and forest class, selected years 1952-1985*

Ownership and forest class	Year				
	1952	1962	1970	1977	1985
	thousand acres				
National Forest					
Pine plantations	79	123	101	80	99
Natural pine	436	460	467	519	378
Mixed pine-hardwoods	288	241	228	252	283
Upland hardwoods	108	145	133	143	161
Bottomland hardwoods	125	140	132	129	132
Total	1,036	1,109	1,119	1,123	1,053
Other public					
Pine plantations	10	17	24	28	39
Natural pine	217	197	225	174	141
Mixed pine-hardwoods	177	124	126	118	148
Upland hardwoods	68	76	75	69	85
Bottomland hardwoods	211	197	201	166	191
Total	683	611	651	555	604
Forest industry					
Pine plantations	78	208	348	482	977
Natural pine	851	883	927	843	651
Mixed pine-hardwoods	670	534	543	689	633
Upland hardwoods	358	456	450	562	513
Bottomland hardwoods	564	601	617	719	786
Total	2,521	2,682	2,885	3,295	3,560
Other private					
Pine plantations	117	297	460	531	609
Natural pine	3,643	3,593	3,489	2,644	1,781
Mixed pine-hardwoods	3,174	2,406	2,265	2,393	2,496
Upland hardwoods	3,007	3,642	3,334	3,466	3,588
Bottomland hardwoods	2,672	2,704	2,572	2,498	2,381
Total	12,613	12,642	12,120	11,532	10,855
Total, all ownerships					
Pine plantations	284	645	933	1,121	1,724
Natural pine	5,147	5,133	5,108	4,180	2,951
Mixed pine-hardwoods	4,309	3,305	3,162	3,452	3,560
Upland hardwoods	3,541	4,319	3,992	4,240	4,347
Bottomland hardwoods	3,572	3,642	3,522	3,512	3,490
Total	16,853	17,044	16,775	16,505	16,072

Table 6.--*Area of timberland in Oklahoma, by ownership and forest class, selected years 1952-1985*

Ownership and forest class	Year				
	1952	1962	1970	1977	1985
	thousand acres				
National Forest					
Pine plantations	2	5	10	17	30
Natural pine	28	40	84	83	75
Mixed pine-hardwoods	18	30	36	38	39
Upland hardwoods	151	130	83	75	65
Bottomland hardwoods	14	18	6	6	5
Total	213	223	219	219	214
Other public					
Pine plantations	0	0	0	0	0
Natural pine	56	61	37	42	48
Mixed pine-hardwoods	45	52	32	36	41
Upland hardwoods	291	203	194	185	175
Bottomland hardwoods	29	28	80	81	80
Total	421	344	343	344	344
Forest industry					
Pine plantations	1	6	29	210	489
Natural pine	129	126	365	268	123
Mixed pine-hardwoods	109	111	256	260	150
Upland hardwoods	593	546	241	233	246
Bottomland hardwoods	57	76	42	44	47
Total	889	865	933	1,015	1,055
Other private					
Pine plantations	3	22	11	11	21
Natural pine	515	505	265	263	284
Mixed pine-hardwoods	435	444	348	342	365
Upland hardwoods	2,371	2,184	2,178	1,834	1,724
Bottomland hardwoods	228	305	323	291	263
Total	3,552	3,460	3,125	2,741	2,657
Total, all ownerships					
Pine plantations	6	33	50	238	540
Natural pine	728	732	751	656	530
Mixed pine-hardwoods	607	637	672	676	595
Upland hardwoods	3,406	3,063	2,696	2,327	2,210
Bottomland hardwoods	328	427	451	422	395
Total	5,075	4,892	4,620	4,319	4,270

Table 7.--*Area of timberland in Tennessee, by ownership and forest class, selected years 1952-1985*

Ownership and forest class	Year				
	1952	1962	1970	1977	1985
	thousand acres				
National Forest					
Pine plantations	2	5	2	0	0
Natural pine	126	94	104	93	94
Mixed pine-hardwoods	162	108	106	109	110
Upland hardwoods	274	384	388	356	380
Bottomland hardwoods	0	0	0	0	0
Total	564	591	600	558	584
Other public					
Pine plantations	40	56	39	21	18
Natural pine	25	9	48	44	42
Mixed pine-hardwoods	166	110	121	102	93
Upland hardwoods	259	360	410	378	390
Bottomland hardwoods	60	73	69	58	60
Total	550	608	687	603	603
Forest industry					
Pine plantations	9	38	55	112	141
Natural pine	89	73	77	63	59
Mixed pine-hardwoods	148	106	165	143	127
Upland hardwoods	432	645	787	814	859
Bottomland hardwoods	86	112	92	97	107
Total	764	974	1,176	1,229	1,293
Other private					
Pine plantations	55	198	221	180	159
Natural pine	1,453	988	790	823	826
Mixed pine-hardwoods	1,715	1,004	1,203	1,100	968
Upland hardwoods	6,645	8,147	7,607	7,770	7,852
Bottomland hardwoods	805	855	537	599	652
Total	10,673	11,192	10,358	10,472	10,457
Total, all ownerships					
Pine plantations	106	297	317	313	318
Natural pine	1,693	1,164	1,019	1,023	1,021
Mixed pine-hardwoods	2,191	1,328	1,595	1,454	1,298
Upland hardwoods	7,610	9,536	9,192	9,318	9,481
Bottomland hardwoods	951	1040	698	754	819
Total	12,551	13,365	12,821	12,862	12,937

Table 8.--*Area of timberland in Texas, by ownership and forest class, selected years 1952-1985*

Ownership and forest class	Year				
	1952	1962	1970	1977	1985
	thousand acres				
National Forest					
Pine plantations	29	33	43	34	49
Natural pine	444	417	434	424	404
Mixed pine-hardwoods	70	67	54	75	90
Upland hardwoods	50	48	18	22	27
Bottomland hardwoods	61	58	29	21	23
Total	654	623	578	576	593
Other public					
Pine plantations	4	10	8	6	8
Natural pine	57	59	55	55	47
Mixed pine-hardwoods	34	28	22	22	24
Upland hardwoods	18	84	73	60	66
Bottomland hardwoods	19	29	43	57	56
Total	132	210	201	200	201
Forest industry					
Pine plantations	16	92	174	523	1,182
Natural pine	1,623	1,732	1,753	1,361	893
Mixed pine-hardwoods	619	688	800	906	764
Upland hardwoods	341	379	400	523	458
Bottomland hardwoods	448	498	514	530	548
Total	3,047	3,389	3,641	3,843	3,845
Other private					
Pine plantations	55	158	232	206	356
Natural pine	3,519	2,957	2,341	2,101	1,719
Mixed pine-hardwoods	1,455	1,531	1,582	1,521	1,569
Upland hardwoods	2,477	2,344	2,463	2,439	2,450
Bottomland hardwoods	1,742	1,748	1,681	1,540	1,385
Total	9,248	8,738	8,299	7,807	7,479
Total, all ownerships					
Pine plantations	104	293	457	769	1,595
Natural pine	5,643	5,165	4,583	3,941	3,063
Mixed pine-hardwoods	2,178	2,314	2,458	2,524	2,447
Upland hardwoods	2,886	2,855	2,954	3,044	3,001
Bottomland hardwoods	2,270	2,333	2,267	2,148	2,012
Total	13,081	12,960	12,719	12,426	12,118

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Timberland area trend estimates are presented for the Midsouth and for its individual states. Planted pine has increased to a 9 percent share of all Midsouth timberland. Natural pine has decreased from 28 percent to 20 percent of timberland between 1952 and 1985. Bottomland hardwood areas continue to decline. Upland hardwood type acreage is increasing.

Additional keywords: forest area, forest trends, forest ownership, forest type.

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