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INTRODUCTION

This forest survey of Oklahoma is the fifth conducted by the Forest Inventory and Analysis (FIA) unit of the Southern Forest Experiment Station. The previous survey was made in 1976. Normally the next survey would have been 1986, but to aid the State in its current forest resource planning an abbreviated midcycle survey was made in 1981. A new sampling procedure based on prior survey data and current photography was used to develop forest resource estimates for this midcycle or 5-year survey in Oklahoma. The midcycle technique involves remeasurement of about 10 percent of the forest plots and costs roughly 15 percent as much as regular surveys. Reliability of the estimates, however, is considerably lower than regular surveys.

METHODS

Current, high altitude, panoramic, color infrared aerial photography was obtained for this midcycle survey. All of the 1,828 permanent forest survey plots in Oklahoma were photointerpreted into forest and nonforest categories. Plots classified as forest were subdivided into forested, recently clear-cut, and 3 stages of regeneration (appendix page 6). Nonforest plots were classed as permanent nonforest, cropland, or water. Plots where clear-cutting or land clearing had occurred were used to estimate a portion of timber removals and withdrawals from commercial forest land as explained below. The remaining forested plots were selected for remeasurement using probability proportional to size sampling (Stage 1971). Plots were ranked in order of growing-stock volume at the last survey and a cumulative list of volumes was developed. Total volume was divided by the quantity (.1 x number of forested locations) to obtain the sampling interval. From a random start in the cumulative list, this sampling interval was used to select 80 forested plots for field remeasurement. Personnel of the Forestry Division, Oklahoma State Department of Agriculture and the FIA unit remeasured the plots using standard FIA plot procedures.

Volumes of individual trees were computed deterministically from dendrometry data using algorithms developed as part of STX (Grosenbaugh 1967). These volumes were summarized in softwood and hardwood categories and compared to 1976 values. Estimates of volume per acre for both surveys were calculated for each of the resurveyed plots. Volume changes then were used to update all permanent plots which, according to photointerpretation, were still forested.

Growth estimates for east Oklahoma were developed by applying relationships obtained from remeasured plots to each of the forested plots that was not remeasured. During remeasurement, changes in individual trees, and in other plot dynamics such as ingrowth, mortality, and removals, were accounted for. Net growth per acre per year for softwood and hardwood growing-stock volume was computed for each remeasured plot.

Regression equations were developed to predict net growth per acre of softwood growing-stock volume from past softwood growing-stock volume (R^2 = .64). Equations for hardwood growth were developed similarly (R^2 = .68). Net growth per acre of growing-stock volume was predicted for each plot, expanded and then summed to obtain county and state totals.

Removal volumes were developed from three components. For the first

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component -- plots which had forest cover in 1976 and 1982 -- volume removed was predicted from past diameter at breast height of cut trees. The second component consisted of plots clear-cut since the last survey. For these plots, growing stock as of the 1976 survey was reported as removed. The last component of removals was land clearing. Like clear-cut plots, all of the past growing-stock volume was assumed to be removed on plots which had been cleared. Volumes from all three components were expanded by plot expansion factors and summed to get county and state estimates. All estimates were developed as average annual estimates on a per acre basis; no effort was made to account for different times of removals.

The midcycle survey was designed to achieve acceptable sampling errors for large areas. Consequently, estimates are most reliable at the State level and for major components such as forest area and growing-stock volume (table 1). Smaller components have higher sampling errors. Since growth and removals are small in comparison to the inventory, reliability is correspondingly low. Estimates for individual or small groups of counties must be used with caution, and using growth and removals estimates requires special attention.

Table 1.--*Sampling errors for forest land and volume estimates, 1982*

Item	Sampling error
	- - *percent* - -
Area	1.6
Growing-stock volume	4.6
Sawtimber volume	6.1
Growth on growing stock	7.7

RESULTS

Forest Area

Timberlands, formerly termed commercial forest lands, comprise 4.3 million acres or about 40 percent of the total area in the eighteen counties surveyed in East Oklahoma (fig. 1). While timberland has been declining since 1956, losses were negligible from 1976 to 1982. Losses in some counties were offset by gains in others. Gains in forest area were primarily in the southeastern counties, although gains were reported as far north as Delaware county and as far west as Pittsburg county. Nearly all counties gaining timberland since the last survey reversed prior declines. The exception was Muskogee county where forest area has increased since 1966.

Forest type acreage has changed only slightly since the 1976 survey (appendix table 5). Oak-hickory types predominate, with pine and oak-pine types next in occurrence. Oak-gum-cypress and elm-ash-cottonwood types declined about 6 percent. These forest types generally occur on bottomlands where conversion to agriculture is common.

Timber Volume

Growing stock in east Oklahoma totaled 2.1 billion cubic feet in 1982. This volume is essentially the same as in 1976, but only because losses in softwood volume were offset by gains in hardwood volume. Despite acreage losses in bottomland types, hardwood growing stock increased roughly 10 percent while softwood volume declined 10 percent. Losses in softwood growing stock were primarily in sawtimber-size stands (appendix table 17) while hardwood gains were largely in the poletimber and sapling-seedling stand sizes (appendix table 18).

About 85 percent of the softwood inventory --growing-stock and sawtimber-- is in LeFlore, McCurtain, and Pushmataha counties. While only Pushmataha showed a loss in forest acreage, all three counties showed declines in softwood inventories. Growing stock is down about 100 million cubic feet with four-fifths of the loss in sawtimber-size stands. The decline in board foot volume, however, was only about 8 percent in softwood sawtimber-size stands. The hardwood growing stock in these three counties declined about 4 percent. Most of the loss occurred in sawtimber-size stands as reflected by a 4 percent decline in hardwood sawtimber volume.

Growth and Removals

Because of the low sampling intensity in this survey, growth and removals estimates are valid only for

Figure 1.--*Forest resource regions of east Oklahoma.*

extensive areas and should be interpreted with considerable care. Net growth of growing stock averaged roughly 23 cubic feet per acre per year, down 3 cubic feet per acre from the 1975 estimate. Average volume per acre was 482 cubic feet, an increase of 5 cubic feet over 1976. Stocking increased while net growth declined.

Average annual net growth for softwoods was 57.0 million cubic feet in east Oklahoma and removals averaged 55.2 million cubic feet (appendix tables 25 and 27). Hardwood growth, 40.5 million cubic feet, considerably exceeded the 32.3 million cubic feet average annual removals.

The balance in softwood removals and growth belies the change in inventory volume during the period. With growth and cut estimates roughly equivalent, the inventory could be expected to remain stable. Removal rates, however, changed drastically just prior to the 1976 survey. Softwood removals rose 37 percent from 1966 to 1976. From 1976 to 1982, the increase was only about 1 percent, but within the period removals varied substantially. Based on the output of forest products in 1975 (Bertelson 1977) and 1978 (Rudis and Jones 1981), removals of softwood growing stock continued to increase during the early part of the inter-survey period. Conversion of vast areas of primarily all-age pine stands in Oklahoma to even-age management has changed the inventory dramatically.

The current decline in softwood inventory may be temporary as the effect of even-age management is not yet reflected in inventory volumes. Photointerpretation of the 1,828 permanent plots indicated that 335,000 acres were cut and regenerated to pine in the past 10 years. One-third of these stands are 6 to 10 years old. Although these young stands show little cubic volume, virtually all of it was ingrowth and contributed to average annual growth for the period. Another third of the acres have been regenerated and these 3 to 6 year old stands are nearing the size to contribute to the growing stock. These findings are corroborated by planting records in eastern Oklahoma over the past 30 years (USDA undated). Figure 2 indicates that the dramatic increase in acres planted between 1972 and 1974 was sustained through 1980. These regenerated stands are expected to contribute to the inventory at the next survey scheduled for 1986.

APPENDIX

Tables in this publication correspond to those in the 1976 "Forest Statistics for Oklahoma Counties" (Earles 1976) with the following exceptions. Table 4 was omitted because ownership was not resurveyed. Sampling method and size limited the reliability of tables 22-24 and 30-34, so they too were excluded. Table 9 may be computed directly from Table 10, converting cubic feet to cords. Appropriate factors can be derived from the 1976 state totals. Table 12 has been expanded to 12a, 12b, 12c, and 12d to give more details of volume by site class.

The sampling methods were developed to provide suitable survey unit estimates. Estimates for smaller areas are presented, but the sampling error increases as the area decreases. Sampling errors presented in table 1 are based on one standard deviation or a probability of two chances out of three. To estimate the sampling error for a combination of counties one can use the following:

$$SE_G = \frac{SE_T \sqrt{X_T}}{\sqrt{X_G}}$$

where:

SE = standard error of estimate (percent)
X = variable of interest (area, volume)
G = group of counties to be combined
T = total for the unit

A sample computation of the standard error for hardwood growing-stock volume for the first five counties in table 10 follows:

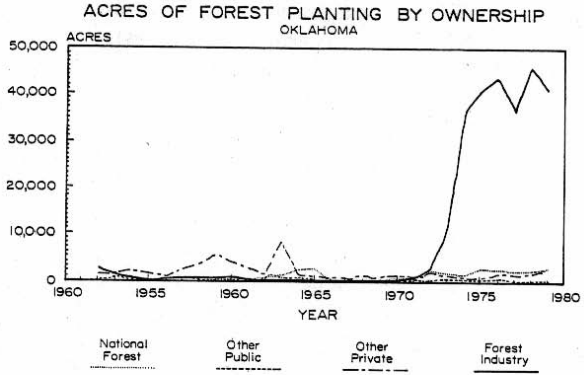

Figure 2.--*Illustration of marked increase in planting by forest industry 1973-1975.*

X_G = 388.3 million cubic feet
X_T = 2,065.4 million cubic feet
SE_T = 4.6, expressed in percent

$$SE_G = \frac{4.6\sqrt{2065.4}}{\sqrt{388.3}}$$

$$= 4.6 \times 2.3 = 10.6 \text{ percent}$$

Thus, there are 2 chances out of 3 that the true value for hardwood growing-stock volume is included in the interval 347.1 and 429.5 million cubic feet (388.3 ± 10.6 percent).

DEFINITIONS OF TERMS

Standard Survey

Acceptable trees.--Growing-stock trees of commercial species that meet specified standards of size and quality as desirable trees.

Desirable trees.--Growing-stock trees that are of commercial species, have no defects in quality for timber products, are of relatively high vigor, and contain no pathogens that may result in death or serious deterioration before rotation age.

Forest type.--A classification of forest land based upon the species forming a plurality of live-tree stocking.

Growing-stock trees.--Live trees that are of commercial species and qualify as desirable or acceptable trees.

Growing-stock volume.--Net volume in cubic feet of growing-stock trees at least 5.0 inches in diameter at breast height, from a 1 foot stump to a minimum 4.0-inch top diameter outside bark of the central stem, or to the point where the central stem breaks into limbs.

Mortality.--Sound-wood volume of live trees dying from natural causes during a specified period.

Net annual growth.--The average annual net volume increase for the inter-survey period.

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

Physiographic site.--A classification of forest land according to its suitability for growing certain species groups--pines, upland hardwoods, or bottomland hardwoods.

Poletimber trees.--Growing-stock trees of commercial species at least 5.0 inches in diameter at breast height, but smaller than sawtimber size.

Rotten trees.--Live trees of commercial species that do not contain at least one 12-foot saw log, now or prospectively, primarily because of rot.

Rough trees.--Live trees of commercial species that do not contain at least one 12-foot saw log, now or prospectively, primarily because of roughness or poor form. (Includes all live trees of noncommercial species.)

Sawtimber trees.--Live trees that are of commercial species, contain at least a 12-foot saw log, and meet regional specifications for freedom from defect. Softwoods must be at least 9.0 inches in diameter at breast height and hardwoods at least 11.0 inches.

Sawtimber volume.--Net volume of the saw-log portion of live sawtimber trees in board feet, International 1/4-inch rule.

Site class.--A classification of forest land in terms of inherent capacity to grow crops of industrial woods.

Stand-size class.--A classification of forest land based on the size class of growing-stock trees on the area; that is, sawtimber, poletimber, or sapling and seedling.

Timber removals.--The net volume of growing-stock trees removed from the inventory by harvesting, cultural operations such as timber-stand improvement, land clearing, or changes in land use.

Timberland.-- (Formerly *commercial forest land.*) Forest land producing or capable of producing crops of industrial wood and not withdrawn from timber utilization.

Optical Bar Photo-Interpretation Key

Forest.--An area characterized by a more or less dense and extensive tree cover. Softwoods appear rough in texture and are shades of red to magenta. Hardwoods appear very rough in texture with tones of light and dark gray.

Recent clear-cut.--An area of forest during the last inventory and signs of recent logging activities are present. No regeneration of softwoods can be detected. The image has a very rough texture of light and dark with no visible pink color.

Stage I regeneration site.--An area of planted pine with an average height of approximately two feet. The appearance is generally smooth in texture and with very little pink or red color.

Stage II regeneration site.--A pine plantation in which individual trees may be seen on the photography. Trees exceed five feet in height.

Stage III regeneration site.--A plantation in which pines have reached full crown closure in appearance. The trees are a bright magenta and have a smoother texture than stage II. Individual trees cannot be seen and shadows are not apparent.

Cropland.--Cropland, including improved pasture, appears very smooth and has road access. The color varies from the white of freshly harvested cropland to a very dark freshly plowed field. A growing crop appears bright red, whereas, young pine trees are more magenta or blood red.

Permanent nonforest.--Urban areas, highways, pipelines, and other permanent features.

Water.--Water appears dark blue to black, in shades of blue when turbid.

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Table 2.--*Timberland, growing-stock, and sawtimber volume, 1982, and change since 1978*

Resource region	Timberland		Growing stock				Sawtimber			
			Softwood		Hardwood		Softwood		Hardwood	
	Area	Change	Volume	Change	Volume	Change	Volume	Change	Volume	Change
	thousand acres	*percent*	*million ft3*	*percent*	*million ft3*	*percent*	*million fbm*	*percent*	*million fbm*	*percent*
Southeast	3,235.2	..	866.8	-10	762.1	+ 5	3,367.2	-1	1,829.1	+ 5
Northeast	1,049.1	-3	40.5	- 4	396.0	+21	151.3	-5	905.7	+21
State	4,284.3	-1	907.3	-10	1,158.1	+10	3,518.5	-2	2,734.8	+10

Table 3.--*Total area, timberland, and proportion of total area, 1982, and change since 1976*

County	Total area[1]	Timberland		
		Area	Proportion	Change since 1976
	thousand acres		*percent*	
Adair	364.8	210.1	58	-3
Atoka	634.5	248.2	39	-8
Bryan	594.5	82.0	14	-7
Cherokee	501.8	224.8	45	-4
Choctaw	508.8	191.3	40	+18
Coal	336.6	47.1	14	-4
Delaware	498.5	209.4	42	+7
Haskell	397.4	119.6	30	-4
Latimer	471.7	277.8	59	-1
LeFlore	1,012.5	589.3	58	-2
McCurtain	1,199.4	842.0	70	-3
McIntosh	460.8	79.3	17	-10
Mayes	440.3	92.9	21	-5
Muskogee	538.2	96.3	18	-16
Ottawa	309.1	44.2	14	-24
Pittsburg	876.2	182.2	21	+5
Pushmataha	910.7	655.7	72	-7
Sequoyah	456.3	92.1	20	-11
All counties	10,612.6	4,284.3	41	-1

1 United States Bureau of the Census; Land and Water Area of the United States.

Table 5.--*Timberland by forest type,*[1] *1982*

County	All types	Loblolly-shortleaf pine	Oak-pine	Oak-hickory	Oak-gum-cypress	Elm-ash-cottonwood
	thousand acres					
Adair	210.1	6.2	12.4	185.4	6.2	...
Atoka	248.2	29.6	47.3	94.6	70.9	6.9
Bryan	82.0	...	...	65.6	16.4	...
Cherokee	224.8	5.8	...	190.2	5.8	23.1
Choctaw	191.3	11.9	...	160.6	11.9	5.9
Coal	47.1	...	...	33.1	7.0	7.0
Delaware	209.4	...	...	209.4	...	...
Haskell	119.6	...	23.9	59.8	17.9	17.9
Latimer	277.8	55.6	30.9	179.0	12.3	...
LeFlore	589.3	128.4	159.4	250.7	23.3	17.5
McCurtain	842.0	324.2	204.8	250.3	56.9	5.7
McIntosh	79.3	...	...	68.0	...	11.3
Mayes	92.9	...	5.8	75.5	5.8	5.8
Muskogee	96.3	...	...	79.3	11.3	5.6
Ottawa	44.2	...	...	38.7	5.5	...
Pittsburg	182.2	6.8	6.8	135.4	26.3	5.8
Pushmataha	655.7	270.4	154.1	185.9	11.5	...
Sequoyah	92.1	6.6	6.6	78.0	...	...
All counties	4,284.3	846.4	652.0	2,344.5	289.0	113.5

2 Columns may not sum to totals, due to rounding.

Table 6.--*Timberland by stand-size class,*[1] *1982*

County	All classes	Sawtimber	Poletimber	Sapling and seedling	Nonstocked areas
	thousand acres				
Adair	210.1	49.4	92.7	68.0	...
Atoka	248.2	48.1	60.5	122.0	17.7
Bryan	82.0	16.4	27.3	21.9	16.4
Cherokee	224.8	40.3	98.0	80.7	5.8
Choctaw	191.3	47.8	41.8	101.6	...
Coal	47.1	13.6	6.9	13.6	13.6
Delaware	209.4	13.0	98.1	91.6	6.5
Haskell	119.6	17.9	47.8	53.8	...
Latimer	277.8	55.5	98.8	104.9	18.5
LeFlore	589.3	135.5	288.5	147.3	17.5
McCurtain	842.0	335.7	221.8	273.0	11.5
McIntosh	79.3	17.0	17.0	39.5	5.7
Mayes	92.9	11.6	23.2	58.1	...
Muskogee	96.3	5.6	48.1	25.8	16.1
Ottawa	44.2	5.5	11.1	22.1	5.5
Pittsburg	182.2	13.4	49.2	119.5	...
Pushmataha	555.7	172.5	247.3	230.1	5.7
Sequoyah	92.1	13.2	46.0	26.3	5.6
All counties	4,284.3	1,012.1	1,624.2	1,600.9	146.1

[1] Columns may not sum to totals due to rounding.

Table 7.--*Timberland by size class,*[1] *1982*

County	All classes	165 ft^3 or more	120-165 ft^3	85-120 ft^3	50-85 ft^3	Less than 50 ft^3
	thousand acres					
Adair	210.1	...	...	...	74.2	135.9
Atoka	248.2	...	...	...	135.9	112.3
Bryan	82.0	...	...	5.5	21.9	54.7
Cherokee	224.8	...	...	11.5	86.5	126.8
Choctaw	191.3	...	...	11.4	84.2	96.1
Coal	47.1	...	...	...	13.6	33.5
Delaware	209.4	...	...	...	39.3	170.1
Haskell	119.6	5.7[2]	...	...	45.2	67.7
Latimer	277.8	...	6.2	...	92.6	179.0
LeFlore	589.3	...	5.5	23.3	215.4	345.0
McCurtain	842.0	...	22.9	143.2	523.9	152.5
McIntosh	79.3	...	...	...	11.3	68.0
Mayes	92.9	...	...	...	34.8	58.1
Muskogee	96.3	...	...	5.5	48.1	42.8
Ottawa	44.2	...	...	...	11.1	33.2
Pittsburg	182.2	...	...	...	54.2	127.9
Pushmataha	555.7	...	...	5.8	327.9	322.2
Sequoyah	92.1	...	...	13.2	46.1	32.9
All counties	4,284.3	5.7[2]	34.5	219.4	1,867.2	2,158.8

[1] Columns may not sum to totals, due to rounding.
[2] Represents a single location; valid at State level only.

Table 8.--*Timberland by physiographic site class,*[1] *1988*

County	All sites	Pine	Upland hardwood	Bottomland hardwood
	thousand acres			
Adair	210.1	55.6	148.3	6.2
Atoka	248.2	112.7	59.1	75.6
Bryan	82.0	...	65.6	16.4
Cherokee	224.8	63.4	132.6	28.8
Choctaw	191.3	71.0	103.9	16.4
Coal	47.1	...	33.6	13.5
Delaware	209.4	48.0	161.6	...
Haskell	119.5	85.5	...	34.0
Latimer	277.8	253.2	12.3	12.3
LeFlore	589.2	460.5	87.5	40.8
McCurtain	842.0	714.4	66.5	61.0
McIntosh	79.3	12.1	56.0	11.3
Mayes	92.6	11.5	69.7	11.4
Muskogee	96.3	5.4	74.9	16.1
Ottawa	44.2	...	38.7	5.5
Pittsburg	182.2	95.5	58.9	26.7
Pushmataha	655.7	621.7	22.5	11.3
Sequoyah	92.1	36.3	55.7	...
All counties	4,284.3	2,647.2	1,247.5	388.7

[1] Columns may not sum to totals due to rounding.

Table 10.--*Growing-stock volume on timberland by species group,*[1] *1988*

County	All species	Softwood	Hardwood
	million cubic feet		
Adair	118.5	12.3	106.2
Atoka	85.9	25.4	61.5
Bryan	40.3	...	40.3
Cherokee	113.8	7.4	106.4
Choctaw	81.5	7.6	73.9
Coal	26.1	...	26.1
Delaware	58.3	1.3	57.0
Haskell	56.3	7.7	48.6
Latimer	102.6	63.7	38.9
LeFlore	296.7	168.9	127.8
McCurtain	582.1	340.3	241.8
McIntosh	19.2	...	19.2
Mayes	32.6	2.8	29.8
Muskogee	39.9	...	39.9
Ottawa	15.2	...	15.2
Pittsburg	34.5	2.4	32.1
Pushmataha	321.9	250.8	71.1
Sequoyah	39.0	16.7	22.3
All counties	2,066.4	907.3	1,158.1

[1] Columns may not sum to totals, due to rounding.

Table 11.--*Sawtimber volume on timberland by species group,*[1] *1982*

County	All species	Softwood	Hardwood
	million board feet		
Adair	299.2	46.4	252.8
Atoka	207.1	63.9	143.2
Bryan	94.3	...	94.3
Cherokee	290.0	28.5	261.5
Choctaw	225.3	22.8	202.5
Coal	91.1	...	91.1
Delaware	124.4	11.8	112.6
Haskell	160.9	22.2	138.7
Latimer	302.5	234.9	67.6
LeFlore	880.5	619.5	261.0
McCurtain	2,118.4	1,486.3	632.1
McIntosh	52.2	0.4	51.8
Mayes	91.4	4.2	87.2
Muskogee	60.8	...	60.8
Ottawa	41.7	...	41.7
Pittsburg	102.6	18.8	83.8
Pushmataha	1,013.6	898.8	114.8
Sequoyah	97.3	60.0	37.3
All counties	6,253.3	3,518.5	2,734.8

[1] Columns may not sum to totals, due to rounding.

Table 12a.--*Growing-stock volume of softwoods on timberland by site class,*[1] *1982*

County	All classes	165 ft^3 or more	120-165 ft^3	85-120 ft^3	50-85 ft^3	Less than 50 ft^3
	million cubic feet					
Adair	12.3	...	...	...	10.8	1.6
Atoka	25.4	...	...	...	12.4	13.1
Bryan	...	...	...	...	...	...
Cherokee	7.4	...	...	...	6.7	0.8
Choctaw	7.6	...	...	...	7.4	0.3
Coal	...	...	...	...	...	...
Delaware	1.3	...	...	...	0.4	0.9
Haskell	7.7	...	...	...	...	7.7
Latimer	63.7	...	...	...	43.8	20.0
LeFlore	168.9	...	...	6.1	92.7	70.1
McCurtain	340.3	...	16.8	59.3	231.1	33.1
McIntosh	...	...	...	...	...	...
Mayes	2.8	...	...	...	2.8	...
Muskogee	...	...	...	...	...	...
Ottawa	...	...	...	...	...	...
Pittsburg	2.4	...	...	...	1.1	1.3
Pushmataha	250.8	...	...	1.8	176.9	72.1
Sequoyah	16.7	...	...	...	17.0	...
All counties	907.3	...	16.8	67.2	602.8	221.0

[1] Columns may not sum to totals, due to rounding.

Table 12b.--*Growing-stock volume of hardwoods on timberland by size class,*[1] *1982*

County	All classes	165 ft^3 or more	120-165 ft^3	85-120 ft^3	50-85 ft^3	Less than 50 ft^3
	million cubic feet					
Adair	106.2	...	...	...	45.7	60.6
Atoka	61.5	...	...	...	47.2	14.3
Bryan	40.3	...	...	7.1	13.9	19.3
Cherokee	106.4	...	...	19.5	43.7	43.1
Choctaw	73.9	...	...	6.8	31.0	36.1
Coal	26.1	...	...	...	17.2	8.9
Delaware	57.0	...	...	...	13.5	43.5
Haskell	48.6	17.5[2]	...	...	22.9	8.3
Latimer	38.5	...	5.4	...	12.5	21.0
LeFlore	127.5	...	4.9	7.5	37.5	77.9
McCurtain	241.8	...	23.9	45.9	125.6	46.3
McIntosh	19.2	...	...	...	7.2	12.0
Mayes	29.8	...	...	...	14.0	15.8
Muskogee	39.9	...	...	3.0	25.4	11.5
Ottawa	15.2	...	...	...	3.9	11.4
Pittsburg	32.1	...	...	...	14.4	17.7
Pushmataha	71.1	...	...	0.5	35.1	35.4
Sequoyah	22.3	...	...	4.3	11.8	6.2
All counties	1,158.1	17.5[2]	34.2	94.8	522.6	489.3

[1] Columns may not sum to totals, due to rounding.
[2] Represents a single location; valid at State level only.

Table 12c.--*Sawtimber volume of softwoods on timberland by size class,*[1] *1982*

County	All classes	165 ft^3 or more	120-165 ft^3	85-120 ft^3	50-85 ft^3	Less than 50 ft^3
	million board feet					
Adair	46.4	...	...	...	38.0	8.4
Atoka	63.9	...	...	...	28.2	35.7
Bryan	...	...	...	...	...	...
Cherokee	28.5	...	...	...	22.1	6.4
Choctaw	22.6	...	...	...	19.2	3.5
Coal	...	...	...	...	...	...
Delaware	11.8	...	...	...	2.7	9.1
Haskell	22.2	...	...	...	...	22.2
Latimer	234.9	...	...	...	161.6	73.3
LeFlore	619.6	...	...	24.0	367.0	228.6
McCurtain	1,486.2	...	92.1	292.3	977.3	124.5
McIntosh	0.4	...	...	...	...	0.4
Mayes	4.2	...	...	...	4.2	...
Muskogee	...	...	...	...	...	...
Ottawa	...	...	...	...	...	...
Pittsburg	18.8	...	...	...	7.9	10.9
Pushmataha	898.5	...	...	10.9	640.1	247.5
Sequoyah	50.0	...	...	...	50.0	...
All counties	3,518.5	...	92.1	327.2	2,328.3	770.9

[1] Columns may not sum to totals, due to rounding.

Table 12c.--*Sawtimber volume of hardwoods on timberland by size class,*[1] *1982*

County	All classes	165 ft^3 or more	120-165 ft^3	85-120 ft^3	50-85 ft^3	Less than 50 ft^3
	million board feet					
Adair	252.8	...	...	...	114.4	138.4
Atoka	143.2	...	...	...	114.6	28.6
Bryan	94.3	...	...	14.0	37.7	42.7
Cherokee	261.5	...	...	74.9	106.6	79.9
Choctaw	202.5	...	...	16.3	80.0	106.2
Coal	91.1	...	...	...	66.1	25.0
Delaware	112.6	...	...	...	31.3	81.3
Haskell	138.7	55.4[2]	...	...	55.5	13.8
Latimer	67.6	...	13.3	...	9.7	44.5
LeFlore	261.0	...	0.2	12.4	72.4	176.0
McCurtain	632.1	...	72.7	156.3	331.1	72.0
McIntosh	51.8	...	...	...	21.4	30.4
Mayes	87.2	...	...	...	39.9	47.3
Muskogee	60.8	...	...	7.9	39.1	13.8
Ottawa	41.7	...	...	...	5.5	36.3
Pittsburg	83.8	...	...	...	41.4	42.5
Pushmataha	114.8	...	...	1.6	52.6	60.6
Sequoyah	37.3	...	...	12.4	16.7	8.2
All counties	2,734.8	55.4[2]	86.2	295.8	1,236.0	1,047.7

[1] Columns may not sum to totals, due to rounding.
[2] Represents a single location; valid at State level only.

Table 13.--*Growing-stock volume of softwoods on timberland by forest type,*[1] *1982*

County	All types	Loblolly-shortleaf pine	Oak-pine	Oak-hickory	Oak-gum-cypress	Elm-ash-cottonwood
	million cubic feet					
Adair	12.3	6.2	6.1	...	...	...
Atoka	26.4	18.1	7.7	0.1	...	...
Bryan	...	...	...	...	...	...
Cherokee	7.4	6.3	...	0.7	....	0.4
Choctaw	7.5	4.4	1.6	1.7	...	...
Coal	...	...	...	...	...	...
Delaware	1.3	...	...	1.3	...	...
Haskell	7.7	...	6.7	1.0	...	...
Latimer	63.7	39.5	15.4	8.8	...	...
LeFlore	168.9	105.6	47.5	16.0	...	...
McCurtain	340.3	247.9	65.5	25.2	1.8	...
McIntosh	...	...	...	...	...	...
Mayes	2.8	...	2.8	...	...	...
Muskogee	...	...	...	...	...	...
Ottawa	...	...	...	...	...	...
Pittsburg	2.4	1.0	0.3	1.2	...	...
Pushmataha	250.6	195.1	56.7	9.5	...	...
Sequoyah	16.7	11.6	5.1	0.1	...	...
All counties	907.3	625.7	215.3	65.2	1.8	0.4

[1] Columns may not sum to totals, due to rounding.

Table 14.--*Growing-stock volume of hardwoods on timberland by forest type,*[1] *1982*

County	All types	Loblolly-shortleaf pine	Oak-pine	Oak-hickory	Oak-gum-cypress	Elm-ash-cottonwood
	million cubic feet					
Adair	106.2	1.4	1.9	97.3	5.5	...
Atoka	51.5	2.4	4.6	18.8	33.5	2.2
Bryan	40.3	...	...	24.4	15.9	...
Cherokee	105.4	0.4	...	72.0	11.2	22.8
Choctaw	73.9	1.9	2.3	59.1	4.7	5.9
Coal	26.1	...	...	8.9	7.3	9.9
Delaware	57.0	...	...	57.0	...	...
Haskell	48.5	...	3.2	10.0	10.9	24.5
Latimer	38.3	3.6	4.3	25.2	5.7	...
LeFlore	127.8	9.7	18.4	78.0	8.8	12.9
McCurtain	241.8	26.0	40.0	113.8	62.0	...
McIntosh	19.2	...	...	12.0	...	7.2
Mayes	29.5	...	0.8	23.4	2.9	2.7
Muskogee	39.9	...	...	31.3	7.3	1.4
Ottawa	15.2	...	...	13.1	2.1	...
Pittsburg	32.0	...	...	21.1	10.6	0.3
Pushmataha	71.1	15.6	20.4	33.5	1.6	...
Sequoyah	22.3	1.6	0.6	20.1	...	...
All counties	1,158.1	62.5	96.5	719.0	190.0	89.9

[1] Columns may not sum to totals, due to rounding.

Table 15.--*Sawtimber volume of softwoods on timberland by forest type,*[1] *1982*

County	All types	Loblolly-shortleaf pine	Oak-pine	Oak-hickory	Oak-gum-cypress	Elm-ash-cottonwood
	million board feet					
Adair	46.4	19.5	22.2	4.7	...	...
Atoka	63.9	39.3	22.3	2.3	...	...
Bryan	...	...	...	...	...	...
Cherokee	28.5	18.5	...	8.0	...	1.7
Choctaw	22.8	9.9	5.1	7.8	...	...
Coal	...	...	...	...	...	...
Delaware	11.8	...	...	11.8	...	...
Haskell	22.2	...	16.1	5.1	...	...
Latimer	234.9	133.9	54.9	46.1	...	...
LeFlore	519.5	358.5	179.8	81.1	...	...
McCurtain	1,486.2	1,015.7	301.4	154.9	14.2	...
McIntosh	0.4	...	...	0.4	...	...
Mayes	4.2	...	4.2	...	...	...
Muskogee	...	...	...	...	...	...
Ottawa	...	...	...	...	...	...
Pittsburg	18.8	5.7	2.5	10.5	...	...
Pushmataha	898.8	648.1	209.8	40.8	...	...
Sequoyah	60.0	36.5	21.3	2.3	...	...
All counties	3,518.5	2,286.0	839.6	376.8	14.2	1.7

[1] Columns may not sum to totals, due to rounding.

Table 16.-- *Sawtimber volume of hardwoods on timberland by forest type,*[1] *1988*

County	All types	Loblolly-shortleaf pine	Oak-pine	Oak-hickory	Oak-gum-cypress	Elm-ash-cottonwood
	million board feet					
Adair	252.8	2.8	2.7	234.4	12.8	...
Atoka	143.2	4.2	11.6	36.6	86.8	4.2
Bryan	94.3	...	...	52.1	42.2	...
Cherokee	261.5	...	...	146.9	51.4	63.2
Choctaw	201.5	1.5	5.4	156.3	13.7	26.7
Coal	91.1	...	...	25.0	24.3	41.8
Delaware	112.6	...	...	112.6	...	...
Haskell	138.7	...	4.0	18.6	33.3	82.8
Latimer	67.6	10.3	6.8	37.0	13.5	...
LeFlore	261.0	17.9	34.3	155.1	25.5	28.3
McCurtain	632.1	67.3	98.9	241.3	224.6	...
McIntosh	51.8	...	...	30.4	...	21.4
Mayes	67.2	...	2.3	64.1	8.2	12.6
Muskogee	60.8	...	...	37.5	17.8	5.6
Ottawa	41.7	...	...	37.7	4.0	...
Pittsburg	83.8	...	...	40.1	43.5	0.2
Pushmataha	114.8	27.9	33.7	48.6	4.5	...
Sequoyah	37.3	4.1	1.4	31.8	...	...
All counties	2,734.8	136.0	201.1	1,506.1	606.1	285.8

[1] Columns may not sum to totals, due to rounding.

Table 17.--*Growing-stock volume of softwoods on timberland by stand-size class,*[1] *1992*

County	All classes	Sawtimber	Poletimber	Sapling and seedling
	million cubic feet			
Adair	12.3	10.1	...	2.2
Atoka	28.4	8.2	8.5	5.7
Bryan	...	...	...	...
Cherokee	7.4	7.4	...	...
Choctaw	7.6	2.5	3.8	1.2
Coal	...	...	...	...
Delaware	1.3	...	1.3	...
Haskell	7.7	...	5.8	1.9
Latimer	53.7	26.5	27.1	8.2
LeFlore	168.9	76.8	79.8	12.4
McCurtain	340.3	247.5	71.2	21.6
McIntosh	...	...	...	...
Mayes	2.8	...	2.8	...
Muskogee	...	...	...	...
Ottawa	...	...	...	...
Pittsburg	2.4	...	0.7	1.7
Pushmataha	250.8	131.7	91.1	28.0
Sequoyah	16.7	16.5	0.3	...
All counties	907.3	529.2	292.5	85.9

[1] Columns may not sum to totals, due to rounding.

Table 18.--*Growing-stock volume of hardwoods on timberland by stand-size class,[1] 1968*

County	All classes	Sawtimber	Poletimber	Sapling and seedling	Nonstocked areas
	million cubic feet				
Adair	108.2	29.2	60.6	16.4	...
Atoka	61.5	19.9	21.0	18.9	1.7
Bryan	40.3	11.4	22.0	4.7	2.2
Cherokee	106.4	38.3	50.7	16.9	0.4
Choctaw	73.9	33.8	15.7	23.4	...
Coal	26.1	17.2	4.1	3.0	1.9
Delaware	57.0	5.9	31.5	18.4	1.2
Haskell	48.6	27.7	14.6	6.3	...
Latimer	38.9	4.8	24.3	9.1	0.7
LeFlore	127.8	28.4	83.3	15.6	0.5
McCurtain	241.8	133.1	89.2	18.6	0.8
McIntosh	15.2	9.6	2.9	5.0	0.7
Mayes	29.8	5.3	8.7	15.9	...
Muskogee	39.9	3.0	29.0	5.5	2.3
Ottawa	15.2	5.3	3.9	5.5	0.6
Pittsburg	32.1	10.4	14.5	7.2	...
Pushmataha	71.1	13.0	38.7	19.0	0.4
Sequoyah	22.3	2.2	15.2	3.3	0.6
All counties	1,158.1	398.5	531.9	213.7	14.0

[1] Columns may not sum to total, due to rounding.

Table 19.--*Sawtimber volume of softwood on timberland by stand-size class,[1] 1968*

County	All classes	Sawtimber	Poletimber	Sapling and seedling
	million board feet			
Adair	46.4	36.0	...	10.4
Atoka	63.9	23.3	14.8	25.8
Bryan	...	...	...	...
Cherokee	28.5	26.4	2.0	...
Choctaw	22.8	10.1	7.4	5.3
Coal	...	...	...	...
Delaware	11.8	...	10.0	1.8
Haskell	22.2	...	13.6	8.6
Latimer	234.9	127.9	71.7	35.3
LeFlore	619.5	341.4	230.6	47.6
McCurtain	1,486.2	1,152.1	238.3	95.9
McIntosh	0.4	...	0.4	...
Mayes	4.2	...	4.2	...
Muskogee	...	...	...	...
Ottawa	...	...	...	...
Pittsburg	18.8	...	4.8	14.0
Pushmataha	898.8	527.4	247.4	124.0
Sequoyah	50.0	37.7	2.3	...
All counties	3,518.5	2,302.3	847.5	368.7

[1] Columns may not sum to totals, due to rounding.

Table 20.--*Sawtimber volume of hardwoods on timberland by stand-size class,*[1] *1982*

County	All classes	Sawtimber	Poletimber	Sapling and seedling	Nonstocked areas
	million board feet				
Adair	252.8	99.7	110.3	42.7	...
Atoka	143.2	64.6	34.5	41.0	3.1
Bryan	94.3	37.3	41.0	9.3	6.7
Cherokee	261.5	134.9	87.7	38.9	...
Choctaw	202.5	120.4	33.6	48.3	...
Coal	91.1	66.1	20.9	9.3	4.8
Delaware	112.6	18.6	54.2	36.8	3.0
Haskell	138.7	101.2	25.2	11.3	...
Latimer	67.6	13.2	25.2	27.2	2.0
LeFlore	261.0	95.4	120.2	43.4	2.0
McCurtain	632.1	468.7	115.5	45.9	2.0
McIntosh	61.6	32.4	5.3	12.7	1.4
Mayes	87.2	19.8	20.9	46.4	...
Muskogee	60.8	7.9	39.8	6.0	7.1
Ottawa	41.7	19.9	5.5	14.9	1.5
Pittsburg	83.6	43.3	23.8	16.8	...
Pushmataha	114.8	26.7	49.6	38.2	0.2
Sequoyah	37.3	5.5	22.3	7.1	2.4
All counties	2,734.8	1,375.6	826.7	496.2	36.2

[1] Columns may not sum to totals, due to rounding.

Table 21.--*Growing-stock volume on timberland by physiographic site class and species group,*[1] *1982*

County	All sites and species	Pine		Upland hardwood		Bottomland hardwood	
		Softwood	Hardwood	Softwood	Hardwood	Softwood	Hardwood
	million cubic feet						
Adair	118.5	12.3	20.5	...	80.2	...	5.5
Atoka	86.9	25.4	9.9	...	15.9	...	35.6
Bryan	40.3	...	...	...	24.4	...	15.9
Cherokee	113.8	7.0	20.0	...	52.4	0.4	34.0
Choctaw	81.5	7.3	23.0	0.3	40.4	...	10.5
Coal	26.1	...	...	...	8.9	...	17.2
Delaware	58.3	1.3	8.0	...	49.1	...	...
Haskell	56.3	7.7	13.1	...	...	...	35.5
Latimer	102.6	63.7	30.6	...	2.6	...	5.7
LeFlore	296.7	168.9	74.5	...	31.6	...	21.7
McCurtain	582.1	338.6	140.8	...	38.9	1.7	62.0
McIntosh	19.2	...	1.1	...	10.9	...	7.2
Mayes	32.6	2.6	3.6	...	20.5	...	5.8
Muskogee	39.9	...	2.7	...	28.5	...	8.7
Ottawa	15.2	...	...	...	13.1	...	2.1
Pittsburg	34.5	2.4	9.9	...	11.3	...	11.0
Pushmataha	321.9	250.8	61.5	...	8.0	...	1.6
Sequoyah	39.0	16.7	6.8	...	15.5	...	...
All counties	2,065.4	904.9	425.3	0.3	452.0	2.1	279.9

[1] Columns may not sum to totals, due to rounding.

Table 25.--*Average annual net growth of growing stock on timberland by species group,*[1] *1976-1981*

County	All species	Softwood	Hardwood
	million cubic feet		
Adair	5.7	0.9	4.8
Atoka	4.1	1.7	2.4
Bryan	1.1	...	1.1
Cherokee	3.2	0.6	2.6
Choctaw	2.5	0.5	2.0
Coal	0.7	...	0.7
Delaware	2.2	0.2	2.0
Haskell	2.1	0.5	1.6
Latimer	5.7	3.9	1.8
LeFlore	15.0	10.3	4.7
McCurtain	29.0	21.8	7.2
McIntosh	1.1	...	1.1
Mayes	1.2	0.2	1.0
Muskogee	1.3	...	1.3
Ottawa	0.5	...	0.5
Pittsburg	1.7	0.2	1.5
Pushmataha	18.5	15.0	3.5
Sequoyah	1.9	1.2	0.7
All counties	97.5	67.0	40.5

[1] Columns may not sum to totals, due to rounding.

Table 26.--*Average annual net growth of sawtimber on timberland by species group,*[1] *1976-1981*

County	All species	Softwood	Hardwood
	million board feet		
Adair	20.1	5.0	15.1
Atoka	20.6	6.3	14.3
Bryan	5.8	...	5.8
Cherokee	20.1	4.3	15.8
Choctaw	16.5	3.5	13.0
Coal	4.0	...	4.0
Delaware	15.0	3.1	11.9
Haskell	11.0	2.6	8.4
Latimer	17.1	12.7	4.4
LeFlore	54.1	31.9	22.1
McCurtain	93.7	70.2	23.5
McIntosh	4.6	...	4.6
Mayes	7.6	1.4	6.2
Muskogee	6.2	...	6.2
Ottawa	3.0	...	3.0
Pittsburg	6.3	2.6	3.7
Pushmataha	52.4	43.7	8.7
Sequoyah	8.8	4.3	4.5
All counties	366.9	191.6	175.2

[1] Columns may not sum to totals, due to rounding.

Table 27.--*Average annual timber removals from growing stock on timberland by species group,*[1] *1976-1981*

County	All species	Softwood	Hardwood
	million cubic feet		
Adair	2.2	0.3	1.9
Atoka	2.1	1.3	0.9
Bryan	.6	...	.6
Cherokee	2.3	.2	2.1
Choctaw	2.0	.2	1.8
Coal	.4	...	.4
Delaware	.9	...	.8
Haskell	.8	.2	.7
Latimer	2.2	1.3	.9
LeFlore	12.3	7.5	4.8
McCurtain	38.2	28.0	10.2
McIntosh	.1	...	...
Mayes	.4	...	.4
Muskogee	.5	...	.5
Ottawa	.2	...	.2
Pittsburg	.6	...	.6
Pushmataha	20.8	16.2	4.6
Sequoyah	.9	...	.9
All counties	87.6	55.2	32.3

[1] Columns may not sum to totals, due to rounding.

Table 29.--*Average annual mortality of growing stock on timberland by species group,*[1] *1976-1981*

County	All species	Softwood	Hardwood
	million cubic feet		
Adair	...	...	...
Atoka	1.2	.1	1.1
Bryan	.9	...	.9
Cherokee	2.3	...	2.3
Choctaw	1.5	...	1.5
Coal	.8	...	.8
Delaware	1.1	...	1.1
Haskell	.4	...	.4
Latimer	.8	.2	.6
LeFlore	2.8	.6	2.2
McCurtain	5.2	1.1	4.1
McIntosh	...	...	...
Mayes	.6	...	.6
Muskogee	.8	...	.8
Ottawa	.3	...	.3
Pittsburg	.5	...	.5
Pushmataha	2.2	1.0	1.2
Sequoyah	.4	...	.4
All counties	21.6	3.0	18.6

[1] Columns may not sum to totals, due to rounding.

Thomas, C.E.
1985. Oklahoma midcycle survey shows change in forest resource trends. U.S. Dep. Agric. For. Serv. Resour. Bull. SO-100 . South. For. Exp. Stn., New Orleans, LA., 19p.

The first extensive midcycle update of Oklahoma's forest resources shows a 6% decrease in inventory volume between 1976 and 1981. Forest area declined by about 1% during the same period. Softwood inventory declined for the first time since 1930's.

Additional keywords: Area, forest type, stand size growth, removals, mortality, midcycle survey, inventory.

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