United States
Department of
Agriculture

Forest Service

Southern Forest
Experiment Station

Research Note

SO-329
December 1986

Status of Privately Owned Harvested Timberland in Louisiana, 1974-84

William H. McWilliams and Paul D. Frey

SUMMARY

Nearly 3.8 million acres or 28 percent of Louisiana's privately owned timberland were harvested between 1974 and 1984. This total excludes timberland impacted by thinning. Partial cutting was the most prevalent cutting practice and was most common on nonindustrial private land. Stocking of pine exceeded 60 percent in 50 percent of the pine and mixed pine-hardwood stands receiving final harvest cuts.

Additional keywords: Harvesting, regeneration, site preparation, pine stocking, forest type transition.

INTRODUCTION

The Forest Inventory and Analysis Unit (Forest Survey) of the Southern Forest Experiment Station conducts periodic inventories of Midsouth forest resources. An important component of these surveys is the collection of information on harvesting practices and the success of pine regeneration following harvest. Past reports have stressed the importance of regenerating harvested pinelands back to pine (Birdsey et al. 1981; Boyce and Knight 1980; McWilliams and Birdsey 1982).

Successful pine regeneration is especially important because of expected increased demands for the Midsouth's softwood resource, recent findings of declining pine-type acreage, decreased cropland reversions, and declines in the number of small pine trees (Rudis et al. 1985; van Hees 1980). This Research Note summarizes the findings for stands harvested on privately owned timberland since the 1974 full survey of Louisiana's forests.

DATA COLLECTION

Data were collected during the recent inventory of Louisiana in 1984. Forest acreage and timber volume data were secured by a systematic sampling method involving a forest-nonforest classification on aerial photographs and on-the-ground measurements of trees at sample locations. The sample locations were at intersections of a grid of lines spaced 3 miles apart. On-the-ground measurements included collection of data describing crop tree removals, site preparation, other stand treatments, and the stocking of well-established, free-to-grow pine seedlings (6 inches or greater in height). Sample locations were assigned a code describing any harvest that occurred after the previous measurement. Field crews used existing plot conditions, along with judgment, to distinguish between harvesting and other management activities such as commercial thinning, precommercial thinning, or stand improvement cuttings.

HARVESTING

In the 10-year period ending in 1984, 3.8 million acres of privately owned timberland were harvested in Louisiana. Harvesting was heaviest on forest industry land where 1.5 million acres or about 40 percent of the total forest showed some form of crop tree removal other than thinning or improvement cuts (table 1). This harvested acreage had undergone clearcutting, seed tree, shelterwood, pine-selection, diameter-limit, salvage, single-tree selection, or group selection cuts. Even-age regeneration cuts including clearcuts, seed tree cuts, and shelter-

Southern Forest Experiment Station/T-10210 U.S. Postal Services Bldg., 701 Loyola Avenue, New Orleans, La. 70113
Forest Service, U.S. Department of Agriculture.
Serving Alabama, Arkansas, Louisiana, Mississippi, E. Oklahoma, Tennessee, E. Texas, Puerto Rico, U.S. Virgin Islands

Table 1.—*Area of timberland harvested[1] by ownership class, past forest type, and method of harvest for private ownerships, Louisiana, 1974-84*

Ownership class and past forest type	Total past timberland	Harvested timberland	Even-age regeneration cuts		Partial cuts	
			Clearcuts	Seed-tree and shelterwood cuts	Pine-selection, diameter-limit, and salvage cuts	Other selection cuts[2]
	Thousand acres					
Forest industry:						
Pine types	1,718.2	708.8	368.2	78.2	72.6	189.8
Mixed pine-hardwoods	657.5	361.8	153.4	11.4	85.1	111.9
Hardwood types	1,385.7	390.5	155.0	28.2	52.1	155.2
Total	3,761.4	1,461.1	676.6	117.8	209.8	456.9
Nonindustrial private:						
Pine types	2,901.1	1,036.8	273.6	54.1	195.2	513.9
Mixed pine-hardwoods	1,393.6	469.0	114.7	23.2	85.8	245.3
Hardwood types	5,448.5	796.2	207.2	29.3	111.4	448.3
Total	9,743.2	2,302.0	595.5	106.6	392.4	1,207.5
Total private:						
Pine types	4,619.3	1,745.6	641.8	132.3	267.8	703.7
Mixed pine-hardwoods	2,051.1	830.8	268.1	34.6	170.9	357.2
Hardwood types	6,834.2	1,186.7	362.2	57.5	163.5	603.5
Total	13,504.6	3,763.1	1,272.1	224.4	602.2	1,664.4

[1]Excludes thinnings.
[2]Includes single-tree selection and group selection.

wood cuts occurred on 21 percent of forest industry timberland. Roughly one-quarter of the total nonindustrial private forest was impacted by harvesting, and only 7 percent received regeneration cuts.

Pine forest types were preferred for harvest and accounted for 46 percent of the cutting. The 1.7 million acres cut in this category represented 38 percent of the total pine acreage in Louisiana in 1974; however, only 17 percent of the total received regeneration cuts. Logging of hardwood stands accounted for nearly one-third of the total acreage harvested but only 17 percent of the total area in hardwood types. Cutting in the mixed pine-hardwood type made up the remaining harvested acreage and involved more than 40 percent of the mixed stands.

The most common logging activity was partial cutting, which affected 2.3 million acres. Single-tree selection, under which only a few crop trees per acre are removed, was used on more than three-fourths of the area treated with partial cuts. While single-tree selection affected a large area, the contribution to total removal volume was low compared to clearcuts. Clearcutting was the second most prevalent logging activity on 1.3 million acres. Pine-selection, diameter-limit, and salvage cuts accounted for 16 percent of the harvested acreage. Salvage cuts were a minor 12 percent of the cutting in this category. Pine-selection and diameter-limit cutting typically remove the bulk of a forest stand, leaving trees that are undesired because of species or merchantability. Seed tree and shelterwood cuts were implemented on 6 percent of the privately held harvested acreage.

Some significant contrasts appear when comparing cutting practices by ownership class. Partial cutting occurred 70 percent of the time on nonindustrial private land, compared to 46 percent on forest industry land. Forest industry used regeneration cuts on 54 percent of its harvested area while nonindustrial private owners used them on 31 percent.

Additional differences are apparent regarding clearcuts. On-the-ground classification of clearcuts included the distinction between complete and merchantable cuts. Merchantable clearcuts occur when nonutilizable trees are left standing. Fifty-five percent of the clearcutting on nonindustrial private land left nonmerchantable trees standing. These residuals can make stand regeneration more difficult; they also tend to provide an inferior seed source for the future stand. Two-thirds of the forest industry clearcuts removed all trees.

SITE PREPARATION

Eighty-five percent of all site preparation activities were applied on clearcut lands. Forest industry prepared 65 percent of its clearcut area while the nonindustrial private owners prepared 39 percent of their clearcut

William H. McWilliams is research forester, Southern Forest Experiment Station, USDA Forest Service, Starkville, MS. Paul D. Frey is assistant chief, Forest Management, Louisiana Forestry Commission, Baton Rouge, LA.

area. This is most likely an underestimate of activity for both ownerships because of the lag between harvesting and site preparation. Some of the plots classified as not being site prepared will probably be prepared in the future.

The most preferred method of site preparation involved mechanical techniques, such as shearing and raking, used in combination with controlled burning. Seventy-three percent of this activity was found on forest industry clearcuts.

REGENERATION

The extent of successful pine regeneration was determined by assessing the stocking of pine following final harvest. Stocking percentage is calculated in relation to "normal" stocking standards used by Forest Survey. These standards reflect the density of trees required for full stocking. The following tabulation shows the density standard in terms of trees per acre by 2-inch diameter class:

D.b.h.	No. of trees	D.b.h.	No. of trees
Seedlings	600	16	72
2	560	18	60
4	460	20	51
6	340	22	42
8	240	24	36
10	155	26	31
12	115	28	27
14	90	30	24

The findings for acreage harvested with clearcuts indicate that 58 percent of the area in pine and mixed pine-hardwoods had high stocking of pine (table 2). An additional 21 percent had medium stocking. Both ownerships were successful at regenerating pine types. Forest industry was more successful at regenerating mixed pine-hardwoods to pine following clearcut, leaving just 18 percent of such acreage in the lowest pine stocking class. Nonindustrial private owners left 40 percent in the lowest pine stocking class. Some of the poorly stocked acreage was recently cut and will be adequately regenerated within a short period of time.

One opportunity for expanding the pinelands of Louisiana involves converting hardwood forest types to pine. Forty-one percent of the hardwood type acreage receiving clearcuts had medium or high pine stocking. This conversion was most apparent on forest industry tracts.

Regeneration following pine-selection, diameter-limit, and salvage cuts was not as favorable as after clearcutting. Both ownerships had similar results in regenerating to pine following this activity. Thirty-six percent of the acreage cut in the pine and mixed pine-hardwood types exhibited high pine stocking (table 3). Another 31 percent showed medium stocking. Roughly three-fourths of the hardwood acreage had low stocking and will most likely remain in this category.

The significant area impacted by other selection cuts (single-tree and group selection) raises the issue of shifts from pine to hardwood forest types. Some of the acreage cut using these methods may involve uneven-

Table 2.—*Area of timberland harvested using clearcuts by ownership class, past forest type, and pine stocking class*[1] *for private ownerships, Louisiana, 1974-84*

Ownership class and past forest type	Total	Pine stocking class		
		Low	Medium	High
	Thousand acres			
Forest industry:				
Pine types	368.2	73.8	62.4	232.0
Mixed pine-hardwoods	153.4	27.0	34.5	91.9
Hardwood types	155.0	64.9	29.7	60.4
Total	676.6	165.7	126.6	384.3
Nonindustrial private:				
Pine types	273.6	50.7	67.9	155.0
Mixed pine-hardwoods	114.7	46.2	22.9	45.6
Hardwood types	207.2	149.6	16.6	41.0
Total	595.5	246.5	107.4	241.6
Total private:				
Pine types	641.8	124.5	130.3	387.0
Mixed pine-hardwoods	268.1	73.2	57.4	137.5
Hardwood types	362.2	214.5	46.3	101.4
Total	1,272.1	412.2	234.0	625.9

[1]Low indicates 0–29 percent stocked with pine (all size classes).
Medium indicates 30–59 percent stocked with pine (all size classes).
High indicates 60 percent or greater stocked with pine (all size classes).

age management in the traditional sense. However, most of the area should be considered "high graded." Nearly 30 percent of the acreage in pine types shifted to mixed pine-hardwood and hardwood types after being cut (table 4). Additional acreage shifted from mixed pine-hardwoods to pure hardwood types. While some acreage shifted towards pine, the net effect was a shift of about 120,000 acres out of the pure pine type.

Table 3.—*Area of timberland harvested using pine-selection, diameter-limit, and salvage cuts by ownership class, past forest type, and pine stocking class*[1] *for private ownerships, Louisiana, 1974-84*

Ownership class and past forest type	Total	Pine stocking class		
		Low	Medium	High
	Thousand acres			
Forest industry:				
Pine types	72.6	5.2	27.9	39.5
Mixed pine-hardwoods	85.1	47.2	20.4	17.5
Hardwood types	52.1	35.2	11.4	5.5
Total	209.8	87.6	59.7	62.5
Nonindustrial private:				
Pine types	195.2	61.1	47.7	86.4
Mixed pine-hardwoods	85.8	34.1	39.4	12.3
Hardwood types	111.4	83.6	27.8	....
Total	392.4	178.8	114.9	98.7
Total private:				
Pine types	267.8	66.3	75.6	125.9
Mixed pine-hardwoods	170.9	81.3	59.8	29.8
Hardwood types	163.5	118.8	39.2	5.5
Total	602.2	266.4	174.6	161.2

[1]Low indicates 0–29 percent stocked with pine (all size classes).
Medium indicates 30–59 percent stocked with pine (all size classes).
High indicates 60 percent or greater stocked with pine (all size classes).

Table 4.—*Area of timberland harvested using other selection cuts*[1] *by ownership class, past forest type, and present forest type for private ownerships, Louisiana, 1974-84*

Ownership class and past forest type	Total	Present forest type		
		Pine types	Mixed pine-hardwoods	Hardwood types
	Thousand acres			
Forest industry:				
Pine types	189.8	126.6	52.6	10.6
Mixed pine-hardwoods	111.9	28.7	60.8	22.4
Hardwood types	155.2	....	14.7	140.5
Total	456.9	155.3	128.1	173.5
Nonindustrial private:				
Pine types	513.9	373.2	128.4	12.3
Mixed pine-hardwoods	245.3	47.6	110.3	87.4
Hardwood types	448.3	6.5	34.7	407.1
Total	1,207.5	427.3	273.4	506.8
Total private:				
Pine types	703.7	499.8	181.0	22.9
Mixed pine-hardwoods	357.2	76.3	171.1	109.8
Hardwood types	603.5	6.5	49.4	547.6
Total	1,664.4	582.6	401.5	680.3

[1]Includes single-tree selection and group selection (excludes thinnings).

CONCLUSIONS

The overall status of harvested timberland in Louisiana appears favorable. Both forest industry and the nonindustrial private owners have had success at regenerating pine and mixed pine-hardwood stands following final harvest (including clearcuts, pine-selection, diameter-limit, and salvage cuts). Fifty percent of these stands exhibited a high level of pine stocking and an additional 24 percent showed medium pine stocking. The 345,000 acres of timberland left in the lowest pine stocking class after final harvest may be scheduled for future reforestation or improvements to enhance pine stocking. The recent economic downturn had major effects on investments in forestry. These effects showed up as regeneration problems on nonindustrial private lands in the 1982 survey of Alabama (McWilliams and Birdsey 1982). Since then, forest products output has picked up, and it would seem that this would prompt reforestation to continue.

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.

Boyce, S. G.; Knight, H. A. Prospective ingrowth of southern pine beyond 1980. Res. Pap. SE-200. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southeastern Forest Experiment Station; 1980. 48 p.

McWilliams, W. H.; Birdsey, R. A. Alabama survey points to lack of regeneration on harvested lands. Forest Farmer. 43(10): 18; 1982.

Rudis, V. A.; Rosson, Jr., J. F.; Kelly, J. F. Forest resources of Alabama. Resour. Bull. SO-98. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station; 1985. 55 p.

van Hees, W. W. S. Arkansas forests: trends and prospects. Resour. Bull. SO-77. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station; 1980. 32 p.

☆U.S. GOVERNMENT PRINTING OFFICE:1987-761-086/60008