Private forest land ownership and management in the loblolly-shortleaf type in southern Arkansas, northern Louisiana and central Mississippi

Henry Howard Chamberlin
PRIVATE FOREST LAND OWNERSHIP AND MANAGEMENT IN THE LOBLOLLY-SHORTLEAF TYPE IN SOUTHERN ARKANSAS, NORTHERN LOUISIANA AND CENTRAL MISSISSIPPI

By

H. H. CHAMBERLIN
Assistant Forester

L. A. SAMPLE
Assistant Forester

and

RALPH W. HAYES
Forester

LOUISIANA STATE UNIVERSITY
AND
AGRICULTURAL AND MECHANICAL COLLEGE
AGRICULTURAL EXPERIMENT STATION
W. G. TAGGART, Director
FOREWORD

The study herein reported was made possible by a grant from the General Education Board to the Forestry Department at Louisiana State University. The work was started early in 1942, and completed early in 1945.

Dr. A. D. Folweiler, Associate Professor of Forestry, Louisiana State University, outlined the procedure used in collecting the field data, and directed the work on the first three units. He entered the armed forces in December, 1943, and the general direction of the work on Units 4 and 5 was taken over by Prof. Ralph W. Hayes. H. J. Vaux, Associate Forester, Louisiana Agricultural Experiment Station, was field supervisor on the first two units, or until he, too, joined the armed forces. Dr. Folweiler personally supervised the field work on Unit 3, and H. H. Chamberlin on Units 4 and 5.

Acknowledgment is made to the following persons and organizations for the part they had in facilitating the work: to the Soil Conservation Service through its offices in Mansfield, Farmerville and Ruston, Louisiana, for use of aerial photographs; to the assessors of DeSoto, Sabine, Union, and Bienville Parishes, Louisiana, for use of tax rolls; to AAA offices in Philadelphia and Carthage, Mississippi, for use of aerial photographs; to the assessors in Leake and Neshoba Counties, Mississippi, for use of tax rolls; to AAA offices in Union County, Arkansas, for use of aerial photographs; to the County Agents in DeSoto, Bienville, and Union Parishes, Louisiana; Leake and Neshoba Counties, Mississippi; and Union County, Arkansas, for their general assistance.

The State Foresters of the three states where work was done, Massey Anderson in Louisiana, Albert Legett in Mississippi, and Fred Lang in Arkansas, gave us their full cooperation, particularly in selecting the areas to be worked.
INTRODUCTION

As a region, the South has approximately 44 percent of all our commercial forest land, or three times as much as any other region in the nation. Private rather than public ownership predominates.

The management of the forest lands in private ownership is one of the most important forestry problems in the United States today. The South now leads in private ownership of forest lands, and in the future is expected to be the leading timber producing region of the country.

On page 29 of the 1944 Report of the Chief of the Forest Service can be found the following statement:

"Private forest lands will continue to constitute the area from which the bulk of the raw material for our forest industries must come. Since the productivity of these lands is so vital to national security, their management cannot be left to chance. The public interest in them can only be safeguarded if measures for public cooperation and aid are backed by appropriate regulation of cutting and related practices."

This indicates the attitude of the U. S. Forest Service toward regulation. Naturally, private industry objects to close regulation of its operations. This controversy is not without good points on both sides. Any information, from any source, which presents facts should help in the final solution. It is believed that the results of the project as reported here will be of some value.

The purpose of this investigation was to determine, on limited areas, the effect, if any, of different types and sizes of forest land ownership on cutting practice and management policies. Because of limitation of funds and time, it was necessary to confine the study to one timber type. The shortleaf-loblolly pine type was chosen because it can be managed for all kinds of forest products, and in a broad application, is probably the most widely distributed type in the Southwestern Gulf States.
The map on page 4 shows the location of the five intensively worked units. Table 1 below shows additional detail for each unit. They are all similar in character and within the desired type. Representing as near typical conditions as we were able to find in the three states, they afforded an opportunity to study the effect of several slight variables resulting from differences in each state. In these areas are some of the large old oil and gas fields of the South. Mineral resources have caused considerable speculation in subsurface values, which has, of course, had some effect on land ownership and management. Agriculture in the region is characterized by the production of cotton and corn on small farm units.

### Table 1.

<table>
<thead>
<tr>
<th>Sample Area No.</th>
<th>Gross Acreage</th>
<th>Forest Acreage</th>
<th>Percent Forested</th>
<th>Pine Forest Acreage Sampled</th>
<th>Parish County</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>1…...</td>
<td>207,360</td>
<td>137,721</td>
<td>66</td>
<td>58,389</td>
<td>DeSoto</td>
<td>Louisiana</td>
</tr>
<tr>
<td>2…...</td>
<td>172,800</td>
<td>128,040</td>
<td>74</td>
<td>68,221</td>
<td>Sabine</td>
<td>Louisiana</td>
</tr>
<tr>
<td>3…...</td>
<td>161,280</td>
<td>109,070</td>
<td>68</td>
<td>37,763</td>
<td>Union</td>
<td>Louisiana</td>
</tr>
<tr>
<td>4…...</td>
<td>178,560</td>
<td>128,050</td>
<td>72</td>
<td>35,900</td>
<td>Bienville</td>
<td>Louisiana</td>
</tr>
<tr>
<td>5…...</td>
<td>103,680</td>
<td>71,001</td>
<td>68</td>
<td>23,853</td>
<td>Neshoba</td>
<td>Mississippi</td>
</tr>
<tr>
<td>Total…..</td>
<td>823,680</td>
<td>573,882</td>
<td>70</td>
<td>224,126</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Description of the Field Work

**Selection of Sample Units**

The project called for intensive field work on selected units in Arkansas, Louisiana, and Mississippi. Areas to be worked were determined by the "purposive selection" procedure. Purposive selection may be characterized briefly as one in which "the statistician seeks to secure a sample having the same characteristics as the universe of inquiry in respect to one or more ‘control’ factors."¹ For the particular purpose of the study, this means a sample in which forest growing stock is present in sufficient quantities to provide an economic asset important to the community and one in which the forest lands are controlled by individuals of varied economic and institutional character.

The criteria used for selecting the areas were: (1) a gross area of more than 100,000 acres and not more than 600,000 acres; (2) ownership of the forest land distributed among three categories of owners;

(3) merchantable timber present in the form of pulpwood or sawlogs in sufficient quantity to form an economic asset to the community; (4) areas located within sections where wood manufacturing plants are capable of utilizing the timber; (5) the individual areas lie in not more than two minor political units, such as the county or parish, and not more than one major political unit, such as a state.

Unit Location

In order that field units would be selected which met the requirements of the above criteria, a month was devoted to an extensive field survey of parishes and counties in the shortleaf-loblolly pine type in the states of Louisiana, Mississippi, and Arkansas. Several parishes and counties were excluded immediately, either because of lack of sufficient and properly distributed pine timber or because of large public ownership.

When a number of possible units had been determined, the assessors' records in each parish or county were checked to determine the approximate number of owners and the forest acreage owned in each ownership class.

Another field survey was then made to classify the forest capital in the possible unit selected. The pine volumes were tallied on 100 to 200 quarter-acre plots in each county or parish. This information was used as a basis for determining the pine volume in each unit.

After the above information was collected and studied, the unit to be worked was definitely located by land survey divisions and on a large scale map. In each unit an effort was made to minimize the hardwood area included, and provide solid working blocks.

Methods Employed in Obtaining Data for Study Units

Determining Ownership Characteristics

The ownership of the forest land in the unit was one of the principal objectives of the study. The assessors' rolls for each county or parish provided a convenient means of obtaining such ownership records. In each unit the latest tax rolls were used and then brought up to date by checking with the clerk's office. In no case were the assessor's rolls over two years old. All timber land owners in each unit were classified and placed in one of the three classes described below.

Class I owners are those who own both agricultural and forest land.

Class II owners are those who own forest land only, but do not own any type of wood processing or utilization plant.

Class III owners are those who have some type of wood utilization plant in addition to the forest land owned. In most cases their ownership covered a large acreage, and they are utilizing or plan to utilize the timber grown on their land.
Selection of Sample Owners

The number of owners in the respective units ranged from 655 to 1,303, which made it impossible with the time allotted and money available, to make a detailed study of each individual land owner. Consequently, it was necessary to employ some sampling technique whereby a representative number of owners could be selected for intensive field work. The size of the sample varied with the type of ownership. One-fourth of the Class I owners, one-eighth of the Class II owners, and all of the Class III owners were selected for interview, and their lands examined. In Table No. 2 are the data showing the number of owners and their acreage by units, together with the number of samples on which intensive work was done.

Table 2.
NUMBER OF OWNERS AND FOREST AREA BY CLASSES OF OWNERSHIP BY UNITS*  

<table>
<thead>
<tr>
<th>Ownership Classification</th>
<th>Number of Owners</th>
<th>Percent in Samples</th>
<th>Forest Acreage</th>
<th>Percent in Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In Unit</td>
<td>In Samples</td>
<td></td>
<td>In Unit</td>
</tr>
<tr>
<td>I</td>
<td>776</td>
<td>97</td>
<td>12.5</td>
<td>52,649</td>
</tr>
<tr>
<td>II</td>
<td>463</td>
<td>121</td>
<td>26.1</td>
<td>41,906</td>
</tr>
<tr>
<td>III</td>
<td>8</td>
<td>8</td>
<td>100</td>
<td>43,166</td>
</tr>
</tbody>
</table>

| UNIT NO. 2 |
|------------------|------------------|--------------------|----------------|--------------------|
| I                 | 643              | 81              | 12.6               | 48,979  | 6,648      | 13.5                      |
| II                | 218              | 51              | 23.4               | 19,301  | 6,618      | 34.3                      |
| III               | 2                | 2               | 100                | 59,760  | 59,760     | 100                       |

| UNIT NO. 3 |
|------------------|------------------|--------------------|----------------|--------------------|
| I                 | 594              | 71              | 11.9               | 47,234  | 5,514      | 11.7                      |
| II                | 175              | 42              | 24.0               | 24,327  | 11,952     | 49.1                      |
| III               | 8                | 8               | 100                | 37,509  | 37,509     | 100                       |

| UNIT NO. 4 |
|------------------|------------------|--------------------|----------------|--------------------|
| I                 | 1,170            | 97              | 8.3                | 77,132  | 7,062      | 9.1                       |
| II                | 129              | 39              | 30.2               | 10,175  | 3,553      | 34.9                      |
| III               | 4                | 4               | 100                | 40,743  | 40,743     | 100                       |

| UNIT NO. 5 |
|------------------|------------------|--------------------|----------------|--------------------|
| I                 | 511              | 63              | 12.3               | 40,320  | 5,386      | 13.3                      |
| II                | 142              | 39              | 27.4               | 13,666  | 4,704      | 34.4                      |
| III               | 2                | 2               | 100                | 17,015  | 17,015     | 100                       |

| RECAPITULATION UNITS NO. 1, 2, 3, 4, 5 |
|------------------|------------------|--------------------|----------------|--------------------|
| I                 | 3,694            | 409             | 11.1               | 266,314 | 30,607     | 11.5                      |
| II                | 1,127            | 292             | 25.9               | 109,375 | 39,783     | 36.4                      |
| III               | 24               | 24              | 100                | 198,193 | 198,193    | 100                       |

* Data taken from assessors' records.

---

2 Because of the difficulty of getting a representative proportion of Class I and Class II owners in the Mississippi area, every twelfth Class I name was taken as a sample owner.
Preparation of Type Maps

When each sample owner was selected, his legal land description was copied from the assessor's records (see Form 20—Appendix). In order to obtain correct acreage of each owner and to facilitate location of specific properties in the field, type and location maps were prepared for each area to be sampled. To distinguish between the various owners, different colors on each plat sheet represented different ownerships. The map in Fig. 2 shows a typical area, with crosshatching substituted for colors.

Interviewing Sample Owners

An attempt was made to contact and interview 624 forest land owners in the five working areas. In 516 cases, the land owner or the delegated administrator was interviewed. Where a personal contact could not be made, questionnaires were mailed to the individuals and from these, 53 replies were received. No information was obtained from 55 owners, either because of wrong address or because the owner failed to reply after receiving the questionnaire.

Where a personal interview was made, the interviewer stated the general purpose of the project and, through discussion, learned the attitude of the landowner with regard to his interests in his timber land. A questionnaire was filled out at the time of the interview (see Form 41—Appendix). Modified forms were used for Class III owners and those contacted by mail (see Forms 43 and 45—Appendix). Factual evidence on class of ownership, length of ownership, type of cutting, etc., was obtained at the time of the interview.

Classifying Forest Capital

In classifying forest capital of sample owners, the number of plots on each area varied with the size of the tract. In Units 1 and 2 the sampling technique was as follows: on forest tracts less than 60 acres in size, 20 percent; 61 to 640 acres, 10 percent; more than 640 acres, 2 to 5 percent. In Units 3, 4, and 5, tracts less than 60 acres in size, 10 percent; over 60 acres, 2 to 5 percent.

The location of the sample plots to be used in classifying each tract was governed by: (1) the percentage of sampling required, (2) the shape of the timbered area, and (3) the means of access to the tract. Plots were taken at predetermined intervals by pacing along a compass line, usually in a cardinal direction.

It is assumed that an indication of the owner's attitude toward his forest land is to be found in its relative productive condition. At the time the land was examined, the state of productivity was determined on each plot by the composition, density and size of pine timber in the stand. The classification was made by an ocular estimate of a half-acre
Forest Composition

A. Composition 4.  
B. Composition 3.  
C. Composition 2.  
D. Composition 1.
Forest Density

A. Density 4.
B. Density 3.
C. Density 2.
D. Density 1.
circular plot. In classifying the plot, the observer would visualize it in four quadrants formed by two lines perpendicular to each other at its center. For example, while the observer was determining the composition of each plot, he determined by ocular estimate the percentage of pine trees present in each quadrant, rating them from 1 to 4, according to the percentage of its pine trees. The average of the four quadrants determined the composition of the plot. In classifying the density of the plot, the observer would determine whether the forest canopy covered less than one-quarter, from one-quarter to two-quarters, from two-quarters to three-quarters, or over three-quarters of the plot. Each quadrant was assigned a value of 1 to 4, based on the degree of crown cover. The average of the four determined the density. Any cutting which had been done in the last five years was recorded at the same time (see Form 60—Appendix). Pictures on page 10 show the classification of composition. Also pictures on page 11 show the classification of density and those on page 24 show classes of recent cutting.

A summary of the classification system used in this work appears in the following set of definitions.

A. *Species Composition*

1. Less than 25 percent of the trees are pines.
2. 25 percent to 50 percent of the trees are pines.
3. 50 percent to 75 percent of the trees are pines.
4. Over 75 percent of the trees are pines.

B. *Stand Density*

1. Severely depleted stands. Individual trees are isolated and scattered.
2. Sparsely stocked stands. There are either (a) many large gaps in the area occupied by trees considered, or (b) many of the trees considered are wolf trees.
3. Moderately stocked stands. There are numerous small or a few large gaps in the area occupied by trees considered, and/or a few wolf trees are present.
4. Densely stocked stands. Trees occupy all of the area; there are no wolf trees.

C. *Stand Size* (Consider only pine trees)

1. Regeneration. Pine trees less than 10 feet in height.
2. Saplings. Pine trees more than 10 feet in height but less than 5 inches d.b.h.
3. Pulpwood. Pine trees more than 5 inches d.b.h. but less than 13 inches d.b.h.
4. Sawtimber. Pine trees more than 13 inches d.b.h.
4. **Conditions of Cutting**

1. All merchantable pine removed within last 5 years. (A few pulpwood trees may be left.)

2. All pine sawlogs removed within last 5 years. (Some or all pulpwood remains.)

3. High-grading for some forest products without stand improvement within last 5 years. (Some merchantable timber remains.)

4. Improvement cutting. Only part of the merchantable pine has been removed, and residual stand indicated trees were removed in such a way as to improve the productivity of the stand. Several well-formed sawlog or pulpwood trees have been left on the plot, apparently for future growth.

5. Uncut. There is no evidence that timber has been cut on the plot within the last 5 years. Stands in which an occasional tree has been removed but which have not been subject to any form of organized cutting should also be included here.

The following table shows the total number of owners and acreage in each class of ownership for the five units. This table is included to give an overall picture of the situation, and the ownership characteristics are further broken down later.

<table>
<thead>
<tr>
<th>Ownership</th>
<th>Number of Owners</th>
<th>Percent of Total</th>
<th>Total Forest Acreage</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class I</td>
<td>3,694</td>
<td>76.2</td>
<td>266,314</td>
<td>46</td>
</tr>
<tr>
<td>Class II</td>
<td>1,127</td>
<td>23.3</td>
<td>109,375</td>
<td>19</td>
</tr>
<tr>
<td>Class III</td>
<td>24</td>
<td>0.5</td>
<td>195,193</td>
<td>35</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4,845</strong></td>
<td><strong>100</strong></td>
<td><strong>573,882</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

**Non-Industrial Owners**

Since non-industrial owners (Classes I and II) account for 99.5 percent of all the owners and 65 percent of the total forest land, it is desirable that their ownership characteristics be further examined.

It is of some importance, therefore, to examine these groups according to the relationship of the owner's residence to property location. Forest land owners were accordingly grouped in three classes: resident, adjacent, and non-resident. Resident owners were those living on the property; adjacent owners were those who live within a twenty-five mile radius of the property; and non-resident owners were those living more than 25 miles away.
The data in Table 4 show that over half of the non-industrial owners (Classes I and II combined) live on their property which constitutes 43 per cent of the total forest land. While few in number, the non-resident owners have title to one-fifth of the land. Eighty percent of the land is owned by people who live either on the land or only a short distance from it.

### Table 4.

<table>
<thead>
<tr>
<th>Tenure Group</th>
<th>Total NumberOwners</th>
<th>Total Forest Acres Owned</th>
<th>Number Owners Sampled</th>
<th>Pine Forest Acres</th>
<th>PSI*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resident</td>
<td>2,458</td>
<td>153,299</td>
<td>257</td>
<td>13,258</td>
<td>47</td>
</tr>
<tr>
<td>Adjacent</td>
<td>976</td>
<td>89,822</td>
<td>107</td>
<td>8,339</td>
<td>30</td>
</tr>
<tr>
<td>Non-resident</td>
<td>260</td>
<td>23,193</td>
<td>48</td>
<td>6,556</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td>3,694</td>
<td>266,314</td>
<td>412</td>
<td>28,153</td>
<td>100</td>
</tr>
<tr>
<td>Class II</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resident</td>
<td>176</td>
<td>10,420</td>
<td>14</td>
<td>879</td>
<td>4</td>
</tr>
<tr>
<td>Adjacent</td>
<td>560</td>
<td>49,055</td>
<td>101</td>
<td>10,084</td>
<td>53</td>
</tr>
<tr>
<td>Non-resident</td>
<td>391</td>
<td>49,900</td>
<td>97</td>
<td>8,164</td>
<td>43</td>
</tr>
<tr>
<td>Total</td>
<td>1,127</td>
<td>109,375</td>
<td>212</td>
<td>19,127</td>
<td>100</td>
</tr>
<tr>
<td>Class I &amp; Class II</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resident</td>
<td>2,634</td>
<td>163,719</td>
<td>271</td>
<td>14,137</td>
<td>30</td>
</tr>
<tr>
<td>Adjacent</td>
<td>1,536</td>
<td>138,877</td>
<td>208</td>
<td>18,423</td>
<td>39</td>
</tr>
<tr>
<td>Non-resident</td>
<td>651</td>
<td>73,083</td>
<td>145</td>
<td>14,720</td>
<td>31</td>
</tr>
<tr>
<td>Total</td>
<td>4,821</td>
<td>375,689</td>
<td>624</td>
<td>47,280</td>
<td>100</td>
</tr>
</tbody>
</table>

*P.S.I. is explained on page 25.

**Legal Identity**

The classifications listed in Table 4 were further broken down, according to the nature of ownership, into individual owners, joint owners and corporate owners. Some forest properties are owned by individuals, others are controlled by joint owners, either in the form of a partnership or estate; and a third group is composed of corporate owners. The data in Table 5 show that individual owners are by far the most numerous, comprising more than four-fifths of the total, and owning slightly more than three-fourths of the land.

**Ownership and Management Situation in the Working Units**

**Size of Timber by Ownership Classes**

The competition of markets appears to have a definite influence on the size of timber in each ownership class. The industrial owners either process timber from their own lands, or buy from lands of non-industrial
owners in order to conserve the forest capital on their own lands. In adopting this practice they are postponing the time when they will have to depend largely upon their own lands for their timber requirements. It is a general belief among sawmill operators that the sawlog timber on non-industrial lands is badly depleted. The validity of this statement finds support in the following table.

**Table 6.**

**Size of Pine Timber on Industrial and Non-Industrial Lands**

<table>
<thead>
<tr>
<th>Ownership Class</th>
<th>Seedlings</th>
<th>Saplings</th>
<th>Poles 5-12&quot; d.b.h.</th>
<th>Sawlog trees over 13&quot; d.b.h.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 and II</td>
<td>8</td>
<td>29</td>
<td>54</td>
<td>9</td>
<td>100</td>
</tr>
<tr>
<td>III</td>
<td>4</td>
<td>18</td>
<td>51</td>
<td>27</td>
<td>100</td>
</tr>
</tbody>
</table>

The data in Table 6 were determined by the predominant number of trees in the size classification found on each sample plot. It is evident that the industrial lands are supporting three times as much sawlog timber as the non-industrial lands by pine acreage. Also these data confirm the statement, made previously, that industrial owners are conserving the timber on their own lands. Timber of pulpwood size is approximately the same in percentage value on industrial and non-industrial lands.
A. AND B. Fire kept out. Both sites are reproducing to pine.
C. AND D. Sites burned. All pine seedlings killed.
Attitude Toward Forest Fires

With the exception of the Mississippi Unit, all the units are within the fire protection districts of their respective states. Due to lack of local interest, timber land owners in the sample Mississippi Counties are not receiving state aid for fire protection. There was a noticeable variation among the working units as to the number of uncontrolled fires and the extent of burning. Field examination showed that the Arkansas Unit suffered less from uncontrolled fires than any other. However, the interviews with the Arkansas owners revealed that only two non-industrial sample owners were cooperating with the Arkansas State Forestry Commission by having their lands in fee under a cooperative agreement for fire protection. It was quite evident from observations made in the field that the Mississippi unit suffered the greatest amount of damage from uncontrolled fires.

The only sample owners who were cooperating to any extent with the state forestry departments by paying fees for fire protection are the industrial or Class III owners. In the working units within fire protection districts, over 98 percent of the industrial lands were under cooperative agreements for fire protection with state forestry organizations. The percentage of non-industrial land that was under cooperative agreement with the state forestry departments was negligible. In the five selected units, only two Class I and five Class II owners indicated interest in fire protection by having their land under cooperative agreement with the state forestry departments.

An attempt was made at the time of the interview to discover why the non-industrial owners were taking a negative attitude toward fire protection. Their reasons fall into one of the three following categories: first, these owners feel that they do not own enough forest land or produce enough timber to warrant placing their lands under cooperative agreements with the state forestry departments; second, those adjacent to, or interspersed with, industrial lands know that they will receive some protection gratis under an efficient fire protection system; and, third, they have not yet been educated to the necessity for protection.

Many owners realize the importance of keeping uncontrolled fires off their lands, and make a personal effort to protect their forest land and suppress the fires that occur. Resident owners are prepared to do this because they are constantly accessible. Adjacent and nonresident owners, on the other hand, are not in a position to suppress fires that might occur on their lands because they are not there when the fire occurs. They often do not know a fire has occurred until some time later.

Effects of Uncontrolled Fires

A forest may not be reproduced except through seedlings. All young pine trees are highly susceptible to injury or death from contact with fire. Even light annual burning will eventually kill most seedlings.
Fire Kill of Larger Pine Trees

Hot fires ran through slash of all four sites after logging.

A. Seed trees killed—now reduced to snags.
B. Seed trees killed.
C. and D. Seed trees and most of residual growing stock killed.
Periodic burnings of up to eight or ten years in thick stands of reproduction and saplings kill all or most of the trees, and seriously injure those left, thus defeating the purpose of seed trees.

Merchantable sized pine trees also, are killed or injured by uncontrolled fires. This is especially true where stand improvement cuttings have been made. Slash allowed to burn around seed trees or the residual stands from selective cuttings kills most of the trees regardless of size. Such periodic burning tends to discourage the non-industrial owners with stand improvement cutting, and encourage clear cutting. A number of sample owners on the units had cut their timber under stand improvement methods but subsequent fires had practically wiped out the residual stand.

Relation of Timber Markets and Timber Sales to Forest Management

In all the working units, timber markets were very active during the last five years. This keen competition had a definite effect on the type of forest management practiced on non-industrial lands. Because of this keen competition, the question of whether the owner or buyer promoted the sale was investigated. From data gathered, the buyer urged the owner to sell in 70 percent of the sales. This high percentage tends to indicate the scarcity of timber in the units studied.

Highly competitive markets made it impossible for some of the industrial owners to convince other forest land owners of more desirable cutting practices. Some of the industrial owners had cut timber under a conservative system on non-industrial lands, only to have the owner sell the residual stand of pulpwood to someone else. Over 55 percent of the non-industrial owners sold their timber on a lump sum bases. They were primarily interested in getting the maximum current income at the time of the sale. The consensus of opinion among non-industrial owners when ready to market their timber, was that they would be "skinned," so at the time of cutting they preferred to take one big skinning and be finished with it. Because of this prevalent opinion, relatively few owners were taking any interest in periodic cutting.

While a number of owners sold their timber on a unit basis, they had no means of checking the amount of timber taken from their lands. They appeared content, accepting whatever scale the buyer credited to them. In 78 percent of the sales the timber was cut below ten inches diameter at stump height.

Reasons for Owners' Negative Attitude

At the time of interview, information was sought on ownership attitudes unfavorable to forest management. The various reasons why owners are uninterested in their forest lands are shown in Table 7. The
Cuttings to Diameter Limits

A. and B. Pine cut to 6" butt diameter.
C. and D. Pine cut to 10" butt diameter.
two reasons advanced most frequently for a negative attitude were incompetence to carry on forest practices and inability to spare the time required. In over one-fifth of the cases, no attempt was made to improve the forest land because of sheer lack of interest. Only 3 percent of the owners felt that the cost was too great in relation to the return from forest products.

**Table 7.**

**Negative Owner Attitudes**

<table>
<thead>
<tr>
<th>Reasons for Negative Attitudes</th>
<th>Class I</th>
<th></th>
<th>Class II</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
<td>Percent</td>
</tr>
<tr>
<td>Not competent to conduct</td>
<td>127</td>
<td>38</td>
<td>48</td>
<td>31</td>
<td>175</td>
<td>36</td>
</tr>
<tr>
<td>forestry practices...........</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unable to spare time...........</td>
<td>118</td>
<td>36</td>
<td>50</td>
<td>33</td>
<td>168</td>
<td>35</td>
</tr>
<tr>
<td>Not interested in forest land</td>
<td>64</td>
<td>19</td>
<td>38</td>
<td>25</td>
<td>102</td>
<td>21</td>
</tr>
<tr>
<td>Believe woods need no care.</td>
<td>15</td>
<td>5</td>
<td>11</td>
<td>7</td>
<td>26</td>
<td>5</td>
</tr>
<tr>
<td>Trespass, fires, or other</td>
<td>6</td>
<td>2</td>
<td>6</td>
<td>4</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>costs too high ............</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total ..........................</td>
<td>330</td>
<td>100</td>
<td>153</td>
<td>100</td>
<td>483</td>
<td>100</td>
</tr>
</tbody>
</table>

It is impossible to point to any one particular factor which contributed to the negative attitude held by most of the non-industrial owners toward improving management on their forest lands. More than two-thirds of them are classified in the agricultural group, and have always realized income from their farm crops annually. As a result, they are reluctant to adopt measures for improving their timber stands which involve waiting a number of years between harvesting timber crops. In general, non-industrial owners use their timber as a bank account, and in emergencies cut and sell regardless of the condition of the stand or the stumpage value. In 76 of the 328 instances where timber was sold, it was because the owner was badly in need of funds.

With the exception of the Mississippi unit, the investigations were made within some of the oldest oil and gas fields in the South. Speculation is constantly going on in these areas and has had some affect on forest values and management. Many owners of forest land are interested in speculative values, because they believe mineral deposits might eventually be discovered there. To this group, forestry has very little appeal. Evidence collected shows that over 9 percent of the non-industrial owners are holding their land primarily for speculative purposes.

**Cutting Practices on Industrial and Non-Industrial Lands**

At the time the land was examined, observations were made of any cutting practices carried on during the previous five years. The data in Table 8 show that 73 percent of the industrial lands had not been cut,
Contrasts of Cutting Practices

A. and B. Adjacent sites of formerly identical stands. A. is being selectively cut for pulpwood. B. was clear-cut for pulpwood. Hardwood brush taking possession of the site.

C. Improvement cutting was made for sawlogs and pulpwood, leaving good trees to grow.

D. All merchantable trees were cut, leaving poor quality trees to grow.
in contrast to 55 percent for the non-industrial. Another impressive fact is that 43 percent of the industrial land was cut under stand improvement methods in contrast to 9 percent for non-industrial land. These data not only indicate that forest capital is being conserved on industrial lands, but that these lands have a valuable seed source for restocking the areas cut.

<table>
<thead>
<tr>
<th>Character of Cutting</th>
<th>All Land</th>
<th>Cut Land in Last 5 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Industrial</td>
<td>Non-industrial</td>
</tr>
<tr>
<td>All merchantable</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>timber removed......</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All sawlogs (13&quot; dbh and over) removed</td>
<td>7</td>
<td>17</td>
</tr>
<tr>
<td>Partial cutting for special products</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Stand improvement cutting</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>Uncut within last 5 years</td>
<td>73</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

In addition, it was noted on the ground that an appreciable amount of normally pine lands are reverting to low grade hardwood stands. This was usually so in the case of mixed pine-hardwood stands supporting pines of merchantable size only. The pines were clearcut, releasing the hardwoods to grow, reproduce, and take possession of the site.

Large hardwood trees of the wolf type, unmerchantable because of too much rot, were left standing because they were at the time uneconomical to fell. These trees could have been girdled in a few minutes, each, but the land owner or operator had not learned the value of this.

Stands of merchantable even-aged pine trees supported a suppressed understory of hardwoods. Either selective or clearcutting in the pines released some or all of the hardwoods to largely take possession of the sites.

**THE ATTITUDE OF OWNERS TOWARD THEIR PROPERTY**

**Methods of Measuring Attitude**

The attitude which an owner takes toward his forest property may be determined either by interviewing him and getting his ideas on the subject in question, or by actually checking on what he is doing through field examination. In an interview, a person might give misleading answers to questions and, therefore, conceal his true attitude relative to the information sought. In spite of this condition, much evidence was collected in this way which reflected the owner’s attitude. Because of
Classes of Cutting

A. Stand improvement cutting (No. 4).

B. High-grading for forest products without stand improvement. Some merchantable timber remains (No. 3).

C. All sawlogs removed. Pulpwood trees remain (No. 2).

D. All merchantable pine trees cut (No. 1).
the wide variation in ownership attitudes, the interviewer's judgment at the time of the interview may be valuable. Since sufficient authentic information concerning his management practices could not be determined from an interview, field examination of his forest land was resorted to in determining its condition.

Measuring Pine Productivity

Another objective of the study was to measure pine stocking on each sample area. Consequently, a technique was devised for its determination on each plot without measuring the individual trees. This was expressed in terms of pine stocking index. It indicates the extent to which the forest area is occupied by pine trees without regard to size class. The pine stocking index will be referred to as the PSI wherever used in this report.

In computing the PSI on each plot, the two variables recorded were composition and density. By composition is meant the percentage of forest cover composed of pine growing stock on each plot. Density is defined as the degree to which the plot is covered by forest vegetation, regardless of species. The effect of these factors shows the extent to which the site is utilized by pine growing stock. Index numbers showing the PSI as determined for each plot by the indicated composition and density are shown in Table 9. All plots on each sample tract are averaged to give the PSI for that tract or for that sample owner.

**Table 9.**

<table>
<thead>
<tr>
<th>Composition</th>
<th>Density</th>
<th>PSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

These index numbers were based on classification definitions on page 12. As a check on the validity of this method, measurements were taken and computed on 52 basal area plots distributed throughout the units which showed that pine stocking was almost identical with PSI based on the classification definitions.
Residual Hardwoods on Pine Lands

All pines cut to 6" minimum diameter. Uncontrolled hardwood trees taking possession of the pine sites.
ILLUSTRATING PSI

A. PSI 0.
B. PSI 1.
C. PSI 2.
D. PSI 4.
ILLUSTRATING PSI

A. PSI 5.
B. PSI 6.
C. PSI 7.
D. PSI 9.
Illustrating PSI

A. PSI 10.
B. PSI 9.
C. PSI 6.
D. PSI 1.
Numbers of Owners and PSI

Table 10 shows the distribution of ownerships among the pine stocking indices. The lands of over four-fifths of the owners are producing pine timber at less than half of their capacity. The lands of two-thirds of the owners are producing at only one-third of their capacity.

Management in Relation to Various Factors Which Differentiate Ownership

In the previous portion of this report the discussions have been concerned with the type of ownership and management of the forest land and the attitudes of the owners. The remaining portion will be devoted to these and other factors considered in the study as measured quantitatively by means of the pine stocking index.

Factors Affecting Management on Industrially Owned Forest Lands

Of the twenty-three industrial owners of forest land in the five working units, nine were classified as small owners and fourteen as large owners. All those with a rated annual capacity of over 8 million board feet were classified as large owners. As a whole, the sample forest areas are in good productive condition.

Of the twenty-three industrial owners mentioned above, with an aggregate of 176,846 acres of pine forest land, three were pulpwood operators and twenty were sawmill operators. The nine small operators held title to an aggregate of 2,185 acres. Lack of capital, and lack of interest in continuous operation, are indicated by the small amount of forest land owned by small operators. Additional evidence that the small operator is not interested in forest management is reflected by the pine stocking index of his land. The weighted PSI for the small operator was 3.1 while for the large operator it was 4.9.

The management practices on the sampled areas varied from “very extensive” on the lands held by small industrial owners to “very intensive” on the large industrial holdings. Most of the large operators are showing a definite interest in their forest lands by building up the forest capital on them. Timber cutting over most of the large holdings has been rather conservative. However, there was no indication that the small operators were attempting to increase their forest capital. None of the nine small operators control enough forest land to maintain a permanent source of raw material for their plants and, to continue in operation, they will have to depend on the non-industrial owners for future raw materials.
### Table 10.
**Number and Percent of Owners by Productivity Classes (PSI)**

<table>
<thead>
<tr>
<th>Average PSI</th>
<th>UNIT 1. LOUISIANA</th>
<th>UNIT 2. LOUISIANA</th>
<th>UNIT 3. LOUISIANA</th>
<th>TOTAL - LOUISIANA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of Sample Owners</td>
<td>Number of Sample Owners</td>
<td>Number of Sample Owners</td>
<td>Number of Sample Owners</td>
</tr>
<tr>
<td></td>
<td>Percent of Total</td>
<td>Percent of Total</td>
<td>Percent of Total</td>
<td>Percent of Total</td>
</tr>
<tr>
<td>0.1 - 1.0...</td>
<td>8</td>
<td>4.2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1.1 - 2.0...</td>
<td>28</td>
<td>14.6</td>
<td>7</td>
<td>6.7</td>
</tr>
<tr>
<td>2.1 - 3.0...</td>
<td>39</td>
<td>20.3</td>
<td>22</td>
<td>21.2</td>
</tr>
<tr>
<td>3.1 - 4.0...</td>
<td>44</td>
<td>22.9</td>
<td>23</td>
<td>22.1</td>
</tr>
<tr>
<td>4.1 - 5.0...</td>
<td>40</td>
<td>20.8</td>
<td>14</td>
<td>13.5</td>
</tr>
<tr>
<td>5.1 - 6.0...</td>
<td>21</td>
<td>10.9</td>
<td>19</td>
<td>18.5</td>
</tr>
<tr>
<td>6.1 - 7.0...</td>
<td>9</td>
<td>4.7</td>
<td>7</td>
<td>6.7</td>
</tr>
<tr>
<td>7.1 - 8.0...</td>
<td>3</td>
<td>1.6</td>
<td>6</td>
<td>5.8</td>
</tr>
<tr>
<td>8.1 - 9.0...</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>4.8</td>
</tr>
<tr>
<td>9.1 - 10.0...</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Total...192</td>
<td>100.0</td>
<td>104</td>
<td>100.0</td>
<td>112</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Average PSI</th>
<th>UNIT 4. MISSISSIPPI</th>
<th>UNIT 5. ARKANSAS</th>
<th>TOTAL OF ALL UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of Sample Owners</td>
<td>Number of Sample Owners</td>
<td>Number of Sample Owners</td>
</tr>
<tr>
<td></td>
<td>Percent of Total</td>
<td>Percent of Total</td>
<td>Percent of Total</td>
</tr>
<tr>
<td>0.1 - 1.0...</td>
<td>17</td>
<td>12.6</td>
<td>11</td>
</tr>
<tr>
<td>1.1 - 2.0...</td>
<td>38</td>
<td>28.1</td>
<td>27</td>
</tr>
<tr>
<td>2.1 - 3.0...</td>
<td>23</td>
<td>17.0</td>
<td>20</td>
</tr>
<tr>
<td>3.1 - 4.0...</td>
<td>17</td>
<td>12.6</td>
<td>16</td>
</tr>
<tr>
<td>4.1 - 5.0...</td>
<td>17</td>
<td>12.6</td>
<td>16</td>
</tr>
<tr>
<td>5.1 - 6.0...</td>
<td>9</td>
<td>6.7</td>
<td>6</td>
</tr>
<tr>
<td>6.1 - 7.0...</td>
<td>11</td>
<td>8.2</td>
<td>5</td>
</tr>
<tr>
<td>7.1 - 8.0...</td>
<td>2</td>
<td>1.5</td>
<td>2</td>
</tr>
<tr>
<td>8.1 - 9.0...</td>
<td>1</td>
<td>0.7</td>
<td>1</td>
</tr>
<tr>
<td>9.1 - 10.0...</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td>Total...135</td>
<td>100.0</td>
<td>104</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Type of Cutting on Industrial Lands

The type of cutting that is being applied to industrial lands further reflects the attitude of the owner. During the five years preceding the field examination, the large operators cut only 26 percent of their pine timber land while the small operators cut 62 percent. On the lands that were cut only 2 percent of the land of the small operator was cut under stand improvement. On 88 percent of the land cut by them, all the sawlogs and merchantable timber had been removed. These facts reflect the lack of interest shown by the small operators in increasing the forest capital on their lands. Table 11 below shows these facts.

**Table 11.**

MANNER IN WHICH CUTTINGS WERE MADE ON THE LANDS OF INDUSTRIAL OWNERS WITH RELATED PSI

<table>
<thead>
<tr>
<th>Type of Class III Owner</th>
<th>Stand Improvement</th>
<th>Partial Cut</th>
<th>All Sawlogs Removed</th>
<th>All Merchantable Material Removed</th>
<th>Pine Acres Cut</th>
<th>(Weighted) PSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large</td>
<td>45</td>
<td>20</td>
<td>25</td>
<td>10</td>
<td>45,903</td>
<td>4.9</td>
</tr>
<tr>
<td>Small</td>
<td>2</td>
<td>10</td>
<td>33</td>
<td>55</td>
<td>1,359</td>
<td>3.1</td>
</tr>
</tbody>
</table>

The difference in PSI, by states, on the units worked, is shown in the following table. The low PSI for Mississippi's Class III owners can be partly explained by the fact that there were only three industrial owners in the unit, and two of them owned very little land, and were not doing a good cutting job.

**Table 12.**

COMPARATIVE WEIGHTED PSI BY STATES

<table>
<thead>
<tr>
<th>Ownership Class</th>
<th>Louisiana</th>
<th>Mississippi</th>
<th>Arkansas</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>4.0</td>
<td>2.9</td>
<td>3.4</td>
</tr>
<tr>
<td>II</td>
<td>3.9</td>
<td>5.4</td>
<td>2.7</td>
</tr>
<tr>
<td>I &amp; II</td>
<td>4.0</td>
<td>3.3</td>
<td>3.1</td>
</tr>
<tr>
<td>III</td>
<td>5.3</td>
<td>3.2</td>
<td>5.1</td>
</tr>
</tbody>
</table>

**Factors Affecting Forest Management on Non-Industrial Lands**

Factors affecting forest management on non-industrial lands may or may not be correlated with ownership classification. To obtain some evidence of the relationship between ownership class and the type of management, the data on forest productivity were classified under different categories and analyzed to determine the significant differences.
Residence and PSI

The amount of time devoted to supervision of forest land is determined to some degree by the distance an owner lives from his forest property. Resident and adjacent owners have an advantage over non-resident owners in supervision, as indicated by Table 4. It may be noted from this table that in Class I the non-resident owners have a lower PSI than the other two groups. Different types of residence had no appreciable effect on pine productivity.

Legal Identity and PSI

One characteristic chosen for determining the relationship between management and productivity was the legal identity of the land owner. The data presented in Table 5 show that the individual male owners are by far the most numerous but their lands have the lowest PSI classification. There is a marked contrast in productivity of land owned by the male group of individuals and of the non-industrial corporate owners. The joint ownership groups have the same PSI as the mean for the non-industrial corporate owners.

Length of Ownership and PSI

Length of ownership has always been cited as one of the determinants of interest in forest land. The data in Table 13 show that there is very little correlation between length of ownership and the productivity of the land. Although differences are small, the productivity index increases as the length of ownership increases. The differences, however, are not great enough to assume that the management of forest lands under stable ownership are greatly superior to those under short time ownership.

Table 13
Relation of Longevity of Ownership to PSI

<table>
<thead>
<tr>
<th>Title Acquired</th>
<th>PSI</th>
<th>Number of Owners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before 1913</td>
<td>3.7</td>
<td>112</td>
</tr>
<tr>
<td>1913 to 1931</td>
<td>3.5</td>
<td>243</td>
</tr>
<tr>
<td>1931 to 1942</td>
<td>3.4</td>
<td>205</td>
</tr>
</tbody>
</table>

Size of Holding and PSI

Another factor which has been considered of importance in influencing forest practice is the distribution of ownership according to the size of holding. The size of holding and distribution of non-industrial owners is shown in Table 14. Most of the owners interviewed were of the opinion that they did not own enough forest land to carry on forest practices. To them the incentive to adopt forest management practices is limited to owners who have large tracts of timber. The data in Table
14 show that the difference in productivity between small and large land owners is comparatively small. This seems to disprove the validity of the previous statement. The small land owners, those with less than 75 acres, amount to 74 percent of all the ownerships studied in the survey, but control only one-third of the forest land. Of considerable significance is the fact that 40 percent of the forest land is in holdings of over 200 acres, and is held by only 6 percent of the owners. The size of forest holding does not appear to have significant relationship to forest practice on the land, as indicated by PSI in Table 14.

TABLE 14.
RELATION OF SIZE OF HOLDING TO PSI

<table>
<thead>
<tr>
<th>Size of Holding (acres)</th>
<th>Number of Owners</th>
<th>Area</th>
<th>PSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-25</td>
<td>29</td>
<td>7</td>
<td>3.2</td>
</tr>
<tr>
<td>26-50</td>
<td>31</td>
<td>14</td>
<td>3.5</td>
</tr>
<tr>
<td>51-75</td>
<td>14</td>
<td>11</td>
<td>4.0</td>
</tr>
<tr>
<td>76-100</td>
<td>9</td>
<td>9</td>
<td>3.7</td>
</tr>
<tr>
<td>101-125</td>
<td>4</td>
<td>6</td>
<td>4.6</td>
</tr>
<tr>
<td>126-150</td>
<td>3</td>
<td>5</td>
<td>4.1</td>
</tr>
<tr>
<td>151-175</td>
<td>2</td>
<td>4</td>
<td>3.3</td>
</tr>
<tr>
<td>176-200</td>
<td>2</td>
<td>40</td>
<td>4.7</td>
</tr>
<tr>
<td>Over 200</td>
<td>6</td>
<td></td>
<td>4.3</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Ownership Objective and PSI

The primary purpose or objective of a land owner in holding forest property is of importance in relation to the productivity of the land. In order to determine the objective of ownership or land use, each person interviewed was classified according to the categories listed in Table 15. The table indicates that farm owners interested in the growing of timber in conjunction with farming, have a higher PSI than

TABLE 15.
RELATION OF OBJECTIVE TO PSI (NON-INDUSTRIAL OWNERSHIP)

<table>
<thead>
<tr>
<th>Ownership Objective</th>
<th>Number of Owners</th>
<th>Pine Forest Acres</th>
<th>PSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farming by owner</td>
<td>196</td>
<td>8,288</td>
<td>3.3</td>
</tr>
<tr>
<td>Farming by tenant</td>
<td>56</td>
<td>3,859</td>
<td>3.1</td>
</tr>
<tr>
<td>Explored subsurface values</td>
<td>9</td>
<td>2,349</td>
<td>4.0</td>
</tr>
<tr>
<td>Existing timber values</td>
<td>55</td>
<td>4,957</td>
<td>2.8</td>
</tr>
<tr>
<td>Timber growing values</td>
<td>100</td>
<td>10,604</td>
<td>3.8</td>
</tr>
<tr>
<td>Speculative values</td>
<td>44</td>
<td>5,791</td>
<td>3.0</td>
</tr>
<tr>
<td>Grazing</td>
<td>7</td>
<td>241</td>
<td>3.3</td>
</tr>
<tr>
<td>Other values</td>
<td>9</td>
<td>444</td>
<td>3.2</td>
</tr>
<tr>
<td>Timber growing and farming by owner</td>
<td>77</td>
<td>4,850</td>
<td>4.2</td>
</tr>
<tr>
<td>Timber growing and farming by tenant</td>
<td>17</td>
<td>1,205</td>
<td>4.5</td>
</tr>
</tbody>
</table>
any other group of owners. Owners who said that their primary interest in owning land was for the existing timber actually had the lowest PSI. They probably meant that their interest in such timber was to get all they could out of what they have now, and were not interested in the future. The object of ownership appears to have some relation to the PSI found on the areas studied, but this factor is less important than others.

**Occupation and PSI**

The occupation of an owner might be of importance in determining his attitude toward management of his forest land. During the field work, information on the owner's occupation was collected. The owners were grouped according to their occupations, and PSI ratings as shown in Table 16. The professional group includes teachers, lawyers, physicians, preachers and pharmacists; the business class is composed of salesmen, bankers and filling station operators; the agricultural class includes all those associated with farming; wage earners include all those who work by the day, week, or by piece work; domestics are housewives; inactives are men and women who have retired. On examination of the data in this table, one may see at once that there is little correlation between PSI and occupational group. However, forest lands owned by the professional group had the highest PSI, while those owned by the inactive group had the lowest. The PSI for all other occupational groups varied only slightly.

**Table 16.**

**Occupation Related to Productivity of Non-Industrial Forest Land**

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Number in Sample</th>
<th>Percent</th>
<th>Area of Pine Land</th>
<th>Percent</th>
<th>PSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional</td>
<td>36</td>
<td>7</td>
<td>2,164</td>
<td>5</td>
<td>3.7</td>
</tr>
<tr>
<td>Business</td>
<td>82</td>
<td>15</td>
<td>14,042</td>
<td>32</td>
<td>3.5</td>
</tr>
<tr>
<td>Agriculture</td>
<td>235</td>
<td>43</td>
<td>12,662</td>
<td>29</td>
<td>3.5</td>
</tr>
<tr>
<td>Wage Earners</td>
<td>76</td>
<td>14</td>
<td>5,411</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Domestics</td>
<td>70</td>
<td>13</td>
<td>5,344</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Inactives</td>
<td>42</td>
<td>8</td>
<td>4,546</td>
<td>10</td>
<td>3.4</td>
</tr>
<tr>
<td>Total</td>
<td>541</td>
<td>100</td>
<td>44,169</td>
<td>100</td>
<td>3.4</td>
</tr>
</tbody>
</table>

The previous pages have reported the facts from the study. It is not our purpose to go into detailed discussion of these facts, or make recommendations from them. The important things are self-evident, and where conditions should be changed anyone really interested can see what changes would help the situation. It is felt, however, that the following brief summarization of facts and more or less self-evident conclusions will clarify the story.
The statements here are, of necessity, based on the findings on the five units studied. It should not be assumed that they would apply exactly to any other unit area that might be set up in the loblolly-shortleaf type in the Southwestern Gulf region, but it is believed that they indicate the average condition to be found.

The investigation was undertaken with the main purpose of studying ownership characteristics in relation to productivity of forest lands. The conclusions and summary statements given here result from the analysis of 647 samples mechanically chosen from a total of 4,821 owners of forest land in the five units.

1. The industrial owners represent less than 1 per cent of the total number of owners, but control about 35 per cent of the total forest land and 79 per cent of the pine forest land.

2. The non-industrial owners, therefore, represent over 99 per cent of the total number of owners, but own only about 65 per cent of the total forest land and 21 per cent of the pine forest land.

3. The timber on industrially owned land is larger in size than that on either of the other two classes of ownership. Over one-fourth of the pine forest land in industrial ownerships is supporting timber of sawlog size (13 inches d.b.h., and over), while less than one-tenth of such lands in the other ownership classes has timber of this size.

4. Over 98 percent of the industrial lands are under cooperative agreement for fire protection in the states where protection is available. Non-industrial owners are not cooperating with state organizations in fire protection. However, in the areas where privately owned land is interspersed with industrial land, it is receiving indirect protection against fires.

5. In the States of Arkansas, Mississippi, and Louisiana, the non-industrial owners are producing pine at the rate of 31, 33, and 40 percent of their full capacity, respectively. Comparable percentages for the industrial owners are 51, 32, and 53, respectively.

6. Most large industrial owners are showing a definite interest in forest conservation by gradually increasing the size of their holdings, and by applying cutting practices which maintain or increase the forest capital on their lands. The small industrial owners and some of the large industrial owners are not increasing the size of their holdings, and their current cutting methods are rapidly depleting the pine timber on their lands.

7. In two-thirds of the cases in which owners took a negative attitude toward forest improvement practices, the reasons cited were incom-
petency to carry on forest practices, and inability to spare the necessary
time involved to do the work.

8. Current cutting practices have so depleted the forest capital on
non-industrial lands that they are producing only about one-third of
their potential capacity. Type of cutting contracts, rather than the
class of product removed, is responsible for the existing condition.

9. On non-industrially owned lands, timber production is higher
where the owner is interested in timber growing in conjunction with
agriculture.

10. Over half of the non-industrial owners live on their property,
and control 43 percent of the total non-industrial forest land. Resident
and adjacent owners comprise 87 percent of the number of non-industrial
owners, and control 80 percent of the non-industrial forest land.

11. Ownership under the same title, held over a long period of
time, has a slightly higher productivity rating than lands held for
shorter periods.

12. There was no significant relationship between occupation of
the various occupational groups or of residence of the owner, to forest
productivity.

The facts heretofore presented seem to indicate that in the shortleaf-
loblolly pine type of the South, past management practices were pro-
ducing less than half of the pine which the land was capable of growing.
Recent indications are that particularly large industrial owners are
doing a much better job than they did a few years ago, indicating that
the amount of timber produced in the future will be greater than has
been grown in the recent past. Heavy cutting and fire have been respon-
sible for the low productivity at present indicated throughout the region.

On a large portion of the non-industrially owned lands the type of
cutting contracts rather than the type of products removed has been
responsible for poor cutting practices. This has been true on a few
industrial ownership, but not many. This overcutting has often reduced
the seed production possibilities to such an extent that the original
pine stands are being replaced by poor quality hardwoods.

Based on the facts of the investigation, it is evident that there is a
real lack of understanding among the non-industrial landowners as to
what constitutes proper forest management. Very few of them seem to
realize that a periodic income can be had every 10 or 15 years from
properly managed forest land. To them, a timber sale is something to
be made once in a lifetime. Here, we feel, is one of the outstanding
opportunities for improving forest practices by increased education and
well-placed and well-advertised demonstrations of proper forest cutting.
Inadequate fire protection was given by many owners as a reason for heavy cutting of their forests. Many of them felt that if selective cutting were practiced it would only be a short time before a fire would get into the slash and destroy the residual stand. They did not feel they were justified in leaving small-sized trees to grow, when the chances were that fire would destroy them. This indicates the desirability, really the necessity, of more complete fire protection in order to assure the best possible future forest development. This opinion was, of course, almost universal among non-resident and adjacent owners who were unable to give their lands any personal protection.

All indications seem to point to the fact that during the past few years interest in forestry and timber growth has been increasing to a marked degree. The necessity for overproduction to satisfy the demands of war has done two things: it has depleted many of our forest stands, particularly those controlled in small holdings; and it has made clear to many people the need for future forest protection. Proper education in forest practices and greatly increased efforts toward complete fire protection would, no doubt, make the shortleaf-loblolly pine region of the South one of the most productive in the nation.
## APPENDIX

### FORMS USED FOR COLLECTING INFORMATION IN THE FIELD

LAES Project No. 507

### OWNERSHIP INVENTORY

Form 20—Revised 6/5/42.

<table>
<thead>
<tr>
<th>Ownership Classification</th>
<th>R.</th>
<th>I.</th>
<th>S.</th>
<th>L.</th>
</tr>
</thead>
<tbody>
<tr>
<td>NR.</td>
<td>II.</td>
<td>J.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IIIa.</td>
<td>C.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IIIb.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IIIc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IIId.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Details**

- **Work Unit**
- **Date Copied**
- **Ward Number**
- **Name of Owner**
- **Owner No.**
- **Address**
- **Total acreage**
- **Forested acreage**
- **Agric. acreage**
- **Assessed value of forest**
- **Am't. taxes on forest**
- **Homestead tax exemption**
- **Location of Ownership**

LAES Project 507

### OWNERSHIP QUESTIONNAIRE: CLASSES 1 AND II

Form 41—Revised 9/5/42

<table>
<thead>
<tr>
<th>Ownership Classification</th>
<th>R.</th>
<th>I.</th>
<th>S.</th>
<th>L.</th>
</tr>
</thead>
<tbody>
<tr>
<td>NR.</td>
<td>II.</td>
<td>J.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Details**

- **Work Unit**
- **Owner No.**

---

39
Location of land: T.______ R.______
Sections____________________

1. Name of owner____________________ a. white____ la.
                b. colored____ lb.

2. Address of owner____________________

3. Residence of owner____________________

4. Occupation of the owner________ (5) Approx. age____ years. 4 & 5.

6. How many persons have an interest in the ownership?________

7. Has owner delegated administration of the tract? Yes No ______

If "Yes", a. To whom? Name____________________
                Address____________________

b. Distance of residence from forest land,______ miles b.

8. Total land area owned in unit:________ acres

Forest acres owned in unit:________

9. Primary ownership objective is
   a. Farming____________________
      i. by owner____________________ ai.
      ii. by tenant____________________ aii.
   b. Explored oil or mineral values____________________
   c. Existing timber values____________________
   d. Timber growing values____________________
   e. Speculative values____________________
   f. Grazing values____________________
   g. Other values____________________

10. In what years have commercial cuttings been made?________, ________, ________

When timber was sold:
   a. seller urged buyer to make the purchase____________________ a.
   b. buyer urged seller to make sale____________________ b.
   c. seller knew that timber is sold on a partial cut basis____________________ c.
   d. buyer proposed to cut timber on a partial cut basis: Yes d. No

   e. seller was interested in continuous timber production____________________ e.
   f. seller was interested mainly in maximum present income____________________ f.
   g. at time of sale, income was badly needed for____________________ g.
   h. sale was conducted on following basis: lump sum________ h.

   unit____________________

i. timber was utilized by____________________

Permanent sawmill__. Temporary sawmill__. Pulpwood mill__

tie, pole or piling plant__. Other__

   i. timber was cut by____________________

   ii. timber sale was negotiated by____________________

j. what minimum diameter limit was specified in the cutting contract________ butt________

dbh
11. Is the owner opposed to the sale of pulpwood in accordance with current practices?
   a. Yes
   b. No

12. Owner uses woods primarily for the following purpose:
   a. to meet farm needs for fuel, posts, etc.
   b. as commercial timber land
   c. for both of the above purposes

13. Has owner practiced any forestry?
   Yes
   No

(If answer is yes, check one or more below)
   a. puts out fire when he finds it on his or other's land
   b. installed improvements designed to keep fire out
   c. has cooperative agreement with State Forestry Division in fire control
   d. has planted pine trees
   e. has thinned stands
   f. has pruned trees
   g. specified a minimum diam. limit on a timber sale in excess of 9" stump d.b.
   h. marked trees to be removed in a commercial sale so that stand was improved by cutting
   i. practiced light or controlled burning
   j. marked trees to act as seed trees
   k. cut as fuelwood only trees of poor form and low value
   l. other practices

(If answer is no, check one or more below)
   m. believed woods need no care in order to produce value
   n. believed forestry expenditures not economically justified because:
   o. not competent to conduct forestry practices
   p. places high value on leisure time
   q. unable to spare time for necessary labor
   r. does not have necessary money for cash outlay required
   s. not interested in his forest land

14. a. Is owner aware that services of Extension Forester are available? Yes; No
   b. Is owner willing to avail himself of such public advice? Yes; No

15. Does fuelwood cutting occur annually on the forest land?
   Yes; No

16. Present owner acquired title in the year(s)

17. He acquired title to land by:
   a. purchase
   b. foreclosure
   i. land was divided into ___________________ parcels

Date of interview ___________________

(Signature of interviewer)
OWNERSHIP QUESTIONNAIRE FOR CLASS III

Parish ___________________ Wd. _______________

Work Unit ________________________________

Date of field work _________________________

Location: T ___________ R ___________ Sec. ______________________

1. Name of owner ___________________________________ 1.
2. Address of owner ___________________________________ 2.
3. Location of industrial operation ____________________________ 3.
5. Approx. average annual units of product mfgd. _______________ 5.
6. If owner is a corporation, is it a "one man," family, or open corporation? one man 6. family open

7. Length of haul from forest land to industrial location:
   a. shortest haul: _______ truck miles; _______ rail miles 7.
   b. longest haul: _______ truck miles; _______ rail miles
   c. number of connecting railroads in haul __________________

8. Total land area owned in this project unit ______________________ ac. 8.
9. Number of year(s) land has been owned ______________________ 9.
    Name ______________________ experienced woodsman

11. Has the owner practiced forestry on land held in fee
    simple? Yes 11. No

(If answer is YES, check one or more below)

a. installed woods improvements to keep out fire, but does not cooperate with State Division of Forestry
   in protection _____________________________ a.

b. cooperates with State Forestry Division in fire control _____________________________ b.

c. planted trees within the last 10 years _____________________________ c.

d. thinned stands _____________________________ d.

e. pruned trees _____________________________ e.

f. marked trees to be cut from own land so as to improve condition of the stand _____________________________ f.

g. use a minimum diameter limit in timber cutting _____________________________ g.

i. what was specified minimum diameter? _____ in. dbh _____________________________ i.

h. marked trees to act as seed trees _____________________________ h.

12. If answer to No. 11 is no, check one or more below.

a. owner was liquidating his forest assets because: _____________________________ a.
i. there is no way in which he can secure a perpetual timber supply for his mill. 

ii. he wishes to get out of the business

iii. they provide the only available source of timber to meet his existing requirements

iv. high carrying charges force him to liquidate

b. in the future, sufficient timber to run his mill can be obtained from lands not owned by this owner

c. future effects of taxation are too uncertain

d. he believes markets for his product are shrinking

e. permanent forest management is too expensive in the long run market outlook

f. owner considers fire danger too great to warrant forestry

g. other reasons:

13. a. If forest area owned by the industrial unit is too small to warrant employing a full time forester, would the management be willing to employ a forester on a short time or temporary basis? Yes No

b. If the industrial unit does not own sufficient forest land to supply its timber needs, would it be willing to enter into contractual agreements with private owners in the vicinity of the mill whereby the land would be leased and the leasee would then practice forestry, rental to be paid in the form of a share of stumpage returns? Yes No

c. If the forest lands are depleted of forest capital would the company borrow money at not more than 4% interest in order to rehabilitate its land? Yes No

14. Total assessed value of forest land $ ; per acre $  

15. Total amount of taxes assessed to it $ ; per acre $ 

16. What is the present condition of the industrial unit's forest capital?

(Enter percentages obtained from "% of Strip" line on Form 60.)

Stand Characteristic % of Area

A. Species composition:

1. More than 75% hardwoods

2. 25% to 50% pine

3. 50% to 75% pine

4. Over 75% pine

Total 100%

B. Stand density:

1. Severely depleted
2. Sparsely stocked
3. Moderately stocked
4. Densely stocked

Total 100%

C. Stand size:
1. Regeneration
2. Saplings
3. Merchantable pulpwood
4. Merchantable sawtimber

Total 100%

D. Condition of cutting:
Cut:
1. Clear-cutting
2. Seed tree cutting
3. Minimum diameter limit cutting
4. Selective cutting

Total 100%

Form 45
LAES Project No. 507

(leader’s name)

Description of land
Parish
Sec., T., R.

Sec., T., R.

My present Residence is:
(City or town) (State)

My occupation is:
(Check one)  
a. I am the sole owner of the above described tract(s)
b. I own the above tract(s) jointly with other persons.

(number)

Administration of the property has been delegated to:
(Name)

(Address)

The property is for sale, provided the price is high enough.

yes no

The principal reason for continuing to retain title to the land is:
(check one or more)

for farming

for timber now on it

for continuous timber growth

for oil or minerals
The last commercial timber cutting was made on this land in 19___.
The timber was purchased by ____________________________
(Name of sawmill, pulp company or other buyer)
Timber was sold down to a diameter of (check one)
   _____6"; _____8"; _____10"; _____12"
Property was acquired by me in 19__, by:
   _____purchase
   _____inheritance
   _____foreclosure

It is understood that the replies you make to the questions asked above or below do not in any way constitute a legal agreement. Your answers are used merely for purposes of information.

Would you be interested in using the services of a forester to mark trees for cutting, supervise cutting, and scale the timber cut, provided the cost of his services did not exceed 10% of the gross stumpage value? (By using the services of a forester, your lands would remain in productive condition for continued timber growth after each cutting.)
   _____Yes. _____No.

Would you be interested in pooling your forest land with that of other owners in the area where it is located, to be handled on a cooperative basis by a forester who would supervise cutting, mark timber, market it, and act as manager of the property?
   _____Yes. _____No.

Would you be interested in leasing your land on a long term basis to an individual or corporation who would handle the management of the area, on the basis of good forestry practices, with rental to be paid in the form of a share of the stumpage returns whenever timber is sold?
   _____Yes. _____No.
<table>
<thead>
<tr>
<th>Chainage</th>
<th>Composition</th>
<th>Density</th>
<th>Size</th>
<th>Cutting</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>65</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>70</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>80</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Plots</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of Plots</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

46