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A Sociological Analysis of Man-Caused Forest Fires in Louisiana.

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A SOCIOLOGICAL ANALYSIS OF MAN-CAUSED FOREST FIRES IN LOUISIANA

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ABSTRACT

The fires that burn in the forest of Louisiana constitute a major threat to the raw materials for the state's second largest industry. Forest fires are a serious threat to the economic welfare of the people of the state. Over 99 per cent of the forest fires in Louisiana are man-caused; consequently, they are at least theoretically preventable.

The purpose of this study was to seek information on <u>why</u> people start forest fires. Such information was considered basic to planning an effective fire prevention program. Specific objectives were to determine: (1) the pattern of fire occurrence with respect to causative agents, (2) the relationship between socio-cultural and -economic factors and man-caused fires, and (3) the attitudes and motivation of people which are related to their behavior with respect to forests. The hypothetical premise for the study was that the man-caused forest fire problem could be explained in terms of certain cultural and social factors related to the use of forest land.

The methodological approach to the study of the problem

included three separate but interrelated phases. Initially, fire statistics for the state of Louisiana were analyzed in order to determine the patterns of fire occurrence with respect to various causative agents. Secondly, statistical procedures, utilizing regression and correlation analyses, were employed to measure the association between the incidence of fire and related social factors. Finally, personal informal interviews were conducted with a random sample of rural residents in areas of high and low fire incidence to determine the differences in attitudes and opinions which might explain their behavior toward the forest. The IBM 650 Electronic Computer was employed in the analysis of data.

The findings obtained from secondary source data indicated that: (1) forest fires in Louisiana follow a pattern that is cyclic both between and within years, (2) the pattern of fire occurrence is related primarily to human behavior, (3) incendiary fires, the major and most destructive type of fires in Louisiana, predominate in the southeastern and southwestern sections of the state where intensive use is made of free range for cattle pasturage, (4) "carelessness fires" (debris-burning, smoker, and hunter fires) predominate in north Louisiana, (5) incendiary fires are

associated with low expenditures for education, (6) incendiary fires increase with an increase in proportion of white farm operators, (7) debris-burning fires are not associated with educational expenditures, (8) debris-burning fires increase with a decrease in proportion of white farm operators and families with low buying incomes, (9) debris-burning fires are associated with a high density of the rural population.

Information obtained from interviews showed fire-setting to be part of a cultural complex. It was determined that rural residents in St. Helena Parish: (1) practice woods-burning because in their tradition they had a "right to burn," (2) burn the forest to "keep it clean" and "looking good," (3) consider forestry as an innovation that is unacceptable, and (4) define large forest landowners as unfair and a threat to their economic well-being, thus burn for spite and cattle pasturage.

On the basis of these results, it can be concluded that man-caused forest fires are closely related to the social environment of people. The findings further indicate that the rural residents' attitudes toward the forest are the results of cultural differences and conflict situations

between social systems. This suggests that fire prevention programs can be successful if they proceed within the framework of the cultural complex of the people.

CHAPTER I

INTRODUCTION

The forests of the United States support the nation's fourth largest industrial structure. Forest industries are widely diversified and complex. They include about 57,000 different companies[1] owned by more than 350,000 shareholders the latter represent a cross section of the people of the United States. Forest industries employ 1,600,000 persons who earn a total of $7 billion annually.[2]

It is quite significant, from a social standpoint, that the forest industries of today are different from what they were a few years past. These industries are now permanent members of their communities rather than itinerant organizations. This had come about as growing trees as a perpetual crop has taken firm hold.

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[1]The number of different companies which comprise the forest industries of the United States are as follows: sawmills-46,000; pulp mills--350; paper and paperboard mills--800; plywood and veneer mills--300; cooperage mills--200.

[2]Industrial Forestry in the United States (Washington: American Forest Products Industries, Inc., 1960), p. 8.

The social significance of the forest of the United States is not confined alone to the payrolls of the forest industries. Its importance can be seen in the water and irrigation districts whose water comes from mountain forests, in the survival of many species of wildlife, in public recreation, in the aesthetic value of forests as opposed to barren wasteland, in the favorable modification of local climate, and in the wood pulp of the newspaper. Thus the forests which played such an important part in the settlement of the frontiers of this country continue to represent a living and powerful force in the lives of the people of the nation.

I. THE IMPORTANCE OF FORESTRY TO THE ECONOMY OF THE SOUTH

Forests, from the beginning of the white man's settlement in the South, have played a major role in the region's economic life.[3] At first, the forest provided the settlers primarily shelter and fuel with only a few of its products being used for trade or sale. However, as the nation

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[3]The geographical region referred to here as "the South" consists of 11 states: Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and those areas of east Texas on which tree cover predominates in contrast to plains counties.

continued to expand and the virgin forests in the New England and Lake States became depleted, the South developed a great lumber industry. A large acreage of virgin pine was basic to the development of the lumber industry in the South during the early 1900's. With the removal of these virgin stands this early forest industry migrated to the west.

The pattern of migration of the forest industry from one timbered area to another, cutting out and moving on, forms a saga of American history. But it is a saga of the past, insofar as the South is concerned. A changed national economy, based on supplying the ever-expanding needs of a fast-growing population, has brought a new concept of permanency to the South's forest industry.

The 178 million acres of commercial forest land[4] in the South represent 37 per cent of the timber producing area of the United States. This commercial timberland produces one-half of the nation's total annual production of 13 billion cubic feet of wood.[5]

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[4]The term "commercial forest land" denotes forest land that is capable of producing timber crops of commercial value and is available for that purpose.

[5]Forest Farmer (eighth edition; Atlanta: Forest Farmers Association, 1960), p. 19.

Today, the South's forest, now largely re-growth, provide raw material basic to some of the region's largest and most productive industries. These include pulp and paper, lumber, furniture, plywood, veneer, cooperage, rayon textiles, and many others. These industries, which have developed in a region that contains the fastest growing forest in the world, are a major source of income in the South. They account for approximately one-sixth of the region's industrial payroll and employ over half a million people.[6] In addition, thousands more find part-time work in the woods and mills and many others earn all or part of their incomes in businesses and industries directly or indirectly dependent on the forests. The gross sales value of southern forest products in 1960 was $8½ billion. This exceeded by $1½ billion the $7 billion worth of products of the area's petroleum industry.[7] It is not incorrect to say that trees have become the South's foremost "crop" since they surpass in annual value of harvest the output of the region's great petroleum industry.

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[6]Southern Forest Facts: 1953-54 Edition (Washington: American Forest Products Industries, Inc., 1955), p. 6.

[7]Caldwell Walker (ed.), The Blue Book of Southern Progress (1960 edition; Baltimore: Manufactures' Record Publishing Company, 1960).

II. THE IMPORTANCE OF FORESTRY TO THE ECONOMY OF LOUISIANA

Parallel with the growth of the wood-using industries in the South has been the development of the forest industry in Louisiana.

Thirty years ago, Louisiana was on the verge of forest poverty. The last vestiges of its timber horizon were disappearing, marking a tragic end to a 40-year "golden era" when "Louisiana tidewater cypress" and "longleaf yellow pine" had become household words halfway around the world. Timber poverty hit its depth in the state at the same time as the depression of the 1930's and was probably causally related. The lumber barons had come and gone, and in leaving, left the state with more than five million acres of denuded, barren land. Thus, with the removal of the virgin stands in the early 1900's, the first lumbering industry in Louisiana created for the state a great liability.

The economic importance of forestry in Louisiana today, however, is entirely different, for now Louisiana forestry is in a real "golden era" which makes the other one appear as a sham. In the past the state was primarily a raw material state shipping its materials elsewhere to be fabricated for distribution and use. However, the wood-using

industries of Louisiana no longer ship most of their logs, lumber, pulp and paper to factories in the North for further fabrication, but manufacture furniture, boats, prefabricated houses, fibre boxes, paper bags, and other products right here in the state.

In order to understand the social and economic importance of forestry in Louisiana one needs only to examine some of the statistics of Louisiana's second most important industry.

More than half the land in the state (16 million acres) is covered with forests. There is more forest land in Louisiana than there is farmland, about five million acres more. This forest land of Louisiana is owned by 111,654 persons. The private owners hold 95 per cent of the commercial forest, most of which is in small ownerships (under 500 acres each) held by 109,893 people. There are only 1 [illegible] ownerships larger than 500 acres each. Farmers own ab[illegible] a fifth of Louisiana's commercial forest land.[8]

This valuable resource is the base of industries that are a major part of Louisiana's economy, for the forest industries are directly dependent on forests for raw material. These industries mean full-time employment for

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[8]Louisiana Forest Facts (New Orleans: The Louisiana Forest Industries Committee, 1958), pp. 2-4.

40,000 to 45,000 people and part-time jobs for thousands of others in woods and mills. The payrolls of industries in Louisiana that convert trees into some of the 5,000 wood articles used every day amount to about $130 million a year. One of every five dollars paid out to Louisiana industrial workers comes from the forest-dependent industries. In 1957 the estimated value of Louisiana's primary forest products amounted to $735 million, which was about one-sixth of the value of the state's entire industrial output.[9]

Forest products were harvested in 59 of the 64 parishes during 1959. Within certain of these parishes timber provided more than twice the income obtained from the sale of other agricultural products.[10]

While these statistics show the tremendous importance of the forest industry there are others which indicate that the job of maintenance and further improvement has just begun. There are many problems related to the maintenance and improvement of the forests of Louisiana. However,

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[9]F. L. Corty, The Louisiana Forest Industry, Its Economic Importance and Growth, Louisiana Agricultural Experiment Station Bulletin 521 (Baton Rouge, Louisiana, 1959).

[10]F. L. Corty, "Cash Income from Farm Marketings Compared to Returns from Timber and Pulpwood," Louisiana Rural Economist, XXII (August, 1960), 14-15.

foresters generally agree that fire is one of the greatest enemies of the forest and that the prevention of fire is the major problem in Louisiana's forestry picture.[11]

III. THE PROBLEM OF FIRE IN THE FOREST

It has been often said that prevention of forest fires is three-fourths of forestry. This is literally true for the coniferous forests as well as the hardwood forests, not only of Louisiana, but for the entire South.

As the data in Table I indicate, the number of forest fires on protected forest land in the United States averaged 98,850 annually during the ten-year period 1949-1958.[12] Almost 92 per cent of these fires were man-caused; the rest were started by lightning. For the same period, the number of fires in the South averaged 63,332 annually or 64 per cent of the nation's total. Approximately 98 per cent of the forest fires that occurred in the South during the 1949-1958 period were man-caused. Eighty-seven per cent of all the

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[11]Fire used here means the same as "wildfire" or "uncontrolled fire" and can be thought of as any fire on forest land which is not being used as a tool in forest protection or management in accordance with an authorized plan.

[12]Forest Fire Statistics (Washington: United States Department of Agriculture, Forest Service, 1949-1958).

TABLE I

CAUSES IN NUMBER AND PER CENT OF FOREST FIRES ON PROTECTED LAND[a]
IN THE UNITED STATES, THE SOUTH, AND LOUISIANA, 1949-1958
(Figures represent yearly averages)

Cause[b]	United States		The South		Louisiana	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Incendiary	30,370	30.7	26,466	41.8	4,187	61.9
Debris burning	20,982	21.2	13,949	22.0	701	10.4
Smokers	18,377	18.6	10,934	17.3	699	10.3
Campers	4,218	4.3	2,165	3.4	114	1.7
Lumbering	2,201	2.2	1,612	2.5	133	2.0
Railroads	3,052	3.1	1,456	2.3	59	.9
Lightning	8,082	8.2	1,122	1.8	29	.4
Miscellaneous	11,561	11.7	5,628	8.9	841	12.4
Totals	98,850		63,332		6,763	

[a]Protected land, in the sense used here, refers to the forest acreage on which there are activities by public (local, state and federal) and/or private agencies for the prevention and control of damage to living trees from fire. In Louisiana, approximately 76 per cent of the forest land is under protection.

[b]For an explanation of cause groups see Appendix A.

incendiary fires that occurred in the United States during the same period were in southern forests.

While the rest of the United States loses one million acres to forest fires annually, the South loses almost eight million acres. Of every 100 acres burned by forest fires in the nation, 89 are in the South.[13]

The actual loss in timber resources resulting from fires and the cost of forest fire control are difficult to ascertain. However, it has been estimated that the annual cost of forest fire control in the United States is $100 million. Of this amount $45 million, or 45 per cent of the nation's total, is spent annually for forest fire control in the eleven southern states of the southern pine region. The damage to the timber burned annually in the South is estimated at $35 million.[14] Thus, the annual cost of forest fires in the South amounts to more than $80 million (damage to timber plus cost of fire control).

Forest fires in the South annually burn up more wood than is used by all the southern pulp mills.[15] The

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[13]Facts About Wildfire in the South (New Orleans: Southern Forest Fire Prevention Conference Bulletin, 1956), p. 1.

[14]Ibid. [15]Forest Farmer, op. cit., p. 92.

significance of this statement can be better understood when it is realized that there are 75 pulp mills in the South. These mills, representing an investment in excess of $3½ billion, consumed 20 million cords[16] of pulpwood in 1959.[17]

The forest fire problem in the South has increased in the past years. The region now has twice as many fires annually as it did 20 years ago. What really stands out in this respect is the fact that those fires started by incendiarism and debris burning have increased.[18] The seriousness of the problem is further evidenced when it is realized that the wood-using industries of the region can become a 15-billion-dollar-a-year business by 1975 if fires and other menaces to the forest are eliminated.[19]

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[16]Since 20 million cords is such a large amount of pulpwood for any person to comprehend, perhaps it would be better to point out that it requires the services of 80,000 pulpwood cutters, each cutting an average of 1.8 cords per day, in order to harvest annually the amount of wood destroyed each year by forest fires in the South.

[17]A. S. Todd, Jr., and Anges C. Nichols, 1959 Pulpwood Production in the South, United States Department of Agriculture, Forest Survey Release 56 (Asheville, North Carolina: Southeastern Forest Experiment Station, 1960), pp. 1-5.

[18]Kenneth P. Davis, Forest Fire: Control and Use (New York: McGraw-Hill Book Company, Inc., 1959), p. 234.

[19]Facts About Wildlife in the South, loc. cit.

As indicated in Table I, the causes of forest fires in Louisiana during the 1949-1958 period differed from the other southern states in some respects. For instance, approximately 62 per cent of the Louisiana fires were deliberately set, but only 10 per cent were caused by debris burning and 10 per cent by smokers. These three causative agents alone accounted for an average in excess of 82 per cent of all the forest fires in the state during 1949-1958. More than 99 per cent of all the fires which burned in Louisiana forests each year were man-caused. Only four out of a thousand were due to causes beyond man's control.

The number and causes of fires in Louisiana on protected areas in 1959 are listed in Table II.[20] As these data indicate, there occurred in Louisiana 6,067 fires in protected areas during 1959. These fires burned 113,018 acres of forest land and resulted in damages exceeding $514 thousand. The cost of controlling them exceeded $2.6 million. The loss due to forest fires in Louisiana during 1959 exceeded $3 million.

A comparison of the data in Table I with that presented

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[20]Unless otherwise stated, the forest fire statistics for Louisiana used in this study were obtained from records of the Louisiana Forestry Commission.

TABLE II

FOREST FIRES BY CAUSE IN LOUISIANA, 1959

Cause	Number Fires	Acres	Average Size	Per Cent of Total Fires
Incendiary	4,047	83,947	20.7	66.7
Debris burning	609	14,813	24.3	10.0
Smokers	594	4,541	7.7	9.8
Campers	267	2,603	9.8	4.4
Hunters	122	1,210	10.0	2.1
Lumbering	65	737	11.3	1.1
Railroads	100	821	8.2	1.6
Lightning	14	78	5.6	.2
Miscellaneous	249	4,268	17.1	4.1
Totals	6,067	113,018	18.6	100.0

in Table II shows that there was a percentage increase in incendiary fires during 1959 over the average for the previous 10 years. Of the various causes of forest fires, incendiary fires are the most dangerous, since they tend to be set at a time and place where damaging fires are to be expected.

It is assumed that the local forest residents are responsible for the incendiary fires that occur in the various parishes of Louisiana. This is a logical assumption. The record indicates that only a mere fraction of known forest incendiaries have exhibited pyromania. Their purposeful action of woods-burning is usually related to the achievement of some sort of economic gain. Consequently, if they are to achieve economic gain, they must at least reside in the general vicinity of the area burned. This does not mean to imply that all forest residents are incendiaries. In fact, the actual number of persons who deliberately set the forest on fire is relatively low, even in parishes where the incidence of fire is high. Many foresters familiar with the fire problem in their districts are reasonably certain of the identity of the woods-burners in their areas. It is extremely difficult, however, to establish that a given person has deliberately set fire to the forest. Arson, a difficult

crime to prove even in the city, is extremely difficult to prove in the open and relatively unpopulated forested areas. This is further complicated by the fact that it has been difficult to convict persons of woods-burning in Louisiana even with the existence of reliable evidence. For instance, during the 5-year period 1955 through 1959, 1,383 investigations of incendiary fires were made in Louisiana. From the evidence gained in these investigations 82 arrests were made; however, only 56 persons were convicted. Many district attorneys will nolle prosequi cases of persons arrested for woods-burning. Another common practice has been the one followed by many magistrates and judges of releasing persons without any punishment.

Debris-burning fires are also the result of the actions of people who live near the forest since they result from fires that have escaped control. The other causes of man-caused fires might not be the result of local forest residents. In fact, there are certain areas of the state where they are more likely to be the result of outside persons coming into the forest for camping, hunting, and so forth. In spite of this, however, local forest residents must be considered as the major causes of forest fires in Louisiana, since the greatest proportion of the fires result from

incendiarism and debris burning.

In presenting the problem of man-caused forest fires, consideration should be given not only to its direct economic effect but also to the direct and indirect effects to the soil, vegetation, water storage, erosion, and a large number of other related factors. Each of these constitute a separate field within itself and without a doubt a study of each would provide a clearer understanding of man's relation to his natural environment. The only over-all conclusion that can be drawn from this brief review of fire cause and effect is the fact that there are no grounds for complacency regarding the occurrence of man-caused forest fires.

IV. REASONS FOR THE STUDY

The problem of the destruction of timber in the South by fire is more serious today than it has been in the past. The forests of the South, in particular Louisiana, are no longer characterized by the original high-crowned, fire-hardy, old-growth timber. Today, the forests of Louisiana are second growth, ranging from seedlings to young sawtimber, with the majority of the forested area containing pulpwood and

pole-sized trees.[21] The forest floor beneath these trees is covered with inflammable leaves, needles, sedge and wire-grass, and a head-high understory of hot-burning palmetto, gallberry, and other brush. In such woods, fires are severe, fast-moving, hard to extinguish, and very destructive. This problem has been increased with the establishment of pine plantations and will be increased more and more in the future, since thousands of acres of abandoned "old fields" and cut-over land are planted each year in Louisiana. Thus, foresters are confronted with a problem which has all indications of becoming worse unless the attitudes of people toward the forest can be changed or improved.

Most of the work in the field of forest fire research in the United States has been directed toward the technical aspects of the problem; namely, fire suppression and control. Although it is known that practically all of the forest fires in the nation are man-caused and a large percentage of them are deliberately set, little attention has been focused on the human and social factors at the root of the problem: why people set fires; the social, psychological, and economic

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[21]Forests of Louisiana, 1953-54, United States Department of Agriculture, Forest Survey Release 75 (New Orleans: Southern Forest Experiment Station, 1955), p. 6.

factors involved, and the historical development of the use of fire in the woods.

Modern forestry consists of more than just the mere matter of growing trees. Trees must be grown, but in addition they must be protected. This involved, primarily in the South, direct protection from fire or indirect protection from people as the cause of fire. Herein lies a series of problems in human relations.

Several reasons for this investigation are evident; however, there are three conditions, resulting from changes which have occurred and are occurring in the South, that stand out at being of paramount importance.

Probably the most important of these conditions is the difference in the economic situation in Louisiana today from what it was during the depression period of the 1930's. Although it is true that the depression began during the early 1930's, its full effects in many areas of the rural South was not felt until after 1936 and many of these same areas did not begin to recover until after the beginning of World War II. Anyone who lived in the rural South during this time can certainly remember it as a time of much uncertainty. The economic character of the problem which beset the isolated and highly internally integrated rural

communities was one with which the people were unable to cope. The usual standards were broken down by forces that were not under control and the people became not only personally dissatisfied but also came to believe that something was wrong. Thus there was much restlessness in the isolated rural communities and, since the people were blocked in the achievement of their normal goals, the situation became characterized by what Shea called frustration.[22] These groups and individuals, when frustrated, expressed themselves by acts of aggression and some object was searched for upon which they could act in aggression. This object of aggression, according to Shea, became the forest, and the people set fires as reactions to frustration in order to burn out an enemy; to damage a "hostile" environment; and to get back at "outsiders."[23] However, changes in the times have brought

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[22]John P. Shea, "New Design for Forest Fire Prevention in the South" (paper read at the 65th Annual Meeting of the American Forestry Association, Biloxi, Mississippi, February 1-3, 1940), pp. 24-25.

[23]Ibid., p. 11. Shea, a psychologist, based his conclusions on the results of a series of participant-observer studies conducted by a team of researchers on National Forests in Alabama, Kentucky, Missouri, and Montana during 1938 and 1939. He presented no objective data to substantiate his conclusions. It is somewhat difficult to understand why individuals or groups would choose the forest as the object of aggression. This does not mean to discount his hypothesis;

about economic conditions in Louisiana which are different today than they were during the latter 1930's. The changes, brought about largely by the forest industry itself, are evident even in the most isolated rural communities. This betterment of the economic situation most certainly has had an influence on relieving the restlessness and frustration of the forest residents, yet in many areas of Louisiana incendiary fires still persist and in some cases have increased. Perhaps the woods burners in these areas are the very dregs of that drained southern society characterized by Cash. He believed these lawless people to be the "least reconstructible" characters ever developed. "Violence, intolerance, . . . an inclination to act from feeling rather than from thought, an exaggerated individualism and a too narrow concept of social responsibility," were some of the failings which he found still lingering in the South.[24]

Another condition (directly related to economics), which is different today than it was during the latter 1930's, is the difference in the value of forest products. The

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rather, it suggests the need for further study in order to test it.

[24]W. J. Cash, The Mind of the South (New York: Alfred A. Knopf, Inc., 1941), p. 426.

primary forest products in Louisiana are pine pulpwood and sawtimber. During the depression period the prices paid to landowners by the forest industries for pulpwood averaged about one dollar per cord, and for sawtimber about five dollars per thousand board feet. Naturally, this low value of the forest products affected the attitude of the people toward the forest. However, today, the prices paid for pulpwood and sawtimber are many times greater than they were in the past. The present average market price of pine pulpwood in Louisiana is $5 per cord and the price of pine sawtimber is between $30 and $45 per thousand board feet. Not only is the value of these products higher but it has also been steadily increasing. It is not difficult to understand the feelings of the people toward the forest when the products of the forest have such a low value; however, it is difficult to understand why people will destroy, through the use of fire, products of the forest that now have much greater value. Perhaps the forest residents still remember the low value, as well as the low monetary yield, of the forest products and consequently have a poor conception of the present-day value of timber.

A final condition, which is different in Louisiana today than it was during the depression period, is the

economic importance of the forests which has resulted from the tremendous growth of the forest industry during the past twenty years. The economic importance of the forest industry has already been discussed. It will suffice only to mention that the growth of this industry, with the resulting increase of forest products, has exceeded the wildest imagination of those who have lived through it. The growth of the forest industry in the South can be demonstrated by the growth of a single wood-using industry; namely, the pulp and paper industry. In 1937 the total consumption of pulpwood in the South was 3,000,000 cords; by 1959 this consumption exceeded 20,000,000 cords. Louisiana industries consumed a large share of this pulpwood, since 10 out of the 75 pulpmills in the South are in Louisiana.[25] As a matter of fact, the sixth largest pulpmill in the South is in Louisiana. During 1957 this mill used over one million cords of pulpwood, which was equal to one-third of the total pulpwood consumption in the South during 1937.

One fact stands out in the growth of the forest industry in Louisiana and that is the increased competition for the

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[25]A. S. Todd, Jr., and Anges C. Nichols, 1959 Pulpwood Production in the South, United States Department of Agriculture, Forest Survey Release 56 (Asheville, North Carolina: Southeastern Forest Experiment Station, 1960), p. 5.

use of land between forest and non-forest agriculture. While it is true that growing trees will provide the greatest income from most of the forest land in the state, it is a practice which has long-term economic consideration. The forest resident, in particular the open-range stockman, is not interested in long-term economics. His major interest is in short-term economics through the grazing of cattle on free range. It is doubtful that the setting of fires in the open-range cattle country has a pathological basis. The widespread fence-cutting practice in the West was certainly not a pathological symptom of a population gone berserk; it was an economic tool used in an economic war fought by cattlemen and the farmers over which land-form was to be the dominant one in a particular area.

In any event, changes in Louisiana forestry since the late 1930's, plus the increased hazards of man-caused forest fires which continue to defy solution, indicated the need for additional research into this extremely complex problem.

The Hypothesis

Two factors stand out above all others as having the most probable relation to the incidence of man-caused forest fires within certain areas of Louisiana. It seems that the

problem of man-caused fires stems mostly from these two conditions: (1) the lack of the appreciation of the value of timber, and (2) the problem of grazing cattle on the open range.

The problem of the lack of appreciation of the value of timber has probably had much to do with the lackadaisical attitude of most people toward the forest. This has caused them to have a poor conception of the economic importance of the forest industry, plus a false impression of the value of timber as a crop. This poor conception of timber as a crop has probably been aggravated by the tradition of woods burning in the South and the lack of vested interest in timber. Within certain areas of the state the people do not own the forest property; consequently, they do not reap the bulk of profits of the forest directly. Therefore, they have little concern about forest fires and fail to fully realize its harmful effects.

The tradition of grazing cattle on open range is probably one of the most influential factors in determining the attitudes of many people within certain areas of Louisiana toward the forest and the use of fire in the forest. Although no investigations have been made concerning this matter within recent years, there is evidence which seems to point

out a growing conflict of interest between stockmen and foresters. For instance, since World War II, the area seventy-five miles square encompassing southwest and central Louisiana has experienced more fires each year than any other similar area in the United States. This area lies largely within the open range cattle country.

In view of these factors discussed and the changes which have occurred in Louisiana forestry, it was the purpose of this investigation of the social aspects of man-caused forest fires to test the general hypothesis that behind man-caused forest fires within certain areas of Louisiana was unfavorable attitudes created by the lack of the appreciation of the value of timber, and the conflict between forest residents and forest landowners over the use of land.

Objectives of Study

The over-all aim of this study was to determine some of the human-relationship aspects of man-caused forest fires that would be helpful in planning an effective fire prevention program. Specific objectives were as follows:

1. To determine the patterns of fire occurrence with respect to the various causative agents through an analysis of the existing statistical reports of forest fires in Louisiana.

2. To determine the relationship between various socio-cultural and socio-economic factors and the cause and occurrence of man-caused forest fires in the various parishes of Louisiana.

3. To determine the attitudes and motivation of people within certain areas of Louisiana which are related to their behavior with respect to forests.

CHAPTER II

THE USE OF FIRE IN THE FOREST: ITS CULTURAL SETTING

The consideration of the social aspects of man-caused forest fires must be approached from a background of understanding which includes the cultural characteristics of the people involved.

The term culture is a fundamental concept of sociology, since those elements of recurrent behavior which reflect group life are expressed by the culture of the group. The kind of organization used to satisfy the many interests of people living in groups and the very aims of the activity itself are determined by the culture of the group.

It would be well to review briefly what is meant by culture and how it is to be regarded here. Edward Tylor first defined culture, by stating that,

> . . . culture . . . is that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society.[1]

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[1]Edward B. Tylor, Primitive Culture (second edition; London: John Murray, 1873), p. 1.

A summary definition of culture, formulated from the writings of many scholars, is:

> Culture consists in patterned ways of thinking, feeling, and reacting, acquired and transmitted mainly by symbols, constituting the distinctive achievements of human groups, including their embodiments in artifacts; the essential core of culture consists of tradition (= historically derived and selected) ideas and especially their attached values.[2]

Others define culture as "the sum of meanings and values found among people in a given society,"[3] or,

> . . . culture, in its broadest sense, consists of all of the values, attitudes, behavior patterns, and material objects which men living in different societies employ in coping with their environment.[4]

Whatever the definitions given to culture by these various authors they all stress the point that culture is acquired, that it is learned. It is taught to the individual unconsciously through imitation and consciously through inculcation by the other members of society. Common understanding of how individuals are to behave come down from the past and

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[2]A. L. Kroeber and C. Kluckhohn, "Culture: A Critical Review of Concepts and definitions," Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University, LXVII (1952), 34-35.

[3]Arnold M. Rose, Sociology: The Study of Human Relations (New York: Alfred A Knapp, Inc., 1956), p. 109.

[4]Saxon Graham, American Culture (New York: Harper and Brothers, 1957), p. 31.

are taught as the major part of the socialization process. Thus, culture is socially inherited.

I. INDIAN CULTURE AND ITS RELATION TO FOREST FIRES

The Indian, as the first known inhabitant of North America, had a determining influence on the forests which evolved on this continent.[5] The historical evidence proves that the majority of the Indians lived in fixed habitations, tilled the soil, and subsisted to a great extent on their agricultural products. The various cultural practices which they employed in the preparation of land, the tillage of crops, and the rotation of fields were passed on to the European colonists to such a degree that many of the American farm practices of today still show the influence of Indian culture.[6] A major force employed by the Indians in the

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[5]After reviewing the effect of various ecological factors on the pine forest of southeastern United States and with the evidence presented from excavations at Vero and Melbourne, Florida, Stewart suggested that man's occupancy of the New World extended back to the time of the third interglacial or approximately 40,000 years ago. See Omer C. Stewart, "Fire as the First Great Force Employed by Man," Man's Role in Changing the Face of the Earth, William L. Thomas, Jr., editor (Wenner-Gren Foundation for Anthropological Research International Symposium. Chicago: The University of Chicago Press, 1956), p. 125.

[6]Lyman Carrier, The Beginning of Agriculture in

management of their environment was fire.

Reports from early geological and natural history surveys describe the diverse effects of prehistoric fires on the forests of the various regions. The writings of early explorers and traders explain how fire has left its imprint on the forest types[7] which have evolved. The major type was the even-aged stands of conifers which resulted from early land abandonment and also from patchy coverage of forest conflagrations at irregular periods of time.

The general attitude of aboriginal man toward fires in the forest is a subject on which there are differences of opinion. Various writers have stated that the natives were careless with fires and that they even deliberately set the forest afire. Others, however, credit the earliest known inhabitants of North America with caution in handling fire and hold that they recognized that forest fires damaged their environment. The work of Lutz[8] in evaluating the use of fire

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America (New York: McGraw-Hill Book Company, Inc., 1923), pp. 41-102.

[7]A forest type is an aggregation of trees occupying a specific area which are of similar character as regards composition and development due to certain ecological factors.

[8]Harold J. Lutz, Aboriginal Man and White Man as Historical Causes of Fires in the Boreal Forest, with Particular Reference to Alaska, Yale University School of Forestry Bulletin 65 (New Haven, Connecticut, 1959).

by aboriginal man in the boreal forest of North America affords a basis for judging the role of primitive cultures in forest burning.

After an exhaustive review of the writings, reports, and diaries of anthropologists, ethnologists, foresters, geographists, geologists, explorers, priests, adventurers, travelers, hunters, and novelists, Lutz concluded that:

> The general attitude of aboriginal man toward fire was that of carelessness. Campfires were in general use and the evidence is that they were not carefully extinguished but frequently started forest fires. Use of fire in signaling was widespread and must have been a major source of forest fires. Whenever the birch bark canoe was used, frequent gumming of sewn seams was necessary along with repairs of cracks or tears in the bark. This necessitated making a fire for heating and applying the gum: the evidence is that this use of fire at least occasionally led to fires in the forest. Fires were at times used in hunting but this practice probably was not an important source of forest hunting. On some occasions, at least, aboriginal man seems to have employed fire in warfare but evidence on this use is scanty. In his efforts to combat mosquitoes and gnats, aboriginal man generally employed fire and smoke and this led to frequent forest fires. Of the miscellaneous uses of fire by aboriginal man that occasionally must have led to forest burning the following seem most worthy of mention: clearing away of forest growth, cutting down trees, cutting up trunks of fallen or felled trees, and killing trees for a supply of dry fuel. It seems certain that even prior to contact with white man, aboriginal man was responsible for frequent and widespread fires in the boreal forest.[9]

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[9] Ibid., p. 41.

The record reveals that Indians of the United States commonly fired the forests and grasslands. As a matter of fact, Hough[10] regarded fire as a hunting aid used by primitive peoples throughout their history the world over. In a review of more than 200 references covering all the major geographic and cultural areas of the United States which were inhabited by Indians, Stewart[11] concluded that fires set by Indians were allowed to burn unchecked so that they could spread until burned out or were extinguished by natural causes. He found few references where methods of controlling or directing fires were used and no mention was made of the Indians putting out fires or of not starting them in order to protect forest growth. According to Stewart, fires were used for various reasons; a major one was to aid in hunting. Fires were used to drive all kinds of game, to reduce pasturage and thus force game into a limited area, and to clear the forest of underbrush to improve visibility and facilitate travel. Furthermore, fires were employed by the Indians to increase

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[10]Walter Hough, Fire as an Agent in Human Culture, United States National Museum, Bulletin 139 (Washington: Government Printing Office, 1926), pp. 60-65.

[11]Omer C. Stewart, "Burning and Natural Vegetation in the United States," The Geographical Review, XLI (April, 1951), 317-20.

the growth of plants which provided vegetable and seed foods and to prepare seedbeds for tobacco and maize. In the eastern and southern forests these primitive agriculturists used fire as an indispensable aid in clearing forests to provide crop space as well as to drive off mosquitoes. Finally, according to Stewart, the use of fire in war for both offense and defense was practiced by the Indians most effectively in the extensive grasslands of the Mississippi Valley, where topography and wind combined to increase its destructiveness.

Ecologists and foresters have assigned considerable importance to Indian fires in the South. They are in general agreement that fires modified the species composition of southern forests and created extensive open, park-like woods free of undergrowth.

If one thing is certain about aboriginal farming in the South, it is that the Indians continually cleared new land and abandoned old fields. In so doing, the Indians customarily burned over not only the woodlands but the open tracts as well and this burning, to judge from old reports, was common and widespread. As a result of this practice of fire-agriculture there must have developed much open country in the South which probably reached a maximum some time before contact was made between the Indians and the Europeans.

The cessation of Indians burning due to their displacement from the region caused the area of cleared land to diminish and the forest to increase as a result of plant succession. Thus, there was without a doubt much more "forest primeval" in the South in 1850 than in 1650.[12]

The earliest travelers observed burning and the evidence of burning throughout the South and along the Atlantic Coast from Florida to New Hampshire.[13] The most notable impressions gained from the accounts of DeSoto's travels in the 1540's through what is now Florida, Georgia, South Carolina, North Carolina, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, and Texas are the numerous references to the cleared land and open forests.[14]

In the vicinity of Onslow Bay, North Carolina in 1524, Giovanni da Verrazzano wrote, ". . . and we saw everywhere

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[12]Erhard Rostlund, "The Myth of a Natural Prairie Belt in Alabama: An Interpretation of Historical Records," Annals of the Association of American Geographers, XLVII (December, 1957), 409.

[13]For an account of the Indians use of fire in the Northeast see Gordon M. Day, "The Indian as an Ecological Factor in the Northeast Forest," Ecology, XXXIV (April, 1953), 329-46.

[14]Rosthlund, op. cit., pp. 394-96.

great fires by reason of the multitude of the inhabitants."[15]

Woodward in describing his journeys into the interior of Georgia in 1670 and 1674 related that he discovered, "a pleasant and fruitful country, the woods being so clear of coppice and underbrush that a man could ride his horse a hunting."[16]

Lederer in 1669 reported that much of the Virginia and North Carolina Piedmont "by the industry of Indians was very much open and clear of wood."[17] Lawson, in the record of his trip in the winter of 1701 from Charleston, South Carolina to Pamlico Sound, North Carolina by way of the Piedmont, made several references to the Indian custom of annually burning the woods.[18] Likewise Catesby, while exploring the interior

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[15]Richard Hokluyt, Divers Voyages Touching the Discovery of America and the Islands Adjacent (London: The Hakluyt Society, 1850), cited by Kenneth B. Pomeroy, "Forester's Notebook," American Forests, LXVI (June, 1960), 45.

[16]Henry Woodward, "Letters," in "The Shaftesbury Papers," Collections of the South Carolina Historical Society, V (1897), pp. 186, 308-309, 457-58, cited by Rosthlund, op. cit., p. 397.

[17]Sir William Talbot (comp. and trans.), The Discoveries of John Lederer in Three Several Marches from Virginia to the West of Carolina and Other Parts of the Continent (London, 1672; reprint Rochester, 1902), pp. 16-24, cited by Rosthlund, op. cit., p. 397.

[18]John Lawson, Lawson's History of North Carolina

of the Carolinas in the 1720's, observed many Indian-set fires.[19]

The Virginia Indians, according to Maxwell, by means of their clearings and burnings deforested from 30 to 40 acres for each individual in the tribes.[20] Elsewhere in this region, Foote referred to the existence in the 1750's of "vast prairies" and "extensive tracts covered only with grass" on the North Carolina and Virginia Piedmont and along the Holston and Clinch rivers in the folded Appalachians of Tennessee.[21] Writing of the Cumberland Plateau in Tennessee Featherstonhaugh stated, "the openness of the woods gave a parklike appearance to the country, and enabled you to see through the forest for a great distance."[22] This "openness

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(London, 1714; reprint Richmond: Garrett and Massie Publishers, 1937), pp. 5-52 passim, 80, 219.

[19]Mark Catesby, The Natural History of Carolina, Florida, and Bahama Islands (Vol. II, London, 1731-1743), pp. 4, 27, cited by Rosthlund, op. cit., p. 397.

[20]Hu Maxwell," The Use and Abuse of Forests by the Virginia Indians," William and Mary College Quarterly Historical Magazine, XIX (1910), 95-96.

[21]William Henry Foote, Sketches of North Carolina (New York, 1845), pp. 79, 187, 308, cited by Rosthlund, op. cit., p. 408.

[22]G. W. Featherstonhaugh, Excursion Through the Slave States (London: John Murray, 1844), p. 185.

of the woods," according to him, was due to the Indians who "were in the habit of annually setting fire to it" in order to keep "the underwood down" so that they could see and pursue their game.[23] He noted later, however,

> The white men having now driven the ancient race out of their country, the underwood is beginning to spring up quite thick, as the old settlers say, in comparison to its ancient state.[24]

An extensive report on the vegetation of the South in the 1770's is contained in the report of the travels of William Bartram. In writing about his travels in North and South Carolina, Georgia, East and West Florida, Alabama, and Southeast Louisiana, Bartram referred numerous times to "the open airy groves of superb pines," to "extensive old fields," to "grand high forest," and to "the level green plains, thinly planted by nature with the most stately forest trees." In southwestern Alabama he reported seeing "a vast open forest which continued above seventy miles."[25] Although he never reported the Indians burning the woods, his record of the landscape lends support to this activity of the earliest inhabitants of the southern region.

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[23]Ibid., p. 186. [24]Ibid., p. 185.

[25]Francis Harper (ed.), The Travels of William Bartram (New Haven: Yale University Press, 1958), pp. 24-299 passim.

Hodgson on his trip from Natchez to the Choctaw country in central Mississippi recorded that the forest was open and "occasionally interspersed with small natural prairies, and assumed the appearance of an English park."[26]

Du Pratz in his travels through the valley of the Mississippi from its mouth to the Missouri and Ohio rivers reported that the Indians annually set fires in September in order to facilitate travel and improve pasturage for "herds of all creatures."[27] In describing the high lands on both sides of the Mississippi from Manchac Bayou to the Ohio and Arkansas rivers he wrote, "all these high lands are generally meadows and forests of tall trees, with grass up to the knee." In describing the openness of the forest he recorded that the trees "seem to have been planted by men's hands in these meadows."[28]

The substance of these old reports is that early observers found two kinds of forest and several types of open,

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[26]Adam Hodgson, Remarks During a Journey Through North America in the Years 1819, 1820, and 1821 (New York: Samuel Whiting, 1823), p. 273.

[27]Antoine Simon LePage Du Pratz, The History of Louisiana (London, 1774; reprint New Orleans: Pelican Press, Inc., 1947), pp. 118-19.

[28]Ibid., pp. 142-63, passim.

treeless land in the South. One kind of forest was "high and dense," obviously a forest dominated by stands of mature timber with heavy undergrowth. These were undoubtedly virgin forests undisturbed by man. It is difficult to say how widespread they were in aboriginal time; however, it can be said that not many references were made to forests of this type in the early historic record. The second type of forest was the "open airy grove" with trees so far apart and so clear of underbrush that horses could freely gallop through them. References to the "openness of the woods" are found in so many of the old reports from so many different parts of the South, that one can readily conclude that open woodland with little underbrush must have been the most common type of forest.

The burning of the forests and the meadows by the Indians was not wantonly destructive but was rather, as Day put it, a method of maintaining a balance in the forest favorable to their economy.[29] The woods were burned to increase the food supply for game and to improve conditions for hunting by keeping down the underbrush. In other words, burning was primitive management of a food resource. It

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[29]Day, op. cit., p. 339.

appears to have been a universal culture trait among the Indian tribes that inhabited the southern region of the United States.

II. THE WHITE MAN'S CULTURE AS A HISTORICAL CAUSE OF FOREST FIRES

White man, without a doubt, has been the cause of even more fires in the forests of North America than aboriginal man. He was generally more careless with fire; also, he possessed easier means of striking fire than the Indians.

The history of the United States is fundamentally a history of rapid exploitation of immensely valuable natural resources. The possession and exploitation of these resources have given most of the distinctive traits to American character.

Whatever behavior compulsives toward conservation our European forefathers may have had were lost in the course of their migration from Europe and settlement in the land of abundant resources. This country was settled chiefly by farmers and by people who wanted to farm. These people were convinced that the resources of this country were inexhaustible. They apparently believed, with the laissez faire economists, that the public good was served best by everyone

serving his own interest. Likewise they seemed to share with Herbert Spencer the belief that the best government is the least government. These attitudes and beliefs set the cultural pattern for the most astounding and destructive exploitation of natural resources that the world has ever seen.[30]

In a study such as this an attempt should be made to evaluate the various cultural factors underlying the use of fire. Such an evaluation permits a determination of the relative importance of each cultural trait or complex in shaping the behavior of those who occupy and/or use the forest. An understanding of the use of fire may be obtained by a brief survey of the history of land use, with particular emphasis on fire and its place in the economic and social life of the people at various times and places. Changing patterns of the use of, and outlook toward, fire can be especially traced in relation to the cultural use of fire in land clearing, lumbering, grazing, turpentining, and other activities.

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[30]It is unnecessary to review the story of destructive exploitation of natural resources here. It has been well told in such books as William Vogt, Road to Survival (New York: William Sloane Associates, Inc., 1948); Stewart H. Holbrook, Burning an Empire (New York: The Macmillan Co., 1945); Fairfield Osborn, Our Plundered Planet (Boston: Little and Brown, 1948); and many others.

Land Clearing

The early American settler found on the eastern coast of this country a forest that stretched west to the prairie region. In addition, extensive forest also existed in the Rocky Mountain Area and in the West Coast Region. As a matter of fact 48 per cent (915 million acres) of the total land that was to become the United States[31] was at that time occupied by forest and woodland.[32] This forest was an enemy to the colonist. It was something to get rid of so that the land could be freed for crops and pastures.

The rapid settlement of the South beyond the Atlantic seaboard did not begin until after the Battle of the Horseshoe Bend in Alabama when the Indian was removed as a dismaying problem. During the early 1800's as the settler moved into the previously unsettled areas of the South the physical difficulties which he faced and had to overcome were enormous.[33] These settlers and their descendants were

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[31]References made to the United States do not include Hawaii and Alaska.

[32]Hardy L. Shirley, Forestry and Its Career Opportunities (New York: McGraw-Hill Book Company, Inc., 1952), p. 17.

[33]W. J. Cash, The Mind of the South (New York: Alfred A. Knopf, Inc., 1941), pp. 23-24.

exclusively a farming people and their first task was to clear the virgin soil for cultivation. To the settler, the forest was one of his greatest obstacles, and the only effective tool which the settler had available to attack the forest with was fire. Aided by his neighbors, he deadened, cut, and piled the trees into great heaps and set fire to them and the woods to clear land for farming, to create pastures, to facilitate hunting, and to get rid of brush that would feed larger and more consuming conflagrations to threaten his homestead.

Writers of the history of Louisiana in the 1800's tell of a country so dense with trees, vines, briars, and brush that it was almost impossible to penetrate. Since this primeval forest stood in the way of farming and since it was of no value it was destroyed indiscriminately.[34] The fires that broke out in the woods as a result of land clearing often reached such intensity that the sun was blotted by smoke. So effective were these fires in clearing the brush that buffalo once again came into north Louisiana in the spring to feed on the lush growth of switchcane that

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[34]H. Skipwith, Sketches of the Pioneers (New Orleans: Hopkins Printing Office, 1892), pp. 5, 16, 22, 42, 46.

developed on the forest floor following such fires.[35] The firing of the woods for the clearing of land thus was considered normal behavior, and was passed on from generation to generation. Out of this practice there arose an attitude of indifference toward the forest still seen today.

Lumbering

The story of lumbering in America is inseparable from the story of the early pioneers and their struggle to make a home in the forests of the New World.

The cutting of timber proceeded at a moderate pace during the colonial period and the early life of the republic. However, with the development of the steam sawmill in 1811 and the opening of an active market for the products of the forest, the lumber industry began to exploit the forest for its own benefit. The forest was no longer merely an encumbrance of the soil but a source of vitally needed raw material for the rapidly growing cities and villages in a rapidly growing nation.

The migratory lumbering industry that developed in the United States was an inescapable part of the political and

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[35]D. W. Harris and B. M. Hulse, The History of Claiborne Parish, Louisiana (New Orleans: W. B. Stansbury and Company, 1886), pp. 21-42.

economic philosophy of a free land. The apparently inexhaustible supply of forest resources and the ideology linked with an expanding capitalism merged in the liquidation philosophy of forest conservation which simply stated was, "cut out and move on." The tradition was also deeply rooted in pioneering Americans that "the plow will follow the ax," and it was often cited as justification for migratory lumbering and runaway forest fires.

The sweep of the American forest industry across the continent of North America began in the New England states in 1840, at which time lumbering got under way at a very rapid rate. Maine led all other states in lumber production until 1850, at which time New York took the lead. Ten years after New York's brief supremacy, Pennsylvania took the lead and maintained it until 1870. After the War Between the States, around 1870, there occurred a tremendous demand for lumber. This demand pushed the center of lumber production into the Great Lakes states of Michigan, Wisconsin, and Minnesota. Here the lumbermen, coming from the East with larger and more modern mills, flourished in the heyday of their prosperity.

By 1890 the lumber industry of the Great Lakes states was at the height of its glory. However, by the turn of the

century a change had begun to take place. The depletion of the timber resources in the North caused the lumber industry to shift to the South, where by 1910 it had become the center of lumber production in the United States. The great boom of the 1920's led many operators who were nearing the end of their southern timber supply to move westward. It was in the Pacific Northwest that the "last stand" of the migratory lumber industry came to an end.[36]

The lumbering industry, which developed in the early South, played an important role in determining the attitudes of people toward the forest and fire. In fact fire itself had much to do in shaping the character of early forest-using industries. It helped to accentuate their migratory habits and to create the lumbermen's tradition of "cut out and get out." Lumbering, in the early days, was a risky business whose raw material might be swept out any autumn day by an explosive mixture of heat, slash, and drought. Consequently, timber came to be regarded as an asset for quick liquidation, rather than a source for permanent industry. This idea has carried over until the present time. The reason given by

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[36]A. R. Recknagel and S. N. Spring, Forestry--A Study of Its Origin, Application, and Significance in the United States (New York: Alfred A. Knopf, 1929), pp. 3-22.

many landowners for not entering a forest management program is the fear of having their timber destroyed by fire. Thus, the actions of the early lumber industry has had much to do with shaping the attitudes and behavior patterns of the people toward the forest.

The lack of appreciation of the value of timber has also done much toward shaping the attitudes of many people toward the forest. While it is true that today timber has a much higher value than in the past many people remember the days of the virgin forest as the only important time of forest industry. Although the virgin stands of timber had a great value to the mill owner in the early part of this century, he was very effective in concealing its value. Much of the virgin pine timber in Louisiana plus the land on which it grew was bought by the mill owners for an average price of $1.50 per acre. From these virgin stands was milled, on the average, approximately 10,000 board feet of lumber per acre. This, plus the idea that there was plenty of timber and that land that was not fit for plowing was of no good anyway, has done much to shape the attitude of indifference of the farmer toward the forest.

Grazing

As mentioned previously, burning in preparation for planting and for the increase of pasture has been a universal practice with agricultural and pastoral people.[37] In fact, it is impossible to understand clearly the distribution and history of vegetation of the earth's land surfaces without careful consideration of fire as a universal factor influencing the plant geography of the world. In this connection, Stewart concluded from his review of the record of vegetation burning by American Indians that fire was the powerful force employed by these primitive peoples in the formation and maintenance of grasslands in America.[38]

The burning-over of pastures and woods has been a common practice in the South for many years.[39] The record

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[37]Carl O. Sauer, "The Agency of Man on the Earth," Man's Role in Changing the Face of the Earth, William L. Thomas, Jr., editor (Wenner-Gren Foundation for Anthropological Research International Symposium. Chicago: The University of Chicago Press, 1956), p. 55.

[38]Omer C. Stewart, "Fire as the First Great Force Employed by Man," Man's Role in Changing the Face of the Earth, William L. Thomas, Jr., editor (Wenner-Gren Foundation for Anthropological Research International Symposium. Chicago: The University of Chicago Press, 1956), p. 129.

[39]Kenneth H. Garren, "Effects of Fire on Vegetation of the Southeastern United States," The Botanical Review, IX (November, 1943), 644.

shows that the ancient habit of woods-burning passed from Indians to the early white settlers to the extent that a law of North Carolina in 1731 required the burning of pastures and rangelands "every 10th of March."[40] Romans reported in the 1770's that the stockmen in the wiregrass country of southern Alabama, Georgia, and Florida frequently fired the woods in order to procure young grass for cattle.[41] Thus, the practice of turning forest into pasture land which was begun by the Indians has been employed in the South since the introduction of domesticated livestock.

Another factor associated with rangeland burning that has contributed to the attitude of some people in the South toward forest fires has been the practice of open range which once was prevalent in many parts of the South. Into this category fell the hundreds of open-range cattlemen and sheep-men who burned each year for direct economic gain. These men have been lords of the land for nearly fifty years

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[40]Lyman Carrier, The Beginnings of Agriculture in America (New York: McGraw-Hill Book Company, Inc., 1923), p. 197.

[41]Bernard Romans, Natural History of East and West Florida (New York, 1775), p. 16, cited by Lyman Carrier, The Beginnings of Agriculture in America (New York: McGraw-Hill Book Company, Inc., 1923), p. 29.

in the Gulf Coast states.

To understand how this has come about one needs only to review the early practices of the lumber industry in the South. After the virgin timber had been cut, the companies moved and much of the land was abandoned by the owners. The cutover areas were thought so valueless for timber production that many landowners pictured it as the future breadbasket of the nation and even carried out settlement programs to attract small stockmen and farmers. However, much of the land could not be sold and it was simply left unmanaged and unprotected for years. As a result, veritable dynasties were built up by cattlemen and sheepmen, even though many did not own a single acre of the cutover lands. Through the years, grazing rights on thousands of acres of stump-marked land were "acquired" by an unwritten code and many nesters became wealthy. They grazed the cattle yearlong on the free range and every year added more acreage to their empire and burned the stubble off at springtime "to green up the grass."[42] It made no difference if regenerated trees were destroyed, since the land had been abandoned as a depleted asset by the lumbermen and was theirs for the using. This practice of free

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[42]Ed Kerr, "Southerners Who Set the Woods on Fire," Harper's Magazine (July, 1958), p. 4.

range and spring burning has been passed down from generation to generation and has become accepted as normal behavior over a wide area of Louisiana and other areas, since the stockmen know that their cattle thrive best on range which has been well burned over.

Turpentining

In the naval stores belt of the South turpentine operators have always made a practice of burning over the floor of their turpentine orchards every winter.[43] This is done primarily to prevent wholesale losses of "cups" and "faces" later in the spring fire season when the stockmen start their woods burning.[44] The turpentine operators also burn over their orchards annually to keep the woods open and the ground free of underbrush for the convenience of their employees, whose labors are increased if they have to walk

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[43]The naval stores belt of the South includes those states lying within the natural longleaf-slash pine country. It includes southeastern South Carolina; southern Georgia, Alabama, and Mississippi; southeastern Louisiana; and northern Florida.

[44]The term "cup" refers to the container which is attached to the base of the tree to collect the sap (resin) as it flows from the tree. "Face" refers to the area of the tree which has been cut in order to bring about the flow of resin.

from tree to tree through heavy brush or over ground covered with debris. Many times the turpentine laborers will burn over their working grounds even without orders to do so, since they dread stepping on snakes, which are difficult to see in rough woods.

Although very little turpentining is done in Louisiana now, this practice of woods burning by those connected with a forest industry is presented to further demonstrate how the use of fire has become normal and accepted behavior in certain areas.

Other Activities

A brief mention should be made of some of the numerous other activities which have contributed to the accepted use of fire by some people in southern woods. Collectors of pine knots and stumps, which are sold for destructive distillation, frequently set brush fires in order to get at the knots and stumps more easily. Fishermen using the practice of "grunting"[45] for collecting fishing worms burn off the area first in order to make it easier to see the worms when they

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[45]When "grunting" for fishing worms a wooden stake is placed into the ground and then rubbed with a brick or stick, causing a vibration which brings the worms to the surface.

come to the surface. Unethical timber buyers have often burned off a tract of land belonging to an unsuspecting small landowner in order to buy the damaged timber for a much lower price. Pulpwood cutters have been known to set fires near their homes with the hope of getting a job cutting the salvageable pulpwood. Juvenile delinquency accounts for almost 50 per cent of the known woods arson cases in Louisiana. In the cities, the "juvenile delinquents" break windows, terrorize schoolmates, steal automobiles and loot stores; in the country, they set forest fires and other like acts. Spite against the big landowners is one of the many excuses advanced by woods burners and in some communities, the practice of "burning the big man" has become more or less a pastime.[46]

From this it can be seen that the historical use of fire in the woods in the South has social and economic roots. The use of fire in the economic pursuits of the people as a primary labor-saving device for clearing the forest and disposal of brush and litter to encourage grass to grow for pasturage for cattle, are customs which are an integral part of the economic history of the South. All of the economic practices mentioned have been largely predicted upon the

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[46]Kerr, op. cit., pp. 2-5.

assumption that timber was either an undesirable barrier to land use or, at best, an expendable commodity secondary in importance to other land uses. Here the changing economic value of timber has played its part in the forming of attitudes toward fire in the forest.

Out of the traditional pioneer habits of burning the woods there has arisen additional attitudes and opinions with regard to fire and the forest. Many people have come to believe that burning has additional benefits other than for land clearing and grazing. Among the many additional reasons that have been given for burning the woods are that fire gets rid of ticks and redbugs, cotton weevils, wolves, snakes, and all other kinds of vermin that would otherwise descend upon the gardens and fields and destroy the crops. Then, too, woods burning is thought to be conducive to good health in the community since it gets rid of the "fever" that is constantly lurking in the forest.[47] Whether or not burning the forest accomplishes any of these is not the concern here, but what is important is that almost every new zone of American settlement has developed its own code of perfectly good

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[47]Hillard Henson, "Why Incendiary Fires in the Southern Appalachians," American Forests, XLVIII (September, 1942), 419.

frontier logic for burning the forests around the homesteads. And the crystallizing of these pioneer practices into fixed habits of thinking has become a primary source of forest destruction, of opposition to laws for forest protection, and the outstanding obstacle to timber growing.

CHAPTER III

REVIEW OF LITERATURE

In reviewing the literature only two studies were found where the social and psychological aspects of man-caused forest fires had been investigated. The information obtained from these studies, conducted during the 4-year period 1938-1941, was published only in mimeographed form. Since these reports were initially labeled "confidential" by the United States Forest Service, they were rarely circulated outside official Forest Service channels.[1]

Shea and associates conducted a series of investigations during 1938 and 1939 on National Forests in Alabama, Kentucky, Missouri, and Montana. The National Forest Units selected for study in the South were typical southern forest areas and the investigations were carried out employing participant observation and/or interviewing techniques for

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[1]The writer obtained the reports through the courtesy of Mr. David Bruce, Chief, Division of Forest Fire Research, Southern Forest Experiment Station, Alexandria, Louisiana.

the collecting of data. The objectives of these studies were to determine why people burn the woods persistently and what could be done about it in the way of fire prevention.[2]

From an analysis of the data collected in the southern studies, Shea concluded that: (1) forest residents constitute the biggest fire problem in the South; (2) man-caused fires in the South are a problem of human group behavior primarily, and only secondarily of individual behavior; and (3) the root causes of the major fire problem of the South are cultural and frustration.

In his discussion of the fundamental causative factors of forest fires, Shea ascribed the non-malicious fires of the intentional, thoughtless, and careless types to cultural causes and the malicious fires, particularly of the intentional type, to frustration. He stated that non-malicious woods burning constituted the major part of the woods burning in the areas studied and that it is a practice which has survived from pioneer agrarian culture. He further stated that this folk practice has undergone transformation in its values to the people. Shea concluded that in the course of

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[2]John P. Shea and others, "Man-Caused Forest Fires: The Psychologist Makes a Diagnosis" (Washington: United States Department of Agriculture, Forest Service, 1939), pp. 1-23. (Mimeographed.)

time the values of the southern ruralist which were predominantly economic, had changed until they had become by 1938 predominantly recreational and emotional. He explained this and the reaction of the rural population to the Forest Service's attack on the fire problem in the following manner:

> The sight and sound and odor of burning woods provide excitement for a people who dwell in an environment of low-stimulation and who, quite naturally, crave excitement. They are people who have not yet learned to dislike fire. Woods burning gives them distinct emotional satisfactions which they strive to explain away (as we do hunting and fishing) by pseudo-economic reasons that spring from defensive beliefs. Their defensive beliefs are emotionalized ways of protecting their feelings, their habitual ways of life, their culture. Their sincere explanations of the value of fire in killing off snakes and boll weevil and other economic advantages are something more than mere ignorance. They are the defensive beliefs of a disadvantaged culture group. That is why these people get hot under the collar and resist our direct attack on the man-caused fire problem. They feel it as a direct attack on themselves.[3]

Shea, therefore, came to the conclusion that the majority of the people in isolated sections of the South set forest fires because they did not have enough things to entertain them. Since they will continue to burn the woods whenever they can according to the pattern of their ancestors

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[3]John P. Shea, "New Design for Forest Fire Prevention in the South" (paper read at the 65th Annual Meeting of the American Forestry Association, Biloxi, Mississippi, February 1-3, 1940), p. 13.

until their habits are changed, he recommended, as a weapon against incendiarism, programs of recreation for backwoods communities.[4]

Weltner conducted investigations on man-caused forest fires during 1940 and 1941 on National Forests in Louisiana and Florida. The Vernon Unit (southwestern Louisiana) of the Kisatchie National Forest in Louisiana, and the Wakulla Unit of the Appalachicola National Forest in Florida were chosen for study. The Vernon Unit was chosen because it represented a difficult problem in fire control and in public relations, and the Wakulla Unit because it was thought to be an average or possibly worse than average southern forest in these same respects. The purpose of the investigations was to learn why people set fires in these areas, why and to what extent they were favorable or unfavorable to the Forest Service and its

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[4]The findings of the studies conducted by Shea and associates on the National Forests were never made public. They were published in the confidential mimeographed report entitled, "Man-Caused Forest Fires: The Psychologist Makes a Diagnosis." However, Shea's conclusions (derived from these studies) on the motivational aspects of human behavior in woods-burning were presented at the 65th annual meeting of the American Forestry Association in 1941.

program, and what could be done to improve the situation.[5]

He concluded that the large number of fires in these areas was the result of a general conflict between the forest community and the Forest Service. From an analysis of the data collected and from the point of view of what motivated the people to set fires, he suggested two major classes of man-caused fires: (1) fires which served an alleged interest, such as grazing, insect control, and so forth; and (2) fires of resentment and retaliation against the Forest Service because of alleged injuries, such as dispossession of land, fences, fire regulations, personal insults, and so forth. He also suggested a third minor class which he called "delinquency fires" or fires set as a result of a desire for excitement.[6]

The underlying cause of the major classes of man-caused fires in these National Forests was thought to be the practice of open range to which the forest residents had been accustomed for many years. Weltner further pointed out that

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[5]George H. Weltner, "Study of Attitudes Towards Woods Burning and the Forest Service in two Southern Districts" (Washington: United States Department of Agriculture, Forest Service, 1942), pp. 1-5. (Mimeographed.)

[6]*Ibid.*, p. 32.

the fear on the part of the people of having their cattle "driven off the range" by fences erected by the Forest Service, plus the resentment toward "outsiders" and poor public relations were the causes of increased woods-burning on the part of the forest residents.

These investigations, conducted almost twenty years ago, have given an insight into the causes of forest fires in the South. In reviewing the reports of these social scientists (psychologist and social psychologist respectively), it has become increasingly clear that there is not one "cause behind the cause" of man-caused forest fires. It is obvious that there are a number of causes growing out of the complex conditions--cultural, economic, psychological, and sociological--under which the various types of woods burners live. These investigations have also pointed out the need for research in the major factors which determine human behavior, such as human attitudes, social conditions, and cultures of forest residents and forest users.

One apparent weakness of these studies is the fact that they were confined entirely to National Forests. Consequently, most of the information obtained was of such a nature that it was directed toward the Forest Service as the possible scapegoat in explaining attitudes towards forest

fires. It should be remembered that the relations of local residents towards forest fires are just one part of the picture. This may be something like examining the relations of people with the police department as they influence attitudes towards crime. Any investigation of attitudes towards forest fires will inevitably get into the relations between the people and forest organizations, but if the inquiries are centered on other factors, such as tree growing and other benefits of forest land, more of the information collected will reflect ideas and attitudes of the people independent of the forestry organizations and their actions.

In addition to these investigations conducted during 1938 through 1941, two other studies are currently in progress where psychological investigations of human factors in forest fires are being made. The University of Southern California in cooperation with the California Forest and Range Experiment Station and the California Division of Forestry initiated one of these studies in 1956. The University of Mississippi in cooperation with the Southern Forest Experiment Station commenced investigations of human factors in forest fires in 1957. To date, only progress reports dealing primarily with methodology have been published from either of these investigations.

Although the investigations of Shea and associates and Weltner have been helpful in pointing out some of the underlying factors affecting man-caused forest fires, new studies of this situation are needed.

CHAPTER IV

METHODS OF INVESTIGATION

I. ANALYSIS OF FIRE OCCURRENCE

Essential to the understanding of the forest fire situation in Louisiana was the knowledge of the responsible causative agents. In addition, it was necessary to establish whether the fires within the state followed any set pattern. This phase of the fire problem was paramount to this study. Forest fires in Louisiana are the result primarily of human group behavior. Consequently, the question arose as to whether or not there was any consistency and order in this behavior, since it is recurrent behavior which reflects group life. In this connection the first phase of the study was to analyze the existing statistical reports of forest fires in Louisiana.

Initially, monthly fire report summaries of the Louisiana Forestry Commission for the period July, 1943 through December, 1959 were examined.[1] The data obtained from these

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[1]Reliable forest fire statistics for the entire state of Louisiana are not available prior to July, 1943.

reports were converted to number of fires per million protected areas for each month during the period. This was done so that the data could be compared on an equal basis, since the acres under protection varied from year to year. The data thus obtained was plotted in order to establish the changes and trends that had developed with respect to the occurrence of forest fires during the period.

After reviewing the monthly summary reports and the chart prepared therefrom, it was decided to make a detailed analysis of the forest fire statistics of each parish for the period January, 1955 through December, 1959. This interval of years[2] was selected because (1) it appeared to represent an average in fire occurrence, (2) it was a conservative interval with respect to weather conditions, and (3) the most reliable and inclusive fire statistics were available for this period. A series of tables were prepared from the basic fire data of the 1955-1959 period in order to gain a true perspective of the monthly and yearly fire occurrence by cause and damage for each of the forested parishes of Louisiana. After a review of this data, it was decided to

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[2]An interval of years was used since it was felt that an average of the fire occurrence for a period of years would be a more reliable measure of the fire situation.

confine the second phase of the study to the pine and pine-hardwood areas. In addition, those parishes which had only partial fire protection were also deleted. The parishes thus deleted are mostly confined to the Mississippi and Atchafalaya River Basins and the prairie section of Louisiana. They are entirely different from the other forested parishes with respect to vegetation type and fire conditions. The parishes thus selected for a detailed analysis of forest fire cause and occurrence are shown in Figure 1.

II. REGRESSION AND CORRELATION ANALYSIS

The second phase of the study measured the association between the incidence of fire and certain related social factors. This statistical procedure was accomplished by the use of correlation and regression analyses. In this procedure the problem of man-caused forest fires was viewed as human group behavior in relatively specific types of environment. This implies that the incidence, or number, of man-caused forest fires is a function of certain interrelated factors of the environment. Since the factors of the environment as well as the number of fires varied from parish to parish, they were designated as variables. The number of fires was assumed to be dependent upon the values and

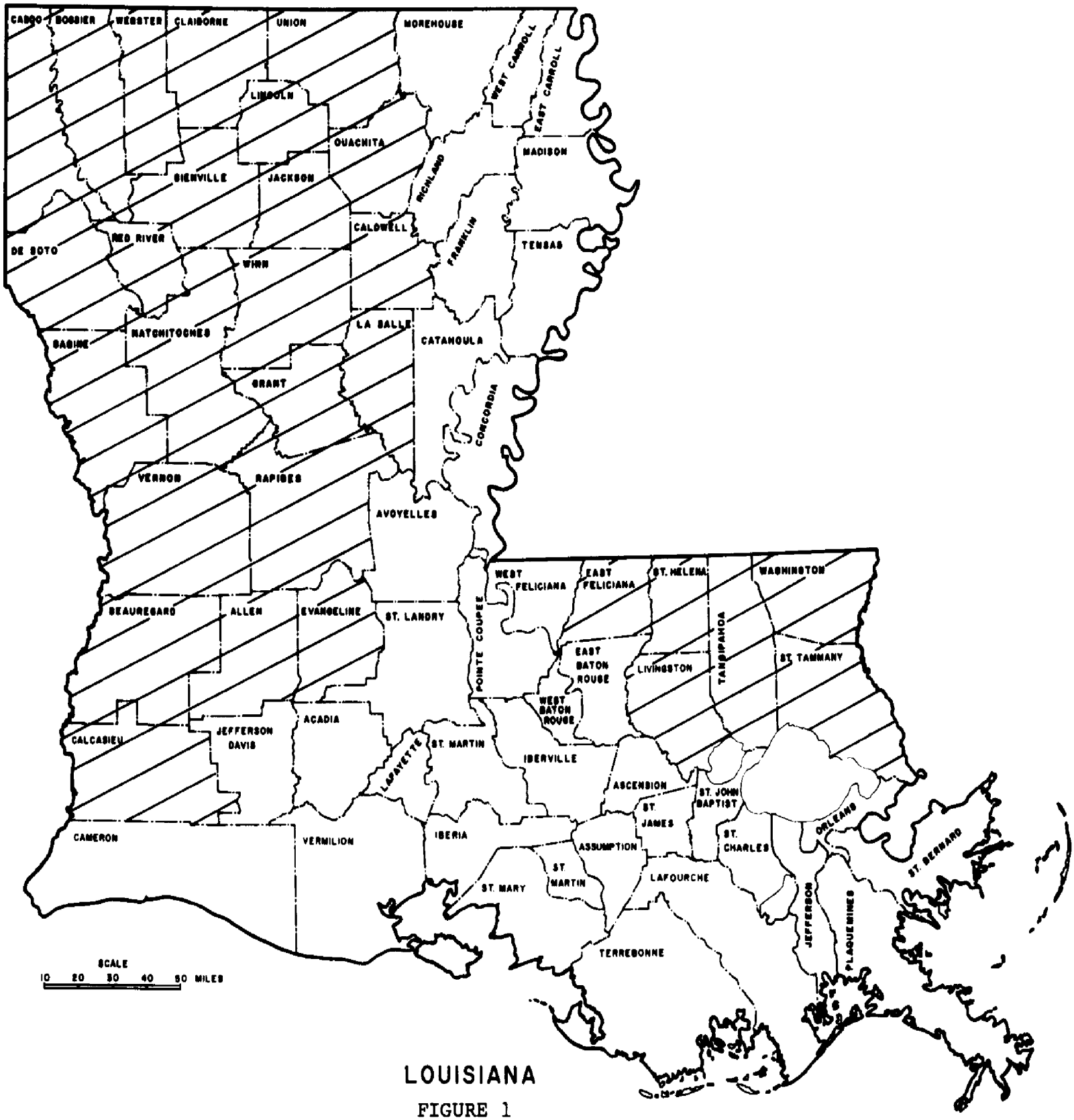

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FIGURE 1

LOCATION OF PARISHES WITHIN PINE AND PINE-HARDWOOD REGION

relationships of the variables present in the environment. Hence, the number of fires was the dependent variable (Y). The conditions (social, economic, and cultural) of the environment that operated to produce the dependent variable (number of fires) were therefore identified as independent variables (X_1, X_2, X_3, etc.). Thus, the number of man-caused forest fires was viewed as a function of the independent variables operating in a given environment.[3]

The over-all objective of the use of multiple regression analysis in this study was to determine statistically if the number of fires of various causes (expressed as Y_1, Y_2, and Y_3) depended on various socio-cultural and socio-economic variables (expressed as X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8) and, if so, to obtain a measure of the relationship. In this connection, the following dependent variables for each of the twenty-nine parishes in the pine and pine-hardwood areas were selected for analysis. Numerical values for each of the dependent variables were obtained from the previously analyzed forest-fire data.

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[3]In mathematical parlance Y is said to be a function of X, but in biological statistics the descriptive term "regression" is generally used. For a detailed explanation of regression and correlation analyses see George W. Snedecor, Statistical Methods (fifth edition; Ames, Iowa: The Iowa State College Press, 1956).

Y_1 = total number of forest fires per 10M protected acres during 1955-59 caused by incendiarism, debris burning, smokers, hunters, and campers.[4]

Y_2 = total number of forest fires per 10M protected acres during 1955-59 caused by incendiarism.

Y_3 = total number of forest fires per 10M protected acres during 1955-59 caused by debris burning.

Initially 24 independent variables which were assumed to be associated with the incidence of fires were selected for each of the predetermined parishes. These 24 variables were reduced to 8 by the combination of related variables into composite indices or through the deletion of those which duplicated the measurement of certain characteristics.[5]

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[4]For this analysis the man-caused fires due to lumbering, railroad, and miscellaneous causes were deleted. Lumbering and railroad fires are the result of occupational activities. Miscellaneous fires are the result of a variety of activities (see Appendix A).

[5]The 24 independent variables originally selected and for which numerical data were obtained for each parish were: (1) number of farms, (2) per cent land area in farms, (3) average size of farm, (4) average value (dollars) per farm of land and buildings, (5) per cent farm operators white, (6) per cent tenancy, (7) average age farm operator, (8) per cent farm operators working 100 or more days off farm, (9) per cent class one commercial farms, (10) per cent class two commercial farms, (11) per cent class three commercial farms, (12) per cent class four commercial farms, (13) per cent class five commercial farms, (14) per cent class six

The eight independent variables thus selected for the first multiple linear regression[6] on each of the above listed dependent variables were:[7]

X_1 = percentage of farm operators white.

X_2 = percentage of tenancy.

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commercial farms, (15) per cent part-time farms, (16) per cent part-retirement farms, (17) per cent farms reporting sale of forest products, (18) average amount (dollars) received per farm from forest products, (19) rural population density per square mile (1960), (20) educational expenditures per pupil in terms of average daily membership (1959), (21) effective buying income per household, (22) per cent households with cash effective buying income less than $2500, (23) per cent households with cash effective buying income between $4000-$6999, and (24) burning index. For a listing of the numerical values of each of the above variables by parish see Appendix B.

[6]Regression analyses were accomplished by the use of the IBM 650 electronic computer utilizing the One-Pass Multiple Regression Program number 6.2.003 of the Louisiana State University Computer Research Center. The writer is indebted to Dr. Barton R. Farthing, Statistician, Louisiana State University Agricultural Experiment Station, for his assistance in the preparation, analysis, and interpretation of the regression data.

[7]Numerical values for each of the independent variables were obtained from the following sources: variables X_1, X_2, X_3, and X_4--United States Bureau of the Census, 1959 Census of Agriculture--Preliminary (Washington: United States Department of Commerce, December, 1960); variable X_5--United States Bureau of the Census, 1960 Census of Population, Advance Reports: Louisiana (Washington: United States Department of Commerce, November, 1960); variable X_6--One Hundred Tenth Annual Report, Louisiana State Department of Education Bulletin 904 (Baton Rouge: State Department of Education, 1959); variable X_7--Sales Management: Survey of Buying Power (Memphis: Wallace Witmer Company, 1960), pp. 171-76; variable X_8--records of the Louisiana Forestry Commission.

X_3 = index of rural-farm economic level; determined from composite score of the percentage of each class of commercial farm.

X_4 = index of farm-forest economic situation; determined from composite score of percentage of farms reporting sale of forest products and the average return received by farmers reporting sale of such products.[8]

X_5 = rural population density per square mile.

X_6 = educational expenditures per student.

X_7 = percentage of households with cash effective buying income less than $2,500.

X_8 = burning index; determined by summing the burning indices for each day during 1955-59.[9]

An analysis was made of the data obtained in the regression of the various dependent variables on the eight

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[8]In a sense this variable is a measure of the appreciation of the value of trees as a crop if "forest-agriculture" is accepted as an innovation.

[9]Burning index is a measure of fire danger. It is a rating based on the variables affecting inflammability, such as fuel moisture and wind velocity. Its inclusion in this regression measures the unit of change in the number of fires for each unit of change of the non-human aspects of the environment.

independent variables. From this analysis certain independent variables were selected for a second multiple linear regression. The variables selected were the ones which showed a strong or statistically significant correlation[10] with the dependent variables and were not intercorrelated. The independent variables thus selected for the second multiple linear regression were as follows:

For regression on Y_1 : X_1, X_3, and X_6.

For regression on Y_2 : X_1, X_3, and X_6.

For regression on Y_3 : X_1, X_5, X_7, and X_8.

The data thus obtained from the correlation and regression analyses were tabulated and critically evaluated in an attempt to gain a better understanding of the complex problem.

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[10]It frequently happens that a mutual relationship exists between the measurements of certain natural phenomena, i.e., the variables tend to be related. Variables which exhibit such relationship are said to be correlated. The statistical measurement of such relationship is the correlation coefficient (r) which varies between -1 and +1. Correlation analysis does not imply a cause and effect relationship, it simply tells how closely two variables are related.

III. THE EXPERIMENTAL APPROACH

The final phase of the study was a comparison of the rural population[11] of a parish with a large number of fires with that of a parish with a small number of fires during the 1955-1959 period. The parishes selected for this pilot study were St. Helena (high number of fires) and East Feliciana (low number of fires). These parishes (Figure 2) were selected because they are adjacent and similar with respect to forest vegetation and climatic conditions, but different with respect to the occurrence and cause of forest fires. In a sense East Feliciana Parish was the control or check. Thus, the problem became one of determining whether or not the differences in fires between the two parishes were due to real differences in the human factors of the environment. In this connection the primary purpose of this phase of the study was to seek an understanding of the factors and conditions which motivate the behavior of rural residents within certain areas of Louisiana toward the forest. It was

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[11]The entire population has an effect on forest fires; however, a survey of the entire population was a task too large to undertake in this study. Consequently, only the segment of the rural population which lived in and nearby the forest was investigated.

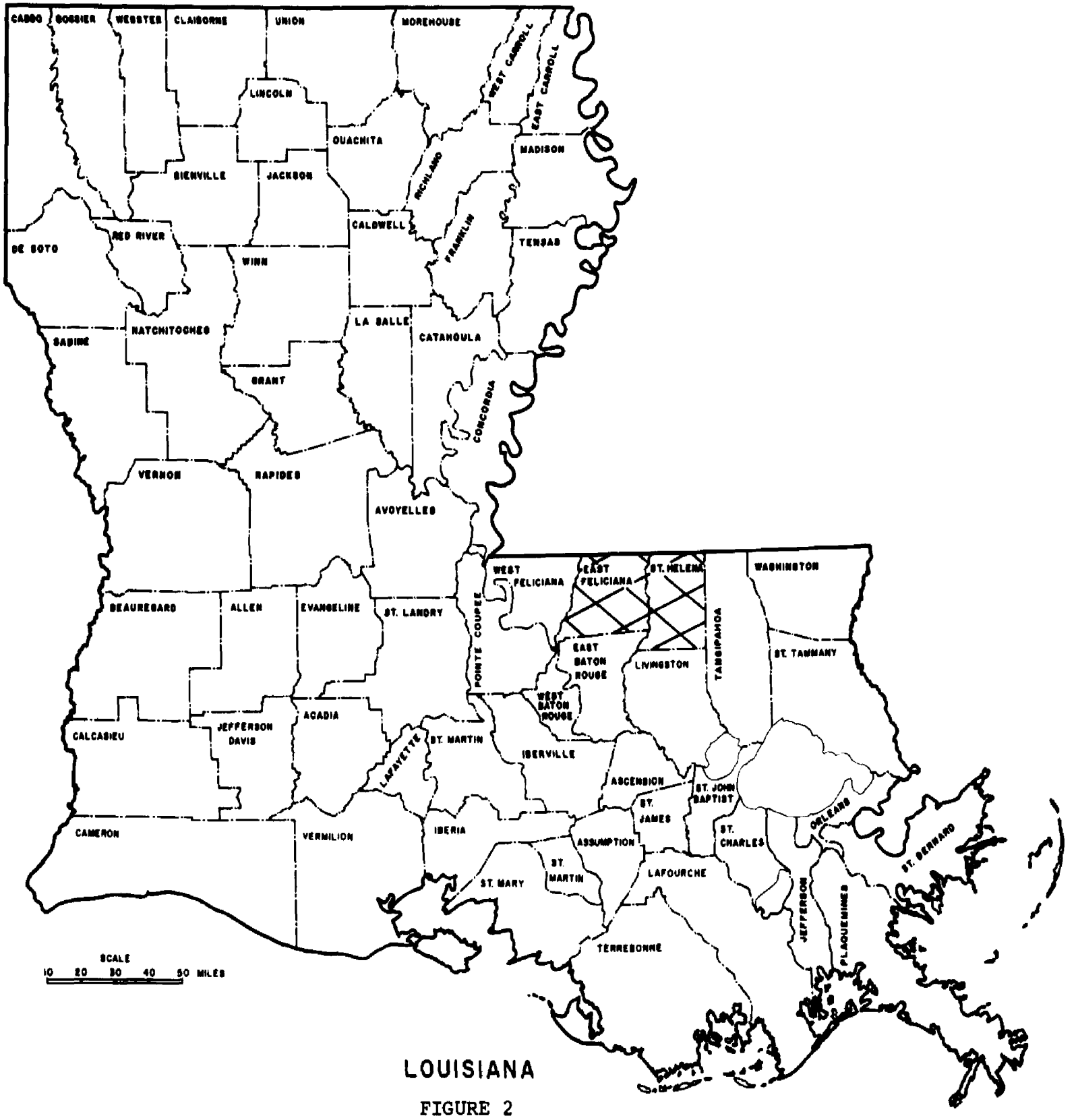

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FIGURE 2

LOCATION OF SAMPLE PARISHES SELECTED FOR PILOT STUDY

necessary, therefore, to obtain the attitudes of the people toward the forest and forest fires.

Probably the most useful concept in this study was that of attitude. Thurstone defines the concept attitude as "the sum total of a man's inclinations and feelings, prejudice or bias, preconceived notions, ideas, fears, threats, and convictions about any apecific topic."[12] Consequently, an attitude was thought of as a tendency to act in a certain way toward a situation.[13] These tendencies, and the factors behind them, of the forest residents to act favorably or unfavorably toward the forest became chief concern of the study. The tendencies to act in a certain way could not be observed directly; therefore, the attitudes of the people had to be determined from their verbal responses to questions.

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[12]L. L. Thurstone and E. J. Clave, The Measurement of Attitude (Chicago: The University of Chicago Press, 1929), pp. 7-9.

[13]The two indices of attitudes, or the observable phenomena correlated with them, which were used in this study were (1) the actions themselves which presuppose the attitudes, and (2) the opinions or verbal expression of attitudes.

Development of the Schedule

In order to obtain valid information from the forest residents relating to their attitudes toward the forest some type of interview was necessary. Due to the criminal taint of forest fires and the possible similarity of ideas of the people, a schedule employing both structured and unstructured type questions were used. The schedule was constructed and administered so as to give the impression that a general farm survey relating to problems of farming and rural life was being conducted.[14]

The schedule (interview guide) developed for the purpose of gathering information from rural residents in St. Helena and East Feliciana parishes pertaining to their attitudes and opinions about forestry and forest fires is included in Appendix C. The 46 questions used in the interview were selected after a careful review of other studies dealing with attitudes and opinions of rural residents that were similar in many respects to this investigation. Only 13 of the questions asked during the course of each interview were related in any way to forestry.

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[14]The schedule was in a sense an interview guide since considerable flexibility was used in asking the questions.

In order to take advantage of the best features of both the guided (structured) and nondirective (unstructured) type of interview the following procedure was followed. During the first part of each interview the standardized guided interview employing structured questions was used to obtain background information. As the interview progressed and rapport became established certain open-end type questions relating to farming and land use were introduced so as to encourage the respondent to "open-up" and reveal much about himself or any new information that might present interesting leads. In the final stages of the interview when the subject of forestry and forest fires was introduced the informal non-directive interview was used to secure information related to fires. This procedure necessitated the recording of much of the interviewee's conversation after leaving his presence. This presented no difficulties, however, provided notes were made adjacent to the questions during the course of the interview.

It was assumed prior to the pre-test of the schedule that some difficulty might be encountered if the questions related to forest fires were introduced directly. In view of this problem it was planned to introduce, if necessary, in an informal and indirect manner six questions related to forestry

after the formal interview had been completed and to record the answers after departing from the respondent. During the pre-test it was found that this was not a problem. In fact only twice during this entire phase of the investigation was it necessary to follow the procedure of seeking information in a nondirect manner.[15]

Sampling Procedure

In keeping with the conclusions of Shea and due to the complexity of the problem, only the rural population which lived adjacent to or within the forest was interviewed.[16] In order to assure a representation of this population a random sampling procedure based on probability area sampling as outlined by Houseman and Reed was utilized in

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[15]The procedure thus outlined in the developing and administering of the schedule proved to be successful in establishing rapport and soliciting information. The results were such that the informal (unstructured) interview appeared to be mere conversation following the apparent (structured) interview. Only in two instances during the entire course of the interview were persons approached who refused to cooperate.

[16]For purposes of this investigation the rural population was considered to be that population outside of incorporated towns and populated unincorporated places which had estimated populations of 100 or more and/or a density of more than approximately 100 persons in a square mile.

the investigation.[17]

Initially, parish highway maps for the year 1960 which indicated the location of farm units or dwellings were obtained for each parish. On the parish maps, boundaries of incorporated towns and populated unincorporated places for both parishes were delineated. In addition, for East Feliciana Parish certain other areas were delineated (Figure 3). These areas were: Ward 1--a nonforested area, East Louisiana State Hospital, Louisiana State University Idlewild Experimental Farm, and various large plantations.[18] The area thus remaining in each parish was used for the random selection of persons to be interviewed.

The parishes were next subdivided according to wards, since it was believed that these would be the smallest political divisions to which rural persons would identify themselves. The wards were then divided into counting units

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[17]Earl E. Houseman and T. J. Reed, Application of Probability Area Sampling to Farm Surveys, Agricultural Marketing Service, United States Department of Agriculture, Handbook 67 (Washington: Government Printing Office, 1954), pp. 3-13.

[18]The plantations which were deleted from the area to be sampled were Blairstown, Gayden, Dunham, Beechgrove, and Richland. These plantations are managed for the production of forest products and/or cattle.

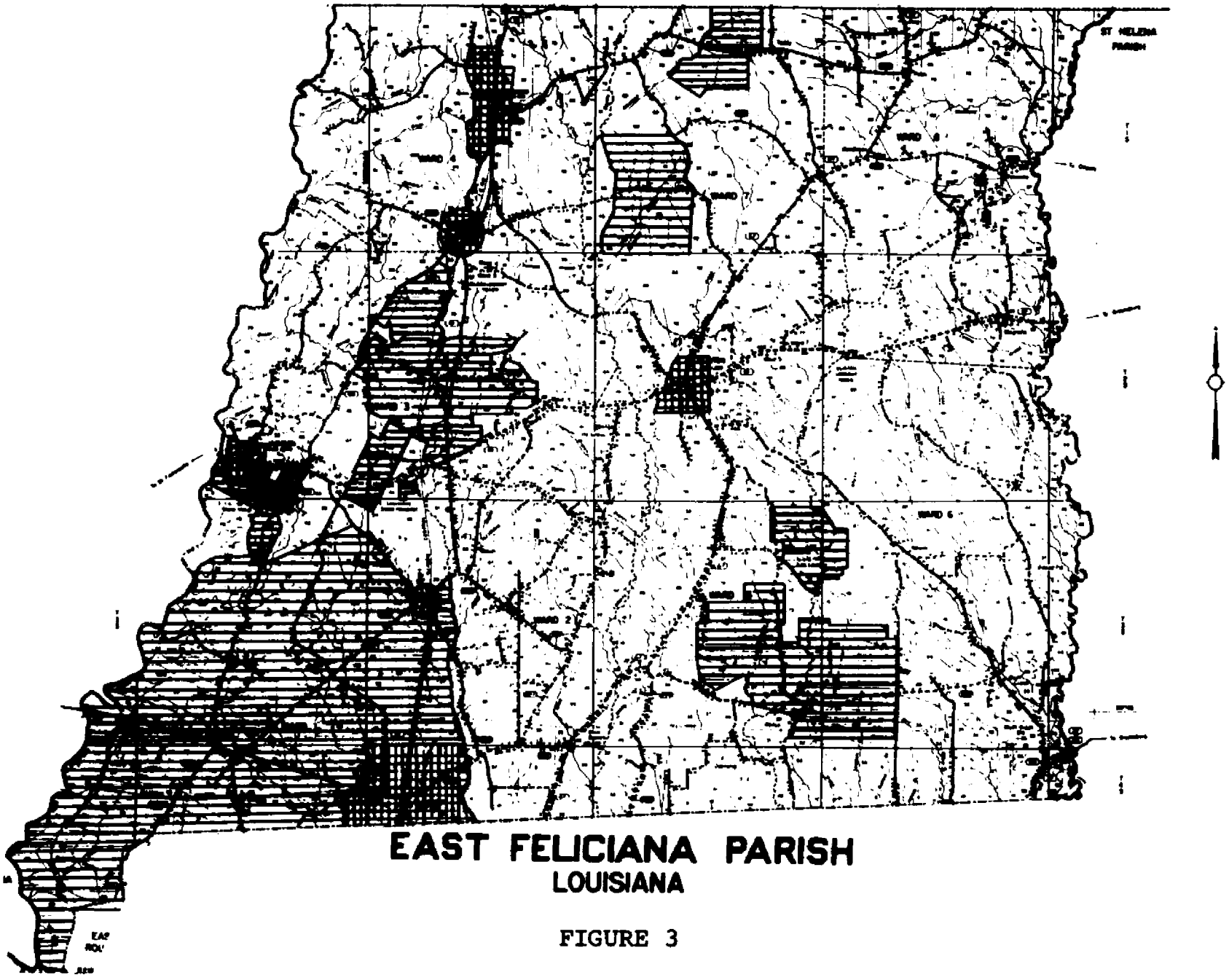

FIGURE 3

PLACES IN EAST FELICIANA PARISH NOT INCLUDED IN SAMPLE AREA

which contained from 40 to 60 farm buildings each. These counting units were areas in which farm dwellings tended to be grouped due to the location of roads and topographic features. Each counting unit was then numbered by wards and further assigned a number of sample segments without actually dividing the counting units into segments. The number of sample segments assigned to each counting unit depended on the number of farm dwellings within the unit. In any event it was intended that each sample segment would contain from 8 to 12 farm dwellings.[19]

The final step in the sampling procedure consisted of the actual selection of sample segments within which interviews were to be made. This procedure was accomplished by first randomly selecting a number of counting units from each ward. The number of counting units selected depended upon the number of farm units or dwellings in each ward as it had previously been decided that approximately 10 per cent of the farm dwellings were to be included in the sample. As

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[19]The number of farm units or dwellings assigned to each sample segment was approximately twice as large as suggested by Houseman and Reed. However, this was done in order to overcome the problem previously encountered in a rural central Louisiana parish. In this parish approximately one-half of the rural buildings indicated on the parish map were vacant or else were not dwellings.

a further control on the stratification of sampling areas, one counting unit was selected for every 8 to 12 of the farm dwellings that were to be included in the sample.[20] Once the counting units had been chosen at random they were subdivided into the assigned number of segments. One segment was then randomly selected from each counting unit. This procedure thus assured the selection of sampling areas in accordance with the density of farm dwellings, or rural population, for each word of each parish.

The random selection of houses from which people of a sample area are to be interviewed is often found to be unworkable. This is due to the fact that houses are encountered which are vacant, or the desired prospective interviewee is not at home, or the respondent is not cooperative. In order to overcome this anticipated problem in this study, one alternate sample segment was selected for approximately every three primary sample segments in each ward. The

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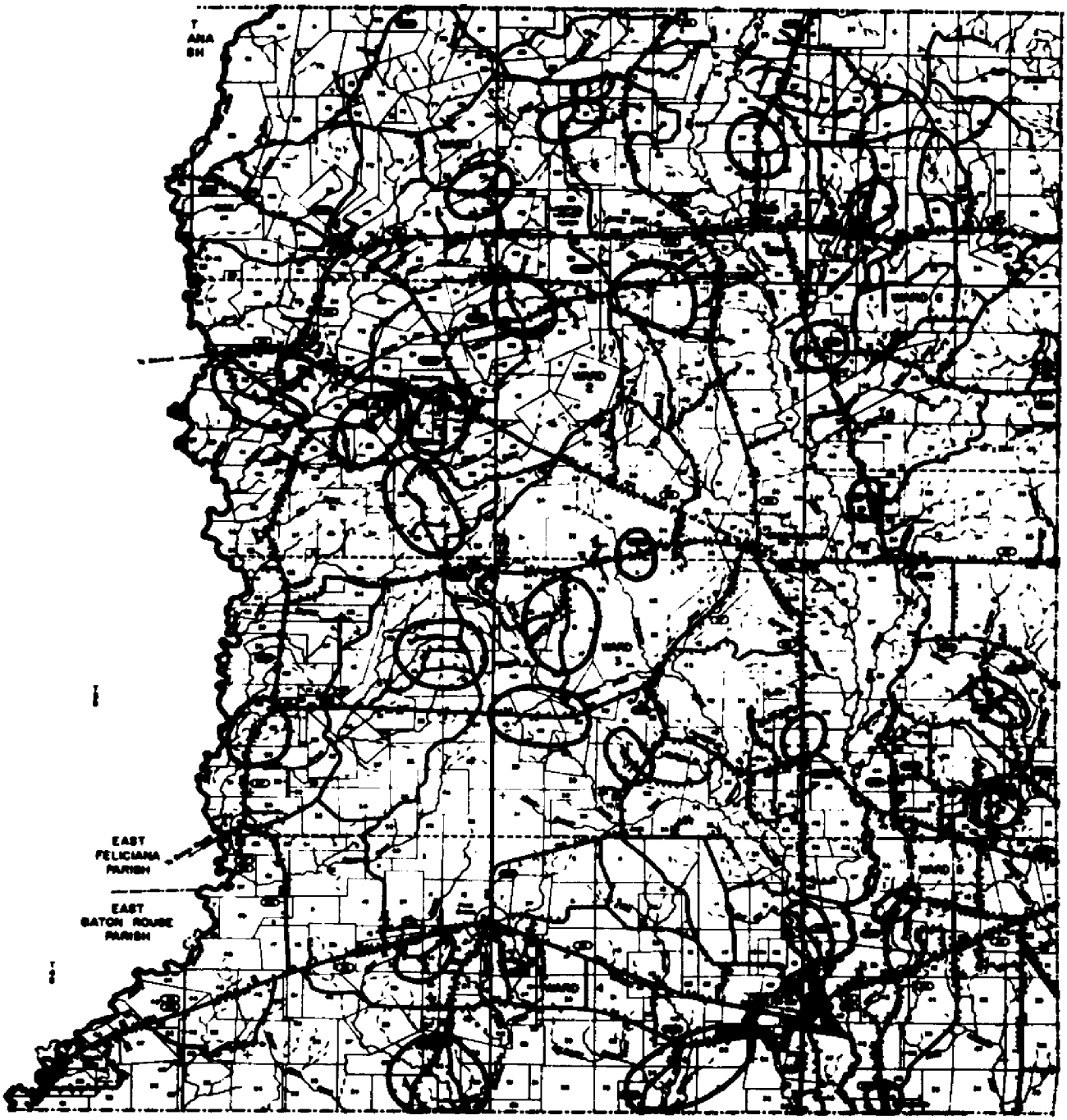
[20]An explanation of the procedure is as follows. Assume that a count made from a parish map of farm units or dwellings for a particular ward equaled to 358. Ten per cent of 358 equals to 36, or the number of farm dwellings to be included in the sample for the ward. Dividing this number 36 by 12, the maximum number of farm dwellings per sample segment, equals to 3, the number of counting units to be selected for the particular ward in question.

alternate sample segments were randomly selected in the manner previously described. The selection of alternate sample segments proved to be worthwhile since 14 of the total 16 designated alternate sample segments had to be utilized during the interview process.

The sample areas selected from which schedules were taken in St. Helena and East Feliciana parishes are shown in Figures 4 and 5. A total of 32 sample areas, 23 primary and 9 alternate, were delineated in St. Helena Parish. Twenty-seven of these areas, 20 primary and 7 alternate, were used in the interview process. A total of 24 sample areas, 17 primary and 7 alternate, were delineated in East Feliciana Parish. All of them were used in the interview process.

Interview Procedure

After the pre-test of the schedule and prior to commencing the interview process, a pre-investigation conference was held for the purpose of briefing the investigators on the general nature of the problem. At the conference land ownership maps showing cooperative ownerships of forest industries for both parishes were discussed. In addition fire occurrence maps which indicated the location of every fire by month, by year during the 1955-1959 period for both parishes



ST. HELENA PARISH

LOUISIANA

FIGURE 4

LOCATION OF SAMPLE SEGMENTS IN ST. HELENA PARISH

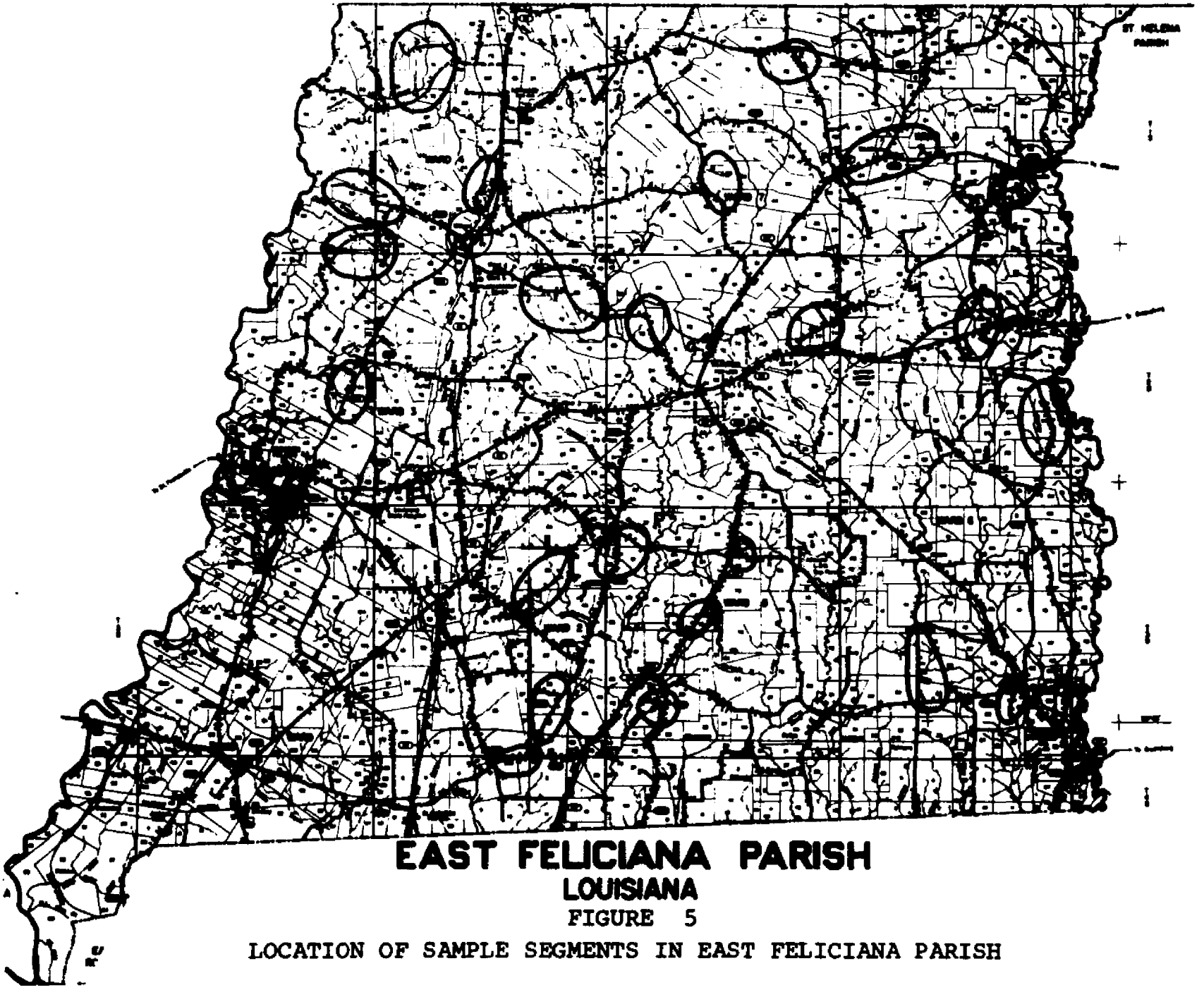


FIGURE 5

LOCATION OF SAMPLE SEGMENTS IN EAST FELICIANA PARISH

were also presented.[21]

These charts were discussed in detail with the investigators so that each would have a knowledge of land ownership and the related fire occurrence patterns in each of the parishes. Investigators were also briefed on the general farming and economic conditions of each parish. It was believed that this knowledge would be helpful to the investigators during the course of interviewing.

Interviewing began in St. Helena Parish on July 18, 1960. It was completed in East Feleicana Parish on August 19, 1960. Data were collected by four experienced investigators, including the author, working in teams of two. A total of 219 interviews, 118 in St. Helena Parish and 101 in East Feliciana Parish, was conducted. An average of about three interviews per day per man were made during the interview process.

Every attempt was made to interview men rather than women, since they were more likely to be heads of household. The rationale for this decision was based on the belief that male heads of household would be more likely to have knowledge

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[21]The basic data necessary for the construction of land ownership and fire occurrence maps for St. Helena and East Feliciana parishes were obtained from District 1, Louisiana Forestry Commission.

of the information sought and, since the interviewers were all males, would be the easier sex with which to establish rapport. When the male head of a household was not available, another responsible adult member of the household, usually the wife, was interviewed. This procedure resulted in a final ratio of approximately five men to each woman in St. Helena Parish and two men to each woman in East Feliciana Parish.

A more or less standardized procedure was developed to facilitate the establishment of rapport with the respondents and to improve the possibilities of collecting valid data. The procedure consisted of an introduction, a statement that the investigator was an employee of Louisiana State University, and a statement that the University was interested in the problems of farmers and as such was conducting a survey on the problems of rural living and farm life in the area.[22] Each investigator was furnished with a letter of

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[22]During the course of the interviewing in St. Helena Parish it was found that the color of the automobile in which the interviewers traveled was related to their initial acceptance by some of the interviewees. When traveling in a black automobile some reluctance was expressed initially by respondents. However, if the color of the car was green acceptance was spontaneous. It was discovered that a black automobile identified the interviewers as "a welfare worker." Whereas, a green automobile identified them as employees of "the telephone company." At the time Southern Bell Telephone and

introduction from the county agent to be shown if needed. The nature of the research had been discussed with the County Agent of each parish prior to commencing the study.

Analysis of Data

After the collection of data had been completed by the interview process, the schedules were reviewed in order to develop some systematic procedure for the classifying of answers made in response to the open-end questions.

Initially, a sample number of schedules was selected. The answers given on these schedules in response to the unstructured questions were recorded on a master sheet and reviewed. Following this review, various categories were developed and coded into which similar responses to the same questions could be placed.

A detailed review of each schedule was then made. Data from the schedule were coded and transferred to International Business Machine cards to further facilitate the analysis of the data. The facilities and equipment of the Computer Research Center of Louisiana State University were

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Telegraph Company was in the process of establishing rural telephone facilities in the parish. Also, it was learned that many of the rural resident were already receiving welfare checks.

used for the transfer and analysis of data.

Frequency distributions by number and percentages of respondents by parish were used in analyzing and presenting the data pertaining to the characteristics of respondents and their attitudes and opinions towards forestry and forest fires.

CHAPTER V

FOREST FIRE OCCURRENCE: ITS RELATIONSHIP TO VARIOUS SOCIAL FACTORS

I. PATTERN OF FIRE OCCURRENCE

A major concern of the study was the determination of the pattern of fire occurrence. Furthermore, a measure of the relation of this occurrence to the various causative agents was considered a prerequisite to the understanding of the problem so that it could be further investigated.

The occurrence of fires in the forest of Louisiana has followed a definite pattern throughout the 17-year period from July, 1943 through December, 1959. This pattern of fire occurrence is graphically presented in Figure 6.

This illustration shows that in relation to area protected there has been, on the average, a gradual increase in the number of fires during the period. In general, the curves indicate that the occurrence of fires tended to be cyclic.

The number of fires increased steadily from 1944

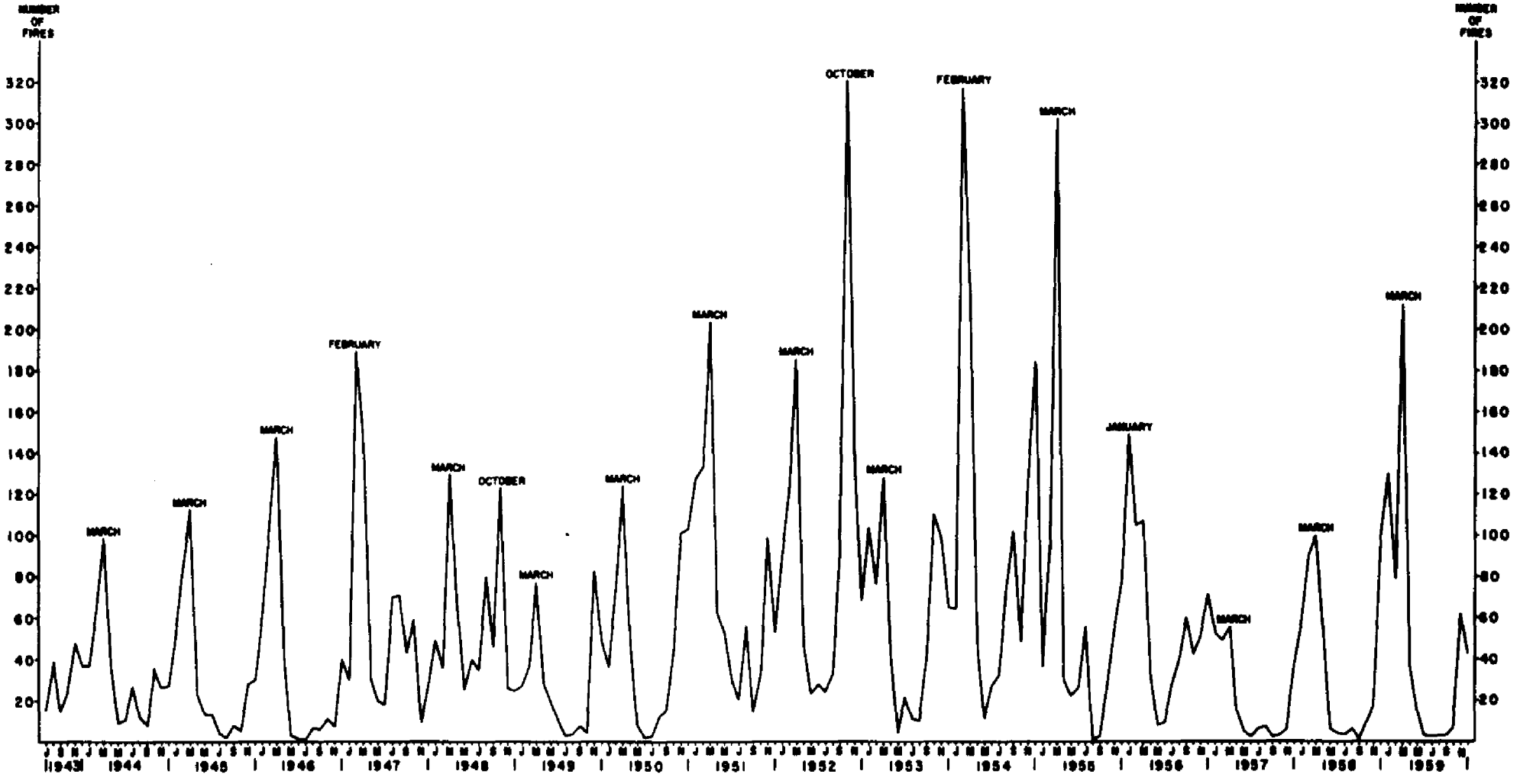


FIGURE 6-NUMBER OF FOREST FIRES PER MILLION ACRES OF LAND PROTECTED IN LOUISIANA FOR THE PERIOD JULY 1943 THRU DECEMBER 1959

through 1947. A decrease in fire occurrence is noted beginning in 1948 and continuing through 1950, at which time it took a sharp upturn. The peak in fire occurrence for the period was reached during the years 1952, 1953, and 1954. A decrease is again noted in 1956 and 1957, followed by another upturn in 1958 which continued on through the end of the period.

The periodic cyclic occurrence of fires is without a doubt somewhat related to weather phenomena. Weather records indicate that the years 1948, 1949, and 1950 were "wet" years. Considerable precipitation also occurred in 1956, 1957, and 1958. In fact, 1957 was the "wettest" year on record in many sections of Louisiana. In contrast, drought conditions were prevalent throughout Louisiana in 1952 and 1954. However, insofar as the data presented in Figure 6 are concerned, it is significant to note that the fire pattern remained the same and that the yearly occurrence of fires was greater at the end of the 17-year period than the beginning.

Probably the most significant feature of the data presented in Figure 6 is the close similarity in the pattern of fire occurrence for each year during the period. For 13 out of 16 full years represented by the chart, the maximum number of fires occurred in the early spring (eleven times in March

and twice in February). Only twice during the entire period (once in November and once in October) did the number of fires per year reach a maximum during the fall months. The curves show the number of fires to be relative low in January and February followed by a rapid increase in March. In the months that follow the number of fires decreased until the minimum was reached during the summer months after which an increase again occurred.

The monthly variation in fire occurrence was also related to the conditions of the weather and the vegetation, since both have a determining influence on the combustion of fuels and fire behavior. Climatic conditions (humidity, precipitation, wind velocity, and so forth) in Louisiana during the spring and fall months are suited for woods burning. The dead and/or dry condition of the vegetation at this time further increases the fire hazard. However, these factors in Louisiana only provide the conditions for burning. They do not cause fires _per se_.

The incidence and occurrence of fires in Louisiana are the result primarily of human behavior, since over 99 per cent are caused by man. Consequently, the answer as to why there are large number of fires during March must be sought in the factors that motivate human behavior during this period

toward woods burning. Of utmost consideration in this respect is the practice of the use of fire to improve grazing conditions for cattle.

In Louisiana in areas of open range this use of fire is incendiarism (simple arson) since it is the deliberate burning of the land of another. The removal of dead vegetation from the range by the use of fire in the spring is extremely important to the open-range cattlemen. The rapid release of plant nutrient elements as a result of burning increases the early growth of grass. Also, the removal of the dead vegetation makes the new grass easier to eat. This "early grass" is of considerable economic importance to the cattlemen as it is much needed for their cattle that have "overwintered" on a range consisting mostly of stubble. The deliberate burning of the range and/or forest in the fall would be an economic loss to the cattlemen because the dead vegetation that provides winter forage would be destroyed.

Fires started for the purpose of destroying the forest of another are most destructive in Louisiana in the spring because of the influence of favorable weather conditions, which increase their rate of spread, and also because of the growth conditions of the trees. In addition, fires which have escaped from burning debris are also most likely

to occur in March, since "spring cleaning," a cultural activity, mostly occurs at this time of the year. In this respect, patterns of human behavior are also related to the monthly variations in fire occurrence.

II. NUMBER, DISTRIBUTION, AND CAUSES OF FIRES

The results of the analysis of fire statistics for the 5-year period 1955 through 1959 give a further insight into the problem.

As of 1959 there were 41 forested parishes in Louisiana that had all or part of their forested acreage under fire protection. These parishes with a land area of approximately 19,722,700 acres had 11,602,000 acres of forest land under protection (Table III). This forested acreage is 72 per cent of the total commercial forest area of the state.

During the 5-year period 1955 through 1959 there occurred in this area of protected forests a total of 26,755 fires. This was an average of 5,351 fires per year. The number of fires ranged from a high of 6,684 in 1955 to a low of 2,423 in 1957.

The data in Table III further indicate that four parishes, Livingston, Beauregard, Allen, and St. Tammany, with a total of 1,774,000 forested acres (15 per cent of the

TABLE III

NUMBER OF FOREST FIRES ON PROTECTED AREAS IN LOUISIANA BY PARISH
BY YEAR DURING 1955-59

Parish	Acres		Year					Total
	Total	Protected	1955	1956	1957	1958	1959	
Livingston	425,600	316,000	1,335	464	265	764	1,069	3,897
Beauregard	757,800	676,000	595	843	262	534	693	2,927
Allen	496,000	352,000	529	622	318	430	493	2,392
St. Tammany	581,000	430,000	534	362	308	523	543	2,270
Rapides	850,500	548,000	248	466	176	275	329	1,494
Tangipahoa	513,900	372,000	309	171	113	356	542	1,491
St. Helena	268,800	213,000	384	290	131	283	354	1,442
Vernon	870,400	510,000	282	300	82	168	251	1,083
Evangeline	430,100	130,000	156	288	106	162	190	902
Calcasieu	706,600	265,000	212	246	105	144	150	857
Caddo	570,200	290,000	167	303	36	47	97	650
Natchitoches	830,000	489,000	197	272	36	60	78	643
Sabine	658,600	548,000	203	234	36	47	83	603
Washington	425,600	291,000	142	93	51	98	80	464
Bossier	538,200	350,000	85	188	25	46	108	452
Webster	400,000	253,000	107	126	38	58	109	438
Winn	608,000	451,000	98	181	11	60	76	426
LaSalle	408,300	255,000	139	139	25	37	74	414
Union	579,900	463,000	110	118	29	41	60	358
Bienville	528,600	377,000	79	110	39	43	86	357
DeSoto	571,600	360,000	73	151	25	22	49	320
Jackson	373,100	311,000	142	91	21	24	39	317
Claiborne	490,200	295,000	100	89	32	24	63	308
Ouachita	410,900	283,000	50	92	24	37	44	247
Lincoln	300,200	179,000	34	68	19	39	55	215

TABLE III (Continued)

Parish	Acres		Year					Total
	Total	Protected	1955	1956	1957	1958	1959	
Grant	428,800	226,000	45	72	16	18	55	206
Caldwell	352,000	294,000	63	65	9	30	26	193
E. Feliciana	290,600	170,000	20	45	18	21	43	147
Red River	264,300	142,000	23	45	8	15	42	133
Concordia[a]	453,800	353,000	5	40	5	9	12	71
Tensas[a]	398,700	246,000	9	27	2	3	3	44
Franklin[a]	414,700	166,000	18	63	6	19	32	138
Richland[a]	368,600	154,000	21	41	2	26	50	140
Madison[b]	423,700	296,000	--	9	1	8	16	34
E. Carroll[b]	276,500	147,000	--	1	0	9	14	24
W. Carroll[a]	227,800	102,000	16	59	0	15	21	111
Morehouse	514,600	125,000	60	81	23	30	33	227
Catahoula	468,500	90,000	77	82	14	20	21	214
E. Baton Rouge	295,700	55,000	15	18	3	14	21	71
Avoyelles	528,600	9,000	1	1	1	1	4	8
Jefferson Davis	421,100	20,000	1	18	2	3	3	27
Total	19,722,700	11,602,000[c]	6,684	6,974	2,423	4,563	6,111	26,755

[a]Under fire protection since October, 1955.

[b]Under fire protection since October, 1956.

[c]Area of complete protection in the two general forest types:
9,914,000 acres - Pine and Pine-Hardwood Type
1,688,000 acres - Delta Hardwoods.

total protected), accounted for 43 per cent of the forest fires during the period. Two of the parishes, Livingston and Beauregard, accounted for 26 per cent. Livingston Parish alone, with less than 3 per cent of the forest land under protection, accounted for 15 per cent of the fires.

The area burned as a result of fires during the 1955-1959 period was 467,686 acres (Table IV). The burned acreage ranged from a yearly high of 129,581 acres in 1956 to a low of 38,361 acres in 1957: it averaged 93,537 acres per year.

The parish with the largest acreage burned was Beauregard with 29 per cent of the total. Allen and St. Tammany parishes also had a large number of acres burned. In fact, these three parishes accounted for 54 per cent of the burned acreage during the period. The vegetation type in these parishes is extremely favorable for the rapid spread of incendiary fire, which is the major type of fire in the three parishes.

It is of interest to note that during the 5-year period 1955 through 1959 the acreage burned in Beauregard Parish amounted to 20 per cent of the parish's forested area under protection. A similar situation existed in Allen Parish where 19 per cent, and in Evangeline Parish where 16 per cent, of the forested acreage burned over in a 5-year period.

TABLE IV

NUMBER OF ACRES BURNED BY FOREST FIRES ON PROTECTED AREAS IN LOUISIANA BY PARISH BY YEAR DURING 1955-1959

Parish	Year 1955	1956	1957	1958	1959	Total	Per Cent of Total
Livingston	10,063	2,099	2,535	7,032	8,252	29,981	6.4
Beauregard	24,548	44,581	10,625	27,474	28,241	135,471	29.0
Allen	15,458	19,192	6,265	12,135	15,062	68,112	14.6
St. Tammany	10,894	10,193	6,189	9,582	13,133	49,991	10.8
Rapides	1,817	3,688	847	1,425	2,953	10,730	2.3
Tangipahoa	6,710	2,175	3,135	5,748	11,798	29,566	6.3
St. Helena	2,892	1,621	1,094	2,408	2,852	10,867	2.3
Vernon	3,479	2,360	638	4,202	5,617	16,296	3.5
Evangeline	3,653	6,380	1,290	6,949	2,463	20,735	4.4
Calcasieu	6,521	7,858	3,359	4,260	3,255	25,253	5.4
Caddo	1,348	7,883	95	229	4,794	14,349	3.1
Natchitoches	1,716	1,793	266	418	738	4,931	1.1
Sabine	671	2,366	64	71	517	3,694	.8
Washington	1,148	341	190	460	297	2,436	.5
Bossier	540	2,785	109	161	1,132	4,727	1.0
Webster	943	652	244	697	1,563	4,099	.9
Winn	271	623	46	163	393	1,496	.3
LaSalle	673	314	143	105	167	1,402	.3
Union	494	351	103	105	426	1,479	.3
Bienville	604	920	221	628	485	2,858	.6
DeSoto	412	1,338	112	112	663	2,637	.6
Jackson	1,007	553	99	126	233	2,018	.4
Claiborne	942	890	204	359	436	2,831	.6
Ouachita	201	529	57	181	195	1,163	.2

TABLE IV (Continued)

Parish	Year 1955	1956	1957	1958	1959	Total	Per Cent of Total
Lincoln	199	301	104	629	456	1,689	.4
Grant	87	191	19	27	221	545	.1
Caldwell	71	64	12	37	34	218	.04
E. Feliciana	164	386	61	93	293	997	.2
Red River	74	154	9	82	230	549	.1
Concordia	7	1,454	14	27	165	1,667	.3
Tensas	32	222	1	1	20	276	.05
Franklin	354	1,040	13	208	1,203	2,818	.6
Richland	375	582	1	660	1,984	3,602	.8
Madison	--	69	2	29	184	284	.06
E. Carroll	--	0	0	17	160	177	.03
W. Carroll	84	2,001	0	261	1,956	4,302	.9
Morehouse	473	361	100	248	323	1,505	.3
Catahoula	116	145	32	25	23	341	.07
E. Baton Rouge	109	41	4	37	80	271	.05
Avoyelles	12	1	2	1	6	22	.004
Jeff. Davis	40	984	55	105	17	1,201	.2
Total	99,207	129,581	38,361	87,517	113,020	467,686	100.0

The causes of the forest fires that burned in Louisiana during 1955 through 1959 are listed in Table V. These data show that incendiarism accounted for almost 68 per cent of all the fires. This single causative factor resulted in a total of 18,138 fires which ranged from a high of 4,632 in 1955 to a low of 1,767 in 1957. Fires resulting from debris burning, smokers, and hunters were the only other major causative factors. These cause classes, generally referred to as the "carelessness group," accounted for 22 per cent of the fires. Thus, 90 per cent of all the fires that burned in the protected forests of Louisiana during 1955 through 1959 were caused by incendiarism, debris burning, smokers, and hunters.

Acreage burned is one of the better methods of assessing fire damage. This is especially true when the cause class is also considered. In recent years the acreage lost yearly to forest fires regardless of the cause has decreased, even though there has been little change in the number of fires. This has been due primarily to improvements in fire detection and control. In spite of this, there is still a relationship between the number and causes of fires and acreage burned. The data presented in Table VI show the relationship between fire cause and acres burned.

TABLE V

NUMBER OF FOREST FIRES ON PROTECTED AREAS IN LOUISIANA
BY CAUSE BY YEAR DURING 1955-1959

Cause	Year					Total	Per Cent of Total
	1955	1956	1956	1958	1959		
Incendiary	4,632	4,303	1,767	3,389	4,047	18,138	67.8
Debris burning	428	612	166	322	609	2,137	8.0
Smokers	354	587	144	229	594	1,908	7.1
Hunters	477	838	170	349	122	1,956	7.3
Campers	65	52	10	15	267	409	1.5
Logging	136	196	34	50	65	481	1.8
Railroad	32	116	44	58	100	350	1.3
Lightning	23	81	4	6	14	128	.5
Miscellaneous	537	189	84	145	293	1,248	4.7
Total	6,684	6,974	2,423	4,563	6,111	26,755	100.0

TABLE VI

ACRES BURNED BY FOREST FIRES ON PROTECTED AREAS IN LOUISIANA
BY CAUSE BY YEAR DURING 1955-1959

Cause	Year 1955	1956	1957	1958	1959	Total	Per Cent of Total	Average Size
Incendiary	86,732	102,326	33,257	75,140	83,947	381,402	81.6	21.0
Debris Burning	3,702	6,742	1,514	5,081	14,814	31,853	6.8	14.9
Smokers	1,537	2,878	385	1,262	4,541	10,603	2.3	5.6
Hunters	2,531	5,069	1,007	2,434	1,211	12,252	2.6	6.3
Campers	350	180	9	45	2,603	3,187	.7	7.8
Logging	1,229	1,260	1,060	117	737	4,403	.9	9.2
Railroad	118	853	301	952	821	3,045	.7	8.7
Lightning	123	488	10	9	78	708	.1	5.5
Miscellaneous	2,885	9,785	818	2,477	4,268	20,233	4.3	16.2
Total	99,207	129,581	38,361	87,517	113,020	467,686	100.0	
Damage (dollars)	$466,010	$554,592	$144,733	$378,556	$514,602	$2,058,493		

The total forest acreage burned by incendiary fires during the period was 381,402 acres. It ranged from a high of 102,326 acres in 1956 to a low of 33,257 acres in 1957 and averaged 76,280 acres per year. The forested area burned as a result of incendiary fires amounted to 82 per cent of the total burned. The only other major cause class in this respect was debris burning, which accounted for 7 per cent of the acreage burned. Thus, with respect to fire damage, incendiarism and debris burning were the major problem since they accounted for 89 per cent of the acreage burned. Another factor which increases the seriousness of the problem is the fact that fires resulting from incendiarism and debris burning are the largest in area covered per fire. For the period of the study, incendiary fires averaged 21 acres in size while the size of fires resulting from debris burning was 15 acres. This is not unusual since incendiary and debris-burning fires occur at a time when the forest burns most readily.

The data in Table VI also show that the total damage resulting from forest fires for the period was $2,058,493.00. This was an average of $411,698.00 per year.

The majority of the fires that burned in the protected forest of Louisiana during 1955 through 1959 were in the 29

parishes that are situated within the pine and pine-hardwood areas of the state. During the period of the study 25,646 fires or 96 per cent of the total for the entire protected forested area of the state occurred within this area. As the data in Table VII indicate, there were essentially no differences in the causes of fires within the pine and pine-hardwood forest and the state as a whole.

There was a minor increase (2 per cent) in the incendiary fires in this area; however, this was offset by a decrease in debris burning and hunter fires. The net result was that incendiary, debris burning, smoker, and hunter fires accounted for the same percentage of fires in the pine and pine-hardwood region as they did for the entire forested area of the state.

The yearly pattern of fire occurrence in the pine and pine-hardwood region for the 1955-1959 period was similar to that of the entire state during 1943 through 1959 (Figure 7). The curve shows that within this area the maximum number of fires also occurred in March. The data in Figure 7 also indicat that there was a strong relationship (correlation) between the monthly burning index of the entire region and the total number of fires for the 1955-1959 period.

In studying the distribution of type of fire to time

TABLE VII

NUMBER OF FOREST FIRES IN PINE AND PINE-HARDWOOD AREAS OF LOUISIANA DURING THE 5-YEAR PERIOD 1955-1959

Parish	Cause									Total	Per Cent of Total
	Incendiary	Debris Burning	Smokers	Hunters	Campers	Logging	Railroads	Lightning	Misc.		
Livingston	3,745	64	27	14	3	18	2	0	24	3,897	15.2
Beauregard	2,555	123	26	34	10	20	31	15	113	2,927	11.4
Allen	2,165	40	83	21	6	15	7	0	55	2,392	9.3
St. Tammany	1,927	166	77	21	4	9	4	8	54	2,270	8.9
Rapides	1,272	78	34	19	11	24	28	3	25	1,494	5.8
Tangipahoa	1,257	89	34	53	15	11	3	10	19	1,491	5.8
St. Helena	1,083	42	120	75	7	10	0	1	104	1,442	5.6
Vernon	748	41	85	45	29	33	22	16	64	1,083	4.2
Evangeline	834	6	16	10	0	2	0	0	34	902	3.5
Calcasieu	726	34	27	20	5	4	8	1	32	857	3.3
Caddo	42	192	230	88	16	11	18	3	50	650	2.5
Natchitoches	254	44	110	132	44	26	2	5	26	643	2.5
Sabine	186	38	78	143	41	36	26	9	46	603	2.4
Washington	282	63	52	30	5	3	0	6	23	464	1.8
Bossier	44	87	71	150	35	18	16	1	30	452	1.8
Webster	39	143	70	47	7	9	71	1	51	438	1.7
Winn	141	68	59	98	13	41	7	6	13	426	1.7
LaSalle	179	40	55	32	6	22	8	1	71	414	1.6
Union	36	70	31	90	15	31	3	3	79	358	1.4
Bienville	44	98	93	49	10	15	8	11	29	357	1.4
DeSoto	37	55	74	89	14	17	7	2	25	320	1.3

TABLE VII (Continued)

Parish	Cause									Total	Per Cent of Total
	Incen-diary	Debris Burning	Smok-ers	Hunt-ers	Camp-ers	Log-ging	Rail-roads	Light-ning	Misc.		
Jackson	112	59	8	59	13	12	4	4	46	317	1.2
Claiborne	14	108	94	30	3	8	1	1	49	308	1.2
Ouachita	18	40	86	49	10	9	15	0	20	247	1.0
Lincoln	38	71	44	21	2	8	9	0	22	215	.8
Grant	43	38	41	42	4	11	16	3	8	206	.8
Caldwell	31	22	44	48	7	10	8	3	20	193	.8
E. Feliciana	28	38	32	18	3	4	7	2	15	147	.6
Red River	39	22	26	16	12	9	1	1	7	133	.5
Total	17,919	1,959	1,827	1,543	350	446	332	116	1,154	25,646	100
Per Cent of Total	69.9	7.6	7.1	6.0	1.4	1.7	1.3	.5	4.5		

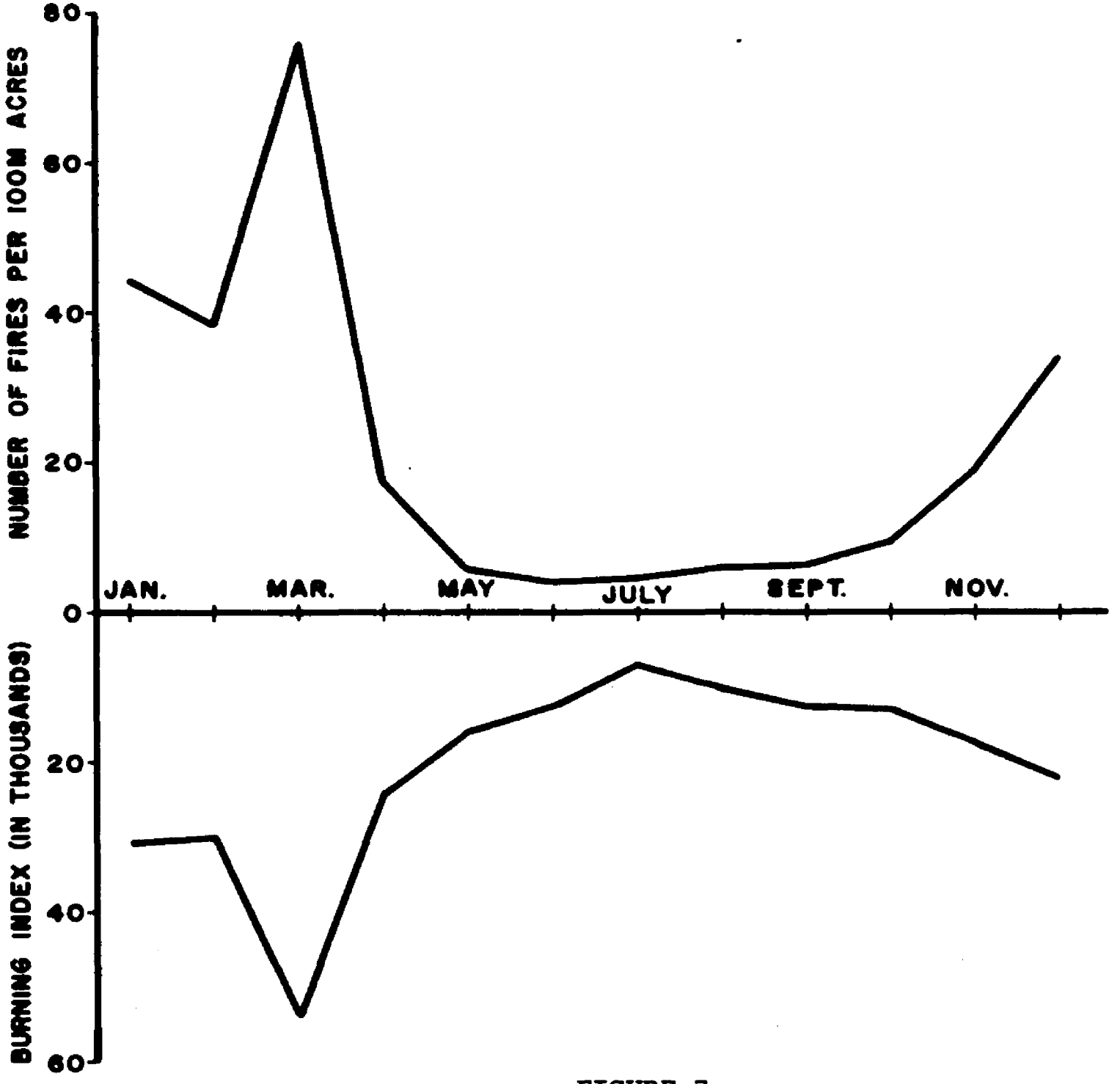


FIGURE 7

AVERAGE NUMBER OF FIRES PER MONTH IN THE PINE AND PINE-HARDWOOD REGIONS OF LOUISIANA, 1955-59, RELATED TO THE BURNING INDEX

of year certain differences are revealed (Table VIII). Incendiary fires, although higher than any other single cause regardless of season, occurred mostly in the late winter and early spring months. In fact, 52 per cent of all the incendiary fires during the 1955-1959 period were in the months of February and March. Fires resulting from debris burning and smokers were similar in occurrence to incendiary fires. Hunter fires occurred mostly during December, although they were high also in November and January. The peak months for camper fires were November, December, and March. Fires resulting from logging and railroad activity tended to be greatest during the winter and early spring, while lightning fires were confined to the summer months.

It was assumed that the concentration of large numbers of incendiary fires in a specific period and in a few parishes would cause a yearly pattern of fire occurrence for the pine and pine-hardwood region that would be completely different from most of the parishes that were in the region. In this connection fire occurrence curves for each of the 29 parishes were constructed (Appendix D). These curves show that in general the pattern of fire occurrence was essentially the same for all parishes. There were, however, ten parishes that deviated from the average pattern of occurrence as

TABLE VIII

NUMBER OF FOREST FIRES IN PINE AND PINE-HARDWOOD AREAS OF LOUISIANA BY CAUSE BY MONTH DURING THE 5-YEAR PERIOD 1955-1959

Cause	Month											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Incendiary	2983	3129	6229	1345	407	254	224	240	313	407	712	1676
Debris Burning	318	247	436	122	44	49	32	87	73	73	191	287
Smokers	237	193	289	107	35	38	58	96	102	117	230	325
Hunters	249	52	51	10	2	1	3	16	16	161	393	589
Campers	27	16	41	17	5	7	3	7	18	22	125	62
Logging	64	47	65	20	18	24	30	32	46	31	27	42
Railroad	37	27	63	15	10	10	18	25	24	20	45	38
Lightning	0	1	7	4	4	14	42	18	21	5	0	0
Miscellaneous	209	160	281	57	37	31	16	30	44	41	92	156
Totals	4124	3872	7462	1697	562	428	426	551	657	877	1815	3175

established in Figure 7. In Bossier Parish the peak in fire occurrence was reached in November and December; whereas, in Red River, Grant, Ouachita, Union, Caldwell, Caddo, Natchitoches, Sabine, and Winn parishes the number of fires was just as great in November and December (the hunting season) as in March. This is explained by the fact that hunter and camper fires are generally higher in these parishes while incendiary fires are relatively lower.

With respect to fire causes within the various parished the data in Table VII and IX present some interesting information. Incendiarism was the major cause of fires in 16 of the 29 parishes; however, it was most prevalent in Livingston, Evangeline, Allen, Beauregard, Rapides, St. Tammany, Calcasieu, Tangipahoa, St. Helena, and Vernon parishes. In these ten parishes, located principally in the southeast and southwest sections of the state, incendiary fires were greater than the over-all average for the pine and pine-hardwood region (Table X). It is of interest to note that the first seven of the above-listed parishes accounted for 78 per cent of all the incendiary fires that occurred in the region during 1955 through 1959. Livingston Parish alone was responsible for 21 per cent of the incendiary fires. All of the parishes in which incendiarism is the major causative

TABLE IX

AVERAGE NUMBER OF FOREST FIRES ANNUALLY IN PINE AND PINE-HARDWOOD AREAS OF LOUISIANA DURING 5-YEAR PERIOD 1955-1959

Parish	Cause									
	Incen-diary	Debris Burning	Smok-ers	Hunt-ers	Camp-ers	Log-ging	Rail-road	Light-ning	Misc.	Total
Livingston	749.0	12.8	5.4	2.8	.6	3.6	.4	0	4.8	779.4
Beauregard	511.0	24.6	5.2	6.8	2.0	4.0	6.2	3.0	22.6	585.4
Allen	433.0	8.0	16.6	4.2	1.2	3.0	1.4	0	11.0	478.4
St. Tammany	385.4	33.2	15.4	4.2	.8	1.8	.8	1.6	10.8	454.0
Rapides	254.4	15.6	6.8	3.8	2.2	4.8	5.6	.6	5.0	298.8
Tangipahoa	251.4	17.8	6.8	10.6	3.0	2.2	.6	2.0	3.8	298.2
St. Helena	216.6	8.4	24.0	15.0	1.4	2.0	0	.2	20.8	288.4
Vernon	149.6	8.2	17.0	9.0	5.8	6.6	4.4	3.2	12.8	216.6
Evangeline	166.8	1.2	3.2	2.0	0	.4	0	0	6.8	180.4
Calcasieu	145.2	6.8	5.4	4.0	1.0	.8	1.6	.2	6.4	171.4
Caddo	8.4	28.4	46.0	17.6	3.2	2.2	3.6	.6	10.0	130.0
Natchitoches	50.8	8.8	22.0	26.4	8.8	5.2	.4	1.0	5.2	128.6
Sabine	37.2	7.6	15.6	28.6	8.2	7.2	5.2	1.8	9.2	120.6
Washington	56.4	12.6	10.4	6.0	1.0	.6	0	1.2	4.6	92.8
Bossier	8.8	17.4	14.2	30.0	7.0	3.6	3.2	.2	6.0	90.4
Webster	7.8	28.6	14.0	9.4	1.4	1.8	14.2	.2	10.2	87.6
Winn	28.2	9.6	11.8	19.6	2.6	8.2	1.4	1.2	2.6	85.2
LaSalle	35.8	8.0	11.0	6.4	1.2	4.4	1.6	.2	14.2	82.8
Union	7.2	14.0	6.2	18.0	3.0	6.2	.6	.6	15.8	71.6
Bienville	8.8	19.6	18.6	9.8	2.0	3.0	1.6	2.2	5.8	71.4
DeSoto	7.4	11.0	14.8	17.8	2.8	3.4	1.4	.4	5.0	64.0
Jackson	22.4	11.8	1.6	11.8	2.6	2.4	.8	.8	9.2	63.4

TABLE IX (Continued)

Parish	Cause									
	Incen-diary	Debris Burning	Smok-ers	Hunt-ers	Camp-ers	Log-ging	Rail-roal	Light-ning	Misc.	Total
Claiborne	2.8	21.6	18.8	6.0	.6	1.6	.2	.2	9.8	61.6
Ouachita	3.6	8.0	17.2	9.8	2.0	1.8	3.0	0	4.0	49.4
Lincoln	7.6	14.2	8.8	4.2	.4	1.6	1.8	0	4.4	43.0
Grant	8.6	7.6	8.2	8.4	.8	2.2	3.2	.6	1.6	41.2
Caldwell	6.2	4.4	8.8	9.6	1.4	2.0	1.6	.6	4.0	38.6
E. Feliciana	5.6	7.6	6.4	3.6	.6	.8	1.4	.4	3.0	29.4
Red River	7.8	4.4	5.2	3.2	2.4	1.8	.2	.2	1.4	26.6
Total	3583.8	391.8	365.4	308.6	70.0	89.2	66.4	23.2	230.8	5129.2

TABLE X

CAUSATIVE PERCENTAGE OF FOREST FIRES IN PINE AND PINE-HARDWOOD AREAS OF LOUISIANA DURING THE 5-YEAR PERIOD 1955-1959

Parish	Cause								
	Incen-diary	Debris Burning	Smok-ers	Hunt-ers	Camp-ers	Log-ging	Rail-road	Light-ning	Misc.
Livingston	96.1	1.6	.7	.3	.1	.5	.1	0	.6
Beauregard	87.3	4.2	.9	1.2	.3	.7	1.0	.5	3.9
Allen	90.5	1.7	3.5	.9	.2	.6	.3	0	2.3
St. Tammany	84.9	7.3	3.4	.9	.2	.4	.2	.3	2.4
Rapides	85.1	5.2	2.3	1.3	.7	1.6	1.9	.2	1.7
Tangipahoa	84.3	6.0	2.3	3.5	1.0	.7	.2	.7	1.3
St. Helena	75.1	2.9	8.3	5.2	.5	.7	0	.1	7.2
Vernon	69.1	3.8	7.8	4.2	2.7	3.0	2.0	1.5	5.9
Evangeline	92.4	.7	1.8	1.1	0	.2	0	0	3.8
Calcasieu	84.7	4.0	3.2	2.3	.6	.5	.9	.1	3.7
Caddo	6.5	29.5	35.4	13.5	2.5	1.7	2.8	.5	7.6
Natchitoches	39.5	6.9	17.1	20.5	6.9	4.0	.3	.8	4.0
Sabine	30.9	6.3	12.9	23.7	6.8	6.0	4.3	1.5	7.6
Washington	60.8	13.6	11.2	6.5	1.1	.6	0	1.3	4.9
Bossier	9.7	19.3	15.7	33.2	7.8	4.0	3.5	.2	6.6
Webster	8.9	32.6	16.0	10.7	1.6	2.1	16.2	.2	11.7
Winn	33.1	11.3	13.8	23.0	3.1	9.6	1.6	1.4	3.1
LaSalle	43.2	9.7	13.3	7.7	1.5	5.3	1.9	.3	17.1
Union	10.0	19.6	8.7	25.1	4.2	8.7	.8	.8	22.1
Bienville	12.3	27.5	26.1	13.7	2.8	4.2	2.2	3.1	8.1
DeSoto	11.6	17.2	23.1	27.8	4.4	5.3	2.2	.6	7.8
Jackson	35.3	18.6	2.5	18.6	4.1	3.8	1.3	1.3	14.5

TABLE X (Continued)

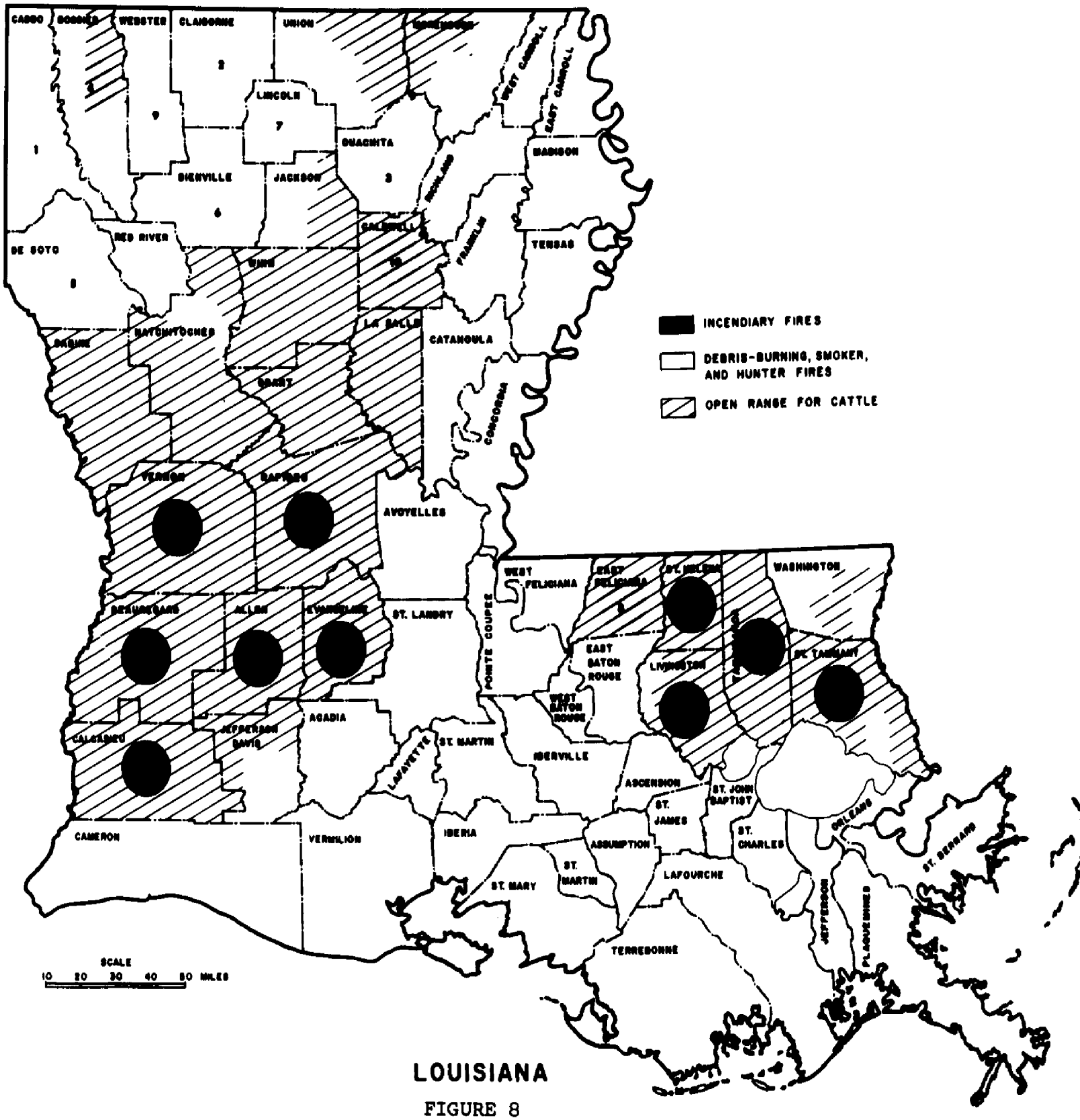
Parish	Cause								
	Incen-diary	Debris Burning	Smok-ers	Hunt-ers	Camp-ers	Log-ging	Rail-road	Light-ning	Misc.
Claiborne	4.6	35.1	30.5	9.7	1.0	2.6	.3	.3	15.9
Ouachita	7.3	16.2	34.8	19.8	4.1	3.6	6.1	0	8.1
Lincoln	17.7	33.0	20.5	9.8	.9	3.7	4.2	0	10.2
Grant	20.9	18.4	19.9	20.4	1.9	5.3	7.8	1.5	3.9
Caldwell	16.1	11.4	22.8	24.9	3.6	5.2	4.1	1.5	10.4
E. Feliciana	19.0	25.9	21.8	12.2	2.0	2.7	4.8	1.4	10.2
Red River	29.3	16.5	19.5	12.0	9.0	6.8	.8	.8	5.3

factor lie within the area where cattle are permitted to graze on the open range. Furthermore, within these parishes cattlemen make extensive use of the open range.

The data in Tables VII and X further indicate that the other major causes, debris burning, smokers, and hunters, accounted for the greatest percentage of fires in the northern part of the state. As an average of all three causes, the greatest percentage of fires resulting from the "carelessness group" occurred in Caddo, Claiborne, Ouachita, Bossier, DeSoto, Bienville, Lincoln, East Feliciana, Webster, and Caldwell parishes.

In order to portray the pattern of fire occurrence with respect to the major causes, Figure 8 has been prepared. This figure shows the location and concentration of the major types of fires during 1955 through 1959 in relation to the open-range cattle country. It reveals that there are areas of open range in which incendiary fires are no longer a major problem.

The data presented in Table XI shows the rank order of parishes with respect to total number of fires per unit of protected forest land. This table was prepared so that the parishes could be compared on an equal basis since the acreage of forest land under protection in each parish



LOUISIANA

FIGURE 8

PATTERN OF FIRE OCCURRENCE BY CAUSE IN RELATION TO OPEN RANGE
(NUMBERS INDICATE RANK ORDER OF PARISHES)

TABLE XI

NUMBER OF FOREST FIRES PER 10M PROTECTED ACRES IN PINE AND PINE-HARDWOOD AREAS OF LOUISIANA DURING THE 5-YEAR PERIOD 1955-1959

Parish	Cause								
	Incen-diary	Debris Burning	Smok-ers	Hunt-ers	Camp-ers	Log-ging	Rail-roads	Light-ning	Misc.
Livingston	118.51	2.02	.85	.44	.09	.56	.06	0	.75
Evangeline	64.15	.46	1.23	.76	0	.15	0	0	2.61
Allen	61.50	1.13	2.35	.59	.17	.42	.19	0	1.56
St. Helena	50.84	1.97	5.63	3.52	.32	.46	0	.04	4.88
St. Tammany	44.81	3.86	1.79	.48	.09	.20	.09	.18	1.25
Beauregard	37.79	1.81	.38	.50	.14	.29	.45	.22	1.67
Tangipahoa	33.79	2.39	.91	1.42	.40	.29	.08	.26	.51
Calcasieu	27.39	1.28	1.01	.75	.18	.15	.30	.03	1.20
Rapides	23.21	1.42	.62	.34	.20	.43	.51	.05	.45
Caddo	1.44	6.62	7.93	3.03	.55	.37	.62	.10	1.72
Vernon	14.66	.80	1.66	.88	.56	.64	.43	.31	1.25
Webster	1.54	5.65	2.76	1,85	.27	.35	2.80	.03	2.01
LaSalle	7.01	1.56	2.15	1.25	.23	.86	.31	.03	2.78
Washington	9.69	2.16	1.78	1.03	.17	.10	0	.20	.79
Natchitoches	5.19	.89	2.24	2.69	.89	.53	.04	.10	.53
Bossier	1.25	2.48	2.02	4.28	1.00	.51	.45	.02	.85
Lincoln	2.12	3.96	2.45	1.17	.11	.44	.50	0	1.22
Sabine	3.39	.69	1.42	2.60	.74	.65	.47	.16	.83
Claiborne	.47	3.66	3.18	1.01	.10	.27	.03	.03	1.66
Jackson	3.60	1.89	.25	1.89	.41	.38	.12	.12	1.47
Bienville	1.16	2.59	2.46	1.29	.26	.39	.21	.29	.76
Winn	3.12	1.06	1.30	2.17	.28	.90	.15	.13	.28

TABLE XI (Continued)

Parish	Cause								
	Incen-diary	Debris Burning	Smok-ers	Hunt-ers	Camp-ers	Log-ging	Rail-roads	Light-ning	Misc.
Red River	2.74	1.54	1.83	1.12	.84	.63	.07	.07	.49
Grant	1.90	1.68	1.81	1.85	.17	.48	.70	.13	.35
DeSoto	1.02	1.52	2.05	2.47	.38	.47	.19	.05	.69
Ouachita	.63	1.41	3.03	1.73	.35	.31	.53	0	.70
East Feliciana	1.64	2.23	1.88	1.05	.17	.23	.41	.11	.88
Union	.77	1.51	.66	1.94	.32	.66	.06	.06	1.70
Caldwell	1.05	.74	1.49	1.63	.23	.34	.27	.10	.68
Total	526.38	60.98	59.12	45.73	9.62	12.46	10.04	2.82	36.50

varies. On a given unit-of-measure basis for each parish, the data in this table further emphasize the problem of incendiarism as the major cause of fires in Louisiana.

The over-all results of this analysis of the forest fire statistics of Louisiana show that the occurrence of fires in the protected forests of the state has followed a definite pattern. This pattern of fire occurrence is cyclic both between and within years and is essentially the same for the various parishes. The cyclic pattern of fire occurrence is related primarily to the actions of man as the sole cause of destructive fires in the state. The major and most destructive cause of fires in Louisiana is incendiarism. Incendiary fires are concentrated in ten parishes all located within southeastern and southwestern Louisiana where widespread use is made of the forest and adjacent land for free cattle range. Debris burning, smokers, and hunters (all representative of a lackadaisical attitude toward the forest) are the major causes of fires in northern Louisiana.

III. SOCIAL FACTORS RELATED TO FIRE CAUSE AND OCCURRENCE

As previously stated an attempt was made in this study to measure the relationship between the incidence of fires and certain supposedly related social factors. The statistical technique selected to measure this relationship was that of the multiple linear regression. In the selection of this type of regression it was assumed that a straight line relationship existed between the dependent and independent variables. This assumption was made after a careful examination of the data. The decision to use a multiple regression analysis was further supported by the availability of an electronic computer program which would yield all the calculations necessary for the interpretation of the data. The computations required to find the least square linear relationships of the various dependent variables on the independent variables were performed by the International Business Machine 650. The data thus obtained from the computer program for each regression was subjected to analysis of variance in order to assess the joint and individual influence of the various independent variables on the dependent variables. In addition, correlation coefficients were

calculated in order to further measure the relationship of variables.

Regression of Y_1 on Independent Variables

In order to test the joint and individual influence of the eight independent variables on the total number[1] of man-caused fires occurring in each of the 29 pine and pine-hardwood parishes during the 1955-1959 period, an analysis of variance was performed. This analysis is summarized in Table XII.

In an analysis of this type, the "F" test provides evidence for or against the null hypothesis that the independent variables have no effect on the dependent variable. The variance ratio, "F," measures the probability that differences of the magnitude observed will occur due to chance.

The ratio obtained for the total regression, i.e., the joint influence of all independent variables, is below that required at the 5 per cent level of probability. However, this regression analysis does indicate that the ratio obtained from the independent variable X_6 is above that

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[1]Total number here refers to fires caused by incendiarism, debris burning, smokers, hunters, and campers (see Chapter IV, page 69).

TABLE XII

ANALYSIS OF VARIANCE REGRESSION NUMBER 1:
Y_1 ON X_1, X_2, X_3, X_4, X_5, X_6, X_7, AND X_8

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square	F
Total	28	20150.027	719.644	
Regression	8	8604.548	1075.569	1,863
due to X_1	1	613.642	613.642	1.063
due to X_2	1	1.732	1.732	.003
due to X_3	1	22.514	22.514	.039
due to X_4	1	941.534	941.534	1.631
due to X_5	1	.577	.577	.001
due to X_6	1	4288.569	4288.569	7.429*
due to X_7	1	1578.844	1578.844	2.735
due to X_8	1	432.956	432.956	.750
Error	20	11545,479	577.274	

R^2 = .427 or 43 per cent

*Significant at the 5 per cent level of probability.

required at the 5 per cent level of probability. Therefore, it can be concluded that the total number of man-caused forest fires within each of the parishes is significantly related to educational expenditures per student.

The data presented in Table XII indicate the square of the multiple correlation coefficient, "R^2," to be .427. This value of .427 is a measure of the variation in the dependent variable accounted for by the regression. Thus in this regression approximately 43 per cent of the variation in total number of fires in the 29 parishes studied was associated with variation in the eight independent variables included in the regression equation.

In a further attempt to study the effect of each variable singly, simple correlation coefficients were calculated to measure the tendency for the total number of fires to vary with each independent variable. These coefficients are shown in Table XIII. As indicated in Table XIII only one of the independent variables, X_6, was significantly correlated with the total number of man-caused fires. The sign shows that a negative relationship exists between the total number of fires and educational expenditures per student. Thus it can be concluded that there is a strong tendency for the total number of fires to increase with a decrease in

TABLE XIII

SIMPLE CORRELATION COEFFICIENTS BETWEEN VARIOUS FACTORS AND THE TOTAL NUMBER OF MAN-CAUSED FOREST FIRES (Y_1) IN LOUISIANA DURING 1955-1959

Variable	Correlation Coefficients[a] r
Fires caused by incendiarism (Y_2)	.993**
Fires caused by debris burning (Y_3)	-.063
White farm operators (X_1)	.289
Tenancy (X_2)	-.030
Rural-farm economic level (X_3)	.190
Farm-forest economic situation (X_4)	.044
Rural population density (X_5)	.187
Educational expenditures per student (X_6)	-.495**
Cash effective buying income (X_7)	-.071
Burning index (X_8)	.155

**Significant at the 1 per cent level of probability

[a].367 required for significance at .05P.
.470 required for significance at .01P.

educational expenditures.

The data in Table XIII show the close relationship between total number of man-caused fires and incendiary fires. With respect to further similar regression analyses, this means that whatever relationships exist for total number of man-caused fires will also exist for incendiary fires and vice versa. It is also of interest to note that burning index was not correlated with the total number of man-caused fires.

It was assumed at the outset that some of the eight independent variables might not contribute significantly to the relationship. The data presented in Tables XII and XIII substantiated this assumption. Consequently, a second regression analysis seemed to be necessary. In the second analysis only those independent variables were included which showed a significant correlation, or a strong correlation, or were not intercorrelated. The analysis of the second regression of Y_1 on X_1, X_3, and X_6 is presented in Table XIV.

The second regression equation on all three independent variables was significant at the 5 per cent level and had a squared correlation coefficient of .316, indicating that approximately 32 per cent of the variation in total number of man-caused fires in the parishes studied was associated

TABLE XIV

ANALYSIS OF VARIANCE REGRESSION NUMBER 2: Y_1 ON X_1, X_3, AND X_6

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square	F
Total	28	20150.027	719.644	
Regression	3	6376.257	2125.419	3.858*
due to X_1	1	1385.642	1385.642	2.515
due to X_3	1	4.408	4.408	.008
due to X_6	1	3679.802	3679.802	6.679*
Error	25	13773.770	550.951	

R^2 = .316 or 32 per cent[a]

*Significant at the 5 per cent level of probability

[a]Of the 32 per cent of variation accounted for by the regression:

X_1 = accounted for .084 or 8 per cent

X_3 = accounted for .050 or 5 per cent

X_6 = accounted for .183 or 18 per cent.

with variation of the three independent variables. In addition, the data in Table XIV indicate that educational expenditures per student, which was also significant, accounted for 18 per cent of the variation in total number of man-caused fires.

Regression of Y_2 on Independent Variables

As previously stated, the highly significant correlation between total number of man-caused fires and incendiary fires would indicate that each would show similar relationships when correlated with the same variables. This fact is clearly demonstrated in the data presented in Tables XV, XVI, and XVII. The data presented in these tables show that incendiary fires are significantly related to the same independent variable; the only difference is in the magnitude of the relationship.

According to the solution of the equation in the third regression (Table XV), approximately 47 per cent of the variation was accounted for by the eight independent variables. The only variable significantly associated with incendiary fires in this regression was educational expenditures per student.

In the fourth regression which included only the

TABLE XV

ANALYSIS OF VARIANCE REGRESSION NUMBER 3:
Y_2 ON X_1, X_2, X_3, X_4, X_5, X_6, X_7, AND X_8

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square	F
Total	28	21287.240	760.259	
Regression	8	9960.994	1245.124	2.199
due to X_1	1	1006.336	1006.336	1.777
due to X_2	1	1.699	1.699	.003
due to X_3	1	9.627	9.627	.017
due to X_4	1	853.432	853.432	1.507
due to X_5	1	24.918	24.918	.044
due to X_6	1	4889.538	4889.538	8.634**
due to X_7	1	1909.604	1909.604	3.372
due to X_8	1	231.055	231.055	.408
Error	20	11326.246	566.312	

R^2 = .468 or 47 per cent

**Significant at the 1 per cent level of probability

TABLE XVI

SIMPLE CORRELATION COEFFICIENTS BETWEEN VARIOUS FACTORS AND FOREST FIRES CAUSED BY INCENDIARISM (Y_2) IN LOUISIANA DURING 1955-1959

Variable	Correlation Coefficients[a] r
Fires caused by debris burning (Y_3)	-.152
White farm operators (X_1)	.355
Tenancy (X_2)	-.074
Rural-farm economic level (X_3)	.173
Farm-forest economic situation (X_4)	.042
Rural population density (X_5)	.142
Educational expenditures per student (X_6)	-.492**
Cash effective buying income (X_7)	-.046
Burning index (X_8)	.106

**Significant at the 1 per cent level of probability

[a].367 required for significance at .05P.
.470 required for significance at .01P.

TABLE XVII

ANALYSIS OF VARIANCE REGRESSION NUMBER 4: Y_2 ON X_1, X_3, AND X_6

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square	F
Total	28	21287.240	760.259	
Regression	3	7527.127	2509.042	4.559*
due to X_1	1	2270.971	2270.971	4.126
due to X_3	1	10.458	10.458	.019
due to X_6	1	3860.541	3860.541	7.014*
Error	25	13760.113	550.405	

R^2 = .354 or 35 per cent[a]

*Significant at the 5 per cent level of probability

[a]Of the 35 per cent of variation accounted for by the regression:

X_1 = accounted for .126 or 13 per cent
X_3 = accounted for .046 or 5 per cent
X_6 = accounted for .181 or 18 per cent.

related and non-intercorrelated variables (Table XVII), the variance ratio indicates that the joint influence of the three independent variables had a significant effect on the number of incendiary fires. These data show only educational expenditures to be significant; however, the variation accounted for by percentage of white farm operators approached significance at the 5 per cent level. Of the 35 per cent variation accounted for by the fourth regression, 18 per cent was accounted for by educational expenditures per student and 13 per cent was accounted for by percentage of white farm operators.

The correlation coefficient indicated for burning index (Table XVI) further indicates the lack of association between weather phenomena and incendiary fires. This coefficient is even lower than the one calculated to measure the association between burning index and total number of man-caused fires. This would indicate that incendiarism, as the largest part of the man-caused fire statistic employed in calculating the association between total fires and burning index, was primarily responsible for the lack of association. This lack of correlation between total number of fires and incendiary fires and burning index might seem to be in contradiction to the data presented in Figure 7. However, it

must be remembered that the data included in Figure 7 was a measure of the association between the total monthly occurrence of fire and the total monthly burning index for the entire 29 parishes as a whole. The correlation coefficients presented in Tables XII and XVI are a measure of the relationship resulting from the variation between fire occurrence (incendiary and total man-caused) and burning index in each of the 29 parishes. An explanation of this can be sought in reviewing statistical fire data and burning indices for different parishes (see Table 7 and Appendix B). For instance, Livingston Parish with a total of 3,853 man-caused fires and 3,745 incendiary fires had a burning index of 6,778 during the 1955-1959 period; whereas, Caddo Parish with a total of 568 man-caused and 42 incendiary fires had a burning index of 12,047 for the same period. Thus a parish with a relative large burning index had only a fraction of the fires of a parish with a relative low burning index. In this respect, this indicates the lack of association between incendiary and total man-caused fires and burning index. It further emphasizes the role of human behavior in fire causation, i.e., people start forest fires in different parts of Louisiana not necessarily in accordance with weather phenomena but in accordance with their own desires.

Regression of Y_3 on Independent Variables

The analysis of variance presented in Table XVIII of regression number five shows the joint and individual influence of the eight independent variables on fires resulting from debris burning in the 29 parishes. This analysis indicates that the total regression was significant and that it accounted for approximately 58 per cent of the variation in debris-burning fires. In addition, the data further show that the variations in the number of debris-burning fires accounted for by changes in the rural population density (X_5), the cash buying income (X_7), and the burning index (X_8) were also significant. An interesting aspect of this regression was that variation in educational expenditures in the various parishes was not significantly associated with fires which were a result of debris burning.

The correlation coefficient in Table XIX further indicate the relationship of the individual variables to debris-burning fires. The association between the rural population density and debris-burning fires was highly significant. This relationship was positive. It can be concluded, therefore, that fires resulting from debris burning increase as the rural population density increases. The degree of association between burning index and debris-burning fires

TABLE XVIII

ANALYSIS OF VARIANCE REGRESSION NUMBER 5:
Y_3 ON X_1, X_2, X_3, X_4, X_5, X_6, X_7, AND X_8

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square	F
Total	28	57.455	2.052	
Regression	8	33.102	4.138	3.400**
due to X_1	1	2,363	2.363	1.942
due to X_2	1	.001	.001	.001
due to X_3	1	3.376	3.376	2.774
due to X_4	1	.477	.477	.392
due to X_5	1	5.658	5.658	4.649*
due to X_6	1	1.362	1.362	1.119
due to X_7	1	6.386	6.386	5.247*
due to X_8	1	6.257	6.257	5.141*
Error	20	24.343	1.217	

R^2 = .576 or 58 per cent

**Significant at the 1 per cent level of probability
*Significant at the 5 per cent level of probability

TABLE XIX

SIMPLE CORRELATION COEFFICIENTS BETWEEN VARIOUS FACTORS AND FOREST FIRES CAUSED BY DEBRIS BURNING (Y_3) IN LOUISIANA DURING 1955-1959

Variable	Correlation Coefficients[a] r
White farm operators (X_1)	-.375**
Tenancy (X_2)	.189
Rural-farm economic level (X_3)	.029
Farm-forest economic situation (X_4)	.156
Rural population density (X_5)	.451**
Educational expenditures per student (X_6)	-.155
Cash effective buying income (X_7)	-.360
Burning index (X_8)	.357

**Signigicant at the 1 per cent level of probability

[a].367 required for significance at .05P.
.470 required for significance at .01P.

approached significance. A similar condition existed with respect to effective buying income. In the case of the former this relationship was positive, whereas with the latter it was negative. Thus, it can be concluded that there is a tendency for debris-burning fires to increase with an increase in burning index. On the other hand, fires resulting from debris burning tend to increase with a decrease in the percentage of households with a minimum cash effective buying income below $2,500.

The fact that debris-burning fires are associated with burning index may again seem to be in contradiction to previously presented data. However, it should be remembered that fires which result from debris burning are the consequence of fires getting out of control. Although the letting of fires spread to the land of another is in part related to the lackadaisical attitude of people, it is also logically related to the weather conditions which would increase the likelihood of fires getting out of control.

The correlation coefficient calculated as a measure of the association between percentage of white farm operators and debris-burning fires indicates a highly significant correlation between the variables (Table XIX). The nature of this association is negative. The variance ratio obtained

from the analysis of variance of regression number six (Table XX) shows that the variation in debris-burning fires accounted for by the variation among parishes in white farm operators was significant. Therefore, it can be concluded that there is a strong tendency for debris-burning fires to increase with a decrease in proportion of white farm operators.

The data presented in Table XX show that of the 43 per cent of the variation accounted for by the four variables, percentage of white farm operators accounted for 14 per cent and rural population density accounted for 13 per cent. These data also indicate that the variation accounted for by variables X_5, X_7, and X_8 was not significant. The change in the significance of variables from the fifth regression to the sixth regression is probably a result of the increase in the error mean square, which assumed the variation accounted for by variables X_2, X_3, X_4, and X_5. In addition the change is also probably associated with the intercorrelation of these variables with those remaining in regression number six.

The results of the regression and correlation analyses have indicated some significant relationship between various causative factors of fires in Louisiana and certain social factors of the environment.

TABLE XX

ANALYSIS OF VARIANCE REGRESSION NUMBER 6:
Y_3 ON X_1, X_5, X_7, AND X_8

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square	F
Total	28	57.445	2.052	
Regression	4	24.966	6.241	4.613**
due to X_1	1	5.913	5.913	4.370*
due to X_5	1	2.173	2.173	1.606
due to X_7	1	4.363	4.363	3.225
due to X_8	1	3.567	3.567	2.636
Error	24	32.479	1.353	

R^2 = .434 or 43 per cent[a]

**Significant at the 1 per cent level of probability
*Significant at the 5 per cent level of probability

[a]Of the 43 per cent of variation accounted for by the regression:

X_1 = accounted for .141 or 14 per cent
X_5 = accounted for .127 or 13 per cent
X_7 = accounted for .105 or 10 per cent
X_8 = accounted for .062 or 6 per cent

Total man-caused fires and incendiary fires showed the same relationship to the social factors. This was to be expected since they were essentially perfectly correlated. Both variables were significantly affected by the amount of money expended in support of public education. In this respect, total man-caused fires and incendiary fires increased with a decrease in expenditures for education. In addition, these two independent variables indicated no relationship to burning index, thus emphasizing the role of human behavior to fire causation in certain parishes.

Fires resulting from debris burning exhibited a different relationship to the social factors of the environment. This causative factor showed a negative association to the proportion of white farm operators and the amount of buying income per household, and a positive association to density of rural population. All of these relationships were significant; that is, debris-burning fires increased with decreases in the percentage of white farm operators and the percentage of households with a minimum cash buying income of less than $2,500. However, with an increase in the density of the rural population there was an increase in fires. In addition, this cause class showed a positive and significant association to weather phenomena, emphasizing the carelessness aspect of debris-burning fires.

CHAPTER VI

DESCRIPTION OF THE SAMPLE PARISHES AND SAMPLE POPULATION

The parishes selected for the interview phase of the study are included in the area of southeastern Louisiana generally referred to as the "Florida Parishes."[1] This area of the state was once the property of Spain and was known as the Province of West Florida. For several years after the Revolutionary War and the Louisiana Purchase ownership of this area was much disputed due to claims made by Spain, France, and the United States. A northern boundary line which separated this Spanish territory from "the States" was established in 1797 as the result of the treaty made with Spain on October 27, 1795.[2] This line of demarcation, the 31st parallel of latitude, was not effective, however, in

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[1]Alvin L. Bertrand, The Many Louisianas, Louisiana State University Agricultural Experiment Station Bulletin 496 (Baton Rouge, Louisiana, 1955).

[2]H. Skipwith, Sketches of the Pioneers (New Orleans: Hopkins Printing Office, 1892), p. 29.

keeping settlers out of the region. In September, 1810 the numerous settlers in the region revolted against Spanish rule and established the independent county of Feliciana which existed until October 27, 1810 when President Madison issued his proclamation declaring West Florida under the jurisdiction of the United States.[3] From this region were ultimately formed the Louisiana parishes of West Feliciana, East Feliciana, St. Helena, Tangipahoa, Livingston, St. Tammany, and Washington.

I. EAST FELICIANA PARISH

There is no record of the first permanent settlement within East Feliciana Parish. Settlers were attracted to the area from the East in 1796 after the purchase of the Chickasaw lands in Mississippi. The Yazoo Purchase was thus responsible for the first wave of immigration into the area. By 1802 a settlement was established in the southwestern part of the parish near the Mississippi River. The proclamation by President Jefferson in October, 1803, claiming purchase to all Louisiana, brought the second wave of immigration from

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[3]Luther Williams, "The People of Tangipahoa Parish: A Sociological Comparison of Two Ethnic Groups" (unpublished Master's thesis, Louisiana State University, Baton Rouge, 1951), p. 18.

the East. Many families with slaves and some entire neighborhoods from North Carolina, South Carolina, Georgia, and Virginia came by flatboats down the Tennessee and Mississippi Rivers to Natchez and then overland into the region. These early settlers were mainly protestant descendents of the Cavaliers and Huguenots who had originally settled on the coast of North and South Carolina.[4]

The population of the western part of the "County of Feliciana" increased steadily during the early years of settlement. In 1824, due to complaints that floods and quick sands of Thompson Creek established a barrier to communications within the larger parish, the state government created the parishes of East and West Feliciana with Thompson Creek as the boundary of separation.

Cotton, perfectly suited to the rich loess soil of the area, became the main crop from the very beginning of settlement. The growing of cotton increased rapidly under the plantation system until the outbreak of the Civil War. During the Reconstruction Period following the Civil War, Negroes left the parish for the sugar-cane fields and many acres of cotton land were left idle. However, cotton farming soon

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[4]Skipwith, op. cit., pp. 4-5.

began to increase again; it continued to develop until the advent of the boll weevil in 1908.[5] The migration of the boll weevil into the area brought a decline in the large scale growing of cotton in East Feliciana Parish. This second decline in cotton production caused another migration of Negroes out of the parish. Cotton is no longer produced in any quantity in the parish; instead livestock farming has become the major agricultural enterprise.

The Civil War brought an end to the original plantation system that had developed in East Feliciana Parish. However, the planters found that cotton could be grown successfully under the tenant system on the large farms and plantations. As a result, there developed a system of social organization within the tenant farmer--plantation framework which has continued until recent times.

In 1910 the population of East Feliciana Parish was 20,055 of which 14,536 (72 per cent) were Negroes. There were 20,198 persons in the parish in 1960, according to Census reports. Over one-half (54 per cent) of this number were Negroes. Eighty-three per cent of the population is

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[5]Soil Survey of East Feliciana Parish, Louisiana, United States Department of Agriculture, Bureau of Soils (Washington: Government Printing Office, 1913), p. 11.

presently classified as rural.

There were 900 farms in East Feliciana Parish in 1959, 21 per cent of which were tenant operated. The farms are generally large in size, averaging 222 acres. The average value per acre of farm land and buildings was $140 in 1959.

Sixty-nine per cent of the land area of East Feliciana Parish is in farms. Since the raising of beef cattle is the major agricultural enterprise, approximately 67 per cent of the farm land is devoted to grassland farming. Cattle are raised in fenced pastures as most of the better cultivated fields were already fenced before being converted to pasture land. Although the grazing of cattle on free range is permitted, it is practiced only in a limited section in the southeastern part of the parish.

The total commercial forest land of the parish is approximately 170,000 acres or 59 per cent of the parish's total land area. About 15,000 acres of this is owned by wood-using industries.[6] The forest products harvested from the forested area of East Feliciana Parish in 1959 amounted to $823,000. Thirty-nine farmers reported the sale of forest products in 1959. They received an average of $3,246

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[6]Forest Landownership in Louisiana (third edition; Baton Rouge: Louisiana Forestry Commission, 1955), p. 29.

for the sale of such products.

East Feliciana Parish ranks 27th with respect to the number of forest fires in the 29 pine and pine-hardwood parishes of Louisiana (Table XI). As indicated by Figure 8, it is a parish in which the fires that do occur are primarily the result of carelessness. In fact, 60 per cent of the fires that burned in East Feliciana Parish during the 1955-1959 period were the result of debris burning (30 per cent), smokers (22 per cent), and hunters (12 per cent), (Table X).

II. ST. HELENA PARISH

St. Helena Parish was established in 1811. Originally it was a large parish which contained, in addition to its present area, all the area occupied by Livingston Parish and most of the area now in Tangipahoa Parish. Livingston was established in 1832 and Tangipahoa was organized in 1871. The early settlers were French and Spanish who remained in the southern part of the area along Lake Maurepas and the lower Amite River. Prior to 1800 there were a few English settlers along the upper Amite River who carried on an illicit trade with the colonists.[7]

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[7]Sherman S. McFerrin, "An Occupational Study of St. Helena Parish" (unpublished Master's thesis, Louisiana State University, Baton Rouge, 1951), p. 6.

Settlement of St. Helena Parish was slow. Initially it was confined largely to the stream courses where early settlements were made in the form of Spanish land grants which are recognized today as "headrights" or irregularly shaped sections. After 1810 settlers began to move into the area from adjoining regions to the east, north, and west.

The first major settlements were no doubt along the Amite River in the northwestern and western sections of the parish. The settlers in this section were Anglo-Saxon Protestants who had originally settled in the Carolinas and Georgia. Many had stopped in East Feliciana Parish and Amite County, Mississippi before migrating east and south into this part of the parish. The first important crops grown along the Amite River were cotton and corn. Agriculture developed here on self-sustaining plantations. Cotton farming followed the same pattern of development as in East Feliciana Parish, i.e., the Civil War and the boll weevil brought an end to this system of farming. After the outbreak of the boll weevil in 1908 and following the depression of the 1930's large acreages of abandoned land were sold to lumber companies.

Settlement of the eastern part of St. Helena Parish was made by settlers largely of Scotch-Irish origin, with

some of English origin, who had originally settled in the Carolinas, Georgia, and Virginia. Many had stopped in Alabama, Mississippi, and other points a year or more before migrating west and south into St. Helena Parish. These settlers were engaged principally in livestock raising with some cotton farming along the Tickfaw River.

The raising of livestock (cattle, hogs, sheep, and goats) soon became an important industry. Stock was raised with little trouble since most of the land was open range. Cattle were turned out in the spring, collected in the fall, and driven to New Orleans to market. There soon developed large herds of cattle that roamed the woods and fattened upon the native grasses. For winter pasture they were driven westward toward the Mississippi River and grazed in canebrakes. Throughout this period the lands, and indeed the timber as well, were considered almost worthless, so that large areas were sold to lumber companies for taxes. Thus, the early agricultural settlers over a large part of St. Helena Parish ranged their stock over thousands of acres not necessarily their own. They lived on small clearings and were apparently content with a few acres.

Lumbering became an industry in St. Helena Parish around 1885. Lumber companies obtained considerable acreages

of virgin pine forest both from the large estates along the stream courses and the smaller holdings scattered over the parish. After the removal of the virgin timber a few companies sold some land as small holdings to farmers engaged in the trucking and dairy industry.

Truck farming and dairy farming started in the parish around 1890. Truck farming increased steadily until the mid-1940's. Since then it has declined until it is no longer a major industry in the parish. Dairy farming is now the most important agricultural enterprise. Dairies are scattered throughout the parish; however, most of the larger dairy farms are concentrated along the Tickfaw River.

Agricultural development in St. Helena Parish has followed a definite pattern. Dairying and truck farming developed along the Tickfaw River. Cotton farming was mostly confined to the northwestern and western sections of the parish along the Amite River. The southern end of the parish was devoted mainly to truck crops. Livestock raising was scattered throughout the parish.

Following the removal of the virgin timber in the early 1900's most of the parish entered a state of transition from a community whose main interest was centered in lumbering to one in which agriculture (truck and dairy farming) was

the chief occupation. It was difficult for many of the older agricultural settlers to accustom themselves to the new and changing conditions. Many complained bitterly of the curtailed range for their livestock and some even openly condemned the further settlement of the parish. Manifestations of the conflict of interest on the part of cattlemen are still present in the parish.

The population of St. Helena Parish in 1910 was 9,172 of which 4,573 (50 per cent) were Negroes. The 1960 Census reports indicate there were 9,162 persons in the parish at that time. Of this number, 5,085 or 56 per cent were Negroes. The entire population of St. Helena Parish is presently classified as rural.

There were 1,045 farms in St. Helena Parish in 1959. Only 14 per cent of this number were operated by tenants. Farms are generally small in size, averaging 86 acres in 1959. At that time, the average value per acre of farm land and buildings was $128.

Only 33 per cent of the land area in St. Helena Parish is presently in farms. Since dairy farming is the major agricultural enterprise, about 69 per cent of the farm land is devoted to grassland farming. Dairy cattle are mostly grazed in fenced pastures; however, due to a shortage of

pasture land and especially during drought periods, the majority of the dry cows and calves are turned loose on the open range. Some farmers permit their milking cows to graze the free range. This is not, however, a widespread practice. The raising of beef cattle is also an important agricultural enterprise in St. Helena Parish. In this type of livestock farming, intensive and widespread use is made of the free range.

The total commercial forest land of St. Helena Parish is approximately 213,000 acres. This is 79 per cent of the land area of the parish. About 100,000 acres of this forest land is owned by wood-using industries.[8] The forest products harvested in St. Helena Parish in 1959 amounted to $1,054,000.[9] The sale of forest products was reported from 46 farms in 1959. The average amount received by each farm for the sale of such products was $521.

St. Helena Parish is a parish in which the occurrence

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[8]Forest Landownership in Louisiana, op. cit., p. 60.

[9]The value of forest products reported here for St. Helena and East Feliciana parishes is based on the average price paid for standing timber. It was determined from Severance Tax collections and reported by the Louisiana Forestry Commission.

of forest fires is a serious problem. It ranks fourth with respect to the number of fires in Louisiana (Table XI). Incendiarism is the major cause of fires in St. Helena Parish. During the 1955-1959 period, 75 per cent of the fires that occurred in this parish were the result of this causative factor (Table X).

III. LAND OWNERSHIP AND FIRE OCCURRENCE

Prior to the initiation of the interview phase of the study, it was felt that a knowledge of the pattern of fire occurrence in the sample parishes was necessary. Furthermore, the determination of its relation to land ownership in the parishes seemed to be a prerequisite to the understanding of the problem in the sample parishes. In this connection, land ownership maps showing cooperative ownership of forest land in East Feliciana and St. Helena parishes were constructed.[10]

Figures 9 and 10 were prepared to show the location and extent of cooperative land ownership in the parishes, and to make possible a comparison of fire occurrence with type of ownership.

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[10]In the sense used here, cooperative ownership implies the ownership of forest land by two or more persons; it may or may not exist in the form of a legally organized corporation or company.

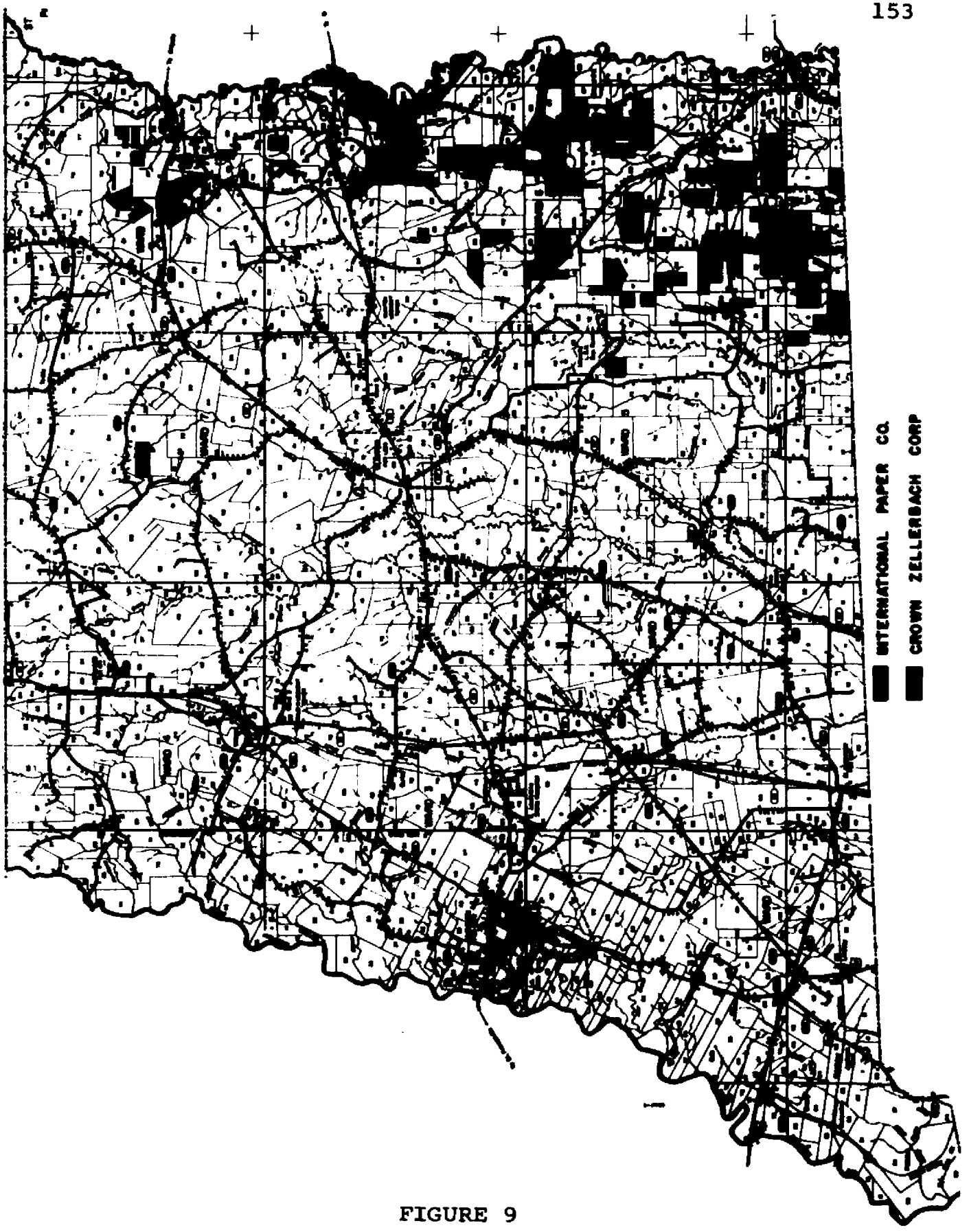

FIGURE 9

COOPERATIVE LAND OWNERSHIP, EAST FELICIANA PARISH, 1959

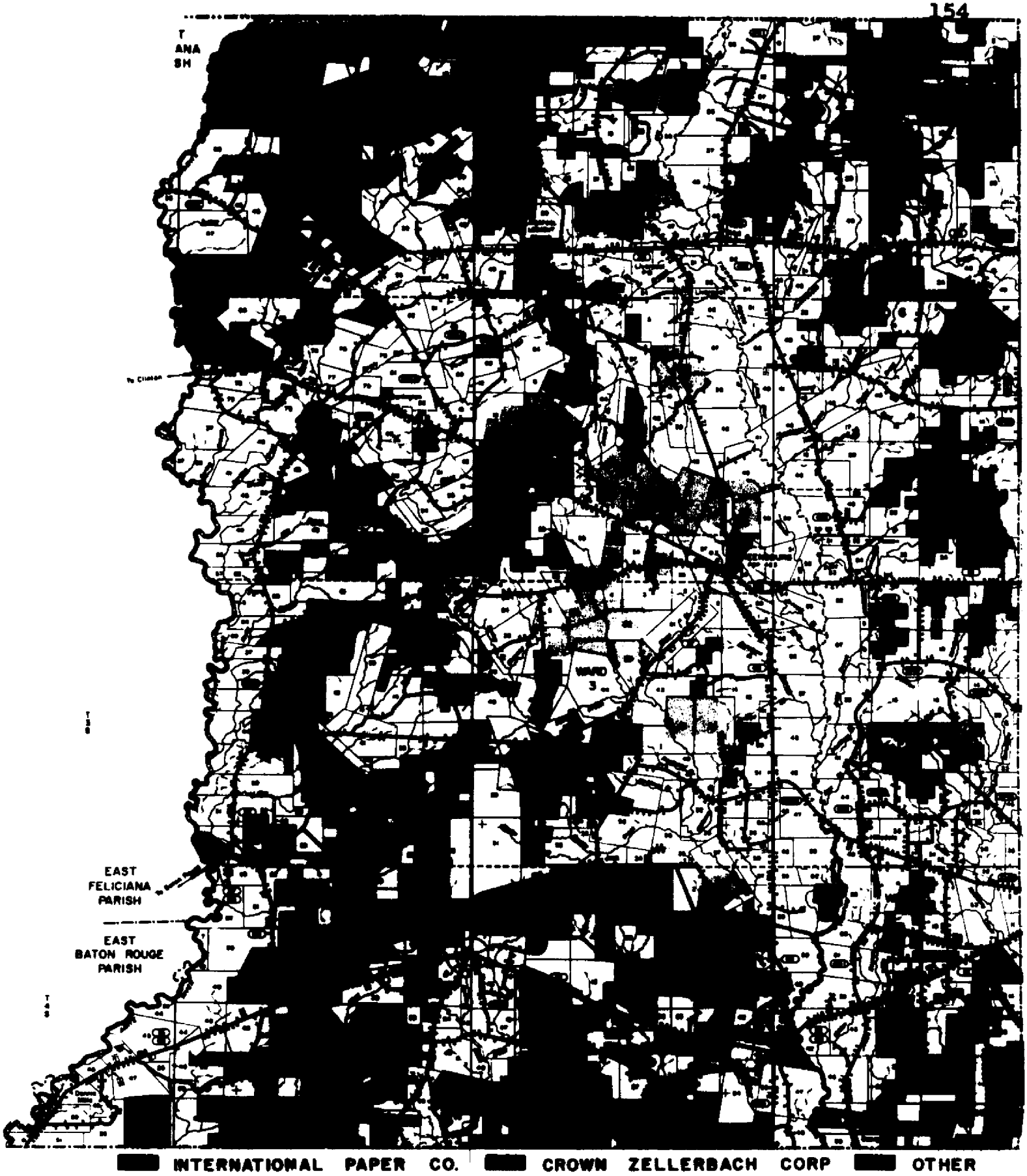

FIGURE 10

COOPERATIVE LAND OWNERSHIP, ST. HELENA PARISH, 1959

It is apparent at first glance that there is little cooperative ownership of forest land in East Feliciana Parish as compared with St. Helena Parish. The land owned by wood-using industries in East Feliciana Parish amounts to approximately 15,000 acres. As indicated by Figure 9, International Paper Company is the largest forest land owner in the parish. This figure also shows that the holdings of the wood-using industries are concentrated in the southeastern section of the parish in Ward 6 and along the Amite River.

The cooperative ownership of forest land in St. Helena Parish accounts for approximately 38 per cent of the total land area of the parish. Of this amount, International Paper Company and Crown Zellerbach Corporation own and/or control 32 per cent (approximately 86,000 acres). This is almost equivalent to the land area that was in farms in 1959. International Paper Company controls about 60 per cent of the cooperative ownership lands in St. Helena Parish: this is approximately 23 per cent of the total land area. Crown Zellerbach Corporation owns 25 per cent of the lands managed by wood-using industries in the parish. Their land holdings

account for 9 per cent of the total land area of St. Helena Parish.[11]

Figure 10 shows the forest land of the Crown Zellerbach Corporation to be concentrated in the northwestern section of the parish, mostly in Ward 1. Purchase of these lands from local residents was arranged by Richard Henry Hurst, a native farmer, for the Great Southern Lumber Company during the early 1900's.

The forest land managed by International Paper Company extends throughout St. Helena Parish. However, as indicated by Figure 10, the land managed by this organization is concentrated in the west-central, southern, and northeastern sections of the parish.

In order to determine the pattern of fire occurrence and its relation to type of ownership, fire occurrence maps which showed the location of each fire during a given year were prepared. An example of these fire occurrence charts for each parish is shown in Figures 11 and 12. It may be

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[11]Crown Zellerbach Corporation, formerly Gaylord Container Corporation (1937-1955), formerly Great Southern Lumber Company (1905-1937), is the owner of the lands as indicated in St. Helena Parish. International Paper Company owns little land in St. Helena Parish; rather, they control it by right of a long-term lease with the heirs of the old Natalbany Lumber Company.

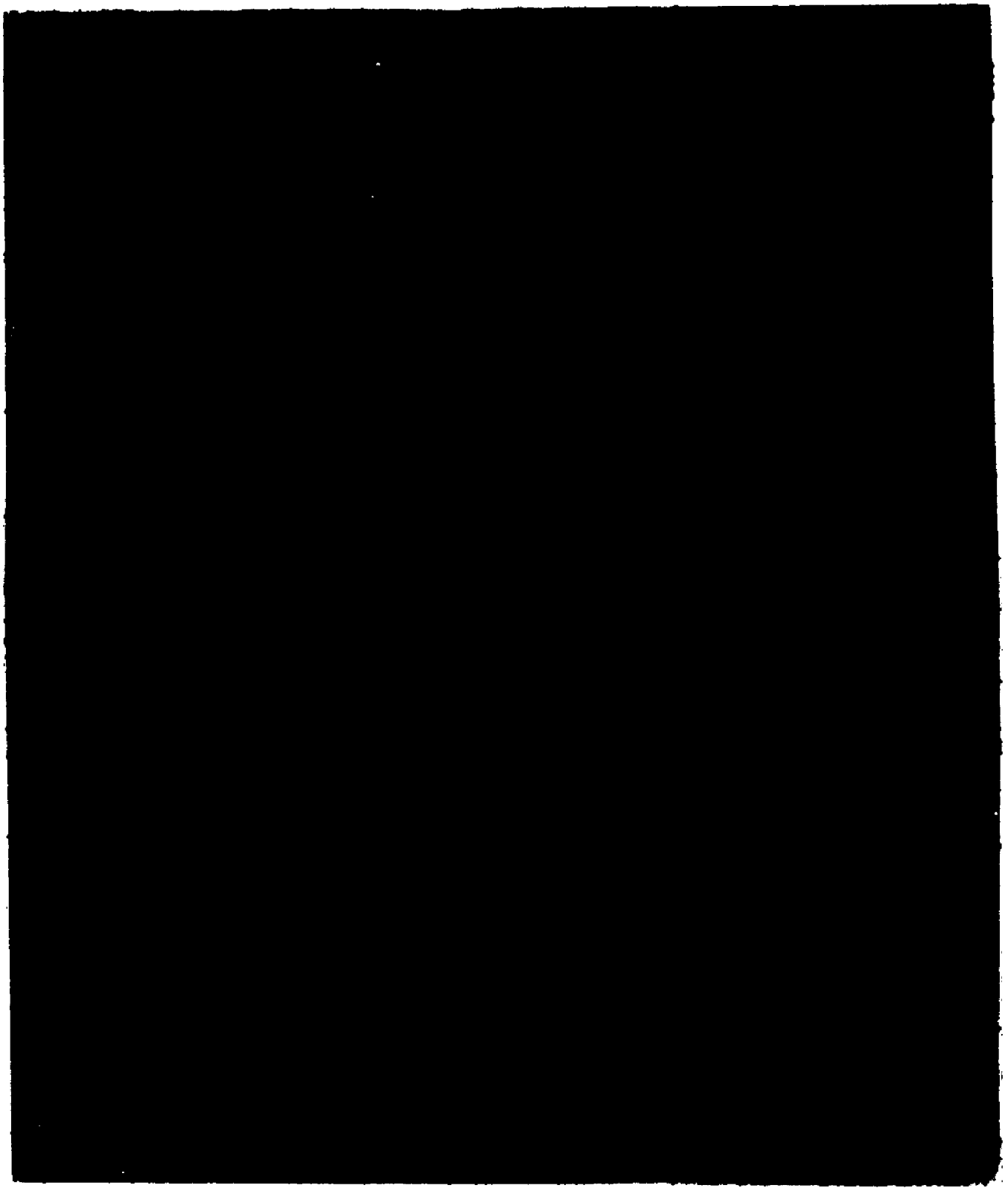

FIGURE 11

DISTRIBUTION OF FOREST FIRES IN EAST
FELICIANA PARISH, 1959
(EACH DOT REPRESENTS ONE FIRE)

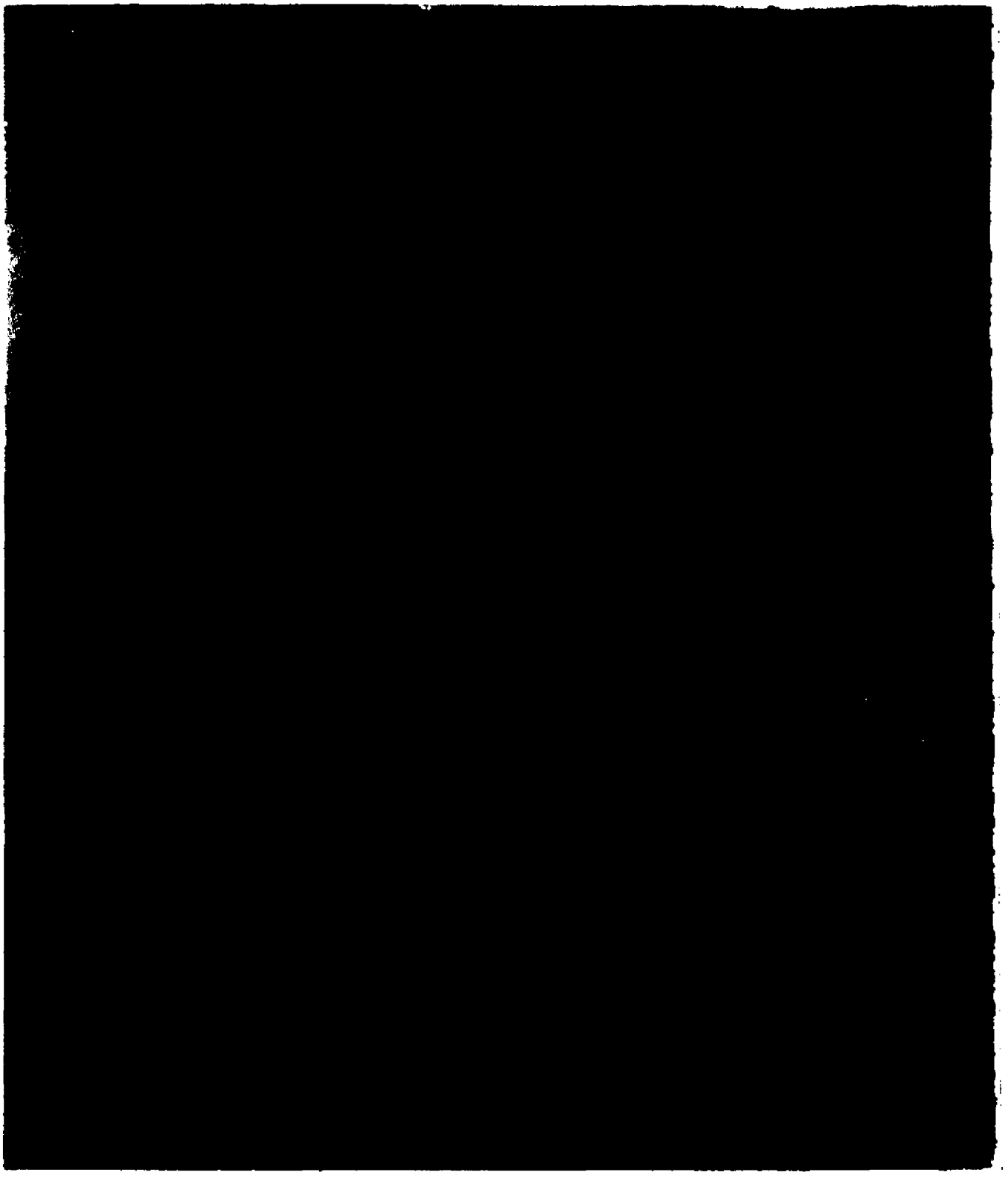

FIGURE 12

DISTRIBUTION OF FOREST FIRES IN
ST. HELENA PARISH, 1959
(EACH DOT REPRESENTS ONE FIRE)

seen from these charts there was no definite pattern of fire occurrence in East Feliciana Parish; however, there was a very definite pattern in St. Helena Parish. Furthermore, the pattern of fire occurrence was essentially the same in St. Helena Parish for each year investigated. This fact emphasizes the persistence of the rural residents in certain areas either toward burning the woods or permitting them to be burned.

An analysis of the data obtained from the fire occurrence charts of St. Helena Parish and presented in Table XXI reveals some interesting information. During the period of the investigation, the number of forest fires that occurred in Ward 3 was consistently higher than any other ward. The data show that 31 per cent of the fires occurred in Ward 3 during the 1955-1959 period. Wards 4 and 2 also had a large proportion of the fires during this period: 21 per cent and 19 per cent, respectively. Thus, the fires that burned in these three wards, which constitute approximately 50 per cent of the land area of the parish, accounted for 71 per cent of the total number of fires. The data in Table XXI further indicate that the least number of fires occurred in Ward 5, with Wards 1 and 6 occupying somewhat of a mid-position in this respect.

TABLE XXI

FOREST FIRE OCCURRENCE RELATED TO LAND OWNERSHIP BY WARD, ST. HELENA PARISH, 1955-59

Land Ownership	Year					Total
	1955	1956	1957	1958	1959	
			WARD 1			
Non-cooperative	19	16	10	15	10	70
Cooperative	52	18	7	23	18	118
International Paper	1	0	0	0	1	2
Crown Zellerbach	48	15	7	21	16	107
Other	3	3	0	2	9	9
Total	71	34	17	38	28	188
			WARD 2			
Non-cooperative	30	40	7	16	30	123
Cooperative	34	32	17	27	34	144
International Paper	20	15	9	18	22	84
Crown Zellerbach	6	8	1	2	1	18
Other	8	9	7	7	11	42
Total	64	72	24	43	64	267

TABLE XXI (Continued)

Land Ownership	Year 1955	1956	1957	1958	1959	Total
			WARD 3			
Non-cooperative	55	30	21	31	52	189
Cooperative	58	42	27	59	78	264
International Paper	55	34	25	56	71	241
Crown Zellerbach	0	0	0	0	0	0
Other	3	8	2	3	7	23
Total	113	72	48	90	130	453
			WARD 4			
Non-cooperative	14	16	4	19	16	69
Cooperative	71	52	20	56	30	229
International Paper	54	44	20	51	26	195
Crown Zellerbach	3	4	0	3	3	13
Other	14	4	0	2	1	21
Total	85	68	24	75	46	298
			WARD 5			
Non-cooperative	13	8	4	3	15	43
Cooperative	6	6	2	7	15	36
International Paper	4	4	2	7	11	28
Crown Zellerbach	0	0	0	0	0	0
Other	2	2	0	0	4	8
Total	19	14	6	10	30	79

TABLE XXI (Continued)

Land Ownership	Year 1955		1956		1957		1958		1959		Total	
					WARD 6							
Non-cooperative	11		15		4		5		26		61	
Cooperative	21		15		8		22		30		96	
International Paper		19		13		8		21		30		91
Crown Zellerbach		0		0		0		0		0		0
Other		2		2		0		1		0		5
Total	32		30		12		27		56		157	

A summary of the fire occurrence data for St. Helena Parish presented in Table XXII indicates that for each year more fires occurred on the lands of wood-using industries than any other type of ownership. Of the 1,442 fires that burned in the parish during the period of the investigation, 887 or 62 per cent occurred on cooperative ownership lands. The forest land held by cooperative ownership in St. Helena Parish amounts to approximately 102,000 acres or 48 per cent of the total forest acreage. Thus, over three-fifths of the fires occurred on less than one-half of the parish's forested land.

A further analysis of the data presented in Tables XXI and XXII indicates that 72 per cent of the fires that burned on cooperative ownership lands occurred on the areas managed by International Paper Company. The 641 fires that occurred on this company's land during 1955 through 1959 amounted to 44 per cent of the total number of fires in the parish. The forest land managed by International Paper Company in St. Helena Parish is approximately 30 per cent of the forested area of the parish. Thus about two-fifths of the total number of fires that burned in the parish during 1955 through 1959 occurred on less than one-third of the parish's forested area. On this company's land there occurred the equivalent

TABLE XXII

SUMMARY OF FOREST FIRE OCCURRENCE BY LAND OWNERSHIP CLASS, ST. HELENA PARISH 1955-59

Land Ownership	Year					Total	Per Cent of Total
	1955	1956	1957	1958	1959		
Non-cooperative	142	125	50	89	149	555	38
Cooperative	242	165	81	194	205	887	62
International Paper	153	110	64	153	161	641	44
Crown Zellerbach	57	27	8	26	20	138	10
Other	32	28	9	15	24	108	8
Total	384	290	131	283	354	1442	

of approximately one fire for every 100 acres.

The fires that burned on the forest land owned by Crown Zellerbach Corporation amounted to 16 per cent of those that occurred on cooperative ownership lands. They constituted 10 per cent of the total number of fires that occurred in the parish during the period of investigation. Crown Zellerbach Corporation owns approximately 12 per cent of the forest land in St. Helena Parish. Thus one-tenth of the fires occurred on one-eighth of the forested acreage of the parish. During the 1955-1959 period there occurred on Crown Zellerbach's land the equivalent of one fire for every 180 acres.

From this analysis of forest fire occurrence in St. Helena parish, it is evident that the major portion of the problem is associated with the forest land managed by International Paper Company. An interesting feature of this analysis is the fact that only a limited number of fires occurred on the forest holdings of Crown Zellerbach Corporation included in the western township of Ward 1. As the data in Table XXI indicate, 107 fires occurred on the lands owned by Crown Zellerbach Corporation in Ward 1 during the 1955-1959 period. However, only 21 per cent of the fires that burned on this company's holdings in this ward occurred in the western township. Actually, as indicated by Figure 10,

Crown Zellerbach owns a larger percentage of the land in the western township of Ward 1 than in the eastern township. The question then may be asked, "Why is it that less fires have occurred in this company's land in this particular location?" Some logical explanation seems to be in order. In this connection, it might be assumed that Richard Henry Hurst and members of his immediate family have had an influence on the fire situation in this area. It should be recalled that Hurst arranged for the purchase of the lands in this area, and also, that he and his sons have been associated with the management of the Crown Zellerbach holdings since they were originally purchased.[12] This assumption has to be made with some caution, however, since at no time during the interviewing of persons in this section of the parish was the name of the Hurst family mentioned.

It could be argued that there were fewer fires in this area during the 1955-1959 period because of the lower density of rural population. However, regression analyses have indicated no correlation between total number of fires and

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[12]Richard Henry Hurst died in 1957; however, part of the original Hurst homestead and the family cemetery are still maintained in the north-central part of the western township of Ward 1 by members of the Hurst family who still reside in the area.

incendiary fires and density of the rural population. There is an association of this factor with debris-burning fires; however, debris-burning fires are not a major factor in St. Helena Parish. In this parish during the 1955-1959 period, 75 per cent of the fires resulted from incendiarism.

Less burning of the forest in this section of the parish could be related to the attitudes of the people toward the use of fire as a land management tool, i.e., the rural residents of this area might not have followed the practice of burning the woods in the past and consequently do not burn now. The interviews with persons in this area did not indicate this to be the situation. In fact, these people have the same agrarian cultural background as the other members of the sample population of St. Helena Parish. Furthermore, they expressed similar opinions toward woods-burning and the practice of forestry.

There might be differences in land management policies followed by the company in this particular section that are related to the incidence of fires. This does not seem to be the case. It is not logical to assume that in this region the forest management practices of the company differ so greatly between townships of the same ward that they cause differences in fire occurrence. This is further confirmed by

the fact that Crown Zellerbach has an incendiary problem on their holdings in Livingston Parish which adjoin St. Helena Parish on the south (see Figure 2, Chapter IV). During the 1955-1959 period, 21 per cent of all the incendiary fires that burned in Louisiana occurred in Livingston Parish. Crown Zellerbach owns approximately 46 per cent of the forest land in this parish.

The original assumption that Richard Henry Hurst and members of his family have influenced the fire situation in the western township of Ward 1, St. Helena Parish, seems to be logical. It could be that fear on the part of the natives of this area of being caught by members of the Hurst family has prevented woods-burning. Indications are that it has been respect for Hurst and his family, rather than fear, that has kept fires at a minimum in this area. Hurst's ancestors were among the original settlers of this section. They and their dependents took an active role in the social development of the community, and came to be recognized as local community leaders. Through their participation in the acquisition and management of the forest land people came to identify them with the forest. Consequently, the actions of the rural residents in this area toward the forest have probably been influenced by their respect for the Hurst family.

IV. CHARACTERISTICS OF SAMPLE POPULATION

Table XXIII describes and compares the personal and social characteristics of the sample populations in the two parishes. A knowledge of these characteristics is basic to an understanding of the data and discussions which follow. As indicated by the data in Table XXIII the characteristics of the sample populations in the parishes studied were similar in many respects; however, there were some major differences.

Approximately three-fifths of the rural residents interviewed were white: there was essentially no difference in this respect between parishes. The percentage of Negroes in the sample population of each parish was somewhat less than that indicated by the 1960 Census.

The majority of the interviewees were males. Eighty-four per cent of the rural residents interviewed in St. Helena Parish were male, whereas only 63 per cent of the respondents in East Feliciana Parish were of this sex. A larger proportion of the male rural residents in East Feliciana were employed off the farm, consequently they were not available for interviewing. Since the majority of the heads of households were male this caused a greater number of housewives to be interviewed in East Feliciana Parish than in St. Helena Parish.

TABLE XXIII

SELECTED SOCIO-CULTURAL CHARACTERISTICS
OF SAMPLE POPULATION

Characteristic	St. Helena Parish (N=118)		East Feliciana Parish (N=101)	
	Number	Per Cent	Number	Per Cent
Race				
White	73	62	60	59
Negro	45	38	41	41
Sex				
Male	99	84	64	63
Female	19	16	37	37
Family Role				
Head of household	105	89	80	79
Housewife	12	10	20	20
Father of head	1	1	0	0
Son of head	0	0	1	1
Age				
20-29 years	9	8	6	6
39-39 years	14	12	11	11
40-44 years	7	6	5	5
45-49 years	14	12	15	15
50-54 years	15	13	15	15
55-59 years	19	16	11	11
60-70 years	23	19	16	16
Over 70 years	17	14	22	22
Education (years attended)				
0	7	6	14	14
1 thru 3	24	20	7	7
4 thru 7	42	36	33	33
8 (grade school)	12	10	16	16
9 thru 10	7	6	13	12
11 (high school)	21	18	10	10
12 thru 13	1	1	2	2
15 (college)	4	3	6	6

TABLE XXIII (Continued)

Characteristic	St. Helena Parish (N=118)		East Feliciana Parish (N=101)	
	Number	Per Cent	Number	Per Cent
Occupation				
Farmer	44	37	25	25
Housewife	14	12	19	19
Retired	16	14	12	12
Welfare	19	16	18	18
Skilled laborer	5	4	15	15
Unskilled laborer	17	14	9	9
Professional	2	2	3	3
Unemployed	1	1	0	0
Marital Status				
Single	3	3	6	6
Married	109	92	83	82
Divorced	0	0	1	1
Separated	1	1	11	11
Widow(er)	5	4	0	0
Native				
Yes	99	84	83	83
No--more than 5 years	11	9	14	14
No--3 to 5 years	5	4	4	4
No--less than 1 year	3	3	0	0
Parents Native				
Yes	94	80	77	76
No--Louisiana	15	13	11	11
No--Mississippi	8	7	7	7
No--South	1	1	3	3
No--Midwest	0	0	1	1
No--Europe	0	0	2	2
Rural Living				
Strongly favorable	100	85	93	92
Favorable	18	15	7	7
Unfavorable	0	0	1	1

TABLE XXIII (Continued)

Characteristic	St. Helena Parish (N=118)		East Feliciana Parish (N=101)	
	Number	Per Cent	Number	Per Cent
Neighborhood Visits				
Frequent	34	29	28	28
Occasional	59	50	58	57
Seldom	25	21	15	15
Relations With Neighbors				
Good	104	88	94	93
Fair	14	12	6	6
Poor	0	0	1	1
Relations With Outsiders				
Good	84	71	88	87
Fair	31	26	12	12
Poor	3	3	1	1
Gross Family Income				
Under $1,500	66	56	39	39
$1,500 - $2,999	20	17	19	19
$3,000 - $4,999	11	9	22	22
$5,000 - $9,999	17	14	15	15
Over $10,000	4	3	6	6

There was essentially no difference in the ages of persons that made up the sample population. It is of interest to note that about one-half (49 per cent) of the persons interviewed in both parishes were older than 55 years. Only one out of every thirteen in St. Helena and one out of every seventeen in East Feliciana was under 30 years.

The educational attainment of the rural residents in both parishes was low. Within broad categories there were only minor differences between parishes. It is significant to note that 62 per cent of the respondents in St. Helena Parish and 54 per cent in East Feliciana Parish attended school less than eight years. Over one-third (34 per cent in St. Helena and 38 per cent in East Feliciana) had completed from 8 to 12 years of schooling. Only four per cent in St. Helena and eight per cent in East Feliciana pursued their education beyond high school.

Although farmers made up the greatest percentage of the occupational groups (37 per cent in St. Helena and 25 per cent in East Feliciana), it is of interest to note certain significant and similar conditions with respect to occupations in both parishes. For instance, 30 per cent of the persons interviewed in both parishes were retired and/or on welfare. Eighteen per cent of the sample population in

St. Helena Parish were laborers; less than one-fourth of which were skilled. In St. Helena, there were approximately one-half as many laborers as farmers. However, there were just as many laborers in the sample population of East Feliciana Parish as farmers. Furthermore, about two-thirds of the laborers were skilled. Only two per cent of the interviewees in St. Helena Parish and three per cent in East Feliciana Parish were professionally employed. It should be pointed out that only one person out of the 219 interviewed admitted to being unemployed.

Most of the persons interviewed in both sample parishes were native-born and had lived in the parishes all their lives. In fact only four per cent of the respondents in East Feliciana and seven per cent in St. Helena had lived in the areas for less than five years. The majority of the parents of the interviewees were also native to the area. Eighty per cent of the persons interviewed in St. Helena Parish stated that their parents were native. In East Feliciana, a similar number (76 per cent) admitted that their parents were also native-born.

There was exhibited considerable homogeneity in the answers to the question asked of the interviewees: "How do you feel about living in the country?" Eighty-five per cent

of the respondents in St. Helena Parish were strongly in favor of the country as a place to live: 92 per cent of the rural residents in East Feliciana Parish expressed a similar attitude toward rural living. The quotations below, which illustrate the attitudes of the respondents, are typical.

> I wouldn't like to live in town and be poor. I like to raise cows and calves and garden.
>
> Only place to live worth a damn, and I've lived in Baton Rouge.
>
> Why, I wouldn't live anywhere else in the world.
>
> This is the garden spot of the world: it's the only place I'd stay.

Although only slightly more than one-fourth of the respondents in each parish admitted to frequent neighborhood visits, the majority stated that the relations with their neighbors were good. It was of interest to discover during the course of interviewing that the rural residents in both parishes defined their neighbors as those persons living in the immediate vicinity. This was especially the situation in St. Helena Parish where a neighbor was considered to be the person living no further than one-half mile "down the road."

The feelings of the rural residents in St. Helena Parish toward outsiders was not as good as in East Feliciana

Parish. In fact, 26 per cent of the interviewees in St. Helena Parish acknowledged only fair relations toward outsiders who came into their areas. Only 12 per cent of the respondents in East Feliciana Parish expressed such an attitude.

The data presented in Table XXIII on the gross family income of the sample population show some major differences between parishes. Fifty-six per cent of the persons interviewed in St. Helena Parish reported a gross annual income of less than $1,500. Whereas, only 39 per cent of the respondents in East Feliciana Parish earned less than $1,500 per year. Both parishes had essentially the same percentage of rural families who reported an annual income of between $1,500 and $3,000. However, only one-fourth (26 per cent) of the interviewees in St. Helena Parish earned more than $3,000. In East Feliciana Parish almost one-half (43 per cent) of the persons interviewed acknowledged a gross annual family income in excess of $3,000.

This brief description of the characteristics of the sample population has indicated some major differences between the rural residents of the two parishes. The educational attainment of the rural residents in East Feliciana Parish was higher than those in St. Helena Parish. More farmers

were interviewed in St. Helena Parish; however, a greater percentage of laborers were interviewed in East Feliciana Parish. Furthermore, over three times as many skilled laborers were present in the sample population of East Feliciana Parish. A larger percentage of the respondents in East Feliciana Parish had greater gross incomes. This would indicate a higher socio-economic status of the rural residents of that parish as compared with St. Helena Parish.

CHAPTER VII

INTERVIEWEES ATTITUDES TOWARD AND OPINIONS ABOUT THE PRACTICE OF FORESTRY

It was expected that rural residents would have definite opinions about the relative advantages of forest-agriculture, i.e., the growing of trees as a crop. Furthermore, it was believed that these opinions would condition their acceptance of this practice. In fact, the management of land for timber production might be so foreign to the agricultural way of life in certain areas that it could produce unfavorable attitudes toward forestry. For this reason certain questions were designed to determine the respondents' feelings about forestry in general.

This section is concerned with the attitudes and opinions of rural residents toward forestry and the problem of forest fires. Initially, the data will be presented without differentiating groups of respondents within each parish so that a comprehensive examination can be made of the problem. Secondly, the attitudes and opinions of the interviewees will be classified and compared according to race.

This breakdown is basic to the study since race is a fundamental social distinction, especially in the South. Finally the attitudes and opinions of the respondents will be analyzed according to the major occupational groups represented in the sample populations. The occupational distinction is employed because it has a determining influence on the value orientation of people.

I. OPINIONS AND ATTITUDES OF THE SAMPLE POPULATION AS A WHOLE

The first general question related to forestry that was posed to the residents dealt with the general opinion of the people toward tree farming. As the data in Table XXIV indicate, the rural residents of East Feliciana Parish were more strongly in favor of growing trees as a crop than those of St. Helena Parish. However, the majority (76 per cent) of the people interviewed in both parishes stated that they were at least in favor of tree farming. It is doubtful, however, that these favorable sentiments expressed by rural residents represented their real attitudes, especially in St. Helena Parish. In almost every instance when a person stated that he was in favor of growing trees, he added the condition, "if I had enough land" or "if my land wasn't fit

TABLE XXIV

ATTITUDES AND OPINIONS OF RURAL RESPONDENTS IN ST. HELENA AND EAST FELICIANA PARISHES TOWARD TREE FARMING, FOREST FIRES, AND LARGE LANDOWNERS

	St. Helena Parish (N=118)		East Feliciana Parish (N=101)	
	Number	Per Cent	Number	Per Cent
Opinion of Tree Farming				
Strongly favorable	19	16	41	41
Favorable	71	60	35	35
Unfavorable	14	11	9	9
Indifferent	14	11	16	16
Objections to Growing Trees				
No objections	67	57	79	78
Fire destroy	16	14	2	2
Insects destroy	0	0	2	2
Slow growth	13	11	15	15
Fire & slow growth	18	15	0	0
Cheap product	4	3	2	2
Difficult to grow	0	0	1	1
Improvements in Fire Protection				
No improvement	7	6	1	1
More equipment	83	70	50	49
Don't burn now	23	19	24	24
More careful	2	3	11	11
Realize value of timber	0	0	11	11
Don't know	3	2	4	4
Causes of Fires				
Set on purpose, grazing and spite	21	18	2	2
Set on purpose, spite	8	7	0	0
Set on purpose, grazing	44	37	0	0
Carelessness	26	22	62	61
Accidents	9	8	8	8
Smoking	5	4	10	10
Lightning & dry weather	2	2	1	1
No fires here	0	0	13	13
Don't know	3	2	5	5

TABLE XXIV (Continued)

	St. Helena Parish (N-118)		East Feliciana Parish (N-101)	
	Number	Per Cent	Number	Per Cent
How to Prevent Man-Caused Fires				
Nothing	56	47	52	51
Arrest, jail	18	15	8	8
Arrest, fine	5	4	15	15
Education	5	4	2	2
Improve protection	7	6	6	6
Let people use land	1	1	0	0
Employ local people	1	1	0	0
Friendly companies	1	1	1	1
Don't know	24	20	17	17
People that Burn the Woods				
No particular group	25	21	21	21
Careless people	12	10	23	23
No deliberate burning	3	2	42	42
Cattlemen	47	40	1	1
Hunters	2	2	5	5
Uninformed people	6	5	2	2
People with grudge	8	7	1	1
Don't know	15	13	6	6
Relations of People with Large Landowners				
Excellent	5	4	49	49
Good	32	27	41	41
Fair	56	47	7	7
Bad	12	10	2	2
Very bad	7	6	0	0
Don't know	6	5	2	2
How Large Landowners Can Improve Relations				
Nothing else can do	22	19	7	7
Stop killing hardwoods	12	10	0	0
Sell land to farmers	35	30	0	0
Cooperate with farmers	5	4	8	8
Hire local people	4	3	0	0
Rent land	2	2	1	1
Burn for cattlemen	4	3	0	0
Develop community spirit	0	0	1	1
Don't know	33	28	17	17
Does not apply	1	1	67	66

for nothing else." Approximately the same percentage of the sample populations in both parishes were not in favor of tree farming. As will be pointed out later, these persons considered tree farming as a threat to their means of livelihood, or else, they were unfavorably inclined due to the practices employed in tree farming.

The interviewees in East Feliciana Parish had less objections to the growing of trees than those in St. Helena Parish. It is of interest to note that 78 per cent of the persons interviewed in East Feliciana had no objections to growing trees; this is essentially the same as the number in favor of tree farming. The major objection given by respondents in East Feliciana was the slow growth of trees. A different situation in this respect existed in St. Helena Parish where almost one-half (43 per cent) gave objections to the growing of trees. It is significant to note that the rural residents of this parish recognized fire as the major threat to timber production.

When asked about improvements in fire protection, 70 per cent of the people in St. Helena indicated that protection had improved due to more equipment, fire wardens, fire towers, and so forth. Only 19 per cent admitted that people had stopped burning purposely and no one indicated that fire

had decreased due to the realization of the value of timber. In contrast, only 49 per cent of the interviewees in East Feliciana attributed improvements in fire protection to improvements in equipment, and so forth. The people in this parish acknowledged changes in human behavior as a major factor in the improvement of fire protection. Twenty-four per cent of the sample population agreed that people had stopped burning the woods, 11 per cent indicated that people were more careful, and 11 per cent stated that the realization of the value of timber had resulted in improved fire protection.

The data in Table XXIV show that there were considerable differences in the opinions of the rural residents in the sample parishes as to the causes of fires. Sixty-two per cent of the interviewees in St. Helena readily admitted that the fires in their parish were set on purpose. The burning of the woods for pasturage was indicated as the major reason for deliberately burning the property of another. Only seven per cent acknowledged "spite burning" as a contributory cause; however, about one out of every five combined "spite burning" and "burning for grass" as a cause. Although "spite burning" was mentioned, it is doubtful that the people of St. Helena were entirely truthful in this

respect. Their actions and answers to other questions would indicate that more "spite burning" was practiced than admitted. In this connection, it is believed that the majority of the respondents rationalized carelessness as a cause of fires: 22 per cent of the rural residents in St. Helena mentioned this causal factor. It was of interest to learn that they defined "carelessness fires" as those resulting from pasture- and/or debris-burning and "accident fires" as resulting primarily from hunting. The reasons given by the interviewees in East Feliciana Parish as to the causes of fires were entirely different. It is significant that only one person out of fifty (two per cent) mentioned incendiarism as a cause of fires in East Feliciana Parish. The people of this parish defined carelessness, i.e., fires which have escaped control, as the major cause. One person out of every eight stated that fires no longer occurred in their area.

The data presented in Table XXIV seem to indicate that the residents of both parishes were in general agreement as how to prevent man-caused fires. Approximately 50 per cent of the respondents indicated that nothing else could be done. However, the interviewees of each parish defined this situation in an entirely different manner. St. Helena residents

readily admitted that certain people were going to burn the woods regardless and there was nothing that could be done to prevent them from doing so. On the other hand, residents of East Feliciana Parish recognized that the incidence of fires had been reduced to the minimum and stated that nothing else could be done to decrease them further.

There were also differences between the parishes in the responses made by rural residents as to the kind of people that burn the woods. In St. Helena, 40 per cent of the people agreed that cattlemen were responsible for the fires in their parish. Only one out of forty said that there was no deliberate burning of the forest. This situation was reversed in East Feliciana Parish where 42 per cent stated that there was no intentional forest burning: only one out of fifty mentioned incendiarism as a cause of fires.

The residents of East Feliciana had more favorable attitudes toward large landowners. Ninety per cent of the respondents stated that the relations of the people toward large landowners were good to excellent. In contrast, 47 per cent of the interviewees in St. Helena Parish felt that the relations of rural residents toward large landowners was

only fair; 16 per cent were of the opinion they were bad to very bad.[11]

In seeking to explain how large landowners could improve their relations with rural residents, 30 per cent of the respondents in St. Helena admitted that this could only be done by selling some of their land to the farmers in need of additional acreage. Ten per cent rationalized that the elimination of the practice of girdling hardwoods would improve relations. It is especially significant to note that in this parish not a single person admitted the development of community spirit on the part of "the lumber companies" would improve relations. The improvement of relations between large landowners and rural residents in East Feliciana Parish is not a problem. As the data in Table XXIV indicate, this question did not apply to two-thirds of the respondents since they had no unfavorable attitudes toward large landowners.

This analysis of the attitudes and opinions of rural

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[11]In St. Helena Parish a large landowner was considered to be anyone who owned more than 200 acres of land. Primarily it included only "the lumber companies" and/or "absentee owners." However, East Feliciana Parish residents considered a large landowner to be anyone who possessed more than 400 acres of land.

residents has indicated that the people of St. Helena Parish in general have a lukewarm or even unfavorable attitude toward the practice of forestry. In comparison with the residents of East Feliciana they indicated a considerably different value orientation toward the forest. Although St. Helena residents admitted that fire protection had improved (as a result of improvements in equipment and not in human behavior), they agreed that fire was the major obstacle to the growing of trees. They readily admitted that incendiarism on the part of cattlemen was the major cause of fires and were in general agreement that nothing could be done about it.[12] Furthermore, they acknowledged poor relations with large landowners ("the lumber company") and indicated that the best way to improve them was by the sale of land to farmers. This indicates that their unfavorable attitude toward forestry is conditioned primarily by the conflict of interest over the use of the land.

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[12]In the sense used here, cattlemen refer to farmers engaged in the practice of raising cattle, whether it be for dairy or beef production.

II. DIFFERENCES IN OPINIONS AND ATTITUDES OF WHITE AND NEGRO RESPONDENTS

The general pattern of answers that developed in response to most of the questions related to forestry were similar within each parish, regardless of race. That is, within each parish white and Negro respondents showed a tendency to answer certain questions in a similar manner. However, there were major differences between parishes in the attitudes and opinions of both white and Negro respondents toward forestry.

White respondents in East Feliciana Parish were more strongly in favor of growing trees as a crop; whereas, in St. Helena Parish, it was the Negro population that indicated the most favorable opinion in this respect (Table XXV). However, the opinions expressed by the Negro respondents in St. Helena Parish with regard to tree farming are not necessarily a true measure of their feelings. Their answers given to other questions substantiate this conclusion. Also, it was the general consensus of the interviewers that most of the Negroes in St. Helena Parish were suspicious. Consequently, they attempted to answer the questions in the manner in which they thought the interviewers wanted them answered. This was

TABLE XXV

ATTITUDES AND OPINIONS OF WHITE AND NEGRO RESPONDENTS IN ST. HELENA AND EAST FELICIANA PARISHES TOWARD TREE FARMING, FOREST FIRES, AND LARGE LANDOWNERS

	White		Negro	
	St. Helena (N=73) Per Cent	E. Feliciana (N=60) Per Cent	St. Helena (N=45) Per Cent	E. Feliciana (N=41) Per Cent
Opinion of Tree Farming				
Strongly favorable	20	53	91	22
Favorable	59	28	0	44
Unfavorable	11	5	0	15
Indifferent	10	12	9	17
Objections to Growing Trees				
No objections	64	83	44	71
Fire destroy	10	2	20	2
Insects destroy	0	2	0	2
Slow growth	11	2	11	20
Fire & slow growth	10	0	24	0
Cheap product	5	0	0	5
Difficult to grow	0	2	0	0
Improvements in Fire Protection				
No improvement	5	0	7	2
More equipment	69	52	73	46
Don't burn now	19	18	20	32
More careful	3	12	0	10
Realize value of timber	0	15	0	5
Don't know	4	3	0	5

TABLE XXV (Continued)

	White		Negro	
	St. Helena (N=73) Per Cent	E. Feliciana (N=60) Per Cent	St. Helena (N=45) Per Cent	E. Feliciana (N=41) Per Cent
Causes of Fires				
Set on purpose, grazing and spite	21	0	13	5
Set on purpose, spite	7	0	7	0
Set on purpose, grazing	34	0	42	0
Carelessness	22	65	22	56
Accidents	7	10	9	5
Smoking	5	7	2	15
Lightning & dry weather	1	2	2	0
No fires here	0	12	0	15
Don't know	3	5	2	5
How to Prevent Man-Caused Fires				
Nothing	40	48	60	56
Arrest, jail	19	7	9	10
Arrest, fine	6	0	2	5
Education	6	17	2	12
Improve protection	4	7	9	5
Let people use land	0	0	2	0
Employ local people	1	0	0	0
Friendly companies	1	2	0	0
Don't know	23	20	16	12

TABLE XXV (Continued)

	White		Negro	
	St. Helena (N=73) Per Cent	E. Feliciana (N=60) Per Cent	St. Helena (N=45) Per Cent	E. Feliciana (N=41) Per Cent
People that Burn the Woods				
No particular group	14	23	33	17
Careless people	11	22	9	24
No deliberate burning	4	35	0	51
Cattlemen	40	1	40	0
Hunters	1	8	2	0
Uninformed people	8	3	0	0
People with grudge	10	2	2	0
Don't know	12	5	13	7
Relations of People with Large Landowners				
Excellent	5	52	2	37
Good	26	40	29	42
Fair	38	5	62	10
Bad	14	3	4	0
Very bad	10	0	0	0
Don't know	7	0	2	12
How Large Landwoners Can Improve Relations				
Nothing else can do	22	10	13	2
Stop killing hardwoods	11	0	9	0
Sell land to farmers	30	0	29	0
Cooperate with farmers	5	7	2	10
Hire local people	3	0	4	0

TABLE XXV (Continued)

	White		Negro	
	St. Helena (N=73) Per Cent	E. Feliciana (N=60) Per Cent	St. Helena (N=45) Per Cent	E. Feliciana (N=41) Per Cent
How Large Landowners Can Improve Relations (Continued)				
Rent land	1	0	2	2
Burn for cattlemen	3	0	4	0
Develop community spirit	0	2	0	0
Don't know	25	13	36	22
Does not apply	0	68	0	63

especially true with the question which dealt with the general opinion of the residents toward tree farming. It is of interest to note that the rural Negroes of East Feliciana Parish were not as favorably impressed with the growing of trees. Many defined this practice as a definite threat to their means of livelihood. The following quotations express typical views of the matter.

> Raising trees is just causing the land to grow up in briars and bushes. It puts people out of work and anyway it don't look too good. Now you take Mr. ____ place over here. They hires people and works it; nice open pastures and fields--it looks good.

> I'm not in favor of planting trees, puts people out of work. Anyway folks need land so can have something to eat.

> Used to have fires in here, people who owned land then didn't care. Take Mr. ____, he didn't care if people went thru his place and set fire to a straw field when they was hunting for something to eat. Now they won't even let you on their land and if you do cross it you'd better be careful and not set no fire.

It is interesting that many Negroes defined tree farming as a threat to their basic physiological needs. Probably an influencing factor in this regard is the low level of living of Negroes.

A greater percentage of the Negroes interviewed gave objections to growing trees. Fifty-five per cent of the Negroes in St. Helena Parish considered fire and slow growth

to be the major objections; whereas, East Feliciana Negroes indicated slow growth as the most important consideration in this respect.

White and nonwhite respondents of the same parish generally had the same opinion in regard to improvements in fire protection; that is, respondents in St. Helena regarded improvements in equipment as the major factor, while East Feliciana residents considered changes in human behavior to be equally important. The common reason given by interviewees in East Feliciana Parish was, "We're particular with fire over here." The following series of quotations illustrates the attitude of the white rural residents.

> Why, we realize the value of timber in every way and naturally we take care of it. I really don't know what we would have done if it had not been for the timber. (retired female teacher)

> We don't burn around here now, have learned value of timber. I don't burn 'cause I'm afraid it might get on my neighbor and I wouldn't like for him to let fire get on me. Where you have fire is where you have open range: people using company land burn it for tender grass. (carpenter and cattle farmer)

> When we came out here in 1928 we used to burn the woods every year, the smoke was rough too. The woods was kept clean and the timber was big and you could see everywhere. We don't burn here anymore because the landowners don't want us to. Why if I set the woods on fire back here behind my place they'd know who did it 'cause no one else would want to. I don't want my neighbors going around saying that____ sets the woods on fire. Why people all the way over

to Mr. _____ would know I did it. (small dairy farmer)

Now I'll tell you why we used to burn and now don't. A few years ago when the boll weevil first come in here we used to stick fire to this entire area and burn off everywhere to kill the boll weevil. Since then though we have learned to control the weevil with poison and also learned the value of timber. We don't burn no more. (retired deputy sheriff)

People don't burn around here because we're civilized. We respect people's property over here. (housewife)

People have found out the damage fire does. Also, people are more careful because if fire spreads on other people's land the law will handle them. (bus driver and cattle farmer)

There are a lot of people here who would prefer to burn the woods, but they are afraid to. (large landowner)

The following responses given by Negro residents of East Feliciana Parish further explain the situation.

They won't let us burn the woods no more. If they catch you they'll make you pay or else put you in jail. Anyway they told us it don't do any good to burn. Sometimes we'd like to burn off the woods where there is lots of straw on account of boll weevils, but we don't. (farmer)

Landlords used to burn off their land but they don't even burn now and won't let any body else burn. (tenant farmer)

Used to burn but don't stick no fire now. People know better. I'm scared to set fire now, it might get on other fellow's land. (farmer)

Used to have lots of fires around here. Owner

> wanted to burn off the land so he'd hire us to set it afire. Used to burn for ticks, cattle ran in woods then. Now cattle in pasture and people know value of timber. (retired unskilled laborer)
>
> People won't set fires now because its against the law. Neighbors don't want you to burn the land. The woods need to be burned but people won't do it. (housewife)

As these quotations suggest the rural residents of East Feliciana Parish no longer burn the woods because of the powerful social forces which are at work in their environment. These forces, "respect for the neighbor's property," "fear of legal sanctions," and "realization of the value of timber," have an influence on their behavior toward the forest.

The rural residents of both races in a given parish were in general agreement as to the causes of fires. However, a greater percentage of the Negro respondents indicated that nothing else could be done to prevent them. It should be pointed out that both white and Negro interviewees of East Feliciana Parish considered education as an important preventative measure.

Over one-half of the Negroes interviewed in East Feliciana agreed that there was no deliberate burning of the forest in their area. This opinion was not given by a single Negro in St. Helena Parish. Both races in St. Helena acknowl-

edged that cattlemen were responsible for two-fifths of the fires in that parish.

Some differences were noted in the responses given by the white and nonwhite respondents in both parishes with regard to relations with large landowners. In East Feliciana only 79 per cent of the Negroes indicated good to excellent relations: in comparison 92 per cent of the white respondents of this parish indicated that relations were at this level. Sixty-two per cent of the Negroes in the sample population of St. Helena Parish admitted to fair relations with large landowners; only four per cent mentioned that relations were bad. However, one-fourth of the white people of this parish acknowledged that the feelings toward large landowners were bad to very bad. Only one out of three of this race indicated fair relations.

A few of the members of both races of the sample population of St. Helena did mention that nothing else could be done to improve the feelings of the rural residents toward large landowners. However, the majority were in general agreement that two steps could be taken by large landowners in this respect. One measure would be for them to sell land to the farmers and/or cooperate with them in their attempts to achieve a livelihood. The other course of action would

be the cessation of killing hardwoods.[13] It is significant that these factors were seldom mentioned by the respondents of either race in East Feliciana Parish. In fact this aspect of the problem did not apply to 68 per cent of the white and 63 per cent of the Negro respondents of East Feliciana Parish.

The significant feature of this analysis of the attitudes and opinions of white and Negro interviewees is the fact that the members of both races in each parish had essentially the same value orientation toward the forest. The data indicate that certain members of both races in East Feliciana Parish would prefer to burn the woods. However, due to the system of social control, which has arisen out of their cultural and social organization, their real attitudes toward the forest are not expressed by deliberate burning. There appeared to be little in the culture of the rural residents of St. Helena Parish that would moderate their unfavorable attitudes toward the forest.

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[13]Killing hardwoods is a practice employed in forest management to improve the environmental conditions for favored species, in this case pine. In forestry terminology it is known as timber stand improvement, "TSI," and refers to the practice of weed-tree control and eradication primarily through the use of chemicals and/or girdling.

III. DIFFERENCES IN OPINIONS AND ATTITUDES OF RESPONDENTS IN VARIOUS OCCUPATIONAL GROUPS

Farmers

The largest occupational group interviewed in either of the sample parishes was farmers. As previously indicated, more farmers were interviewed in St. Helena Parish than East Feliciana Parish. In general, the greatest differences between parishes in attitudes and opinions toward forestry were displayed by this occupational group. Because of the importance of farmers in this phase of the study it might be well to examine the characteristics of this group prior to analyzing their attitudes and opinions.

The data in Table XXVI presents the specific characteristics of the farmers interviewed in St. Helena and East Feliciana parishes. Some major differences are to be noted between parishes in the farmer's characteristics.

The farms owned or operated by the farmers interviewed in East Feliciana were larger. Over three-fourths of the farmers interviewed in St. Helena owned less than 100 acres; only one out of fifty managed more than 500 acres. In contrast, less than one-half of the farms in East Feliciana were smaller than 100 acres, and one out of every seven were larger than 500 acres in size.

TABLE XXVI

GENERAL CHARACTERISTICS OF FARMERS[a] INTERVIEWED IN ST. HELENA AND EAST FELICIANA PARISHES

Characteristic	St. Helena Parish (N=54)		East Feliciana Parish (N=35)	
	Number	Per Cent	Number	Per Cent
Race				
White	38	70	21	60
Negro	16	30	14	40
Native				
Yes	44	81	29	83
No--more than 5 years	6	11	6	17
No--3 to 5 years	2	4	0	0
No--less than 1 year	2	4	0	0
Land Tenure				
Own farm	45	83	30	86
Rent for cash	2	4	1	3
Rent for shares	3	5	2	6
Own part and rent part	3	5	2	6
Operate for owner	1	2	0	0
Acres Owned, Rented or Operated				
Less than 25 acres	11	20	6	17
25-49 acres	14	26	6	17
50-99 acres	16	30	4	11
100-149 acres	8	15	8	23
150-199 acres	1	2	2	6
200-299 acres	2	4	2	6
300-499 acres	1	2	2	6
Over 500 acres	1	2	5	14
Years Owned, Rented or Operated				
Less than 10 years	10	19	6	17
10-19 years	20	37	13	37
20-39 years	18	33	8	23
Over 40 years	6	11	8	23

[a]Includes also the wives of farmers.

TABLE XXVI (Continued)

Characteristic	St. Helena Parish (N=54)		East Feliciana Parish (N=35)	
	Number	Per Cent	Number	Per Cent
Type Farm				
Beef cattle	8	15	6	17
Dairy	17	31	4	11
Cotton	3	6	0	0
General farming	20	37	18	51
Tree farm	2	4	0	0
Don't farm now	1	2	3	9
Rent farm	3	5	3	9
Land in soil bank	0	0	1	3
Gross Farm Income				
Under $250	18	33	10	29
$250-$490	9	17	10	29
$500-$1,999	2	4	2	6
$2,000-$5,999	9	17	5	14
$6,000-$9,999	6	11	0	0
Over $10,000	3	5	4	11
No farm income	7	13	4	11
Per Cent Acreage in Woodland				
Less than 10 per cent	22	41	13	37
10-29 per cent	12	22	6	17
30-49 per cent	5	9	5	14
50-75 per cent	12	22	7	20
Over 75 per cent	3	5	4	11
Per Cent Farm Income From Timber				
Less than 25 per cent	3	5	3	9
25-49 per cent	0	0	1	3
50-75 per cent	1	2	0	0
Over 75 per cent	1	2	2	6
No income	49	91	29	83

TABLE XXVI (Continued)

Characteristic	St. Helena Parish (N=54)		East Feliciana Parish (N=35)	
	Number	Per Cent	Number	Per Cent
Other Uses of Woodland				
Recreation & home use	8	15	2	6
Grazing	22	41	6	17
Recreation, home use and grazing	11	20	9	26
No other use	13	24	18	51
Use Adjoining Land				
No	22	41	22	63
Yes, grazing	12	22	3	9
Yes, hunting	6	11	8	23
Yes, grazing & hunting	14	26	1	3
Yes, firewood	0	0	1	3
Want More Land				
Yes	28	52	6	17
No	26	48	29	83
What Prevents Land Purchase				
Not available	8	15	3	9
Companies won't sell	9	17	0	0
Excessive price	3	5	1	3
Don't have money	8	15	2	6
Does not apply	26	48	29	83
Received Farming Help				
Yes	20	37	12	34
No	34	63	23	65
Part-Time Work				
Yes	14	26	11	31
No	38	70	18	51
Does not apply	2	4	6	17

TABLE XXVI (Continued)

Characteristic	St. Helena Parish (N=54)		East Feliciana Parish (N=35)	
	Number	Per Cent	Number	Per Cent
Socio-Economic Status				
Upper	30	54	19	54
Middle	10	19	10	29
Lower	14	26	6	17
Value Farm Equipment				
Under $2,500	27	50	19	54
$2,500 - $4,999	8	15	3	9
$5,000 -$10,000	6	11	2	6
$10,000-$20,000	6	11	4	11
Over $20,000	1	2	0	0
Don't know	6	11	7	20
Gross Family Income				
Under $1,500	24	44	11	31
$1,500-$2,999	10	19	7	20
$3,000-$4,999	3	5	8	23
$5,000-$9,999	13	24	5	14
Over $10,000	4	7	4	11

Forty-six per cent of the farmers in St. Helena Parish managed their land for the production of cattle; two-thirds of these cattle farmers were dairymen. Thirty-seven per cent were engaged in general farming. In East Feliciana only 28 per cent of the farms included in the sample population were cattle farms; whereas, over one-half were considered by the interviewees to be general farms. A greater percentage of the farmers interviewed in St. Helena Parish reported higher gross farm incomes.

Approximately one-third of the farmers in both parishes reported that between 30 and 75 per cent of their land was woodland; however, 91 per cent in St. Helena and 83 per cent in East Feliciana reported that they had received no income from their timber holdings during the previous year. In this connection, 41 per cent of the St. Helena farmers admitted that they used their woodland entirely for grazing. In contrast, only 17 per cent of the East Feliciana farmers indicated such an exclusive use of their woodland. Also, 48 per cent of the farmers in St. Helena Parish acknowledged that they used adjoining forest land for grazing. Only 12 per cent admitted to this practice in East Feliciana Parish.

It is of interest to note that over one-half (52 per cent) of the farmers interviewed in St. Helena Parish

emphasized that they wanted to purchase more land. In reply to the question, "What prevents you from buying additional land?": 15 per cent mentioned that it was not available; 17 per cent were more emphatic in this respect and stated that the "lumber" companies would not sell; 5 per cent complained that land prices were too high; 15 per cent agreed that they did not have the money. The desire for more land on the part of farmers in East Feliciana Parish did not seem to be a problem.

The socio-economic status of the farmers in East Feliciana Parish was generally higher than those of St. Helena Parish.[14] In fact, a greater percentage of the farmers in

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[14]By socio-economic status is meant the relative position of farmers with regard to the possession of certain material items. It is an indirect measure of farmer income and is considered a reliable measure of the relative standing of a farmer in the area.

The items listed below were determined for each farm household, weighed as shown, and summed. Those farmers with scores of 64 or more were classed as upper; those with scores from 53 to 63 as middle; and those 52 or below as lower. Items and weights used were as follows:

Tractor: Yes (8), No (3)
Automobile: Yes (5), No (2)
Television: Yes (6), No (3)
Radio: Yes (6), No (3)
Deepfreeze: Yes (6), No (3)
Hot running water: Yes (8), No (4)
Cold running water: Yes (6), No (3)
Bathroom: Yes (6), No (3)
Washing machine: Yes (6), No (3)

East Feliciana reported that their family income was greater that $3,000.

At first glance the data in Table XXVII seem to indicate that the farmers in both St. Helena and East Feliciana parishes had favorable opinions toward tree farming. It will be noted that only nine per cent in St. Helena and six per cent in East Feliciana expressed unfavorable sentiments toward the growing of trees as a crop. In fact 56 per cent of the farmers in St. Helena Parish stated that they were in favor of growing trees: 54 per cent in East Feliciana indicated that they were strongly in favor of this practice. Although farmers of both parishes made such statements they do not appear to be true expressions of their attitudes. This is especially true of farmers in St. Helena Parish. Questions designed to cross check the opinions given by respondents toward tree farming substantiate this conclusion. For instance, although 75 per cent of the farmers in each parish stated that they were in favor of tree farming, only 31 per cent in St. Helena and 26 per cent in East Feliciana who owned timberland acknowledged that they managed it in any

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Telephone: Yes (6), No (3)
Refrigerator: Yes (6), No (3)
Construction of house: brick, shingle, painted (5), unpainted (3).

TABLE XXVII

ATTITUDES AND OPINIONS OF FARMERS IN ST. HELENA AND EAST FELICIANA PARISHES TOWARD TREE FARMING, FOREST FIRES, AND LARGE LANDOWNERS

	St. Helena Parish (N=54)		East Feliciana Parish (N=35)	
	Number	Per Cent	Number	Per Cent
Manage Own Timberland				
Yes	17	31	9	26
No	16	30	10	29
Doesn't apply	21	39	16	46
Method of Selling Timber				
No contract, all timber	16	30	6	17
Contract, all timber	0	0	1	3
No contract, dia. limit	0	0	2	6
Contract, dia. limit	1	2	2	6
No contract, marked trees	3	6	1	3
Contract, marked trees	1	2	2	6
Never sold	33	61	21	60
Opinion of Tree Farming				
Strongly favorable	11	20	19	54
Favorable	30	56	8	23
Unfavorable	5	9	2	6
Indifferent	8	15	6	17
Objections to Growing Trees				
No objections	35	65	24	69
Fire destroy	5	9	2	6
Insects destroy	0	0	2	6
Slow growth	7	13	5	14
Fire & slow growth	6	11	0	0
Cheap product	1	2	1	3
Difficult to grow	0	0	1	3

TABLE XXVII (Continued)

	St. Helena Parish (N=54)		East Feliciana Parish (N=35)	
	Number	Per Cent	Number	Per Cent
Improvement in Fire Protection				
No improvement	3	6	0	0
More equipment	38	70	15	43
Don't burn now	10	18	9	26
More careful	2	4	5	14
Realize value of timber	0	0	6	17
Don't know	1	2	0	0
Causes of Fires				
Set on purpose, grazing and spite	10	18	2	6
Set on purpose, spite	4	7	0	0
Set on purpose, grazing	18	33	0	0
Carelessness	16	30	20	57
Accidents	2	4	1	3
Smoking	3	6	4	11
No fires here	0	0	7	20
Don't know	1	2	1	3
How to Prevent Man-Caused Fires				
Nothing	23	43	19	54
Arrest, jail	7	13	3	9
Arrest, fine	3	6	1	3
Education	3	6	5	14
Improve protection	5	9	3	9
Let people use land	1	2	0	0
Employ local people	1	2	0	0
Friendly companies	0	0	0	0
Don't know	11	20	4	11
People that Burn the Woods				
No particular group	15	28	5	14
Careless people	6	11	9	26
No deliberate burning	1	2	15	43
Cattleman	18	33	0	0
Hunters	1	2	2	6
Uninformed people	4	7	2	6
People with grudge	3	6	1	3
Don't know	6	11	1	3

TABLE XXVII (Continued)

	St. Helena Parish (N=54)		East Feliciana Parish (N=35)	
	Number	Per Cent	Number	Per Cent
Relations of People with Large Landowners				
Excellent	2	4	20	57
Good	10	18	12	34
Fair	26	48	3	9
Bad	10	18	0	0
Very bad	6	11	0	0
How Large Landowners Can Improve Relations				
Nothing else can do	8	15	2	6
Stop killing hardwoods	5	9	0	0
Sell land to farmers	21	39	0	0
Cooperate with farmers	2	4	3	9
Hire local people	1	2	0	0
Rent land	2	4	1	3
Burn for cattlemen	1	2	0	0
Develop community spirit	0	0	0	0
Don't know	13	24	7	20
Does not apply	1	2	22	63

manner whatsoever. Furthermore, only two per cent of the farmers in St. Helena Parish and six per cent in East Feliciana who indicated that they had sold timber admitted that they had done so under a contract with the trees marked. This is a basic forest management practice.

Approximately two-thirds of the farmers interviewed stated that they had no objections to growing trees. However, they clarified their opinions, almost without exception, with the following phrases, "if a fellow has enough land" or "if you don't use your land for something else." Many farmers in St. Helena Parish did not object to forestry but they did object to the planting of trees as a crop. The following series of quotations illustrates their attitudes in this respect.

> Now I'm not in favor of growing trees, leastwise not planting 'em on open land. Now its O.K. to grow 'em out there where the tree is, if you do it right and burn it.

> I'd sponsor a one-mill tax to help re-seed and re-establish the forest land, but I can't buy the present program of planting trees.

> Why, 95 per cent of the trees planted under the conservation program the land had been out of cultivation from 4 to 10 years. Just speculators in the program. Why, I was in the office up at Greensburg and a lawyer fellow come in and told 'em to go ahead and plant that 75 acres 'cause his son wanted a place to hunt.

> I'm not in favor of planting trees. My trouble is to keep 'em from spreading to my pasture. A few years ago little pines came up out here in my pasture--thick as could be. I sharpened my hoe and went out there and cut 'em all down. Don't want no pines in my pasture.
>
> Timber is worth something if you got the right stuff, but you can't sit around and wait for it to get that size--you gotta eat now. I got a friend just down the road who sold all his beef-cattle and planted his 40 acres pasture in trees. He sure played the devil planting 'em pine bushes 'stead of keeping his cattle so he'd have some income.

Statements such as the above were seldom mentioned by white farmers in East Feliciana Parish.

Farmers in St. Helena Parish considered improvements in fire protection to be the result of improvements in equipment, and so forth. Many made very definite remarks in this respect.

> Why, its getting so a fellow can't even burn off a little patch of woods. Every time I stick a fire one of them fool trucks comes out here and puts it out.
>
> It's getting so you can't even burn no mo'. Just let one of 'em fire wardens see a smoke and he'll be here in 15 minutes. Why, they even got airplanes spottin' fire.
>
> You can't burn no more now, too many of 'em fire watchers. But, by God we used to burn. Set the piney woods on fire ever spring, all the way from here to Greensburg.

It is interesting that only 18 per cent of the St.

Helena farmers admitted that people had stopped burning. Over one-half of the farmers in East Feliciana agreed that improvements in fire protection were due to the fact that people had stopped burning (26 per cent), were more careful (14 per cent), or had realized the value of timber (17 per cent).

The farmers' comments with respect to the causes of fires followed the same pattern as previously discussed; that is, the majority of St. Helena farmers acknowledged that they were deliberately set while East Feliciana farmers attributed them mainly to carelessness. Also, one out of every fifth farmer in East Feliciana stated that forest fires no longer occurred in their area. This situation evidently did not exist in the thinking of St. Helena Parish farmers since none of them mentioned this fact. St. Helena farmers were very emphatic in describing the causes of fires. The following quotations illustrate the point.

> We got open range up here; that is, we suppose to, but since the companies let their land grow up there ain't no range left that's any good. Woods range ain't much good even though you burn it, course when your pastures dry up you gotta do something with your cattle. I have to do this sometimes, but my milk production sure drops off.

> People burn off pastures to improve grass--we have to. If it gets in the woods just let it go, can't do nothing about it. Anyway burning the woods is good

> for it. It keeps the ticks down. We have lots of ticks where we run cattle. They eat you up if'n you don't burn.
>
> We have to burn the pastures. Why, if I didn't burn the woods around here the ticks would eat us up. They are really bad, but burning keeps 'em down--helps the grass too. You can't dip dairy cattle.

Another common theme expressed by many farmers was their dissatisfaction with the landowners. The following quotations illustrate the tone of a number of such responses.

> The big lumber companies got all the land and they won't sell, lease, or trade a foot of it. They won't even discuss it with us. I tried to get 'em to lease me 340 acres which to my memory has never been used since it was cut about 10 years ago. I tried to trade 'em 26 acres of stream-bottom land for 22 acres of hill land adjoining my place. Know what their supervisor told me? He said, "Why should we be concerned with you, if you can't make a living out here no one can and eventually we'll get your land." The hell they will, we'll do anything out here just to bring the big man down. If they won't sell land to us or lease it to us then we'll see to it that they won't get any good out of it either. We're going to destroy that timber, not because we don't like the timber, but just to fight 'em. We're gonna burn 'em out.
>
> People burn the woods for cattle grazing and to get even. I used to live in Livingston Parish and they burned there to fight back at the big companies, ain't much different here. They set a young plantation down the road belonging to IP[15] on fire last fall and killed most of them damn pine bushes.

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[15]International Paper Company.

Consider the attitudes of farmers such as these in St. Helena Parish toward woods-burning.

> Now I'll tell you about this fire in the woods. I don't believe what they say about fire being bad. Why, I remember when we had timber around here 4-foot thru and we burned the woods every year. It didn't hurt 'em either, made 'em look a lots better.
>
> The woods should be burned every year to keep the straw from getting so thick and to keep the brush down, 'cause if'n you don't the straw builds up and the brush gets too thick. Then is when a fire really does damage.
>
> If you don't burn the woods it gets thick and the pines is smaller. The reason the pine ain't no bigger is because we don't burn enough. All that brush saps 'em and they don't grow as big. Why, anybody can see that.

These reasons given by farmers in St. Helena Parish as to the causes of fires do not necessarily mean that all the farmers burn the woods. Neither do these remarks imply that all farmers are in agreement with the practice of open range and the woods-burning which accompanies it. Although 43 per cent of the St. Helena farmers agreed that people were going to burn and nothing could be done to prevent it, 19 per cent indicated that enforcement of laws would eliminate most of the fires. The quotations below, from interviews with farmers in St. Helena Parish illustrate the attitudes of this group.

> Reason you have fires west of here is open range

> cattle. Cattlemen burn the woods for range even though it ain't any good. Of course they're a bunch of lazy bastards who don't aim to do nothing but sit on their ass and use someone else's land. Damn cattle ain't no good but they don't cost 'em anything, so they make money. What we need is a good stock law, and enforce it.
>
> These damn open range cattle and lazy bastards who own 'em is what's ruining this country. What we need is a good stock law, enforced. Now I ask ya', have you ever seen a country or any place that was worth a damn where there was open range?

It is interesting that one-third of the farmers interviewed in St. Helena Parish acknowledged that cattlemen were responsible for the forest fires in their area. This is not to imply that the cattlemen actually set the fires, it only establishes them as the responsible agents in the minds of the interviewees. Perhaps the following quotation taken from an interview with a retired St. Helena farmer best illustrates the point.

> The cattlemen are responsible for all the fires over here, don't make no difference how you look at it. They're smart though. They hire these dumb niggers over here or else give a couple of bucks to the young kids and tell 'em to set that patch of woods on fire. Then if the niggers or kids get caught folks blame it on ignorant niggers or juvenile delinquency.

Only two per cent of the farmers in St. Helena Parish admitted that there was no deliberate burning of the woods. In contrast, 43 per cent of the East Feliciana farmers stated

that people did not purposely burn the woods in that parish. They mostly attributed fires to the actions of careless people. Many of the East Feliciana farmers were familiar with the fire situation in St. Helena Parish. They offered comments such as the following to explain why people burn in that parish.

> Now you take over in St. Helena Parish where everybody that's got 15 acres tries to have a dairy or raise a few cattle, they set the woods on fire every spring to get that green grass. They have a grass over there like broomsedge which comes in after a fire just like oats. It is tender and they need it 'cause they don't have enough of their own land for pasture.
>
> I used to live over there in St. Helena. Owned 65 acres, sold it 'cause I couldn't buy any more. Not being able to buy land is what creates all that bad feeling over there. Lumber companies got all the land and won't sell. People hate 'em for it. That's why they have all them fires. Friend of mine over there is really mad, said he'd show 'em. Know what he does--he sets their woods on fire every year. I told him they'd catch him. He claims they can't and I guess he's right. He's been burning 'em for 15 years and they ain't caught him yet. Lots of folks over there feel that way.
>
> People in St. Helena burn the woods all the time because they run the cows in the woods. They work together to set fire. One fellow will set fire and another fellow will set a fire a mile away and they'll let them burn toward each other. Lumber companies can't fight them all at the same time.

In view of the quotations presented above there should be little doubt as to the feelings of the farmers in St.

Helena Parish toward large landowners. As the data in Table XXVII indicate, only four per cent considered relations to be excellent. Almost one-half (48 per cent) stated that the relations were just fair. One farmer, who was a local leader,[16] expressed the attitudes of most farmers as follows: "I'd say the relations were not real bad, but just a general feeling of neutrality." However, twenty-nine per cent of the farmers in St. Helena Parish did not agree with him. They considered that relations with the large landowners were bad to very bad and expressed themselves in the following manners.

> These large landowners ain't nothing but a bunch of hogs. All big shots don't care about small people. They hog the land and won't let anyone else have land. They got land when it was cheap by paying up taxes.
>
> Lumber companies and banks acquired land by fraud and deceit during the depression. Natalbany would buy 40-acre blocks until they surrounded a place and then have it assessed over to them. They got 250 acres right up the road from me by having it assessed to 'em after paying only one year's back taxes. When the bank went busted they sold their notes to the Greensburg Bank for one-half price. Then the Greensburg Bank would sell some of them back to the directors for what they paid for them. Why, Mr. ____ got 1300 acres over here for $2000. It had a $5000 mortgage against it. Bet he's sold over $100,000 worth of

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[16]A local leader is a farmer to whom other farmers go for advice on or discussion of farm problems. He is a farmer who is similar in personal and social characteristics to the majority. He is thought of as a neighbor or friend rather than a leader.

timber off it. They hold him up as a good farmer, want you to come out there for farm demonstrations, barbecue and all that. Why, we hate his guts!

Relations is poor. We don't like 'em too much because they won't sell the land to them that lives out here and needs it. They don't use land for nothing 'cept timber.

I'd say relations with lumber companies in this area is bad and I'll tell you why. They got all the land and won't sell any to them that wants to buy. You see we used to raise strawberries, beans, and truck crops around here and about 20 acres was all a man could manage. People didn't need much land, couldn't buy it then anyway even though it was $2 to $3 per acre. Well the lumber companies come in and bought it all up. Now that we're in dairy we need more land and the companies won't sell. They ain't using it except ever now and then cut a few trees and plant pine bushes.

You know what the timber companies do? Why they come in and cut everything off, just strip the land, then leave it to come back into trees. They won't sell any land either. They got it leased and claim they can't sell. Of course that's one way of getting around it.

Pressure for land around here is bad. People trying to dairy and those trying to start want some yet can't buy it. Companies won't sell even though they ain't using it. There has been a few acres south of here planted to trees; other land is just laying idle growing up.

Consider the following quotations taken from interviews with St. Helena Parish farmers concerning taxes.

Companies not even paying a little bit of the cost of protection. Timber land only assessed at $6 per acre, while agriculture land is assessed at $15.

Companies don't pay enough land taxes. They should be made to pay more taxes.

> The big companies have got all the land and they don't pay any taxes on it, whereas the small landowners doesn't have much land yet pays much higher taxes. Why, some of this timber land with fine timber worth $200-$300 per acre is only assessed at $5. We tried to force 'em into paying more taxes hoping to force 'em into selling some of their land. It didn't work out. They got a bunch of high priced damn lawyers who didn't care about the little man to fight it.

These views on land ownership and taxes are not restricted entirely to the farmers of St. Helena Parish. On April 23, 1961, Representative Jerry Ashley, committee chairman of a special legislative committee studying public school funds in Louisiana, made the following comments concerning St. Helena's educational money problems.

> These big companies own vast acreages. Their tax assessments are low . . . it's hurting the educational system in some places. The legislature ought to consider some kind of special school taxes on these foreign corporations, owning large undeveloped acreage, who give little employment and contribute little in taxes.[17]

Because of these expressions of attitudes on the part of the farmers in St. Helena Parish it is not difficult to understand why 39 per cent of them admitted that relations with large landowners could be improved only through the sale of land. Many apparently successful farmers felt that "the

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[17]News item in the Baton Rouge Sunday Advocate, April 23, 1961.

companies should be made to sell land to them that needs it." One out of seven (15 per cent) took somewhat of a defeatist attitude in this respect and stated:

> Ain't nothing can be done to improve relations over here. The large companies got all the land and they won't sell or lease a foot of it. 'Course IP kinda pulled a deal on us by leasing the land from Natalbany and under a lease set up they can't sell or re-lease, they say.

Twenty-one per cent of the farmers mentioned that large landowners could improve relations if they would "just cooperate with us" by: "stop killing hardwoods so we'd have plenty to hunt," "hire local people," "rent us land," or "burn for us in the spring." Thus, 60 per cent of the farmers in St. Helena Parish agreed that relations could be improved by action on the part of large landowners that would improve their general economic situation.

As indicated by the data in Table XXVII ill feelings toward large landowners were not expressed by farmers in East Feliciana Parish. The following quotation expresses a typical view of feelings expressed by interviewees in this sample area.

> The relations with companies here is very good, not so over in St. Helena Parish. The problem there is the dairy farmer who doesn't have enough land and uses the company land. He has to burn in order to get tender grass. It is not so much due to different class of people as it is to land ownership.

There were some discrepancies, however, in the way East Feliciana farmers defined the situation in St. Helena Parish. This can best be explained by reference to the following quotation.

> Relations with the company and people around here is good. It's different over in St. Helena Parish. People over there have always had a grudge. Don't know why but they've always fought amongst themselves and the big companies ever since I can remember. Politics over there is rotten, people sell their votes for $5. You better not say anything about it either or they'd beat you up. They've always had a grudge. They just don't co-operate like they do over here.

One large landowner in East Feliciana Parish succinctly stated:

> If the people get into a squeeze in this area, as they have in St. Helena, then there will probably be many problems that will arise if they want to buy land and can't get it. There is no problem right here now.

The significant feature of this review of the attitudes and opinions of the farmers interviewed is the fact that the farmers in St. Helena defined forestry as a definite threat to their "way of life." This situation was not apparent in East Feliciana Parish. Many St. Helena farmers were not in favor of planting trees and others agreed that the woods needed to be burned just "to keep it clean." These attitudes are no doubt a result of agrarian culture.

For the most part, however, their attitudes toward forestry and forest fires are conditioned by the conflict that exists between them and large landowners and "the lumber company"[18] over the use of land. This situation is further aggravated by the methods that were employed by some lumber companies and large landowners in the acquisition of land during depression times. This analysis indicates that the practice of forestry as defined by the farmers of St. Helena Parish is involved in a complex web of human relations.

Retired and Persons on Welfare

The data presented in Table XXVIII describes the attitudes and opinions of persons belonging to the second largest "occupational group" in each of the sample parishes. Only a brief discussion of the major differences will be given since the expressed attitudes of these respondents are closely related to those of the farmers in a given parish.

Retired persons of both parishes expressed essentially the same favorable opinion toward tree farming. The majority

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[18]It should be pointed out that the many references made by St. Helena farmers to "the lumber company" referred to the "old Natalbany Lumber Company" which is no longer in existence. The specific names of International Paper Company or Crown Zellerbach Corporation were seldom mentioned.

TABLE XXVIII

ATTITUDES AND OPINIONS OF RETIRED PEOPLE AND PERSONS ON WELFARE IN RURAL AREAS OF ST. HELENA AND EAST FELICIANA PARISHES TOWARD TREE FARMING, FOREST FIRES AND LARGE LANDOWNERS

	Retired		Welfare	
	St. Helena (N=16) Per Cent	E. Feliciana (N=12) Per Cent	St. Helena (N=19) Per Cent	E. Feliciana (N=18) Per Cent
Race				
White	81	92	42	17
Negro	19	8	58	83
Opinion of Tree Farming				
Strongly favorable	12	33	16	22
Favorable	56	33	63	44
Unfavorable	6	8	16	22
Indifferent	25	25	5	11
Objections to Growing Trees				
No objections	88	83	26	72
Fire destroy	0	0	26	0
Insects destroy	0	0	0	0
Slow growth	6	17	10	22
Fire & slow growth	6	0	37	0
Cheap product	0	0	0	6

TABLE XXVIII (Continued)

	Retired		Welfare	
	St. Helena (N=16) Per Cent	E. Feliciana (N=12) Per Cent	St. Helena (N=19) Per Cent	E. Feliciana (N=18) Per Cent
Improvements in Fire Protection				
No improvement	0	0	5	0
More equipment	81	33	79	50
Don't burn now	12	33	16	28
Realize value of timber	0	25	0	6
Don't know	6	8	0	17
Causes of Fires				
Set on purpose, grazing & spite	19	0	26	0
Set on purpose, spite	6	0	5	0
Set on purpose, grazing	25	0	53	0
Carelessness	25	58	5	61
Accidents	19	17	5	0
Smoking	6	8	0	17
Lightning & dry weather	0	0	5	0
No fires here	0	8	0	11
Don't know	0	8	0	11
How to Prevent Man-Caused Fires				
Nothing	50	50	47	39
Arrest, jail	25	0	16	11
Arrest, fine	0	0	5	6
Education	0	17	0	28
Improve protection	0	0	5	0
Friendly companies	0	8	5	0
Don't know	25	25	21	17

TABLE XXVIII (Continued)

	Retired		Welfare	
	St. Helena (N=16) Per Cent	E. Feliciana (N=12) Per Cent	St. Helena (N=19) Per Cent	E. Feliciana (N=18) Per Cent
People that Burn the Woods				
No particular group	6	25	21	6
Careless people	19	25	0	22
No deliberate burning	6	33	0	56
Cattlemen	31	0	53	0
Hunters	0	8	5	6
Uninformed people	12	0	0	0
People with grudge	12	0	0	0
Don't know	12	8	10	11
Relations of people with Large Landowners				
Excellent	19	42	0	33
Good	37	50	16	50
Fair	25	0	79	0
Bad	6	8	0	0
Very bad	6	0	0	0
Don't know	6	0	5	17
How Large Landowners Can Improve Relations				
Nothing else can do	37	8	16	5
Stop killing hardwoods	12	0	21	0
Sell land to farmers	12	0	10	0
Cooperate with farmers	0	8	11	5
Hire local people	6	0	0	0
Burn for cattlemen	0	0	5	0
Don't know	31	8	32	33
Does not apply	0	75	0	56

of them had no objections to the growing of trees. Their general attitude in this respect was that it was all right for someone else but not for them.

Most of the retired people in St. Helena considered improvements in fire protection to be the result of improvements in equipment. In East Feliciana they stated that people didn't burn because they realized the value of timber. In St. Helena, 50 per cent of this group stated that fires were the result of incendiarism; this causative factor was not mentioned in East Feliciana Parish.

Almost one-third of the retired persons in St. Helena mentioned that cattlemen burned the woods. The only way to stop woods-burning, according to them, was to arrest the persons involved. In East Feliciana, careless people were indicated by this group to be the major cause of fires; education was the solution indicated.

Ninety-two per cent of the retired people interviewed in East Feliciana Parish expressed good to excellent feelings toward large landowners. In St. Helena Parish, 37 per cent felt that relations were fair to very bad and generally agreed that nothing could be done to improve them.

The persons receiving welfare checks in East Feliciana Parish generally expressed the same opinion toward forestry

and forest fires as did retired persons. In St. Helena, however, some differences in attitudes are noted by members of this group. Sixty-three per cent of the persons on welfare in St. Helena Parish considered fire as a major objection to growing trees. It is of interest to note that 84 per cent of these persons stated that fires in St. Helena were set on purpose. The majority (53 per cent) agreed that cattlemen were responsible and that nothing could be done to prevent man-caused fires. Although they did not admit to any bad feelings toward large landowners, they generally agreed that relations in this respect were only fair. They considered the cessation of hardwood girdling as the best way to improve relations.

The interesting aspect of this study of the attitudes and opinions of retired people and persons on welfare toward the practice of forestry is that they have essentially the same value orientation toward the forest as the farmers of the parish in which they reside.

Skilled and Unskilled Laborers

The actual number of skilled and unskilled laborers in the sample population was small. It should also be pointed out that there were three times as many skilled laborers in

the sample population of East Feliciana Parish than in St. Helena Parish. However, the St. Helena sample contained approximately twice as many unskilled laborers. The majority of the skilled laborers were white. They were employed by the industrial plants at Baton Rouge, Louisiana or at the East Louisiana State Hospital at Jackson, Louisiana. Most of the unskilled laborers were Negroes. They were locally employed. Although the actual number of persons in these occupational groups was small and unequally distributed between parishes, there are some characteristics of this group that should be mentioned.

The data presented in Table XXIX indicate that there were differences between parishes in the attitudes of skilled and unskilled laborers toward forestry. With few exceptions, these differences were essentially the same as those outlined for the farmers of the sample population.

Skilled laborers in St. Helena Parish did not have as favorable opinions toward tree farming. Their major objections to the growing of trees were fire and slow growth. The majority agreed that fires were set on purpose to improve grazing. They indicated that the persons most responsible for fires were cattlemen. Although they mentioned arrest as a preventive measure, they were just as much in favor of

TABLE XXIX

ATTITUDES AND OPINIONS OF SKILLED AND UNSKILLED LABORERS IN RURAL AREAS OF ST. HELENA AND EAST FELICIANA PARISHES TOWARD TREE FARMING, FOREST FIRES, AND LARGE LANDOWNERS

	Skilled		Unskilled	
	St. Helena (N=5) Per Cent	E. Feliciana (N=15) Per Cent	St. Helena (N=17) Per Cent	E. Feliciana (N=9) Per Cent
Race				
White	80	93	41	11
Negro	20	7	59	89
Opinion of Tree Farming				
Strongly favorable	20	47	12	33
Favorable	60	47	59	44
Unfavorable	20	0	23	11
Indifferent	0	7	6	11
Objections to Growing Trees				
No objections	40	87	35	78
Fire destroy	20	0	23	0
Insects destroy	0	0	0	0
Slow growth	20	13	12	22
Fire & slow growth	0	0	30	0
Cheap product	20	0	0	0

TABLE XXIX (Continued)

	Skilled		Unskilled	
	St. Helena (N=5) Per Cent	E. Feliciana (N=15) Per Cent	St. Helena (N=17) Per Cent	E. Feliciana (N=9) Per Cent
Improvements in Fire Protection				
No improvement	0	0	12	11
More equipment	40	60	59	56
Don't burn now	40	7	39	22
More careful	0	20	0	11
Realize value of timber	0	13	0	0
Don't know	20	0	0	0
Causes of Fires				
Set on purpose, grazing & spite	0	0	6	0
Set on purpose, spite	0	0	12	0
Set on purpose, grazing	60	0	47	0
Carelessness	0	67	23	56
Accidents	20	27	12	11
Smoking	0	7	0	11
Lightning & dry weather	20	0	0	0
No fires here	0	0	0	22
How to Prevent Man-Caused Fires				
Nothing	40	53	71	67
Arrest, jail	20	7	18	22
Arrest, fine	0	0	6	11
Education	20	13	0	0
Improve protection	0	13	6	0
Don't know	20	13	0	0

TABLE XXIX (Continued)

	Skilled		Unskilled	
	St. Helena (N=5) Per Cent	E. Feliciana (N=15) Per Cent	St. Helena (N=17) Per Cent	E. Feliciana (N=9) Per Cent
People that Burn the Woods				
No particular group	20	53	12	33
Careless people	0	13	18	22
No deliberate burning	20	27	0	44
Cattlemen	60	7	53	0
Hunters	0	0	0	0
People with grudge	0	0	6	0
Don't know	0	0	12	0
Relations of People with Large Landowners				
Excellent	0	53	0	33
Good	60	33	35	33
Fair	40	7	53	22
Bad	0	7	6	0
Don't know	0	0	6	11
How Large Landowners Can Improve Relations				
Nothing else can do	20	20	23	0
Stop killing hardwoods	20	0	0	0
Sell land to farmers	40	0	29	0
Cooperate with farmers	0	13	0	11
Hire local people	0	0	12	0
Rent land	0	0	0	0
Burn for cattlemen	0	0	12	0
Don't know	0	7	23	22
Does not apply	20	60	0	67

education. They admitted that relations with large landowners were only fair to good and acknowledged the sale of land to farmers as the best way to improve relations.

The unskilled laborers of St. Helena Parish considered fire to be more of a problem in the growing of trees than did the skilled laborers. A larger proportion acknowledged that fires were set on purpose and that basically there was nothing that could be done about it. They indicated that selling land to farmers, hiring local people, and burning for cattlemen as ways in which the large landowners could improve relations.

There were essentially no differences in the responses given by skilled and unskilled laborers in East Feliciana Parish with respect to their attitudes toward forestry. Skilled laborers in this parish preferred education and improvement in detection methods as the preventive measures in fire causation; whereas, unskilled laborers favored arrest. For the most part, however, they had the same value orientation toward the forest.

This analysis indicates that the skilled laborers in the sample population have practically the same value orientation toward the forest as the farmers of the parish in which they live. Although their occupation places them in an

entirely different work environment, their attitudes toward the forest are still primarily influenced by the environment in which they live. This further indicates the influence of their agrarian culture on their internalized values. The data also indicate that the value orientation of the unskilled laborers toward the forest is essentially the same as the farmers of the parish in which they live.

CHAPTER VIII

SUMMARY AND CONCLUSIONS

I. SUMMARY OF FINDINGS

The man-caused forest fires that burn annually in Louisiana constitute one of the major forestry problems of the state. They represent a direct economic loss of approximately $3 million; no attempt has ever been made to assess their indirect damage to the soil, water storage, erosion, and other factors. Very little headway has been made toward the solution of the problem. In fact, indications are that the problem may become greater due to the increased acreage of young forests brought about by recent reforestation activities. This investigation was conducted to determine some of the human-relation aspects of man-caused forest fires, so that more effective fire prevention programs might be planned. Specific objectives were to determine: (1) the patterns of fire occurrence with respect to causative agents; (2) the relationship between various socio-cultural and socio-economic factors and man-caused fires; and (3) the attitudes

and motivation of people which are related to their behavior toward the forest. The hypothetical premise for the study was that the man-caused forest fire problem could be explained in terms of certain cultural and social factors related to forest residents' use of land.

The use of fire in the forest appears to have been a universal cultural trait among the aboriginals that inhabited the South long before the coming of the white man into the region. Historical records reveal that the Indians burned the woods for primitive management of a food resource. The practice of burning the forest was adopted and expanded by the white settlers as they moved into the region and nation. In the course of time, fire-setting became an integral part of southern culture, following definite patterns.

Just as in the region the fires that burn in the protected forest of Louisiana follow a definite pattern. This pattern of occurrence is cyclic both between and within years and has displayed the same general trends for the entire period for which reliable records exist. Furthermore, the record shows that the number of fires for the state as a whole has not decreased within recent years.

Forest fires are the result of several causative agents. It is not difficult for the average person to comprehend that

some fires are related to the physical factors of the environment, such as weather phenomena and vegetation type. Wind velocity, atmospheric precipitation, and temperature, some of the determinants of inflammability, produce effects that are concrete and predictable over a period of time. The predictability of weather phenomena in producing conditions for fire occurrence makes it possible to compute a burning index. Such an index was computed and its validity tested as part of the present study. Its utility may be seen by the fact that the analysis made of fire data for the entire state established an almost perfect correlation between yearly and monthly fire occurrence and the computed burning index.

In the present study the burning index was utilized to locate areas where the incidence of fires was greater than might be expected from causes primarily related to natural phenomena. Regression and correlation procedures determined the above relationships and determined that man was responsible for most forest fires in the state.

Once it was established that the actions of man were the major cause of fires in Louisiana, the next problem was to determine why individuals and groups persisted in setting fires. This problem was approached in two ways. The first was a study of the data available on fires in the state over

a period of years. From this study it was determined that:

1. Incendiary fires predominated in southeastern and southwestern Louisiana. Further analysis indicated that incendiarism was concentrated in the parishes where intensive use was made of open range for cattle pasturage. The use of free range has been practiced in these areas since earliest settlement. Probably the continued practice of this method of animal husbandry in these areas has been related to meagerness of natural resources, and, perhaps to a lesser extent, isolation.

2. Debris-burning, smoker, and hunter fires (carelessness fires) predominated in north Louisiana. Free range for cattle pasturage is no longer used in this section of the state. In this once intensively farmed area, the planting of trees as a crop has developed rapidly. The lackadaisical attitude toward the forest, expressed in careless burning, seems related to the agrarian culture of the region.

3. The high incidence of incendiary fires was associated with low expenditures for education. The amount of money expended in support of education indicates the relative economic level of the people and suggests various aspects of their value orientation. People in parishes with a relative high economic level are more likely to have a better

appreciation of natural resources which are the basis of their economy. Consequently, they are likely to indoctrinate their children in the benefits of resource management and support educational programs and acquire better trained teachers. The study made indicates these groups define the forest as a natural resource important to the economy of their region. Consequently, they direct their actions toward its protection through the elimination and control of deliberate burning.

4. The incidence of incendiary fires increased with an increase in the proportion of farm operators who are of the white race. The areas where incendiary fires tend to persist are characterized by small self-sufficing farms scattered about in the midst of large timbered tracts. Farm ownership in these areas is concentrated in the hands of whites, with relatively few Negroes and a low percentage of tenancy. Intensive use is made of the open range for cattle pasturage. Therefore, the white farm operators, as the persons engaged in this type of animal husbandry, are the ones benefiting most from incendiary fires.

5. Debris-burning fires were not related to educational expenditures. This does not mean to imply that education is not involved in this aspect of forest protection.

Rather, it stresses the fact that public education has a more positive influence on reducing incendiarism through the teaching of proper methods of resource management. Debris-burning fires are not the direct result of purposive action; rather, they result from a lackadaisical attitude toward the forest. Such an attitude is probably the result of a particular cultural background.

6. Debris-burning fires increased with a decrease in the proportion of white farm operators. This relationship indicates a problem in communications characteristic of the region. That is, Negroes in the rural population are probably not so well informed as whites of the dangers of burning debris. This association further indicates the attitude of indifference associated with debris-burning fires. Negroes living in the areas characterized by debris-burning fires own little forest land. They are primarily small landowners and/or tenants and consequently obtain few direct economic benefits from the forest. Therefore, an attitude of marked indifference toward the practice of forestry could be understood.

7. Debris-burning fires increased with a decrease in the proportion of families with low incomes. This association is probably related to the ownership of property.

Families with low incomes no doubt own little property; consequently, they are not likely to engage in debris-burning activities that could cause forest fires. Retired people and persons on welfare make up a large proportion of this low-income group in certain areas. They are mostly elderly members of the population and, as such, are less likely to be engaged in activities that could result in debris-burning fires.

8. The incidence of debris-burning fires increased with an increase in the density of the rural population. A high density of rural population implies more activity on the part of people, thus increasing the chances of fires occurring as a result of burning debris.

The above analysis was done to discover the important socio-cultural factors related to the setting of forest fires. The second methodological approach was to interview a sample of rural residents in areas of high (St. Helena Parish) and low (East Feliciana Parish) fire incidence to determine the differences in attitudes and opinions which might explain their behavior toward the forest. The study made indicated that fire-setting is part of a cultural complex. From the study made it was determined that:

1. People burned the forest because they felt that

they had the "right to burn." In this sense, burning is regarded as a "folkway," a commonly accepted rule of conduct, a behavior pattern that has arisen out of the culture of forest residents--it is the right way to behave.[1] They justify their action on the basis that burning is necessary as a land management practice to insure good grazing and to get rid of "pests."

2. Rural residents burned the forest to "keep it clean" and "looking good." This belief pattern is associated with their agrarian culture of "row-crop" and "clean-field" farming. The "pine bush" to the rural resident represents a sign of poverty and depression through its natural re-establishment on abandoned farm land along with briars and other "unwanted" vegetation. Typical comments were:

> The land ain't doing nothing but growing up in briars and pine bushes and it ought to be burned--it don't look good.
>
> I've spent the last ten years rooting up them damn pine bushes and stumps out of my pasture.

3. Forestry (the growing of trees as a crop) was a

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[1]Alvin L. Bertrand and others, Rural Sociology: An Analysis of Contemporary Rural Life (New York: McGraw-Hill Book Company, Inc., 1958), pp. 16-18.

new idea, an innovation, and not acceptable to some individuals.[2] To the rural resident of St. Helena Parish, forest-agriculture is something new, a departure from prevailing practice. It threatens to modify their way of life by causing them to discard the patterns of the past. They rationalize their feelings and defend their positions with such expressions as:

> Growing trees is all right if you have enough land and it ain't fit for nothing else.
>
> Growing trees is O.K.; that is, if you grow 'em out there where the trees is.
>
> Don't want no pine bushes in my pasture. No sir, don't aim to plant a pine bush on my place. My land is too good to grow trees.

In contrast, landowners and rural residents of East Feliciana Parish have accepted the innovation of forest-agriculture. In this parish of relatively large-size, privately-owned farms, the growing of trees as a crop is considered as an agricultural enterprise of economic importance. The people own the land that produces the forest products; consequently, they have an appreciation of the

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[2]H. G. Barnett, Innovation: The Basis of Cultural Change (New York: McGraw-Hill Book Company, Inc., 1953), pp. 7-8. Barnett points out that "an innovation is any thought, behavior, or thing that is new because it is qualitatively different from existing forms."

value of timber.

4. Some rural residents resent the monoploy of the land and burn for spite. The agricultural enterprises of dairying and the raising of cattle on the open range have been practiced in St. Helena Parish from 70 to 100 years. With the removal of the virgin timber and partial abandonment of the cut-over lands these agricultural enterprises formed the economic base of the region and many habits and customs related to them became ingrained into the culture of the people. Foremost among these habits was the use of the partially abandoned land of the "lumber company." Continued use of this land "that don't belong to nobody and ain't being used anyway" developed to such an extent that the forest residents came to look upon it as their own, since they had acquired "squatters rights" to it from their parents who had used it before them. The return of the wood-using industries to the parish after World War II for the management of the lands for the production of timber products was directly opposed to their agricultural way of life. Thus, they have come to define the practice of forestry as a threat to their "way of life" and economic well being.

According to W. I. Thomas, "If men define situations

as real, they are real in their consequences."[3] Thomas' sociological principle, "the definition of the situation," implies that individuals and groups behave in accordance with the way in which they define a situation.

Forest management to the St. Helena residents has become a threat, a challenge, an influence which has disrupted their habits and caused a crisis. This crisis has grown into a conflict. The enemy is the "lumber company," a "faceless" organization, represented to the rural residents by the forest, which they seek to destroy through the deliberate use of fire. Their defiance is suggested by such expressions as:

> The big companies ought to be made to sell some of the land they ain't using to someone who will use it.
>
> Do you reckon anything can ever be done to make the lumber companies sell us some land? Not that I would want any myself, but my son needs some land.
>
> The pressure is on us. We know it. It is getting worse every day. I aim to stay here though and I aim to raise and educate my two little girls.

The situation is further aggravated by the rural residents' definition of the manner in which the large landowners and lumber companies acquired land. Although the methods of

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[3]W. I. Thomas, The Child in America (New York: Alfred A. Knopf, Inc., 1928), p. 572.

land acquisition were no doubt in keeping with the legal limits of the laws of the time, they define them as being against the mores of the people. During the course of time through the indoctrination by their parents and grandparents they have "socially inherited" attitudes and values that further explain their behavior toward the forest. In this respect, they expressed themselves in the following manners:

> The large landowners acquired this land by fraud and deceit by having it assessed over to them.
>
> My father lost a hundred acres of land that he'd worked hard over just because he couldn't pay taxes on it. It was bought up by one of the large landowners--that land by rights is mine.
>
> They bought it from our forefathers for nothing with with all that good timber on it and cut it off. Now they won't sell the young folks who want to get a start even a little bit of it.

Thus, this aspect of the social environment has further conditioned their unfavorable attitude toward the forest.

II. ANALYTICAL FRAME OF REFERENCE

This study is in the realm of social change theory. As indicated, it involves a study in the situational change from the tradition of woods-burning to non-burning that is centered in the conflict of interest over the use of land.

The introduction of forest management practices has aggravated the situation to the extent that a crisis situation has developed. The rural residents in St. Helena Parish define the situation as a threat or violation against traditional rights and rationalize that the woods should be burned to eliminate ticks, "varmits," fever, boll weevils, and so forth. They define the situation as a threat against their economic well-being and state that the forest land "ain't being used," "the companies should sell some land," or "the companies should pay more taxes." The people take the action to which they are accustomed. The action pattern becomes one of violence through the burning of the forest. Burning becomes an end in itself to some (spite fires): it becomes a means to an end to others (burning for cattle pasturage).

Basically this study involves a conflict situation between two different social systems: the formally organized land company and the informal rural community groups. Loomis and Beegle state that "social systems are organizations composed of persons who interact more with members than non-members when operating to attain the system's objectives."[4]

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[4]Charles P. Loomis, and J. Allan Beegle, Rural Social Systems (New York: Prentice-Hall, Inc., 1950), p. 33.

They may be viewed as abstract units or as systems in which patterns of relationships prevail from generation to generation and from region to region. In any event, they are composed of social interaction and cultural factors which structure these interactions.[5] They are functioning entities which are composed of interrelated parts.

The formally organized land company is a bureaucratic organization with a definite hierarchy in which relations both with members and non-members of the system are impersonal. It is an organization interested in managing its holdings for the production of timber at a profit. In order to achieve this end, it has certain formal company rules or regulations that govern the application of the means in the attainment of its objectives. The specific objectives of this organization in St. Helena Parish is to stop the forest fires that burn on company land, to eliminate hardwoods (weed trees) as competitors with the pines, to re-establish open land and/or otherwise introduce additional management practices that will improve conditions favorable to the growing of trees. The company seeks to achieve these goals by

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[5]For an explanation of the conceptual scheme of the social system, see: Charles P. Loomis, and J. Allen Beegle, Rural Sociology: The Strategy of Change (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1957), p. 2.

rational action administered by persons occupying definite "positions" within the organization.

The informal rural community groups are unstructured social systems in which relations with members are personal. The norms, or guiding standards, which govern the application of means in the attainment of ends are derived from the customs of the community groups. In St. Helena Parish, the agricultural customs are centered in the raising of cattle for the production of milk or beef products both in fenced pastures and on the open range, and not in the growing of trees. The specific objective of these groups in this respect is to burn the woods either for economic reasons and/or spite. They seek to achieve this goal by their traditional right of burning, which has community acceptance.

Following the conceptual scheme of a social system as presented by Loomis and Beegle, the elements of the on-going systems operating in the forest environment of St. Helena Parish may be viewed as follows:

	Forest Land Company	Rural Community Group
Ends or Objectives	Stop forest fires	Burn the woods, either for economic reasons or spite
Norms	Company rules (interested in growing trees)	Community customs (not interested in growing trees)

Status-roles	Bureaucratic organization; impersonal relations	Unstructured group; personal relations
Power	Lies in status position involves control of jobs	Community leader controls; familistic type; physical threat
Social rank	Depends on "position" held in organization	Rooted in values of the community; little social rank
Sanctions	Legal threats (laws, courts, etc.)	Community acceptance

It can be seen from this outline that in every aspect the systems differ. Not only do the systems differ in their value orientation (ends or objectives and norms), but also, in their social structure (status-roles, power, social rank, and sanctions) and its function.

Social action in the land company is rationally or instrumentally oriented. The organization functions for one purpose--the management of its lands for timber products. In this sense, people and facilities are considered means to ends rather than ends in themselves. The value orientation of the social system is therefore, Gesellschaft-like. On the other hand, social action in the rural community group is non-rational. The norms which determine the relationships are personal and the relationship itself determines what is done. Action toward the forest is rooted in the customs of the community and the traditions of the past.

The value orientation of this social system is therefore, Gemeinschaft-like.[6]

It is evident, then, that the two systems are essentially opposites. In their actions toward the use of land, one system (the rural community group) seeks to maintain the status quo, the other (the forest land company) seeks to bring about a change--thus, the existence of a built-in conflict situation.

III. CONCLUSIONS

The findings of this study leave little doubt that man-caused forest fires are closely related to the social environment of people. In fact, this investigation has demonstrated that fire-setting can be understood in terms of the cultural complex of an area. Informal interviews with rural residents indicated that they defined the practice of forestry

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[6]Loomis and Beegle utilize Toennies' concepts of Gemeinschaft and Gesellschaft to point up the difference in the value orientation of social systems. In this connection, they explain Gemeinschaft as including all human relationships based on emotion or inclination and in which the relationship is an end in itself. Gesellschaft systems include all associations originating from rational and calculated wishes to attain given objectives. For a more detailed explanation, see: Rural Sociology: The Strategy of Change, pp. 12-15.

as an innovation which was unacceptable because it was a threat to their way of life. Thus, it becomes a problem of social adjustment. This phenomenon may be understood in terms of the theoretical concept of the social system. The rural community groups and the forest land companies, as the systems operating in the forest environment, are opposed to one another in value orientation and objectives. The former is attempting to maintain the status quo; the latter seeks to bring about change.

Obviously the findings represent a serious problem in forest management. They suggest that fire prevention programs can be successful if they proceed within the framework of the cultural complex of the people. The findings further suggest that the problem is partly a problem of communications. In this respect, perhaps more attention should be devoted to "selling" forestry to rural people through educational programs and means which they understand and accept. A significant observation made during the interview was the fact that "Smokey Bear," the national symbol of forest-fire prevention, was mentioned only once during the 219 interviews. In somewhat of a farcical manner while discussing burning-the-woods, a male respondent commented, "Of course, my granddaughter would say that Smokey the Bear wouldn't like it."

In conclusion, this study has been an attempt to seek some of the answers as to <u>why</u> people start forest fires. It is hoped that reference points and possible hypotheses have been established which may serve as guides to future studies of the problem.

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APPENDIX A

CLASSIFICATION OF CAUSES OF FOREST FIRES

For statistical purpose forest fires are grouped into broad cause classes. The causes used for published fire statistics are:

Incendiary. A fire willfully set by anyone to burn vegetation or property not owned or controlled by him and without consent of the owner or agent. The key feature of this cause class is the intentional setting of a wildfire on somebody else's property, i.e., it is a fire resulting from simple arson.

Debris burning. A fire which has spread from any fire originally set for the purpose of clearing land, or debris, or meadow burning. This class centers on fire used for land management purposes that has escaped control, usually onto the land of another.

Smoker. A fire caused by smokers' matches, or by burning tobacco in any form. This cause group is centered around tobacco and matches in general and is characterized by carelessness.

Camper. A fire started by persons camping or traveling

on or near wild land. The central feature of this category is that a fire was built by somebody for some personal-convenience use and was allowed to escape its initial bounds through carelessness.

Lumbering. A fire, except one caused by smokers, resulting from lumbering. This cause group includes those fires resulting from all activities connected with the harvesting or processing of wood for use or sale.

Railroad. A fire resulting from maintenance of right-of-way or construction or operation of a common-carrier railroad. This is another occupational grouping. The key feature of this cause class is that the fire had its origin on or near the right-of-way and had something to do with railroading.

Lightning. A fire caused directly or indirectly by lightning.

Miscellaneous. A fire of known cause that cannot be properly classified under any of the other seven standard causes.

In Louisiana an additional cause class is used for published fire statistics:

Hunter. A fire, except one caused by smokers, started by persons while hunting wildlife.

APPENDIX B

STATISTICAL DATA UTILIZED IN REGRESSION AND CORRELATION ANALYSES

SOCIO-CULTURAL AND SOCIO-ECONOMIC VARIABLES

Parish	Number of farms (1)	% land area in farms (2)	Average size of farm (acres) (3)	Average dollar value per farm of land and buildings (4)	% farm operators white (5)	% tenancy (6)
Livingston	1520	15.7	43.9	12027	94.3	4.7
Evangeline	2706	50.9	79.8	14229	74.8	42.6
Allen	767	30.2	195.6	29959	92.3	11.5
St. Helena	1045	33.4	86.0	9959	56.3	14.4
St. Tammany	705	13.6	112.4	21190	92.2	3.0
Beauregard	1045	21.1	153.2	17992	98.7	7.4
Tangipahoa	2985	35.9	61.8	13390	84.9	10.1
Calcasieu	771	66.3	607.5	75372	97.1	17.1
Rapides	2338	30.7	111.7	23564	90.0	15.8
Caddo	1532	47.3	175.6	26346	52.8	39.0
Vernon	1398	11.3	70.0	8450	98.8	5.3
Webster	1210	36.9	121.3	17100	72.1	13.2
LaSalle	666	8.4	51.5	8358	97.9	10.5
Washington	2266	45.9	86.2	13814	77.6	10.0
Natchitoches	1761	32.5	152.6	14468	68.7	23.6
Bossier	1286	43.3	180.7	30146	52.3	15.9
Lincoln	835	39.4	141.6	16788	80.1	9.3
Sabine	1337	20.1	98.8	9213	92.7	9.4
Claiborne	1198	38.6	158.1	14247	58.2	25.1
Jackson	519	12.7	91.1	10332	79.8	4.4
Bienville	976	23.6	127.2	12184	67.0	11.5
Winn	750	9.6	78.1	8960	85.5	4.5
Red River	720	56.9	208.8	21527	67.2	25.1
Grant	857	18.9	93.4	15709	84.9	9.6
DeSoto	1670	52.0	177.7	13968	52.4	18.1
Ouachita	972	30.1	126.4	23765	79.0	18.4
E. Feliciana	900	68.9	222.4	27340	49.2	20.9
Union	1230	24.1	113.5	11210	81.6	9.3
Caldwell	660	19.4	103.5	13180	81.4	9.2

Parish	Average age farm operator (7)	% farm operators working 100 or more days off farm (8)	% class 1 commercial farms ($40,000. +) (9)	% class 2 commercial farms ($20,000. +) (10)	% class 3 commercial farms ($10,000. +) (11)	% class 4 commercial farms ($5,000. +) (12)
Livingston	49.8	56.3	.4	1.3	1.6	3.3
Evangeline	47.3	26.3	1.2	3.0	2.9	5.2
Allen	51.1	45.5	3.0	6.4	7.4	4.7
St. Helena	51.3	37.4	.2	1.4	6.8	5.8
St. Tammany	50.9	58.4	1.3	.8	3.0	3.2
Beauregard	51.7	58.6	.8	1.8	5.2	9.3
Tangipahoa	48.8	42.6	.9	1.2	8.9	12.6
Calcasieu	51.5	46.3	7.4	14.5	5.4	4.6
Rapides	50.7	52.4	1.9	3.8	4.3	5.2
Caddo	51.8	37.2	5.5	1.9	3.3	9.3
Vernon	51.9	60.5	.5	1.4	2.6	3.6
Webster	54.8	52.0	1.0	.6	3.2	5.0
LaSalle	51.5	65.8	0	0	2.1	2.1
Washington	50.0	53.8	0	.3	4.0	11.5
Natchitoches	53.1	37.8	1.9	2.8	4.4	7.2
Bossier	55.0	48.0	4.1	1.9	3.3	3.2
Lincoln	56.1	47.1	.6	2.6	2.1	3.8
Sabine	54.0	52.0	.1	.5	4.1	4.3
Claiborne	56.3	40.9	0	2.0	2.8	3.1
Jackson	54.3	58.4	.2	0	3.7	1.9
Bienville	55.1	49.4	.7	1.1	2.3	3.5
Winn	54.2	60.5	0	.1	1.0	2.3
Red River	51.7	41.8	3.6	4.5	3.5	4.6
Grant	52.5	50.8	.5	1.9	1.2	3.1
DeSoto	54.4	43.8	.9	2.5	3.6	5.3
Ouachita	52.0	52.2	2.3	3.7	2.9	7.8
E. Feliciana	54.0	43.9	.8	2.4	5.1	3.6
Union	54.2	51.1	.6	1.9	1.5	4.9
Caldwell	52.8	47.3	1.5	1.5	.8	7.1

SOCIO-CULTURAL AND SOCIO-ECONOMIC VARIABLES

Parish	% class 5 commercial farms ($2,500. +) (13)	% class 6 commercial farms ($50. +) (14)	% part-time farms (15)	% part-retirement farms (16)	% farms reporting sale of forest products (17)	Average amount (dollars) received per farm from sale of forest products (18)
Livingston	4.3	11.3	62.6	15.2	5.8	318
Evangeline	17.9	33.4	26.6	9.8	.4	508
Allen	8.8	7.8	52.8	9.1	3.0	362
St. Helena	6.3	16.4	42.9	20.2	4.4	521
St. Tammany	7.3	9.9	58.7	15.9	3.4	1794
Beauregard	9.8	3.8	54.6	14.7	6.2	401
Tangipahoa	10.6	12.6	43.5	9.7	3.8	893
Calcasieu	6.1	4.2	49.0	8.8	1.4	1118
Rapides	10.9	6.3	53.9	13.7	3.3	334
Caddo	16.5	13.0	36.5	14.0	2.2	531
Vernon	5.1	3.2	65.6	18.0	6.5	287
Webster	8.3	8.8	46.8	26.3	8.4	614
LaSalle	5.9	6.4	69.9	13.6	2.9	373
Washington	8.1	6.1	56.3	13.7	6.0	314
Natchitoches	11.7	11.9	40.3	19.8	7.1	432
Bossier	7.2	7.3	48.8	24.2	3.4	379
Lincoln	10.2	6.2	52.9	21.6	9.3	507
Sabine	6.0	4.3	59.4	21.3	8.5	646
Claiborne	4.0	12.7	50.0	25.4	11.4	597
Jackson	5.5	.9	61.8	26.0	6.9	270
Bienville	4.3	10.0	49.9	28.3	12.4	337
Winn	6.5	4.3	67.4	18.4	9.9	376
Red River	15.4	14.7	40.3	13.4	7.6	374
Grant	11.2	9.9	54.4	17.8	6.3	334
DeSoto	6.2	11.0	48.4	22.1	6.5	680
Ouachita	9.2	8.1	52.4	13.6	2.1	190
E. Feliciana	6.4	15.9	47.1	18.7	4.3	3246
Union	6.0	8.5	57.5	19.1	16.8	476
Caldwell	12.3	9.9	47.1	19.8	5.9	547

SOCIO-CULTURAL AND SOCIO-ECONOMIC VARIABLES

Parish	Rural population density per square mile (19)	Educational expenditures per student (dollars) (20)	Effective buying income per household (dollars) (21)	% households with cash buying income less than $2,500. (22)	% households with cash buying income between $4,000-6,999. (23)	Burning index (24)
Livingston	29.8	289.57	4902	33.2	29.2	6778
Evangeline	29.1	311.66	4100	41.4	22.8	8327
Allen	10.5	323.22	4458	33.5	27.2	10742
St. Helena	21.8	387.47	4182	43.9	21.5	8896
St. Tammany	25.0	322.79	4225	36.5	25.6	12675
Beauregard	9.1	358.88	4363	33.9	27.9	10703
Tangipahoa	41.8	305.65	4289	40.5	23.5	8886
Calcasieu	27.7	290.90	6143	19.2	37.2	8744
Rapides	34.2	316.07	4908	31.6	28.4	9457
Caddo	46.8	321.24	5965	24.3	32.5	12047
Vernon	10.0	348.07	3820	44.1	21.2	8528
Webster	25.8	353.38	4669	29.2	31.2	11959
LaSalle	13.5	370.07	4603	33.3	29.0	5777
Washington	29.2	333.43	4779	32.6	27.5	7639
Natchitoches	16.0	403.34	4054	45.7	19.7	10561
Bossier	20.2	336.50	6612	28.5	32.3	10638
Lincoln	22.1	369.36	5332	37.9	25.3	6548
Sabine	13.7	409.24	4054	42.8	21.5	10730
Claiborne	15.3	367.08	4831	35.5	26.7	6944
Jackson	20.5	380.90	4837	29.2	31.6	6583
Bienville	15.9	396.52	4081	40.6	23.9	7195
Winn	9.5	373.56	4236	38.8	24.3	6316
Red River	20.1	376.47	4001	46.6	19.4	7446
Grant	17.2	380.26	4207	43.1	22.2	7191
DeSoto	19.1	324.53	4399	42.7	22.2	10105
Ouachita	33.1	316.88	5514	25.3	32.8	7299
E. Feliciana	37.0	309.69	4284	46.8	18.4	6251
Union	14.6	389.92	4440	35.8	26.2	8772
Caldwell	14.5	393.92	4303	39.1	22.8	6400

DEPENDENT VARIABLES

Parish	Y_1	Y_2	Y_3
Livingston	121.91	118.51	2.02
Evangeline	66.60	64.15	.46
Allen	65.74	61.50	1.13
St. Helena	62.28	50.84	1.97
St. Tammany	51.03	44.81	3.86
Beauregard	40.62	37.79	1.81
Tangipahoa	38.91	33.79	2.39
Calcasieu	30.61	27.39	1.28
Rapides	25.79	23.21	1.42
Caddo	19.57	1.44	6.62
Vernon	18.56	14.66	.80
Webster	12.07	1.54	5.65
LaSalle	12.20	7.01	1.56
Washington	14,83	9.69	2.16
Natchitoches	11.90	5.19	.89
Bossier	11.03	1.25	2.48
Lincoln	9.81	2.12	3.96
Sabine	8.84	3.39	.69
Claiborne	8.42	.47	3.66
Jackson	8.04	3.60	1.89
Bienville	7.76	1.16	2.59
Winn	7.93	3.12	1.06
Red River	8.07	2.74	1.54
Grant	7.41	1.90	1.68
DeSoto	7.44	1.02	1.52
Ouachita	7.15	.63	1.41
E. Feliciana	6.97	1.64	2.23
Union	5.20	.77	1.51
Caldwell	5.14	1.05	.74

INDEPENDENT VARIABLES

Parish	X_1	X_2	X_3[a]	X_4[b]
Livingston	.943	.047	2.1	34
Evangeline	.748	.426	5.6	50
Allen	.923	.115	5.7	36
St. Helena	.563	.144	3.9	51
St. Tammany	.922	.030	2.8	166
Beauregard	.987	.070	4.1	42
Tangipahoa	.849	.101	5.7	85
Calcasieu	.971	.171	8.0	103
Rapides	.900	.158	4.3	33
Caddo	.528	.390	6.2	50
Vernon	.988	.053	2.1	32
Webster	.721	.132	3.0	63
LaSalle	.979	.105	1.7	37
Washington	.776	.100	3.5	34
Natchitoches	.687	.236	4.6	46
Bossier	.523	.159	3.7	38
Lincoln	.801	.053	3.0	55
Sabine	.927	.094	2.0	66
Claiborne	.582	.251	2.4	65
Jackson	.798	.044	1.6	31
Bienville	.670	.115	2.3	42
Winn	.855	.045	1.4	43
Red River	.672	.251	5.6	41
Grant	.849	.096	2.8	36
DeSoto	.524	.181	3.4	68
Ouachita	.790	.184	4.4	19
E. Feliciana	.492	.209	3.7	299
Union	.816	.093	2.6	59
Caldwell	.814	.092	3.6	55

[a] X_3 = Sum of (variable 9 x 6) + (variable 10 x 5) + (variable 11 x 4) + (variable 12 x 3) + (variable 13 x 2) + (variable 14 x 1) ÷ 21.

[b] X_4 = Sum of (variable 17 x 10) + (variable 18) ÷ 11.

INDEPENDENT VARIABLES

Parish	X_5	X_6	X_7	X_8
Livingston	29.8	289.57	.332	6778
Evangeline	29.1	311.66	.414	8327
Allen	10.5	323.22	.335	10742
St. Helena	21.8	387.47	.439	8896
St. Tammany	25.0	322.79	.365	12675
Beauregard	9.1	358.88	.339	10703
Tangipahoa	41.8	305.65	.405	8886
Calcasieu	27.7	290.90	.192	8744
Rapides	34.2	316.07	.316	9457
Caddo	46.8	321.24	.243	12047
Vernon	10.0	384.07	.441	8528
Webster	25.8	353.38	.292	11959
LaSalle	13.5	370.07	.333	5777
Washington	29.2	333.43	.326	7639
Natchitoches	16.0	403.34	.457	10561
Bossier	20.2	336.50	.285	10638
Lincoln	22.1	369.36	.379	6548
Sabine	13.7	409.24	.428	10730
Claiborne	15.3	367.08	.355	6944
Jackson	20.5	380.90	.292	6583
Bienville	15.9	376.52	.406	7195
Winn	9.5	373.56	.388	6316
Red River	20.1	376.47	.466	7446
Grant	17.2	380.26	.431	7191
DeSoto	19.1	324.53	.427	10105
Ouachita	33.1	316.88	.253	7299
E. Feliciana	37.0	309.69	.468	6251
Union	14.6	389.92	.358	8772
Caldwell	14.5	393.92	.391	6400

APPENDIX C

SCHEDULE

LOUISIANA STATE UNIVERSITY
Agricultural Experiment Station

Project LS: 1052

Schedule No._____ Interviewer_____

Parish:_____

Sample Area:_____ Segment No._____

Interviewee:_____

Color: W [ ] N [ ] O [ ]

Sex: M [ ] F [ ]

Section I

1. Head of household: [] Yes [] No, indicate_____.

2. Age____; Educational level (last grade attended)_____.

3. Main occupation_____ Secondary occupation_____.

4. Marital status_____ No. of children_____.

5. Others than immediate family living in household_____

_____

6. Were you reared here? (1) [] Yes (2) [] No. If no, how long lived here_____ yrs.

7. Were parents reared in this area? (1) [] Yes (2) [] No. If not, from where_____.

8. Is it possible for the average person to make a good living in this area? (1) [ ] Yes (2) [ ] No. Why_____

9. How do you feel about living in the country?

   (1) [ ] Strongly favorable

   (2) [ ] Favorable

   (3) [ ] Unfavorable

10. How often do you visit in homes of your neighbors?

    (1) [ ] Frequently (2 or more times a week)

    (2) [ ] Occasionally (less than twice a week, more than once a month)

    (3) [ ] Seldom (not more than once a month)

11. In general what are relations (feelings) of people in this area toward one another?

(1) [ ] Good (2) [ ] Fair (3) [ ] Poor

Toward outsiders: (1) [ ] Good (2) [ ] Fair (3) [ ] Poor.

Section II

12. Do you (1) Own the farm that you operate [ ]; (2) Rent for cash [ ]; (3) Rent for shares [ ]; (4) Own part and rent part [ ]. Other:_____

13. Total acres owned_____; how long owned_____

Approx. acres in: Cropland_____; Pastureland_____

Timberland_____.

14. How do you classify your farm:

(1) [ ] Cotton (6) [ ] Grain

(2) [ ] Cattle (7) [ ] Truck

(3) [ ] Dairy (8) [ ] General farming

(4) [ ] Hogs (9) [ ] Tree farm

(5) [ ] Poultry (10) [ ] Other_____

15. Crops, kind_____, _____, _____, _____

Acres_____, _____, _____, _____

16. Beefcattle, type_____.

Number	(1) [ ]	0 - 10	(5) [ ]	100-200
	(2) [ ]	10 - 50	(6) [ ]	200-400
	(3) [ ]	50 - 75	(7) [ ]	500-over
	(4) [ ]	75 -100		

17. Dairy cattle, type_____.

Number (1) [ ] 0-10 (3) [ ] 25- 50
(2) [ ] 10-25 (4) [ ] 50-100

18. Hogs, type_____.

Number (1) [ ] 0-10 (3) [ ] 25- 50
(2) [ ] 10-25 (4) [ ] 50-100

19. Other cattle, type_____.

Number (1) [ ] 0-10 (3) [ ] 25- 50
(2) [ ] 10-25 (4) [ ] 50-100

20. Trees, species_____.

Do you manage your timberland (1) [ ] yes; (2) [ ] No.
Last time sold timber_____.

Products sold:
[ ] Pulpwood [ ] Sawlogs [ ] Poles-piling.

How sold_____.

Note: If manages timberland ask questions in Section III directly which relate to forestry and forest fires after completing Sections I and II.

21. Gross income of products sold from farm last year:

(1) [ ] Under $250 (5) [ ] $2000-4000
(2) [ ] $250-500 (6) [ ] $4000-6000
(3) [ ] $500-1000 (7) [ ] $6000-10,000
(4) [ ] $1000-2000 (8) [ ] $10,000-over

Amount per cent from:

Crops_____; Cattle_____; Timber_____.

22. If you don't manage timberland for products, what good do you get out of your woodlands?

(1) [ ] Recreation (3) [ ] Grazing
(2) [ ] Home use (4) [ ] Other_____.

23. What do you think your land is best suited for?

(1) [ ] Crops
(2) [ ] Cattle
(3) [ ] Hogs
(4) [ ] Sheep
(5) [ ] General farming
(6) [ ] Timber
(7) [ ] Other_____

24. If question 23 not consistent with questions 15 thru 20 ask:

What prevents your using your land for the thing(s) you think it is best suited for?_____

25. What would you do differently from what you are doing if

you had more land?_____.

Less land?_____.

26. Are you interested in buying additional land? (1) [ ] Yes

(2) [ ] No. Selling your land? (1) [ ] Yes (2) [ ] No.

If Yes to either: What prevents you from doing so?

_____.

27. Do you get any good out of the adjoining land?

(1) [ ] Yes (2) [ ] No. If Yes what?

(1) [ ] Hunting
(2) [ ] Grazing
(3) [ ] Other_____.

28. Have you received any help or advice on farming? (1) [ ] Yes (2) [ ] No. On timber? (1) [ ] Yes (2) [ ] No.

29. What kind of help or advice did you get?_____

_____.

30. Where or from whom did you get help?_____

31. How did you learn of this help?

(1) [ ] Newspaper
(2) [ ] Newsletter
(3) [ ] Fairs
(4) [ ] Farmer's meeting
(5) [ ] County agent
(6) [ ] Magazines
(7) [ ] Movie
(8) [ ] Radio or TV
(9) [ ] Church
(10) [ ] School
(11) [ ] Other

32. Do you do any part-time work? (1) [ ] Yes (2) [ ] No.

If yes, what kind?_____.

33. How many days or weeks did you work off the farm last year?_____

34. Items used on farm or have used.

(1) [ ] Crop rotation
(2) [ ] Hybrid seed
(3) [ ] Winter cover crops
(4) [ ] Improved pastures
(5) [ ] Soil testing
(6) [ ] Planted trees
(7) [ ] Tractor
(8) [ ] Combine
(9) [ ] Hay baler
(10) [ ] Power saw
(11) [ ] Auto(s), year___
(12) [ ] T.V.
(13) [ ] Radio(s)
(14) [ ] Deep freeze
(15) [ ] Hot running water
(16) [ ] Cold running water
(17) [ ] Bathroom
(18) [ ] Washing machine
(19) [ ] Telephone
(20) [ ] Refrigerator

35. Value of farm machinery and equipment:

(1) [ ] Under $2,500
(2) [ ] $2,500-5,000
(3) [ ] $5,000-10,000
(4) [ ] $10,000-15,000
(5) [ ] $15,000-20,000
(6) [ ] $20,000-over

36. Gross family income last year:

(1) [ ] Under $1,500
(2) [ ] $1,500-3,000
(3) [ ] $3,000-5,000
(4) [ ] $5,000-10,000
(5) [ ] $10,000-over

Indicate following:

Proximity to forest area_____.

Type road live on_____.

Type home: (1) [ ] Painted wood
(2) [ ] Unpainted wood
(3) [ ] Brick or stone
(4) [ ] Stucco
(5) [ ] Shingles
(6) [ ] Asbestos siding

Condition of home, yard, and surroundings with respect to neatness, cleanliness, and soundness of structures:

_____

_____.

Section III

Note: If manages timberland, or introduces subject of forestry or forest fires, or otherwise indicates a positive attitude toward forestry ask the following questions in a direct manner, where applicable.

37. What type of management practices do you employ on your timberland?

(1) [ ] Firebreaks
(2) [ ] Fences
(3) [ ] Mark timber to cut
(4) [ ] Supervise cutting
(5) [ ] Cut own timber
(6) [ ] Protect reproduction
(7) [ ] Deaden hardwoods
(8) [ ] Other_____

38. What do you think of forestry (tree farming) in general, i.e., what is the value of forest to you?_____

(1) [ ] Favorable (2) [ ] Unfavorable

39. In your opinion is tree farming profitable?

(1) [ ] Yes (2) [ ] No.

Is it too much trouble? (1) [ ] Yes (2) [ ] No.

Does it interfere with other farm enterprises?

(1) [ ] Yes (2) [ ] No. If yes, how_____.

40. What are some of the objections which you have to the growing of trees, if any?

(1) [ ] No objections

(2) [ ] Fear of having timber destroyed by:

(a) [ ] Fire (b) [ ] Insects (c) [ ] Disease

(d) [ ] Other_____

(3) [ ] Takes too long to grow.

(4) [ ] Fear of not being able to sell timber.

(a) [ ] Will be too much timber in future.

(b) [ ] Companies have monopoly, set price, demand, etc.

(5) [ ] Cheap product, i.e., don't get enough money for.

(6) [ ] Difficult to grow, work too hard.

(7) [ ] Other_____.

41. Has protection of timberland improved in this area?

(1) [ ] Yes (2) [ ] No

Explain_____.

42. What is the cause of forest fires in this area?_____

_____.

43. In your opinion what can be done to stop forest fires in this area that are caused by people?_____

_____

44. Who or what kind of people burn the woods?_____

_____.

45. Note: Ask this question only where applicable. In reviewing the land ownership of this area I noticed that lots of the land is owned by large landowners or companies, what are the relations between the people in this area toward these large landowners, i.e., how do they feel toward them?

_____

_____.

If relations are poor, why?_____.

46. What do you feel the large landowners can do to improve their relations with the rural residents? _____

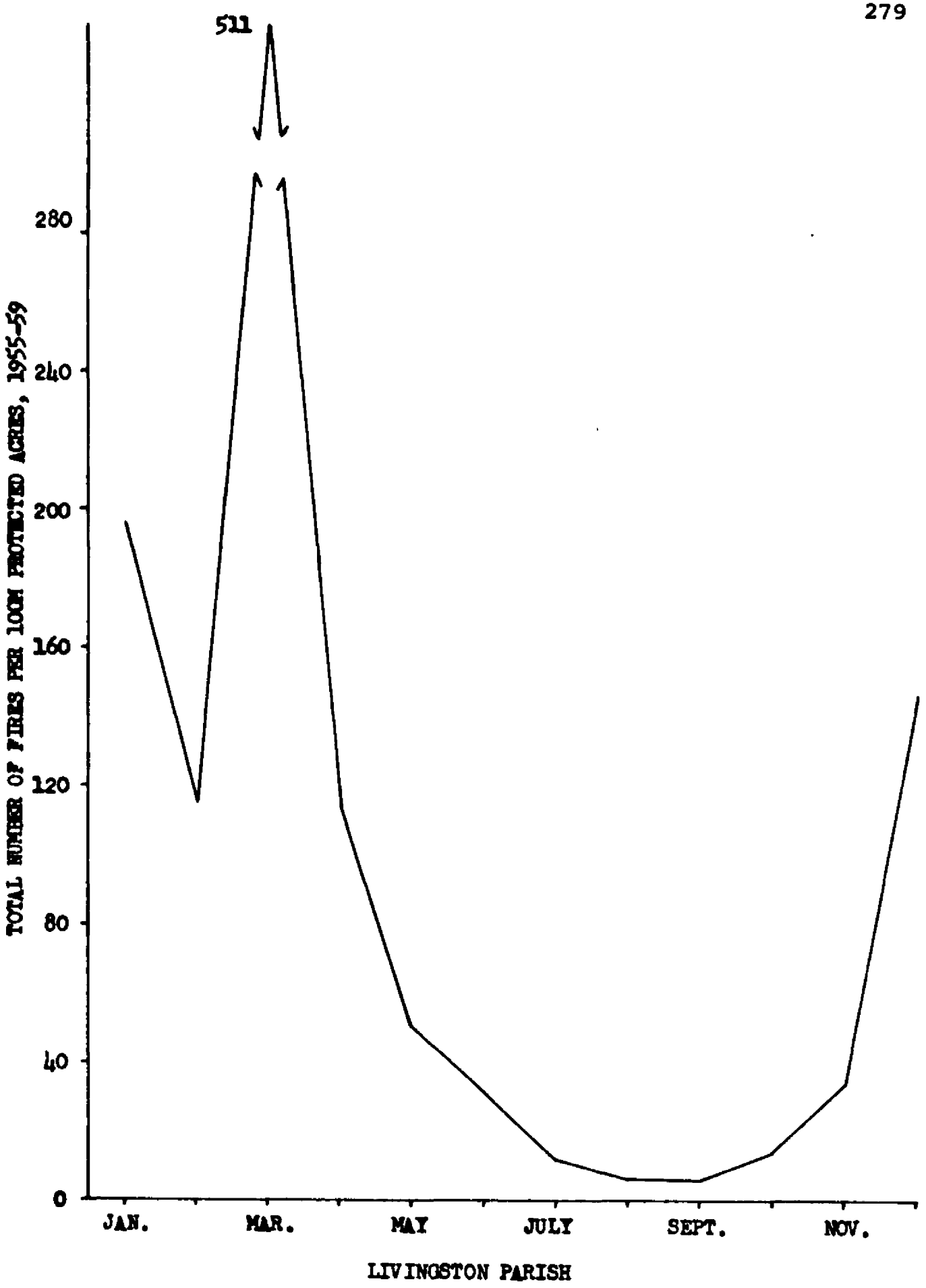
_____.

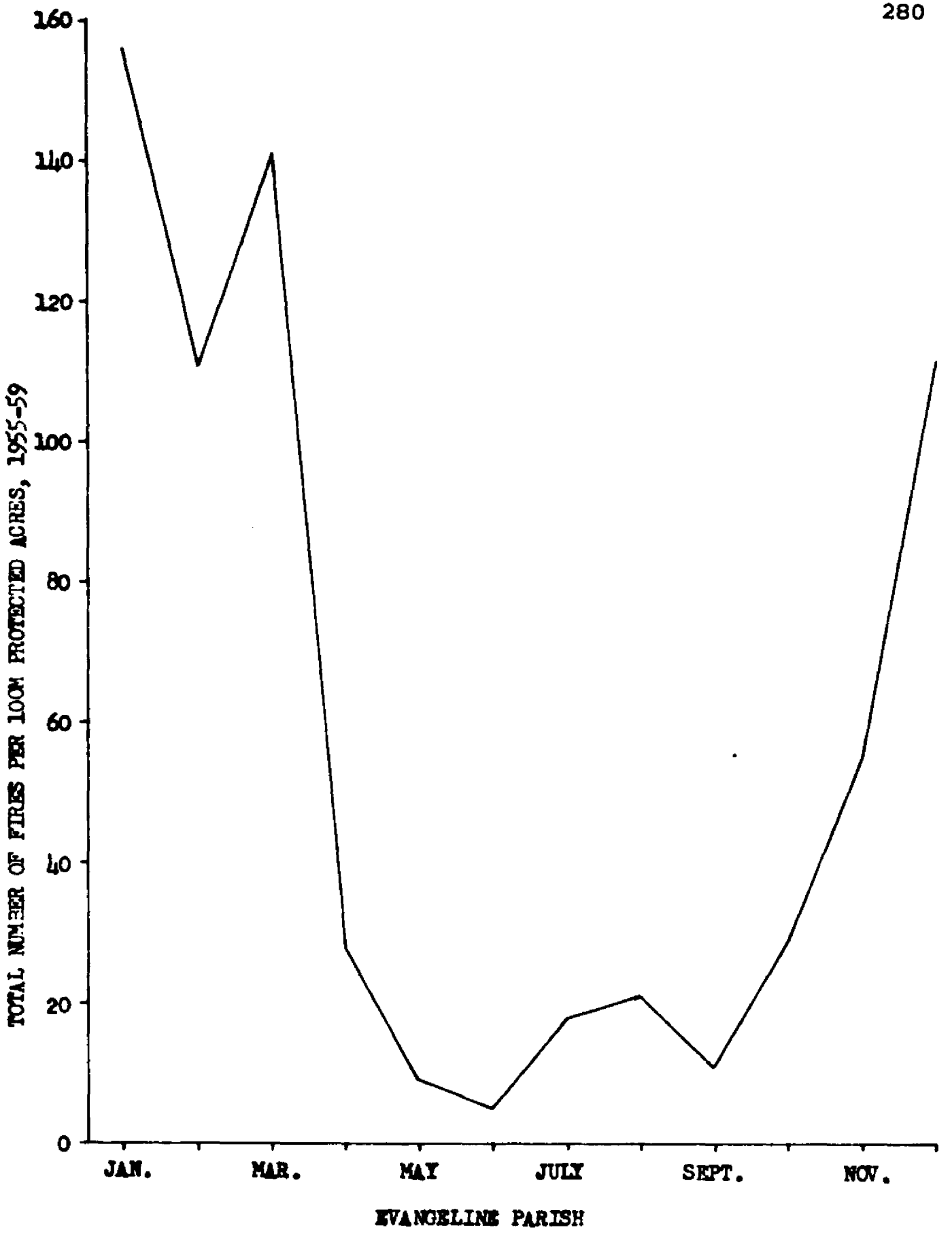
Note: If respondents don't manage timberland, or don't introduce subject of forestry or forest fires, or otherwise indicate a negative attitude toward forestry then introduce the following general questions in a non-direct manner.

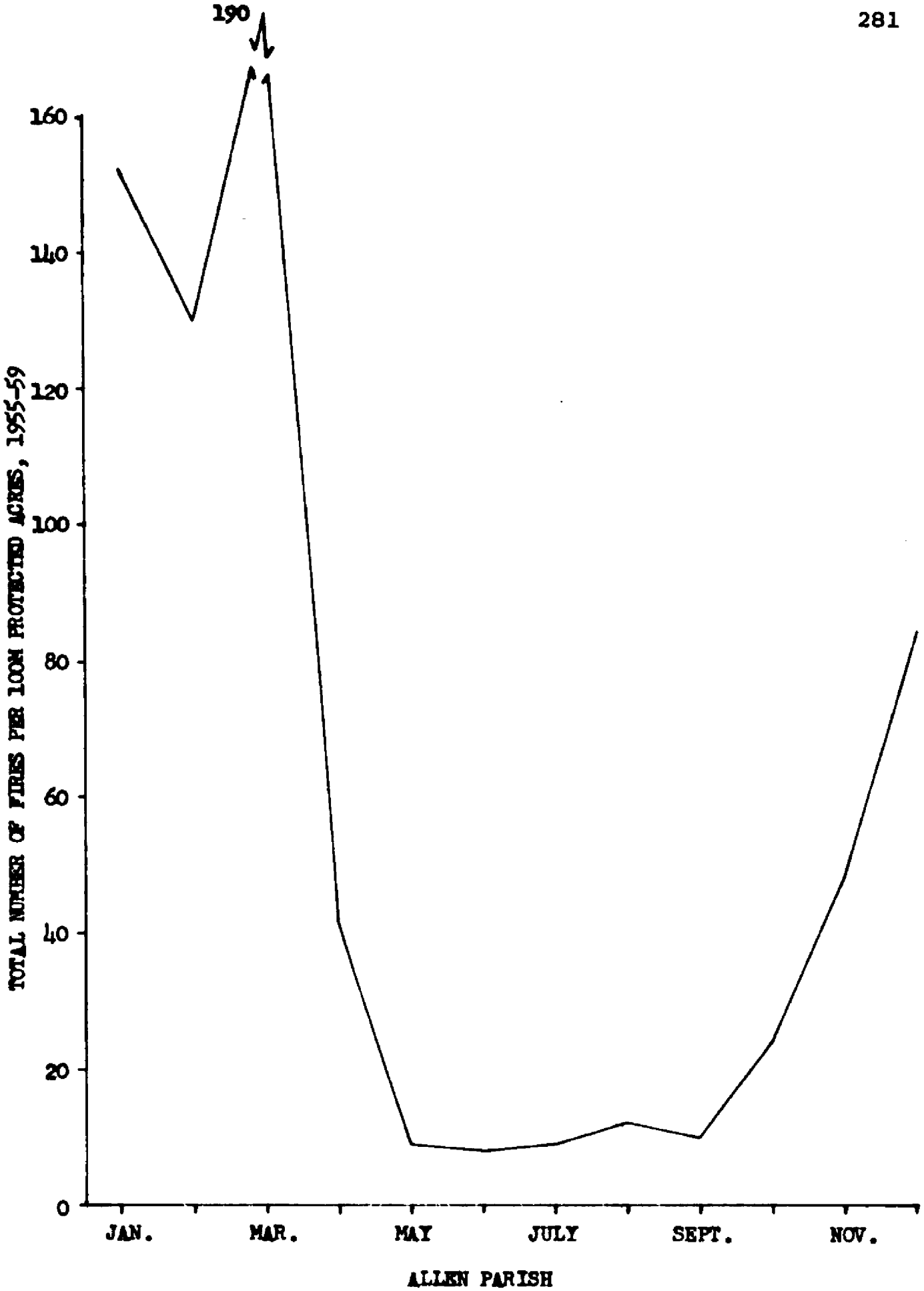
1. What do you think of forestry in general?
2. What are your objections to growing trees?
3. What causes forest fires in this area?
4. What can be done to prevent forest fires?
5. What kind of people burn the woods?
6. What are relations with large landowners (absentee owners) and how can improve such relations?

APPENDIX D

FIRE OCCURRENCE CURVES


511
280
240
200
160
120
80
40
0
TOTAL NUMBER OF FIRES PER 100M PROTECTED ACRES, 1955-59
JAN.
MAR.
MAY
JULY
SEPT.
NOV.
LIVINGSTON PARISH


160
140
120
100
80
60
40
20
0
TOTAL NUMBER OF FIRES PER 100M PROTECTED ACRES, 1955-59
JAN.
MAR.
MAY
JULY
SEPT.
NOV.
EVANGELINE PARISH


190
160
140
120
100
80
60
40
20
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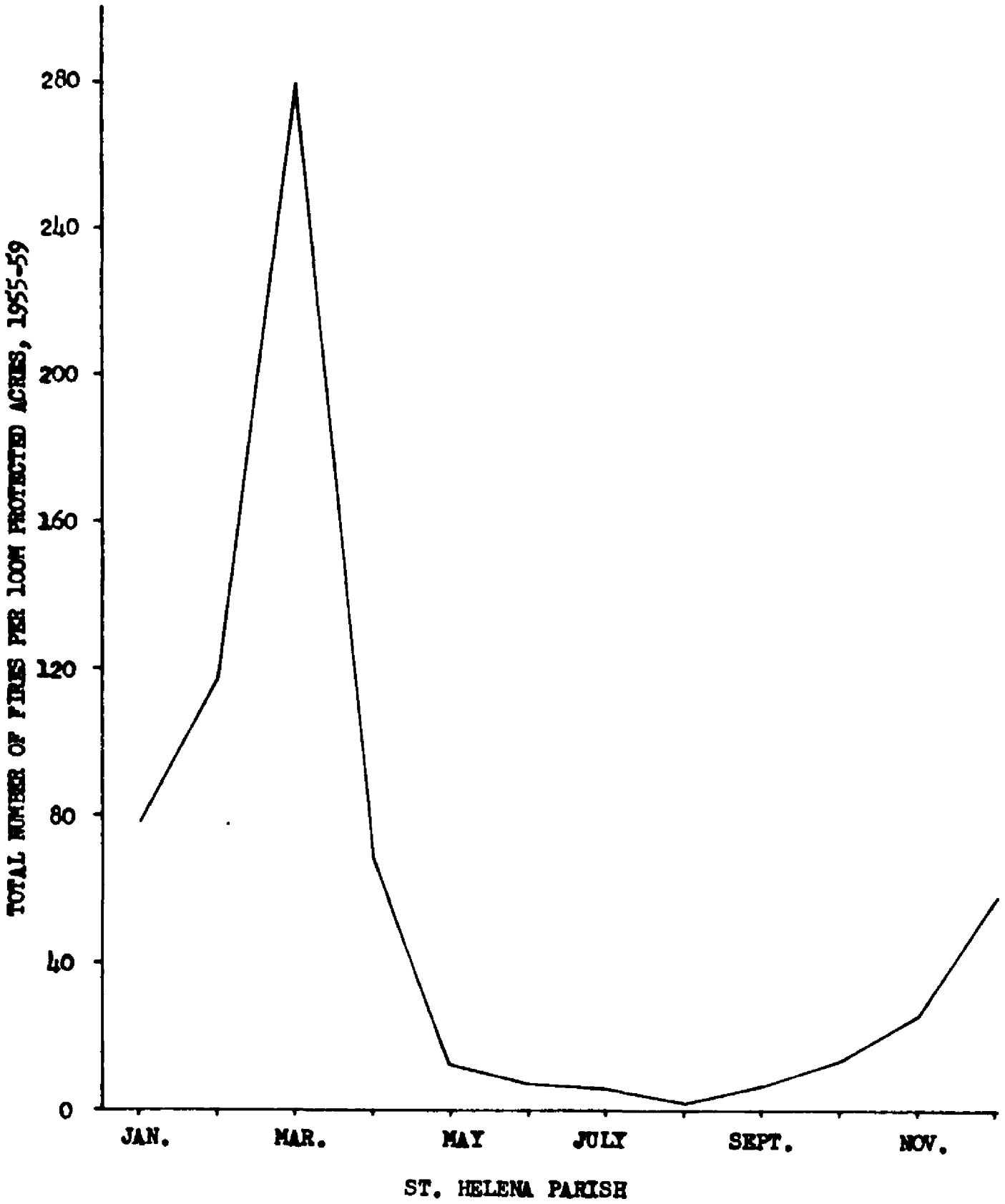
TOTAL NUMBER OF FIRES PER 100M PROTECTED ACRES, 1955-59
JAN.
MAR.
MAY
JULY
SEPT.
NOV.
ALLEN PARISH


280
240
200
160
120
80
40
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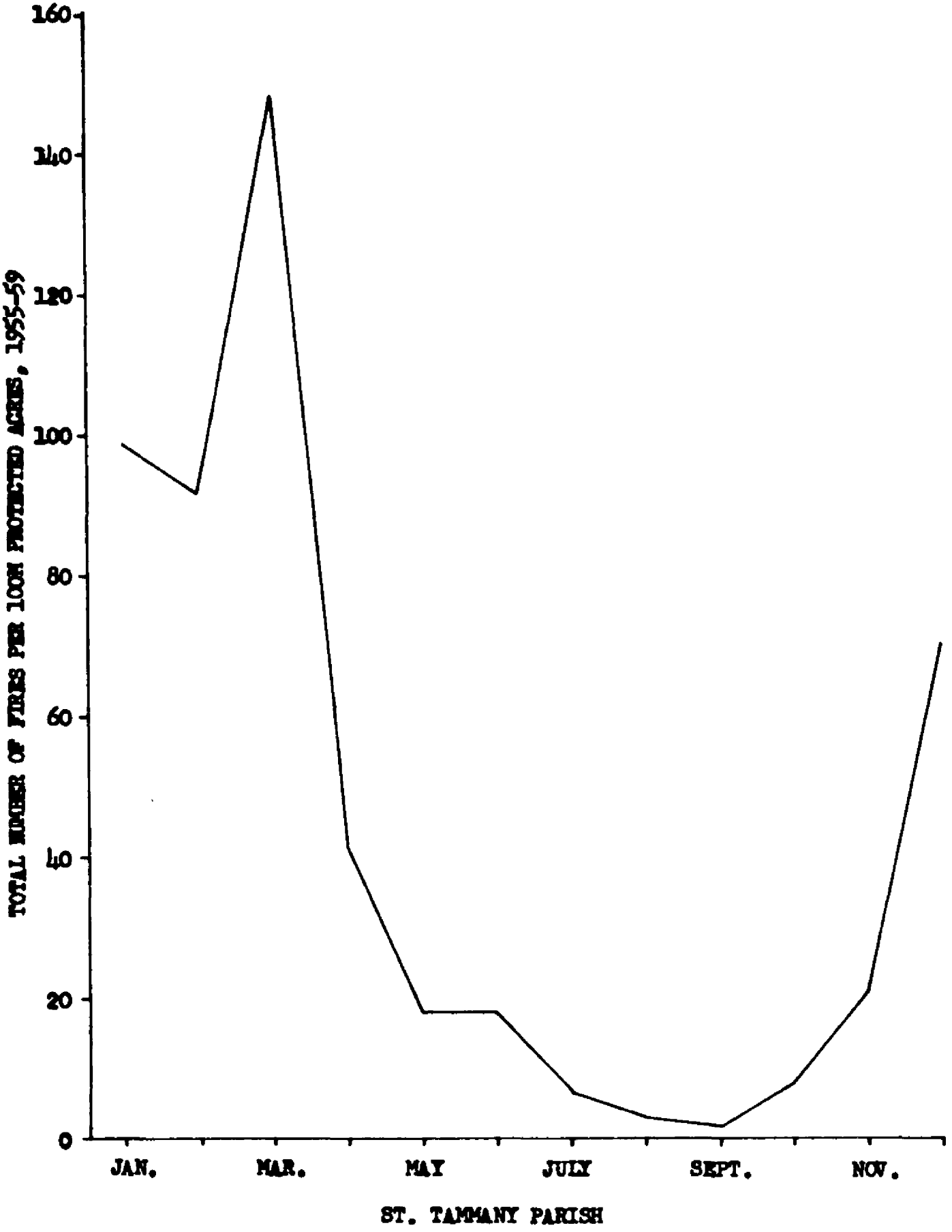
TOTAL NUMBER OF FIRES PER 100M PROTECTED ACRES, 1955-59
JAN.
MAR.
MAY
JULY
SEPT.
NOV.
ST. HELENA PARISH


160
140
120
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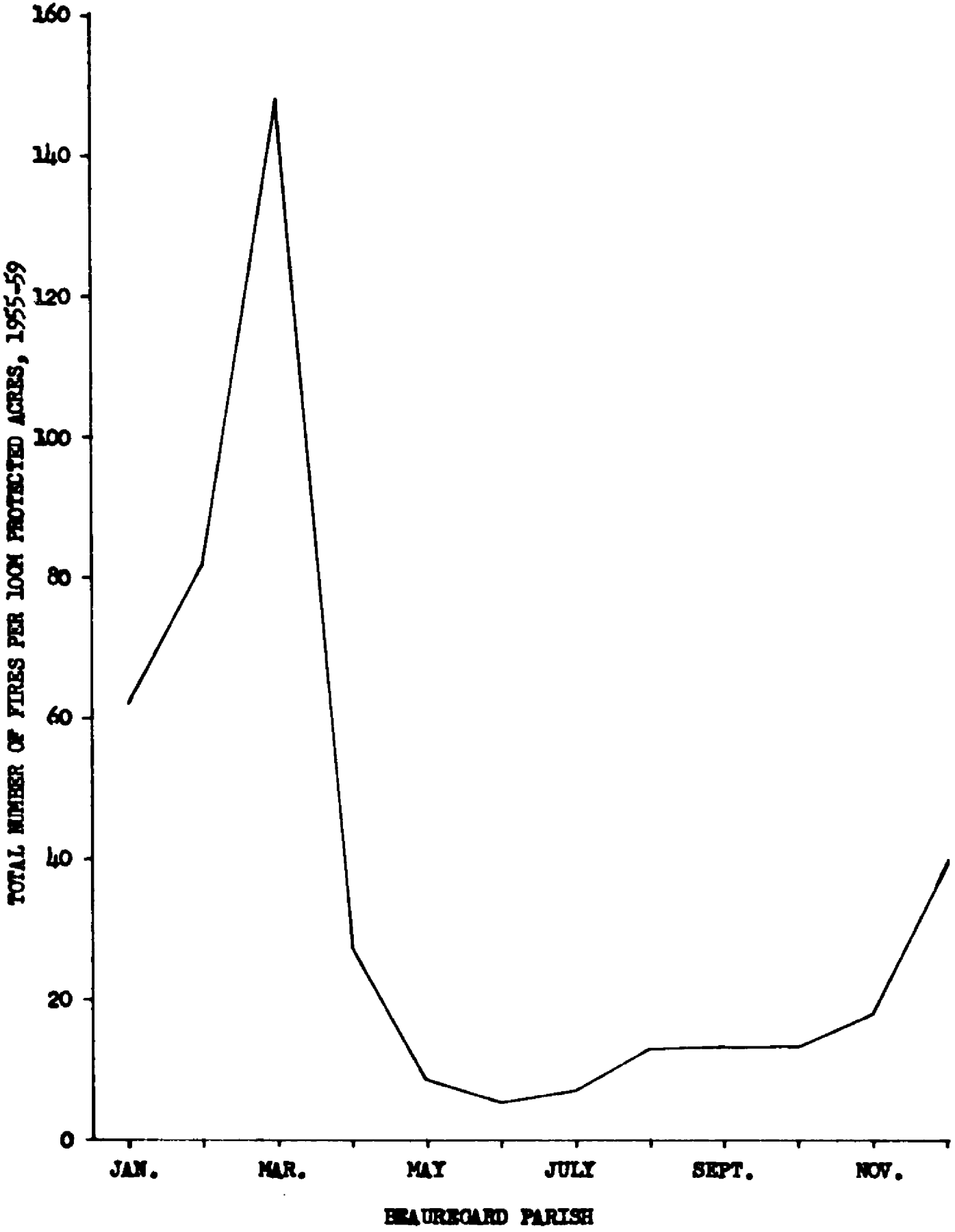
80
60
40
20
0
TOTAL NUMBER OF FIRES PER 100M PROTECTED ACRES, 1955-59
JAN.
MAR.
MAY
JULY
SEPT.
NOV.
ST. TAMMANY PARISH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140
120
100
80
60
40
20
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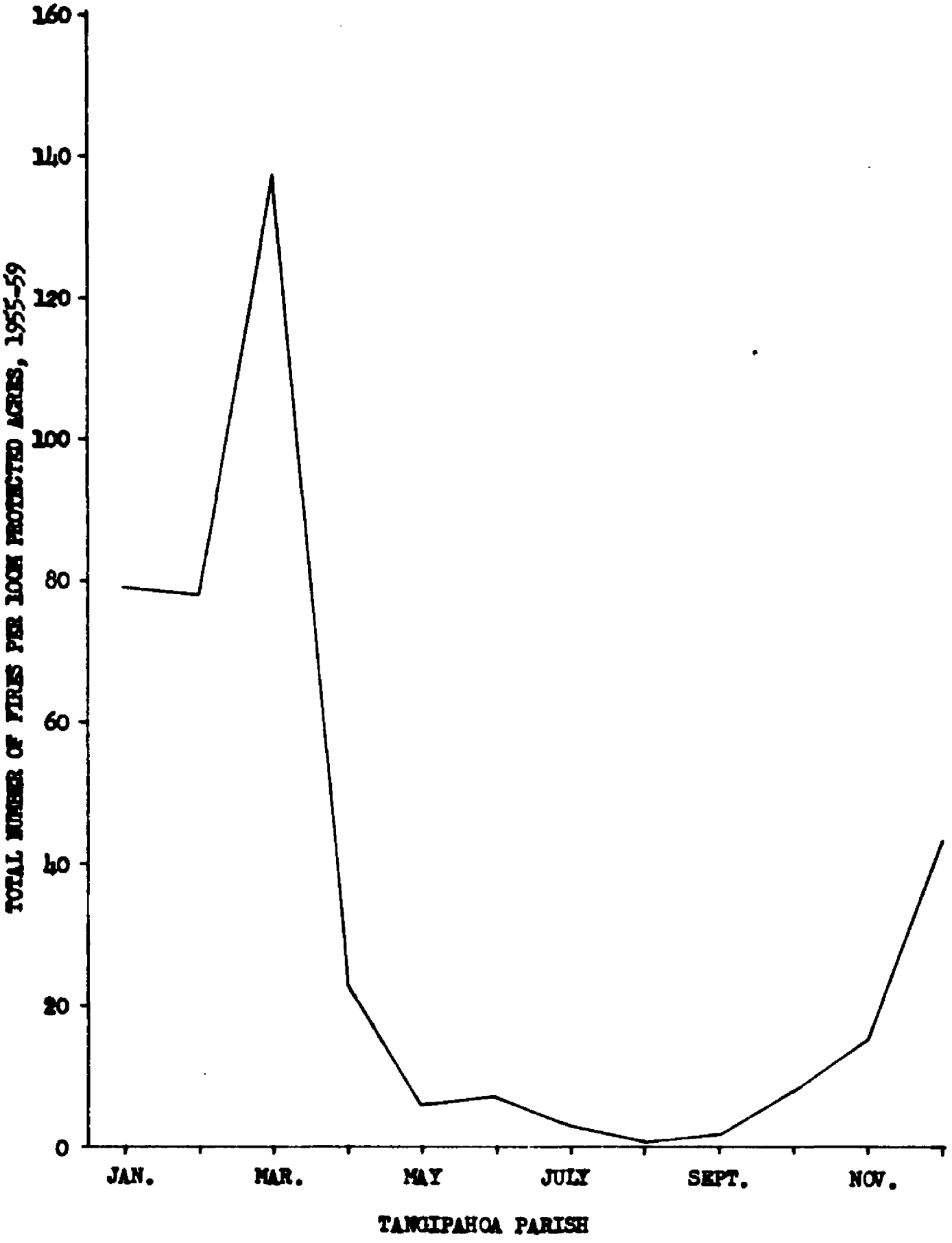
TOTAL NUMBER OF FIRES PER 100M PROTECTED ACRES, 1955-59
JAN.
MAR.
MAY
JULY
SEPT.
NOV.
BEAUREGARD PARISH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140
120
100
80
60
40
20
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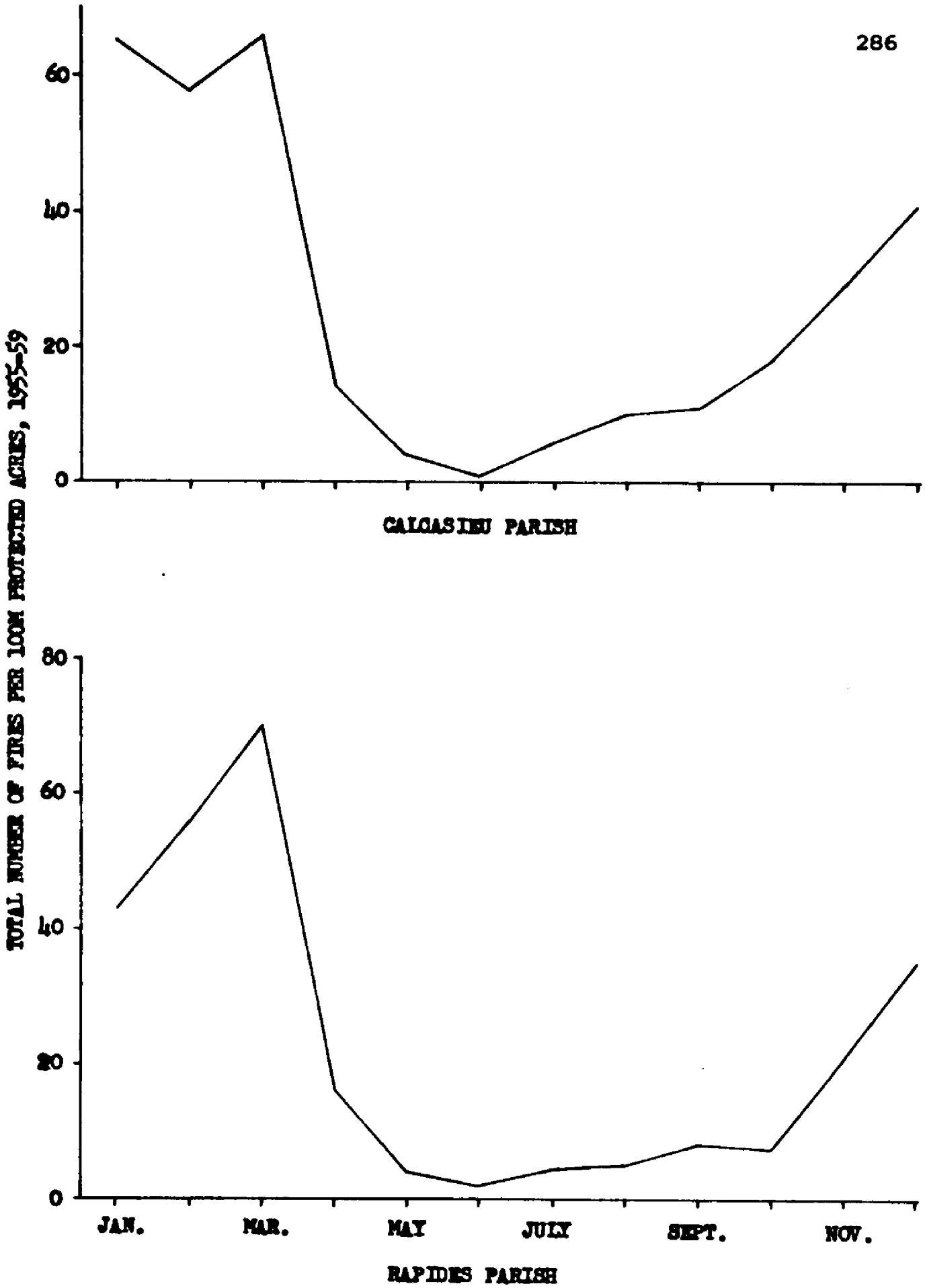
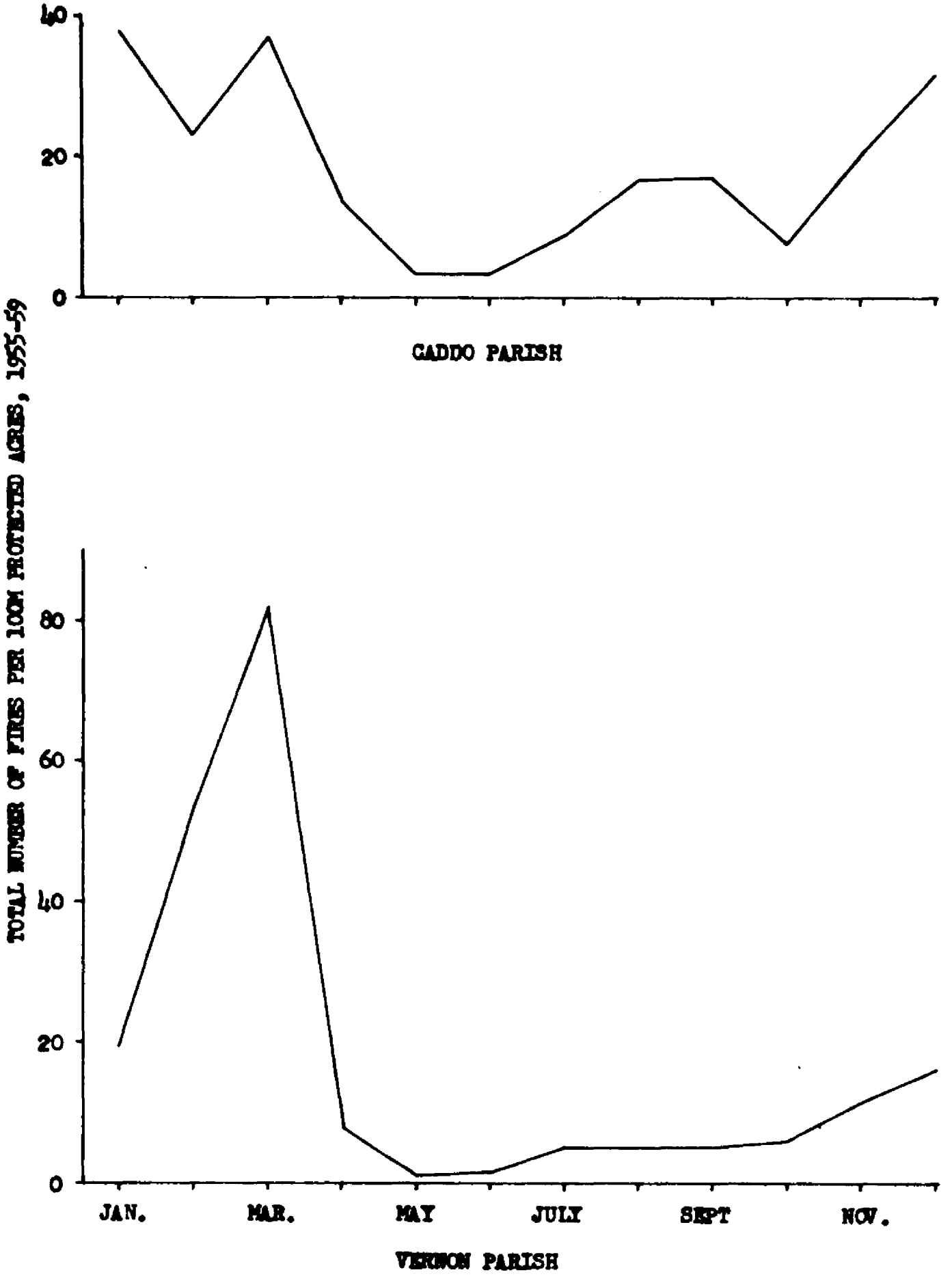
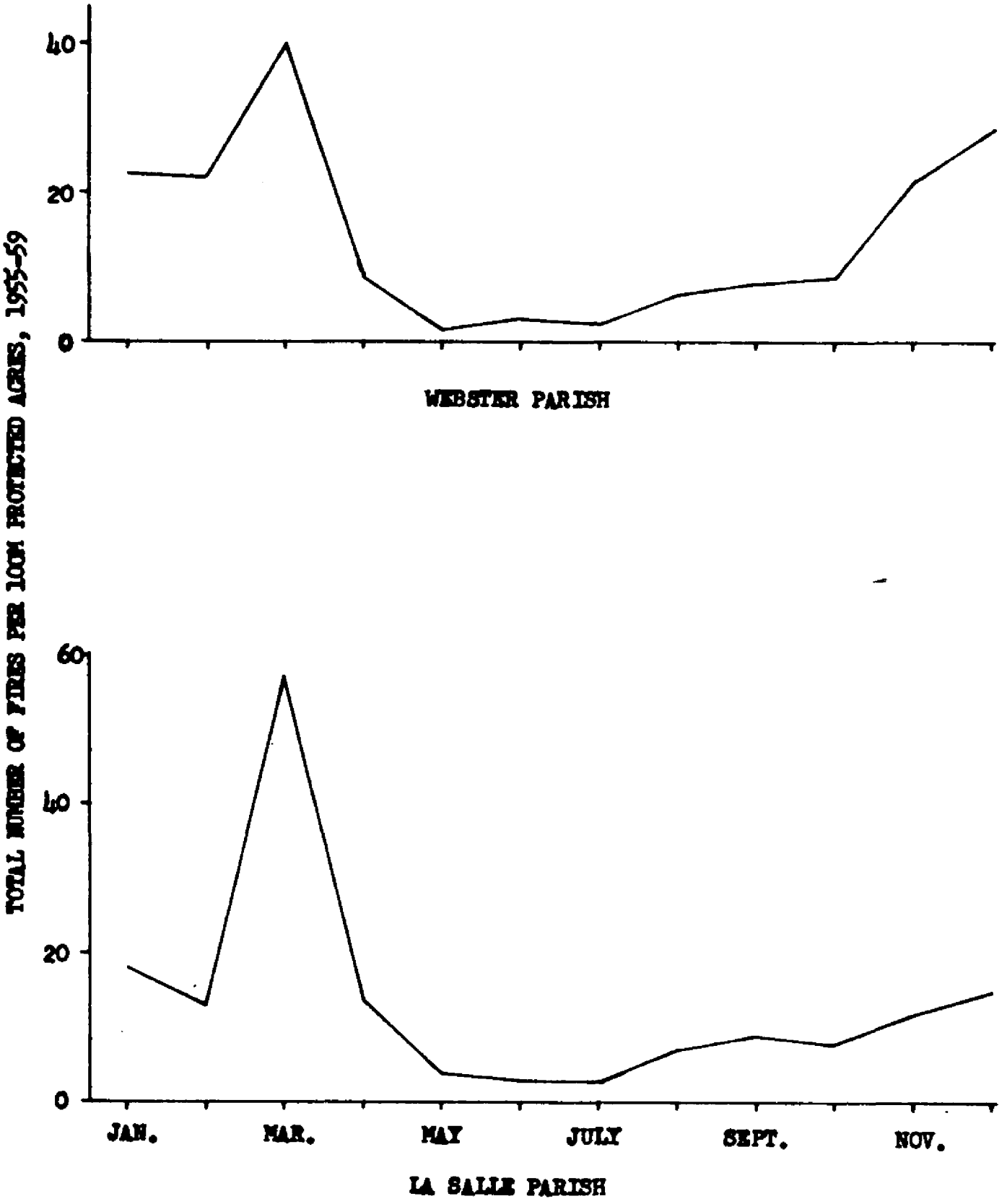
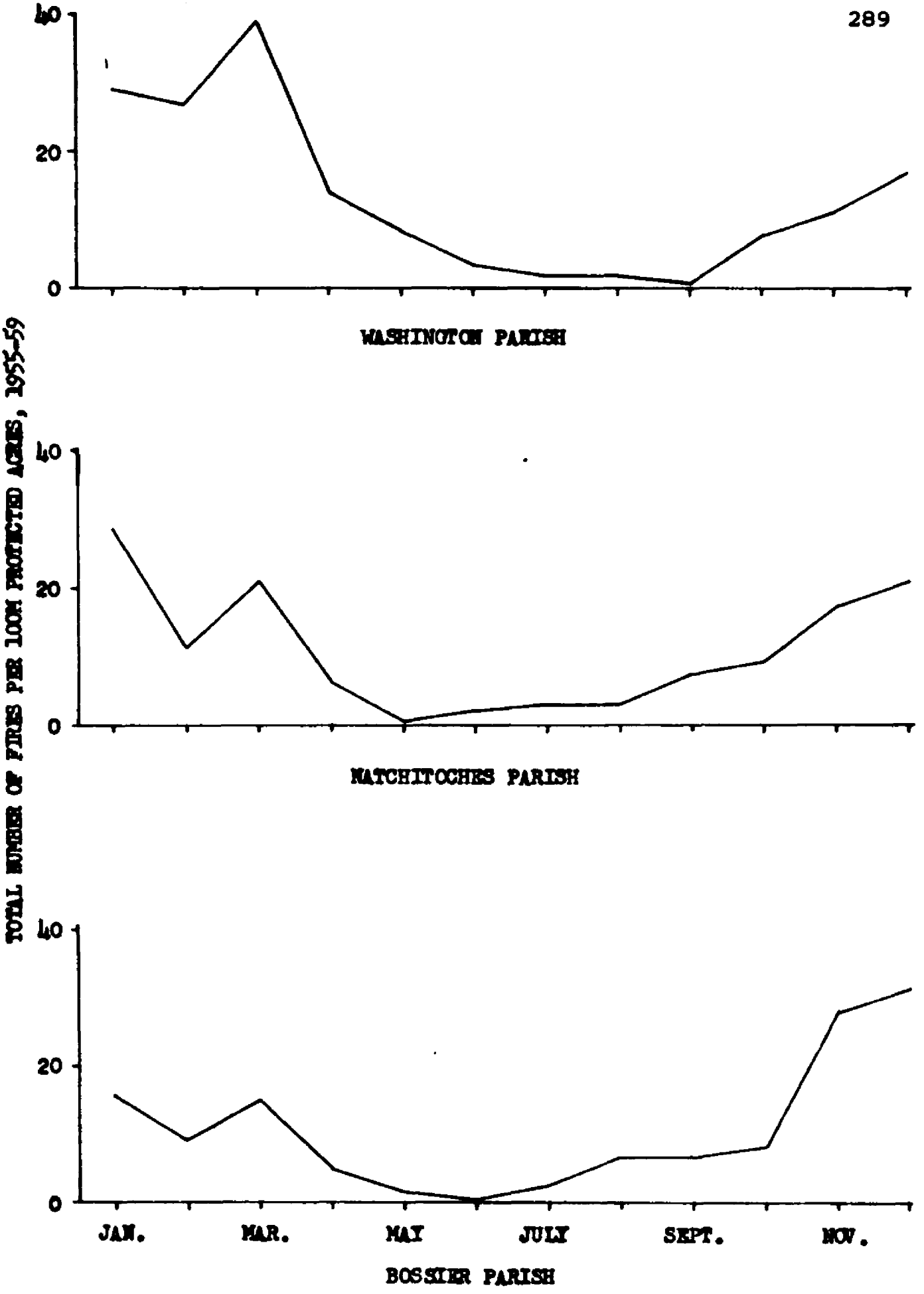
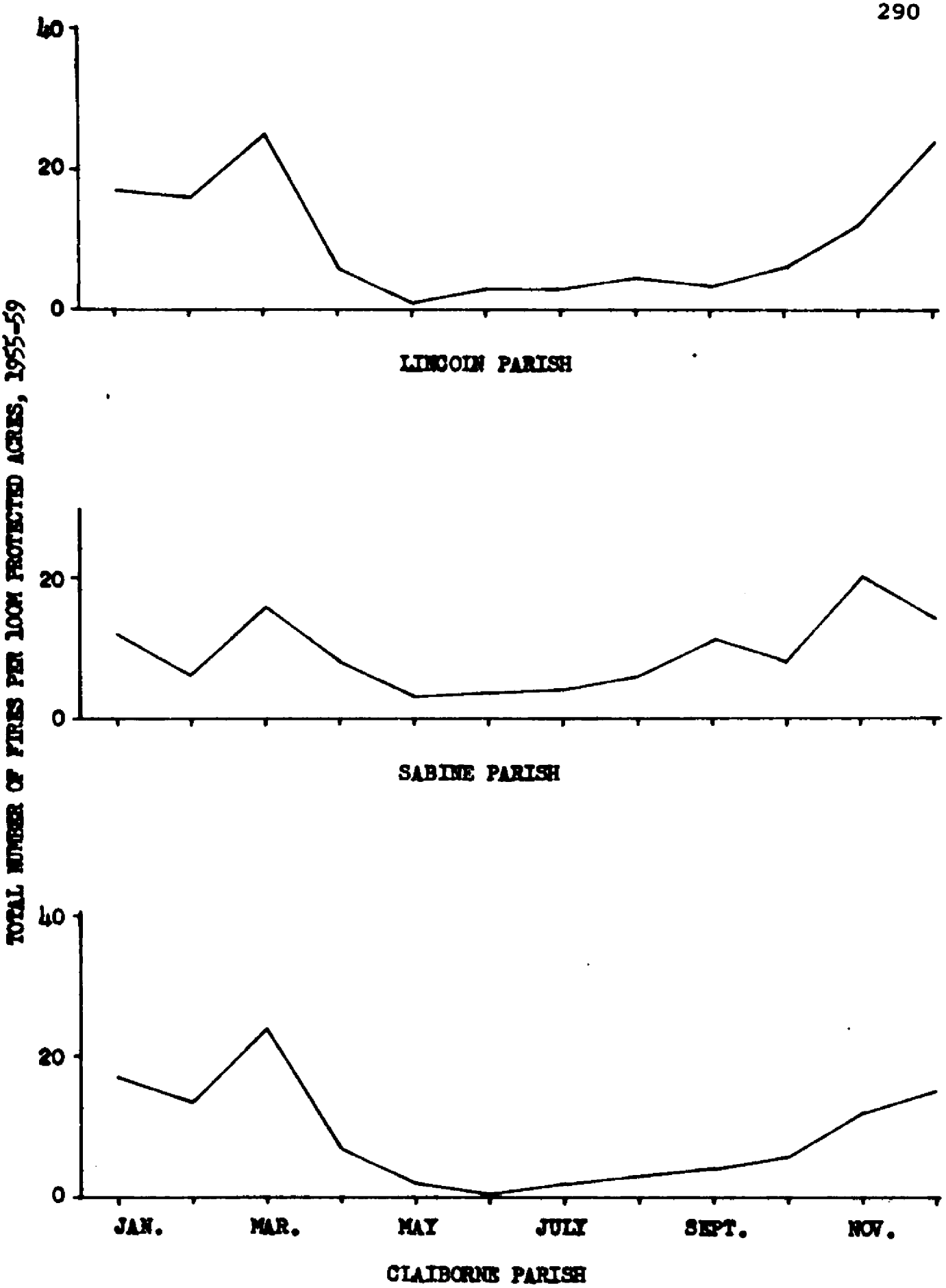
TOTAL NUMBER OF FIRES PER 100M PROTECTED ACRES, 1955-59
JAN.
MAR.
MAY
JULY
SEPT.
NOV.
TANGIPAHOA PARISH

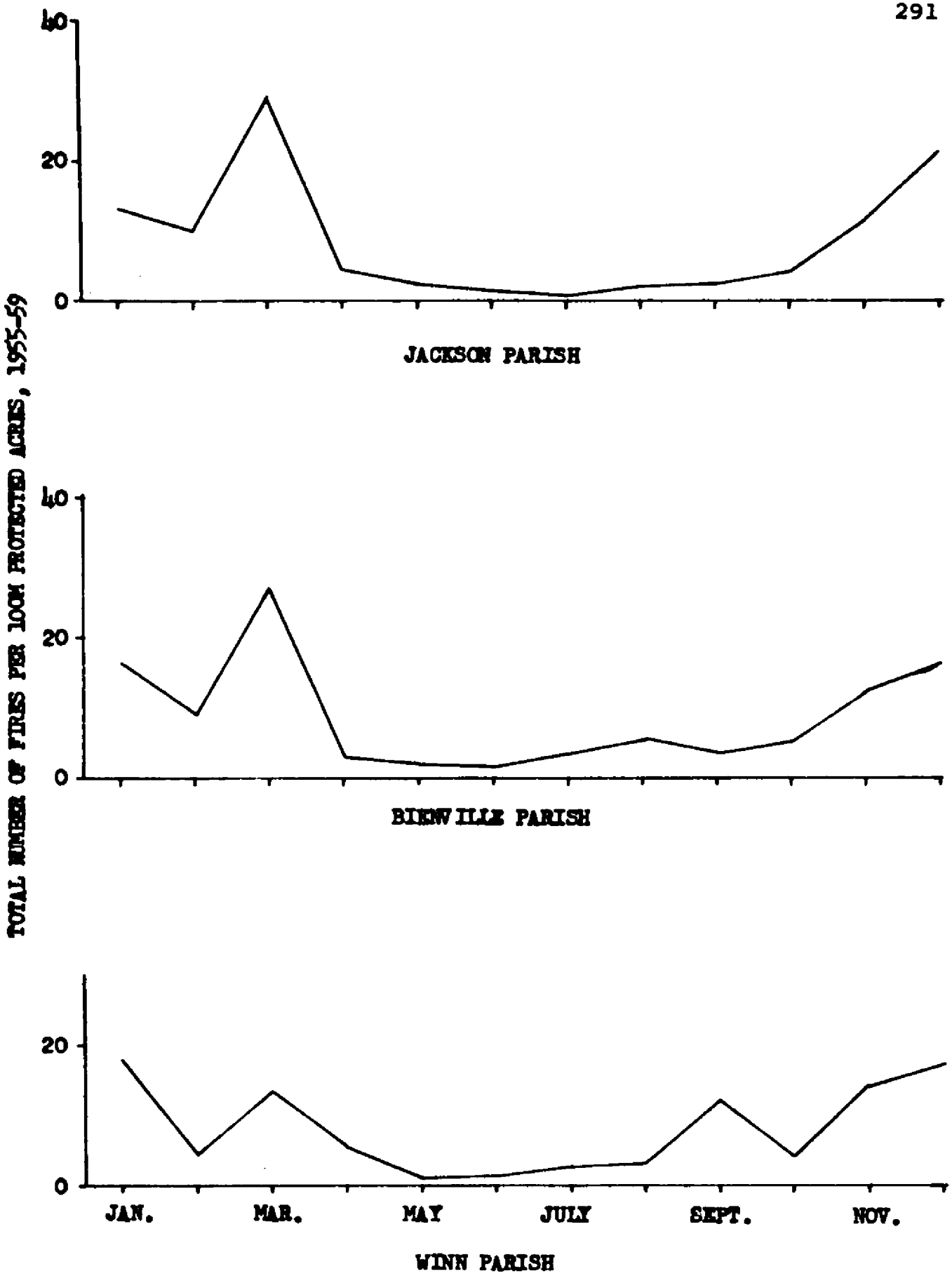

TOTAL NUMBER OF FIRES PER 100M PROTECTED ACRES, 1955-59
60
40
20
0
CALCASIEU PARISH
80
60
40
20
0
JAN.
MAR.
MAY
JULY
SEPT.
NOV.
RAPIDES PARISH

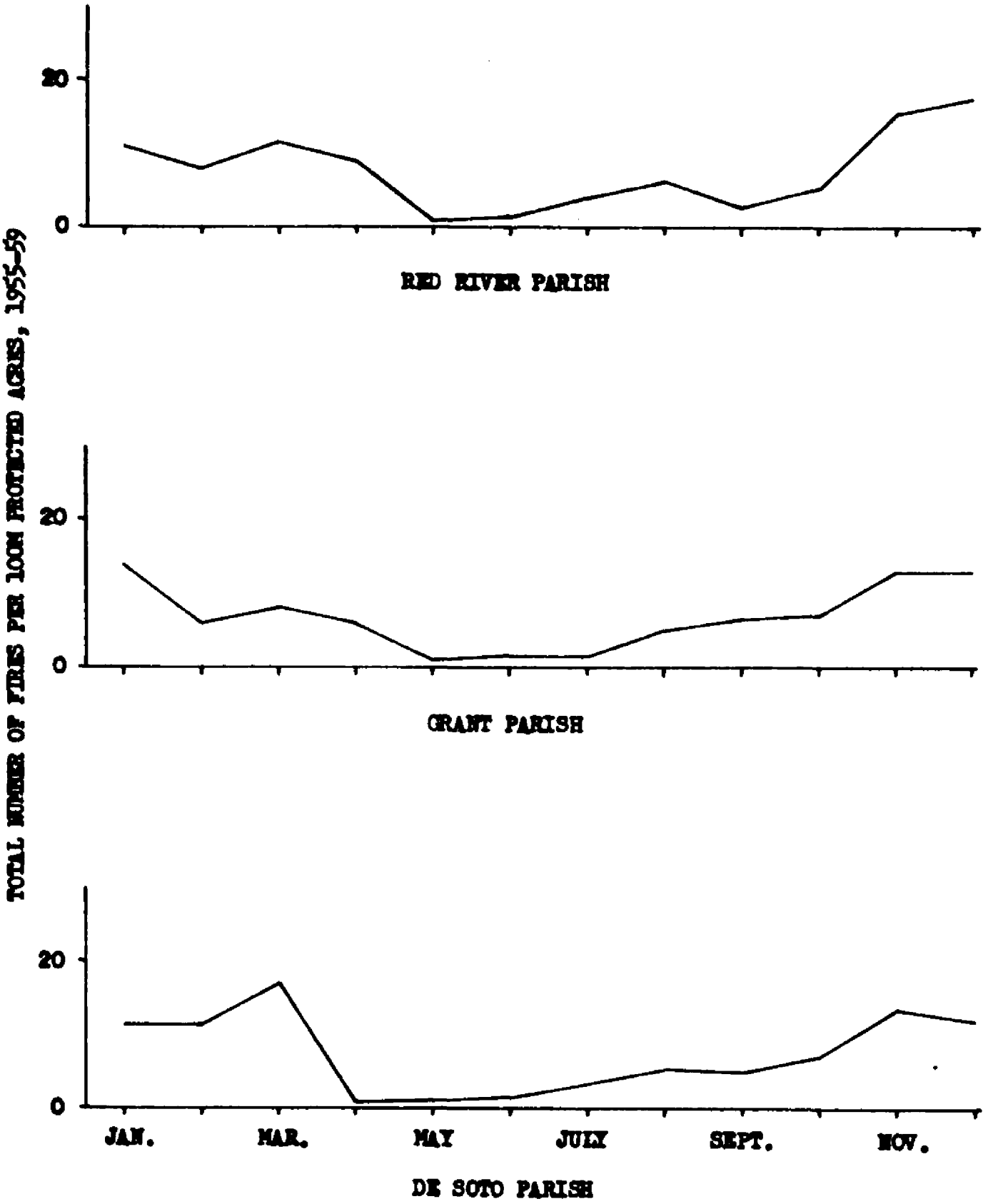

TOTAL NUMBER OF FIRES PER 100M PROTECTED ACRES, 1955-59
40
20
0
CADDO PARISH
80
60
40
20
0
JAN.
MAR.
MAY
JULY
SEPT
NOV.
VERNON PARISH

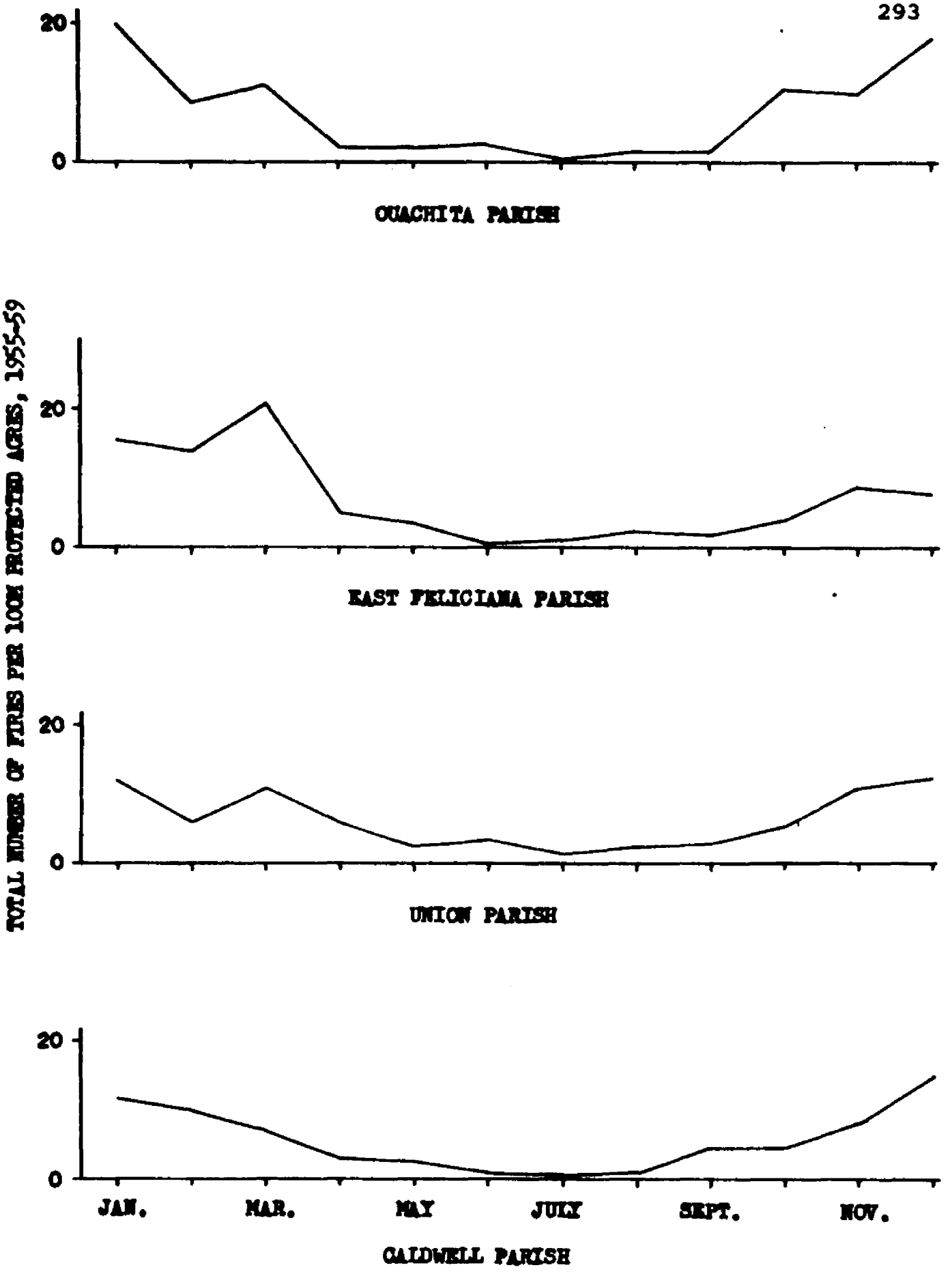

TOTAL NUMBER OF FIRES PER 100M PROTECTED ACRES, 1955-59
40
20
0
WEBSTER PARISH
60
40
20
0
JAN.
MAR.
MAY
JULY
SEPT.
NOV.
LA SALLE PARISH


TOTAL NUMBER OF FIRES PER 100M PROTECTED ACRES, 1955-59
40
20
0
WASHINGTON PARISH
40
20
0
NATCHITOCHES PARISH
40
20
0
JAN.
MAR.
MAY
JULY
SEPT.
NOV.
BOSSIER PARISH


TOTAL NUMBER OF FIRES PER 100M PROTECTED ACRES, 1955-59
40
20
0
LINCOLN PARISH
20
0
SABINE PARISH
40
20
0
JAN.
MAR.
MAY
JULY
SEPT.
NOV.
CLAIBORNE PARISH


TOTAL NUMBER OF FIRES PER 100M PROTECTED ACRES, 1955-59
40
20
0
JACKSON PARISH
40
20
0
BIENVILLE PARISH
20
0
JAN.
MAR.
MAY
JULY
SEPT.
NOV.
WINN PARISH


TOTAL NUMBER OF FIRES PER 1000 PROTECTED ACRES, 1955-59
20
0
RED RIVER PARISH
20
0
GRANT PARISH
20
0
JAN.
MAR.
MAY
JULY
SEPT.
NOV.
DE SOTO PARISH


TOTAL NUMBER OF FIRES PER 100M PROTECTED ACRES, 1955-59
20
0
OUACHITA PARISH
20
0
EAST FELICIANA PARISH
20
0
UNION PARISH
20
0
JAN.
MAR.
MAY
JULY
SEPT.
NOV.
CALDWELL PARISH

NUMBER OF FOREST FIRES PER 100M PROTECTED ACRES
BY MONTH DURING 5-YEAR PERIOD 1955-59

Parish	Month					
	Jan.	Feb.	Mar.	Apr.	May	June
Livingston	196.5	115.2	511.4	113.6	51.0	31.3
Evangeline	156.2	111.5	140.8	27.7	9.2	4.6
Allen	152.4	129.6	189.5	41.8	9.4	7.7
St. Helena	77.9	116.9	279.3	69.5	11.7	7.0
St. Tammany	98.8	91.6	148.1	41.9	18.4	17.7
Beauregard	62.1	82.4	148.2	27.5	8.4	5.3
Tangipahoa	78.8	78.2	136.6	23.4	5.9	6.7
Calcasieu	65.3	57.7	65.7	14.3	3.8	1.1
Rapides	43.1	56.0	70.1	16.4	4.2	2.2
Caddo	38.3	23.4	37.2	14.1	3.4	3.4
Vernon	19.4	53.3	81.4	7.8	1.0	1.4
Webster	22.5	21.7	39.5	8.3	1.6	3.2
LaSalle	17.7	13.3	56.5	14.1	3.9	2.7
Washington	28.5	26.5	38.8	13.8	8.6	3.4
Natchitoches	29.2	11.4	21.1	6.3	.4	2.0
Bossier	15.4	8.9	14.9	5.1	1.4	0
Lincoln	16.8	15.6	25.1	5.6	1.1	2.8
Sabine	12.2	5.8	15.5	7.9	2.9	3.5
Claiborne	17.0	13.6	23.7	7.1	2.0	0
Jackson	13.2	10.0	29.3	4.5	2.3	1.6
Bienville	16.4	9.3	17.0	2.9	2.1	1.6
Winn	18.2	4.4	13.1	5.3	.9	1.1
Red River	10.6	8.4	11.3	9.2	.7	1.4
Grant	13.7	6.2	17.7	5.8	.9	1.3
DeSoto	11.4	11.4	16.9	.8	1.1	1.4
Ouachita	20.1	8.5	11.0	1.8	1.8	2.5
E. Feliciana	15.3	14.1	21.2	5.3	3.5	.6
Union	11.9	6.3	11.2	5.8	2.6	3.5
Caldwell	11.6	9.9	6.8	2.7	2.4	.7
Average	44.5	38.7	75.8	17.6	5.7	4.2

NUMBER OF FOREST FIRES PER 100M PROTECTED ACRES
BY MONTH DURING 5-YEAR PERIOD 1955-59

Parish	Month					
	July	Aug.	Sept.	Oct.	Nov.	Dec.
Livingston	12.0	5.7	6.0	13.6	33.9	143.0
Evangeline	17.7	20.8	11.5	29.2	54.9	110.8
Allen	9.4	11.7	9.7	24.4	47.7	84.1
St. Helena	6.1	2.4	6.6	14.1	27.2	58.2
St. Tammany	7.2	3.3	2.3	7.9	20.7	70.0
Beauregard	7.7	13.2	13.5	13.5	18.3	38.8
Tangipahoa	3.0	.5	1.6	8.3	15.3	42.5
Calcasieu	5.7	10.2	10.9	18.1	29.4	41.1
Rapides	4.4	4.9	8.0	7.3	21.0	35.0
Caddo	9.0	17.2	17.6	7.9	20.3	32.1
Vernon	5.1	5.1	5.1	5.7	11.4	15.7
Webster	2.4	6.3	7.9	8.7	22.1	28.8
LaSalle	3.1	7.1	9.0	7.8	12.2	14.9
Washington	1.7	2.1	.7	7.6	11.0	16.8
Natchitoches	3.1	2.9	7.4	9.4	17.6	20.7
Bossier	2.6	6.6	6.6	8.0	28.3	31.4
Lincoln	2.8	4.5	3.4	6.2	12.3	24.0
Sabine	4.0	5.7	10.6	7.9	20.1	14.1
Claiborne	2.0	2.7	3.7	5.4	11.9	15.2
Jackson	.3	1.9	2.3	4.2	11.3	21.2
Bienville	3.2	5.6	3.4	5.0	11.9	16.2
Winn	2.4	2.7	11.8	3.6	13.8	17.3
Red River	4.2	6.3	2.8	5.6	15.5	17.6
Grant	1.3	4.9	6.6	7.1	12.8	12.8
DeSoto	3.3	5.3	4.7	7.2	13.3	11.9
Ouachita	0	1.4	1.4	10.6	10.2	18.0
E. Feliciana	1.2	2.4	1.8	4.1	8.8	8.2
Union	1.5	2.6	2.8	5.6	11.0	12.5
Caldwell	.3	.7	4.4	4.4	8.2	15.0
Average	4.4	5.7	6.3	9.3	19.0	34.1

VITA

The author was born on June 24, 1923, in Greenfield, Weakley County, Tennessee. He received his elementary and secondary education in that city, graduating from Greenfield High School in May, 1941. In September of the same year he entered the University of Tennessee. He enlisted in the United States Navy as an aviation cadet on July 14, 1942 and was commissioned a 2nd Lieutenant in the United States Marine Corps (Aviation) on December 23, 1943.

On March 17, 1944 he married Virginia Sanders of Dresden, Weakley County, Tennessee. They now have two children, Thomas Allen, born May 9, 1951 and Faith, born October 17, 1954.

The author was honorably separated from military service January 8, 1946. In February, 1946, he began his undergraduate study in forestry at Louisiana State University, receiving the Bachelor of Science in Forestry in June, 1949.

He was employed by Louisiana State University as a Research Associate in Forestry at the North Louisiana Hill Farm Experiment Station, Homer, Louisiana, on June 15, 1949.

He resigned this position to enter private business in September, 1950.

On June 14, 1952, he was recalled to active duty in the Marine Corps as a result of the Korean War. He was released to inactive duty in the Marine Corps Reserve in February, 1955. As a Major in the Marine Corps Reserve, he is the Intelligence Officer, 8th Marine Reserve Staff Group, New Orleans, Louisiana.

He was employed as Assistant Forester at the North Louisiana Hill Farm Experiment Station in April, 1955. In September, 1956, he re-entered Louisiana State University and received the Master of Forestry degree in June, 1957. At the present time he is an assistant professor in the School of Forestry, Louisiana State University.

EXAMINATION AND THESIS REPORT

Candidate: Thomas Hansbrough

Major Field: Sociology

Title of Thesis: A Sociological Analysis of Man-Caused Forest Fires in Louisiana

Approved:

Alvin L. LeVeaux

Major Professor and Chairman

W. L. Johnson

Dean of the Graduate School

EXAMINING COMMITTEE:

J. D. Burns Jr.

J. M. Sanders

Fred C. Frey

Frederick L. Bates

Paul T. Burns

Date of Examination:

July 7, 1961